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Engineering Alloys

Engineering Alloys

FIFTH EDITION

Edited by

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Consulting Metallurgical Engineer
and Editor of "Alloy Digest"
Formerly Chief Metallurgical Engineer, Bendix Aviation Corporation;
Senior Materials Engineer and Director of Research, United States Naval Gun Factory
Research Metallurgical Engineer, Westinghouse Electric Corp.;
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Preface to Fifth Edition

Since publication of the Fourth Edition in 1962 a number of changes have taken place. The major one, as far as this book is concerned, was the death of Norman E. Woldman late in 1969. Dr. Woldman had developed Engineering Alloys through four editions to the high standard that made it a world wide valuable publication. He was at work gathering data for the Fifth Edition at the time of his death. His general knowledge, initiative and organizing ability will be greatly missed.

As an old friend and former co-worker I was asked to finish the revision of the Fifth Edition along the lines he had planned. This involved several procedures to permit the maximum number of alloy entries with a minimum increase in the number of pages.

1. Eliminate the obsolete and discontinued alloys. This has been largely done but a list of the discontinued alloys is given in Section IV along with the code number of the supplier so that if any information on these alloys is required a reference can be made to the source.
2. Eliminate the Alphabetical Index, formerly Section II and put all alloy listings in alphabetical order. This leaves room for many new alloys.
3. Weed out and eliminate a number of duplicate listings.

An additional number of alloys and suppliers is included, and many alloys have been revised and brought up to date. Over 10,000 new or revised alloys are listed.

One trend among suppliers has been noted and that is the tendency to drop certain trade names and go to numbers corresponding to Trade Association standards, particularly Copper Development Association, American Iron and Steel Institute, and the Aluminum Association. This was a major reason for updating many alloy names, and also a reason for many suppliers, particularly foundries, in ceasing to use proprietary names.

Because of this trend an additional section has been added listing some of these association alloys, mainly for composition but also for some mechanical properties. It should be noted that these lists change from year to year.

I wish to express appreciation to The Aluminum Association, American Iron and Steel Institute, American Society for Testing and Materials, Copper Development Association, and Society of Automotive Engineers, Inc. for permission to use some of their charts and tables I also wish to express appreciation to my wife, Mildred, for aid and assistance in the arduous task of alphabetizing.

Robert C. Gibbons

Preface to Fourth Edition

Since the publication of the Third Edition in 1952 over 15,000 additional proprietary alloys have been accumulated from sources throughout the world, making a grand total of over 35,000 alloys for the newly revised Fourth Edition. Publication rights to the Fourth Edition have been transferred from the American Society for Metals to the Reinhold Publishing Corporation to take advantage of their international sales capabilities.

As in the previous editions, obsolete and discontinued proprietary alloys have been retained not only for historical value but because many of these alloys can still be found on metal fabricators' and consumers' blueprints and specifications. And, although not necessarily a standard or active product with the alloy mill, the alloy or alloys may continue to be made by the respective mills if ordered in mill lots.

The data and information on all the alloys were brought up to date by sending tear sheets from the Third Edition to all the ferrous and non-ferrous alloy manufacturers, with the request that they make the necessary corrections, changes and additions for their own alloys and submit the approved copies to the author. All these corrections and changes have been incorporated in the Fourth Edition.

The format of the Fourth Edition has been changed to enable the author to include more useful information on the alloys. Instead of the previous tabulated organization where space was limited, each alloy is now abstracted in a separate paragraph showing the chemical composition, mechanical properties, uses, and general characteristics.

Preface to Third Edition

During the seven years since the publication of the second edition we have accumulated information on more than 7000 new proprietary alloys which have been incorporated in this third edition.

The methods used in securing information on the new alloys as well as supplementing and correcting data on previously listed alloys followed very closely those outlined in the prefaces to the first and second editions.

Section III, Uses and Applications, as previously published in the first and second editions has been deleted from the present edition. So numerous have become the applications to which specific alloys can be put and so large the number of alloys appropriate to each use, it was felt that Section III on uses and applications has become of little practical value, the more so since some information regarding the primary uses appears in Section II. Consequently, Section IV on Manufacturers and Their Alloys as published in the previous editions is now Section III in the present edition.

The author is grateful for the continued cooperation of the alloy manufacturers in making possible the completeness and accuracy of the text.

Preface to Second Edition

In the eight years since the publication of the first edition, many new allows have been developed and marketed by the ferrous and non-ferrous manufacturers.

There have been several changes in the composition, properties, and even trade names of many alloys. Some have become obsolete and are no longer being manufactured. It therefore would seem wise to incorporate the new proprietary trade name alloys, and the changes in the alloys already listed, in a second edition.

The manufacturers included in the first edition were requested to supply any changes in composition and properties of their alloys, as originally published. They were also asked to furnish data and information regarding new alloys put out and marketed by them. Many additional manufacturers supplied data on their alloys for incorporation in the revised edition.

Where the proprietary trade names were changed, an attempt was made to record the old name in Section II under the "Remarks" column. Wherever the alloys have become obsolete and their manufacture has been discontinued, it has been so indicated.

All alloys have been credited to the proper manufacturer, except where this information was unobtainable.

Section VI in the original edition, comprising the references in serial order according to their key number (R-number), has been deleted. Since the alloys covered by these references were checked with the manufacturers, it did not seem necessary to show the source of the original information. Section VII, "Useful Data Appendix," of the first edition, will therefore become Section VI.

Professor Albert Dornblatt, co-author of the first edition, died in 1942. Mr. Robert J. Metzler, formerly Assistant Chief Metallurgist of the Eclipse-Pioneer Division of Bendix Aviation Corporation, and now Chief Metallurgist of the Breeze Corporation, has assumed the responsibilities of co-authorship of this second edition.

Preface to First Edition

This book is the result of a growing demand for a practical and technical reference book on engineering alloys.

The authors of the book have made a careful compilation of the available data and information on practically all proprietary commercial and technical alloys manufactured in the United States of America, and on many alloys made in foreign countries, including England, France, Germany and Sweden. The book is devoted to data on the chemical composition, physical and mechanical properties, uses, and manufacturers of proprietary alloys. No attempt has been made to include alloys conforming to standard specification analyses as such; examples of the common engineering alloys produced to customers' specifications will be found among listed proprietary alloys. However, because of their widespread usage, the Society of Automotive Engineers' specification alloys, as well as a few others of general interest, have been included.

The aim has been to present as large an amount of reliable and up-to-date information on commercial alloys as was consistent with convenience in form and breadth of scope of this book. This information has been obtained by direct correspondence with the alloy manufacturers, and supplemented by data obtained from commercial literature and technical publications.

The book is divided into seven sections, as follows: Section I, which gives an alphabetical listing of all alloys and their corresponding index or serial number; Section II, which gives the trade name, composition, properties, uses, general remarks and a key number designating the manufacturer and the reference for each alloy as listed in serial order; Section III, an index of alloys classified according to typical uses or special characteristics such as corrosion-resistance; Section IV, an alphabetical listing of the manufacturers with a summary of the alloys listed that are produced by each; Section V, which lists the manufacturers, with addresses, in serial order according to the key number (M-number); Section VI, comprising the references, in serial order according to their key number (R-number); and Section VII, an appendix containing useful tables and miscellaneous information pertaining to the properties and testing of alloys.

With this arrangement, data on a particular alloy are located by using the alphabetical index (Section I) to ascertain the alloy serial number, and then turning to that number in Section II for the desired information regarding composition, properties, and uses. The manufacturer's name and address can be located by referring to the appropriate M-number in Section V. Similarly, the source of information is ascertained in Section VI under the appropriate R-number. Where an M-number appears in the reference column of Section II, the information was supplied by the manufacturer. Section IV is intended as an index of manufacturers, and while complete so far as the alloys listed in the second section (excepting discontinued alloys) are concerned, it should not be considered as a listing of all the alloys produced by the particular manufacturer.

Some of the alloys listed are either obsolete or are not in commercial production at the present time, but they have been embodied in the text in order to make it as complete a reference as possible. Some of the blank spaces in the xt appear because of the manufacturers' feeling that certain information is either onfidential or of no practical interest. The latter comment applies particularly to data on physical properties of tool steels. As it is not feasible to include all the information that could be desired, should more specific data on any particular alloy be wanted by the reader, it is recommended that he refer to the reference or manufacturer cited, or else communicate directly with the authors.

Undoubtedly many important alloys are not listed, despite the authors' best efforts in search of new data. This is especially true in regard to alloys not of American manufacture. The authors will be grateful for any additional information or suggestions for the improvement of this work that may be incorporated at a later time, and they hope that the reader will call to their attention any omissions and errors.

The nature of this compilation is such as to make a critical analysis of the data impracticable, and the authors assume no responsibility for the accuracy or reliability of the quoted values and information; in fact, they have attempted to present the data as impartially and faithfully as possible and have abstained from interjecting their personal judgment or opinion in any respect. It should be borne in mind, also, that the mechanical properties of commercial alloys vary between wide limits, and, therefore, the values assigned in a given instance usually represent the most probable values that would be obtained under the given conditions. Some values are quoted from the manufacturers that refer to a test characterizing but a single specimen. In general, however, all these values should be looked upon as being indicative or suggestive rather than definitive. The same is true of the applications cited. Special care must also be exercised in interpreting remarks relative to the corrosion-resistance of any alloy. Furthermore the reader is cautioned against using the data in such manner as would incur liability for infringement of any patents that may now exist or are pending.

Information was obtained from so many sources in the preparation of this book, that a complete acknowledgement, beyond that noted in the citation of sources of information in the reference column of Section II, is difficult to make. Considering the unprecedented nature of this book, the cooperation of the manufacturers listed was most gratifying and their assistance is as deeply appreciated as it was indispensable. The authors wish to make special acknowledgment to the following: the American Society for Metals, the American Society for Testing Materials, the Society of Automotive Engineers, and the National Research Council for permission to use data appearing in their publications; to *Iron Age, Chemical and Metallurgical Engineering,* and the *Metal Industry* (London) for use of information that appeared in these magazines; to the Louis Cassier Company (London) and Verlag Chemie for permission to utilize some of the data published in their respective books, *Metals and Alloys* and *Die Werkstoffe Der Chemischen Apparate* (Dr. -Ing. H. Freytag).

The authors wish to acknowledge their appreciation of the services rendered by Professor H. Bluestone of the United States Naval Academy Postgraduate School, who aided in making translations, and by Marie I. Dornblatt, who assisted in checking data and reading proof. In addition the authors are indebted to Dr. F. L. Coonan for his helpful suggestions and criticism during the preparation of the manuscript.

Abbreviations

AA	Aluminum Association
ACI	Alloy Casting Institute
AISI	American Iron and Steel Institute
Ann	Anneal or annealed
A Rock	Hardness Rockwell A scale
ASTM	American Society for Testing and Materials
B	Flux density
Bal	Balance or remainder
BHN	Brinell hardness number
Br	Remanence flux in gausses
Brin	Brinell Hardness Number (10 mm. ball and 3000 kg. load) (# means 500 kg. load)
CD	Cold drawn
CDA	Copper Development Association
CEL	Elastic Limit in Compression in pounds per square inch
CF	Cold finished
Ch	Charpy impact in foot-pounds
cmf	Circular mil feet
Coef Exp	Coefficient of Expansion per °C.
Coef Res	Temperature Coefficient of Resistance per °C
CS	Crushing strength in pounds per square inch
CUS	Ultimate strength in compression in pounds per square inch
CYP	Yield point in compression in pounds per square inch
DPN	Depth penetration hardness (Vickers hardness)
SAE	Society of Automotive Engineers
Sc	Shore Scleroscope hardness number
SC	Sand cast
Sp H	Specific heat in calories per gram per °C
Sp Res	Specific Resistance in microhms per centimeter cube
SS	Shear strength in pounds per square inch
ST	Ultimate strength in Torsion in pounds per square inch
SYP	Shear Yield Point in pounds per square inch
TC	Total carbon content
Th C	Thermal Conductivity in calories per centimeter cube per sec. per °C
Tr D	Transverse Deflection in inches
Tr S	Transverse strength in pounds
TS	Ultimate Tensile Strength in pounds per square inch
t.s.i.	Tons per square inch
VDH	Vickers hardness
YP	Yield point in tension in pounds per square inch
YPC	Yield Point in compression in pounds per square inch
YS	Yield strength in tension in pounds per square inch
YS (comp)	Yield strength in compression

SECTION I

ALLOY DATA

NO. 000 DOUBLE EXTRA CARBON.
M-350, 1.1-1.3 C, bal Fe.
For intricate tools, broaches, drawing and threading dies, water hardening.

000 EXTRA
M-459; 0.9 C, 19 W, 4 Cr, 2.2 V, bal Fe.
For high speed cutters, high speed steel.

000 SPEZIAL 31
M-459; 0.8 C, 4 Cr, 0.3 Mo, 2.6 V, 10 W, bal Fe.
For turning, shaping and slotting tools, high speed steel.

1% NEB-BRONZE
M-1720, 89-93 Cu, 0.7-1.3 Sn, 0.10 max Pb, 0.05 max Fe, bal Zn
Good hot and cold working properties, good for welding, brazing, soldering.
For jewelry products, flat springs for electrical switchgear.
Copper alloy No. 413

NO. 1 STANDARD
M-179, 55-60 Cu, 0.2 max Pb, 1.5 max Al, 3.5 max Mn, 1.5 max Sn, bal Zn.
Extruded 76,000 TS, 37,000 YS, 28 El; 20 RA; 135 Brin.
Drawn: 86,000 TS, 41,000 YS, 25 El; 18 RA; 140 Brin
For pump valves, propellers, condenser tubes; Parson's manganese bronze

"NO 1 TA" QUALITY
M-179, 55-60 Cu, 0.2 max Pb, 2-3 Mn, bal Zn
Rolled. 76,000 TS, 36,000 YS, 25 El, 25 RA, 125 Brin
For hydraulic tubes, Parson's manganese bronze

2 AS
M-1487,
High speed steel, similar to AISI M2

NO 2 DIE METAL
M-1391, 3.5-4.5 Al, 2.5-3.5 Cu, 0.02-1.0 Mg, bal Zn
Sand cast 37,000 TS, 3 El
For stamping and drop hammer dies; subject to intergranular attack

NO 2 RELAY
M-1, 1-1.5 Si, bal Fe
For armatures, relays, solenoid switches; high permeability.

NO 2 SS RELAY
M-1, 1-1.5 Si, bal Fe
For armatures, relays, solenoid switches, high permeability.

NO 3 C
M-69, C, Cr, Co, bal Fe.
For coldwork dies

NO 3 MINE TALABOT SPECIAL D.
M-1119; 0.95 C, bal Fe.
For tools, springs, taps, drills; water hardened.

4-6 CHROME.
M-735; 4-6 Cr, Ti = 4 to 6 × C, 0.10 C, bal Fe
Annealed 66,000 TS, 39,000 YS; 45 El; 143 Brin.
For oil stills and refinery tubes; corrosion resistant.

NO. 5 RELAY
M-1; 2.5 Si, bal Fe.
For armatures, switches, solenoid switches; high permeability.

NO 6 MINE TULIPE SPECIAL D.
M-1119, 0.75 C, bal Fe.
For tools, springs, punches; water hardened.

NO. 7 ALLOY (MATHER & PLATT).
M-454, 3.0 C, 4-5 Cu, 12-14 Ni, 1.0-1.2 Mn, 4-6 Cr, 1.2-1.5 Si, bal Fe .
25,000-30,000 TS, 200-220 Brin
For valves, centrifugal pumps; austenitic cast iron; abrasion and corrosion resistant

13 CrMo 44
M-459; 0.13 C, 0.85 Cr, 0.45 Mo, 0.55 Mn, bal Fe.
For cams, camshafts, bolts, shafts, case hardening, tough.

14 NiCr 74.
M-459, 0.13 C, 0.7 Cr, 3.5 Ni, 0.5 Mn, bal Fe
Heat treated 157,000-185,000 TS, 143,000-171,000 YS, 13-10 El.
For gears, cams, camshafts, shafts; case hardening steel, tough

15 CrNi 6
M-459, 0.15 C, 1.5 Cr, 1.5 Ni, bal Fe.
For gears, shafts, cams, camshafts; case hardening, tough.

16 MnCr 5.
M-459, 0.16 C, 1.2 Mn, 1 Cr, bal Fe.
For gears, shafts, cams, camshafts, case hardened, tough.

18 CrNi 8.
M-459, 0.18 C, 2 Cr, 2 Ni, bal Fe.
For gears, shafts, cams, camshafts, case hardened, tough

20 MnCr 5.
M-459, 0.2 C, 1.3 Mn, 1.2 Cr, bal Fe.
For gears, shafts, cams, camshafts; case hardened, tough.

24 CrMo 5
M-459, 0.24 C, 1.15 Cr, 0.25 Mo, 0.55 Mn, bal Fe.
For bolts, hardware, shafts, rams, water hardened.

30 CrNiMo 8.
M-459, 0.3 C, 2 Cr, 0.2 Mo, 2 Ni, bal Fe.
For gears, shafts, machinery parts; shock resistant, oil hardened

34 Cr 4
M-459; 0.33 C, 0.65 Mn, 1.0 Cr, 0.25 Si, bal Fe
For fasteners, gears, shafts, water or oil hardened.

34 CrNiMo 6.
M-459; 0.34 C, 1.5 Cr, 0.15 Mo, 1.5 Ni, bal Fe.
For gears, shafts, machinery parts, shock resistant, oil hardened

NO 35 MONEL.
M-68; 31.25 Cu, 65.5 Ni, 1 Fe.
Cold rolled: 78,000-85,000 TS; 45,000-65,000 YS; 40-20 El.
For table tops; corrosion resistant.

36 CrNiMo 4.
M-459; 0.36 C, 1 Cr, 0.15 Mo, 1 Ni, bal Fe.
For gears, shafts, machinery parts; shock resistant, oil hardened.

NO. 37 ALUMINUM SOLDER.
M-1713.
For solder for aluminum; resists pressures up to 1000 lbs.

37 MnSi 5.
M-459; 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
For punches, upsetters, crimpers; oil hardened, tough.

42 CrMo 4.
M-459; 0.42 C, 1.1 Cr, 0.2 Mo, bal Fe.
For gears, bolts, shafts, axles; oil or water hardened.

47 Cr 4.
M-459; 0.4 C, 1.1 Cr, bal Fe.
For gears, cams, shafts, oil hardened.

50 CrMo 4.
M-459, 0.50 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, shafts, axles; water hardened.

50 CrV 4.
M-459; 0.50 C, 0.85 Mn, 1.0 Cr, 0.1 V, bal Fe.
For bolts, springs, shafts, gears; oil hardened, shock resistant.

NO. 50 SOLDER ALLOY.
M-1136, In-Pb.
For solder; M.P. 600°F.

NO. 55 ALLOY.
England, 27-30 Cr, bal Fe.
For glass-to-metal seals, same coefficient of expansion as glass.

58 CrV 4.
M-459, 0.58 C, 0.95 Mn, 1.0 Cr, 0.09 V, bal Fe.
For springs, punches, forging dies, oil hardened, tough.

NO. 93 CHROME MOLYBDENUM.
M-1; 0.5 C, 0.7 Cr, 0.5 Mo, bal Fe.
For tools, oil hardening, shock resisting; now Atlas 93.

100 Cr 6.
M-459, 1.0 C, 1.5 Cr, bal Fe.
For ball bearings and races, header dies; water hardened, wear resistant.

100 CrMn 6.
M-459, 1.0 C, 1.1 Mn, 1.5 Cr, bal Fe.
For roller bearings, oil or water hardened.

"101" VAN PUNCH.
M-1409, 0.5 C, 5 W, bal Fe.
For punches, piercing dies; head, impact and abrasion resistant.

NO. 122 ALLOY.
M-137; 9.25-10.75 Cu, 0.15-0.35 Mg, 0.9-1.5 Fe, bal Al.
Cast: 17,000 TS; 16,000 YS, 0.5 El; 80 Brin.
Heat treated: 40,000 TS; 0.5 El; 160 Brin.
For pistons, permanent molds.

NO. 155 PREMIUM SILVER BRAZING ROD.
M-1713, 55 Ag, bal Cu.
Cast: 50,000 TS.
For silver brazing; 1155°F working temperature.

"401" COPPER-NICKEL ALLOY.
M-1499; 45.5 Ni, 53.1 Cu, 1.7 Mn, 0.50 Co.
Annealed: 70,000 TS; 30,000 YS; 45 El.
For electronic components.

NO. 444 ALLOY.
M-739; 80-96 Cu, 3.5-5.0 Sn, 3.5-4.5 Pb, 4 Zn.
For bearings, bushings; SAE 791.

NO. 446 ALLOY.
England; 27-30 Cr, bal Fe.
For glass-to-metal seals.

NO. 500 ALLOY.
U.S.; Al alloy.
Cast: 27,000 TS, 20,000 YS; 2 El.
For casting, light weight.

NO. 712 ALLOY.
M-18; 29 Os, 40-50 Ir, bal Pt.
For contact points; corrosion resistant.

NO. 812.
M-57, 1.8 C, 12.5 Cr, bal Fe.
For dies; non-deforming.

NO. 812.
M-357, 1.8 C, 12.25 Cr, bal Fe.
For blanking and coining dies, taps, reamers; non-deforming.

NO. 999.
M-340, 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For hogging cuts for fast speeds, cutters, high speed steel.

NO. 1040 ALLOY.
German, 15 Cu, 1 Mn, 3 Mo, 71 Ni, 10 Fe.
For electrical equipment; magnetic alloy.

NO. 3074 HOT WORK.
M-365, 0.40-0.45 C, 8-10 W, 2.5 Cr, 0.10-0.15 V, bal Fe.
For hot work tools and dies, forging mandrels, hot work steel.

NO. 9500-1.
M-216, 95 Bi, 5 Sn. For solder, soft.

"A71NB" QUALITY.
M-179; 61 Cu, 1 min Sn, 0.5 max Pb, bal Zn.
Extruded: 60,000 TS, 25 El, 25 RA, 120 Brin.
Drawn: 66,000 TS, 22 El, 20 RA, 130 Brin.
For condenser tubes, Naval Brass.

A-7W.
M-373, 2.25 C, 5.25 Cr, 4.75 V, 1.0 W, 1.0 Mo, bal Fe.
Air hardening tool steel, AISI A7.

A9V.
M-78; 8.5 Al, 0.5 Zn, 0.3 Mn, bal Mg.
For castings, light metal parts; heat treatable.

A-110.
M-64, 1.2 C, 0.3 Mn, 0.3 Si, bal Fe.
Water hardening tool steel, AISI W1.

"A" ALLOY-1.
M-311, 77 Al, 20 Zn, 3 Cu.
Hot rolled: 60,000 TS, 41,000 YS, 21 El; 36 RA.
For light alloy wrought parts, non-hardenable.

"A" ALLOY-2.
M-311, 4.7 Cu, 1.34 Mg, 1.85 Ni, 1.5 Pb, 0.5 Fe, bal Al.
For light alloy wrought parts, age-hardenable.

A-ALLOY GR. A.
M-59, 0.4-0.8 C, 66-68 Ni, 19-21 Cr, 0.5-1.0 Mn, bal Fe.
Cast: 60,000-80,000 TS; 40,000-50,000 YS; 40 El; 30 RA, 217 Brin.
For heat and corrosion resistant parts, heat and corrosion resistant.

AA NICKEL-COBALT.
M-580, Ni-Co.
For anodes, electroplating.

A.A.A.A.
M-590; Pb, Sb, bal Sn.
For bearings; Babbitt, antifriction metal.

AB2.
M-England; 8.5-10.5 Al, 3 5-5 5 Fe, 4.6-6.5 Ni, 1.5 max Mn, 0.50 max Zn, bal Cu.
For impellers and propellers, gears, pumps, shafts, bushings.
B S. 1400 equivalent; heat treatable, corrosion resistant.

"AB164" QUALITY.
M-179; Al, Fe, Ni, bal Cu.
Extruded 82,000 TS, 42,000 YS; 20 El, 12 RA; 170 Brin.
Drawn· 88,000 TS, 46,000 YS, 18 El, 10 RA; 180 Brin.
For engine valve guides, Al bronze, heat resistant.

"AB197" QUALITY.
M-179, Al, Fe, Ni, bal Cu.
Extruded· 110,000 TS; 62,000 YS, 18 El; 10 RA; 190 Brin.
Drawn. 115,000 TS, 68,000 YS; 15 El; 10 RA; 210 Brin
For hardware, Al bronze, corrosion resistant.

A B C
M-40, M-487, 0 4 C, 0 5 W, 0.25 Cr, 0 3 Si, 0.5 Mn, bal Fe
For tools, chisels, hammers, drills, gears, shafts, tough and hard.

A B.C
M-80, high C, alloy, bal Fe.
For chisels; shock resistant.

ABC-III
Germany, 0 7 C, 2 5 Mo, 2 5 V, 3 W, bal Fe.
For cutting tools, oil hardened

ABK METAL.
M 1099, 3 3 75 C, 0 3 0 9 Mn, 0 3-1.2 Si, 3 5-6 5 Ni, 1 5-4 Cr, bal Fe
Cast 35,000-80,000 TS, 0 10-0 30 El, 500-650 Brin.
For castings, crushing rolls, liners, wear resistant, cast iron

ABK Ni-HARD
M-9, 4 5 Ni, 2 7-3 6 C, 1 5 Cr, 0 5-1 5 Si, 0 3-0 7 Mn, bal Fe
Cast 30,000-40,000 TS, 575-750 Brin
For pump plungers, roller bearing races, chilled rolls, corrosion resistant, tough

ABRADUR 500
M-884, 0 40 C, 3 5 Ni, 1 4 Cr, 0 4 Mo, bal Fe
For gears, shafts, crankshafts, oil hardened, shock resistant

ABRASALLOY.
M-353; 0 35 C, 1 Cr, 0.25 Mo, 0 75 Mn, 0 35 Si, bal Fe
For crusher hammers, coal screens, dredge pumps; tough, wear resistant

ABRASOCRAFT.
M-175; C, alloy, bal Fe.
Welded 350 500 Brin
For hard surfacing electrode, abrasion resistant

ABRASIST.
M-1460; C, alloy, bal Fe.
For machinery castings; abrasion resistant.

ABRASOHARD
M-811; C, alloy, bal Fe.
For welding rods; abrasion resistant.

ABRASOWELD.
M-578; 2.1 C, 1 1 Mn, 0.75 Si, 0 40 Mo, 6.5 Cr, bal Fe.
Hard surfacing arc welding electrodes for resistance to abrasion and impact.

ABROS
Eng.; 10 Cr, 88 Ni, 2 Mn.
For electrical resistance, heating elements; stainless and corrosion resistant.

ABSCO METAL 25H
M-9, high C, Si, Mn, bal Fe.
Cast· 25,000 TS; 150-210 Brin.
For ingot molds, pig molds, cast iron, Class 25

ABSCO METAL 30.
M-9, high C, Si, Mn, bal Fe
Cast: 30,000 TS, 20,000 YS, 0 6 El; 170-240 Brin.
For gears, pulleys, general castings; cast iron, Class 30

ABSCO METAL 30H.
M-9; high C, Si, Mn, alloy, bal Fe.
Cast· 30,000 TS; 220-280 Brin
For heat and wear resistant castings; cast iron.

ABSCO METAL 35.
M-9, high C, Si, Mn, bal Fe
Cast· 35,000 TS; 200-260 Brin
For gears, housings, general castings, cast iron, Class 35.

ABSCO METAL 40
M-9, high C, Si, Mn, bal Fe
Cast· 40,000 TS; 210-260 Brin.
For meter bodies, water valves, compressor cylinders; cast iron, Class 40

ABSCO METAL 40H
M-9, high C, Si, Mn, alloy, bal Fe
Cast. 40,000 TS, 230-290 Brin.
For heat and wear resistant castings, cast iron.

ABSCO METAL 50
M-9, high C, Si, Mn, bal Fe.
Cast 50,000 TS, 220-280 Brin
For press parts, cylinder heads, forming dies; cast iron, Class 50

ABSCO METAL 55.
M 9, high C, Si, Mn, bal Fe.
Cast: 55,000 TS, 45,000 YS, 0 7 El, 230-310 Brin.
For crankshafts, tool shanks, cutter bodies, cast iron, Class 55

ABSCO METAL 400
M 9; high C, Si, Mn, alloy, bal Fe.
Cast· 400 Brin.
For ash-sluice pipe chutes, burner nozzles; heat and wear resistant.

ABYSSINIAN GOLD
Eng , 88 Cu, 11 5 Zn, 0 5 Au.
For ornaments, jewelry

ABYSSINIAN GOLD
Eng., 90 92 Cu, 8-10 Zn, 1 plated Au.
For ornaments, jewelry; sheets plated with Au

AC-254
M-642; 0.24 C, 1.0 Mn, 0 4 Si, 12 0 Cr, 1.0 Ni, 2 5 Mo, 1.0 W, 0.25 V, 0.22 B, bal Fe.
At 1100°F; 85,000 TS, 70,000 YS, 18 El, 55 RA.
For steam turbine blading, jet engine components. Stainless, martensitic, creep resistant.

AC-AMSCO NO. 217.
M-607, 3 C, 8 Cr, 15 W, bal Fe
600-700 Brin.
For hard facing welding rod; maintains hardness up to 1000°F.

AC-AMSCO NO. 459.
M-607; 3 C, 4 Cr, 4 Mo, bal Fe.
500-600 Brin.
For hard surfacing welding rod; for severe wear and abrasion.

AC-COATED 18-8.
M-607; C, 18 Cr, 8 Ni, bal Fe.
Coated.
For stainless steel welding rod; coated rods.

ACCOLLOY.
M-653, 3.5 Ni, 0.3 C, bal Fe.
For chains.

ACCOLOY CN-1.
M-1005; 0.20 C, 28 Cr, 3 max Ni, bal Fe.
For furnace parts, heat treating equipment, heat resistant, ferritic.

ACCOLOY CN-2.
M-1005; 0.40 C, 28 Cr, 10 Ni, bal Fe.
Cast: 95,000 TS; 45,000 YS, 20 El, 200 Brin.
For furnace parts, heat treating equipment, pots, Type HE, austenitic, heat resistant.

ACCOLOY CN-3.
M-1005; 0.30 C, 25 Cr, 20 Ni, bal Fe.
Cast 75,000 TS, 50,000 YS, 17 El, 170 Brin.
For furnace parts, heat treating equipment, pots, Type HK, austenitic, heat resistant.

ACCOLOY CN-4
M-1005, 0.35 C, 25 Cr, 12 Ni, bal Fe
Cast. 80,000 TS, 50,000 YS, 25 El, 185 Brin.
For furnace parts, heat treating equipment, pots; Type HH, austenitic, heat resistant.

ACCOLOY CNC-4B
M-1005, 0.10 max C, 24 Cr, 12 Ni, bal Fe.
For furnace parts, heat treating equipment pots, corrosion and heat resistant, austenitic

ACCOLOY CNC-4D
M-1005, 0.20 max C, 24 Cr, 12 Ni, bal Fe
For furnace parts, heat treating equipment, pots, heat and corrosion resistant, austenitic.

ACCOLOY CN-5
M-1005; 0.25 C, 18 Cr, 8 Ni, bal Fe
Cast: 75,000 TS; 45,000 YS; 30 El, 175 Brin
For carburizing boxes; corrosion and heat resistant, austenitic

ACCOLOY CNC-5A.
M-1005, 0.07 C, 18 Cr, 8 Ni, bal Fe
Cast 85,000 TS, 150 Brin
For castings, baskets, carburizing boxes; Type 304, stainless, austenitic.

ACCOLOY CNC-5B
M-1005; 0.10 C, 18 Cr, 8 Ni, bal Fe
Cast: 85,000 TS; 150 Brin.
For heat treating boxes, pots, baskets, Type 302, stainless, austenitic

ACCOLOY CNC-5C
M-1005, 0.16 max C, 18 Cr, 8 Ni, bal Fe
Cast: 90,000 TS, 160 Brin
For heat treating boxes, chemical plant equipment, Type 302; stainless, austenitic.

ACCOLOY NC-1
M-1005, 0.2 C, 68 Ni, 18 Cr, bal Fe
Cast. 65,000 TS, 36,000 YS; 9 El, 176 Brin
For autoclaves, furnace parts, Type HX, austenitic, heat resistant.

ACCOLOY NC-2
M-1005, C, 60 Ni, 18 Cr, bal Fe.
For castings; heat resistant.

ACCOLOY NC 3
M-1005, 0.40 C, 18 Cr, 38 Ni, bal Fe.
For furnace parts, cylinder liners, conveyors, fixtures; Type HU; austenitic, heat resistant

ACCOLOY NC-4
M-1005, 0.25-0.70 C, 35 Ni, 15 Cr, bal Fe.
Cast: 70,000 TS, 40,000 YS; 10 El; 180 Brin.
For cyanide pots, furnace equipment; Type HT; austenitic, heat resistant.

ACCOLOY NC-5
M-1005; C, 30 Ni, 10 Cr, bal Fe.
For castings, heat resistant.

ACCULOY 280 C.
M-1538; Au, bal Sn
Uses: Brazing alloy for electronic parts.
High corrosion and etch resistance. High electrical conductivity.

ACCUMULATOR METAL.
U S., 90 Pb, 9.2 Sn, 0.8 Sb
Bearings, battery plates, antifriction.

ACCURATE METAL
M-1676; 29-32 Ni, 68 min Cu, 0.4-0.7 Fe.
Annealed: 57,000 TS, 21,000 YS, 43 El, B 44 Rock.
Hard: 82,000 TS, 75,000 YS, 5 El; B 86 Rock
Soft 54,000 TS, 16,000 YS, 35 El, B 40 Rock
For electronic components, marine hardware, ferrules, pump valves.
Corrosion resistant, non-magnetic

ACCURLOY
M-1510, 0.51 C, 1.05 Cr, 0.25 Mo, 0.53 Ni, 0.21 V, 0.97 Mn, bal Fe
Heat treated 165,000 TS, 150,000 YS, 20 El, 59 RA, 280-300 Brin
For shafts, pins, boring bars, piston rods, heat treated and stress-relieved bars, shock resistant.

ACEROID
M-592, Zn, bal Cu
For castings

ACEROLD
M-592, C, alloy, bal Fe.
For machinery castings

ACHORN 6-6-4-2
M-608, 0.85 C, 4 Cr, 2 V, 6.5 W, 5 Mo, bal Fe
For tools, cutters, high speed steel

ACHORN 9W HOT WORK
M-608, 0.30 C, 3.0 Cr, 0.5 V, 9.5 W, bal Fe
Hot work tool steel, oil hardening, for forging dies, hot forming dies, AISI H21

ACHORN 11W HOT WORK
M-608, 0.40 C, 3.0 Cr, 0.45 V, 12.0 W, bal Fe
Oil hardening hot work tool steel, tungsten type, for forging and hot working dies
AISI H22.

ACHORN 15W HOT WORK
M 608, 0.45 C, 3.5 Cr, 0.7 V, 14 W, bal Fe
Air or oil hardening hot working tool and die steel, AISI H24

ACHORN 18-4-1
M-608, 0.65 C, 3.75 Cr, 18.5 W, 1.2 V, bal Fe
For tools, cutters, high speed steel

ACHORN 33 HOT WORK
M 608, 0.33 C, 0.85 Si, 5.0 Cr, 0.2 V, 1.25 W, 1.45 Mo, bal Fe.
Hot work tool steel, chromium type; AISI H12

ACHORN 33A HOT WORK
M-608, 0.40 C, 0.3 Mn, 0.9 Si, 5.0 Cr, 0.5 V, 1.3 Mo, bal Fe
Oil or air hardening tool and die steel, for forging dies and hot forming dies.
AISI H11.

ACHORN 33M HOT WORK.
MD-608; 0.40 C, 1.0 Si, 5.0 Cr, 1.0 V, 1.0 Mo, bal Fe
Air or oil hardening hot work tool steel; AISI H13

ACHORN AF-33 HOT WORK.
M-608, 0.30-0.35 C, 0.8-1.0 Si, 5 Cr, 1.1 W, 1.5 Mo, bal Fe
For hot work dies, hot work steel

ACHORN 100 CHROMIUM.
M-608; 1.0 C, 1.5 Cr, bal Fe.
Low alloy tool steel, oil hardening.
AISI L1.

ACHORN 225 C HIGH PRODUCTION DIE.
M-608; 2.1 C, 12 0 Cr, 0.75 W, bal Fe.
Oil or air hardening cold work tool steel; chromium type; for punch and trim dies, thread rolling tools, gages.
AISI D3.

ACHORN "350" FINISHING.
M-608; 1 3 C, 3.5 W, bal Fe
For tools, dies, fast finishing steel

ACHORN 512
M-608, 0.10 C, 0.48 Mn, 1.5 Cr, 3 5 Ni, bal Fe.
Low carbon steel for cold hubbing and then case hardening for molds.

ACHORN ALLOY PIVOT
M-608, 1 10 C, 0 40 Mn, 0 25 Si, 1 35 Cr, 0 40 Mo, bal Fe
Oil hardening steel for shafts, pivots, lathe centers.
AISI L7

ACHORN BEST CARBON
M-608, 0.8-1.2 C, 0 25 Si, 0 25 Mn, bal Fe
Water hardened. 166,000-216,000 TS; 110,000-150,000 YS, 11-15 El, 32-37 RA; 330-600 Brin.
For taps, reamers, drills, punches, stamps, knurls, mandrels, cutters.
Type W1 water hardening

ACHORN CARBON DRILL ROD
M-608, 1 0 C, 0 25 Mn, 0 28 Si, bal Fe.
Water hardening tool steel, AISI W1

ACHORN CM AIR HARDENING.
M-608, 0 70 C, 2 0 Mn, 0 3 Si, 1 0 Cr, 1 35 Mo, bal Fe
Medium alloy, air hardening cold work tool steel; AISI A6

ACHORN COLD DRAWN TOOL STEEL
M-608, 1.05 C, 0 25 Mn, 0 28 Si, bal Fe
Water hardening tool steel, for drills, arbors, lathe centers, bushings AISI W1

ACHORN COLD HEADING
M-608; 0 8-1 2 C, 0 25 Si, 0 25 Mn, bal Fe
Water hardened 166,000-216,000 TS, 110,000-150,000 YS, 11-15 El, 32-37 RA, 330-600 Brin
For taps, drills, reamers, punches, stamps, knurls, mandrels, cold heading tools
Type W1 water hardening.

ACHORN COMPOSITE STEEL
M-608, 1.0 C, 0 40 Cr, 0 40 V, 1 25 W, bal Fe
Water or oil hardening steel for shafts, arbors, lathe centers, drill bushings
AISI F1

ACHORN CRM-50
M-608, 0 5-0 55 C, 0 6 Mn, 1 0 Cr, 0 20 Mo, bal Fe.
For hot work dies, hot work steel

ACHORN CVM
M-1421, 0 95 C, 0 7 Mn, 5 Cr, 0.25 V, 1.2 Mo, bal Fe
For punches, blanking and forming dies, air hardened, non deforming.

ACHORN EXTRA BLADE
M-608, 1 1 C, 0 25 Mn, bal Fe.
For tools, cutters, oil hardened.

ACHORN EXTRA CARBON
M-608, 1.05 C, 0 25 Mn, 0 28 Si, bal Fe.
Water hardening tool steel, AISI W1

ACHORN EXTRA CHISEL
M-608; 0.8-1.1 C, 0.25 Si, 0.25 Mn, bal Fe.
Water hardened: 166,000-216,000 TS; 110,000-150,000 YS; 11-15 El; 32-37 RA; 330-600 Brin.
For taps, drills, reamers, punches, stamps, knurls, mandrels.
Type W1 water hardening.

ACHORN EXTRA SOLID DRILL.
M-608; 1 15 C, 0 30 Mn, bal Fe.
For tools, drills; water hardened.

ACHORN FAGERSTA BEST.
M-608, 1.05-1 15 C, 0.20-0.25 Mn, 0.25 Si, bal Fe.
For drills, cutters, reamers, taps, broaches; Type W1; water hardened

ACHORN FAGERSTA CHISEL
M-608, 0.8-0.9 C, 0.3 Mn, 0.25 Si, bal Fe
For chisels, screw drivers, water hardened, Type W1.

ACHORN FAGERSTA COLD HEADING.
M-608; 0.95 C, 0.3 Mn, 0.25 Si, bal Fe.
For cold heading dies, form tools; Type W1; water hardened.

ACHORN FAGERSTA ENVELOPE DIE
M-608, 1 05-1 15 C, 0.3 Mn, 0.25 Si, bal Fe.
For envelope dies, cutters, drills, form tools; Type W1, water hardened.

ACHORN FAGERSTA EXTRA
M-608; 1 0-1.1 C, 0 3 Mn, 0 25 Si, bal Fe.
For tools, cutters, drills, taps, reamers; Type W1; water hardened.

ACHORN FAGERSTA EXTRA CUTLERY.
M-608, 1 07-1 12 C, 0 25 Mn, 0 3 Si, bal Fe.
For cutlery tools, drills, taps, Type W1; water hardened.

ACHORN FAGERSTA FINISHING
M-608, 1 15 C, 0.4 Mn, 0 4 Cr, 2 5 W, bal Fe.
For finishing cutters, water hardened, keen cutting edge

ACHORN FAGERSTA HIGH PRODUCTION.
M-608, M-385, 1 6 C, 0 8 Mn, 12 Cr, 0.2 V, bal Fe.
For blanking and forming dies, air hardened, non-deforming

ACHORN FAGERSTA HOT DIE
M-608, 0 55 C, 0 45 Mn, 5 0 W, 3 0 Ni, bal Fe.
For upsetting and forging dies, extrusion rams and liners, hot work steel, oil hardened.

ACHORN FAGERSTA SHOE DIE
M-608, M-385, 0.55 C, 0 65 Cr, 0 35 Mo, bal Fe
For shoe dies, cutting dies for leather and rubber, oil hardening

ACHORN FAGERSTA SILVER DIE.
M-608, 1 0 C, 0 25 Mn, 0 25 Si, bal Fe
For silver dies, Type W1, water hardened.

ACHORN FAGERSTA SMOOTH BOR HOLLOW.
M-608, 0 80 C, 0 25 Mn, 0.25 Si, bal Fe.
For rock drills, Type W1, water hardened

ACHORN FAGERSTA SOLID DRILL
M-608; 0 8-0 9 C, 0 35 Mn, 0 25 Si, bal Fe.
For solid drills; Type W1, water hardened.

ACHORN FAGERSTA SPECIAL ALLOY DIE
M-608, 0.45-0 55 C, 0 9 Cr, 1.2 W, 0 2 Mo, bal Fe.
For dies, tools, oil hardened

ACHORN FAGERSTA STANDARD.
M-608, 0 9-1.0 C, 0 3 Mn, 0.25 Si, bal Fe.
For tools, drills, taps, hobs, reamers; Type W1; water hardened.

ACHORN FAGERSTA STANDARD CUTLERY.
M-608; 0.85-0.95 C, 0.35 Mn, 0,25 Si, bal Fe.
For cutlery tools, drills; reamers; Type W1; water hardened.

ACHORN FAGERSTA SUPERIOR OIL.
M-608; 1.0 C, 1.0 Mn, 0.4 Cr, 0.4 W, bal Fe.
For tools, dies, cold headers, water or oil hardened

ACHORN FAGERSTA UNBREAKABLE CHISEL.
M-608; 0.45 C, 0.9 Cr, 1.2 W, 0.2 Mo, bal Fe
For chisels, upsetters, oil hardened, tough

ACHORN FAGERSTA WHITE GOLD.
M-608; 1.15 C, 0.4 Mn, 0.4 Cr, 1.2 W, bal Fe.
For tools, cutters; oil or water hardened.

ACHORN GRAPHITIC OIL.
M-608; 1.45 C, 0.8 Mn, 1.15 Si, 0.20 Cr, 0.25 Mo, bal Fe
Oil hardening cold work tool steel; AISI O6.

ACHORN HEAT TREATED MOLD STEEL
M-608; 0.30 C, 0.80 Mn, 0.50 Si, 1.7 Cr, 0.40 Mo, bal Fe.
Hardened, machinable, for molds; AISI P20.

ACHORN HIGH PRODUCTION.
M-608; 1.6 C, 12 Cr, 0.8 Mo, 0.8 V, bal Fe.
For punches, drawing dies, form tools; air hardened, non-deforming

ACHORN HOLLOW DRILL.
M-608; 0.75 C, 0.3 Mn, bal Fe.
Heat treated: 180,000 TS; 130,000 YS; 12 El, 36 RA, 360 Brin.
For hollow drills, die blocks; water hardened, Type W1.

ACHORN KLOSTER BRILLIANT AX.
M-608, 0.7 C, 4 Cr, 18 W, 1.75 V, bal Fe.
For tools, cutters, reamers, hobs, lathe and planer tools, high speed steel, Type T1.

ACHORN KLOSTER BRILLIANT WKE.
M-608; 0.7 C, 4.5 Cr, 18 W, 1.5 V, 5 Co, bal Fe.
For lathe and planer tools, hobs, reamers, taps, drills, high speed steel, Type T4

ACHORN KLOSTER PRIOR EXTRA
M-608; 0.6-0.7 C, 4-5 Cr, 18-19 W, 1.2 V, 1 Co, bal Fe.
For lathe and planer tools, hobs, reamers, taps, drills, high speed steel, oil hardened.

ACHORN KLOSTER REMA.
M-608, 0.02-0.05 C, 0.02-0.07 Mn, bal Fe
For molding dies for plastics; hobbing steel.

ACHORN M1 HIGH SPEED.
M-608; 0.80 C, 4.0 Cr, 1.0 V, 1.5 W, 8.0 Mo, bal Fe.
High speed steel, molybdenum type; for drills, lathe tools, milling cutters. AISI M1.

ACHORN M-2.
M-608; 0.8 C, 5 Mo, 6.5 W, 2 V, 4 Cr, bal Fe.
For lathe and planer tools, drills, reamers; high speed steel.

ACHORN M2½ (CLASS 1) HIGH SPEED
M-608; 1.0 C, 4.0 Cr, 2.5 V, 6.25 W, 6.25 Mo, bal Fe.
High speed tool steel, molybdenum-tungsten type; AISI M3 Class 1.

ACHORN M3 (CLASS 2) HIGH SPEED
M-608; 1.15 C, 4.0 Cr, 3.0 V, 6.0 W, 5.5 Mo, bal Fe
High speed steel, tungsten-molybdenum-vanadium-chromium. AISI M3 Class 2

ACHORN M4 HIGH SPEED.
M-608; 1.28 C, 4.5 Cr, 4.0 V, 5.5 W, 4.5 Mo, bal Fe.
High speed steel, tungsten-molybdenum-vanadium-chromium, AISI M4

ACHORN M10 HIGH SPEED.
M-608, 0.85 C, 4.0 Cr, 2.0 V, 8.0 Mo, bal Fe.
Molybdenum type high speed steel; AISI M10.

ACHORN M34 HIGH SPEED
M-608; 0.90 C, 4.0 Cr, 2.0 V, 1.75 W, 8.5 Mo, 8 Co, bal Fe
High speed steel, molybdenum-cobalt type, AISI M34.

ACHORN MANGANESE OIL HARDENING.
M-608, 0.90 C, 1.50 Mn, 0.25 Si, 0.30 Mo, bal Fe
Oil hardening in small sections, AISI O2.

ACHORN MOLDALOY.
M-608; 0.10 C, 0.5 Mn, 0.5 Cr, 1.2 Ni, bal Fe
For dies, molds, carburizing grade.

ACHORN Ni-Cro-Mo
M-608, 0.68 C, 0.6 Mn, 0.25 Si, 0.65 Cr, 1.4 Ni, 0.20 Mo, bal Fe
Oil hardening, low alloy tool steel for shafts, arbors, lathe centers, tool holders. AISI L6

ACHORN OIL HARDENING DRILL ROD
M-608, 0.90 C, 1.1 Mn, 0.5 Cr, 0.15 V, 0.5 W, bal Fe.
Oil hardenable in small sections, AISI O1

ACHORN OILWEAR.
M-608, 1.25 C, 0.3 Mn, 0.35 Si, 0.4 Cr, 0.2 V, 1.4 W, bal Fe
Oil hardening cold work tool steel, wear resistant type; AISI O7.

ACHORN REMA IRON
M-608, 0.06 C, 0.21 Mn, bal Fe.
For plastic mold dies, water hardened.

ACHORN SOLID DRILL.
M-608, 0.85 C, 0.35 Mn, bal Fe
Heat treated 190,000 TS, 145,000 YS, 10 El, 30 RA, 400 Brin
For drills, punches, taps, reamers, cutters, water hardened, Type W1.

ACHORN SPRING STEEL SHEET
M-608, 1.0 C, 0.25 Mn, 0.28 Si, bal Fe
Water hardened sheet steel, spring temper, AISI W1

ACHORN STANDARD CARBON
M-608, 1.0-1.1 C, 0.30 Mn, bal Fe
For cutters, drills, reamers, punches, water hardened; Type W1

ACHORN SUPERIOR OIL HARDENING
M-608, C, alloy, bal Fe
For tools, dies, punches, oil hardened

ACHORN T2 HIGH SPEED
M 608, 0.80 C, 4.0 Cr, 2.0 V, 18.5 W, 0.75 Mo, bal Fe
Tungsten type high speed steel, AISI T2

ACHORN T4 HIGH SPEED
M-608, 0.75 C, 4.0 Cr, 1.05 V, 18.5 W, 5.0 Co, bal Fe
Tungsten-cobalt type high speed steel; AISI T4.

ACHORN T5 HIGH SPEED
M-608, 0.80 C, 4.25 Cr, 2.0 V, 19.0 W, 1.0 Mo, 8.0 Co, bal Fe
Tungsten-cobalt type high speed steel, AISI T5.

ACHORN T15 HIGH SPEED.
M-608, 1.5 C, 4.75 Cr, 5.0 V, 12.5 W, 5.0 Co, bal Fe
High speed steel, tungsten, cobalt, vanadium type, AISI T15

ACHORN TOOL STEEL SHEET.
M-608; 1.05 C, 0.25 Mn, 0.28 Si, bal Fe.
Water hardenable sheet steel, AISI W1.

ACHORN UBC.
M-608; 0.48 C, 0.9 Cr, 1.1 W, 0.2 Mo, bal Fe.
For hot work dies; hot work steel.

ACHORN USI STEEL.
M-608; 0.60, 0.85 Mn, 2.0 Si, 0.25 Cr, 0.2 V, 0.25 Mo, bal Fe.
Water or oil hardening tool steel, shock resisting type; AISI S5.

ACHORN V85 STEEL.
M-608; 0.90 C, 0.3 Mn, 0.25 Si, 0.25 V, bal Fe.
Water hardening tool steel; AISI W2.

ACHORN VAMO
M-608; 0.50 C, 0.45 Mn, 1.0 Si, 5.2 Cr, 1.5 Ni, 1.0 V, 1.4 Mo, bal Fe.
Medium alloy, air hardening cold work tool steel, AISI A9.

ACHORN VBC.
M-608; 0.5 C, 0.90 Cr, 1.25 W, 2 Mo, 0.25 Mn, bal Fe
For punches, rivet sets, upsetters; oil hardened, hot work steel.

ACIBAL
Al alloy.
For light alloy parts.

ACIBEL.
M-280, 0.07-0.13 C, 0.15-0.25 Pb, 0.85-1.15 Mn, 0.23-0.33 S, bal Fe.
Rolled 70,000 TS.
For shafts, gears, machine tool parts; free-cutting, case hardened.

ACIBRADE
M-280; 0.55-0.70 C, 1.25-1.55 Mn, 0.1-0.35 Si, bal Fe
Rolled. 137,000 TS; 275 Brin.
For rods for coke crushing rod mills; wear resistant, tough

ACICULAR
M-494, 2.9 C, 2 Si, 2.5 Ni, 0.9 Mo, bal Fe.
Cast: 280-350 Brin
For castings, gears, housings, alloy cast iron

ACID BRONZE 1.
Eng; 88 Cu, 10 Sn, 2 Pb.
For bearings, chemical equipment, corrosion resistant.

ACID BRONZE-2
Eng, 82 Cu, 8 Sn, 8 Pb, 2 Zn
For chemical equipment, corrosion resistant.

ACID BRONZE-3.
Eng, 84 Cu, 9.5 Sn, 6.3 Pb, 0.2 P.
For chemical equipment; corrosion resistant.

ACID BRONZE-4.
Eng, 74 Cu, 8 Sn, 17 Pb, 1.5 Zn.
For chemical equipment; corrosion resistant.

ACID METAL
U.S; 88 Cu, 10 Sn, 2 Pb.
For chemical equipment; corrosion resisting.

ACID RESISTING-1.
Eng.; 10 Cr, 30 Ni, 40.8 Fe, 6.2 W, 1.55 Mn, 0.45 Si
For chemical apparatus, acid resisting vessels and tanks; stainless and corrosion resistant.

ACID RESISTING-2
Eng; 14.5 Cr, 20 Ni, 56 Fe, 5 Co, 4.5 Cu.
For chemical apparatus; resists attack of HNO_3.

ACID RESISTING-3.
Eng.; 15 Cr, 53 Ni, 23 Fe, 4 W, 1.25 Mn, 3.75 Si.
For chemical apparatus;
heat and corrosion resistant

ACIDUR.
M-323; 16-17 Si, bal Fe.
Cast.
For chemical apparatus; corrosion resistant.

ACIER A3.
M-1043; 0.50 C, bal Fe.
Annealed: 96,000 TS, 52,000 YS; 16 El; 23 RA; 170 Brin
For axles, gears, bolts, bushings, crankshafts; water hardened.

ACIER ACM.
M-1043; 0.55 C, 1.4 Ni, 0.6 Cr, 0.35 Mo, bal Fe.
For gears, bolts, forging dies; oil hardened, tough.

ACIER ACMA.
M-1043, 0.55 C, 1.4 Ni, 0.6 Cr, 0.35 Mo, bal Fe
For gears, forging dies; oil hardened, tough.

ACIER AF NO. 1.
M-1043, 0.85 C, bal Fe
Heat treated: 200,000 TS, 150,000 YS; 10 El, 30 RA, 400 Brin
For drills, taps, reamers, hobs, springs; Type W1; water hardened.

ACIER AFS
M-1043; 0.80 C, bal Fe
Heat treated: 188,000 TS, 143,000 YS; 12 El; 35 RA; 388 Brin.
For drills, punches, reamers, taps, springs, hobs; Type W1; water hardened

ACIERAL-1
M-281, 6 Cu, 0.4 Zn, 0.9 Ni, 0.1 Fe, 0.4 Si, bal Al.
Cast 20,000 TS.
For automotive engine parts; castings.

ACIERAL-2.
M-281, 2.3-3.8 Cu, 0.7-1.4 Fe, 1.0-1.5 Mn, bal Al.
Rolled 22,000 TS, 2 El.
For automotive engine parts; high strength.

ACIER AM3.
M-1043, 0.35 C, 1.1 Mn, bal Fe.
For punches, axles, gears, shafts, water hardened.

ACIER AS,
M-1043, 0.50, bal Fe.
Annealed 96,000 TS; 52,000 YS; 16 El; 23 RA; 170 Brin
For axles, gears, bolts, tie rods, water hardened.

ACIER BLN.
M-1043, 0.28 C, 10 W, 3 Cr, 0.3 Mo, 0.3 V, bal Fe.
For extrusion rams and dies, punches, hot work steel, oil hardened.

ACIER BTR.
M-1043, 0.35 C, 4.6 Ni, 0.3 Cr, 1.1 Mo, bal Fe.
For gears, dies, crankshafts, oil hardened, tough.

ACIER CMYO.
M-1043, 1 C, 1 Cr, 0.2 Mo, bal Fe.
For bearings, liners, sleeves; water or oil hardened.

ACIER CNW.
M-1043, 0.38 C, 3 W, 2.5 Cr, 0.7 Mo, 0.3 V, bal Fe.
For hot work dies and tools; hot work steel.

ACIER CTN2
M-1043, 0.10 C, 2 Ni, bal Fe.
For spindles, gears, cams, camshafts; case hardening steel, tough.

ACIER CTN6.
M-1043; 0.10 C, 6 Ni, bal Fe.
For spindles, gears, cams, shafts; case hardening steel, tough.

ACIER DIABOLIQUE SATAN NO. 2.
M-1043; 1.15 C, 1.9 W, 0.5 Cr, bal Fe.
For header dies, fast finishing cutters; water hardened, wear resistant.

ACIER FAM.
M-1043; 0.42 C, 2 Si, 0.6 Mn, bal Fe.
For heat resistant parts; heat resistant.

ACIER FFV NO. 3.
M-1043; 0.85 C, 0.30 Mn, bal Fe.
Heat treated: 200,000 TS; 150,000 YS, 10 El; 30 RA; 400 Brin.
For drills, taps, reamers, springs, hobs; Type W1; water hardened.

ACIER M13AFY.
M-1043, 1.1 C, 13 Mn, bal Fe.
For wear resistant parts; wear and abrasion resistant.

ACIER NC2.
M-1043; 0.3 C, 2.8 Ni, 0.5 Cr, bal Fe.
For gears, bolts, machine tool parts, oil hardened, tough.

ACIER TRIPLE SATAN.
M-1043; 0.32 C, 9 W, 3.2 Cr, bal Fe.
For extrusion rams and dies, punches; hot work steel, oil hardened.

ACIER VDLD.
M-1043, 0.35 C, 3.8 Ni, 1.5 Cr, bal Fe
For gears, bolts, dies, crankshafts, oil hardened, tough.

ACIER VDLDM.
M-1043, 0.35 C, 4 Ni, 1.5 Cr, 0.5 Mo, bal Fe
For gears, shafts, crankshafts, oil hardened, tough

ACIMET C-1.
M-480, 90 Cu, 10 Al, 0.06 max C
Heat treated: 70,000 TS; 28,000 YS, 20 El, 20 RA, 100 Brin
For acetic acid equipment castings, pumps, impeller shafts for rubber pumps; corrosion resistant.

ACIMET C-2
M-480; 85 Cu, 5 Sn, 5 Pb, 5 Zn
30,000-33,000 TS, 18,000-20,000 YS, 20 El, 20 RA, 50-60 Brin.
For fittings and pumps for brewery, distilleries, alcohol plants, etc; pressure tight.

ACIMET C-3.
M-480; 60 Cu, 2 Pb, 38 Zn.
50,000-75,000 TS, 18,000 YS; 40 El
For close grained forged oil fittings, free-cutting.

ACIMET C-4
M-480; 58 Cu, 0.5 Al, 0.5 Sn, 39 Zn, 0.75 max Fe, 0.75 max Mn.
70,000-75,000 TS; 35,000 YS, 20 El; 20 RA, 100-110 Brin
For impeller shaft and gland fittings for rubber and plastic pumps for handling HCl, corrosion resistant

ACIMET HARD LEAD ALLOY.
M-480; 94.5-95 Pb, 4.5-5.5 Sb.
2,800 TS, 1,600 YS, 75 El, 90 RA
For valves, pumps, fittings, castings, handling corrosive chemicals; M P. 495°F.

ACIPCO 1005.
M-285; 0.08 max C, 0.3-0.6 Mn, bal Fe
Cast, normalize and temper: 48,000 TS, 25,000 YS, 35 El, 110 Brin.
For high magnetic permeability parts. AISI 1005.

ACIPCO 1015.
M-285 0.10-0.20 C, 0.3-0.6 Mn, bal Fe.
Cast, normalize and temper 55,000 TS; 30,000 YS, 30 El; 130 Brin.
Standard mild steel, high ductility
AISI 1015

ACIPCO 1025.
M-285; 0.20-0.30 C, 0.3-0.6 Mn, bal Fe.
Cast, normalize and temper: 65,000 TS; 35,000 YS; 25 El, 150 Brin
Standard structural steel, good weldability.
AISI 1025.

ACIPCO 1045.
M-285; 0.40-0.50 C, 0.5-0.9 Mn, bal Fe.
Cast, normalize and temper 85,000 TS, 45,000 YS; 15 El; 180 Brin.
For machine parts, and for flame hardening.
AISI 1045

ACIPCO 1070
M-285, 0.65-0.75 C, 0.5-0.9 Mn, bal Fe.
Cast, normalize and temper 105,000 TS, 50,000 YS; 5 El, 220 Brin
Particularly for parts requiring flame or induction hardened areas AISI 1070.

ACIPCO 4130
M-285, 0.25-0.35 C, 0.4-0.7 Mn, 0.8-1.1 Cr, 0.15-0.25 Mo, bal Fe
Cast, normalize and temper, 80,000 TS, 45,000 YS; 17 El, 185 Brin
Cast, water quench and temper, 100,000-160,000 TS; 65,000-145,000 YS, 16-5 El, 250-450 Brin.
Preferred water quenching grade AISI 4130

ACIPCO 4140
M-285, 0.35-0.45 C, 0.6-1.0 Mn, 0.8-1.1 Cr, 0.15-0.25 Mo, bal Fe
Cast, normalize and temper 100,000 TS, 50,000 YS, 16 El, 200 Brin
Cast, oil quench and temper, 120,000-180,000 TS, 85,000 165,000 YS, 16-5 El, 250-450 Brin
Oil hardening alloy steel
AISI 4140

ACIPCO 4330
M-285, 0.25-0.35 C, 0.4-0.7 Mn, 1.65-2.0 Ni, 0.7-0.9 Cr, 0.2-0.3 Mo, bal Fe
Cast, normalize and temper 100,000 TS, 60,000 YS, 16 El, 200 Brin
Cast, quench and temper 120,000-180,000 TS, 85,000 165,000 YS, 16-5 El, 250-450 Brin
Hardenable in heavy sections. AISI 4330

ACIPCO 8620
M-285, 0.15 0.25 C, 0.6-1.0 Mn, 0.4 0.7 Ni, 0.4-0.6 Cr, 0.15 0.25 Mo, bal Fe
Cast, normalize and temper 70,000 TS, 40,000 YS, 20 El, 150 Brin
Low alloy carburizing grade
AISI 8620

ACIPCO ACICULAR IRONS
M-285, 2.5 3.0 C, 0.5-1.5 Mn, 0.25 max P, 0.12 max S, 1.7-2.3 Ni, 0.8-1.2 Mo, bal Fe
Cast 60,000 TS, 300 Brin
For highly stressed rolls and cylinders, heat treatable.

ACIPCO CA-15
M-285, 0.15 max C, 1.0 max Mn, 1.5 max Si, 11.5-14.0 Cr, 1.0 max Ni, bal Fe
Cast, normalize and temper 100,000 TS; 65,000 YS, 18 El, 228 Brin.
Heat treatable chromium stainless
ACI CA 15, AISI 410.

ACIPCO CF-8
M-285, 0.08 max C, 1.5 max Mn, 2.0 max Si, 18-21 Cr, 8-11 Ni, bal Fe
Cast: 70,000 TS, 30,000 YS; 30 El; 150 Brin.
Austenitic stainless castings. ACI CF-8; AISI 304.

ACIPCO CF-8M.
M-285, 0.08 max C, 1.50 max Mn, 1.50 max Si, 18-21 Cr, 9-12 Ni, 2-3 Mo, bal Fe.

Cast: 75,000 TS; 40,000 YS; 35 El; 160 Brin.
Austenitic stainless, for special corrosive conditions.
ACI CF-8M; AISI 316.

ACIPCO Cl 30.
M-285; 3.1-3.5 C, 0.4-0.7 Mn, 0.75 max P, 0.12 max S, 1.2-2.5 Si, bal Fe
Cast 30,000 TS, 200 Brin
Castings for engineering parts.

ACIPCO Cl. 40.
M-285; 2.8-3.3 C, 0.4-0.7 Mn, 0.40 max P, 0.12 max S, 1.6-2.2 Si, Si inoculated, bal Fe
Cast: 40,000 TS; 225 Brin.
Standard high strength gray iron.

ACIPCO Cl. 50.
M-285, 2.5-3.0 C, 0.4-0.7 Mn, 0.25 max P, 0.12 max S, 1.6-2.2 Si, Si inoculated, bal Fe
Cast: 50,000 TS; 269 Brin
For highly stressed engineering parts.

ACIPCO Cr Alloy
M-285, 3.2-3.6 C, 0.4-0.6 Mn, 0.75 max P, 0.12 max S, 0.5-1.0 Cr, bal Fe
Cast 240-300 Brin, For parts requiring increased hardness and wear resistance

ACIPCO Cr-Cu IRON
M-285, (C + Si adjusted), 0.4-0.7 Mn, 0.75 max P, 0.12 max S, 0.3-0.7 Cr, 0.8-1.2 Cu, bal Fe
Cast 40,000 TS, 235 Brin
Moderate hardness gray iron for rolls, etc

ACIPCO DUCTILE IRON
As per ASTM A339-55, 60-45-10
ASTM A339-55, 80-60-03

ACIPCO HEAT RESISTING IRON
M-285, 3.2 C, alloy bal Fe
Cast
For retorts for magnesium manufacture, heat and pressure resistant

ACIPCO HF
M-285, 0.20-0.40 C, 2.0 max Mn, 2.0 max Si, 19-23 Cr, 9-12 Ni, bal Fe
Cast 75,000 TS, 38,000 YS, 28 El, 165 Brin.
Austenitic stainless steel
ACI HF, AISI 302B

ACIPCO HH
M-285, 0.20-0.50 C, 2.0 max Mn, 2.0 max Si, 24-28 Cr, 11-14 Ni, bal Fe
Cast 75,000 TS, 38,000 YS, 15 El, 170 Brin
Austenitic stainless, for furnace parts, service to 2000°F
ACI HH, AISI 309

ACIPCO HK
M-285, 0.20-0.60 C, 2.0 max Mn, 2.0 max Si, 24-28 Cr, 18-22 Ni, bal Fe
Cast 70,000 TS, 38,000 YS, 15 El, 187 Brin
Completely austenitic stainless, service to 2000°F
ACI HK, AISI 310

ACIPCO HT
M-285, 0.35-0.75 C, 2.0 max Mn, 2.5 max Si, 13-17 Cr, 33-37 Ni, bal Fe
Cast. 68,000 TS, 35,000 YS, 5 El; 170 Brin
Good thermal shock resistance
ACI HT; AISI 330.

ACIPCO Ni-Cr-Mo IRON.
M-285; (C + Si adjusted), 0.4-0.7 Mn, 0.75 max P, 0.12 max S, 1.3-1.8 Ni, 0.2-0.4 Cr, 0.4-0.6 Mo, bal Fe.
Cast 270 Brin
Wear and heat resistant alloy for die parts, heat treatable

ACIPCO REGULAR.
M-285; 3.2-3.6 C, 0.4-0.7 Mn, 0.75 max P, 0.12 max S, 1.20-2.50 Si, bal Fe.
Cast: 25,000 TS.
General gray iron castings.

ACK DIE STEEL.
M-694; 1.0 C, 0.4 Cr, 0.2 V, 1.6 W, bal Fe.
For tools, dies; water hardening.

ACME
M-248; 35 Cr, 18 Ni, bal Fe
Annealed. 75,000 TS, 40 El; 60 RA
For resistances; now Alray D.

ACME 18-8 STAINLESS 302
M-568, 0.08-0.20 C, 18 Cr, 8 Ni, bal Fe
Annealed: 80,000 TS, 35,000 YS, 45 El; 65 RA; 150 Brin.
For chemical plant equipment, Type 302; stainless, austenitic

ACME 18-8 STAINLESS 304
M-568, 0.11 max C, 17-19 Cr, 7-9 Ni, bal Fe
Annealed: 75,000 TS, 32,000 YS, 45 El; 60 RA, 150 Brin.
For chemical plant equipment; Type 304, stainless, austenitic.

ACME COLORSTRIP
M-568, 0.2 C, bal Fe.
For ornamental architecture, cold rolled strip steel in colors

ACMEITE
M-1461, C, alloy, bal Fe
For die blocks, oil hardened

ACMELOY
M-654, 2.75-3.25 C, 1.00-1.75 Si, 0.65-1.75 Mn, bal Fe
Cast 30,000-60,000 TS, 175-275 Brin
Heat treated 75,000-85,000 TS, 400-600 Brin
For cast iron castings, gears, housings, shafts; high strength corrosion, heat and wear resistant.

ACMELOY.
M-1102, Cu alloy.
For resistance and spot welding electrodes.

ACME M
M-1142, 0.2 C, 18 Cr, 8 Ni, bal Fe
For heat resistant castings, corrosion and heat resistant

ACME NICKEL STEEL
Eng., 30.5 Ni, 14.2 Cr, 0.3 C, bal Fe.
For tanks and vessels to resist corrosion; stainless, corrosion resistant.

ACME SATIN STRIP
M-568, 0.8 C, 18 Cr, 8 Ni, bal Fe
For ornamental architecture; cold rolled stainless strip steel.

ACME STAINLESS 410
M-568, 0.12 max C, 12-14 Cr, bal Fe.
Annealed 75,000 TS, 40,000 YS, 35 El; 70 RA; 155 Brin
Cold drawn 100,000 TS, 85,000 YS; 17 El, 60 RA, 205 Brin
For springs, hardware, tableware, turbine blades, pistons, Type 410, corrosion resistant.

ACME STAINLESS 425.
M-568, 0.12 max C, 14-16 Cr, bal Fe
For chemical plant equipment; Type 425; corrosion resistant

ACME STAINLESS 430
M-568, 0.12 max C, 16-18 Cr, bal Fe.
Annealed 70,000 TS; 40,000 YS; 30 El, 55 RA; 140 Brin.

Cold drawn: 130,000 TS; 125,000 YS; 2 El; 185 Brin.
For automotive trim, kitchen sinks, fasteners, bolts; Type 430, corrosion resistant.

ACME STAINLESS STEEL TYPE 301X.
M-568; 0.10 C, 18 Cr, 8 Ni, bal Fe
For stainless parts, corrosion resistant.

ACMITE.
M-35; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, 0.65 Mo, bal Fe.
For cutters, hobs, reamers, broaches, piercing, punches, drills; high speed steel, AISI Type T4.

ACMITE-L.
M-35, 0.50 C, 0.25 Mn, 4 Cr, 18 W, 1 V, bal Fe
For hot work dies and tools, hot work steel.

ACMONITAL
Italy; C, Cr, Ni, bal Fe.
For coins, stainless.

ACN3.
M-1176, 2.9-3.2 Cu, 1.5 Fe, 0.7 Si, 0.6 Mg, 0.2 Ti, 0.6 Ni, bal Al.
Heat treated 47,000-60,000 TS, 43,000-51,000 YS; 5-1 El; 115-150 Brin
For light alloy parts; age-hardened.

ACN10.
M-1176, 9.5-10.5 Cu, 0.8-1.2 Si, 0.3 Mg, 0.2 Ti, 1.3-1.7 Ni, bal Al
Heat treated: 45,000-54,000 TS, 37,000-48,000 YS, 1.0-0.5 El, 115-140 Brin
For engine cylinder heads, pistons, heat resistant

A-COPPER
M-789, 99 Cu, 1 Ni.
Hard: 58,000-67,000 TS
For electrical equipment and instruments
Resistance alloy Max working temperature to 200°C.

ACORN
M-375, 1.2 C, bal Fe
For tools, drills, oil or water hardened.

ACORN BRAND
M-214, 3.7 Cu, 7.4 Sb, special hardened, bal Sn
Cast. 12,500 TS, 22.5 El, 24 Brin
For gas and diesel engine bearings, Babbitt, low coefficient of friction.

ACRON.
M-249, 1 Si, 4 Cu, bal Al
Annealed 31,000-35,000 TS, 16,000-19,000 YS, 50-60 Brin
Heat treated. 42,000-60,000 TS, 28,000-40,000 YS, 90-100 Brin.
For automotive engine parts, age-hardenable, high strength

A.C.T
M-353, 0.65 C, 0.15 Mn, 18 W, 4.5 Cr, 2 V, 0.75 Mo, 10 Co, bal Fe.
For tools, drills, cutters, reamers; high speed steel.

ACT CARBIDE
M-353, WC + Co
For tools, cutters, sintered carbide

AC-WELD
M-607, 0.2 C, bal Fe.
Weld 65,000-70,000 TS; 28-30 El.
For welding rod, A.C. welding.

A-D-70.
M-355; 0.7 C, 0.35 Mn, 0.98 W, 0.3 Cr, 0.12 V, bal Fe
For dies, crimpers, punches, oil hardening

ADAMANT
M-1410; 1.45 C, 0.5 Cr, 0.25 V, 4.75 W, bal Fe.
For rifling tools, burnishing tools, water hardened, keen cutting edge

ADAMANTINE.
M-447; 0.7 C, 0.7 Cr, 0.7 Mn, bal Fe.
Heat treated. 145,000 TS; 77,000 YS, 6.5 El; 16.6 RA; 260-300 Brin.
For heat treat steel balls for grinding mills; wear resistant

ADAMANT SUPER-GENUINE BABBITT
M-178; Cu, Sb, bal Sn.
12,850 TS; 8,600 YS; 22.8 Brin.
For marine, airplane, diesel and other internal combustion engine bearings; Sp. Gr 7.34, tough.

ADAMANT XL
M-56; 1.25 C, 1.75 Ni, 3 Cr, 0.4 Mo, bal Fe.
For cold work tools and dies, oil hardened.

ADAMAS 5X.
M-1086, WC, TaC, TiC, Co.
Sintered 230,000 TrS, A 91.0 Rock
For rough machining steel
BHMA 5-5-5; ISO P30.

ADAMAS 6X
M-1086, WC, TaC, TiC, Co
Sintered 230,000 TrS, A 91.5 Rock.
For general purpose machining steel
BHMA 6-5-5, ISO P20

ADAMAS 7X
M-1086, WC, TaC, TiC, Co.
Sintered: 200,000 TrS, A 92.4 Rock
For finish machining steel
BHMA 9-3-5, ISO P10

ADAMAS 387.
M-1086, 89 WC, 11 Co
Sintered 365,000 TrS, A 90.2 Rock

ADAMAS 434
M-1086, WC TaC, TiC, Co
Sintered 270,000 TrS, A 91.0 Rock
For rough machining steel.
BHMA 5-7-5, ISO P40.

ADAMAS 474
M-1086; WC, Co, TaC
Sintered 300,000 TrS, A 90.0 Rock
For rough machining steel
BHMA 3-8-2, ISO P40

ADAMAS 484.
M-1086,
Sintered 230,000 TrS, A 91.1 Rock.
For rough machining steel
BHMA 5-5-4, ISO P40

ADAMAS 502
M-1086, 88 WC, 12 Co
Sintered. 390,000 TrS, A 88.0 Rock

ADAMAS 548
M-1086, WC, TaC, TiC, Co
Sintered 230,000 TrS, A 92.0 Rock.
For finish machining steel.
BHMA 8-5-4, ISO P10.

ADAMAS 569
M-1086, 90 WC, 10 Co.
Sintered. 370,000 TrS, A 88.5 Rock.

ADAMAS 619.
M-1086, (high in TaC).
Sintered 230,000 TrS, A 91.1 Rock.
For general machining at higher heat.

ADAMAS 783
M-1086, 89 WC, 11 Co
Sintered. 385,000 TrS; A 88.4 Rock.

ADAMAS 815.
M-1086; 91 WC, 9 Co.
Sintered: 340,000 TrS; A 89.2 Rock

ADAMAS A.
M-1086; 94 WC, 6 Co.
Sintered: 300,000 TrS; A 91.7 Rock.
For general purpose machining ferrous and non-ferrous metals. BHMA. 7-6-0, ISO K 20.

ADAMAS AA.
M-1086; 96 WC, 4 Co
Sintered: 240,000 TrS; A 92.0 Rock.
For finish machining ferrous and non-ferrous metals. BHMA 8-5-8; ISO K10, M10.

ADAMAS AAA
M-1086; 97 WC, 3 Co.
Sintered: 200,000 TrS, A 92.6 Rock.
For finish boring ferrous and non-ferrous alloys
BHMA 9-3-0, ISO KO1.

ADAMAS AM
M-1086; WC, Co, TaC
Sintered: 240,000 TrS, A 91.9 Rock.
For general purpose machining steel and cast iron.
BHMA 7-5-1, ISO M20.

ADAMAS B
M-1086, 91 WC, 9 Co
Sintered 300,000 TrS; A 90.5 Rock.
For rough machining ferrous and non-ferrous alloys.
BHMA 4-8-0, ISO K30

ADAMAS BB
M-1086; 87 WC, 13 Co
Sintered 360,000 TrS, A 89.4 Rock
For rough machining ferrous and non-ferrous metals
BHMA 2-9-0, ISO K40

ADAMAS C
M-1086, 76 WC, 15 TiC, 9 Co
Sintered 210,000 TrS, A 92.0 Rock.
For finish machining steel
BHMA 8-4-6, ISO P10

ADAMAS CC
M-1086, 80 WC, 16 TiC, 4 Co
Sintered 175,000 TrS, A 93.2 Rock.
For precision boring steel
BHMA 9-2-6, ISO PO1

ADAMAS D
M-1086; 82 WC, 8 TiC, 10 Co
Sintered: 240,000 TrS, A 91.0 Rock.
For general purpose machining steel
BHMA 5-5-4, ISO P20

ADAMAS DD
M-1086; 83 WC, 5 TiC, 12 Co
Sintered 260,000 TrS, A 90.5 Rock.
For rough machining steel
BHMA 4-6-3, ISO P50

ADAMAS GG
M-1086; WC, Co, TaC
Sintered: 290,000 TrS, A 89.2 Rock.
For rough machining steel
BHMA 2-8-5, ISO P50.

ADAMAS HD-15.
M-1086, 85 WC, 15 Co
Sintered: 400,000 TrS; A 87.4 Rock.
For lamination punches and dies and wear parts.

ADAMAS HD-20
M-1086, 80 WC, 20 Co.
Sintered: 385,000 TrS; A 85.5 Rock.
For heading dies, swaging dies, nail gripper dies.

ADAMAS HD-20T.
M-1086, 75 WC, 5 TaC, 20 Co.
Sintered: 380,000 TrS; A 85.3 Rock.
For small swaging dies and gripper dies where anti-galling properties are important.

ADAMAS HD-25.
M-1086; 75 WC, 25 Co.
Sintered: 360,000 TrS; A 83.5 Rock.
For dies where high impact strength coupled with high abrasion resistance are necessary.

ADAMAS HD-25T.
M-1086; 70 WC, 5 TaC, 25 Co.
Sintered. 380,000 TrS, A 83.5 Rock.
For dies requiring maximum impact strength and anti-galling properties.

ADAMAS PWX.
M-1086; WC, Co, TaC.
Sintered: 230,000 TrS; A 92.3 Rock
For finish machining steel.
BHMA 9-5-1; ISO M10, KO5

ADAMAS TITAN 60.
M-1086; TiC, Mo_2C, Ni.
Sintered: 235,000 TrS; A 91.9 Rock.
For rough machining ferrous and non-ferrous alloys, including superalloys.

ADAMAS TITAN 80.
M-1086, TiC, Mo_2C, Ni.
Sintered: 200,000 TrS, A 93.0 Rock.
For finish machining and boring ferrous and non-ferrous alloys, including superalloys.
BHMA 9-2-9, ISO PO1, P10

ADAMITE
M-229; high C, 1 Cr, 0.75 Ni, bal Fe.
For press dies, rolls, mill guides, furnace parts, castings, cast iron-pearlitic, wear resistant.

ADAPTALOY
M-815; 1.8 Cu, 1.0 Si, 1.0 Mg, bal Zn
Cast 22,000-25,000 TS, 8000-10,000 YS; 11-7 El, 48 Brin
For ornamental grills, valve handles, structural castings, high elongation and impact strength.

ADIC
M-1112, 0.37 C, 1.1 Si, 5 Cr, 1 V, 1.3 Mo, bal Fe.
Annealed 230 Brin.
For die casting dies, hot forging dies; hot work steel, air hardened.

ADIC C T U
M-1112; 0.37 C, 1.1 Si, 5 Cr, 1.75 W, 1 V, 1.3 Mo, bal Fe
Annealed 230 Brin.
For die casting dies, shear blades, slitters; hot work steel, air hardened

ADLERSTAHL 1W.
M-1330, 1.0 C, 0.25 Si, 0.07 Mn, 1.1 Cr, bal Fe.
For bearings, races, liners, sleeves; water hardened, wear resistant.

ADLERSTAHL 3 MH
M-1330, 1.1 C, 0.25 Si, 0.25 Mn, bal Fe.
Annealed: 105,000 TS, 55,000 YS; 20 El; 40 RA, 205 Brin.
For drills, hobs, reamers, dies, cutters; Type W1, water hardened.

ADLERSTAHL 4 ZH.
M-1330, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS, 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, lathe and planer tools, cutters; Type W1; water hardened.

ADLERSTAHL 5 ZAH
M-1330; 0.85 C, 0.25 Si, 0.25 Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 12 El; 35 RA; 400 Brin
For drills, taps, tools, springs, cutters; Type W1; water hardened.

ADLERSTAHL AZ1.
M-1330; 1.05 C, 1.0 Cr, 1.15 W, 0.9 Mn, bal Fe.
For bearings liners, cutters, forming dies; water hardened.

ADLERSTAHL B11.
M-1330; 1.0 C, 0.2 Si, 0.25 Mn, 0.1 V, bal Fe.
For drills, taps, punches, reamers, hobs; Type W2; water hardened.

ADLERSTAHL C1.
M-1330; 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe
For bearings, sleeves, liners; water hardened, wear resistant

ADLERSTAHL C13.
M-1330, 2.1 C, 11.5 Cr, 0.3 Mn, bal Fe.
For blanking and forming dies, punches; oil hardened, nondeforming.

ADLERSTAHL C13TU.
M-1330; 2.1 C, 11.5 Cr, 0.3 Mn, bal Fe.
For blanking and forming dies, punches; oil hardened, nondeforming

ADLERSTAHL C13W
M-1330; 1.65 C, 11.5 Cr, 0.1 V, bal Fe
For blanking and forming dies, punches, oil hardened, nondeforming.

ADLERSTAHL EC2
M-1330, 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For reamers, taps, form cutters, drills, hobs, Type W1; water hardened.

ADLERSTAHL EC3.
M 1330; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 110,000 TS, 55,000 YS, 18 El; 38 RA; 210 Brin
For reamers, drills, taps, cutters, broaches; Type W1, water hardened

ADLERSTAHL EC4
M-1330, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed: 100,000 TS, 53,000 YS, 21 El; 42 RA, 200 Brin
For springs, tools, cutters, drills, reamers, Type W1, water hardened.

ADLERSTAHL EC5
M-1330; 0.85 C, 0.25 Si, 0.25 max Mn, bal Fe
Heat treated. 190,000 TS, 145,000 YS, 10 El; 30 RA; 400 Brin
For springs, tools, drills, cutters, taps, hammers, Type W1, water hardened

ADLERSTAHL EC6
M-1330, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated. 175,000 TS; 128,000 YS. 12 El; 37 RA, 355 Brin.
For springs, tools, rails, axes, Type W1, water hardened

ADLERSTAHL EGH1.
M-1330; 0.35 C, 0.9 Si, 0.3 Mn, 1.05 Cr, 0.18 V, 1.85 W, bal Fe
For header dies, upsetters, crimpers, punches, oil hardened, tough

ADLERSTAHL EGH3
M-1330, 0.55 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe
For header dies, upsetters, shears, crimpers, oil hardened, tough.

ADLERSTAHL EXTRA
M-1330, 0.86 C, 4 Cr, 2.5 V, 0.85 Mo, 12 W, bal Fe.
For reamers, taps, drills, hobs, broaches; high-speed steel

ADLERSTAHL EXTRA P12
M-1330; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, reamers, hobs, taps; high-speed steel.

ADLERSTAHL GCN1.
M-1330; 0.55 C, 0.7 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For gears, shafts, bolts, studs, crankshafts; oil hardening, shock resistant.

ADLERSTAHL GCN2.
M-1330; 0.56 C, Ni, Cr, Mo, V, bal Fe.
For gears, fasteners, bolts, studs; oil hardened, shock resistant.

ADLERSTAHL GDM.
M-1330; 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe
For header dies, upsetters, crimpers; oil hardened, tough

ADLERSTAHL KJ.
M-1330, 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, broaches; high-speed steel.

ADLERSTAHL KT
M-1330, 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2 V, 12 W, bal Fe
For lathe and planer tools, drills, taps, reamers, high speed steel

ADLERSTAHL NI.5H
M 1330, 0.50 C, 1.05 Cr, 3.25 Ni, 0.50 Mn, bal Fe
For gears, bolts, crankshafts, dies, punches, oil hardened, shock resistant

ADLERSTAHL NWO
M-1330, 0.45 C, Ni, Cr, bal Fe
For gears, bolts, crankshafts, oil hardened, shock resistant

ADLERSTAHL 03
M-1330, 1.0 C, 1.1 Cr, 0.25 Si, 0.07 Mn, bal Fe
For bearings, races, liners, sleeves, water hardened, wear resistant

ADLERSTAHL P15
M-1330, 1.35 C, Cr, V, W, Co, bal Fe
For reamers, broaches, cutters, taps, high speed steel

ADLERSTAHL PM35
M-1330, 0.38 C, Si, Cr, V, bal Fe
For gears, springs, punches, bolts, shafts; oil hardened, tough

ADLERSTAHL P45
M-1330, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe
For reamers, broaches, cutters, taps, high-speed steel

ADLERSTAHL PM45
M-1330, 0.45 C, Si, Cr, V, bal Fe
For springs, bolts, crankshafts, gears, oil hardened, shock resistant

ADLERSTAHL PM50
M-1330, 0.61 C, 1.18 Cr, 0.10 V, 0.75 Mn, 0.85 Si, bal Fe
For upsetters, heading and forging dies, oil hardened, tough

ADLERSTAHL PROPHET EXTRA.
M-1330, 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2 V, 12 W, bal Fe
For lathe and planer tools, cutters, reamers, high-speed steel

ADLERSTAHL PZM.
M-1330; 1.4 C, 0.1 V, 0.30 Cr, 0.30 Mn, bal Fe
For bearings, forming and blanking dies, water or oil hardened, wear resistant

ADLERSTAHL RO
M-1330, 1.42 C, W, V, bal Fe
For blanking and forming dies, bearings, water or oil hardened, wear resistant.

ADLERSTAHL SICR.
M-1330; 1.1 C, 0.40 Cr, 0.30 Mn, bal Fe.
Heat treated: 190,000 TS; 120,000 YS; 10 El; 30 RA; 375 Brin
For springs, taps, cutters, drills, reamers; Type W1; water hardened.

ADLERSTAHL SPEZIAL M25.
M-1330; 0.95 C, W, Mo, bal Fe.
For cutters, punches, dies; oil hardened.

ADLERSTAHL WKS.
M-1330; 0.55 C, 1.05 Cr, 0.18 V, 1.85 W. 0.9 Si, bal Fe.
For upsetting and heading dies, punches, oil hardened tough.

ADLERSTAHL WPS.
M 1330; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams and dies, hot punches; oil hardened, hot work steel.

ADLERSTAHL WPS-EXTRA.
M-1330; 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion rams and dies, hot punches; oil hardened, hot work steel

ADLERSTAHL V
M-1330, 0.8 C, 4.7 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe
For lathe and planer tools, taps, reamers, high-speed steel

ADMIRALTY BRASS
M-8, 62 Cu, 37 Zn, 1 Sn.
Cast 56,000 TS, 27,000 YS, 15 El, 25 RA
Rolled hard 71,680 TS, 55,500 YS; 20 El; 30 RA
For pump rods, sheets.

ADMIRALITY BRASS
M-286, M-1560, 70 Cu, 1 Sn, 0.04 As, bal Zn
Annealed 40,300-49,300 TS, 18,000-22,400 YS, 60-75 El, 54-73 Brin
Hard. 71,700-87,400 TS, 60,000-76,000 YS, 8-15 El, 145-175 Brin.
Good resistance to sea air, for fixtures on marine equipment

ADMIRALTY BRONZE MODIFIED
M-126, 86 Cu, 8 Sn, 2 Pb, 4 Zn.
For valves, fittings, pressure tight

ADMIRALTY CAG.
M-657, 87 Cu, 9 Sn, 4 Zn or 88 Cu, 10 Sn, 2 Zn
Cast 36,000 TS, 18,000 YS, 20 El.
For marine castings, resists marine corrosion

ADMIRALTY GUN METAL.
M-711, 87.7 Cu, 10.3 Sn, 1.4 Zn, 0.4 As, 0.08 Pb, 0.05 Fe.
Cast 37,300 TS, 21,300 YS, 9 El, 100 Brin.
For valves, pump parts, corrosion resistant.

ADMIRALTY METAL
M-33, 70-73 Cu, 0.9-1.2 Sn, 0.07 max Pb, 0.06 max Fe, bal Zn
Annealed: 45,000 TS, 18,000 YS; 60 El, 70 Brin.
Hard. 100,000 TS, 98,000 YS, 4 El; 210 Brin.
For condenser tubes, ferrules, distiller tubes, reduced dezincification, corrosion resistant

ADMIRALTY NICKEL.
M-126, 70 Cu, 29 Zn, 1 Ni
For condenser tubes, corrosion resistant

ADMIRALTY WHITE METAL
Eng.; 8-9 Sb, 2-7 Cu, bal Sn.
For bearings.

ADMIRO.
M-2; 48 Cu, 10 Ni, 35 Zn, 2 Al, 3 Mn, 2 Fe.
Cast: 57,000-70,000 TS, 40-20 El, 110-130 Brin.
Hot pressed: 63,000-76,000 TS; 40-25 El; 150-170 Brin.
For turbine bearings, tubes; corrosion resistant.

ADMIRO V.
M-2, 43 Cu, 15 Ni, 35 Zn, 2 Al, 3 Mn, 2 Fe.
Cast: 18-5 El; 160 Brin.
Pressed: 20-8 El, 185 Brin.
For turbine bearings; corrosion resistant

ADMOS.
M-2, 40-55 Cu, 3-15 Ni, 1-3 Mn, 1-2 Fe, 0.5-3.0 Al, bal Zn
Cast 56,000-71,680 TS; 35-20 El; 80-90 Brin.
Hot pressed: 69,440-85,120 TS; 35-20 El; 90-120 Brin.
For bearing bushes, worm wheels, condenser tubes, turbine blading, gear wheels, valves; resists corrosion and erosion of superheated steam.

ADRIATICAL.
M-658; 4-5 Cu, bal Al.
For light alloy parts; similar to Duralumin

ADVALOY
M-1462; Al alloy.
For castings, permanent mold.

ADVANCE
M-44, 54-55 Cu, 44-46 Ni
Rolled. 62,000 TS, 40,000 YS; 40 El; 75 RA.
For rheostats, electrical instrument work, resistance metal, similar to Constantan and Ideal.

ADVANCE
M-585, Cu, Sb, bal Sn.
For bearings, Babbitt metal

ADVANCED DUTY OILITE BRONZE.
M-211, 87.5-90.5 Cu, 1.0 max Fe, 1.75 max C, 9.5-10.5 Sn
Sintered 16,000-18,000 TS, 15,000-20,000 YS; 6.8-7.2 density.
Oilite bearing material
ASTM B255-61 Type 11, SAE 842, PMPMA BT-0010-S

A.E.B. STAINLESS.
M-111a, 0.95 C, 1 Mn, 13.5 Cr, bal Fe
For razor blades, surgical instruments, hardenable, corrosion resistant

AELENER ZINC
3 Sb, 3.5 Cu, 21.6 Pb, 20.5 Sn, 51.4 Zn.
For solder, bearings

AEM 90.
M-1246
For permanent magnets, sintered.

AEM 120
M-1246
For permanent magnets, sintered

AEONITE
M-453; Ni, bal Cu
For sanitary appliances, white metal.

AERAL.
M-187, 2.0-4.5 Cu, 0.2-1.5 Mg, 0.7 Si, 0.3 Mn, 0.5-2.5 Cd, bal Al
Cast 31,500 TS; 25,000 YS; 3 El; 90 Brin
For casings, housings, oil pans
Age-hardenable, good machinability

AERAL
M-623; 3.5-4.5 Cu, 0.4-1.0 Mn, 0.3-0.75 Mg, bal Al.
56,000-75,000 TS, 30,000-55,000 YS, 20-10 El.
For light alloys, airplane and dirigible parts; "Duralumin" type alloy; age-hardening.

AERAL A
M-623; 2.0-4.5 Cu, 0.2-1.5 Mg, 2.5 max Si, 0.8 max Fe, 0.4 max Ti, 0.5-2.5 Cd, 0.5 max Mn, bal Al.

Solution treated: 28,000-34,000 TS; 22,000-24,000 YS; 5-3 El.
For sand and chill castings; heat treatable.

AERALLOY.
M-237; Pt alloy.
For electrical contacts; heat resistant.

AERALLOY NO. 1.
M-237; Ir, bal Pt.
For electrical contacts, vibrators, temperature gages; resists arc erosion.

AERALLOY NO. 2.
M-237; Ir, bal Pt.
For electrical contacts, vibrators, thermostats, resists arc erosion.

AERISWELD.
M-578; 0.05 P, 7.0 Sn, 0.1 Al, 0.02 Pb, bal Cu.
Bronze arc welding electrode
AWS Class E CuSn-C.

AEROLITE.
M-28; 12 Cu, 2 Mn, bal Al.
Cast: 22,000 TS; 14,000 YS; 60 Brin.
For pistons, automobile parts; good machinability.

AEROLITE.
English; 97 Al, 1.2 Cu, 1.0 Fe, 0.5 Si, 0.4 Mg
For pistons, auto parts.

AERO METAL (Cast).
M-287, 4.2 Cu, 27.8 Zn, 0.5 Fe, 0.5 Si, 67 Al.
Cast: 25,000 TS.
For automotive engine parts; cast.

AERO METAL (Sheet).
M-287; 0.2-0.6 Cu, 2.1-2.9 Mg, 96 Al, 0.3-1.3 Fe
Rolled: 20,000 TS
For automotive engine parts; sheet

AEROMIN.
Germ.; 92.7 Al, 6.2 Mn, 0.8 Fe, 0.3 Si.
For light alloy parts

AERON.
M-320, M-299, 1.8 Cu, 0.8 Mn, 1.0 Si, bal Al.
Heat treated: 54,000-60,000 TS; 26,000-34,000 YS; 18-25 El; 90-120 Brin.
For light alloy parts, heat treatable.

AERON.
M-584; 4.5 Cu, 0.75 Si, 0.75 Mn, bal Al.
Annealed: 23,000-35,000 TS, 7,000-12,000 YS; 12-20 El; 45-55 Brin
Quenched. 45,000-53,000 TS, 15,000-30,000 YS; 15-22 El; 68-85 Brin
For light anti-corrosive alloy parts; light anti-corrosion alloy. Similar to Alcoa No. 25S.

AEROSIL 8F
M-1323, 0.12 max C, 0.8 Al, 6.5 Cr, bal Fe
For oil refining equipment; creep and heat resistant.

AEROSIL 9F.
M-1323; 0.12 max C, 1.0 Al, 13 Cr, bal Fe.
For oil refinery and chemical plant equipment; corrosion and heat resistant.

AEROSIL 10A.
M-1323; 0.15 C, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment; Type 302; stainless, austenitic.

AEROSIL 10F.
M-1323; 0.12 max C, 1.0 Al, 18 Cr, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 160 Brin.
For oil refinery equipment; corrosion and heat resistant.

AEROSIL 11FO.
M-1323; 0.2 C, 25 Cr, 4 Ni, bal Fe.
For furnace parts, heat treating boxes; heat resistant.

AEROSIL 12A.
M-1323; 0.15 C, 24 Cr, 19 Ni, bal Fe.
For furnace equipment heat treating boxes, pots; Type 310; stainless, austenitic.

AEROSIL 12F.
M-1323, 0.12 max C, 1.5 Al, 24 Cr, bal Fe.
For furnace parts, conveyors, boxes, fixtures; heat and creep resistant.

AETERNA.
60.4 Cu, 0.2 Pb, 0.1 Mn, 0.3 Sn, 39 Zn.
For marine hardware; corrosion resistant

AETERNA 600 METAL
M-953, 60 Cu, 40 Zn, Mn, Si.
85,000-90,000 TS.
For gears, levers, cams, cranks; high strength.

AF 1753.
M-U S, 0.24 C, 16.25 Cr, 7.2 Co, 1.6 Mo, 8.4 W, 3.1 Ti, 1.9 Al, 0.06 Zr, 0.008 B, 9.5 Fe, bal Ni
At 70°F 187,000 TS, 121,200 SS.
At −320°F: 217,100 TS
At −423°F 219,400 TS, 149,200 SS
For cryogenic fasteners
Good tensile-impact properties.

AFCOLOY 18-8
M-159, 0.2 max C, 1.5 max Mn, 2 max Si, 18-21 Cr, 8-11 Ni, bal Fe.
Annealed: 80,000 TS, 40,000 YS, 45 El; 50 RA; 150 Brin
For stainless castings, chamical plant equipment; ACI-CF 20, stainless, austenitic

AFCOMET 150-12
M-159, 1.4-1.8 C, 0.5-1.25 Mn, 0.25-1.0 Si, 12-14 Cr, bal Fe.
Cast. 50,000 TS; 500 Brin
For forging dies, gauges, tools, Tr S 4000; Ti.D 0.10, wear resistant

AFFRFEZF-III
M-448; 0.15 max C, 1.3 Mn, 0.25 Mo, 0.07 V, bal Fe
For nuclear parts, pressure vessels.
Good creep strength Maximum service life of 790°F.

A-G5.
French, 5 Mg, 0.5 Mn, bal Al.
For automobile chassis, light weight construction

AGATHON ARMATURE.
M-97, 0.5 Si, bal Fe
For electric motors, high permeability

AGATHON DYNAMO
M-97, 2.5 Si, bal Fe
For dynamos; high permeability.

AGATHON ELECTRIC.
M-97, 1.0 Si, bal Fe
For electric motors, high permeability

AGATHON SPECIAL ELECTRIC
M-97, 1.2 Si, bal Fe
For electric motors; high permeability

AGGERLIT A.
M-614, 0.3 C, 2.2 Si, 6 Cr, bal Fe.
For oil refinery equipment, heat resistant.

AGGERLIT B.
M-614; 0.5 C, 1.5 Si, 17 Cr, bal Fe.
For heat treating boxes, furnace parts, fixtures; corrosion and heat resistant.

AGGERLIT C.
M-614; 0.6 C, 1.5 Si, 22 Cr, bal Fe.
For furnace parts and equipment, fixtures; corrosion and heat resistant.

AGGERLIT D.
M-614; 0.6 C, 1.5 Si, 22 Cr, bal Fe
For furnace parts and equipment; fiixtures; corrosion and heat resistant.

AGGERLIT E.
M-614, 0.6 C, 1.5 Si, 29 Cr, bal Fe
For furnace parts and equipment, fixtures, heat resistant.

AGGERSTAHL
M-614, 1.45 C, 1.4 Cr, 0.25 Si, 0.6 Mn, bal Fe.
For bearings, sleeves, liners, water hardened, wear resistant.

AGILE ACTARC.
M-661; pure Fe or low alloy steel.
For welding electrodes, for sheet metal

AGILE NO. 200
M-661, 15 Sn, bal Cu.
For welding and brazing rods, coated, M.P. 1596°F.

AGILE SILVER A-C ELECTRODE
M-661, 0.9 C, 0.7 Mn, 0.7 Cr, 1.5 W, bal Fe.
400-650 Brin
For welding electrodes, deposit should be heat treated

AGILE SILVER BLACK.
M-661, 0.6 C, 12 Cr, 8 Mo, 8 W, 1.5 B, bal Fe
For welding high speed steel cutters; high speed steel

AGILE SILVER CHISEL.
M-661, 0.8-1.0 C, 1.0 Si, 1.5 W, 0.3-0.5 B, bal Fe.
400-620 Brin
For welding electrodes for chisels and shock resisting tools, tough, shock resisting

AGILE SILVER D-C-ELECTRODE
M-661, 1.8-2.2 C, 12-14 Cr, 0.5 V, 0.8 Mo, bal Fe
400-640 Brin
For welding electrodes for punches and cold working dies, must be heat treated.

AGILE SILVER RED
M-661, 0.75 C, 4 Mo, 6 W, 4 Cr, 0.8 B, bal Fe.
For welding high speed steel tools, high speed steel.

AGILE YELLOW ROD
M-661, 67 Ni, 31 Cu, 0.2 B
190 Brin
For welding, electrode for cast iron, machinable.

AGMOLITE.
M-237, Ag-Mo.
For electrical contacts for circuit breakers; sintered

AGNILITE
M-237, Ag, Ni
For electric contacts for circuit breakers, sintered.

AGRAPHITE
M-237, Ag-graphite
For electrical contacts for circuit breakers; sintered

AGRICOLA
M-221; 70 Cu, 30 Pb.
For diesel egine bearings, seals, heavy duty

AGRICOLA BRONZE.
M-699, 70 Cu, 1 Ag, 29 Pb
For bearings, bushings.

AGRILITE BEARING METAL
M-128; 70 Cu, 5 Sn, 25 Pb.
25,000 TS; 16,350 YS, 50 Brin.
For bearings for rolling mill, thrust bearings on steam boats, bearing for washing and ironing machines; self lubricating bearing bronze.

AGRILITE NO. 5.
M-128; 70.49 Cu, 5.39 Sn, 24.0 Pb, 0.09 Ni, 0.005 P.
For connecting rod bearings for aero engines, rolling mill bearings, self lubricating bearing bronze

AH NO. 2.
M-926, 30 Ag, 52.45 Cu, 9.75 Zn, 7.8 Ni.
For brazing; M.P. 1400-1735°F.

AHB-300
M-Russia; 15.5 Cr, 8.5 W, Ti, Al, Fe, 0.10 max C, 0.10 max B, bal Ni
For automotive turbines, aircraft gas turbines.
Good creep and rupture strength. High oxidation resistance.

A.H. CHROME DIE
M-1406, 1.0 C, 5 Cr, 1 Mo, 0.3 V, bal Fe
For dies, gages, mandrels; cold work steel, air hardened, non-deforming.

AICH METAL
Eng., 59.37 Cu, 39.68 Zn; 0.95 Fe.
Cast: 60,000 TS, 21,000 YS, 44 El, 45 RA, 90 Brin.
Forged: 64,500 TS; 31,000 YS, 44 El; 64 RA, 107 Brin
For hydraulic cylinders and forgings, resists oxidation, similar to "Sterro."

AICMA FE PL 52 S (Vascojet 90)
M-1723, 0.12-0.18 C, 0.20 max Si, 0.80-1.10 Mn, 1.25-1.50 Cr, 0.80-1.0 Mo, 0.20-0.30 V, bal Fe
Air or oil hardenable
Hardened: 140,000-184,000 TS, 112,000 min YS, 10 min El
High strength, weldable, low carbon-low alloy steel, can be case hardened for improved wear
AFNOR 15 CDV 6

AIDION
M-587, Sb, Pb, bal Sn
For bearings, antifriction metal

AIKEN METAL
U.S.; 50 Cu, 50 Pb
For plastic metal parts

AIR-4.
M-24, 0.95 C, 2.0 Mn, 2.2 Cr, 1.1 Mo, 0.15-0.35 Pb, bal Fe
General purpose tools, cold forming dies, blanking dies, forming rolls, knurling tools
Free machining type
Type A4 air hardening tool steel

AIRALOY see A-4

AIR-CHROM
M-335, 1.0 C, 0.6 Mn, 5.25 Cr, 0.25 V, 1.1 Mo, bal Fe
For tools, dies
AISI A2 air hardening tool steel.

AIRCO NO. 1
M-663, 0.15 max C, 0.45 Mn, 0.2 Si, 1.0-1.5 Ni, 0.3 max Cr, bal Fe
Low alloy steel welding rod, for gas or tungsten inert gas welding of carbon and low alloy steels
As welded: 62,000 TS, 22 El
AWS RG 60.

AIRCO NO. 4
M-663, 0.08-0.20 C, 0.9-1.2 Mn, 0.15-0.30 Si, bal Fe.
Low alloy steel welding rod, for gas or tungsten inert gas welding of carbon and low alloy steels
As welded: 62,000-67,000 TS; 20-25 El.

AIRCO NO. 7.
M-663, 0.06 max C, 0.25 max Mn, bal Fe
Low carbon steel welding rod, copper coated, for gas welding of low carbon steel sheet, plate and pipe, and for auto body repair.
As welded: 52,000 TS; 23 El.
AWS RG 45.

AIRCO NO. 9.
M-663; 3.25 C, 0.6 Mn, 3.0 Si, bal Fe.
Square cast iron gas welding rod,-for general gas welding of grey cast iron.
AWS-ASTM RCI.

AIRCO NO. 10.
M-663; 3.3 C, 0.6 Mn, 2.25 Si, 1.4 Ni, 0.35 Mo, bal Fe.
Square low alloy cast iron rod,-for welding low alloy gray irons.
AWS-ASTM RCI-A.

AIRCO NO. 20 BRONZE ROD.
M-663; 0.5-1.0 Sn, 60 Cu, 0.06 max Fe, bal Zn.
Bare or coated rod for braze-welding copper, bronze and nickel alloys. Fuses readily at 1625°F; strength: 40,000 TS min.
AWS RB CuZn-A.

AIRCO NO 21 NICKEL SILVER ROD.
M-663; 46-50 Cu, 9-11 Ni, bal Zn.
Bare or coated rod for joining dissimilar metals as mild steel, tool steel, cast iron, stainless steel, monel, inconel, bronze, copper, malleable iron 70,000 min. TS
AWS RB Cu Zn-D

AIRCO NO 22 MANGANESE BRONZE ROD.
M-663, 59 Cu, 0.4 Fe, 0.23 Mn, 1.0 Sn, 0.3 Ni, bal Zn.
Bare or coated rod for braze-welding steel, cast iron, malleable iron, copper base alloys and to build up wearing surfaces and bearings 45,000 min. TS.
AWS R Cu Zn-B.

AIRCO NO 23 A SILICON COPPER ROD
M-663, 0.65-0.90 Sn, 0.1-0.3 Si, 0.1-0.25 Mn, 0.15 max P, bal Cu (deoxidized).
Bare rod for TIG welding; 25,000 TS.
AWS R Cu.

AIRCO NO 27 LOW FUMING BRONZE ROD
M-663, 56-59 Cu, 0.4-0.8 Fe, 0.1 Si, 0.3 Mn, 1.0 Sn, bal Zn.
Bare or coated rod, low fuming, for general purpose braze-welding of steel, cast iron, brass and bronze 50,000 TS min.
AWS R Cu Zn-C.

AIRCO NO. 28.
M-663, 56.5-58.5 Cu, 0.1-0.3 Si, 2.1-2.7 Sn, bal Zn
For bronze welding rod, for wear resistant surfaces

AIRCO 35-Ni 15-Cr TITANIA
M 663, 0.07 C, 1.8 Mn, 16 Cr, 35 Ni, 0.9 Mo, bal Fe
For welding rod, heat and corrosion resistant.

AIRCO 43
M-663, 5% Si Aluminum base electrode, coated, DC reverse polarity
For arc welding aluminum
AWS-ASTM Al-43.

AIRCO 46.
M-663; Coated electrode, DC reverse polarity.
Deposit analysis 0.6 C, 0.2 Mn, 0.1 Si, bal Fe
Hardness 20-25 Rock C.
For build-up to resist abrasion and impact, for excavator bucket fingers, locomotive tire flanges, rails and switches.

AIRCO 57.
M-663; 4.5-6.0 Si, 0.8 Fe, 0.3 Cu, 0.1 Zn, 0.2 Ti, bal Al
General purpose aluminum electrode, coated, DC reverse polarity.
As welded. 14,000 TS min
For welding aluminum alloys 6061, 6063, 5052, 5154, 5454, 3003 and 2024.
AWS-ASTM Al-43

AIRCO 70.
M-663; 4.25 Sn, 0.5 Fe, 0.15 Zn, 0.10 P, 0.10 Si, bal Cu.
Phosphor bronze brazing rod, coated: DC reverse polarity.
As welded: 40,000 TS, 20,000 YS; 15 El; 75 Brin.
For joining brass, bronze, copper, steel, cast iron, malleable iron
AWS-ASTM E Cu Sn-A

AIRCO 77
M-663, 0.10 C, 0.22 Mn, 0.17 Si, bal Fe.
AC-DC reverse polarity coated electrode
For arc welding cast iron cylinder blocks and heads, bearing blocks, machine parts, large frames.
AWS-ASTM E St.

AIRCO NO 92 SILICON BRONZE ROD
M-663, 95.8 Cu, 3.0 Si, 1.0 Mn, 1.0 Zn.
Tin coated rod for brazing galvanized iron by carbon arc process or TIG
AWS R Cu Si-A

AIRCO 100
M-663, 9.0-11.0 Al, 1.5 max Fe, bal Cu
Aluminum bronze brazing rod, coated, DC reverse polarity.
As welded 77,000 TS, 35,000 YS; 27 El, 120 Brin
For welding and build-up on brass, manganese bronze, aluminum bronze and dissimilar metals
AWS-ASTM E Cu Al-A2

AIRCO 116
M-663, 11.0-12.0 Al, 3.0-4.25 Fe, bal Cu
Aluminum bronze brazing rod, coated, DC reverse polarity
As welded: 89,000 TS, 47,000 YS, 15 El, 160 Brin
For overlays on bearing surfaces that are subjected to shock or impact loading, and for joining many dissimilar metals.
AWS-ASTM E Cu Al-B

AIRCO 120
M-663, 12.0-13.0 Al, 3.0-5.0 Fe, bal Cu
Aluminum bronze brazing rod, coated, DC reverse polarity
As welded 90,000 TS, 46,000 YS, 4 El, 200 Brin
For surfacing and overlays for good wear and strength for severe service
AWS ASTM E Cu Al-C

AIRCO 125
M-663, 13.0-14.0 Al, 3.0-5.0 Fe, bal Cu Aluminum bronze brazing rod, coated; DC reverse polarity
As welded 77,000 TS, 54,000 YS, 1.0 El, 250 Brin
For surfacing and overlays for rebuilding aluminum bronze dies or finish layer on ferrous dies to reduce galling.
AWS-ASTM E Cu Al-D

AIRCO 130
M-663, 14.0-15.0 Al, 3.0-5.0 Fe, bal Cu
Aluminum bronze brazing rod, coated, DC reverse polarity
As welded 80,000 TS, 69,000 YS, 0 El, 300 Brin
For overlaying dies, shafts, bearings to minimize scratching and galling
AWS-ASTM E Cu Al-E

AIRCO 308.
M-663, 19 Cr, 9 Ni stainless welding rod; bare wire, cut lengths
AWS ER 308, AISI 308.

AIRCO 308 AC-DC
M-663, 0.07 C, 20 Cr, 10 Ni, 1.7 Mn, 0.4 Si, bal Fe.
AC-DC reverse polarity titania coated electrode.
For welding Austenitic 18-8 type stainless steels
AWS-ASTM E 308-16, AISI 308

AIRCO 308 DC.
M-663; 0.05 C, 19 Cr, 10 Ni, 1.8 Mn, 0.3 Si, bal Fe.
DC reverse polarity lime coated electrode
For welding austenitic 18-8 type stainless steels.
AWS-ASTM E 308-15, AISI 308.

AIRCO 308 ELC.
M-663; Low carbon grade of 308.
For welding AISI 304L, 321 and 347 stainless steels.
AWS ER 308 L; AISI 308 L.

AIRCO 308 ELC AC-DC
M-663; 0.03 C, 20 Cr, 10 Ni, 1.9 Mn, 0.4 Si, bal Fe.
AC-DC reverse polarity titania coated electrode
For welding 304 L, 321, 347 and other 18-8 stainless steels
AWS-ASTM E 308 L-16; AISI 308 ELC.

AIRCO 309
M-663, 25 Cr, 12 Ni stainless welding rod, bare wire, cut lengths.
For welding AISI 309 Stainless steel
AWS ER 309, AISI 309

AIRCO 309 AC-DC
M-663, 0.10 C, 24 Cr, 13 Ni, 1.8 Mn, 0.55 Si, bal Fe
AC-DC reverse polarity titania coated electrode
As welded 89,000 TS, 65,000 YS; 42 El.
For welding austenitic type 309 stainless.
AWS-ASTM E 309-16, AISI 309

AIRCO 309 Cb AC-DC
M-663, 0.09 C, 24 Cr, 13 Ni, 2.1 Mn, 0.55 Si, 0.85 Cb, bal Fe.
AC DC reverse polarity titania coated electrode
As welded: 90,000 TS, 70,000 YS, 35 El
AWS-ASTM E 309 Cb-16, AISI 309 Cb

AIRCO 309 DC
M-663; 0.07 C, 23 Cr, 12.75 Ni, 1.9 Mn, 0.7 Si, bal Fe
DC reverse polarity lime coated electrode
As welded 89,000 TS, 63,500 YS, 42 El.
For welding austenitic type 309 stainless.
AWS-ASTM E 309-15, AISI 309

AIRCO 310
M-663; 25 Cr, 20 Ni, stainless welding rod, bare wire, cut lengths
For welding AISI 310 stainless by TIG or oxyacetylene (with flux) methods, for elevated temperature operations
AWS ER 310, AISI 310

AIRCO 310 AC-DC
M-663, 0.11 C, 26.5 Cr, 21.0 Ni, 1.8 Mn, 0.5 Si, bal Fe.
AC-DC reverse polarity titania coated electrode
As welded. 91,000 TS, 61,000 YS; 36.5 El
For welding austenitic types 310 and 314 stainless steels
AWS-ASTM E 310-16, AISI 310

AIRCO 310 Cb AC-DC.
M-663, 0.11 C, 26 Cr, 21 Ni, 1.9 Mn, 0.6 Si, 0.85 Cb, bal Fe
AC-DC reverse polarity titania coated electrode
As welded 93,500 TS, 69,500 YS, 42 El
For welding austenitic stainless steels and some dissimilar metals
AWS-ASTM E 310 Cb-16, AISI 310 Cb

AIRCO 310 DC
M-663, 0.10 C, 26 Cr, 21 Ni, 1.8 Mn, 0.6 Si, bal Fe
DC reverse polarity lime coated electrode.
As welded: 91,000 TS, 61,000 YS, 36 El
For welding austenitic types 310 and 314 stainless steels.
AWS-ASTM E 310-15; AISI 310.

AIRCO 310 Mo AC-DC.
M-663; 0.10 C, 26 Cr, 21 Ni, 1.9 Mn, 0.55 Si, 2.5 Mo, bal Fe
AC-DC reverse polarity titania coated electrode.
As welded: 89,000 TS; 62,500 YS; 37 El.
For welding type 310 and similar steels and for overlay mild steel for paper pulp digestors and similar applications
AWS-ASTM E 310 Mo-16; AISI 310 Mo.

AIRCO 312 AC-DC.
M-663, 0.12 C, 28 Cr, 9.25 Ni, 2.0 Mn, 0.7 Si, bal Fe.
AC-DC reverse polarity titania coated electrode.
As welded 120,000 TS; 80,000 YS, 36 El.
For welding high strength type 312 base materials particularly for jet aircraft industry, and for dissimilar metals.
AWS-ASTM E312-16; AISI 312.

AIRCO 316.
M-663, 19 Cr, 12 Ni, 2.5 Mo stainless welding rod, bare wire, cut lengths
For welding AISI 316 stainless steel.
AWS ER 316; AISI 316

AIRCO 316 AC-DC
M-663, 0.06 C, 18.5 Cr, 13.0 Ni, 1.9 Mn, 0.6 Si, 2.25 Mo, bal Fe.
AC-DC reverse polarity titania coated electrode.
As welded: 93,000 TS; 75,000 YS, 35 El.
For welding type 316 for corrosion resistant or elevated temperature applications.
AWS-ASTM E316-16, AISI 316.

AIRCO 316 Cb AC-DC
M-663, 0.07 C, 18.5 Cr, 11.5 Ni, 1.9 Mn, 0.55 Si, 2.25 Mo, 0.5 Cb, bal Fe
AC-DC reverse polarity titania coated electrode.
As welded 90,000 TS; 63,000 YS; 36 El.
For welding type 316 and other austenitic stainless steels for best corrosion resistant joints
AWS ASTM E- 318-16, AISI 318.

AIRCO 316 ELC
M-663, Low carbon grade of 316.
For welding AISI 316L stainless steel
AWS ER 316L, AISI 316L.

AIRCO 316 ELC AC-DC
M-663, 0.03 C, 18.5 Cr, 13.0 Ni, 1.9 Mn, 0.6 Si, 2.25 Mo, bal Fe.
AC-DC reverse polarity titania coated electrode.
As welded 88,700 TS, 74,350 YS, 33.5 El.
For welding extra low carbon molybdenum bearing austenitic stainless
AWS-ASTM E 316L-16, AISI 316 ELC.

AIRCO 317 AC-DC
M-663; 0.07 C, 19 Cr, 13 Ni, 2 Mn, 0.55 Si, 3.5 Mo, bal Fe
AC-DC reverse polarity titania coated electrode.
As welded 102,000 TS; 87,000 YS, 31 El
For welding type 317 stainless for severe corrosion resistance
AWS-ASTM E317-16, AISI 317.

AIRCO 330 AC-DC
M-663, 0.20 C, 15 Cr, 34.5 Ni, 1.75 Mn, 0.6 Si, bal Fe
AC-DC reverse polarity titania coated electrode.
As welded: 89,500 TS, 70,000 YS, 35.5 El.
For welding high nickel alloy castings for high temperature operation
AWS-ASTM E330-16; AISI 330.

AIRCO 347
M-663, 19 Cr, 9 Ni, Cb stabilized stainless steel welding rod, bare wire, cut lengths.
For welding AISI 304L, 321 and 347 stainless steels.
AWS ER 347, AISI 347.

AIRCO 347 AC-DC.
M-663; 0.06 C, 19.5 Cr, 10.0 Ni, 1.5 Mn, 0.6 Si, 0.70 Cb, bal Fe.
AC-DC reverse polarity titania coated electrode.
As welded: 109,000 TS; 79,500 YS; 34.5 El.
For welding types 321 and 347 stainless.
AWS-ASTM E347-16; AISI 347

AIRCO 361.
M-663; stainless core rod, composite coating
Deposit comp: 0.50 C, 4.75 Mn, 19.0 Cr, 9.5 Ni, 0.75 Si, bal Fe.
For joining and hardfacing of railroad frogs and switches and similar applications Impact resistant.

AIRCO 363.
M-663; Coated electrode
AC or DC, either polarity.
Deposit analysis: 0.20 C, 1.0 Mn, 0.65 Si, 0.5 Cr, bal Fe Hardness 20-28 Rock C.
For surfacing or intermediate layer with some abrasion and impact resistance, for brake drums, gear teeth, sprockets and bushings

AIRCO 375
M-663, 1.2 C, 1.0 Mn, 0.45 Si, 2.75 Fe, bal Ni
AC-DC reverse polarity
For welding cast iron.
AWS-ASTM E NiCI

AIRCO 410
M-663; 12 Cr, stainless welding rod, bare wire, cut lengths.
For welding AISI 403 and 410 stainless steels
AWS ER 410, AISI 410

AIRCO 410 DC.
M-663; 0.09 C, 12.5 Cr, 0.6 Ni, 0.8 Mn, 0.6 Si, bal Fe
DC reverse polarity lime type coated electrode
As welded: 150,000 TS, 5 El
Heat treated 71,500 TS; 53,000 YS, 20 El.
For welding types 403 and 410 chrome corrosion resistant steels and for stainless overlay on carbon steels.
AWS-ASTM E410-15, AISI 410

AIRCO 502 DC.
M-663; 0.08 C, 5.0 Cr, 0.4 Ni, 0.6 Mn, 0.65 Si, 0.55 Mo, bal Fe
DC reverse polarity lime type coated electrode.
As welded: 145,000 TS; 2.8 El
Heat treated: 80,000 TS, 67,500 YS, 38 El.
For welding types 501 and 502 stainless and some alloy steels as 4130.
AWS-ASTM E502-15, AISI 502

AIRCO 630.
M-663, steel core, composite type coating AC-DC straight polarity
Deposit analysis: 4.5 C, 30 Cr, 2 Si, 1 Mn, bal Fe
For build-ups having resistance to severe abrasion with moderate impact Hardness 56-61 Rock C For dredging parts, dipper teeth, sand muller parts.

AIRCO 660.
M-663, Low alloy steel rod, composite coating
AC-DC either polarity
Deposit analysis: 1.8 C, 4.0 Cr, 0.5 Mn, 0.5 Si, bal Fe. Hardness 45-55 Rock C.
For surfacing or build-up for resistance to abrasion and impact; for crusher rolls, hammermill hammers, impact breaker bars.

AIRCO 718
M-663; 12 Si, bal Al.
Bare aluminum brazing rod. For braze-welding 1060, 1100, 3003, 5005, 6061, 6063 and cast alloys A612 and C612
AWS B AlSi-4.

AIRCO NO. 1010 SILICON BRONZE ROD.
M-663; 95.8 Cu, 3.1 Si, 1.1 Mn, 1.0 Zn.
Bare rod for gas welding of copper, copper-silicon and copper-zinc base alloys to themselves and to plain and galvanized steel. 50,000 min TS. Everdue grade AWS R Cu Si-A.

AIRCO 4043.
M-663; 4.5-6.0 Si, 0.3 max Cu, 0.8 max Fe, 0.1 max Zn, 0.2 max Ti, bal Al
Bare aluminum alloy wire for gas or TIG welding of 3003, 3004, 5052, 6061, 6063, and casting alloys 43, 355, 356 and 214. Flows at 1155°F.
AWS ER 4043.

AIRCO 4130.
M-663, 0.30 C, 0.5 Mn, 0.3 Si, 0.2 Mo, 0.95 Cr, bal Fe
Alloy wire for welding AISI 4130 steel by automatic submerged arc

AIRCO 5183
M-663, 4.3-5.2 Mg, 0.5-1.0 Mn, 0.4 max Si, 0.4 max Fe, 0.25 max Zn, 0.15 max Ti, 0.05-0.25 Cr, 0.10 max Cu, bal Al.
Bare aluminum alloy welding rod for gas or TIG welding of 5052, 5083, 5356, 5454 and 5456 alloys; flows at 1180°F.
AWS ER 5183

AIRCO 5356
M-663, 4.5-5.5 Mg, 0.5 max Si + Fe, bal Al
Bare aluminum alloy, general purpose, for gas or TIG welding of 5050, 5052, 5083, 5086, 5356, 5454, and 5456 Flows at 1180°F
AWS ER 5356

AIRCO 5554
M-663, 2.4-3.0 Mg, 0.5-1.0 Mn, 0.25 max Zn, 0.05-0.20 Ti, bal Al
Bare aluminum alloy rod for gas or TIG welding of 5454 and 5052 alloys Flows freely at 1095°F
AWS ER 5554

AIRCO 5556
M-663, 4.7-5.5 Mg, 0.5-1.0 Mn, 0.25 max Zn, 0.05-0.2 Cr, bal Al
Bare aluminum wire for gas or TIG welding 5052, 5083, 5086, 5356, 5454, and 5456 for maximum weld strength Flows freely at 1180°F.
AWS ER 5556

AIRCO 6010.
M-663, 0.07-0.12 C, 0.2-0.4 Mn, 0.1-0.3 Si, bal Fe
DC reverse polarity coated electrode
Weld metal: 68,500 TS, 58,250 YS, 28.5 El.
AWS-ASTM Class E6010

AIRCO 6010 ARCRODS (001)
M-663, Mild steel coated electrode; DC reverse polarity.
AWS-ASTM Class E6010

AIRCO 6011
M-663, 0.08 C, 0.35 Mn, 0.11 Si, bal Fe.
AC-DC reverse polarity coated electrode
Weld metal 70,000 TS, 62,000 YS; 30 El
AWS-ASTM Class E6011

AIRCO 6011C.
M-663; 0.10 C, 0.58 Mn, 0.19 Si, bal Fe.
AC-DC reverse polarity coated electrode.
Weld metal: 72,000 TS; 59,000 YS, 29.5 El
AWS-ASTM Class E6011.

AIRCO 6011LOC.
M-663, 0.11 C, 0.6 Mn, 0.25 Si, bal Fe.
AC-DC reverse polarity coated electrode.
Weld metal: 71,000 TS; 59,000 YS; 22 El
AWS-ASTM Class E6011.

AIRCO 6012
M-663; 0.08 C, 0.45 Mn, 0.30 Si, bal Fe.
AC-DC straight polarity coated electrode.
Weld metal: 83,000 TS; 74,000 YS, 20 El.
AWS-ASTM E-6012.

AIRCO 6012 C.
M-663; 0.08 C, 0.38 Mn, 0.25 Si, bal Fe.
AC-DC straight polarity coated electrode.
Weld metal 70,000 TS; 60,000 YS; 28 El.
AWS-ASTM E6012.

AIRCO 6013 C.
M-663, 0.09 C, 0.52 Mn, 0.39 Si, bal Fe
AC-DC either polarity coated electrode
Weld metal. 74,500 TS, 63,500 YS, 27 El
AWS-ASTM E6013.

AIRCO 6020.
M-663, 0.12 C, 0.35 Mn, 0.10 Si, bal Fe.
AC-DC either polarity coated electrode.
Weld metal 72,000 TS; 62,000 YS; 28 El.
AWS-ASTM E6020.

AIRCO 6020 D.
M-663, Mild steel coated electrode.
AC or DC either polarity
AWS-ASTM E6020

AIRCO 6020 F.
M-663, Mild steel coated electrode.
AC or DC either polarity.
AWS-ASTM E6020

AIRCO 6150
M-663, 0.50 C, 0.8 Mn, 0.28 Si, 1.0 Cr, bal Fe
Alloy wire for welding AISI 6150 steel by automatic submerged arc

AIRCO 7010-A1
M-663; 0.09 C, 0.43 Mn, 0.14 Si, 0.48 Mo, bal Fe
DC reverse polarity coated electrode
Weld, stress relieved 80,000 TS, 67,000 YS; 29 El.
For welding long distance pipe lines
AWS-ASTM E7010-A1

AIRCO 7016
M-663, 0.09 C, 0.55 Mn, 0.50 Si, bal Fe.
AC-DC reverse polarity coated electrode
Weld metal. 74,000 TS, 62,000 YS, 30 El
Low hydrogen, for assemblies to be enameled
AWS-ASTM E7016

AIRCO 7016 M
M-663, 0.07 C, 0.90 Mn, 0.50 Si, 0.35 Mo, 0.25 Ni, 0.15 Cr, bal Fe
AC-DC reverse polarity coated electrode.
As welded 82,000 TS, 72,000 YS, 29 El.
Good impact strength after stress anneal
AWS-ASTM E7016

AIRCO 7020-A1
M-663; 0.09 C, 0.29 Mn, 0.12 Si, 0.52 Mo, bal Fe
AC-DC either polarity coated electrode.
Weld, stress relieved: 73,000 TS; 63,500 YS, 29 El.
AWS-ASTM E7020-A1.

AIRCO 8016-B2
M-663, 0.07 C, 0.6 Mn, 0.42 Si, 0.45 Mo, 1.30 Cr, bal Fe.
AC-DC reverse polarity coated electrode.
Weld, stress relieved: 84,000 TS, 68,000 YS; 28 El.
AWS-ASTM 8016-B2

AIRCO 8016-C1.
M-663, 0.05 C, 0.82 Mn, 0.4 Si, 2.4 Ni, bal Fe.
AC-DC reverse polarity coated electrode
Weld, stress relieved: 82,000 TS; 69,000 YS; 31 El, Charpy V notch, ft.lbs at −75° F 108.
AWS-ASTM E8016-C1.

AIRCO 8016-C3
M-663, Low carbon, low alloy coated electrode.
AC-DC reverse polarity.
For welding low alloy high tensile steel.
AWS-ASTM E8016-C3.

AIRCO 9016-B3
M-663, 0.09 C, 0.57 Mn, 0.42 Si, 0.98 Mo, 2.26 Cr, bal Fe.
AC-DC reverse polarity coated electrode.
Weld, stress relieved· 99,000 TS; 87,000 YS; 22 El.
For welding equipment for steam power and other assemblies for elevated temperature.
AWS-ASTM E9016-B3.

AIRCO 10013-G.
M-663, Low carbon, low alloy coated electrode.
AC-DC straight polarity.
For welding low alloy high tensile steels.
AWS-ASTM E10013-G.

AIRCO 10016-D2.
M-663, 0.09 C, 1.8 Mn, 0.58 Si, 0.4 Mo, bal Fe.
AC-DC reverse polarity coated electrode.
Weld, stress relieved 106,000 TS; 92,000 YS; 25 El.
For welding higher strength steels
AWS-ASTM E10016-D2

AIRCO 10016-G.
M-663; 0.06 C, 0.8 Mn, 0.34 Si, 0.3 Mo, 1.63 Ni, 0.13 V, bal Fe
AC-DC reverse polarity coated electrode
Weld, stress relieved· 109,500 TS; 102,000 YS, 25 El
For high strength assemblies
AWS-ASTM E10016-G

AIRCO 12015-G
M-663, Low hydrogen electrode; reverse polarity only, for welding high strength and armor steels
AWS-ASTM E12015-G

AIRCO A715
M-663, 0.11 C, 0.44 Mn, 0.5 Si, 1.24 Cr, 0.5 Mo, bal Fe
Low alloy bare wire for machine welding of low alloy steel; copper coated.

AIRCO A725
M-663, 0.12 C, 0.46 Mn, 0.48 Si, 2.35 Cr, 1.0 Mo, bal Fe.
Low alloy bare wire for machine welding of low alloy steel, copper coated

AIRCO AIRCOLOY No 1.
M-663, Bare or coated cobalt base electrode
Deposit analysis 2.5 C, 50.0 Co, 31.0 Cr, 13 W, 1.5 Si.
For wear resistant and corrosion resistant build-up and surfacing Hardness of deposit is 50-58 Rock C
AWS ASTM E Co Cr-C and R Co Cr-C.

AIRCO AIRCOLOY No 6.
M-663, Bare or coated cobalt base electrode.
Deposit analysis: 1.0 C, 60.0 Co, 28.0 Cr, 5.0 W, 1.5 Si, Hardness 38-45 Rock C.
For build-ups resistant to corrosion and abrasion at high temperatures
AWS-ASTM E Co Cr-A and R Co Cr-A.

AIRCO AIR-MANG.
M-663; Steel core rod, composite coating.
Deposit analysis 0.7 C, 14.0 Mn, 4 Cr, 3.5 Ni, bal Fe
For joining or build-up of dipper teeth, coal crusher segments, rail frogs and switches.
Impact resistant.

AIRCO AIROD.
M-663; Steel tube containing tungsten carbide particles used as a bare filler rod for gas welding for hardfacing plow shares, cane knives, conveyor screws. Abrasion resistant.

AIRCO AX-140.
M-663; 0.07-0.11 C, 1.7-2.0 Mn, 0.25-0.45 Si, 2.0-2.5 Ni, 0.85-1.2 Cr, 0.5-0.6 Mo, Ti, bal Fe.
Weld: 140,000 YS; 157,000 TS; 16 El; 57 RA .
For welding high strength steel plates.
Tough, strong and crack free welding wire.

AIRCO BULK TUNGSTEN CARBIDE.
M-663; Hard carbide, to be applied with a binder and subsequently fused into the surface for a hard abrasion resistant skin. Abrasion resistant.

AIRCO CODE-ARC 7018.
M-663; 0.04 C, 0.65 Mn, 0.55 Si, bal Fe.
AC-DC reverse polarity coated electrode.
As welded· 78,000 TS; 67,000 YS; 30 El.
AWS-ASTM E7018.

AIRCO CODE-ARC 7018-A1.
M-663; 0.04 C, 0.6 Mn, 0.6 Si, 0.48 Mo, bal Fe
AC-DC reverse polarity coated electrode
Weld, stress relieved· 81,000 TS; 71,000 YS; 30 El.
AWS-ASTM E 7018-A1.

AIRCO CODE-ARC 8018-C3.
M-663; 0.04 C, 0.9 Mn, 0.4 Si, 1.0 Ni, 0.2 Mo, bal Fe.
AC-DC reverse polarity coated electrode.
As welded: 83,000 TS; 72,000 YS; 31 El.
Good impact properties.
AWS-ASTM E8018-C3.

AIRCO CODE-ARC 11018
M-663; 0.04 C, 1.6 Mn, 0.4 Si, 0.42 Mo, 0.25 Cr, 1.8 Ni, bal Fe.
AC-DC reverse polarity coated electrode.
Weld, stress relieved. 113,000 TS, 105,000 YS; 23 El.
To weld low alloy high strength steels.
AWS-ASTM E11018-M

AIRCO CODE-ARC 12018.
M-663, 0.04 C, 1.8 Mn, 0.4 Si, 0.48 Mo, 0.45 Cr, 2.0 Ni, bal Fe
AC-DC reverse polarity coated electrode.
Weld, stress relieved. 122,000 TS, 113,000 YS, 22 El.
To weld low alloy high strength steels
AWS-ASTM E12018-M.

AIRCO COMMERCIALLY PURE ALUMINUM A1100.
M-663, 100% Al.
For machine welding of 1100 and 3003 aluminum for window frames, heat exchangers, food containers, electrical bus bars, racks
AWS ER 1100.

AIRCO EASYARC 308 AC-DC
M-663,
Weld metal. 0.07 C, 19.6 Cr, 9.5 Ni, 1.65 Mo, 0.68 Si, bal Fe.
As welded 87,900 TS, 57,400 YS, 42 El.
AC-DC reverse polarity; coating. titania type with metal powders, for welding 18-8 type stainless steels
AWS-ASTM E308-16, AISI 308.

AIRCO EASYARC 316 AC-DC.
M-663,
Weld metal· 0.06 C, 18.5 Cr, 12.3 Ni, 1.8 Mn, 0.31 Si, 2.28 Mo, bal Fe.
As welded· 80,400 TS, 56,400 YS, 44 El.
AC-DC reverse polarity; coating: titania type with metal powders; for welding type 316 stainless steel.
AWS-ASTM E316-16; AISI 316.

AIRCO EASYARC 620.
M-663; Alloy steel core rod, chrome iron composite coating; AC-DC either polarity.
Deposit analysis: 6.0 C, 22.0 Cr, 7.0 Mo, 5.0 W, 1.5 Si, 0.5 Mn, bal Fe.
For build-ups resistant to severe abrasion, moderate impact and hot wear up to 1100° F. For crusher parts, coke pusher shoes, hot slag dipper teeth. Hardness 60-65 Rock C.

AIRCO EASYARC 6027.
M-663, 0.07 C, 0.90 Mn, 0.14 Si, bal Fe.
AC-DC either polarity coated electrode
Weld metal: 68,000 TS; 57,000 YS; 30 El.
AWS-ASTM E6027

AIRCO EASYARC 7014
M-663, 0.08 C, 0.45 Mn, 0.30 Si, bal Fe
AC-DC either polarity coated electrode.
Weld metal· 81,000 TS, 73,000 YS; 26 El
AWS-ASTM E7014

AIRCO EASYARC 7018
M-663, 0.06 C, 0.65 Mn, 0.50 Si, bal Fe .
AC-DC reverse polarity coated electrode.
As welded 78,000 TS, 66,000 YS; 28 El
AWS-ASTM E7018

AIRCO EASYARC 7018 C.
M-663; 0.07 C, 0.90 Mn, 0.50 Si, bal Fe.
AC-DC reverse polarity coated electrode
As welded 84,000 TS, 73,000 YS, 30 El
AWS-ASTM E7018

AIRCO EASYARC 7024.
M-663; 0.07 C, 0.75 Mn, 0.50 Si, bal Fe.
DC reverse polarity coated electrode
Weld metal 76,000 TS; 68,000 YS; 20 El
AWS-ASTM E7024

AIRCO EASYARC 7028.
M-663, 0.06 C, 0.70 Mn, 0.35 Si, bal Fe
AC-DC reverse polarity coated electrode
As welded. 80,000 TS, 72,000 YS; 30 El.
AWS-ASTM E7028

AIRCOMATIC A100 ALUMINUM BRONZE.
M-663, Al, Fe, bal Cu
Bare rod for inert gas welding of aluminum bronze or bronze surfacing of steel.
AWS E Cu Al-A2.

AIRCOMATIC A102 PHOS BRONZE
M 663, Sn, P, bal Cu.
Bare rod for inert gas welding of brass, bronze or for overlays on ferrous metals.
AWS E Cu Sn-C.

AIRCOMATIC A104 Ni-Al-Mn BRONZE
M-663, Al, Ni, Mn, bal Cu.
Bare rod for inert gas welding of ship propellers and turbine runners.

AIRCOMATIC A110 SILICON BRONZE.
M-663, Si, bal Cu
Bare rod for inert gas welding of silicon bronze or of many dissimilar metals.
AWS E Cu Si

AIRCOMATIC A145 COPPER.
M-663, Cu.
Bare rod or wire for inert gas welding of copper and copper base alloys and for overlay on steels.
AWS E Cu.

AIRCOMATIC A158 ALUMINUM BRONZE.
M-663; Al, bal Cu.
Iron free bare wire for welding aluminum bronzes, manganese bronze, copper, cast iron, mild steel and alloy steel, and for surfacing; designed for inert gas processes.
AWS E Cu Al-Al

AIRCOMATIC A160 ALUMINUM BRONZE.
M-663; Al, bal Cu.
Aluminum bronze bare wire largely for overlay work to produce corrosion resistant and wear resistant surface. Hardness of deposit 160-210 Brin.
AWS E Cu Al-B.

AIRCOMATIC A308.
M-663,
Wire for welding AISI types 301, 302, 305, and 308 stainless steels, and for depositing stainless overlays on mild steel
AWS ER 308

AIRCOMATIC A308 ELC
M-663; Low carbon grade of A308.
Wire for welding AISI 304 ELC and 308 ELC, also AISI 321 and 347
AWS-ER 308 L.

AIRCOMATIC A308 L Si
M-663; Higher silicon version of A308 for improved arc stability

AIRCOMATIC A309
M-663,
Wire for welding AISI 309 stainless for high temperature operation; also for welding some straight chromium stainless grades
AWS- ER 309.

AIRCOMATIC A309 ELC
M-663; Low carbon grade of A309.
For same purpose as A309 where added insurance against carbide precipitation is required

AIRCOMATIC A310
M-663,
Wire for welding AISI 310 stainless steel for high temperature or corrosion resistant applications.
AWS ER 310

AIRCOMATIC A312
M-663,
Wire designed for welding stainless steels to carbon steels
AWS ER312

AIRCOMATIC A316.
M-663,
Wire for welding AISI 316 stainless.
AWS ER 316

AIRCOMATIC A316 ELC
M-663; Low carbon grade of A316
For welding AISI 316 L stainless steel
AWS ER 316 L.

AIRCOMATIC A316 L Si
M-663, Higher silicon version of A316, for improved arc stability

AIRCOMATIC A347.
M-663,
Wire for welding AISI types 321, 347 and 304 L, particularly for elevated temperature operation or corrosive conditions.
AWS ER 347

AIRCOMATIC A666
M-663; 0.13 C, 1.3 Mn, 0.5 Si, 0.6 Al, bal Fe
Bare mild steel welding wire for CO_2 and inert gas welding, particularly of rusted and scaled steel.
AWS E 70 S-5.

AIRCOMATIC A4043 ALUMINUM ALLOY.
M-663; AA 4043 composition (5.2 Si).
For welding 2014, 4043, 6061, 6062, 6063 alloys for truck bodies, pressure vessels, structural members.
AWS ER 4043

AIRCOMATIC A5183 ALUMINUM ALLOY.
M-663, Mg, bal Al.
Wire for welding liquid oxygen and liquid nitrogen containers. AWS ER 5183.

AIRCOMATIC A5356 ALUMINUM ALLOY
M-663; 5.0 Mg, 0.12 Cr, 0.12 Mn, bal Al.
Wire for welding 5056, 5083, 5086, 5154, 5356 aluminum alloys for truck frames, diesel engine bases, cargo tanks, gun mount bases.
AWS ER 5356.

AIRCOMATIC A5554 ALUMINUM ALLOY.
M-663;
Wire for welding 5052 and 5454 aluminum alloys for truck tankers, dump bodies, railroad tank cars. AWS-ER 5554.

AIRCOMATIC A5556 ALUMINUM ALLOY.
M-663,
Wire for welding 5083, 5086, 5456 high tensile aluminum alloys for truck frames, diesel engine bases, storage tanks
AWS ER 5556

AIRCO NICKEL MANGANESE C
M-663, Steel core rod, composite coating.
Weld metal: 0.60 C, 13.0 Mn, 3.0 Ni, 0.4 Cr, 0.75 Si, bal Fe.
For joining and build-up of Hadfield's manganese steel dipper teeth, shovel tracks, crusher pads; impact resistant.
AWS-ASTM E Fe Mn-A.

AIRCO PHOS-COPPER ROD
M-663, 7.25-7.35 P, bal Cu
Bare rod for torch or furnace braze of transformers, radiators, motors, water coolers, plumbing installations, heat exchangers
AWS B Cu P-2

AIRCO PHOS-SILVER 2 ROD
M-663, 6.75-7.25 P, 1.75-2.25 Ag, bal Cu.
Bare rod for torch or furnace brazing components of copper, brass and bronze
Melt range 1435-1455°F

AIRCO RAILROAD
M-633, 0.2-0.4 C, 0.85-1.15 Mn, 0.1-0.3 V, 0.9-1.25 Cr, bal Fe
Welded 100,000 TS
For welding rod, for rail ends

AIRCO S-10
M-663, 0.10 C, 0.55 Mn, bal Fe.
Mild steel automatic submerged arc welding wire
AWS-EL 12.

AIRCO S-15
M-663, 0.14 C, 0.90 Mn, bal Fe.
Mild steel automatic submerged arc welding wire.
AWS EH 14

AIRCO S-16.
M-663, 0.14 C, 1.9 Mn, 0.5 Mo, bal Fe.
Low alloy steel automatic submerged arc welding wire.

AIRCO S-20
M-663, 0.16 C, 1.1 Mn, 0.2 Si, bal Fe.
Mild steel automatic submerged arc welding wire.
AWS EM 15 K

AIRCO S-65.
M-663; 0.60 C, 1.05 Mn, 0.15 Si, bal Fe
Higher carbon steel automatic submerged arc welding wire

AIRCO S-308.
M-663; 0.06 C, 1.8 Mn, 0.5 Si, 20.5 Cr, 9.8 Ni, bal Fe.
Stainless steel wire for automatic submerged arc welding; for 18-8 stainless
AWS ER 308.

AIRCO S-309.
M-663; 0.07 C, 1.75 Mn, 0.5 Si, 23.0 Cr, 13.0 Ni, bal Fe.
Stainless steel wire for automatic submerged arc welding; designed for AISI 309.
AWS ER 309.

AIRCO S-310.
M-663; 0.12 C, 1.5 Mn, 0.5 Si, 26.8 Cr, 21.0 Ni, bal Fe
Stainless steel wire for automatic submerged arc welding; designed for AISI 310.
AWS ER 310.

AIRCO S-316.
M-663, 0.06 C, 1.65 Mn, 0.45 Si, 19.0 Cr, 12.9 Ni, 2.2 Mo, bal Fe.
Stainless steel wire for automatic submerged arc welding; designed for AISI 316.
AWS ER 316.

AIRCO S-347.
M-663; 0.06 C, 1.65 Mn, 0.5 Si, 19.5 Cr, 9.6 Ni, 0.85 Cb, bal Fe.
Stainless steel wire for automatic submerged arc welding of stabilized 18-8 stainless steel.
AWS ER 347.

AIRCO SELF HARDENING.
M-663; Steel core wire, composite coating
Deposit analysis: 0.85 C, 5.0 Cr, 0.9 Mn, 0.55 Si, 0.35 V, bal Fe; hardness 50-55 Rock C
For hard surfacing and build-up for resistance to abrasion and moderate to heavy impact
For dump truck bodies, brake shoe hangers, bulldozer trunnions.

AIRCO SEMI-AUTOMATIC AIR-MANG.
M-663; Continuous wire version of Airco Air-Mang.
For welding railroad track segments, dredge parts, clamshell lips. Impact resistant.

AIRCOSIL 3.
M-663; 50 Ag, 3 Ni, 16 Cd, 15.5 Cu, bal Zn.
For silver brazing of carbide tools;
M.P. 1170-1270°F.
AWS A5.8-62 and ASTM B260-62; BAg-3.

AIRCOSIL 5.
M-663; 5 Ag, 88.75 Cu, 6.25 P.
For brazing alloy, M.P. 1190-1480°F.
AWS, ASTM BCuP-3

AIRCOSIL 15.
M-663; 15 Ag, 80 Cu, 5 P.
For silver brazing of Cu alloys; M.P. 1185-1500°F; self-fluxing.
AWS, ASTM BCuP-5.

AIRCOSIL 35.
M-663; 35 Ag, 18 Cd, 26 Cu, 21 Zn.
For silver brazing, general purpose;
M.P 1125-1295°F; high plastic range.
AWS, ASTM BAg-2.

AIRCOSIL 45.
M-663; 45 Ag, 24 Cd, 15 Cu, 16 Zn.
For silver brazing; M.P. 1125-1145°F, free-flowing.
AWS, ASTM BAg-1.

AIRCOSIL 50.
M-663; 50 Ag, 18.0 Cd, 15.5 Cu, 16.5 Zn.
For silver brazing for all metals; M.P. 1160-1175°F; high strength.
AWS, ASTM BAg-la.

AIRCOSIL 60.
M-663; 60 Ag, 30 Cu, 10 Sn.
For brazing alloy; M.P. 1115-1325°F.
AWS, ASTM BAg-18.

AIRCOSIL 105.
M-663; 45 Ag, 30 Cu, 12 Zn, 13 Mn.
For brazing alloy; M.P 1298°F; eutectic alloy.

AIRCOSIL A.
M-663; 9 Ag, 53 Cu, 38 Zn.
For brazing alloy, M.P 1410-1565°F.

AIRCOSIL AE-100.
M-663; 92.5 Ag, 7.3 Cu, 0.2 Li.
For brazing alloy; M.P. 1435-1635°F.
AWS-ASTM BAg-19

AIRCOSIL B
M-663; 20 Ag, 45 Cu, 35 Zn.
For brazing alloy, M.P. 1315-1500°F.

AIRCOSIL C
M-663; 20 Ag, 45 Cu, 30 Zn, 5 Cd.
For brazing alloy, M.P. 1140-1500°F.

AIRCOSIL D.
M-663; 30 Ag, 38 Cu, 32 Zn.
For brazing alloy; M.P. 1370-1410°F.

AIRCOSIL E
M-663, 40 Ag, 30 Cu, 28 Zn, 2 Ni
For brazing alloy for carbides, M.P 1240-1435°F
AWS, ASTM BAg-4.

AIRCOSIL EASY.
M-663, 65 Ag, 20 Cu, 15 Zn
For brazing alloy for sterling silver;
M.P 1240-1325°F.
AWS, ASTM BAg-9.

AIRCOSIL F.
M-663; 40 Ag, 36 Cu, 24 Zn
For brazing alloy, M.P. 1325-1415°F

AIRCOSIL G.
M-663; 45 Ag, 30 Cu, 25 Zn
For brazing alloy in food industry,
M.P 1250-1370°F, AWS-ASTM BAg-5.

AIRCOSIL H
M-663, 50 Ag, 34 Cu, 16 Zn.
For brazing alloy in food industry,
M.P 1270-1425°F, AWS-ASTM BAg-6.

AIRCOSIL HARD
M-663; 75 Ag, 22 Cu, 3 Zn
For brazing alloy for sterling silver;
M.P 1365-1450°F
AWS-ASTM BAg-11

AIRCOSIL J.
M-663; 56 Ag, 22 Cu, 17 Zn, 5 Sn.
For brazing alloy on stainless steels,
M.P. 1145-1205°F
AWS, ASTM BAg-7.

AIRCOSIL K
M-663, 60 Ag, 25 Cu, 15 Zn.
For brazing alloy, M.P. 1245-1325°F.

AIRCOSIL L
M-663, 54 Ag, 40 Cu, 5 Zn, 1 Ni
For brazing alloy; M.P. 1325-1575°F.

AIRCOSIL M.
M-663; 72 Ag, 28 Cu
For brazing alloy in electronic industry;
M.P. 1435°F; eutectic alloy.
AWS, ASTM BAg-8.

AIRCOSIL MEDIUM.
M-663; 70 Ag, 20 Cu, 10 Zn.
For brazing alloy for sterling silver;
M.P. 1275-1360°F.
AWS, ASTM BAg-10.

AIRCOSIL N.
M-663; 80 Ag, 16 Cu, 4 Zn.
For brazing alloy; M.P. 1345-1490°F.

AIRCOSIL P.
M-663; 85 Ag, 15 Mn.
For brazing alloy for high temperature applications; M.P. 1760-1778°F.
AWS, ASTM BAg-Mn.

AIRCOSIL Q
M-663; 50 Ag, 28 Cu, 22 Zn.
For brazing alloy; M.P. 1250-1340°F.

AIRCOSIL R.
M-663; 40 Ag, 30 Cu, 25 Zn, 5 Ni
For brazing alloy, M.P. 1240-1560°F.

AIRCOSIL S
M-663; 25 Ag, 52.5 Cu, 22.5 Zn.
For brazing alloy; M.P. 1250-1575°F

AIRCO SPECIAL "B" TUNGTUBE.
M-663; Steel tube containing tungsten carbide particles, used as bare filler rod for build-up on worn core and rock drill bits and post hole digger blades. Abrasion and impact resistant.

AIRCO TIMANG.
M-663; Bare or coated electrode.
Deposit comp 0.75 C, 1.40 Mn, 3.0 Ni, bal Fe
For joining or build-up of manganese steel mill hammers, bucket teeth, crusher jaws.
Impact resistant.

AIRCO TRACKWEAR
M-663; Steel core rod, composite coating.
Deposit comp · 0.85 C, 17.0 Mn, 0.45 V, bal Fe.
For joining and build-up of railroad frogs, switches and cross-overs Impact resistant.

AIRCO TRAC-ROD 27
M-663; 0.08 C, 0.31 Mn, 0.11 Si, bal Fe.
AC-DC either polarity coated electrode
Weld metal· 66,200 TS, 56,300 YS, 27 El.
Welds over rust and scale.
AWS-ASTM E 6027.

AIRCO TUBE AIRCOLITE
M-663, Deposit analysis 4 C, 30 Cr, 2 Si, 1.5 Mn, bal Fe, hardness 60 Rock C.
Bare tubular wire for gas welding and build-up for resistance to severe abrasion with moderate impact For plow shares, cultivator spades, corn picker runners

AIRCO TUNGTUBE
M-663, Steel tube containing tungsten carbide used as a bare filler rod for oxyacetylene flame for hard facing Abrasion resistant

AIRCRAFT.
Eng; 10-11.5 Al, 4-6 Fe, 4-6 Ni, bal Cu
For corrosion resisting parts, aircraft; corrosion resistant.

AIRCRAFT
M-1149; 1.0 C, 0.5 Mn, 1.1 Mo, 0.2 V, 5.0 Cr, bal Fe.
For tools, dies, punches, crimpers, air hardened, ground flat stock

AIRDI 150
M-38; 1.55 C, 11.5 Cr, 0.9 V, 0.8 Mo, bal Fe
Hardened· C 58-63 Rock
Air hardening, somewhat corrosion resistant
For blanking and coining dies, gauges, punches, thread rolling dies, shafts
AISI Type D2 Cold work tool steel

AIRDI 150-S
M-38; 1.5 C, 12 Cr, 0.9 V, 0.8 Mo, 0.15 S, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming

AIR-EEZ.
M-335; 0.95 C, 2.0 Mn, 0.35 Si, 2.2 Cr, 1.1 Mo, 0.30 Pb, bal Fe.
Free machining grade.
AISI A4 low temperature tool steel.

AIRESIST 13.
M-1491; 21 Cr, 11 W, 0.45 C, 2 Cb, 3 Al, 0.5 Y, bal Co.
For jet engine and gas turbine components.
Corrosion resistant. Good high temperature strength. Resists sulphidation and oxidation.

AIRESIST 213.
M-1491, 3.5 Al, 0.10 Y, 0.2 C, 20 Cr, 0.5 Ni, 4.5 W, 6.5 Ta, 3.5 Al, 0.5 Fe, bal Co.
Sheet 160,000 TS; 100,000 YS, 10 El
At 1800°F: 35,000 TS; 22,000 YS, 70 El.
For jet engine and gas turbine components.
Resists sulphur attack up to 2200°F
Corrosion and oxidation resistant.

AIRESIST 215.
M-1491; 0.3 C, 19 Cr, 4.5 W, 4.3 Al, 0.35 C, 0.5 Ni, 0.10 Y, 7.5 Ta, 0.5 Fe, 0.1 Zr, bal Co.
Resists oxidation and sulphidation.

AIREX
M-35; 0.55 C, 2 Si, 0.75 Mn, bal Fe
For chisels, tools; tough, shock resistant.

AIR-HARD.
M-32, 1.0 C, 5 Cr, 1.5 Mo, bal Fe
For tools, dies, wear resistant, air hardening.

AIR HARD.
M-1482; 1.5 C, 0.8 Mo, 0.5 V, 0.7 Mn, 12 Cr, bal Fe
For dies, cams, punches, blanking and forming tools, air hardened, non-deforming

AIR-HARD
M-115, 1.0 C, 0.3 Si, 0.7 Mn, 5.25 Cr, 1.1 Mo, 0.25 V, bal Fe
Annealed: 55,000 YS, 18 El, 38 RA, 223 Brin.
Hardened· 184,000 YS, 5 El; 14 RA; C 46-54 Rock.
For trimming and blanking dies, cold shears, gauges, punches
Air hardening, non-deforming, wear resistant.

AIR HARDENING.
M-97, C, Cr, W, V, bal Fe.
Water hardened 214,000-120,000 TS; 192,000-102,000 YS; 20-12 El; 57-38 RA, 415-255 Brin
For tools, dies; air hardening.

AIR HARDENING.
M-260, M-38; 1 C, 5 Cr, bal Fe
For tools, dies, air hardened

AIR HARDENING.
M-1424; 1.0 C, 0.7 Mn, 0.3 Si, 5.25 Cr, 0.3 V, 1.15 Mo, bal Fe.
AISI Type A2 air hardening tool steel

AIRITE NO. 21
Eng; Ni alloy
For compressor blades, aircraft rotor discs, corrosion and heat resistant

AIRKOOL.
M-38, M-1214; 1 C, 5 Cr, 0.4 V, 1.1 Mo, bal Fe
For dies, gauges, punches, shears, broaches; air hardened, non-deforming.

AIRKOOL-S.
M-38; 1 C, 5.2 Cr, 0.3 V, 1.1 Mo, 0.15 S, bal Fe
For blanking and forming dies, punches, air hardened, non-deforming. AISI A2.

AIRKOOL-V.
M-38; 2.25 C, 5.25 Cr, 4.75 V, 1 Mo, 1 W, bal Fe.
Heat treated· 650 Brin.
For blanking dies, brick mold liners; oil hardened, non-deforming.

AIRLOY.
M-1; 1.0 C, 3.0 Mn, 1.0 Cr, 1.0 Mo, bal Fe
For dies, gauges, thread roller dies, blanking and forming punches; air hardening.

AIRMO
M-57; 1.0 C, 2 Mn, 1 Cr, 1 Mo, bal Fe.
For cold work dies, crimpers, cold work steel, air hardened.

AIRMOLD
M-38, 0.1 C, 5 Cr, 0.5 Mo, bal Fe.
Hardened· 157,000 TS; 110,000 YS; 17 El; 60 RA; 321 Brin
For cold hubbed plastic molds, deep hardening.

AIROLITE.
M-1463; C, alloy, bal Fe.
For high temperature applications, heat resistant.

AIROMAT 33 SELF-HARDENING.
M-353, 0.33 C, 2.5 Cr, 0.75 Mn, 1.0 Mo, 0.75 Si, 0.5 Cu, bal Fe
For shock tools, dies, punches, shears, air hardening.

AIRQUE-4.
M-140, 1.0 C, 2.5 Mn, 1.1 Cr, 1.1 Mo, bal Fe
Air hardening tool steel; AISI A4.

AIRQUE.
M-140; 1 C, 0.7 Mn, 5.25 Cr, 0.25 V, 1.15 Mo, bal Fe.
For gauges, punches, shear blades, dies, air hardened, non-deforming.

AIRQUE SPECIAL
M-140; 0.8 C, 0.7 Mn, 5.2 Cr, 0.25 V, 1.15 Mo, bal Fe.
For blanking and trimming dies, punches, shears; air hardened, nondeforming, tough.

AIRQUE-V
M-140; 1.25 C, 5.25 Cr, 1.15 Mo, 1.0 V, bal Fe
For thread rolling dies, blanking and forming dies; air hardened, non-deforming

AIRPLANE BABBITT.
M-665, 16 Sn, 10 Sb, 72 Pb, 2 Cu, Bi.
For bearings; M P 600-700°F

AIR SERVICE ALUMINUM ALLOY NO. 1.
Eng; 92 Al, 8 Cu
For light alloy parts, airplane construction, non-hardenable.

AIR SERVICE ALUMINUM ALLOY NO 2
Eng, 88.5 Al, 10 Cu, 0.25 Mg, 1.25 Fe
For aircraft parts, light alloy parts, non-hardenable

AIR SERVICE ALUMINUM ALLOY NO. 3.
Eng., 95.75 Al, 2.5 Cu, 0.5 Mg, 1.25 Fe
For aircraft parts, heat treatable

AIR SERVICE ALUMINUM ALLOY NO. 4.
Eng; 94 Al, 5 Cu, 1 Si
For aircraft parts, age-hardenable

AIR SERVICE ALUMINUM ALLOY No. 5.
Eng; 93 Al, 4 Cu, 3 Si
For aircraft parts, age-hardenable

AIR SERVICE ALUMINUM ALLOY No. 6.
Eng.; 4 Cu, 1-5 Mg, 2 Ni, bal Al.
For aircraft parts; age-hardenable

AIR SHOCK.
M-341; 0.50 C, 0.7 Mn, 3.25 Cr, 1.4 Mo, bal Fe.
Air or oil hardening.
For rivet sets, hot gripper dies, punches, chisels, plastic mold, die casting dies.
Type S7 shock resisting tool steel.

AIRTEM.
M-688; 1.3 C, 0.5 Mn, 5 Cr, 0.3 V, 1.25 Mo, 1.0 Si, bal Fe.
For dies, punches, knives; air hardened.

AIR-TOUGH
M-32; 0.7 C, 2 Mn, 1 Cr, 1.25 Mo, bal Fe.
For tools, dies, air hardening, tough.

AIRTREAT A.H.
M-1423, C, alloy, bal Fe
For dies; air hardened.

AIR-TRUE.
M-1015; 1.0 C, 3.0 Mn, 1.0 Cr, 1.0 Mo, bal Fe.
For dies, templates, gauges, punch and die facings; air hardening, non-deforming

AIRVAN
M-57, 1 C, 5.25 Cr, 1.15 Mo, 0.25 V, bal Fe.
Air hardened 615 Brin.
For tools, cutters, cold work dies, shear blades, gauges, punches, air hardening, non-shrinking.

AIR-WEAR
M 32, 1.5 C, 12 Cr, 1 V, bal Fe
For tools, dies, wear resistant, air hardening

AITCH METAL
Eng; 59 Cu, 40 Zn, 1 Fe
For hydraulic cylinders and forgings, high strength

AJAX
English, 70-30 Fe, 25-50 Ni, 5-20 Cu
For bearings

AJAX 1
M-114, 1 C, 4 Cr, 0.5 V, 0.4 Mo, bal Fe
For tools, dies; air hardened

AJAX 2
M-114, 1 C, 4 Cr, 0.5 V, 0.4 Mo, bal Fe
For tools, forging mandrels, hot work steel

AJAX 7½ PHOSPHOR COPPER
M-346, 7.5 P, bal Cu
Phosphor additive to copper alloys and brazing alloys

AJAX 15% PHOSPHOR COPPER
M-346, 15 P, bal Cu
Deoxidizer for copper and copper alloys, Phosphorous additive to copper alloys and brazing alloys

AJAX ANTI-ACID METAL
M-123, 77 Cu, 8 Sn, 15 Pb
Cast 34,000 TS, 17,000 YS, 20 El, 60 Brin
Corrosion resistant, for chemical equipment, mine water pumps, bearings.
Good bearing bronze where acid resisting metal is required.

AJAX BULL
M-123, 17 Sb, 7 Sn, bal Pb
Cast 30,000 TS, 20,000 YS
For bearings, bearing liners, anti-friction

AJAX DRILL ROD
M-339, 1.1 C, bal Fe.
For drills, taps, water hardening

AJAX DRILL ROD.
M-1703, 0.95-1.05 C, 0.3-0.5 Mn, 0.15-0.3 Si, bal Fe
Water hardening tool steel; AISI W1.

AJAX GOLDEN GLOW BRASS
M-123; 64.5 Cu, 2.5 Pb, 33.0 Zn
Cast· 40,000 TS; 18,000 YS, 32 El; 39 Brin.
Normally chillcast, corrosion resistant
For automobile trim, typewriter parts.

AJAX MANGANESE BRONZE XX.
M-123; 60-68 Cu, 2-4 Fe, 3-7.5 Al, 3.5-5 Mn, bal Zn.
Cast: 110,000 TS; 60,000 YS; 12 El, 210 Brin.
For propellers, gears, cams, gibs; corrosion resistant, heavy duty bronze.

AJAX NICKALLOY BRONZE, GRADE 23.
M-123; 61 Cu, 13 Zn, 23 Ni, 3 Al.
Chill cast: 80,000 TS; 60,000 YS; 5 El; 130 Brin.
For automobile trimming, typewriter parts, milking machine parts; corrosion resistant

AJAX PLASTIC BRONZE GR A
M-123, 25 Pb, 5 Sn, 1 Ni, bal Cu.
Cast. 22,000 TS; 12,000 YS, 15 El, 50 Brin.
For car and locomotive bearings, bushings, heavy duty.

AJAX PLASTIC BRONZE GR B
M-123, 20 Pb, 7 Sn, 1 Zn, bal Cu
Cast 30,000 TS, 16,000 YS, 22 El, 54 Brin.
For bearings, bushings; resists severe loads and shock.

AJAX STRUCTURAL BRONZE, GRADE "X"
M-123, 57 Cu, 40 Zn, 3 special hardeners.
Chill cast: 75,000 TS, 33,000 YS, 25 El, 100 Brin
For structural work, corrosion resistant

AJAX T-M
M 1673, 0.40 C, 0.5 Mn, 1.0 Si, 3.3 Cr, 2.5 Mo, 0.35 V, bal Fe
For extrusion and forging dies, hot punches and shears
Hot work die steel, tough, shock resistant

AJAX TOOL STEEL
M-39, 0.9 C, 3.7 Cr, 0.3 V, bal Fe
For tools, compression tools, dies, bolt and rivet headers, shear blades, hot die steel

AKRIT
U.S., 38 Co, 30 Cr, 16 W, 10 Ni, 4 Mo, 2.5 C
For tools, high speed cutting tips on lathe tools, corrosion and heat resistant

AKRO 6
M-1308, 0.12 max C, 0.8 Al, 6.5 Cr, bal Fe
For oil refinery equipment, creep and heat resistant

AKRON
Eng., 63 Cu, 1 Sn, 36 Zn
For fittings, hardware, corrosion resistant

A-L 18 NiCoMo(250)
M-1, 0.02 C, 0.08 Mn, 0.08 Si, 0.003 P, 0.007 S, 18.5 Ni, 7.5 Co, 4.8 Mo, 0.40 Ti, 0.01 Zr, 0.003 B, bal Fe
Hot rolled 165,100 TS, 132,600 YS, 10% El, 53.4% RA
Heat treated 252,000 TS, 245,000 YS, 9.5% El; 46.5% RA
Uses rocket cases, aircraft landing gears, crimping dies
Maraging steel Strengthened by precipitation hardening

A-L 18 NiCoMo(300)
M-1; 0.02 C, 0.08 Mn, 0.08 Si, 0.005 P, 0.005 S, 18.5 Ni, 9.0 Co, 5.0 Mo, 0.6 Ti, 0.01 Zr, 0.003 B, bal Fe
Annealed 150,000 TS, 120,000 YS, 18% El, 75% RA, Rock C 28
Heat treated 306,000 TS, 303,000 YS, 12% El, 60 RA
Uses Rocket cases, aircraft landing gears
Maraging steel Strengthened by precipitation hardening

A-L 20 Ni(250).
M-1, 0.02 C, 0.08 Mn, 0.08 Si, 0.007 P, 0.002 S, 20 Ni, 1.4 Ti, 0.20 Al, 0.50 Cb, bal Fe.
Annealed: 148,500 TS; 110,900 YS; 26.4% El; 68.9% RA, Rock C 29.
Hardened: 269,000 TS; 263,000 YS; 12% El; 59% RA, Rock C 53.
Uses: Rocket cases, aircraft landing gears.
Maraging steel Strengthened by precipitation hardening.

A-L 25 Ni(250).
M-1; 0.02 C, 0.08 Mn, 0.08 Si, 0.008 P, 0.002 S, 25.3 Ni, 1.4 Ti, 0.20 Al, 0.50 Cb, bal Fe
Annealed 105,000 TS; 38,000 YS, 34% El, 77.3% RA, Rock B 89.
Heat treated: 286,000 TS, 276,000 YS, 12% El; 57% RA; Rock C 54.
Uses. Rocket cases, aircraft landing gears.
Maraging steel Strengthened by precipitation hardening

A L 46
M-1, 1.24 C, 4.0 Cr, 3.15 V, 2.0 W, 8.25 Mo, 8.25 Co, bal Fe
High speed steel, molybdenum-cobalt type; AISI M-46

A L 75
M-106, 2.8-3.8 Cu, 4-6 0.3-0.6 Mn, bal Al
Chill cast: 36,000-40,000 TS; 14,500-16,800 YS, 8-10 El, 70-80 Brin; 3.5 Izod.
Gravity die aluminum castings requiring strength and ductility.
Gen Eng BS 1490 LM 22-W.

A L-602
M-1, 0.50 C, 0.7 Mn, 1.7 Si, 0.12 V, 0.4 Mo, bal Fe.
AISI Type S5 Shock resisting tool steel.

A L-609.
M-1, 0.60 C, 0.8 Mn, 2.0 Si, 0.25 Cr, 0.2 V, 0.25 Mo, bal Fe
AISI Type S5 shock resisting tool steel.

ALACRITE NO 52N
M-1115, 55 Co, 26 Cr, 7 W, 10 Ni, 0.5 C.
For hard facing electrode, corrosion and wear resistant.

ALACRITE NO 165 ND.
M-1115; 64 Co, 28 Cr, 5 Mo, 2 Ni, 0.3 max C, 2 max Fe
For hard facing electrode, corrosion and wear resistant

ALACRITE NO. 502
M-1115, 55 Co, 30 Cr, 13 W, 1.0 C, 2 max Fe
For hard facing electrode, corrosion and wear resistant

ALACRITE NO 554
M-1115, 60 Co, 30 Cr, 8 W, 1.8 Fe, 2.0 C
For hard facing electrode, corrosion and wear resistant

ALACRITE NO 602.
M-1115, 66 Co, 27 Cr, 5 W, 1.0 C, 2 max Fe
For hard facing electrodes, corrosion and wear resistant

ALADAR.
Eng., 0.13 Cu, 0.40 Fe, 12.5 Si, 0.09 Mn, bal Al.
For light alloys, castings, same as "Alpax," "Alcoa No. 47," and "Silumen."

ALADDIN
M-666; Al, Cu, bal Zn
For welding rod, for white metal die castings.

ALAIS 4N2
M-678, 0.07-0.13 C, 1.3-2.3 Ni, 0.5 Mn, bal Fe.
Annealed 64,000 TS; 47,000 YS, 25 El
Hardened. 121,000 TS, 99,500 YS, 12 El
For exhaust valves, gears, shafts, case-hardening steel

ALAIS 5C1.
M-678; 0.09-0.15 C, 0.6-1.0 Cr, 0.6-0.9 Mn, bal Fe
Annealed: 71,100 TS, 42,600 YS; 20 El.
Hardened: 114,000 TS, 78,000 YS; 12 El.
For shafts, axles; case-hardening steel.

ALAIS 5N2.
M-678; 0.18-0.25 C, 1.3-2.3 Ni, 0.5 Mn, bal Fe
Annealed: 78,000 TS, 60,000 YS, 20 El.
Hardened: 160,000 TS; 128,000 YS; 8 El.
For gears, shafts, case-hardening steel.

ALAIS 5NC3.
M-678; 0.08-0.13 C, 0.6-0.9 Cr, 2.5-3.0 Ni, 0.35-0.65 Mn, bal Fe
Annealed: 71,000 TS; 57,000 YS; 25 El
Hardened: 140,000 TS; 102,000 YS, 12 El
For shafts, gears; tough, case-hardening.

ALAIS 5½C1
M-678; 0.25-0.30 C, 0.8-1.2 Cr, 0.6-0.9 Mn, bal Fe.
Annealed: 78,000 TS, 48,400 YS; 16 El
Hardened. 128,000 TS, 85,300 YS, 10 El.
For tools, shafts, gears; case-hardening steel

ALAIS 5½NCD1
M-678; 0.07-0.13 C, 0.4-0.7 Cr, 1-1.3 Ni, 0.1-0.2 Mo, 0.5-0.9 Mn, bal Fe.
Annealed: 78,000 TS
Hardened: 140,000 TS, 100,000 YS, 10 El
For shafts, gears; tough, case-hardening

ALAIS 6CD1.
M-678, 0.08-0.16 C, 0.8-1.2 Cr, 0.15-0.30 Mo, 0.6-0.9 Mn, bal Fe.
Annealed: 78,000 TS; 50,000 YS; 25 El
Hardened. 170,000 TS, 114,000 YS; 8 El
For shafts, gears, case-hardening steel

ALAIS 6½
M-678; 0.38 C, bal Fe
Rolled 85,000-121,000 TS, 57,000-83,000 YS; 16-12 El.
For shafts, tools; water hardening

ALAIS AE4
M-678, 0.1 C, bal Fe
Rolled: 50,000-60,000 TS, 35,000 YS, 30 El
For forgings, shafts, weldable.

ALAIS AE4½
M-678; 0.12 C, bal Fe
Rolled. 57,000-72,000 TS, 40,000 YS; 22 El
For forgings, shafts, weldable

ALAIS AE5.
M-678, 0.18 C, bal Fe
Rolled 64,000-100,000 TS, 37,000-60,000 YS, 23-15 El
For forgings, axles, shafts, case hardening

ALAIS AE6
M-678, 0.32 C, bal Fe
Rolled: 78,000-114,000 TS, 50,000-79,000 YS, 20-13 El.
For shafts, axles, water hardening

ALAIS AES7
M-678; 0.4-0.5 C, 1.6-2.1 Si, 0.4-0.8 Mn, bal Fe
Annealed: 99,500 TS, 60,000 YS; 20 El.
Hardened: 210,000 TS, 160,000 YS, 5 El.
For tools, dies, shock resistant.

ALAIS AES8.
M-678; 0.52-0.58 C, 1.5-1.9 Si, 0.5-0.9 Mn, bal Fe.
Annealed 120,000 TS; 64,000 YS, 15 El.
Hardened: 200,000 TS, 160,000 YS, 6 El.
For tools, springs, dies; shock resistant.

ALAIS HC3
M-678; 0.10 C, bal Fe
Rolled. 47,000-72,000 TS; 34,000-43,000 YS; 34-30 El
For case hardened parts; carburized.

ALAIS HC4.
M-678; 0.12 C, bal Fe
Rolled: 57,000-85,000 TS; 28,000-47,000 YS; 30-22 El.
For case hardened parts; carburized.

ALAIS HCC1.
M-678; 0.09-0.15 C, 0.6-1.0 Cr, 0.6-0.9 Mn, bal Fe.
Annealed 74,000 TS; 50,000 YS; 22 El.
Hardened: 93,000 TS, 78,000 YS; 20 El.
For gears, shafts; for carburized parts.

ALAIS HCCD1.
M-678; 0.08-0.16 C, 0.8-1.2 Cr, 0.15-0.30 Mo, 0.6-0.9 Mn, bal Fe
Annealed. 78,000 TS, 50,000 YS, 25 El
Hardened: 170,000 TS; 114,000 YS; 8 El
For gears, shafts; case-hardening steel.

ALAIS HCN2.
M-678; 0.07-0.13 C, 1.3-2.3 Ni, bal Fe
Annealed: 60,000 TS; 45,500 YS; 30 El
Hardened: 99,500 TS; 71,200 YS; 26 El.
For gears, shafts, case-hardening steel

ALAIS HCN5.
M-678, 0.07-0.13 C, Ni, bal Fe
Annealed. 72,000 TS, 57,000 YS, 23 El
Hardened 160,000 TS, 128,000 YS, 10 El
For gears, shafts, case-hardening steel

ALAIS HCNC1½
M-678, 0.11-0.18 C, 0.8-1.2 Cr, 1.2-1.6 Ni, bal Fe.
Hardened. 170,000-200,000 TS; 140,000 YS; 6 El.
For gears, shafts, case-hardening steel

ALAIS HCNCD1
M-678, 0.07-0.13 C, 0.20 Cr, 0.8-1.2 Ni, 0.1-0.2 Mo, 0.4 Mn, bal Fe
Annealed 78,000 TS
Hardened. 155,000 TS, 99,500 YS, 10 El
For gears, shafts, case-hardening steel

ALAKRON
M-187, 5 Si, bal Al.
For decorative light alloy castings, corrosion resistant

ALAMO
M-325, M-559; 0.3 C, 0.6 Mn, 1.0-1.5 Al, 0.6-1.0 Mo, bal Fe
Heat treated 160,000 TS; 135,000 YS, 18 El, 60 RA, 340 Brin
For gears, pinions, shafts, cams; nitriding steel

ALAR 00.5
M-137, M-1272, 0.1 Cu 0.1 Mg, 4.5-6.0 Si, 0.6 Fe, 0.5 Mn, 0.1 Ni, 0.1 Zn, bal Al
Sand cast: 17,000 TS, 8000 YS, 3 El, 40 Brin
Permanent mold 20,200 TS, 9000 YS, 4 El, 50 Brin.
For general purpose light castings, good castability, corrosion resistant

ALAR 00.12
M-137, M-1272, 0.4 C, 0.15 Mg, 10-13 Si, 0.7 Fe, 0.5 Mn, 0.1 Ni, 0.2 Zn, 0.2 Ti, bal Al
Sand cast 23,400 TS, 8000 YS, 3.5 El, 55 Brin
Permanent mold: 27,000 TS; 9000 YS, 5 El, 60 Brin.
For general purpose light castings, corrosion resistant, good castability

ALAR 21.
M-1272, 2-4 Cu, 4-6 Si, 0.8 Fe, 0.4 Mn, 0.3 Zn, 0.2 Ti, bal Al.
Sand cast 20,200 TS; 89,000 YS, 2 El; 65 Brin
Permanent mold 22,400 TS; 11,200 YS; 2 El; 70 Brin.
For crankcases, gear cases, covers, housings; age-hardenable, good castability.

ALARGAN.
Eng.; Ag-Al.

ALASKA WHITE BRASS.
U.S.; Zn, Ni, bal Cu.
For bearings, bushings; heavy duty.

ALA-ZE 63
M-1639; 5-6 Zn, 2-3 rare earth metals, 0.4-1.0 Zr, bal Mg.
Sand Cast: 45,000 TS; 25,000 YS; 8 El.
For general purpose castings, oil pans, cases, housings.
Hydrogen heat treated, high strength and good ductility, pressure tight.

ALBA.
M-296; 30 Pd, 60 Ag, 5 Au, and other elements.
For fountain pen points, dental industry; corrosion resistant, heat treatable

ALBALOY.
M-580; 55 Cu, 30 Sn, 15 Zn.
For bright alloy plating, corrosion resistant

ALBANOID.
M-121, 20 Ni, 62 Cu, 18 Zn.
For architectural and sanitary cast fittings.

ALBANY.
M-1, 0.75 C, 0.90 Cr, 0.20 V, 0.60 Mn, bal Fe
For shear blades, dies, punches, knives, collets, cutlery dies, machine tool parts, great toughness and resistance to impact.

ALBATRA METAL.
U.S., 57.5 Cu, 22.5 Zn, 18.75 Ni, 1.25 Pb
For automobile trimmings, hardware, fittings, (Albata)

ALBIDUR-ALUMINUM
Eng., Al alloy
For light alloy parts, non-hardenable

ALBIN.
Eng., Zn, Ni, bal Cu
For fixtures, hardware, fittings white brass

ALBION HIGH SPEED
M-340, 0.4 C, 0.05 Mn, 2.3 Cr, 15.54 W, bal Fe.
For tools, high speed cutters; high speed steel

ALBION SPECIAL.
M-340, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed cutting tools, high speed steel

ALBION TOOL.
M-340, 1.27 C, 0.33 Mn, bal Fe.
For tools, drills, reamers, water hardening

ALBONDUR
M-116, 1.5 max Mn, 1.0 max Mg, 1.2 max Si, bal Al
For tanks, furniture, marine parts, good formability and weldability.

ALBONDUR
M-1548, 3.5-5.5 Cu, 0.3-0.5 Si, 0.3-1.0 Mn, 0.2-0.7 Mg, bal Al.
Heat treated 74,000-80,000 TS; 57,000-63,000 YS; 8-12 El, 130-150 Brin
For general purpose applications
Age hardenable, high strength.

ALBOR.
M-261; 0.9 C, 1.2 Cr, bal Fe.
For dies for cold stamping white gold and all hard metals, oil hardening.

ALBOR DIE.
M-261, 0.85 C, 0.7 Cr, 0.2 Mo, bal Fe
For coining and medal dies, cutlery dies; deep hardening.

ALBOR DIE.
M-694; 0.85 C, 0.3 Mn, 0.7 Cr, 0.2 Mo, bal Fe.
For cutting tools, dies; oil hardening.

ALBRO.
M-593; 10 Al, 1 Fe, bal Cu.
For acid resisting castings; corrosion resistant.

ALCALOY.
Eng., 9-11 Al, bal Cu.
Cast: 85,000 TS; 41,000 YS; 20 El; Rockwell B50-80.
For safety tools, chains, fittings, hand tools; corrosion resistant, Al-bronze.

ALCALOY.
M-1276, 87-89 Cu, 9-11 Al, 1-2 Fe, 0.1-0.5 Be.
Cast: 85,000 TS; 41,000 YS; 20 El; 83-150 Brin.
For safety tools, chains, chain fittings, hand tools; non-sparking, corrosion resistant.

ALCAN 1S.
M-219, M-643; 99.5 Al, 0.02 max Cu, 0.15 max Si, 0.15 max Fe, 0.03 max Mn, 0.06 max Zn, others 0.2 max.
Wrought: O Temper: 7500-13,500 TS; 29-35 El; 18 Brin.
H4 Temper: 13,500-17,000 TS; 5-8 El; 33 Brin
H8 Temper 18,000 TS; 3-5 El; 44 Brin.
For food and chemical plant equipment, food containers, atomic energy, compression accessories for electrical conductors. Available as sheet and forgings Not heat treatable.

ALCAN C1S
M-219, M-643; 99.5 Al, 0.04 max Cu, 0.1 max Si, 0.4 max Fe
Extrusions Not heat treatable.
M Temper 8500 TS, 25 El.
H2 Temper 12,000 TS, 15 El.
For electrical conductors; bus bar, overhead lines, windings, insulated cable.

ALCAN 2S
M-219, M-643; 99.0 Al, 0.10 max Cu, 0.5 max Si, 0.7 max Fe, 0.1 max Mn, 0.1 max Zn. others 1.0 max.
Sheet, plate extrusions, tube; not heat treatable
O Temper: 10,000-15,000 TS; 20-30 El; 21 Brin.
H4 Temper 15,000-20,000 TS, 3-5 El; 36 Brin.
H6 Temper 17,800-21,300 TS; 2-4 El, 42 Brin.
H8 Temper 20,000 TS, 2-4 El; 46 Brin.
For paneling and mouldings, lightly stressed and decorative assemblies, food and brewing equipment

ALCAN 3S
M-219, M-643, 0.8-1.5 Mn, 0.1 max Cu, 0.1 max Mg, 0.7 max Fe, 0.2 max Zn, bal Al.
Sheet. O. 12,800-18,500 TS; 20-24 El, 27 Brin.
H4: 20,000-25,000 TS, 3-6 El, 46 Brin.
H6 22,800-27,700 TS, 2-4 El, 50 Brin.
H8 25,000 TS, 2-4 El, 57 Brin
For building sheet, vehicle paneling and sheet metal work, packaging, hollow-ware, not heat treatable.

ALCAN 16S
M-219, 2.5 Cu, 0.7 max Fe, 0.3 Mg, 0.7 max Si, bal Al
S-T Temper: 43,000 TS.
For aircraft and structural rivets; heat treatable

ALCAN 17S
M-219, M-643; 3.8-4.5 Cu, 0.5-0.8 Mg, 0.5-0.7 Mn, 0.5 max Fe, bal Al.
Forgings: TB Cond, 67,000 TS; 31,000 YS; 14 El; 31,000 SS, 120 Brin
For stressed parts in aircraft and other structures; heat treatable.

ALCAN 18S
M-219, 4 Cu, 0.6 Mg, 0.9 max Si, bal Al.
S-T Temper 55,000 TS; 40,000 YS; 10 El; 100 Brin
For forgings for light temp service; heat treatable.

ALCAN D19S.
M-219, M-643; 2.5 Cu, 1.5 Mg, 1.3 Ni, 1.0 Fe, bal Al
Plate and forgings
Plate: Ht. Tr to TF Cond 61,000 TS, 54,000 YS, 5 El
Heat treatable
Aircraft structural parts operating up to 200°C; good strength at 200°C

ALCAN 24S
M-219, M-643, 3.8-4.9 Cu, 1.2-1.8 Mg, 0.5 max Si, 0.5 max Fe, 0.3-0.9 Mn, 0.2 max Zn, bal Al
Sheet and plate, heat treatable.
Sheet. O 31,000 max TS
TB· 61,000 TS; 40,000 YS, 120 Brin
For all types of stressed components in aircraft and general engineering.

ALCAN 24S ALCLAD.
M-219, M-643, 3.8-4.9 Cu, 1.2-1.8 Mg, 0.5 max Si, 0.5 max Fe, 0.3-0.9 Mn, 0.2 max Zn, bal Al
Sheet and plate, heat treatable
Sheet: 0. 31,000 max TS
TB 61,000 TS, 40,000 YS, 15 El
For all types of stressed components in aircraft and general engineering

ALCAN 26S
M-219, M-643, 3.9-5.0 Cu, 0.2-0.8 Mg, 0.5-1.0 Si, 0.7 max Fe, 0.4-1.2 Mn, 0.2 max Zn, 0.1 max Cr, bal Al
Plate, extrusions and forgings, heat treatable
Plate TB 54,700 TS, 34,800 YS, 10-14 El
Ht. Tr to TF 62,500 TS, 54,000 YS, 6-9 El
For stressed components of all types in aircraft and general engineering

ALCAN B26S
M 219, M-643; 3.9-5.0 Cu, 0.2-0.8 Mg, 0.5-1.0 Si, 0.7 max Fe, 0.4-1.2 Mn, 0.2 max Zn, bal Al
Sheet 0 25,500 TS; 18-20 El
Ht Tr to TF cond 61,000 TS, 53,000 YS, 6-7 El, 145 Brin
For stressed components of all types in aircraft and general engineering Heat treatable

ALCAN B26S ALCLAD
M-219, M-643, 3.9-5.0 Cu, 0.2-0.8 Mg, 0.5-1.0 Si, 0.7 max Fe, 0.4-1.2 Mn, 0.2 max Zn, 0.1 max Cr, bal Al
Sheet 0 24,000 TS, 18-20 El (est)
Ht Tr to TF Cond 57,000 TS, 46,000 YS, 7-8 El
For parts requiring good strength plus good corrosion resistance, heat treatable

ALCAN 28S
M-219, M-643; 5.6 Cu, 0.2-0.6 Pb, 0.2-0.6 Bi, 0.7 max Fe, 0.4 max Si, 0.3 max Zn, bal Al.
Extrusions 41,000-44,000 TS, 27,000-35,500 YS, 6 El, 25,000-26,000 SS (as heat treated)
For repetition machined parts, free machining screw machined parts, heat treatable.

ALCAN 50S
M-219, M-643; 0.10 max Cu, 0.4-0.9 Mg, 0.3-0.7 Si, 0.40 max Fe, 0.2 max Zn, bal Al
Extrusions, tube, forgings, heat treatable.
Extrusions· Ht. Tr to TF cond. 26,000 TS, 22,700 YS; 7-8 El 75 Brin
Architectural members as window frames, window-screen sections, road transport.

ALCAN C50S.
M-219, M-643; 0.45-0.85 Mg, 0.2-0.6 Si, 0.05-0.2 Cu, 0.15 max Fe, bal Al.
Extrusions Sol Tr TB Cond· 17,800 TS; 16 El.
Ht. Tr. to TF Cond: 26,000 TS; 22,700 YS; 10 El.
Heat treatable
Excellent formability, takes good finish.
For motor car trim and other applications requiring bright finish even with anodizing.

ALCAN D50S.
M-219, M-643, 0.04 Cu, 0.4-0.9 Mg, 0.3-0.7 Si, 0.5 Fe, bal Al
Extrusions. Ht Tr to TF Cond 26,000 TS; 22,700 YS; 7-8 El
Best combination of electrical conductor and mechanical prop, 55% conductivity. Heat treatable
For bus bars, electrical conductors and fittings.

ALCAN B51S
M-219, M-643, 0.10 Cu, 0.5-1.2 Mg, 0.7-1.3 Si, 0.5 max Fe, 0.4-1.0 Mn, 0.2 max Zn, 0.25 max Cr, bal Al
Sheet, plate, extrusions, tube, forgings
Plate Ht Tr to TF Cond 42,000 TS, 34,000 YS, 8 El, 95 Brin
Medium strength, good properties, heat treatable
For structural applications as bridges, cranes, transport equipment, roof trusses

ALCAN B53S
M-219, M-643, 0.10 Cu, 3.1-3.9 Mg, 0.5 max Si, 0.5 max Fe, 0.5 max Mn, 0.2 max Zn, 0.25 max Cr, bal Al
Sheet, plate, extrusions, tube, forgings
Plate, rolled 30,000 TS approx, 75 Brin
Not heat treatable, used in as-rolled or as-forged for road and rail transport, pressure vessels, good weldability and corrosion resistance

ALCAN B54S
M 219, 4.4 Mg, 0.3 Mn, bal Al
F-temper 43,000 TS, 31,000 YS, 16-20 El, 70 Brin
For shipbuilding, structural members, good formability

ALCAN D54S
M-219, M-643, 4.0-4.9 Mg, 0.4 max Si, 0.4 max Fe, 0.5-1.0 Mn, 0.2 max Zn, 0.25 max Cr, bal Al
Sheet, plate, extrusions, forgings
Rolled plate 40,000 TS approx, 10-12 El, 65-70 Brin
Not heat treatable, used in road transport equipment and in ship building, weldable, good resistance to marine atmospheres

ALCAN 55S
M-219, 1.2 Mg, 0.3 Cr, bal Al
For rivets for aircraft, S S 20000

ALCAN 56S
M-219, 5 Mg, 0.1 Mn, 0.1 Cr, bal Al
S-O Temper 42,000 TS, 20,000 YS, 35 El
S-H Temper 58,000 TS, 48,000 YS, 15 El
For rivets, wire products, resists sea water corrosion

ALCAN A56S
M-219, 5 Mg, 0.3 Mn, bal Al
F-temper 38,500 TS, 23,000 YS, 28 El, 70 Brin.
For shipbuilding, structural members, extrusions, good formability.

ALCAN L57S
M-219, M-643, 99.8 Al, 0.8 Mg
Sheet 0: 22,000 max TS
H4· 22,000 29,000 TS.
H6 26,000-33,000 TS
H8 30,000 TS
Excellent formability, takes good finish, For motor car trim and other applications requiring a bright finish, hollow ware; not heat treatable.

ALCAN M57S.
M-219, M-643; 0.1 Cu, 1.7-2.4 Mg, 0.5 max Si, 0.5 max Fe, 0.5 max Mn, 0.2 max Zn, 0.25 max Cr, bal Al.
Sheet, plate.
Plate: 0: 22,700-28,500 TS, 8500 YS; 18-20 El.
H4: 32,000-39,000 TS: 25,000 YS; 3-5 El.
Not heat treatable, good weldability and corrosion resistance, used in panelling and structures for boats, road transport, and aircraft.

ALCAN 61S.
M-219; 0.3 max Cu, 0.6 Mg, 1 Si, 0.3 Cr, bal Al.
S-T Temper: 44,000 TS; 34,000 YS, 14 El, 90 Brin
For automotive and aircraft forgings; heat treatable

ALCAN 65S.
M-219; 0.3 Cu, 1 Mg, 0.6 Si, 0.3 max Cr, bal Al.
S-O Temper 18,000 TS, 8000 YS, 22 El, 30 Brin.
S-W Temper 35,000 TS, 21,000 YS, 22 El; 65 Brin.
S-T Temper. 45,000 TS, 40,000 YS; 12 El, 95 Brin
For structures; heat treatable, corrosion resistant

ALCAN 75S
M-219; 1.5 Cu, 2.5 Mg, 5.6 Zn, 0.3 Cr, 0.2 max Ti, bal Al
S-O Temper 33,000 TS. 15,000 YS, 17 El.
S-T Temper 82,000 TS, 72,000 YS, 11 El, 150 Brin
For aircraft, structures, heat treatable

ALCAN 75S ALCLAD
M-219, 1.5 Cu, 2.5 Mg, 5.6 Zn, 0.3 Cr, 0.2 max Ti, bal Al
S-O Temper 32,000 TS, 14,000 YS, 17 El.
S-T Temper 76,000 TS, 67,000 YS, 11 El
For aircraft, structures, heat treatable, corrosion resistant

ALCAN C75S
M-219, M 643, 5.2-6.2 Zn, 2.2-3.2 Mg, 0.3-0.7 Cu, 0.3-0.7 Mn, 0.5 max Si, 0.5 max Fe, 0.3 max Ti, 0.1 max Ni, bal Al
Forging TF 70,000 TS, 64,000 YS, 6 El, 160 Brin
Heat treatable, for aircraft and other structures where strength/weight ratio is of prime importance

ALCAN M75S
M-219, M 643; 5.3-6.5 Zn, 2.2-3.2 Mg, 0.3-1.5 Cu, 0.3 Mn, 0.1 Ni, 0.5 Si, 0.5 max Fe, 0.3 max Ti, bal Al
Sheet and plate, heat treatable
Sheet O 27,000 TS, 18-20 El, 15,600 SS
Ht Tr to TF: 70,000 TS, 61,000 YS, 8 El, 40,000 SS
Very high strength, for aircraft and other structures where strength/weight ratio is of prime importance

ALCAN M75S ALCLAD
M-219, M-643, 5.3-6.5 Zn, 2.2-3.2 Mg, 0.3-1.5 Cu, 0.3 Mn, 0.1 Ni, 0.5 Si, 0.5 max Fe, 0.3 max Ti, bal Al
Sheet and plate, heat treatable, coated with corrosion resistant mat

ALCAN 99.8
M-219, 99.8 Al, total all others 0.2 max
Sheet 0 13,000 TS max, 16 Brin
H4 13,500-17,000 TS, 28 Brin
H8 18,000 TS, 40 Brin
For fully supported roofing and flashing, collapsible tubes, atomic energy equipment; ann material is very ductile, malleable and durable Not heat treatable

ALCAN 100
M-219, M-643; 99.5 Al, total all others 0.50 max.
Casting: 8500 TS; 24 Brin
For unstressed castings in food and chemical industries and electrical equipment

ALCAN GB-B110.
M-643; Cast aluminum alloy
Heat treat(TF): 47,000 TS, 36,000 YS, 110 Brin
For decorative castings and those requiring both strength and surface suitable for polishing and anodizing.

ALCAN A111.
M-219, 1.2 Cu, 1 Fe, 1 Ni, 2.5 Si, bal Al

ALCAN 117.
M-219, 3 Cu, 0.1 Mg, 0.5 Mn, 4.5 Si, bal Al.
Cast 25,000 TS; 16,000 YS; 3-5 El, 50 Brin.
Cast: 29,000 TS, 17,000 YS, 4 El; 65 Brin
For sand and permanent mold castings; for medium stresses

ALCAN GB-117
M-643, Al-Si5-Cu3 Mn.
Aluminum alloy casting
As cast 22,400 TS, 2 min El; 85 Brin
Heat treated (TF). 40,000 TS; 115 Brin
For gear boxes, clutch housings, oil sumps, gear covers, water pumps, valve covers.

ALCAN 123
M-219; 5 Si, 0.2 max Ti, bal Al.
Cast: 19,000 TS, 9000 YS, 6 El; 40 Brin
Cast: 24,000 TS, 9000 YS, 10 El; 40 Brin
For sand and permanent mold castings; for thin sections

ALCAN 125
M-219, 2.0-4.0 Cu, 4.0-6.0 Si, 0.8 max Fe, 0.3-0.7 Mn, bal Al
Cast. 23,000 TS, 15,000 YS, 2 El, 85 Brin
Cast and aged 40,000 TS, 115 Brin
General purpose castings forlight weight and low cost, gear boxes, clutch housings, valve bodies, radiators, non-solution heat treatable

ALCAN GB-C125
M 643, Al Si5 Cu 1.5 Mg
Aluminum alloy casting
Heat treated, TF 47,000 TS; 37,000 YS, 115 Brin
For cylinder heads, valve bodies water-jackets, hose couplings, can be cast into intricate shapes, high strength at moderate cost

ALCAN D135
M-219, M-643, 0.1 max Cu, 0.20-0.45 Mg, 6.5-7.5 Si, 0.5 max Fe, 0.1 max Ni, 0.3 max Mn, bal Al
Cast 22,700 TS, 12,000 YS, 3 El, 60 Brin
Ht Tr to TF; 40,000 TS; 35,000 YS, 2 El, 95 Brin
Castings for engine components, cylinder blocks, chemical and food equipment, heat treatable

ALCAN GB-D135
M-643, Al-Si7 Mg
Aluminum alloy casting
As cast, (M) 23,000 TS, 12,000 YS; 60 Brin.
Heat treated(TF) 40,000 TS, 36,000 YS 115 Brin
For engine cylinder blocks, chemical and food equipment, many uses

ALCAN A-143
M-219, M-643, 8.5-10.5 Si, 2.0-4.0 Cu, 0.5-1.5 Mg, 0.5-1.5 Ni, 1.0 max Fe 0.5 max Mn, 0.5 max Zn, 0.2 max Ti, bal Al
Cast: heat treated 30,000 TS, 23,000 YS, 105 Brin
Low thermal expansion, good strength and frictional properties, mainly for automotive pistons

ALCAN 160
M-219, M-643, 0.1 Cu, 0.1 max Mg, 10.0-13.0 Si, 0.6 max Fe, 0.5 max Mn, 0.1 Ni, 0.1 Zn, 0.2 Ti, bal Al
Cast. 26,000 TS, 10,500 YS, 6 El; 60 Brin
Not heat treatable, for large castings, general purpose, marine and electrical, valve bodies, radiators, grids and grills.

ALCAN 160N.
M-219; 12 Si, bal Al.
Sand cast: 25,000 TS; 12,000 YS; 8 El; 50 Brin.
For castings; high fluidity.

ALCAN 160X.
M-219; 12 Si, bal Al.
Die cast: 37,000 TS; 18,000 YS; 2 El.
For die castings, instrument cases; for thin wall sections.

ALCAN 162.
M-219; 1 Cu, 1 Mg, 12 Si, bal Al.
Permanent mold: 36,000 TS, 28,000 YS; 0.5 El, 105 Brin.
For permanent mold castings, pistons; low coef. expansion.

ALCAN GB 162 (or A162)
M-643, Al-Si 11.5 Ni2 Cu Mg.
Aluminum alloy casting
Cast, HT to TF: 42,000 TS; 38,000 YS, 130 Brin
For pistons, engine components; low thermal expansion and good high temperature strength.

ALCAN 225.
M-219; 4.5 Cu, 1.5 max Si, 0.2 max Ti, bal Al.
T-22 Temper: 39,000 TS, 28,000 YS, 5 El; 80 Brin.
For sand castings; stressed parts, heat treatable.

ALCAN 236
M-219; 0.65-0.80 Cu, 0.95-1.4 Fe, 1-3 Si, 0.2 max Ti, bal Al.
Cast: 22,000 TS; 14,000 YS; 2 El; 65 Brin.
For sand castings, good machinability.

ALCAN 250
M-219; 10 Cu, 1.5 max Fe, 0.2 Mg, 0.6 max Si, 0.2 max Ti, bal Al
A62 Temper: 25,000 TS; 20,000 YS; 1 El; 75 Brin.
T25 Temper: 36,000 TS, 30,000 YS, 1 El; 100 Brin.
For engine parts, heat treatable

ALCAN A 320.
M-219, 4 Mg, 0.5 Si, 0.2 max Ti, bal Al.
Cast· 25,000 TS; 12,000 YS; 9 El; 50 Brin.
For architectural usage, ornamental and marine parts; sand casting, corrosion resistant

ALCAN 340.
M-219; 8 Mg, bal Al.
Die cast: 42,000 TS, 23,000 YS; 7 El.
For die castings; corrosion resistant.

ALCAN 350.
M-219; 10 Mg, bal Al.
Cast, T4: 47,000 TS, 26,000 YS; 17 El, 75 Brin
For sand castings, heat treatable, corrosion resistant.

ALCHROME 3.
M-61; 14 Cr, 3 Al, bal Fe
For resistors, heating elements, operating below 1500°F.

ALCHROME 6.
M-61; 19-21 Cr, 5.25-6.5 Al, bal Fe.
Annealed: 100,000 TS, 18 El.
For electrical resistors and heating elements, resists S atm.

ALCHROME-D.
M-61; 79.5 Fe, 15 Cr, 5.5 Al.
Wire. Specific resistivity. 137 micro ohm/cm; temperature coefficient· ±20 × 10^{-6} ohm/ohm/°C.
For resistance elements; high specific electrical resistance.

ALCO.
M-144; 0.5 C, 1 Si, 1.7 Cr, 2.2 W, 0.2 V, 0.5 Mo, bal Fe.
For tools, chisels, punches, pneumatic drills; for hot and cold work.

ALCO.
M-594; Zn, bal Cu.
For metalware.

ALCOA 2EC.
M-4; 0.4 Si, 0.6 Mg, bal Al.
T6-temper: 32,000 TS; 29,000 YS; 19 El.
T62-temper: 30,000 TS, 25,000 YS. 20 El.
T64-temper: 17,000 TS, 9000 YS; 24 El
For electrical conductors, good electrical conductivity and mechanical properties. AA 6101.

ALCOA 13.
M-4; 12 Si, 88 Al
Die cast: 43,000 TS; 21,000 YS, 2.5 El; 80 Brin
For carburetor frames, brake shoes, adding machine frames, die casting M.E-10,000,000. AA 413.0.

ALCOA A13.
M-4; 11-13 Si. bal Al.
Die cast· 38,000 TS; 21,000 YS, 2.0 El
For low stressed castings, good castability AA 413.0.

ALCOA 43.
M-4, 5 Si, bal Al
Sand cast: 19,000 TS, 8,000 YS; 6 El, 40 Brin.
Permanent mold: 23,000 TS, 9000 YS, 10 El, 45 Brin.
Die cast· 33,000 TS, 16,000 YS; 9 El; 50 Brin.
For instrument housings, marine castings, cooking utensils; corrosion resistant, good castability AA 443.0.

ALCOA 050
M-1715, 99.5 min Al
Ann(0)· 13,700 TS max; 22-32 El
Max cold work (H8). 19,500 TS min, 3-4 El.
Good corrosion resistance and ductility.
For formed parts for chemical plant, dairy, brewery and bakery equipment
B S 1470, 1471, 1472, 1474

ALCOA 051
M-1715, 99.5 min Al, Cu + Si + Fe 0.05 max.
Extruded· 9500 TS, 4500 YS, 25 El H2 Cond. 12,200 min TS, 15 El
Electrical conductivity 60% I A C.S. min For electric purposes, bus bars B S 2898· E1E

ALCOA 102
M-1715; 99.0 min Al
Ann 13,000 TS, 5,000 YS; 45 El
Good corrosion resistance.
For equipment for chemical, petroleum, pharmaceutical, brewery and food industry, panelling and fully supported roof cladding
B S 1470, 1471, 1474

ALCOA 108
M-4, 4 Cu, 3 Si, bal Al
Sand cast 21,000 TS, 14,000 YS; 2.5 El, 60 Brin.
For light alloy parts; sand castings. AA 208.0

ALCOA A-108
M-4, 4.5 Cu, 5.5 Si, bal Al.
Cast Permanent Mold 28,000 TS; 16,000 YS; 2 El; 65-80 Brin.
For permanent mold castings; intricate. AA 308.0.

ALCOA C-113.
M-4, 7.0 Cu, 3.5 Si, bal Al
Cast: 30,000 TS; 24,000 YS, 1.5 El; 70-90 Brin
For permanent mold castings, non-hardenable. AA 213.0.

ALCOA 122
M-4; 0.5 Si, 10 Cu, 1.2 Fe, 0.2 Mg, bal Al
T-61 Temp: 41,000 TS; 40,000 YS; 0.5 El, 115 Brin.
T-65 Temp. 48,000 TS; 36,000 YS; 0.5 El; 140 Brin.
T-551 Temp: 37,000 TS; 25,000 YS; 0.5 El; 115 Brin.

For pistons, valve guides, cam shaft bearings; wear resist castings, age-hardenable. AA 222.0

ALCOA-A-132.
M-4, 12 Si, 1 Cu, 1 Mg, 2.5 Ni, 0.6 Fe, bal Al.
T551-Permanent mold. 36,000 TS, 28,000 YS, 0.5 El, 105 Brin.
T65-Permanent mold. 47,000 TS, 43,000 YS, 0.5 El, 125 Brin.
Automotive engine pistons and sleeves, permanent mold castings, low expansion alloy; similar to Lo-Ex. AA 332.0.

ALCOA F132.
M-4, 2-4 Cu, 8.5-10.5 Si, 0.5 max Ni, 0.2 Ti, 1.0 max Zn, bal Al
T5-temper 36,000 TS, 28,000 YS, 1 El, 105 Brin
For pistons, cylinder heads; age-hardenable, permanent mold. AA F332.0

ALCOA 138
M-4, 10.0 Cu, 4.0 Si, 0.3 Mg, bal Al
Cast 30,000 TS, 24,000 YS, 1.5 El, 85-110 Brin
For permanent mold castings, retains hardness at high temperatures AA 238.0.

ALCOA 142.
M-4, 4 Cu, 2 Ni, 1.5 Mg, 0.7 Si, bal Al
Sand cast T-21: 27,000 TS, 18,000 YS, 1 El, 70 Brin
Sand cast T-571 32,000 TS; 30,000 YS, 0.5 El; 85 Brin
Permanent mold T-61 47,000 TS; 42,000 YS; 0.5 El; 110 Brin.
Permanent mold T-571 40,000 TS, 34,000 YS, 1 El, 105 Brin
For pistons, air cooled cylinder heads, bearings, retains strength at high temperatures, age-hardenable AA 242.0

ALCOA A 142
M-4, 3.7-4.4 Cu, 0.8 max Fe, 0.5 max Si, 1.4-1.8 Mg, 1.1 max Zn, 1.8-2.2 Ni, 0.7-0.15 Ti, bal Al
Sand cast-T 75-temper 32,000 TS, 28,000 YS, 1 El, 85 Brin
For pistons, cylinder heads, low coefficient of thermal expansion, wear resistant. AA 242

ALCOA 190
M-1715, 0.6 max Si, 0.7 max Fe, 0.8-1.5 Mn, 0.1 max Cu, 0.1 max Mg, 0.2 max Zn, bal Al.
Cond O. 13,000-19,000 TS, 20-25 El
Cond H8 25,400 min TS, 2-4 El
For general purpose non-heat treatable parts and
Good corrosion resistance
assemblies B S 1470. NS3.

ALCOA 195
M-4, 4.5 Cu, 0.75 Si, 0.5 Fe, 0.2 Zn, bal Al
T-4 Temp. 32,000 TS, 16,000 YS, 8.5 El, 60 Brin
T-6 Temp 36,000 TS, 24,000 YS, 5.0 El, 75 Brin
T-62 Temp: 41,000 TS, 32,000 YS; 2.0 El, 90 Brin
For crankcases, general castings, housings, gear cases; age-hardenable. AA 295.0

ALCOA B-195
M-4; 4.5 Cu, 2.5 Si, bal Al
T4-Temper. 37,000 TS, 19,000 YS, 9 El; 75 Brin
T6-Temper: 40,000 TS; 26,000 YS, 5.0 El, 90 Brin
For permanent mold castings; age-hardenable AA B295.0.

ALCOA 214.
M-4, 4.0 Mg, bal Al.
Sand Cast: 25,000 TS; 12,000 YS; 9 El, 50 Brin
For corrosion resistant light alloy castings;
C U. S. 50000; S. S. 20000; C. Y. P. 12000.
AA 514.0.

ALCOA B214
M-4; 3.8 Mg, 1.8 Si, bal Al.
Sand Cast: 20,000 TS; 13,000 YS; 2 El; 50 Brin.
For pipe fittings. AA B514.0.

ALCOA F 214.
M-4, 0.1 max Cu, 0.3 max Fe, 0.3-0.7 Si, 0.3-1.0 Mn, 3.5-4.5 Mg, 0.2 max Ni, 0.1 max Zn, bal Al
Sand cast-F temper: 21,000 TS, 12,000 YS; 3 El; 50 Brin
For architectural applications; corrosion resistant. AA F 514.

ALCOA 218.
M-4, 8 Mg, 0.2 max Cu, 0.3 max Mn, 0.1 max Ni, bal Al.
Die cast 45,000 TS; 27,000 YS, 8 El, 75 Brin.
For airplane wheel flanges and brake shoes; die casting, corrosion resistant. AA 518.0

ALCOA 220.
M-4, 10 Mg, bal Al
T4—Sand Cast 48,000 TS, 26,000 YS, 16 El, 75 Brin
For aircraft castings, high strength, corrosion resistant. AA 520.0

ALCOA 319
M-4, 3.5 Cu, 6.3 Si, bal Al
Sand cast-F temper: 27,000 TS, 18,000 YS; 2.0 El; 70 Brin
T 6-temper 36,000 TS, 24,000 YS; 2.0 El; 80 Brin.
T 5 temper 30,000 TS, 26,000 YS, 1.5 El; 80 Brin
For general utility sand castings, age-hardened AA 319.0

ALCOA 333
M-4, 3.8 Cu, 9.0 Si, bal Al.
F-temper 34,000 TS; 19,000 YS, 2.0 El, 90 Brin
T 5-temper 34,000 TS, 25,000 YS, 1.0 El, 100 Brin
T 6 temper 42,000 TS; 30,000 YS, 1.5 El, 105 Brin
For permanent mold castings, general utility AA 333.0

ALCOA 355.
M-4, 5 Si, 1.3 Cu 0.5 Mg, bal Al
Sand cast T-7. 38,000 TS, 36,000 YS, 0.5 El, 85 Brin
Sand cast T-6 35,000 TS, 25,000 YS, 3.0 El, 80 Brin
Permanent mold T-71. 36,000 TS, 31,000 YS, 3.0 El, 85 Brin
Permanent mold T-62: 45,000 TS; 40,000 YS, 1.5 El; 105 Brin
For liquid cooled engine parts; retains strength to 400°F; age hardenable AA 355.0.

ALCOA C355.
M-4, 1.3 Cu, 5 Si, 0.5 Mg, bal Al
T-6 temper: 36,000 TS, 22,000 YS, 15 El.
T-62 temper 52,000 TS, 44,000 YS; 4 El
T-61 temper 46,000 TS, 34,000 YS, 6.0 El; 100 Brin
For aircraft castings, heat treatable AA C355.0.

ALCOA 356
M-4, 0.2 Cu, 7 Si, 0.3 Mg, bal Al
Sand cast T-7 34,000 TS; 30,000 YS, 2.0 El, 75 Brin
Sand cast T-6. 33,000 TS; 24,000 YS, 3.5 El; 70 Brin.
Permanent mold T-6: 38,000 TS, 27,000 YS; 5 El; 80 Brin.
For leak proof castings, aircraft parts; corrosion resistant, age hardenable. AA 356.0.

ALCOA A356.
M-4; 7 Si, 0.3 Mg, bal Al.
T-6 temper: 37,000 TS; 22,000 YS; 15 El.
T-61 temper: 41,000 TS, 30,000 YS, 10 El; 90 Brin.
For aircraft castings; heat treatable. AA A356.0.

ALCOA A 360
M-4, 0.1 max Cu, 0.4 max Fe, 9-10 Si, 0.4-0.6 Mg, 0.05 max Sn, bal Al
Die cast: 41,000 TS; 23,000 YS, 5 El.
For die castings; high fluidity. AA A360.0.

ALCOA 364.
M-4, 8.5 Si, 0.3 Mg, bal Al.
Die cast: 43,000 TS, 23,000 YS, 7.5 El
For light alloy parts; high ductility. AA 364.0.

ALCOA 380
M-4, 3.5 Cu, 7.5-9.5 Si, 0.1-0.5 Mg, bal Al
Die cast. 45,000 TS, 27,000 YS, 3 El.
For light alloy parts, die castings, high strength and hardness AA 380.

ALCOA A380
M-4, 3.5 Cu, 7.5-9.5 Si, 0.07 max Mg, 0.3 max Ni, bal Al
Die cast. 47,000 TS, 23,000 YS; 4 El
For light alloy parts, die castings; high fluidity. AA A380.

ALCOA 384
M-4; 3.8 Cu, 12 Si, bal Al.
Die cast 47,000 TS, 25,000 YS, 1 El
For die castings, high fluidity AA 384.0

ALCOA 505
M-1715, 0.2 max Cu, 0.5-1.2 Mg, 0.4 max Si, 0.7 max Fe, 0.5 max Mn, 0.2 max Zn, bal Al
Cond O 14,000-22,000 TS, 18-22 El
Cond H8· 27,000 min TS, 24,000 min YS; 1-3 El
Medium strength alloy, particularly suitable for anodizing
B.S. 4 300/7· NS41 (Al-Mg-1)

ALCOA 510
M-1715, 0.1 max Cu, 1.7-2.4 Mg, 0.5 max Si, 0.5 max Fe, 0.5 max Mn + Cr, 0.2 max Zn, bal Al
Cond O 31,000-40,000 TS, 19,000 YS, 12-18 El
Cond H6 33,000-40,000 TS; 25,000 min YS, 3-5 El
Medium strength alloy for architectural and marine applications, panelling, containers, domestic appliances, welded assemblies
B.S. 1470· NS4, B.S. 1472. NF4, etc

ALCOA 520
M-1715, 0.10 max Cu, 3.1-3.9 Mg, 0.5 max Si, 0.5 max Fe, 0.5 max Mn + Cr, 0.2 max Zn, bal Al
Cond O· 31,000-40,000 TS; 12,000 min YS, 12-18 El
Cond H4· 40,000-48,000 TS, 33,000 min YS, 4-6 El
Strong non-heat treatable alloy for general fabrication and for welded structures
B.S. 1470. NS5, B.S. 1472. NF5, etc

ALCOA 540
M-1715, 0.15 max Cu, 0.7-1.2 Mg, 0.10 max Si, 0.10 max Fe, 0.30 max Mn, bal Al
Cond O 22,500 max TS
Cond H8 31,000 min TS
Alloy developed specifically for car and other bright trim

ALCOA 550
M-1715, 0.15 max Cu, 0.3-0.8 Mg, 0.10 max Si, 0.10 max Fe, 0.2 max Mn, bal Fe
Cond O: 18,000 max TS
Cond H4· 18,000-27,000 TS
Cond H8 27,000 min TS
Aluminum alloy more ductile than Alcoa 540; for car and other bright trim.

ALCOA A 612.
M-4, 0.35-0.65 Cu, 6.5 Zn, 0.2 max Ti, 0.7 Mg, bal Al.
Sand cast-F-temper: 35,000 TS, 25,000 YS; 5 El; 75 Brin
For sand castings, excellent brazing AA A712.0.

ALCOA C 612.
M-4, 0.35-0.65 Cu, 0.25-0.45 Mg, 6.5 Zn, 0.2 max Ti, bal Al.
Permanent mold-F-temper 35,000 TS; 18,000 YS, 8 El, 70 Brin
For permanent mold castings, excellent brazing. AA C712.0

ALCOA 750
M-4; 0.2 max Ti, 0.7 max Si, 0.7-1.3 Cu, 0.7-1.3 Ni, 5.5-7 Sn, bal Al.
T5-Temper 20,000 TS, 11,000 YS; 8 El, 40 Brin.
Permanent Mold-T5 23,000 TS, 11,000 YS, 12 El, 45 Brin
For bearings, C Y S 8500 AA 850.0

ALCOA A750
M-4, 6.5 Sn, 2.5 Si, 1.0 Cu, 0.5 Ni, bal Al.
T5-Temper 20,000 TS, 11,000 YS, 5El, 45 Brin
For bearings, cast. AA A850.0

ALCOA B750.
M-4, 6.5 Sn, 2 Cu, 0.75 Mg, 1.2 Ni, bal Fe.
Permanent mold-T5 32,000 TS, 25,000 YS; 5.0 El, 70 Brin
Sand cast T5 27,000 TS, 22,000 YS, 2.0 El.
For bearings, castings for high bearing pressures. AA B850.0

ALCOA 800
M-1715, 5.0-6.0 Cu, 0.4 max Si, 0.7 max Fe, 0.2-0.7 Pb, 0.2-0.7 Bi, bal Al
Cond TD 53,000 TS, 45,000 YS, 11 El
Cond TF 56,000 TS, 43,000 YS, 13 El
A free machining, heat treatable aluminum alloy for high speed automatic work
Nearest U.S. Spec AA 2011

ALCOA 910
M-1715, 0.10 max Cu, 0.4-0.9 Mg, 0.3-0.7 Si, 0.4 max Fe, bal Al
Cond O 14,500 TS, 30-32 El
Cond TF 37,000 TS 32,000 YS, 13-14 El
A general purpose weldable, heat-treatable alloy for glazing bars, window frames
B.S. 1471 HT9 etc, nearest U.S. Spec AA 6063

ALCOA 920
M-1715, 0.10 max Cu, 0.5-1.2 Mg, 0.7-1.3 Si, 0.5 max Fe, 0.4-1.0 Mn, 0.25 max Cr bal Al
Cond O 18,000 TS, 9,400 YS, 26-28 El
Cond TF 49,000 TS, 43,000 YS, 10-12 El
Heat treatable, forgeable, weldable alloy for structural sections subject to stresses and shock loading such as lorry body components
B.S. 1470 HS 30 etc

ALCOA 945
M-1715, 0.15-0.40 Cu, 0.8-1.2 Mg, 0.4-0.8 Si, 0.5 max Fe, 0.1 max Mn, 0.1 max Cr, bal Al
Cond TB 31,000 TS, 19,000 YS, 19 El
Cond TF. 45,000 TS, 40,000 YS; 12 El.
For structural road transport sections, forgeable, weldable, heat-treatable

ALCOA 946
M-1715, 0.15-0.40 Cu, 0.8-1.2 Mg, 0.4-0.8 Si, 0.5 max Fe, 0.4-0.7 Pb, 0.4-0.7 Bi, bal Al
Free machining version of Alcoa 945.

ALCOA 1060
M-4, 99.60 min Al.
O-temper: 10,000 TS, 4000 YS, 43 El, 19 Brin.

H14-temper. 14,000 TS; 13,000 YS, 12 El; 26 Brin.
H18-temper. 19,000 TS, 18,000 YS; 6 El; 35 Brin.
For chemical applications; corrosion resistant. AA 1060.

ALCOA 1100.
M-4, 99.0 min Al, 1 max Si + Fe, 0.2 max Cu.
O-temper 13,000 TS, 5000 YS, 35 El; 23 Brin
H18-temper 24,000 TS; 22,000 YS; 5 El; 44 Brin.
H12-temper· 16,000 TS, 15,000 YS, 12 El, 28 Brin.
For containers, tanks, trim, chemical equipment; corrosion resistant, good formability. AA 1100.

ALCOA 1260
M-4, 99.60 min Al.
O-temper 10,000 TS, 4000 YS, 43 El; 19 Brin
H18-temper· 19,000 TS, 18,000 YS, 6 El, 35 Brin
For chemical equipment, corrosion resistant AA 1260.

ALCOA 2011
M-4, 5.5 Cu, 0.5 Pb, 0.5 Bi, bal Al
T3-temper 55,000 TS, 43,000 YS, 15 El, 95 Brin.
T6-temper· 57,000 TS, 39,000 YS, 17 El, 97 Brin.
For automatic screw machine products; free-cutting. AA 2011.

ALCOA 2014
M-4, 4.4 Cu, 0.8 Si, 0.8 Mn, 0.4 Mg, bal Al
T6-Temper: 70,000 TS; 60,000 YS, 13 El, 34 RA, 135 Brin
T4-Temper· 62,000 TS, 42,000 YS, 20 El, 105 Brin
For light alloy parts, aircraft propellers, forgings; S S 38000, End Lim 20000 AA 2014

ALCOA 2017
M 4, 4 Cu, 0.5 Fe, 0.6 Si, 0.5 Mn, 0.5 Mg, bal Al
O-temper 26,000 TS, 10,000 YS, 22 El, 45 Brin
T4-temper 62,000 TS, 40,000 YS, 22 El, 105 Brin
For aircraft structures and floats, screw machine products age-hardenable, high strength AA 2017

ALCOA 2018
M-4, 4 Cu, 0.6 Mg, 2 Ni, bal Al
T 61 Temper 63,000 TS, 47,000 YS, 16 El; 115 Brin
For light alloy pistons, age-hardened AA 2018

ALCOA 2024
M-4, 3.8-4.9 Cu, 1.2-1.8 Mg, 0.3-0.9 Mn, bal Al
O-Temper 27,000 TS, 11,000 YS, 19 El, 47 Brin
T3-Temper 70,000 TS, 50,000 YS, 18 El, 120 Brin
T36-Temper 72,000 TS, 57,000 YS, 14 El, 130 Brin
For aircraft structures, wings, high strength, age-hardened AA 2024

ALCOA ALCLAD 2024
M-4, Aluminum 2024 core with Al coating
T4 Temper 64,000 TS, 42,000 YS, 19 El
T36-Temper 67,000 TS, 53,000 YS, 11 El
T81-Temper 65,000 TS, 60,000 YS, 6 El
T86-Temper 70,000 TS; 66,000 YS, 6 El
For aircraft structures, wings, pontoons; corrosion resistant AA 2024

ALCOA 2025
M-4; 0.8 Mn, 0.8 Si, 4.5 Cu, bal Al
T6 temper 58,000 TS, 37,000 YS, 19 El, 110 Brin AA 2025
For forged propeller blades, forging alloy, age-hardenable

ALCOA 2117.
M-4, 2.5 Cu, 0.5 Fe, 0.6 Si, 0.5 Mn, 0.3 Mg, bal Al
T4 temper 43,000 TS, 24,000 YS, 27 El, 70 Brin
For rivets, age-hardenable, high strength AA 2117

ALCOA 2218.
M-4; 1.5 Mg, 2 Ni, 4 Cu, bal Al
T72-temper. 48,000 TS, 37,000 YS; 11 El, 95 Brin
T6-temper: 60,000 TS; 37,000 YS; 11 El; 95 Brin.
For aircraft cylinder heads, engine parts; age hardenable, good high temperature strength AA 2218.

ALCOA 2618
M-4, 1.1 Fe, 1.3 Cu, 1.6 Mg, 1.1 Zn, 0.07 Ti, bal Al.
For aircraft forgings; high strength. AA 2618.

ALCOA 3003
M-4, 1.25 Mn, 0.11 Cu, 0.52 Fe, 0.22 Si, bal Al.
O-temper 16,000 TS, 6000 YS, 30 El, 28 Brin
H18-temper· 29,000 TS, 27,000 YS; 4 El, 55 Brin.
H12-temper 19,000 TS; 18,000 YS; 10 El; 35 Brin
For structures, tank cars, pipes, containers; corrosion resistant, good formability AA 3003.

ALCOA 3004.
M-4, 1.25 Mn, 1.0 Mg, bal Al
O-Temper 26,000 TS, 10,000 YS; 20 El, 45 Brin.
H34-Temper 35,000 TS, 29,000 YS, 9 El; 63 Brin.
H38-Temper 41,000 TS, 36,000 YS, 5 El; 77 Brin
For fuel lines, fan blades, sheeting for roofs, light sockets, underground cable sheeting, high resistance to weather corrosion. AA 3004.

ALCOA 4032
M-4, 12 Si, 1 Mg, 0.8 Ni, 0.9 Cu bal Al
T-6 Temper 55,000 TS, 46,000 YS; 9 El, 120 Brin.
For aircraft pistons, forged, low coefficient of expansion AA 4032

ALCOA 4043
M 4, 5 Si, bal Al
F temper 19,000 TS, 8000 YS, 8 El, 40 Brin
For welding wire, marine castings, corrosion resistant AA 4043.

ALCOA 5005
M-4, 0.8 Mg, bal Al
O-temper 18,000 TS, 6000 YS, 30 El, 28 Brin
H34-temper 23,000 TS, 20,000 YS, 8 El, 41 Brin.
H38-temper 29,000 TS, 27,000 YS, 5 El, 51 Brin.
For light reflectors, refrigerator shelves, utensils, good forming properties. AA 5005

ALCOA 5050
M-4, 1.4 Mg, bal Al
O-temper 21,000 TS; 8000 YS, 24 El 36 Brin.
H38-temper 32,000 TS, 29,000 YS, 6 El, 63 Brin
For vessels, tanks, containers, good corrosion resistance and formability AA 5050

ALCOA 5052
M-4, 2.5 Mg, 0.25 Cr, bal Al
O-Temper 28,000 TS, 13,000 YS; 25 El, 47 Brin.
H 34 Temper 38,000 TS, 31,000 YS, 10 El, 68 Brin
For camera cases, deck housings, marine applications, gasoline tanks, resists corrosion AA 5052

ALCOA 5056
M-4, 5.2 Mg, 0.1 Mn, 0.1 Cr, bal Al
O-temper 42,000 TS, 22,000 YS, 35 El, 65 Brin.
H18-temper 63,000 TS, 59,000 YS, 10 El, 105 Brin.
H38-temper 60,000 TS, 100 Brin
For rivets, marine construction, corrosion resistant. AA 5056

ALCOA 5083.
M-4; 0.8 Mn, 4.45 Mg, 0.10 Cr, bal Al.
O-temper. 42,000 TS, 21,000 YS; 22 El.
H113-temper 46,000 TS, 23,000 YS; 16 El.
For welded structures; high strength AA 5083

ALCOA 5086.
M-4, 0.45 Mn, 4.0 Mg, 0.10 Cr, bal Al.
O-temper· 38,000 TS, 17,000 YS, 22 El.
H34-temper 47,000 TS, 37,000 YS, 10 El.
H112-temper 39,000 TS, 19,000 YS; 14 El.
For welded structures, medium strength. AA 5086.

ALCOA 5154.
M-4; 3.1-4.9 Mg, 0.15-0.35 Cr, 0.2 max Ti, bal Al.
O-temper: 35,000 TS; 17,000 YS; 27 El; 58 Brin.
H34-temper: 42,000 TS; 33,000 YS; 13 El; 73 Brin.
H38-temper: 48,000 TS; 39,000 YS; 10 El; 80 Brin.
For unfired pressure vessels, heat exchangers; good low temperature properties.

ALCOA 5254.
M-4; 3.5 Mg, 0.02 Cu, 0.23 Fe, 0.14 Si, 0.25 Cr, bal Al.
O-temper: 35,000 TS; 17,000 YS; 27 El; 58 Brin.
H-38 temper: 48,000 TS; 39,000 YS, 10 El, 80 Brin.
H-112 temper: 35,000 TS, 17,000 YS; 25 El; 63 Brin.
For welding wire, light alloy parts; corrosion resistant. AA 5254

ALCOA 5356.
M-4; 0.05-0.20 Mn, 4.5-5.5 Mg, 0.05-0.20 Cr, 0.2 Ti, 0.0005 Be, bal Al.
H311-temper 38,000 TS; 22,000 YS, 8 El
For welding wire, for welded structures AA 5356

ALCOA 5357.
M-4; 0.30 Mn, 1.0 Mg, bal Al.
O-temper: 19,000 TS; 7000 YS, 25 El; 33 Brin.
H36-temper. 28,000 TS; 26,000 YS, 7 El, 50 Brin.
H38-temper: 32,000 TS; 30,000 YS, 6 El, 55 Brin.
For decorative trim, refrigerator trays; transportation; good formability, takes high polish. AA 5357.

ALCOA 5454.
M-4, 2.75 Mg, 0.8 Mn, 0.1 Cr, bal Al
O-temper. 36,000 TS, 17,000 YS, 22 El; 62 Brin
H-36 temper. 49,000 TS, 48,000 YS, 8 El,
H-112 temper. 36,000 TS, 18,000 YS; 18 El, 62 Brin.
For welded aluminum structures, storage tanks, high strength and corrosion resistance. AA 5454.

ALCOA 5456.
M-4, 5.25 Mg, 0.8 Mn, 0.1 Cu, 0.1 Cr, 0.1 max Ti, bal Al AA 5456.
H-311 temper: 47,000 TS, 33,000 YS, 18 El, 86 Brin
H-321 temper: 51,000 TS, 37,000 YS, 16 El, 90 Brin.
O-temper: 45,000 TS, 23,000 YS, 24 El; 75 Brin.
For pressure vessels, gun mounts, deck houses, overhead cranes, good weldability and corrosion resistant

ALCOA 5554
M-4, 0.8 Mn, 2.7 Mg, 0.1 Cr, 0.1 Ti, bal Al
For Al welding wire, corrosion resistant AA 5554.

ALCOA 5556.
M-4, 0.8 Mn, 5.2 Mg, 0.1 Cr, 0.1 Ti, bal Al.
For Al welding wire; corrosion resistant to sea water. AA 5556.

ALCOA 5652
M-4; 2.5 Mg, 0.25 Cr, bal Al
O-temper: 28,000 TS; 13,000 YS; 25 El, 47 Brin
H32-temper: 33,000 TS, 28,000 YS, 12 El, 60 Brin
H38-temper: 42,000 TS, 37,000 YS, 7 El, 77 Brin.
For welded structures; good strength AA 5652.

ALCOA 6053.
M-4; 0.7 Si, 1.3 Mg, 0.25 Cr, bal Al.
0-Temper: 16,000 TS, 8000 YS, 35 El; 26 Brin.
T-4 Temper 33,000 TS; 20,000 YS, 22 El; 65 Brin
T-6 Temper: 32,000 TS, 32,000 YS, 13 El, 80 Brin
For rivets, forgings. AA 6053

ALCOA 6061.
M-4; 1 Mg, 0.6 Si, 0.25 Cu, 0.25 Cr, bal Al
O-temper: 18,000 TS, 8,000 YS; 25 El; 30 Brin.
T4-temper: 34,000 TS, 21,000 YS, 25 El, 65 Brin
T6-temper: 45,000 TS; 40,000 YS; 17 El, 95 Brin.
For marine constructcion, aircraft fairings, engine baffles; age-hardenable, corrosion resistant.

ALCOA ALCLAD 6061.
M-4; 6061 core with 7072 cladding.
O-temper: 17,000 TS; 7,000 YS; 25 El.
T4-temper: 33,000 TS; 19,000 YS; 22 El.
T6-temper: 42,000 TS; 37,000 YS, 12 El.
For truck body siding; corrosion resistant, age-hardened.

ALCOA 6063
M-4; 0.4 Si, 0.7 Mg, bal Al
O-temper: 13,000 TS, 7000 YS; 25 Brin
T6-temper: 35,000 TS; 31,000 YS, 12 El; 75 Brin.
T835-temper: 48,000 TS; 43,000 YS, 8 El, 105 Brin. AA 6063
For architectural and building applications; good finish.

ALCOA 6151.
M 4, 1.0 Si, 0.6 Mg, 0.25 Cr, bal Al.
T6-Temper: 48,000 TS, 43,000 YS, 17 El, 100 Brin.
For forgings; S. S. 32,000, End. Lim. 11,000, AA 6151.

ALCOA 6463
M-4, 0.7 Mg, 0.4 Si, bal Al.
O-temper 13,000 TS, 7000 YS, 25 Brin.
T-4 temper. 25,000 TS, 13,000 YS, 22 El.
T-6 temper 35,000 TS; 31,000 YS, 12 El, 73 Brin.
For architectural, automotive and appliance parts; heat treatable, extruded products AA 6463.

ALCOA 6951
M-4, 0.15-0.40 Cu, 0.8 max Fe, 0.2-0.4 Si, 0.4-0.8 Mg, 0.2 max Zn, bal Al.
T 4-temper 24,000 TS
T 6-temper 35,000 TS.
For core of brazing sheet, age-hardenable AA 6951

ALCOA 7072
M-4, 0.7-1.2 Zn, bal Al.
For Alclad liner for sheet Al products; corrosion resistant AA 7072.

ALCOA 7075.
M-4, 1.6 Cu, 2.5 Mg, 5.6 Zn, 0.3 Cr, bal Al
O-temper 33,000 TS, 15,000 YS, 17 El; 60 RA
T6-temper 83,000 TS, 73,000 YS, 11 El, 150 RA.
For aircraft parts; high strength, age hardened AA 7075.

ALCOA ALCLAD 7075.
M-4; 5.7 Zn, 1.6 Cu, 2.5 Mg, Ti, bal Al
O-Temper 32,000 TS, 14,000 YS, 17 El
T6-Temper 76,000 TS, 67,000 YS, 11 El.
For structural parts for aircraft; high strength.

ALCOA 7076
M-4, 7.5 Zn, 1.6 Mg, 0.6 Cu, bal Al
T-6 Temper 70,000 TS, 60,000 YS, 14 El; 140 Brin.
For forgings, age-hardenable. AA 7076.

ALCOA 7079
M-4, 4.3 Zn, 3.3 Mg, 0.6 Cu, 0.2 Cr, 0.2 Mn, bal Al.
T6-temper. 78,000 TS, 68,000 YS, 14 El, 145 Brin AA 7079
For highly stressed aircraft forgings, high strength, age-hardenable

ALCOA 7178.
M-4, 1.6-2.4 Cu, 2.4-3.1 Mg, 0.18-0.40 Cr, 6.3-7.3 Zn, 0.2 max Ti, bal Al
T6-temper. 88,000 TS, 78,000 YS; 10 El, 160 Brin.
O-temper: 33,000 TS, 15,000 YS; 15 El, 60 Brin
For airframes, aircraft structural members; age-hardenable; formerly 78S

ALCOA ALCLAD 7178
M-4; 7178 core with 7072 cladding.
O-temper: 32,000 TS, 14,000 YS; 16 El.
T6-temper: 81,000 TS, 71,000 YS; 10 El.
For aircraft structures; high strength, age-hardened

ALCOA 7277.
M-4; 0.8-1.7 Cu, 1.7-2.3 Mg, 0.18-0.35 Cr, 3.7-4.3 Zn, bal Al.
For large rivets; for heavy duty, age hardened. AA 7277.

ALCOA AZ31B.
M-4, 3.0 Al, 0.4 Mn, 1.0 Zn, bal Mg.
Annealed: 38,000 TS; 28,000 YS, 14 El; 50 Brin.
For formed parts, sheets, extrusions.

ALCOA AZ61A
M-4; 6 Al, 1 Zn, 0.30 Mn, bal Mg.
Extruded: 45,000 TS, 33,000 YS; 16 El; 60 Brin.
For light alloy parts, extruded and pressed.

ALCOA AZ80A.
M-4, 8.9 Al, 0.30 Mn, 0.45 Zn, bal Mg
Forged 49,000 TS, 36,000 YS; 11 El, 60 Brin.
T 5-Temper 55,000 TS, 38,000 YS, 6 El, 82 Brin.

ALCOA AZ91A
M-4, 9 Al, 0.6 Zn, 0.10 Mn, bal Mg
Die cast: 38,000 TS, 24,000 YS, 4.5 El, 60 Brin
For pressure die castings, strong

ALCOA AZ92A.
M-4; 9 Al, 1 Zn, 0.10 Mn, bal Mg.
F-temper: 24,000 TS, 14,000 YS, 2 El, 65 Brin.
T 6 temper 38,000 TS, 22,000 YS; 3 El, 80 Brin
For permanent mold castings, heat treatable.

ALCOA EC
M-4, 99.6 min Al
O-Temper 12,000 TS; 4,000 YS, 23 El.
H-18 Temper 21,000 TS, 19,000 YS; 1.5 El.
For wire for trolleys, electrical conductors, high electrical conductivity. AA EC

ALCOA NO 360
M-4, 9-10 Si, 0.5 Mg, 2 max Fe, bal Al
Die cast 47,000 TS, 25,000 YS, 3.0 El
For die castings, corrosion resistant AA 360.0.

ALCO BRONZE
M-404, 10 Sn, 5 Ni, bal Cu
For ships forgings, propellers, skates, surgical instruments, tough, hard, corrosion resistant.

ALCODIE
M 35, 0.35 C, 5 Cr, 0.4 V, 1.5 W, 1.5 Mo, bal Fe
Oil or air hardening tool steel for die casting dies, hot blanking and forging dies, shear blades, AISI H12

ALCOLOY
M-279, 22.7 Zn, 3.4 Al, 0.4 Co, bal Cu
Annealed 78,000-82,000 TS, 47,000-55,000 YS, 36-39 El
Spring temper 120,000 TS; 108,000 YS; 1.5 El
For springs, diaphragms, connectors
Readily deep drawn, good corrosion and stress-corrosion resistance

ALCOLOY R 688
M-279, 73.5 Cu, 22.7 Zn, 3.4 Al, 0.4 Co.
Ann. 77,000-87,000 TS, 47,000-62,000 YS; 30-40 El
Cold rolled 87,000-140,000 TS, 63,000-120,000 YS; 2-29 El
Excellent corrosion resistance, high strength.
For relay springs, electric terminals, shells, connectors.

ALCO M replaced by CYCLOPS S1

ALCO S replaced by CYCLOPS S1

ALCOMAX-I.
M-1010, 25 Co, 11.5 Ni, 7.5 Al, 3 Cu, 1.5 Ti, bal Fe.
For magnetic and electrical equipment.
Permanent magnet. High permeability.

ALCOMAX-II.
M-1010, 8.1 Al, 11.9 Ni, 21 Co, 4 Cu, bal Fe.
For magnetic and electrical equipment.
Permanent magnet, high coercive force.

ALCOMAX III
M 1010; 13.5 Ni, 25.5 Co, 3 Cu, 7.5 Al, 0.9 Cb, 0.17 Si, bal Fe.
For magnets for motors, loud speakers, permanent magnet

ALCOMAX IV
M-1010; 7.4 Al, 13.3 Ni, 24.5 Co, 3 Cu, 2.5 Cb, bal Fe.
For magnets for cycle dynamos; permanent magnet.

ALCONIT-0
Germ.; Ni, Al, bal Fe
For permanent magnets

ALCONIT-10
Germ., Ni, Al, bal Fe
For permanent magnets.

ALCONIT 16
German; Ni, Al, bal Fe.
For permanent magnets.

ALCONITE
M-1464, C, alloy, bal Fe
For castings

ALCO NO 716.
M-4, 10 Si, 4 Cu, bal Al.
For brazing alloy, wire

ALCOP BRONZE
M-508, 62 Cu, 2.5 Al, 35.5 Zn, 0-15 Pb.
Cast 73,000 TS, 37,000 YS, 35 El, 150 Brin
For centrifugal castings, bushings, liners, bearing cages, heavy duty.

ALCOP NO 3
M-1168, 61.5-63.5 Cu, 35-38 Zn, 0.75-1.25 Pb, 0.9-1.3 Al
Cast 63,000 TS, 35,000 YS; 30 El; 102 Brin
For hardware, die castings, leaded bronze, free-cutting

ALCRES
U S; 12 Cr, 5 Al, 83 Fe
For electrical resistances, heat resisting.

ALCRESS
Eng., 70 Fe, 20 Cr, 5 Al
For electrical resistors, heat resistant

ALCROSIL 5
M-376, 0.15 max C, 0.50 max P, 0.50-1.0 Si, 4-6 Cr, 0.45-0.65 Mo, 0.30-0.70 Al, bal Fe.
Annealed 60,000 TS, 25,000 YS, 30 El, 163 Brin.
For high temperature applications, corrosion, heat resistant.

ALCUFONT 4.5
M-1176, 4.5 Cu, 0.8 max Fe, 1 max Si, 0.2 max Ti, bal Al
Heat treated 36,000-43,000 TS, 28,000-33,000 YS; 4-2 El, 75-95 Brin.
For light alloy parts, age-hardenable

ALCUFONT 8
M-1176, 7.0-8.5 Cu, 0.2 max Ti, 0.5 max Si, 0.6 max Fe, bal Al
Heat treated. 20,000-26,000 TS, 11,000-13,500 YS; 5-2 El, 55-70 Brin
For pistons, light alloy parts, age-hardened

ALCUFONT 10
M-1176, 9.3-10.7 Cu, 0.5-1.3 Fe, 0.2-0.4 Mg, bal Al.
Heat treated 40,000-51,200 TS, 34,000-37,000 YS; 0.5-0.2 El, 125-150 Brin.
For pistons, high strength.

ALCUFONT 12.
M-1176; 11.0-12.5 Cu, 0.2 Ti, 1 Fe, bal Al.
Heat treated: 38,400-42,700 TS; 22,800-25,600 YS; 1.5-1.0 El; 110-125 Brin.
For pistons; high strength.

ALCUMAN.
M-1548; 4.8-6.0 Cu, 0.2 max Si, 0.5 Mn, 1.5 Mg, bal Al.
Heat treated: 60,000-71,000 TS; 50,000-57,000 YS; 5-10 El; 120-140 Brin.
For screw machine products, construction and transportation equipment. Age-hardenable. High strength.

ALCUNIC.
M-102; 80 Cu, 1 Ni, 2 Al, 17 Zn.
Hard: 103,000-112,000 TS, 94,000-106,000 YS; 3.5-3.0 El, 200-220 Brin.
For condenser tubing, belt buckles; corrosion resistant.

ALCUNIC "G."
M-102; 70 Cu, 1 Ni, 2 Al, bal Zn.
Soft. 59,000 TS, 20,000 YS; 56 El.
Hard: 100,000 TS, 95,000 YS; 3 El
For condenser tubes, belt buckles; corrosion resistant.

ALCUPLATE
M-926; Cu clad to 2S aluminum alloy
Soft: 17,000 TS; 7800 YS; 33 El
Hard 30,000 TS; 25,000 YS; 5 El.
For electrical contacts, Al alloys plated by lamination with copper, 80% Al-20% Cu

ALDA.
M-667, 0.1-0.2 C,, bal Fe
For welding rods; copper coated.

ALDAL.
M-767; 3.5-4.5 Cu, 0.4-1.0 Mn, 0.3-0.75 Mg, bal Fe.
60,000 TS, 22 El; 120 Brin
For light alloy parts, aircraft construction, Duralumin type.

ALDECOR
M-97, 0.12 max C, 0.35-0.60 Cu, 0.16-0.28 Mo, 0.25-1.50 Cr, 0.25-1.50 Ni, bal Fe
Hot rolled 70,000 TS, 50,000 YS; 22 El.
For transportation equipment, bus and truck bodies, good forming and welding characteristics.

ALDIVAN
M-73; 0.4 C, 2.5 Cr, 0.3 V, bal Fe
For tool steel for Al die castings, hot work steel

ALDREL
Italy, Si, Mg, bal Al
42,500-51,000 TS, 38,000-44,000 YS; 5-9 El.
For light alloy parts

ALDREY.
M-249, M-264, 0.2-1.0 Si, 0.4 Mg, 0.3 Fe, bal Al.
Heat treated. 44,000-49,000 TS, 38,000-43,000 YS; 9-5 El, 90-100 Brin
For auto engine parts, electric transmission wires and cables, age-hardenable

ALDREY.
M-1548; 0.5-0.6 Si, 0.4-0.5 Mg, bal Al.
Heat treated: 43,000-50,000 TS, 38,400-44,000 YS, 5-9 El. 70-80 Brin.
For general structural members, aircraft and aerospace components.
Age hardenable, corrosion resistant

ALDREY 14.
M-624; M-1634, M-541; 0.4-0.6 Si, 0.4-0.6 Mg, 0.3 max Fe, 0.3 max Ti, bal Al.
Annealed: 11,400-17,000 TS; 4300-7100 YS; 20-3 El.
THA16 Temper: 42,700-50,000 TS; 38,400-44,100 YS; 4-9 El.
For marine structures and hardware, architectural applications. Heat treatable.

ALDUR.
Austrian; 0.16 C, 0.24 Si, 1 Mn, 0.055 Al, 0.02 S, bal Fe
69,000-85,000 TS, 47,000 YS, 33 El.
For welded structures.

ALDUR 50
Austrian, Swiss; 0.20 max C, 0.45 Si, 0.95 Mn, bal Fe
Rolled: 70,000-85,000 TS.
For welded structures; good weldability.

ALDUR 58
Austrian, Swiss, 0.20 max C, 0.45 Si, 1.4 Mn, 0.35 Cu, bal Fe.
Rolled: 82,000-96,500 TS; 57,500 YS, 22 El
For welded structures; good weldability.

ALDURAL
M-338; Al clad Duralumin.
For aircraft structures; clad with 99.7 Al.

ALDURAL E.
Eng.; Al clad Al alloy core - 3.0-4.5 Cu, 1.0 max Si, 1.0 max Mg, 1.2 max Mn, 1.0 max Fe, bal Al.
50,000 TS, 38,000 YS; 8 El.
For light metal parts, age hardenable

ALDURAL-G
M--338, 4.5 Cu, 0.6 Mn, 1.5 Mg, bal Al.
Annealed 27,000 TS; 11,000 YS; 20 El, 47 Brin.
Heat treated 72,000 TS, 57,000 YS, 13 El, 130 Brin
For aircraft components, fittings, rivets, fasteners
Age hardenable High fatigue and tensile strength.

ALDURAL K
M-338, 0.4 C, 2.7 Mg, 0.5 Mn, 5.3 Zn, bal Al
Heat treated: 67,000-72,000 TS, 58,000-60,000 YS, 8 El
For aircraft structures; age hardenable, high strength

ALDURAL-L
M-338, 0.4 Cu, 2.7 Mg, 0.5 Mn, 5.3 Zn, bal Al.
Age hardened 72,000 TS, 61,000 YS, 8 El
For high strength applications, manifolds, cylinders. Responds to age hardening.
Sheets and plates, DTD 687A spec.

ALDURAL-LC.
M-338, 0.4 Cu, 2.7 Mg, 0.5 Mn, 5.3 Zn, bal Al.
Age hardened 70,000 TS; 60,000 YS, 10 El
For high strength application, manifolds, cylinders
DTD 687A spec Age-hardenable

ALDURAL Q
M-338; 3.5-5.0 Cu, 0.4-1.2 Mg, 0.7 Si, 0.7 Fe, 0.4-1.2 Mn, 0.2 Ti, bal Al
Heat treated 53,800 TS, 31,400 YS; 10-12 El,
For structural members, age-hardened, high strength.

ALDURAL S.
M-338; 3.5-4.8 Cu, 0.8 Mg, 0.9 Si, 1 Fe, 1.2 Mn, 0.3 Ti, bal Al
W-temper: 54,800 TS, 31,400 YS, 15 El
WP-temper 58,300 TS, 44,800 YS, 8 El
For structural members, age-hardened, high strength.

ALDURAL Z
M-338, 3.5-4.8 Cu, 0.6 Mg, 1.5 Si, 1 Fe, 1.2 Mn, 0.3 Ti, bal Al
WP-temper: 60,500 TS; 47,000 YS, 8 El
For structural members; age-hardened, high strength.

ALDURBRA
M-282, M-150, 76 Cu, 22 Zn, 2 Al.
80,000 TS; 44,000 YS; 16 El; 130 Brin.
For condenser tubes; corrosion resistant.

ALEMITE.
M-595; 10 Si, bal Al.
For light alloy parts; die casting.

ALFENIDE.
59.1 Cu, 30.12 Zn, 9.7 Ni, 1.0 Fe.
For ornaments, hardware, fittings; nickel silver.

ALFENOL.
M-38; 16 Al, bal Fe.
For electrical equipment; high permeability.

ALFENOL-16.
M-32; 16 Al, 84 Fe.
For relays, gyros, signal generators, servo mechanisms; soft magnetic material, high permeability.

ALFER.
M-926; low C-steel clad with Al alloy.
For electron tubes.

ALFER.
Japan; 12-14 Al, bal Fe.
For permanent magnets; high permeability.

ALFERIUM.
M-533, 3.5-4.5 Cu, 0.4-1.0 Mn, 0.3-0.75 Mg, bal Al.
Heat treated: 55,000 TS; 31,000 YS, 16 El
For airplane and dirigible parts, similar to "Duralumin."

ALFERON.
M-44; 23 Cr, 5 Al, bal Fe.
Rolled 110,000 TS; 60,000 YS; 20 El.
For electric resistances; magnetic.

ALGIERS (ALGERS) METAL.
Eng.; 94.5 Sn, 0.5 Sb, 5 Cu.
For bearings; anti-friction.

ALGIERS METAL-1
Eng; 90 Sn, 10 Sb
For bearings, corrosion resistant.

ALGIERS METAL-2
Eng, 75 Sn, 25 Sb
For bearings, corrosion resistant.

ALGO-LOY 1315
M-1253; 0.10-0.20 C, 1.1-1.65 Mn, 0.40 max Cu, bal Fe
Rolled 70,000 TS, 50,000 YS; 22 El
For gears, cams, camshafts, bolts; case hardened, tough

ALGO-LOY 1317
M-1253, 0.25 max C, 1.65 Mn, 0.20 min Cu, 0.05 max Mo, 0.30 max Cr, 0.30 max Ni, bal Fe.
Rolled. 70,000 TS, 50,000 YS; 22 El.
For gears, cams, camshafts, crankshafts; case hardened, tough.

ALGOMA 1315
M-1253, 0.10-0.20 C, 1.1-1.65 Mn, 0.15-0.35 Si, 0.40 Cu, bal Fe.
Rolled: 70,000 TS; 50,000 YS; 22 El.
For compressed gas cylinders, dished heads; good formability and drawability.

ALGOMA 1317.
M-1253; 0.25 max C, 1.65 max Mn, 0.20 min Cu, 0.3 max Ni, 0.3 max Cr, 0.05 max Mo, bal Fe
Rolled: 67,000 TS; 46,000 YS; 20 El.
For highway guard rails, transportation equipment, cars; structural steel.

ALGOMA-AR.
M-1253; 0.35-0.50 C, 1.2-2.0 Mn + Cr, bal Fe.
250 Brin.
For conveyors, chutes, road machinery, dredging equipment; tough and abrasion resistant.

ALGONQUIN.
M-435; 1.0 C, 0.25 Mn, 0.2 Si, bal Fe.
For dies; water hardened.

A-L Grade 173.
M-1; 0.40 C, 0.55 Mn, 1.0 Si, 3.3 Cr, 0.5 V, 2.5 Mo, bal Fe.
Oil hardening hot work tool steel, chromium type; AISI H10.

ALHEAD.
M-1; 1.0 C, 1.5 W, 1.5 Co, 0.15 max Mo, bal Fe.
Annealed: 217 Brin.
Heat treated: 600 Brin.
For cold heading dies; wear and abrasion resistant.

ALIDIE
M-275; 1.5 C, 12 Cr, 0.2 V, 1 Mo, bal Fe.
For blanking and forming dies, punches; Type D2; air hardened, non-deforming.

ALJEP.
France; 3.8 Cu, 1.3 Mg, 1.5 Ni, 0.5 V, bal Al.

ALKADUR 300.
M-1548, 3.5-4.5 Cu, 0.2-1.0 Si, 0.3-1.2 Mn, 0.4-1.4 Mg, bal Al.
Heat treated: 62,700-71,100 TS; 48,000-57,000 YS; 5-15 El, 110-150 Brin.
For aircraft components, fittings, fasteners, rivets.
Heat treatable High strength and fatigue.

ALKALI-RESISTING METAL.
Eng.; 95 Fe, 5 Ni.
For corrosion resisting parts, chemical apparatus, corrosion resistant.

ALKROHMIT 140.
M-27; 0.8 C, 20 Cr, 5 Al, bal Fe.
For electric resistances; heat and oxidation resistant.

ALKRONID
M-1331, 0.34 C, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment, creep resistant.

ALKROTHAL-14
M-1150; 4 Al, 15 Cr, bal Fe
Rolled: 90,000 TS; 70,000 YP; 20 El, 220 Brin
For electrical resistances
For service up to 1920°F

ALKUMAG 302.
M-324, 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
For aircraft structures and parts, age hardenable.

ALKUMAG 303.
M-324; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
For aircraft structural parts; age hardenable

ALKUMAG 311
M-324; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
For aircraft structures and parts; age hardenable.

ALLADIN
Eng; Zn alloy.
For welding rod; for white metal die castings.

ALLAN NO. 2 BRONZE
U.S., 66 Cu, 9 Sn, 25 Pb.
For bearings, hardware, tough.

ALLAN NO. 2 RED METAL.
M-124; 60 Cu, 40 Pb.
For high speed bearings, piston wearing rings.

ALLAN RED BRONZE.
U.S.; 70-55 Cu, 20-40 Pb, 10-5 Sn, 1 S.
For bearings, hardware; tough.

ALLAN RED BRONZE
U.S.; 62.5 Cu, 30 Pb, 7.5 Sn.
For bearings, hardware; tough.

ALLAN RED METAL.
M-124; 50 Pb, 50 Cu.
13.5 Brin.
For bearings, crank-pins for facing pistons; not a true alloy but a mechanical mixture.

ALLAUTAL.
M-116; surface of pure Al on base of "Lautal."
Annealed: 20,000 TS; 25 El.
Normalized: 60,000 TS; 18 El.
For light alloy parts; similar to "Alclad."

ALLAUTAL.
M-1548; 4.5-5.5 Cu, 0.2-0.5 Si, bal Al.
Heat treated: 60,000-71,000 TS; 42,000-57,000 YS; 2-10 El; 120-140 Brin.
For aircraft components, fasteners, fittings, rivets.
Age-hardenable, high tensile and fatigue strength.

ALLCAST.
M-906; 2.5-3.5 Cu, 4.5-6.0 Si, 0.15 max Mg, 1.0 max Fe, 0.2 max Ni, 0.5 max Mn, bal Al.
Cast: 24,000 TS; 12,000 YS; 2 El; 60 Brin.
Heat treated: 30,000 TS; 18,000 YS; 2.5 El; 75 Brin.
For sand and permanent mold castings; age-hardenable.

ALLCAST-46.
M-130; 0.6 max Cu, 6.5-7.5 Si, 0.2-0.4 Mg, 0.5 max Zn, 0.75 max Fe, 0.1-0.2 Ti, bal Al.
Cast: 23,000 TS; 12,000 YS; 3.5 El; 55 Brin.
T6 Temper: 33,000 TS; 24,000 YS; 4 El; 70 Brin
For instrument cases, gear cases, fittings, crankcases, oil pans.
Heat treatable. Similar to aluminum 356.
Corrosion resistant.

ALLCAST-46A.
M-130; 0.20 max Cu, 6.5-7.5 Si, 0.25-0.40 Mg, 0.3 max Zn, 0.5 max Fe, 0.25 max Ti, bal Al.
Permanent Mold Cast: 25,000 TS; 13,000 YS; 7 El; 65 Brin.
T6 Temper: 40,000 TS; 27,000 YS; 5 El; 90 Brinell
For permanent mold castings, oil pans, instrument cases, crankcases.
Heat treatable. Similar to Aluminum 356.

ALLCAST 46-10.
M-130; 0.10 max Cu, 6.5-7.5 Si, 0.28-0.40 Mg, 0.1 max Zn, 0.15 max Fe, 0.2 max Ti, bal Al.
Permanent Mold Cast: 27,000 TS, 14,000 YS; 8 El, 55 Brin.
T61 Temper: 43,000 TS; 28,000 YS; 12 El; 90 Brin.
For gear housings, fittings, oil pans, crankcases, instrument housings.
Heat treatable, permanent mold. Similar to Aluminum A356.

ALLCAST 50.
M-130; 3.5-4.5 Cu, 2.5-3.5 Si, 0.10 max Mg, 1.0 max Zn, 1.0 max Fe, 0.2 max Ti, bal Al.
Permanent Mold Cast: 27,000 TS; 16,000 YS; 3 El; 65 Brin.
T6 Temper: 40,000 TS; 26,000 YS; 4 El; 85 Brin.
For casings, housings, oil pans, manifold and valve bodies, machine frames, piano plates and frames.
Heat treatable, permanent mold. Similar to Aluminum 108.

ALLCAST 51.
M-130; 3.5-4.5 Cu, 5.5-6.5 Si, 0.1 max Mg, 1.0 max Zn, 1.0 max Fe; 0.2 max Ti, bal Al.
Cast: 28,000 TS; 16,000 YS; 2 El; 70 Brin.
T6. 45,000 TS; 28,000 YS; 4 El; 105 Brin.
For permanent mold castings, housings, oil pans, casings, fittings.
Heat treatable. Similar to Aluminum A108.

ALLCAST 52.
M-130; 4-5 Cu, 1.5 max Si, 0.5 max Zn, bal Al.
T6 Temper: 37,000 TS; 24,000 YS; 5 El; 75 Brin.
At 600°F: 4000 TS; 3000 YS; 75 El.
For flywheel housings, aircraft wheels, fittings, crankcases, instrument cases.
Heat treatable. Similar to Aluminum 195
Strong and rugged.

ALLCAST 52A.
M-130, 4-5 Cu, 1.5 max Si, 0.35 max Zn, 0.8 max Fe, 0.25 max Ti, bal Al.
T4 Temper: 32,000 TS; 16,000 YS; 8 El; 60 Brin.
T62 Temper: 41,000 TS, 32,000 YS; 2 El; 95 Brin.
For flywheel housings, crankcases, aircraft and bus wheels
Heat treatable. Strong and rugged.
Similar to Aluminum 195.

ALLCAST 53
M-130; 4.0-5.0 Cu, 2.0-3.0 Si, 0.5 max Zn, 0.35 max Ni, 0.2 max Ti, 1.0 max Fe, bal Al.
Cast: 30,000 TS; 14,000 YS, 3.5 El; 70 Brin.
T6: 40,000 TS, 26,000 YS; 5 El, 90 Brin.
For aircraft fittings and wheels, fuel pump bodies, seat frames.
Heat treatable, permanent mold. Similar to Aluminum B195.

ALLCAST 59A.
M-130, 3.5-4.5 Cu, 0.6 max Si, 1.3-1.8 Mg, 0.25 max Cr, 1.7-2.3 Ni, 0.25 max Ti, bal Al.
Cast. 34,000 TS, 24,000 YS, 1 El; 105 Brin.
T6: 54,000 TS; 51,000 YS; 0.8 El; 120 Brin.
For air cooled cylinder heads, diesel engine pistons, generator housings.
Heat treatable, permanent mold Similar to Aluminum 142.

ALLCAST 60
M-130, 6 Si, 3.5 Cu, bal Al.
F-temper: 27,000 TS; 16,000 YS, 2.5 El; 65 Brin.
T6-temper: 35,000 TS; 24,000 YS, 3.5 El; 85 Brin
For pressure tight castings, heat treatable.

ALLCAST 70.
M-130; 6 Si, 3.5 Cu, bal Al
F-temper: 26,000 TS, 16,000 YS; 2.0 El, 70 Brin.
T6-temper: 36,000 TS; 24,000 YS, 2.0 El, 80 Brin.
For pressure tight castings, heat treatable.

ALLCAST 78
M-130; 3.0-4.0 Cu, 7.5-8.5 Si, 1.0 max Zn, 0.6 max Fe, 0.25 max Ti, bal Al.
Die cast: 43,000 TS, 26,000 YS; 2 El.
At 300°F: 37,000 TS; 24,000 YS; 4 El.
For motor frames, hand truck wheels, oil pans, ornamental parts.
Good high temperature strength.

ALLCAST 125.
M-130, 9.7-10.5 Mg, 0.25 max Ti, bal Al.
T4 Temper: 57,000 TS; 25,000 YS; 30 El; 80 Brin.
For aircraft fittings, car frames, marine parts, lever brackets.
Age hardenable, corrosion resistant, shock resistant, tough.

ALLCAST 400.
M-130; 3.6-4.2 Mg, 0.5 max Si, 0.5 max Zn, 0.6 max Mn, 0.5 max Fe, 0.25 max Ti, bal Al.
Cast (Sand). 25,000 TS; 12,000 YS; 9 El; 50 Brin.
At 300°F: 22,000 TS; 12,000 YS, 7 El.
For food handling equipment, cooking utensils, chemical and textile plant equipment, marine hardware. Similar to Aluminum 214, good corrosion resistance. Not heat treatable.

ALLCAST 405.
M-130; 4.0-5.0 Zn, 0.5 max Si, 1.0 max Fe, 0.2 max Ni, 0.15 max Mn, 0.9-1.4 Sb, bal Al.
Die Cast: 22,000 TS; 11,000 YS; 10 El.
For oil pans, instrument cases, housings, ornaments.
Good corrosion resistant.

ALLCAST 417.
M-130; 6.5-7.5 Mg, 0.12 max Si, 0.10-0.25 Mn, 0.10-0.25 Ti, bal Al.
Sand Cast: 36,000 TS; 19,000 YS; 10 El; 70 Brin.
For automotive and marine castings, cooking utensils, gasoline fuel gages, textile machinery
Similar to Aluminum 2185P and Almag 35. High strength and shock resistant.

ALLCAST 418.
M-130; 7.5-8.5 Mg, 0.3 max Si, 0.9-1.3 Fe, 0.30 max Mn, 0.10 max Ni, bal Al.
Die Cast: 43,000 TS; 25,000 YS; 5 El, 80 Brin
For cylinder blocks, marine fittings, hardware, brake shoes, wheel flanges. Similar to Aluminum 218. Good strength and corrosion resistance.

ALLCAST 420
M-130, 9.7-10.5 Mg, 0.15 max Si, 0.20 max Fe, 0.25 max Ti, bal Al.
T4 Temper: 46,000 TS, 25,000 YS, 16 El; 75 Brin
T5 Temper 35,000 TS, 110 Brin.
For aircraft fittings, marine parts, railroad car frames.
Sand castings Similar to Aluminum 220
High strength and corrosion resistance.

ALLCAST 440
M-130; 0.5-0.65 Mg, 5.2-6.0 Zn, 0.4-0.6 Cr, 0.15-0.25 Ti, 0.4 max Fe, bal Al.
Cast 28,000 TS, 16,000 YS; 12 El, 55 Brin
Aged 36,000 TS; 25,000 YS; 6 El, 75 Brin
For manifolds, aircraft components, transmission housings, tight castings
Self-aging sand casting Natural aging
Similar to Aluminum 40 E.

ALLCAST 470.
M-130, 0.4-1.0 Cu, 0.25-0.50 Mg, 7.0-8.0 Zn, 0.8 max Fe, 0.25 max Ti, bal Al
Sand Cast: 28,000 TS; 15,000 YS, 8 El, 55 Brin.
Aged 34,000 TS, 23,000 YS; 5 El; 75 Brin.
For housings, machinery parts, fittings, hardware, automobile parts Similar to Tenzalloy Ages at room temperature

ALLCAST 700
M-130, 2-3 Cu, 0.7 max Si, 0.9-1.5 Ni, 0.20 max Ti, 6.0-7.5 Sn, bal Al
T5 or T533 Temper 20,000 TS, 16,000 YS; 7 El, 55 Brin
For bearings, bushings. Heat treatable

ALLCAST 700A
M-130; 0.7-1.3 Cu, 5.5-7.0 Sn, 0.7 max Si, 0.2 max Ti, 0.7-1.3 Ni, bal Al.
T5 or T533 Temper: 20,000 TS, 8500 YS, 10 El; 55 Brin.
For bearings. Similar to Aluminum 750 Good imbeddability.

ALLCAST D400
M-130; 1.6-2.0 Si, 3.6-4.5 Mg, 0.5 max Fe, 0.6 max Mn, 0.25 max Ti, bal Al.
Sand Cast 20,000 TS; 13,000 YS; 2 El; 50 Brin.
Permanent Mold: 22,000 TS, 13,000 YS; 2 El; 50 Brin.
For cooking utensils, marine fittings.
Similar to Aluminum B214. Good corrosion resistance. Not heat treatable.

ALLCAST P400.
M-130; 3.6-4.5 Mg, 1.5-2.0 Zn, 0.5 max Si, 0.5 max Fe, 0.6 max Mn, 0.25 max Ti, bal Al.
Permanent Mold: 27,000 TS; 16,000 YS; 7 El; 60 Brin. Die Cast: 40,000 TS; 22,000 YS; 10 El; 65 Brin.
For food and dairy handling equipment, chemical and textile plant equipment, marine hardware.
Similar to Aluminum A214. Not heat treatable, corrosion resistant.

ALLCAST SC8.
M-130; 2.5-4.0 Cu, 5.0-6.5 Si, 0.15 max Mg, bal Al.
Permanent mold cast: 28,000-36,000 TS; 15,000-20,000 YS; 2-3 El; 70-85 Brin.
For permanent mold castings, light alloy parts.

ALLCAST SC8.
M-906, 2.5-3.5 Cu, 4.5-6.0 Si, bal Al.
Cast: 24,000 TS; 12,000 YS, 2 El; 60 Brin.
T6-Temper: 30,000 TS; 18,000 YS; 2.5 El; 75 Brin.
For light alloy castings, sand and permanent mold, hardenable.

ALLCAST Z50
M-130; 3.0-4.0 Cu, 2.5-3.5 Si, 0.1 max Mg, 2.0-3.0 Zn, 1.0 max Fe, 0.2 max Ti, bal Al.
Permanent Mold Cast: 27,000 TS; 16,000 YS; 3 El; 65 Brin.
T6 Temper: 40,000 TS, 26,000 YS; 4 El, 85 Brin.
For casings, housings, fittings, crankcases, axle housings.
Heat treatable, permanent mold, corrosion resistant.

ALLCAST Z51.
M-130, 3.0-4.0 Cu, 5.5-6.5 Si, 0.1 max Mg, 2-3 Zn, 1.0 max Fe, 0.2 max Ti, bal Al.
Cast: 39,000 TS, 22,000 YS, 5.5 El; 90 Brin.
T6: 45,000 TS, 28,000 YS; 4 El, 105 Brin
For permanent mold castings, casings, housings, fittings, oil pans Heat treatable

ALLEGHENY 12
M-1, 0.15 max C, 1.0 max Mn, 11.5-13.5 Cr, bal Fe.
Annealed: 60,000 TS, 30,000 YS, 20 El; 50 RA; 200 Brin.
Hardened: 200,000 TS; 181,000 YS, 2 El; 51 RA, 400 Brin.
For valves, pump shafts, screens; corrosion resistant; Type No 410.

ALLEGHENY 16-16-1.
M-1, C, 16 Cr, 16 Mn, 1 Ni, bal Fe.
For chemical plant equipment, stainless

ALLEGHENY 18-8C.
M-1; 0.08 C, 17-19 Cr, 9-12 Ni, Cb = 12xC, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 40 El, 50 RA; 180 Brin.
For exhaust manifolds, fire walls; stabilized stainless; Type 307

ALLEGHENY 18-8SM.
M-1, 0.12 max C, 16-18 Cr, 14 max Ni, 2-3 Mo, bal Fe.
Annealed 73,000-85,000 TS, 35,000-45,000 YS; 45-60 El; 45-60 RA.
For stainless parts, austenitic.

ALLEGHENY 19-9 DL.
M-1, 0.30 C, 1.0 Mn, 0.5 Si, 19.0 Cr, 9.0 Ni, 1.4 Mo, 1.3 W, 0.4 Cb + Ta, 0.3 Ti, bal Fe.
Heat treated: 148,200 TS; 118,000 YS; 19% El.
Stress-Relieved: 118,500 TS; 69,000 YS; 58% El.
At 1500°F: 32,500 TS; 29,500 YS, 53% El.
Uses: Gas turbine and turbo supercharger component parts as rotors, buckets, fasteners, tail cones.
Stainless. High temperature properties. Heat resistant to 1200°F. Not hardenable.

ALLEGHENY 19-9DX.
M-1; 0.30 C, 1.0 Mn, 0.5 Si, 19.0 Cr, 9.0 Ni, 1.6 Mo, 1.3 W, 0.6 Ti, bal Fe.
Heat Treated: 148,200 TS; 118,000 YS; 19% El.
Stress-Relieved: 118,500 TS; 69,000 YS; 58% El.
At 1500°F: 32,500 TS; 29,500 YS; 53% El.
Uses: Gas turbine and turbo supercharger parts as rotors, buckets, fasteners, tail cones.
Stainless. High temperature properties. Heat resistant to 1200°F. Not hardenable.

ALLEGHENY 19-10M
M-1; 0.16 max C, 18-20 Cr, 14 max Ni, 3-4 Mo, bal Fe.
Cast: 70,000-80,000 TS; 35,000-45,000 YS, 45-60 El; 45-60 RA.
For stainless steel castings, resists sulfuric, nitric and acetic acids.

ALLEGHENY 19-10SM.
M-1; 0.12 max C, 18-20 Cr, 14 max Ni, 3-4 Mo, bal Fe.
Cast: 70,000-80,000 TS, 40,000-60,000 YS; 45-60 El; 45-65 RA.
For stainless parts; stainless steel castings

ALLEGHENY 20-10.
M-1; C, 20 Cr, 10 Ni, bal Fe.
For applications requiring max resistance to corrosion coupled with faculty of fabrication, corrosion resistant, stainless.

ALLEGHENY 20-10S.
M-1; 0.08 max C, 19-21 Cr, 10-12 Ni, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 40 El, 50 RA; 200 Brin.
For chemical equipment; Stainless Type 308

ALLEGHENY 20-25S.
M-1; 0.11 max C, 19-21 Cr, 24-26 Ni, bal Fe
Cast: 60,000-75,000 TS; 40,000-55,000 YS, 40-60 El; 40-60 RA.
For castings, stainless steel castings.

ALLEGHENY 20-25SM.
M-1, 0.11 max C, 19-21 Cr, 24-26 Ni, 2-3 Mo, bal Fe.
Cast 60,000-75,000 TS; 50,000-70,000 YS, 40-60 El, 40-60 RA.
For castings; stainless steel castings.

ALLEGHENY 21.
M-1; C, 18-23 Cr, bal Fe.
For high temperature service.

ALLEGHENY 22.
M-1; 19-22 Cr, 9-12 Ni, 0.08-0.20 C, bal Fe.
Annealed: 80,000 TS; 50 El; 60 RA; 140 Brin.
For chemical engineering equipment, sulfite paper industry, stainless and corrosion resistant.

ALLEGHENY 22 SP.
M-1; 19-22 Cr, 9-12 Ni, 0.11 max C, bal Fe.
Annealed: 75,000 TS; 50 El; 60 RA, 135 Brin.
For chemical engineering equipment; stainless and corrosion resistant.

ALLEGHENY 25-12.
M-1; 0.20 max C, 1.25 max Mn, 22-24 Cr, 12-15 Ni, bal Fe.
Annealed: 75,000 TS, 30,000 YS; 40 El; 50 RA; 200 Brin
For furnace parts, boiler baffles, pump parts; austenitic, resists heat to 2000°F

ALLEGHENY 25-12S
M-1; 0.11 max C, 22-26 Cr, 12-14 Ni, bal Fe.
Cast: 75,000-90,000 TS; 40,000-55,000 YS; 30-50 El; 30-50 RA.
For stainless steel castings; resists sulfuric, nitric and acetic acids.

ALLEGHENY 25-20.
M-1; 24-26 Cr, 19-21 Ni, 0.25 max C, bal Fe.
Annealed: 85,000-75,000 TS; 30,000 YS; 50-40 El; 60-50 RA; 150-180 Brin.
For chemical engineering equipment, furnace parts; stainless and corrosion resistant.

ALLEGHENY 25-20S.
M-1; 0.18 max C, 24-26 Cr, 19-21 Ni, bal Fe.
Cast: 60,000-75,000 TS; 40,000-55,000 YS; 40-60 El; 40-60 RA.
For castings, stainless steel castings.

ALLEGHENY 28.
M-1; 0.35 max C, 23-27 Cr, 0.25 max N, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 20 El; 40 RA; 200 Brin.
For furnace parts, boiler baffles; resists oxidation up to 2150°F.

ALLEGHENY 28-4
M-1; 0.25 max C, 0.15 N, 25-30, Cr, 3-5 Ni, bal Fe
Cast: 70,000-90,000 TS; 35,000-50,000 YS, 10-25 El; 10-25 RA.
For stainless steel castings, resists nitric and acetic acids.

ALLEGHENY 29-9
M-1, 0.20 max C, 27-31 Cr, 8-10 Ni, bal Fe
Cast: 80,000-95,000 TS, 45,000-70,000 YS; 20-30 El; 20-35 RA.
For stainless steel castings, resists nitric and acetic acids

ALLEGHENY 29-9S.
M-1, 0.12 max C, 27-31 Cr, 8-10 Ni, bal Fe
Cast: 75,000-95,000 TS, 36,000-46,000 YS, 20-40 El; 20-45 RA
For castings; stainless steel castings.

ALLEGHENY NO 33
M-1, 0.12 max C, 0.5 max Mn, 0.5 max Si, 12-15 Cr, bal Fe
Annealed: 77,300 TS, 40,600 YS, 37 El, 78.7 RA, 153 Brin
Heat treated: 178,750-109,000 TS, 161,500-91,000 YS, 15-23 El, 51-70 RA; 364-228 Brin
At 1000°C: 70,000 TS, 56.5 El; 92.5 RA;
For automotive parts, interval engine and steam engine parts, tanks, fans, blowers; corrosion resistant.

ALLEGHENY 33 FM
M-1; 12-15 Cr, 0.12 max C, 0.4 max S, bal Fe.
Annealed: 73,000 TS, 35 El, 75 RA, 150 Brin.
For chemical engineering equipment, corrosion resistant, free machining

ALLEGHENY 33 NH NON-HARDENING.
M-1, 11.5-13.5 Cr, 0.5 max Ni, 0.08 max C, 0.1-0.25 Al, bal Fe
Annealed: 70,000 TS; 39,000 YS, 30 El; 68 RA, 143 Brin.
For chemical engineering equipment, corrosion resistant.

ALLEGHENY 33 TURBINE
M-1; 11.5-13 Cr, 0.12 max C, bal Fe
Heat treated: 100,000 TS, 25 El, 70 RA; 200 Brin
For turbine blades, chemical engineering equipment; corrosion resistant; Iz-60 min.

ALLEGHENY 33 W.
M-1; 12-15 Cr, 0.12 max C, 2.5-3.5 W, bal Fe.
Annealed: 87,000 TS; 64,000 YS; 29 El; 64 RA; 170 Brin.
For chemical engineering equipment, high temperature service; corrosion resistant.

ALLEGHENY 34.
M-1; 0.12 max C, 14-16 Cr, bal Fe.
Annealed: 78,000 TS; 42,000 YS; 30 El; 65 RA; 156 Brin.
For corrosion resistant parts; corrosion resistant.

ALLEGHENY NO. 44.
M-1; 0.20 max C, 1.25 max Mn, 0.5 max Si, 22-26 Cr, 11-13 Ni, bal Fe.
Hot rolled: 130,500 TS; 107,300 YS; 31 El; 59.8 RA; 262 Brin.
Annealed: 96,000 TS; 45,000 YS; 62 El; 69 RA, 143 Brin.
For furnace and pump parts, boiler baffles, carburizing boxes, recuperators; high heat resistance; easy to fabricate.

ALLEGHENY NO. 46.
M-1; 0.11-0.25 C, 4-6 Cr, bal Fe.
Annealed: 60,000 TS; 25,000 YS; 30 El; 70 RA; 120 Brin
Water quenched: 177,000 TS; 144,000 YS; 18 El; 60 RA; 300 Brin.
For heat and corrosion resistant parts, furnace, heat exchanger, condenser and preheater tubes and parts, pumps, valves, tie-rods; heat, oxidation and corrosion resistant; resists heat to 1200°F.

ALLEGHENY 46M
M-1; 0.25 max C, 4-6 Cr, 0.4-0.6 Mo, bal Fe.
Annealed: 62,000 TS; 25,000 YS; 25 El, 60 RA; 180 Brin.
For corrosion resistant parts, oil cracking stills; corrosion resistant

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ALLEGHENY 46 TUNGSTEN.
M-1, 0.35 max C, 5-7 Cr, W, bal Fe.
For corrosion resistant parts, corrosion resistant.

ALLEGHENY NO. 55.
M-1; 0.35 max C, 1.0 max Mn, 0.6 max Si, 23-30 Cr, 0.6 max Ni, bal Fe.
Annealed forgings 75,000-100,000 TS, 45,000-60,000 YS; 24-35 El; 45-65 RA, 160-200 Brin
Annealed castings 40,000-80,000 TS, 30,000 70,000 YS; 2-5 El; 2-6 RA, 170-190 Brin
For furnace parts, boiler baffles, furnace dampers, recuperators, heat resistant, corrosion resistant to acid mine waters

ALLEGHENY NO. 66
M-1, 0.12 max C, 16-18 Cr, bal Fe.
Annealed 85,000-70,000 TS, 55,000-40,000 YS, 20-35 El; 85-75 RA, 156 Brin
For hardware, steam engine parts, fans, blowers, condensers, evaporators, corrosion resistant to HNO_3

ALLEGHENY 66W
M-1, 15-18 Cr, 0.12 max C, 2.5-3.5 W, bal Fe
Annealed 80,000 TS, 50,000 YS; 26 El; 50 RA; 170 Brin
For chemical engineering equipment, high temperature service; corrosion resistant

ALLEGHENY 67.
M-1; 18-23 Cr, 0.35 max C, bal Fe
Annealed. 82,000 TS, 52,000 YS, 25 El, 55 RA; 163 Brin
For chemical engineering equipment, corrosion resistant

ALLEGHENY 88X
M-1, 0.2-0.3 C, 10-12.5 Mn, 7-8.5 Ni, bal Fe
For large electrical transformers, switchboard parts, non-magnetic, high electric resistivity.

ALLEGHENY 216
M-1; 0.08 max C, 19.75 Cr, 8.25 Mn, 6.0 Ni, 2.5 Mo, 0.37 N, bal Fe.
Annealed: 100,000 TS; 55,000 YS, 45 El; B 92 Rock.
At 1000°F: 75,400 TS; 36,300 YS; 43.3 El, 67.8 RA.
For marine engineering components, space hardware, woven wire cloth, bushings, bolts, shafting, springs, valve seats. Stainless, improved high temperature strength and endurance limit.
Good weldability.

ALLEGHENY 216L.
M-1; 0.03 max C, 19.75 Cr, 8.25 Mn, 6.0 Ni, 2.5 Mo, 0.37 N, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 45 El; B 92 Rock.
For marine engineering components, space hardware, woven wire cloth, bushings, bolts, shafting, springs.
Good weldability, high fatigue strength. Stainless and corrosion resistant.

ALLEGHENY 303 EZ.
M-1; 0.08 C, 18 Cr, 9 Ni, 0.30 S, bal Fe
Annealed: 80,000 TS, 35,000 YS; 45 El; 175 Brin.
Cold Drawn: 135,000-208,000 TS; 100,000-185,000 YS.
For screw machine products, fasteners, shafts.
Free machining, stainless, austenitic.
Machinability rating of 70%.

ALLEGHENY 416 EZ.
M-1, 0.15 max C, 1.25 max Mn, 0.06 max P, 0.15 min S, 1.0 max Si, 12.0-14.0 Cr, bal Fe.
Annealed: 73,000 TS; 42,000 YS; 35 El, 170 Brin.
Hardened: 135,000 TS; 108,000 YS; 20 El; 285 Brin.
For screw machine products, hardware, fasteners, shafts.
Free machining, hardenable, corrosion resistant.

ALLEGHENY 433.
M-1; 0.05 C, 16.7 Cr, 1 Mo, 0.95 Cu, 0.5 Mn, 0.3 Si, bal Fe.
Annealed. 80,000 TS, 55,000 YS; 28 El.
For kitchen utensils, automobile trim, hub caps, cowls; good formability and weldability, corrosion resistant.

ALLEGHENY 4750
M-1, 47 Ni, bal Fe.
For transformers; high permeability.

ALLEGHENY A-286.
M-1, M-1214, 0.08 max C, 1-2 Mn, 13.5-16.0 Cr, 24-28 Ni, 1.3 Mo, 2.0 Ti, 0.3 V, 0.2 Al, bal Fe.
Rolled 135,000-160,000 TS; 85,000-115,000 YS, 30-20 El; 55-30 RA.
For jet engine and supercharger parts, after-burners; age-hardenable, austenitic, heat resistant.

ALLEGHENY AF-71
M-1; 0.25 C, 18 Mn, 12.5 Cr, 3 Mo, 0.2 B, 0.2 N, bal Fe
Heat treated 159,000 TS, 90,000 YS, 42 El, 37 RA.
For aircraft gas turbines, missiles, airframes; austenitic, age-hardenable.

ALLEGHENY AF-183
M-1; 0.30 C, 18.0 Mn, 12.5 Cr, 3.0 Mo. 0.2 N, 0.8 V, bal Fe
Bar. 137,000 TS. 82,000 YS, 33 El, 23 RA.
At 1500°F: 34,000 TS, 29,000 YS; 34 El, 58 RA.
For high temperature structural parts, gas turbine components, afterburners, nozzles, jet engines.
Good heat resistance. Good strength to 1500°F. Austenitic

ALLEGHENY ALMAR 362
M-1, 0.03 C, 0.10 Mn, 0.08 Si, 15 Cr, 6 Ni, 0.75 Ti, bal Fe.
Annealed: 125,000 TS; 108,000 YS; 16 El; 68 RA; C 25 Rock.
Heat Treated. 188,000 TS; 182,000 YS; 13 El; 54 RA, C 41 Rock.

For jet engine and space craft components, shafts, gears.
Martensitic, age hardening. Corrosion resistant.

ALLEGHENY ALX.
M-1; Cr, bal Co.
For cutting tools; cast to shape.

ALLEGHENY AM 357.
M-1; 0.21-0.26 C, 0.50-1.25 Mn, 13.5-14 5 Cr, 4.0-5.0 Ni, 2.5-3.25 Mo, 0.07-0.13 N, bal Fe.
Sheet: 309,000 TS; 303,000 YS, 4 El
At 1000°F: 158,000 TS; 141,000 YS; 5.5 El.
For valves, pressure tanks, aircraft and jet engine components, missiles.
Semi-austenitic, precipitation hardenable stainless steel.

ALLEGHENY AM-363.
M-1, 0 05 max C, 0.30 max Mn, 0 15 max Si, 11.0-12.0 Cr, 4.0-5.0 Ni, 0.3-0.6 Ti, bal Fe.
Hot Rolled· 138,000 TS; 131,000 YS; 11 El.
Annealed: 124,000 TS; 105,000 YS, 8 El
Aged: 124,000 TS; 118,000 YS; 11.5 El.
For automobile mufflers, jet engine and gas turbine components.
Precipitation-hardenable.
Ferromagnetic, stainless, maraging.

ALLEGHENY AM-367.
M-1; 0 02 C, 14 25 Cr, 3.4 Ni, 15 4 Co, 2.0 Mo, 0.35 Ti, 0.03 Al, bal Fe.
Sheet, cold rolled 50%, annealed and maraged.
At 80°F· 245,700 TS; 242,300 YS; 3 El.
At 100°F· 261,900 TS, 261,000 YS, 3 El.
For aircraft and missile industries, missile and gas turbine components.
Maraging steel, stainless, martensitic

ALLEGHENY ARMATURE.
M-1, 0.5 Si, bal Fe.
For motors, good permeability

ALLEGHENY AUDI TRASFORMER "A."
M-1; 3 5 Si, bal Fe
For audio transformers; high permeabilitv.

ALLEGHENY AUDIO TRANSFORMER "B"
M-1, 3 5 Si, bal Fe
For audio transformers, high permeability.

ALLEGHENY AUDIO TRASFORMER "C"
M-1, 3 5 Si, bal Fe
For audio transformers, high permeability

ALLEGHENY D979
M-1, 0.05 C, 15 Cr, 15 Ni, 4 Mo, 4 W, 1 Al, 3 Ti, 30 Fe, bal Ni.
Rolled· 200,000 TS; 142,000 YS; 17 El, 34 RA.
For aircraft and auto engine components; heat resistant to 1600°F

ALLEGHENY DYNAMO.
M-1; 2.5 Si, bal Fe.
For electric machinery; high permeability.

ALLEGHENY DYNAMO SPECIAL.
M-1; 3 25 Si, bal Fe
For transformers.

ALLEGHENY ELECTRIC METAL
M-1, 47 Ni, bal Fe.
For transformers; high permeability

ALLEGHENY ELECTRICAL SHEET STEEL.
M-1; 1 0 Si, bal Fe.
For motors.

ALLEGHENY G-192.
M-1; 0.60 C, 22.0 Cr, 8.5 Mn, 0.35 N, 0.50 Si, bal Fe.
At R.T.: 148,000 TS; 85,000 YS; 55 El.
At 1200°F: 92,000 TS, 37,000 YS; 15 El.
For high temperature applications, heat treating equipment.
Heat and corrosion resistant.

ALLEGHENY HTB-2.
M-1; 0.80 C, 4 Cr, 4 25 Mo, 1 V, bal Fe.
At 70°F: 412,000 TS; 338,500 YS; 1.6 El; 1.7 RA; 640 Brin.
At 1000°F: 309,000 TS; 250,000 YS; 6.1 El; 11.7 RA.
For punches, hot shears, upsetters; hot work steel, oil hardened

ALLEGHENY HTB-3.
M-1; 0.57 C, 1 15 Si, 4 75 Cr, 5.25 Mo, 0 55 V, bal Fe.
At 70°F 425,000 TS, 365,000 YS, 2.2 El; 3.0 RA; 650 Brin.
At 1000°F 342,500 TS; 313,500 YS; 7.2 El, 7 0 RA.
For punches, hot shears, upsetters; hot work dies, oil hardened.

ALLEGHENY LUDLUM 21-12N.
M-1; 0 2 C, 21 Cr, 12 Ni, 0 2 N, bal Fe.
Water quenched: 226 Brinell, at 1400°F 145 Brinell.
For valves and valve seats, valve heads for high temperature applications
Heat and corrosion resistant

ALLEGHENY-LUDLUM 88
M-1; 6 5-14 0 Ni, 5 0-12 0 Mn, bal Fe
For electrical apparatus, non-magnetic

ALLEGHENY LUDLUM 129
M-1; 0 70 C, 0.3 Mn, 1 0 Si, 12 Cr, 5 25 Mo, bal Fe
Ht Tr 322,000 TS, 265,000 YS, 4 El, C 58 Rock
For tools and bearings for high temperature applications
Stainless, wear resistant, hardenable
High oxidation resistant

ALLEGHENY LUDLUM 418.
M-1, 0 20 C, 1 Mn, 0 5 Si, 12.5 Cr, 3 W, bal Fe
For high temperature applications, heat resistant

ALLEGHENY LUDLUM 419.
M-1; 0 25 C, 1 Mn, 0 3 Si, 11 5 Cr, 0.5 Ni, 0 5 Mo, 2 5 W, 0 4 V, bal Fe
Heat treated. 204,000-272,000 TS, 134,000 206,000 YS, 5-33.5 El, 16-40 RA, 480-510 Brin
For high temperature applications, heat resistant, heat treatable

ALLEGHENY LUDLUM 901
M-1, 0 05 C, 1 5 Mn, 0 4 Si, 13.0 Cr, 43 0 Ni, 6 0 Mo, 2.8 Ti, 0 2 Al, 0 015 B, bal Fe
Bar 176,000 TS, 128,000 YS, 15 El.
At 1200°F 145,000 TS, 115,000 YS, 21 El
For high temperature applications, gas turbine and jet engine components
High strength, good creep and stress-rupture properties. Heat resistant.

ALLEGHENY LUDLUM 1251
M-1; 0.05 C, 1 5 Mn, 13 Cr, 6 Mo, 2.5 Ti, 0 2 Al, 0 01 B, 35 Fe, 43 Ni
At 70°F 165,000 TS, 110,000 YS, 14 El.
At 1200°F 135,000 TS, 100,000 YS, 20 El.
For high temperature applications; heat and oxidation resistant.

ALLEGHENY LUDLUM-LMW.
M-1, 0 8 C, 3.25-4.25 Cr, 1.25-2.0 W, 0.75-1.5 V, 7.5-9.5 Mo, bal Fe.
For reamers, drills, lathe tools, broaches, hobs, form tools.
Type M1 high speed steel. Good red-hardness.

ALLEGHENY LUDLUM-LXX.
M-1; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
Ht. Tr.: 512-715 Brin, 454,000 bend strength, 60 torsion impact.
For tools, dies, cutters, reamers, twist drills, broaches.
Type T 1 high-speed steel, high red-hardness.

ALLEGHENY-LUDLUM ML.
M-1; 0.8 C, 18 W, 4 Cr, 2 V, 0.75 Mo, bal Fe.
Hardened. C 64-66 Rock
For lathe tools, reamers, hobs, broaches, milling cutters.
Type T2 High speed tool steel.

ALLEGHENY LUDLUM-VLM.
M-1; 0.85 C, 8 Mo, 4 Cr, 2 V, bal Fe
Hardened: C 63-66 Rock.
For tools, cutters, reamers, twist drills, milling cutters.
Type M-10 high-speed steel.

ALLEGHENY M-17.
M-1; 0.65 C, 0.25 Mn, 0.40 Si, 17 Cr, bal Fe.
Annealed: 95,000 TS; 55,000 YS; 20 El; 40 RA; 240 Brin.
Hardened: 275,000 TS, 240,000 YS; 2 El; 550 Brin.
For cutlery, stainless.

ALLEGHENY M-252.
M-1; 0.15 C, 19.0 Cr, 55.0 Ni, 10.0 Co, 10.0 Mo, 2.5 Ti, 1.0 Al, 0.005 B, 2.0 Fe
Heat Treated: 178,000 TS, 128,000 YS; 21 El.
At 1500°F: 92,000 TS; 83,000 YS; 19 El.
For high temperature service
For jet engine turbine blades, fasteners, missile and space vehicle components.
Precipitation hardening Oxidation resistant.

ALLEGHENY METAL.
M-1; 0.20 C, 0.50 max Mn, 17-20 Cr, 7-10 Ni, bal Fe
Unannealed. 120,000 TS; 86,000 YS; 36 El; 52 RA; 253 Brin.
Annealed: 90,000 TS; 45,000 YS; 61 El; 75 RA; 135 Brin
At 500°C: 72,730 TS; 20,880 YS, 47 El; 69.5 RA.
At 900°C: 24,560 TS, 13,580 YS, 36 El; 57 RA.
For hardware, fittings, bumpers, automobile radiator shells, dairy and hospital equipment; corrosion resistant, austenitic

ALLEGHENY METAL 12 CAST.
M-1, 0.17 max C, 1.5 max Mn, 11.5-13.5 Cr, 0.75-1.25 Ni, bal Fe
For glass molds, paper and pulp industry equipment; corrosion resistant.

ALLEGHENY METAL L-12.
M-1, 0.15 min C, 12-14 Cr, 0.5 max Ni, bal Fe.
Annealed: 90,000 TS; 50,000 YS; 15 El, 40 RA; 240 Brin
For cutlery, Stainless Type 420; hardenable.

ALLEGHENY METAL 12-2.
M-1; 0.15 max C, 11.5-13.5 Cr, 1.2-2.5 Ni, 1 max Mn, 1 max Si, bal Fe.
Annealed: 100,000 TS; 65,000 YS; 25 El; 50 RA; 250 Brin.
Heat treated: 220,000 TS, 175,000 YS; 2 El; 440 Brin.
For valve parts, tie rods, pumps; AISI Type 414; corrosion resistant.

ALLEGHENY METAL 12 EZ.
M-1; 0.15 max C, 12-14 Cr, 0.07 min S, P, Se, 0.6 max Zr, Mo, bal Fe.
Annealed: 85,000 TS; 50,000 YS; 15 El; 40 RA; 180 Brin.
Hardened: 145,000 TS; 120,000 YS; 15 El; 65 RA; 280 Brin.
For screw machine products; corrosion resistant; Type 416.

ALLEGHENY METAL 12-NH.
M-1; 0.8 max C, 1.0 max Mn, 11.5-13.5 Cr, 0.10-0.30 Al, bal Fe.
Annealed: 60,000 TS; 32,000 YS; 20 El; 50 RA; 180 Brin.
For annealing boxes, quenching racks; corrosion resistant; Type 405.

ALLEGHENY METAL 12 PLURAMELT.
M-1; 0.15 max C, 1 max Mn, 11.5-13.5 Cr, bal Fe.
For petroleum refining equipment; corrosion resistant.

ALLEGHENY METAL 12-TB.
M-1, 0.15 max C, 1.0 Mn, 11.5-13 Cr, bal Fe.
Annealed: 60,000 TS; 200 Brin.
For turbine blades, buckets; corrosion resistant; Type 403.

ALLEGHENY METAL 12-W.
M-1; 0.15 max C, 2.5-3.5 W, 12-14 Cr, bal Fe.
Annealed: 75,000 TS, 40,000 YS; 20 El; 50 RA; 212 Brin.
Hardened: 200,000 TS; 180,000 YS; 10 El; 400 Brin
For oil refinery and chemical equipment; corrosion resistant, Type 418

ALLEGHENY METAL 15-35.
M-1; 14-16 Cr, 33-36 Ni, 0.25 max C, bal Fe.
Casting: 50,000-75,000 TS; 40,000-56,000 YS; 40-60 El; 40-60 RA.
For castings, stainless.

ALLEGHENY METAL 16-1.
M-1; 0.2 max C, 15-17 Cr, 1.2-2.5 Ni, 1 max Mn, 1 max Si, bal Fe.
Annealed: 105,000 TS, 90,000 YS; 20 El; 60 RA; 270 Brin
Heat treated: 220,000 TS, 185,000 YS; 10 El; 240 Brin.
For tie rods, pumps, valve parts; corrosion resistant.

ALLEGHENY METAL 17.
M-1; 0.12 max C, 1.0 max Mn, 1-18 Cr, bal Fe.
Annealed: 60,000 TS; 35,000 YS; 20 El; 40 RA; 200 Brin
Hardened: 150,000 TS; 110,000 YS; 3 El; 300 Brin.
For automotive trim, cold headed parts; corrosion and heat resistant; Type 340

ALLEGHENY METAL 17-7.
M-1; 0.08-0.2 C, 16-18 Cr, 6-8 Ni, 2 max Mn, 1 max Si, bal Fe
Annealed: 100,000 TS; 35,000 YS; 50 El; 60 RA; 180 Brin.
For household utensils, trim; stainless.

ALLEGHENY METAL 17EZ.
M-1, 0.12 max C, 14-18 Cr, 0.5 max Ni, 1.25 max Mn, P, S or Se, 0.07 min or 0.6 max Mo, bal Fe.
Annealed: 60,000 TS; 35,000 YS; 15 El; 40 RA.
Heat treated: 150,000 TS; 110,000 YS; 3 El; 300 Brin.
For screw machine products, cold headed parts; AISI Type 430F; free cutting.

ALLEGHENY METAL 17 PLURAMELT.
M-1; 0.12 max C, 1.0 max Mn, 14-18 Cr, bal Fe.
For tanks and parts in nitric acid industries; corrosion resistant.

ALLEGHENY METAL 18-8.
M-1; 0.08-0.20 C, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 50 El; 60 RA; 180 Brin.
For deep drawn parts; Stainless Type 302.

ALLEGHENY METAL 18-8 CAST.
M-1; 0.09-0.16 C, 18-20 Cr, 8-10 Ni, 1.5 max Mn, bal Fe.
Annealed: 73,500 TS; 154 Brin.
For pump and valve parts, chemical plant equipment; stainless, austenitic; Type 302.

ALLEGHENY METAL 18-8C CAST.
M-1; 0.10 max C, 1.5 max Mn, 17.5-20.0 Cr, 9-12 Ni, Cb = 8 × C, bal Fe.
Annealed: 73,500 TS; 145 Brin.
For pump and valve liners, chemical plant equipment; stainless welded structures; Type 347

ALLEGHENY METAL 18-8 C PLURAMET.
M-1; 0.08 max C, 17-19 Cr, 9-12 Ni, 2 max Mn, Cb = 10 × C, bal Fe.
For chemical industry equipment; austenitic, stainless.

ALLEGHENY METAL 18-8EZ.
M-1; O.15 max C, 17-19 Cr, 10-12 Ni, 0.07 min P, S, or Se, 0.6 max Zr or Mo, bal Fe.
Annealed: 80,000 TS; 3,000 YS; 40 El; 50 RA; 160 Brin.
For screw machine parts, bolts, screws, nuts, Stainless Type 303.

ALLEGHENY METAL 18-8FS
M-1; 0.12 max C, 17-19 Cr, 10-13 Ni, 2 max Mn, 1 max Si, bal Fe.
Annealed: 75,000 TS, 25,000 YS; 50 El, 60 RA; 180 Brin
For stainless structures; stainless

ALLEGHENY METAL 18-8M.
M-1; 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 75,000 TS, 30,000 YS; 40 El; 50 RA, 200 Brin.
For chemical equipment. Stainless Type 316

ALLEGHENY METAL 18-8MC.
M-1, 0.08 max C, 17-19 Cr, 10-14 Ni, 1.75-2.5 Mo, 0.5-0.7 Cb, bal Fe.
Annealed: 75,000 TS; 30,000 YS; 40 El, 50 RA; 200 Brin
For chemical equipment; resists pitting and intergranular attack.

ALLEGHENY METAL 18-8M CAST
M-1, 0.12 max C, 17.5-19.5 Cr, 8-12 Ni, 2-3 Mo, bal Fe.
Annealed: 83,000 TS; 161 Brin
For chemical plant equipment, mixers, agitators; acid resistant; Type 316, austenitic.

ALLEGHENY METAL 18-8M SPECIAL
M-1, 0.10 max C, 18-20 Cr, 11-14 Ni, 3-4 Mo, 2 max Mn, 1 max Si, bal Fe.
Annealed. 75,000 TS, 30,000 YS, 40 El; 50 RA, 200 Brin.
For pharmaceuticals production; stainless.

ALLEGHENY METAL 18-8 PLURAMELT
M-1; 0.08-0.20 C, 17-19 Cr, 8-10 Ni, 2 max Mn, bal Fe.
For cooking utensils; austenitic, stainless.

ALLEGHENY METAL 18-8S.
M-1; 0.08 max C, 18-20 Cr, 8-10 Ni, bal Fe
Casting: 70,000-85,000 TS, 35,000-46,000 YS, 50-75 El; 45-65 RA; 180 Brin.
For castings, stainless parts, stainless, resists acids

ALLEGHENY METAL 18-8S CAST.
M-1, 0.08 max C, 18-21 Cr, 8-10 Ni, 1.5 max Mn, bal Fe.
Annealed. 79,000 TS, 130 Brin.
For pump and valve parts, chemical plant equipment, stainless, austenitic; Type 304.

ALLEGHENY METAL 18-8 S PLURAMELT.
M-1; 0.08 max C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe.
For pans, trays, tanks, for chemical industry; austenitic, stainless.

ALLEGHENY METAL 18-8T.
M-1; 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, 2 max Mn, bal Fe.
Annealed: 75,000 TS; 30,000 YS; 40 El; 50 RA; 200 Brin.
For exhaust manifolds, fire walls, pressure vessels; stainless.

ALLEGHENY METAL 18-11C.
M-1; 0.08 C, 17-18.5 Cr, 10 min Ni, Cb = 8 × C, bal Fe
Cast: 75,000-90,000 TS; 35-50 El; 40-50 RA.
For castings, stainless parts, stainless steel castings.

ALLEGHENY METAL 25-2
M-1, 0.3 max C, 25-30 Cr, 2-5 Ni, 2 max Mn, 0.05-0.15 N_2, bal Fe
For furnace parts, chemical industry; corrosion resistant.

ALLEGHENY METAL 25-2 CAST.
M-1; 0.30 max C, 2 max Mn, 0.05-0.15 N_2, 25-30 Cr, 2-5 Ni, bal Fe
For furnace parts, chemical plant and pulp equipment; corrosion resistant

ALLEGHENY METAL 25-12C.
M-1, 0.2 max C, 22-24 Cr, 12-15 Ni, 2 max Mn, Cb = 10 × C, bal Fe
Annealed. 75,000 TS, 30,000 YS, 40 El, 50 RA; 200 Brin
For stainless parts, resists intergranular corrosion

ALLEGHENY METAL 25-12 CAST.
M-1, 0.2-0.3 C, 2 max Mn, 23-25 Cr, 12-14 Ni, bal Fe
Annealed 80,000 TS, 163 Brin
For furnace parts, chemical plant equipment, corrosion and heat resistant, austenitic.

ALLEGHENY METAL 25-20 C
M-1, 0.15 max C, 23-26 Cr, 17-21 Ni, 1.5 max Mn, bal Fe
Cast. 80,000 TS, 163 Brin
For castings, chemical industry, corrosion resistant

ALLEGHENY METAL 25-20C CAST
M-1, 0.15 max C, 1.5 max Mn, 23-26 Cr, 17-21 Ni, bal Fe
Annealed 80,000 TS, 163 Brin
For furnace parts, chemical plant equipment; corrosion and heat resistant, austenitic

ALLEGHENY METAL 25-20 H
M-1, 0.25 max C, 23-26 Cr, 17-21 Ni, 1.5 max Mn, bal Fe
Cast: 80,000 TS, 163 Brin
For castings, chemical industry, furnace parts, corrosion resistant

ALLEGHENY METAL 25-20H CAST.
M-1; 0.25 max C, 1.5 max Mn, 23-26 Cr, 17-21 Ni, bal Fe
Annealed 80,000 TS, 163 Brin.
For furnace parts, chemical plant equipment; corrosion and heat resistant, austenitic

ALLEGHENY METAL 25-20 + Si.
M-1; 0.25 max C, 23-26 Cr, 19-22 Ni, 1.5-3 Si, 2 max Mn, bal Fe
Annealed: 75,000 TS, 30,000 YS, 40 El, 50 RA, 180 Brin.
For stainless and heat resistant parts; stainless, heat resistant.

ALLEGHENY METAL 28 PLURAMELT.
M-1; 0.35 max C, 1.5 max Mn, 0.25 max N_2, 23-27 Cr, bal Fe.
For furnace linings and parts; corrosion and heat resistant.

ALLEGHENY METAL 42.
M-1; 42 Ni, bal Fe.
Cold drawn: 70,000 TS; 50,000 YS; 28 El; 116 Brin.
For glass-to-metal seals; controlled expansion.

ALLEGHENY METAL 46SM.
M-1; 0.1 max C, 4-6 Cr, 0.5 max Ni, 1 max Mn, 0.4-0.6 Mo, bal Fe.
Annealed: 60,000 TS; 25,000 YS; 25 El; 60 RA; 180 Brin.
Heat treated: 150,000 TS; 110,000 YS; 15 El.
For oil refinery and chemical equipment; AISI Type 502 + Mo, corrosion resistant.

ALLEGHENY METAL 350
M-1; 0.10 max C, 16.5-17.5 Cr, 4.0-4.5 Ni, 2.5-3.0 Mo, bal Fe.
Heat treated: 161,000-200,000 TS; 45,000-142,000 YS; 22-8 El, 200-390 Brin.
For valves, springs, knife blades; for applications up to 1000°F

ALLEGHENY METAL 355
M-1, 0.13 C, 15.5 Cr, 4.35 Ni, 2.75 Mo, 1 N, bal Fe
SCT heat treatment: 190,000 TS, 165,000 YS, 10 El, 20 RA
For jet engine and missile components; high heat resistance.

ALLEGHENY METAL "A"
M-1, 17-19 Cr, 7-9 Ni, 0.11 max C, bal Fe
Annealed: 75,000 TS, 50 El, 60 RA; 130 Brin
For chemical engineering equipment; stainless, austenitic

ALLEGHENY METAL "A-Mo"
M-1, 17-19 Cr, 7-9 Ni, 2-4 Mo, 0.11 max C, bal Fe.
Annealed: 85,000 TS, 50 El; 60 RA, 145 Brin.
For chemical engineering equipment, stainless

ALLEGHENY METAL "A-Ti."
M-1, 17-19 Cr, 7-9 Ni, 0.2 max C, 1.0 Ti, bal Fe.
Annealed: 75,000 TS, 50 El, 60 RA, 130 Brin
For chemical engineering equipment, high temperature service, stainless, austenitic, range 800-1500°F

ALLEGHENY METAL "B."
M-1, 18-20 Cr, 8-10 Ni, 0.08-0.20 C, bal Fe.
Annealed: 80,000 TS, 50 El, 60 RA, 135 Brin
For chemical engineering equipment, stainless, austenitic

ALLEGHENY METAL B (SP)
M-1, 0.11 max C, 18-20 Cr, 8-10 Ni, bal Fe
Annealed. 75,000 TS, 50 El, 60 RA; 130 Brin.
For general engineering purposes, welding grade.

ALLEGHENY METAL "B-Ti"
M-1; 18-20 Cr, 8-10 Ni, 0.2 max C, 1.0 Ti, bal Fe
Annealed: 75,000 TS; 50 El, 60 RA; 130 Brin
For chemical engineering equipment, high temperature service, stainless, austenitic.

ALLEGHENY METAL "C"
M-1, 17-19 Cr, 7-9 Ni, 0.08-0.20 C, bal Fe
Annealed: 80,000 TS; 50 El; 60 RA; 135 Brin.
For chemical engineering equipment; stainless.

ALLEGHENY METALCLAD STEEL.
M-1, 20% of 18-8 stainless steel rolled out 80% of plain C steel.
For sheet or plate to resist corrosion; stainless.

ALLEGHENY METAL FM FREE MACHINING.
M-1; 17-19 Cr, 7-9 Ni, 0.08-0.20 C, 0.30 S, bal Fe.
Annealed: 75,000 TS; 25,000 YS; 50 El; 60 RA; 130 Brin.
For chemical engineering equipment; corrosion resistant; free machining.

ALLEGHENY METAL H-17.
M-1; 0.95-1.2 C, 16-18 Cr, bal Fe.
Annealed: 100,000 TS; 60,000 YS; 8 El, 35 RA; 240 Brin.
For nozzles, valves, valve seats; stainless; Type 440; hardenable.

ALLEGHENY METAL S-590.
M-1, 0.38-0.47 C, 1.0-2.0 Mn, 19-21 Cr, 19-21 Ni, 19-21 Co, 3.5-4.5 Mo, 3.5-4.5 W, 3.5-4.5 Cb, bal Fe.
Rolled: 152,000 TS; 80,000 YS, 19 El; 25 RA, 260 Brin
Aged: 140,000 TS, 42,000 YS; 20 El; 19 RA, 300 Brin
For turbine blades and wheels, super-charger and jet engine components.
Heat resistance to 1100-1400°F. Corrosion resistant

ALLEGHENY METAL S-816.
M-1, 0.4 C, 1.2 Mn, 20.0 Cr, 20.0 Ni, 43.0 Co, 4.0 W, 3.0 Fe, 4.0 Cb
Heat Treated: 140,000 TS; 67,000 YS; 31 El; 31 RA; 269 352 Brin.
For turbine blades, rotors, high temperature hardware, jet propulsion engine parts
High heat and corrosion resistant
For high temperature service to 1520°F.

ALLEGHENY METAL (TYPE 345).
M-1, 0.15 max C, 17-19 Cr, 8-12 Ni, (Cb 6 to 10 times the C), bal Fe
Annealed: 75,000 TS, 50 El; 60 RA, 130 Brin.
For corrosion resistant parts; immune to intergranular corrosion.

ALLEGHENY METAL (TYPE 346).
M-1, 0.15 max C, 19-20 Cr, 8-12 Ni, (Cb 6 to 10 times the C), bal Fe.
Annealed: 75,000 TS, 50 El, 60 RA, 130 Brin.
For corrosion resistant parts, immune to intergranular corrosion

ALLEGHENY METAL (TYPE 347)
M-1; 0.15 max C, 17-19 Cr, 8-12 Ni, (Cb over 10 times the C), bal Fe
Annealed: 75,000 TS, 50 El, 60 RA, 130 Brin.
For corrosion resistant parts, immune to intergranular corrosion

ALLEGHENY METAL TYPE 348)
M-1, 0.15 max C, 19-20 Cr, 8-12 Ni, (Cb over 10 times the C), bal Fe.
Annealed: 75,000 TS, 50 El, 60 RA, 130 Brin.
For corrosion resistant parts; immune to intergranular corrosion.

ALLEGHENY MF-1.
M-1, 0.045 max C, 11 Cr, 0.5 Ti, bal Fe.
Sheet: 65,000 TS, 35,000 YS, 30 El; B 80 Rock.
For automobile mufflers, cargo containers, drainage culverts, transformer cases.
Corrosion resistant. Good weldability.

ALLEGHENY MOLY IRON.
M-1; 0.02 C, 3 Mo, bal Fe
Annealed: 50,000 TS; 25,000 YS; 38 El; 62 RA; 107 Brin.
Rolled: 60,000 TS; 45,000 YS; 29 El; 55 RA; 185 Brin.
For D. C. relays, core material; low hysteresis loss.

ALLEGHENY N-155.
M-1; 0.15 C, 1.5 Mn, 21.0 Cr, 20.0 Ni, 20.0 Co, 3.0 Mo, 2.5 W, 1.0 Cb, 30.0 Fe.
At 70°F: 119,000 TS; 58,000 YS; 40 El; 48 RA.
At 1200°F: 80,000 TS; 43,000 YS; 32 El; 43 RA.
For high temperature service. Tail pipe and afterburner assemblies, combustion chambers, fasteners, turbine wheels and blades.
Austenitic, for service up to 1500°F.

ALLEGHENY R41.
M-1; 0.10 C, 19.0 Cr, 53.0 Ni, 11.0 Co, 10.0 Mo, 3.2 Ti, 1.6 Al, 0.005 B, 2.0 Fe.
Heat Treated: 206,000 TS; 154,000 YS; 14 El.
At 1600°F: 90,000 TS; 80,000 YS; 19 El.
For afterburners, turbine casings, combustion liners, high speed airframe components.
Precipitation hardening. Heat resistant.

ALLEGHENY RADIO TRANSFORMER.
M-1; 3.8 Si, bal Fe.
For electrical equipment, chokes, transformers; low induction.

ALLEGHENY S-816 + B.
M-1; 0.32-0.42 C, B, 19-21 Cr, 19-21 Ni, 3.5-5.0 W, 3.5-4.5 Mo, 3.0-4.5 Cb + Ta, 0.6-1.8 Mn, 5.0 max Fe, bal Co.
Heat treated: 140,000 TS; 67,000 YS; 31 El; 31 RA; 269-352 Brin.
For high temperature applications; age-hardenable, heat and corrosion resistant.

ALLEGHENY SUPER DYNAMO.
M-1; 2.5 Si, bal Fe.
For electrical equipment, transformers; low energy losses.

ALLEGHENY TRANSFORMER A.
M-1; 4-5 Si, bal Fe.
For electrical equipment, transformers; low energy losses.

ALLEGHENY TRANSFORMER AA.
M-1; 4-5 Si, bal Fe.
For power transformers; lowest energy losses.

ALLEGHENY TRANSFORMER B.
M-1; 4-5 Si, bal Fe.
For electrical equipment, transformers; low energy losses.

ALLEGHENY TRANSFORMER C.
M-1; 4-5 Si, bal Fe.
For electrical equipment; low energy losses.

ALLEGHENY TRC.
M-1; 0.10 max C, 15 Cr, 16 Mn, 1 max Ni, 0.15 N_2, bal Fe.
Annealed: 80,000-120,000 TS; 40,000 min YS; 50 min El; Rockwell B95.
For railroad cars and trailer truck bodies; stainless, austenitic, good formability.

ALLEGHENY Type 201.
M-1; 0.15 max C, 5.5-7.5 Mn, 16-18 Cr, 3.5-5.5 Ni, 0.25 max N_2, bal Fe.
Annealed: 115,000 TS; 50,000 YS; 50 El; B 91 Rock.
½ Hard: 159,000 TS; 125,000 YS; 20 El; C 36 Rock.
Hard: 191,600 TS; 148,500 YS; 9 El; C 44 Rock.
For railway cars, trailers, siding and roofing, auto wheel covers, kitchen utensils, tubular furniture.
Austenitic, stainless, non-magnetic.

ALLEGHENY Type 203 EZ.
M-1; 0.06 C, 17 Cr, 6 Ni, 6 Mn, 2 Cu, 0.30 S, bal Fe.
Bar Annealed: 84,000 TS; 40,000 YS; 58 El, 183 Brin.
Bar Cold Drawn: 135,000-208,000 TS.
For screw machine products, fasteners, hardware, shafts.
Austenitic, stainless, free-cutting.
Machinability rating 85%.

ALLEGHENY TYPE 418 SPECIAL.
M-1; 0.15-0.20 C, 12-14 Cr, 1.8-2.2 Ni, 0.5 max Mo, 2.5-3.5 W, bal Fe.
At 70°F: 140,000 TS; 118,000 YS; 20 El; 58 RA.
At 1200°F: 53,000 TS, 30 El; 87 RA.
For jet engine and high presure steam valves; corrosion and heat resistant.

ALLEGHENY V-36.
M-1; 0.25 C, 25 Cr, 20 Ni, 2 W, 4 Mo, 44 Co, 2 Cb, bal Fe.
For high temperature applications; oxidation and corrosion resistant.

ALLEN "B" METAL.
M-210; 0.22-0.27 C, 0.20-0.35 Si, 0.60-0.80 Mn, bal Fe.
For machinery parts, gears; castings

ALLEN CAST IRON SODER
M-242.
For soldering cast iron.

ALLEN C. Cu.
M-210, 0.30-0.35 C, 0.20-0.35 Si, 0.60-0.80 Mn, 0.80-1.1 Cu, bal Fe
For machinery parts, castings.

ALLEN Cr. Mo. 329.
M-210, 0.20-0.35 C, 0.20-0.35 Si, 0.40-0.60 Mn, 3.0-3.25 Cr, 0.45-0.55 Mo, bal Fe
For oil refinery equipment; castings

ALLEN Cr Mo./F Mo.
M-210, 0.50-0.55 C, 0.20-0.35 Si, 0.50-0.80 Mn, 0.7-0.9 Cr, 0.25-0.35 Mo, bal Fe.
For gears, shafts, axles, bolts, crankshafts; castings

ALLEN Cr. Mo "P."
M-210, 0.43-0.48 C, 0.20-0.35 Si, 0.50-0.80 Mn, 0.7-0.9 Cr, 0.25-0.35 Mo, bal Fe.
For gears, shafts, crankshafts, bolts, housings, castings.

ALLEN "C" STEEL
M-210; 0.30-0.35 C, 0.20-0.35 Si, 0.60-0.80 Mn, bal Fe.
For gears, pinions, machinery parts; castings.

ALLEN "D" STEEL
M-210; 0.40-0.50 C, 0.20-0.35 Si, 0.70-1.0 Mn, bal Fe
For gears, machinery parts, housings; castings.

ALLEN HI LUSTER.
M-242
For solder for stainless steel; bright finish.

ALLENITE A.S
M-210, WC.
For cutting tools; sintered carbide.

ALLENITE C.H.
M-210; WC.
For cutting tools for chilled iron rolls; sintered carbide.

ALLENITE D.N.
M-210, WC.
For drawing dies, wood working tools; sintered carbide.

ALLENITE E.S.
M-210; WC.
For cutting tools for finish machining; sintered carbide.

ALLENITE L.C.G.
M-210; WC.
For percussion drilling tools; sintered carbide.

ALLENITE N.
M-210; WC.
For cutting tools for cast iron; sintered carbide.

ALLENITE T.N.
M-210; WC.
For cutting tools for intermittent cuts; sintered carbide.

ALLENITE T.S
M-210; WC.
For cutting tools for rough machining; sintered carbide.

ALLEN MAGNESIUM SODER.
M-242.
For solder for magnesium.

ALLEN MT. Mo "P."
M-210, 0.18-0.25 C, 0.20-0.35 Si, 1.2-1.6 Mn, 0.2-0.3 Mo, bal Fe
For machinery parts, gears, camshafts; castings.

ALLEN MT. Mo "R."
M-210, 0.25-0.33 C, 0.20-0.35 Si, 1.2-1.6 Mn, 0.20-0.30 Mo, bal Fe.
For gears, shafts, crankshafts, castings

ALLEN MT. "P."
M-210, 0.22-0.27 C, 0.20-0.35 Si, 1.2-1.6 Mn, bal Fe.
For machinery parts, gears, camshafts, castings.

ALLEN MT. "R."
M-210, 0.25-0.33 C, 0.20-0.35 Si, 1.2-1.6 Mn, bal Fe
For machinery parts, camshafts, gears, castings.

ALLENOY
M-668, 0.35-0.40 C, 0.9 Mn, 0.2-0.3 Mo, bal Fe
Hardened 170,000 TS, 150,000 YS, 12 El, 35 RA, 400 Brin
For set and cap screws, water hardening

ALLENOY 1038
M-668, 0.35-0.42 C, 0.6-0.9 Mn, bal Fe
Heat treated 145,000-165,000 TS, 115,000-135,000 YS, 11 El, 35 RA, 350-40 Brin
For pipe plugs, similar to AISI 1038.

ALLENOY 4137
M-668, 0.35-0.40 C, 0.70-0.90 Mn, 0.80-1.1 Cr, 0.15-0.25 Mo, bal Fe
Heat treated 170,000-225,000 TS; 150,000-180,000 YS, 12-8 El, 35-25 RA, 400-500 Brin
For nuts, cap screws, set screws, similar to AISI 4137

ALLENOY 8650
M-668; 0.48-0.53 C, 0.75-1.0 Mn, 0.40-0.70 Ni, 0.40-0.60 Cr, 0.15-0.25 Mo, bal Fe.
For wrenches, similar to AISI 8650

ALLEN PRESTO SODER
M-242, Sn, Pb, Ag.
For solder.

ALLENS IMPERIAL SPECIAL
U.S.; 0.68 C, 0.29 Mn, 1.64 Cr, 19.1 W, 1.37 V, bal Fe.
For tools, cutters, dies, punches, high speed steel.

ALLENS OIL HARD.
U.S.; 0.80 C, 1.64 Mn, bal Fe.
For tools, dies, non-deforming.

ALLEN "T" STEEL.
M-210; 0.14-0.16 C, 0.20-0.35 Si, 0.40-0.50 Mn, bal Fe.
For gears, shafts, housings; castings.

ALLIAGE-30.
M-897; 2 Ni, bal Cu.
For heating elements; useful operating temperature to 300°C.

ALLIAGE-60.
M-897; 5-7 Ni, bal Cu.
For heating elements; useful operating temperature to 300°C.

ALLIAGE-90.
M-897; 11-13 Ni, bal Cu.
For heating elements; useful operating temperature to 400°C.

ALLIAGE-180.
M-897, 21-23 Ni, bal Cu.
For heating elements, useful operating temperature to 950°F.

ALLIS-CHALMERS X-1
M-642, C, alloy, bal Fe.
600 Brin.
For hard facing electrodes; for abrasion and mild impact.

ALLIS-CHALMERS X-2
M-642, C, Cr, Mo, bal Fe.
For hard surfacing arc-welding electrodes; resists abrasion, erosion and mild impact.

ALLIS-CHALMERS X-3.
M-642, C, Cr, Mo, bal Fe.
For hard surfacing arc-welding electrodes; resists severe abrasion, erosion and impact.

ALLISITE
M-642, 3 C, bal Fe
For machinery castings, high strength cast iron.

ALLITE.
M-1227, Zn alloy.
For forming and stamping dies.

ALLOY 3-2-1
M-151, 3.3-3.6 C, 2.75-3.25 Ni, 1.5-2.0 Cr, 0.7-1.1 Mo, 0.5-0.8 Mn, 0.3-0.6 Si, bal Fe.
Rockwell C55-62.
For ball mills, grinding balls, wear shoes, liners, chutes, abrasion resistant, martensitic white iron.

ALLOY 3-C DIE.
M-389, 0.9 C, 1.2 Mn, bal Fe.
For blanking and forming dies, punches, oil hardened, non-deforming

ALLOY NO. 4
England, 42-47 Ni, 4-6 Cr, bal Fe.
For glass to metal seals, controlled expansion.

ALLOY 4-22-19
U.S.; 0.35-0.50 C, 23-29 Cr, 13-17 Ni, 5.7 Mo, 2 max Fe, bal Co
For turbo supercharger and jet engine parts; corrosion and heat resistant.

ALLOY 4D.
M-28, 11-14 Si, bal Al.
For die castings, housings, cases; corrosion resistant.

ALLOY 8J
M-61; Ni-Fe.
For instruments, electrical equipment; constant modulus.

ALLOY 9Al-30Mn
M-747; 9 Al, 30 Mn, 1 Si, 1 C, bal Fe.
At room temperature: 120,000 TS; 70,000 YS; 70 El.
At 1200°F: 80,000 TS; 68,000 YS; 18 El.
For high temperature applications; austenitic, high temperature strength.

ALLOY 10.
M-140; 0.8 C, bal Fe.
For springs, punches, drills, taps; Type W1.

ALLOY-10.
M-926 and M-1562; 36 Ni, 64 Fe.
Annealed: 70,000 TS; 24,000 YP; 36 El; 143 Brin.
For instruments, geodetic equipment, textile machinery parts.
Controlled expansion, corrosion resistant.

ALLOY 12-2.
M-151; 1.1-1.4 C, 12-14 Mn, 1.9-2.1 Mo, 0.4-1.0 Si, bal Fe.
Heat treated: 130,000 TS; 70,000 YS; 30 El; 30 RA; 215 Brin.
For wear and abrasion resistant parts; wear and abrasion resistant.

ALLOY 15-3.
M-151; 3-4 C, 1 max Si, 0.5-0.9 Mn, 12-18 Cr, 2.4 Mo, bal Fe.
Cast: 550 Brin.
Heat treated: 620 Brin.
For sand pumps, chute liners, brick mold liners; tough and wear resistant cast iron.

ALLOY 17-W.
M-114; 0.5 C, 12 Cr, 19 Ni, 2.2 W, 1 Mo, bal Fe.
For supercharger wheels for jet engines; heat resistant.

ALLOY 19-9DL.
M-74; 0.3 C, 19 Cr, 9 Ni, bal Fe.
Annealed: 80,000 TS; 42,000 YS, 22 El, 20 RA; 230 Brin.
For gas turbine and jet engine components, corrosion and heat resistant.

ALLOY 19-9 DL.
M-114; 0.26-0.36 C, 8-10 Ni, 18-22 Cr, 1.0-1 5 Mo, 1.0-1.5 W, 0.2-0.8 Cb, 0 2-0 6 Ti.
For jet and gas engine parts, blades, buckets, wells, rockets; heat resistant.

ALLOY 19-9 WMo.
M-114; 0 08-0.12 C, 8-10 Ni, 18-22 Cr, 0.2-0.5 Mo, 1-1.5 W, 0.2-0.6 Cb, 0.2-0.6 Ti, bal Fe.
For jet engines, gas turbines, buckets, wheels, welding rod; heat resistant, cast alloy.

ALLOY 21VFS.
M-951, 2.5 Cu, 1.0-2.5 Ni, 0.5-2.0 Mg, Si, Fe, V, bal Al
For pistons, cylinder heads, age-hardened

ALLOY-30.
M-789; 97 Cu, 3 Ni.
Hard: 58,000-67,000 TS.
For electrical equipment and instruments.
Resistance alloy. Max working temperature to 250°C.

ALLOY 35.
M-118, 2.5 Ag, 0.25 Cu, bal Pb.
For solder; M.P. 304°C.

ALLOY 40N.
U S; 54 TiC, 40 Ni, 6 Cr_3C_2
For cutting tools, wear parts, sintered carbides.

ALLOY 41SM.
French; Al alloy.
For ornaments; corrosion resistant.

ALLOY 42B.
Mg, Si, Be, bal Al.
Sand cast· 46,000 TS, 36,000 YS; 5 El.
Permanent mold: 50,000 TS; 40,000 YS; 6 El.
For gear cases and housings, fittings; heat treatable, high strength.

ALLOP 42-C.
M-1131; 0.5 C, 0.6 Mn, 0.4 Si, 35 Ni, 15 Cr, 5 Mo, 5 W, 25 Co, bal Fe.
For jet engine and turbine blades; high heat resistance.

ALLOY 42-C.
Germany, 0.5 C, 35 Ni, 15 Cr, 5 Mo, 5 W, 25 C bal Fe.
For turbine blades, jet engine components; heat and oxidation resistant.

ALLOY 48S5.
U.S.; 0.15 C, 1.09 Mn, 0.09 V, 0.009 Ti, bal Fe.
For pressure vessels, impact resistant.

ALLOY 60 CASE.
M-1400; 0.60 C, bal Fe.
Heat treated: 600 Brin.
For shafts, rolls, piston rods, axles

ALLOY 61.
M-167, 0.42 C, 24 Cr, 1 Ni, 5 5 W, 1 Fe, 0 3 Mn, 0 6 Si, bal Co.
At 70°F 105,000 TS, 58,400 YS; 7 El, 11 RA
As 1000°F: 77,000 TS; 41,400 YS; 15 El; 25 R
At 1800°F. 33,000 TS.
For jet engine components; heat and oxidation resistant.

ALLOY 73J.
England, 0 73 C, 1 0 Mn, 23 Cr, 6 Ni, 6 Mo, 2 Ta, bal Co.
For valves, pump parts, age-hardenable, corrosion resistant.

ALLOY 89MC
M-69; C, alloy, bal Fe.
For machinery parts, oil hardened, tough.

ALLOY-90.
M-789, 89 Cu, 11 Ni
Hard 58,000-67,000 TS
For electrical equipment and instruments
Resistance alloy Max working temperature to 250°C

ALLOY 95-M-255
U S, 67 Ni, 1 Fe, 25 Mo, 6 Al
Cast.
For high temperature applications, high strength, heat resistant

ALLOY 100NT-2.
England, 1 0 C, 1 5 Mn 20 Cr, 30 Ni, 3 Mo, 2.2 W, 2 Ta, 20 Co, bal Fe
Heat treated. 100,000 TS, 1 5 El; 1 0 RA
For high temperature abrasion resistant parts; abrasion and corrosion resistant

ALLOY 110VT-2
England, 1 1 C, 20 Ni, 23 Cr, 6 Mo, 2 Ta, bal C
For high temperature applications, heat and corrosion resistant

ALLOY 150S.
M-1147, 1.0-1 8 Mg, 0 8 max Fe, bal Al
Annealed: 21,000 TS, 8500 YS, 25 El
Rolled· 32,000 TS; 29,000 YS, 5 El
For general purpose, trim molding, sheets

ALLOY 223
M-1197, 81 Cr, 16 Mo, 3 Si
For high temperature applications; oxidation and creep resistant

ALLOY 234A5
0 1 C, 19 Cr, 5 Ni, Mo, W, Cb, Ti, 4 Mn, bal F
For jet and turbine parts, high heat resistance.

ALLOY 234 A-5
M; 0.38 C, 4.2 Mn, 18.5 Cr, 4 5 Ni, 1.3 Mo, 1.3 W, 0.57 Cb, bal Fe.
For high temperature applications; heat resistant

ALLOY 300M.
M-24, M-114; 0.40-0.47 C, 1.4-1.8 Si, 1.6-2.0 Ni, 0.7-0.95 Cr, 0.30-0.45 Mo, 0.05 min V, bal Fe.
Heat treated: 290,000 TS; 250,000 YS; 20 El; 10 RA; 540 Brin.
For aircraft landing gears, bolts, fittings; fatigue and creep resistant.

ALLOY 325M.
M-24, M-114; C, alloy, bal Fe.
For aircraft landing gears, bolts; fatigue and creep resistance.

ALLOY 348.
Germ.; 46 Fe, 38 Ni, 16 Al.
For permanent magnet

ALLOY 348.
England; 46 Fe, 38 Ni, 16 Al
For permanent magnets; high permeability.

ALLOY 349
England, 78 Fe, 14 Ni, 8 Al.
For permanent magnets, high permeability.

ALLOY 349.
78 Fe, 14 Ni, 8 Al
For permanent magnet

ALLOY 422-19.
M-167, 0.4 C, 0.3 Mn, 0.5 Si, 25 Cr, 16 Ni, 6 Mo, 1 Fe, bal Co
At 70°F: 98, 100 TS, 55, 100 YS; 5 El; 12 RA
At 1500°F 64,000 TS, 47,000 YS, 3 El, 3.5 RA
At 1800°F 37,800 TS, 22 El, 39 RA.
For jet engine components, oxidation and heat resistant.

ALLOY #479
M-1295, 92 Pt, 8 W
Rolled 300,000 TS
For potentiometers, available bare or enamel insulated

ALLOY 694C
0.4 C, 24 Ni, 15 Cr, bal Fe
For furnace equipment, heat treat boxes; heat and corrosion resistant

ALLOY 713 C
M-937, M-167, M-84, M-1317; 0.08-0.2 C, 12-14 Cr, 3.8-5.2 Mo, 0.5-1.0 Ti, 5.5-6.5 Al, 1.0-3.0 Cb, bal Ni
Cast 123,000 TS, 107,000 YS, 8 El; C 30-42 Rock
At 1500°F. 120,000 TS, 95,000 YS, 6 El
For gas turbine blades in jet engines, high temperature bolting
Cast alloy with high rupture strength to 1700°F
High thermal fatigue resistance

ALLOY 713LC
M-937, M-167, M-84, M-1317; 0.05 C, 0.01 B, 0.1 Zr, 12 Cr, 4.5 Mo, 0.7 Ti, 6 Al, 2 Cb, bal Ni
Cast. 130,000 TS, 109,000 YS, 15 El; 21 RA.
At 1500°F. 123,000 TS, 99,000 YS; 15 El; 17 RA
For turbine wheels high temperature parts, turbine blading Casting alloy.
Good thermal fatigue
Combines good low temperature ductility and high temperature strength.

ALLOY 936
M-1295, 8 W, 92 Pt.
For high temperature applications; oxidation resistant.

ALLOY NO 1270.
M-607; 2 Ag, bal Cu.
For silver brazing, M.P. 1220-1270°F.

ALLOY 1751.
M-18; 23.2 Co, 76.8 Pt.
Rolled: $H_c = 4300$, $Br = 6450$, $(BH)\ max = 9.5 \times 10^6$.
For permanent magnets in watches, instruments.
High coercive force and high energy product.

ALLOY 2112.
U.S., 21 Cr, 12 Ni, 0.8 Si, 1.4 Mn, 2 C, bal Fe.
For exhaust valves; heat resistant, austenitic.

ALLOY 2129.
M-108; 45-50 Ni, bal Fe.
For magnetic applications; soft.

ALLOY 6059
M-167, M-31, 0.40 C, 33 Ni, 1 Fe, 25 Cr, 6 Mo, 0.3 Mn, 0.65 Si, bal Co
Cast. 82,500 TS, 46,900 YS, 7 El, 10 RA.
At 1500°F: 51,200 TS, 38,200 YS; 10 El; 14 RA
At 1800°F. 33,700 TS, 26 El 42 RA.
For jet engine components; high strength, heat resistant.

ALLOY 9257.
M-1405, 0.93 C, 0.23 Mn, 0.13 Cr, 0.2 Si, 0.2 V, bal Fe.
For cutters, punches, dies; oil or water hardened.

ALLOY A226.
England; C, alloy, bal Fe
Heat treated. 19,000 TS
For jet engine components; age hardenable, high heat resistance

ALLOY AP
England; 3.45 C, 1.6 Si, 1.0 Mn, 0.15 P, 1.2 Ni, 0.9 Cr, bal Fe
Cast.
For gears, shafts, machine tool housings, cast iron

ALLOY B.
M 114, 1.05 C, 0.35 Mn, 1.35 Cr, bal Fe
For forming rolls, deep drawing dies, oil hardening.

ALLOY B5
M-1270, 0.07 max C, 29 Ni, 20 Cr, 2-3 Mo, 4 Cu, bal Fe.
Cast 65,000-75,000 TS; 28,000-38,000 YS, 50-35 El, 50-40 RA, 120-150 Brin.
For chemical plant equipment, tanks, resists mixed acids, austenitic.

ALLOY B 1900.
M-114 and M-115; 0.10 C, 8 Cr, 10 Co, 6 Mo, 6 Al, 4.3 Ta, 1.0 Ti, 0.015 B, 0.07 Zr, bal Ni.
Hardened 125,000 TS; 110,000 YS; 5 min El
At 1600°F 97,000 TS, 83,000 YS, 1.5 min El
For turbine blades and other high temperature applications
Precipitation hardened. Vacuum-melted and vacuum-cast

ALLOY "B" FINISHING.
M-261, 1.4 C, 4.5 W, 0.8 Cr, bal Fe
For finishing tools, draw dies, wear resistant.

ALLOY BSZ
Italy For solder, soft

ALLOY "C"
M-261, 2.2 C, 13 Cr, bal Fe
For tools, dies, gauges, non-deforming

ALLOY C-422
U.S.; 0.2 C, 13 Cr, 1 Mo, 0.8 W, 0.25 V, bal Fe
For turbine wheels; corrosion and heat resistant.

ALLOY CB-7
M-48; 0.75 Zr, 7.5 Ti, bal Cb.
Rolled: 60,800 YS; 32 El
For high temperature applications; high temperature strength to 2000°F.

ALLOY CB-16.
M-48; 67 Cb, 10 Ti, 20 W, 3 V.
For high temperature applications; oxidation resistant to 2000°F.

ALLOY CB-22.
M-48; 94 Cb, 3 Al, 3 V.
For high temperature applications; oxidation resistant to 2000°F.

ALLOY CB-74.
M-48; 85 Cb, 10 W, 5 Zr.
At 2200°F: 44,800 TS; 42,400 YS
For high temperature applications; oxidation resistant to 2000°F.

ALLOY CH42.
M-694; 1.65 C, 0.45 Mn, 13 Cr, 0.3 V, 0 7 Mo, bal Fe.
For dies, air hardening

ALLOY CMI.
U S.; 65 TiC, 11 CbC, 11 Fe, 5.7 Cr, 5 6 Ni, 0.7 TaC
For cutting tools, wear parts, sintered carbides.

ALLOYCO 18-SMo.
M-1023; 0 07 max C, 19-21 Cr, 9-11 Ni, 2 Mo, bal Fe
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA, 160 Brin.
For valves, pumps; Type 316; stainless, austenitic

ALLOY CROSS CUTS.
M-69; 0.90 C, 0 35 Mn, 0 50 Cr, bal Fe
For saws; water hardened

ALLOY CSA-39
Eng.; 0.10 C, 27 Ni, 40 Fe, 19 Cr, 9 Mo, 3 W.
For jet engine components, high strength, heat resistant.

ALLOY CW.
0.10 C, 1.5 Mn, 0 5 Si, 21 5 Cr, 20 5 Ni, 20 Co, 3 Mo, 2 W, 1 Cb, 0 14 N, bal Fe
At 70°F 118,000 TS; 58,000 YS; 49 El.
At 1200°F: 73,500 TS, 37,600 YS, 28 El.
For jet engine components; oxidation and heat resistant.

ALLOY D-31.
U.S ; 10 Ti, 10 Mo, 80 Cb.
At 70°F 100,000 TS.
At 2000°F. 34,500 TS.
For high temperature applications; high oxidation resistance.

ALLOYED GENUINE WROUGHT IRON.
M-292, 5 max Ni, 0 05 Mn, 0.10-0 15 P, 0.05 C, 0-0.75 Cu, bal Fe.
50,000-60,000 TS, 30,000-45,000 YS.
For pipes, hull plates; tough

ALLOY EI 437B.
Russia; 0 05 C, 0 23 Mn, 20.5 Cr, bal Ni
For high temperature applications, high heat and oxidation resistance.

ALLOY FDP.
England; C, Cr, Ni, bal Fe.
For aircraft structures, austenitic, stainless.

ALLOY FINISHING
M-140, 1.4 C, 3 W, bal Fe
For cutting and finishing tools; non-deforming.

ALLOY H40.
English; 0 25 C, 3 Cr, 0.8 V, 0.5 W, 0.5 Mo, 5 Ni, bal Fe
For high temperature bolts, turbine wheels; ferritic, heat resistant.

ALLOY HTB-1.
M-1, M-38, M-115, M-376; 1 C, 1.45 Cr, 1 Al, bal Fe .
For high temperature bearings; heat and creep resistant

ALLOY HUBBING DIE.
M-24; 0.09 C, 0.48 Mn, 0.58 Cr, 1.25 Ni, bal Fe.
For hubbing dies; case hardened.

ALLOY I-336.
U.S ; 0.20 C, 50 Co, 15 Ni, 1 Fe, 20 Cr, 12 W, 1 Cb.
For high temperature applications; high strength, heat resistant.

ALLOY I-1360
U.S., 0.1 C, 70 Ni, 6 Fe, 10 Cr, 5 Mo, 2 Cb, 6 Al, 0.5 Be
Cast.
For high temperature applications; high strength, heat resistant.

ALLOY HIVT2-2
England; 1 11 C, 23 Cr, 6 Mo, 2 Ta, bal Co
Cast· 120,000 TS, 4 El, 1 RA
For valves, pump parts; corrosion, abrasion and heat resistant.

ALLOY IRON
M-139, C, Ni, Cr, bal Fe
Cast. 50,000 TS, 147-255 Brin.
For valve gates, castings

ALLOY L-251
U S , 0 40 C, 54 Co, 10 Ni, 1 Fe, 19 Cr, 14 W
Cast
For high temperature applications, high strength, heat resistant

ALLOY L605
M-1, M-114, 0 05 C, 10 Ni, 53 Co, 1 Fe, 20 Cr, 15 W
Rolled 160,000 TS, 85,000 YS, 55 El.
For gas turbine buckets, afterburners, heat resistant

ALLOY L-605.
M-114, 0.08 C, 21 Cr, 10.5 Ni, 1 6 Mn, 0 6 Si, 15 5 W, 1.6 Fe, bal Co
Rolled 160,000 TS, 85,000 YS, 55 El
For jet engine components, discs, buckets; oxidation and heat resistant.

ALLOY I M-5
40 Mo, 40 Si, 8 Cr, 2 B, 10 Al
Uses Coating for columbium alloys for high temperature applications.
High oxidation resistance

ALLOY L T C
M-1295; Ni, Cr, bal Au
For resistors, high electrical resistance

ALLOY-M.
M-926 and M-1562, .08 C, 18 Cr, 8 Ni, bal Fe.
Annealed: [illegible],000 TS, 35,000 YS; B 80 Rock.
For chemical plant equipment, mixers, digesters, tanks, agitators
Stainless, austenitic.

ALLOY M22 VC.
M-86, 0 08-0 16 C, 5 0-6.5 Cr, 5.9-6.6 Al, 1 5-2.5 Mo, 10 5-11 5 W, 2 6-3 4 Ta, 0.4-0 8 Zr, 1.0 max Fe, bal Ni.
High temperature applications.
Vacuum cast.

ALLOY M-115.
M-115; 1-2 Mn, bal Al.
For light alloy parts; corrosion resistant

ALLOY M-252.
M-1214, M-114, M-31, M-1; 0.2 C, 9-11 Co, 3 Fe, 18-20 Cr, 9-11 Mo, 2.5 Ti, 1 Al, bal Ni.
Annealed: 175,000 TS; 20 El.
At 1000°F: 165,000 TS; 93,000 YS.
At 1600°F: 70,000 TS; 60,000 YS; 35 El.
For jet engine buckets; high heat and corrosion resistant.

ALLOY M-255.
M-259; 0.5 Al_2O_3, bal Al.
At 70°F: 22,600 TS; 17,600 YS; 22 El.
At 300°F: 15,400 TS; 13,600 YS, 22 El.
For high temperature applications; powder metallurgy.

ALLOY M-257.
M-249; 7.8 Al_2O_3, bal Al.
Sintered: 40,000 TS; 26,000 YS; 14 El.
For high temperature applications; powder metallurgy.

ALLOY M-276.
M-249, 16.5 Al_2O_3, bal Al
Sintered. 54,000 TS; 35,000 YS, 3 El
For high temperature applications, powder metallurgy

ALLOY M-308
M-1, M-31, M-114, M-32, 0.08 C, 14 Cr, 33 Ni, 4 Mo, 0.25 Al, 0.25 Zr, 2 Ti, 6.5 W, bal Fe.
For jet engine parts; heat resistant.

ALLOY MC-102
M-86; 0.02-0.06 C, 0.1-0.4 Si, 0.1-0.5 Mn, 4.0 max Fe, 19.0-20.5 Cr, 5.0 max Co, 5.5-6.5 Mo, 6.2-6.7 Cb + Ta, 2.0-3.0 W, bal Ni
For gas turbine stator blades, turbine rotors, pre-combustion chambers of diesel engines.
Good oxidation resistance and strength to 900°C Age-hardenable.

ALLOY MCS
M-114, M-115, 0.70 C, 3.5 Cr, 5.5 Mo, 1 Si, bal Fe
For high temperature bearings; heat resistant.

ALLOYMET 1005.
M-1216, 4.5-5.5 Cr, bal Cu
For Cr additions to Cu alloys, master alloy.

ALLOYMET 1010.
M-1216, 9.5-10.5 Cr, bal Cu
For Cr additions to Cu alloys; master alloy.

ALLOYMET 1110
M-1216; 9-11 Fe, bal Cu
For Cu additions to steel and cast iron, master alloy

ALLOYMET 1115
M-1216, 4.5-5.5 Fe, bal Cu
For Cu additions to steel and cast iron, master alloy.

ALLOYMET 1130
M-1216; 28-32 Fe, bal Cu.
For Cu additions to steel and cast iron; master alloy

ALLOYMET 1230A.
M-1216, 28-32 Mn, bal Cu
For Mn additions for Ni alloys; hardener, deoxidizer.

ALLOYMET 1230B
M-1216, 23.5-26.5 Mn, 4-6 Fe, bal Cu.
For Mn additions to bronzes, hardener, deoxidizer.

ALLOYMET 1315
M-1216, 15 Ni, bal Cu
For alloying additions for bronzes.

ALLOYMET 1330.
M-1216; 30 Ni, bal Cu.
For alloying additions.

ALLOYMET 1350.
M-1216; 50 Ni, bal Cu.
For alloying additions.

ALLOYMET 1410
M-1216, 9-11 Si, bal Cu.
For high conductivity copper; master alloy.

ALLOYMET 1420.
M-1216, 18-22 Si, bal Cu.
For high conductivity copper; master alloy.

ALLOYMET 1430.
M-1216; 28-32 Si, bal Cu.
For high conductivity copper; hardener, master alloy.

ALLOYMET 2000.
M-1216; 100 Ni.
For anodes for plating.

ALLOYMET 2023.
M-1216; 60 Ni, 25 Cu, bal Mn, Si, Fe and C.
For Ni and Cu additions to steel and cast iron, alloying master alloy

ALLOYMET 2030
M-1216; 30 Cu, 70 Ni.
For Ni and Cu additions to steel and cast iron; alloying master alloy.

ALLOYMET 2030M.
M-1216, 65 Ni, 30 Cu, 2 max Fe, 1 max Mn, 0.15 max C
For Ni and Cu additions to steel and cast iron; alloying master alloys

ALLOYMET 2115
M-1216; 77 min Ni, 14-17 Cr, 6-10 Fe, 1 Mn, 0.5 max Cu
For alloying additions to stainless steels; for high temperature castings.

ALLOYMET 2115 WH
M-1216, 33-37 Ni, 14-17 Cr, 0.5-2.0 Mn, 0.8-2.5 Si, bal Fe.
For alloying additions to stainless steels; for high temperature castings

ALLOYMET 2120
M-1216, 77-79 Ni, 19-20 Cr, 1 Fe, bal Mn, C, Si.
For alloying additions to stainless steels, alloying master alloy.

ALLOYMET 2140
M-1216, 57 min Ni, 14-18 Cr, 3 max Mn, 1.5 max Si, bal Fe.
For alloying additions to stainless steels; alloying master alloy.

ALLOYMET 2200.
M-1216; 56 Ni, 23 Cu, 7.5 Cr, bal Fe.
For alloying additions

ALLOYMET 2350
M-1216; 47-50 Ni, bal Fe
For alloying for high permeability; soft magnets.

ALLOYMET 2364.
M-1216; 36 Ni, bal Fe
For alloying for low expansion applications; glass seals

ALLOYMET 2470.
M-1216; 30 Ni, 15 Cu, 0.2 Mn, bal Fe.
For glass to metal seals; low expansion.

ALLOYMET MG.
M-1216, 76 Ni, 14 Cu, bal Fe.
For high permeability alloys; low field strength

ALLOYMET PERMAG.
M-1216; 20 Ni, 60 Cu, bal Fe.
For permanent magnets.

ALLOY MN5.
Russia; Ni, bal Cu.
For high temperature applications; heat resistant.

ALLOY N-153.
M-114; 0.1 C, 1.5 Mn, 0.5 Si, 17 Cr, 15 Ni, 13 Co, 3 Mo, 2 W, 1Cb, 0.14 N, bal Fe.
For jet engine components; oxidation and heat resistant.

ALLOY N-155.
M-114; 0.1 C, 1.5 Mn, 0.5 Si, 21.5 Cr, 20.5 Ni, 20 Co, 3 Mo, 2 W, 1 Cb, 0.14 N, bal Fe.
At 70°F: 118,000 TS; 58,000 YS; 49 El.
At 1200°F: 73,500 TS; 37,600 YS, 28 El.
At 1600°F: 39,000 TS; 30,000 YS; 15 El.
For jet engine components, heat and oxidation resistant.

ALLOY S-844
U.S.; 0.30 C, 44 Co, 20 Ni, 2 Fe, 25 Cr, 3 Mo, 2 W, 2 Cb.
For high temperature applications, high strength, heat resistant.

ALLOY SHOE DIE.
M-38; 0.5 C, 0.7 Cr, 0.15 Mo, bal Fe.
For shoe dies; tough.

ALLOY SSMP.
England; 2.98 C, 1.14 Si, 1.1 Mn, 0.18 P, bal Fe.
Cast.
For gears, shafts, machine tool housings, cast iron

ALLOY TRIMMER.
M-357, C, alloy, bal Fe.
For tools, water or oil hardened.

ALLOY V814.
German; 45 VC, 45 TiC, 7 Ni, 3 Co
For cutting tools, bits, dies, sintered carbides.

ALLOY VCM
England, 0.28 C, 0.7 Mn, 1.0 Cr, 1.0 Mo, 0.7 Ni, bal Fe.
For gears, shafts, cams; nitriding steel

ALLOY-W
M-Germany; 0.5-0.9 Cu, 0.28-0.36 Ni, 0.25 Co, 0.16 Mg, V, W, Cr, Be, bal Al
For anodized die castings, housings

ALLOY-W.5
M-121; 4 Si, 0.5 Mn, bal Ni.
For spark plug electrodes
Resists high temperature corrosion

ALLOY-W 6.
M-121; 2.0 Si, 0.5 Mn, bal Ni.
For spark plug electrodes.
Resists high temperature corrosion.

ALLOY W 7
M-121; 1.0 Si, 2.5 Mn, bal Ni.
For spark plug electrodes.
Resists high temperature corrosion

ALLOY W.9
M-121; 1.0 Si, 4.5 Mn, bal Ni
For spark plug electrodes.
Resists high temperature corrosion.

ALLOY WF-31.
U.S; 0.15 C, 50 Co, 10 Ni, 5 Fe, 20 Cr, 3 Mo, 10 W.
For jet engine components, high strength, heat resistant.

ALLOY Z-FM.
M-353; 0.4 C, 1 Cr, 0.75 Ni, 0.35 Mo, 0.35 Pb, bal Fe.
Heat treated: 143,000 TS; 122,500 YS; 16 El; 52 RA; 300 Brin.
For machinery parts, gears, pins, shafting; oil hardened, shock resistant.

ALL-PO.
M-507; 0.90 C, 0.4 Si, 0.4 Mn, 9.5 Cr, 0.6 Mo, bal Fe.
Coated, hard facing electrode.
As arc welded: 185,000 psi, 52-55 Rc.
For overlay or buildup on scrapers, loaders, dozer bits, blades, shovels, buckets. Good abrasion resistance.

ALL-STATE HS-1.
M-1713; Cr, Mn, Ni.
Welded: 125,000 TS; 19 El; 260-320 Brin.
For hard facing electrode; abrasion and wear resistant, work hardening.

ALL-STATE NO. 4.
M-1713; Ni core
For welding electrode for cast iron; machinable.

ALL-STATE NO 7
M-1713, 40 Sn, 50 Pb, 20 Zn
For cast iron solder rod for repairing cracks in cast iron, corrosion resistant, M.P. 600°F

ALL-STATE NO 11
M-1713, 47 Cu, 43 Zn, 10 Ni.
For brazing, M.P 1665-1715°F

ALL-STATE NO 13.
M-1713; 48 Cu, 9.6 Ni, 0.29 Si, 0.18 Fe, 0.16 Mn, bal Zn
For brazing alloy, nickel silver.

ALL-STATE NO. 21
M-1713; 7 P, 0.5 Sn, bal Cu.
For brazing, M.P 1300-1415°F

ALL-STATE NO. 22
M-1713, P, Sn, bal Cu
Welded: 40,000 TS, 80 Brin
For welding electrodes, arc welding, corrosion resistant.

ALL-STATE NO 23
M-1713, 2 Ag, 7.3 P, bal Cu
For brazing, M.P 1175-1410°F

ALL-STATE NO. 24
M-1713, 7-9 Sn, 0.03-0.35 P, bal Cu.
Welded 45,000 TS; 80-160 Brin
For P-bronze welding electrodes, for welding steel, cast iron and copper alloys

ALL-STATE NO 31
M-1713, 11 Si, 1 Fe, bal Al
Welded 30,000 TS
For Al brazing, for gas welding, M.P. 950°F.

ALL-STATE NO 33.
M-1713; 11 Si, 1 Fe, bal Al
For Al welding rod, for gas welding

ALL-STATE NO. 37.
M-1713, 30 Cd, 28 Zn, 42 Sn.
For solder

ALL-STATE NO. 39.
M-1713, 59 Sn, 41 Zn.
For Al solder, low temperature rub-on solder

ALL-STATE NO 41.
M-1713, 58 Cu, 1 Sn, 1 Fe, bal Zn.
For brazing rod; for gas welding.

ALL-STATE NO. 53.
M-1713; 4 Pb, 3 Al, 2 Cu, bal Zn.
For Zn base welding rod for Zn alloys; for gas welding.

ALL-STATE NO. 61.
M-1713; 10 Al, 1 Zn, 89 Mg.
For magnesium alloy solder.

ALL-STATE NO. 100.
M-1713; 40 Ag, 30 Cu, 28 Zn, 2 Ni.
For brazing, silver solder; M.P. 1220-1435°F.

ALL-STATE NO. 101.
M-1713; 45 Ag, 18 Cu, 19 Zn, 18 Cd.
For brazing, silver solder; M.P. 1140-1190°F.

ALL-STATE NO. 164.
M-1713; 40 Ag, 30 Cu, 25 Zn, 5 Ni
For brazing; silver solder.

ALL-STATE NO. 430.
M-1713; Ag, 18 Cr, 8 Ni, bal Fe.
For stainless steel solder; stainless, austenitic.

ALLVAC 18-15B.
M-1490; 0.01 C, 18 Cr, 15 Ni, 0.8 B, bal Fe.
For neutron control rods, atomic energy uses; stainless, austenitic.

ALLVAC 500 ZB.
M-1490; 0.08 C, 19 Cr, 17 Co, 4 Mo, 54 Ni, 3 Ti, 3 Al, 0.006 B, 0.06 Zr
At R.T: 176,000 TS; 110,000 YS; 16 El.
At 1400°F: 151,000 TS, 106,000 YS; 21 El.
For missiles, space equipment, jet engine and gas turbine parts.
High corrosion and oxidation resistant
Good creep resistance and notch toughness.

ALLVAC 718.
M-1490; 0.03-0.10 C, 17-21 Cr, 2.8-3.3 Mo, 50-55 Ni, 5.0-5.5 Cb, 0.65-1.15 Ti, 0.4-0.8 Al, bal Fe
Heat Treated: 190-000-215,000 TS, 160,000-185,000 YS, 15-25 El, 20-30 RA, C-40-44 Rock
For heat resistant parts to 1300°F
Age hardening, high strength.
Corrosion and oxidation resistant

ALLVAC ASTROLOY
M-1490, 0.06 C, 15 Cr, 17 Co, 5 Mo, 3.5 Cb, 3.5 Ti, 4 Al, 0.03 B, 0.06 Zr, bal Ni
Heat treated: 205,000 TS; 152,000 YS; 12 El, 14 RA
At 1400°F: 160,000 TS; 132,000 YS; 15 El, 17 RA
For turbine wheels and blades, jet engine components, nozzles, compressor discs.
High heat and corrosion resistant
High creep and stress-rupture strength

ALLVAC I-700
M-1490, 0.13 C, 15 Cr, 29 Co, 3.75 Mo, 46 Ni, 2.55 Ti, 3.25 Al
At R.T: 170,000 TS, 103,000 YS, 25 El
At 1400°F: 127,000 TS; 8900 YS; 11 El
For jet engine and gas turbine components, space vehicles and missiles.
Oxidation and corrosion resistant.
Good creep resistance and notch toughness

ALLVAC M-252.
M-1490; 0.10-0.20 C, 0.5 max Mn, 18-20 Cr, 9-11 Co, 9-11 Mo, 2.25-2.75 Ti, 0.5-1.25 Al, 0.006 B, 5 max Fe, bal Ni.
Bar: 180,000 TS, 20 El; C 40 Rock, 122,000 YS.
At 1200°F: 168,000 TS; 108,000 YS; 11 El; C 33 Rock.
For heavy duty jet engine and gas turbine components.
High corrosion and heat resistance.
Age hardenable. Good creep strength.

ALLVAC-N.
M-1490; 0.05 C, 7 Cr, 16.5 Mo, 76.5 Ni, 10 ppm B.
At R.T.: 116,500 TS; 43,000 YS; 62.6 El.
At 1200°F: 96,300 TS; 35,500 YS; 54 El.
For high temperature applications and for equipment handling hot fluoride salts.
High heat, corrosion and oxidation resistant.

ALLVAC R-235.
M-1490; 0.12 C, 15.5 Cr, 5.5 Mo, 65 Ni, 2.5 Ti, 2 Al, 10 Fe.
At R.T: 160,000 TS; 100,000 YS; 30 El.
At 1500° F: 105,000 TS; 85,000 YS; 18 El.
For high temperature components.
Precipitation hardening. Good oxidation and corrosion resistance.

ALLVAC RENÉ 41.
M-1490; 0.09 C, 19 Cr, 11 Co, 10 Mo, 3 Ti, 1.5 Al, 0.006 B, bal Ni.
At 1400°F: 126,000 TS; 88,000 YS; 11 El
At R.T.: 170,000 TS; 103,000 YS; 25 El.
For jet engine and gas turbine components, afterburners, high temperature bolts.
High temperature, high strength properties.
Corrosion and oxidation resistant.

ALLVAC WASPALOY.
M-1490, 0.10 max C, 12-15 Co, 3.5-5.0 Mo, 2.6-3.2 Ti, 1.0-1.6 Al, 0.08 Zr, 0.008 B, 18-21 Cr, bal Ni.
Annealed: 121,000 TS; 70,000 YS; 54 El, B 90 Rock.
At 1400°F: 120,000 TS; 99,000 YS; 28 El, 42 RA.
For turbine engines, airframe assemblies, missile components, fasteners.
High stress-rupture strength and oxidation resistant.

ALMADUR MP6
German, Al alloy.
For bearings.

ALMADUR MZ3.
German; Al alloy.
For bearings

ALMAG
M-871; 3.5-4.5 Cu, 0.4-1.0 Mn, 0.3-0.75 Mg, bal Al.
Rolled: 54,000 TS; 22 El; 100 Brin
For light alloy parts, aircraft construction, Duralumin type.

ALMAG 35
M-1022; 0.1 Ti, 0.1 Mn, 0.05 Be, 6.5-7.5 Mg, bal Al.
Cast: 38,000-42,000 TS; 18,000-21,000 YS, 10-15 El, 70 Brin
For castings, ornaments, machine tool parts; not hardenable, corrosion resistant

ALMANITE-C.
M-82, C, Al, Mn, bal Fe
Cast: 90,000 TS; 15 El; 200-400 Brin.
For mill liners, grinding balls, mixer blades, work hardens, abrasion and wear resistant.

ALMANITE S.
M-82, C, Al, Mn, bal Fe
Cast: 90,000 TS; 12 El, 200 Brin
For mill liners, grinding balls, crushing rolls; austenitic, wear and abrasion resistant

ALMAR 15 (280 HT).
M-1, 0.03 max C, 0.10 max Mn, 0.10 max S, 0.01 max P & S, 15.0 Ni, 4.8 Mo, 0.7 Ti, 9.0 Co, 0.02 Zr, 0.003 B, bal Fe
Heat Treated: 299,700 TS; 293,700 YS; 10 El; 41.5 RA, Rock C 54-55.
For die casting inserts, pistons, cylinders, hot extrusion dies.
High yield strength and ductility.

ALMAR 18.
M-1; 0.03 C, 17.0-19.0 Ni, 7.0-9.5 Co, 3.0-5.2 Mo, 0.15-0.80 Ti, 0.05-0.15 Al, 0.02 Zr, 0.003 B, bal Fe.
Annealed: 148,000 TS; 105,000 YS; 16 El; 68 RA; C 30 Rock.
Aged: 286,000 TS; 280,000 YS; 11 El: 55 RA; C 54 Rock.
For rocket motor cases, airframes, airborne equipment, large machinery parts, bolts, cryogenic equipment, high temperature equipment.
Maraging steel, shock resistant.

ALMAR 18 (200).
M-1; 0.03 max C, 17-19 Ni, 8-9 Co, 3.0-3.5 Mo, 0.15-0.25 Ti, 0.02 Zr, 0.003 B, 0.05-0.15 Al, bal Fe.
Maraged: 210,000 TS; 200,000 YS; 15 El; 67 RA
For fuel rocket cases, aircraft landing gears, missiles and aircraft parts.
Maraging steel, high strength and toughness and ductility.

ALMAR 18 (250).
M-1; 0.03 max C, 17-19 Ni, 7.0-8.5 Co, 4.6-5.2 Mo, 0.3-0.5 Ti, 0.02 Zr, 0.003 B, 0.05-0.15 Al, bal Fe.
Maraged: 243,000 TS; 232,000 YS; 12 El, 57 RA; C 48 Rock.
For fuel rocket cases, aircraft landing gears, missile and aircraft components.
Maraging steel, high strength, ductility and toughness.

ALMAR 18 (300).
M-1; 0.03 max C, 18-19 Ni, 8.5-9.5 Co, 4.6-5.2 Mo, 0.5-0.8 Ti, 0.02 Zr, 0.003 B, 0.05-0.15 Al, bal Fe
Maraged: 295,000 TS; 292,000 YS, 11.5 El, 59 RA, C 48-50 Rock.
For rocket cases, aircraft landing gears, missile and aircraft components
Maraging steel, high strength, ductility and toughness.

ALMAR 20.
M-1, 0.03 max C, 19.0-20.0 Ni, 1.3-1.6 Ti, 0.15-0.30 Al, 0.5 Cb, 0.02 Zr, 0.003 B, bal Fe
Heat Treated: 253,000-265,500 TS, 244,000-260,000 YS; 10-13 El; 52-59 RA; C 49-53 Rock
For rocket motor cases, airframes, airborne equipment, large machinery parts, bolts, cryogenic and high temperature equipment.
Maraging steel, shock resistant

ALMAR 25.
M-1, 0.03 C, 25.0-26.0 Ni, 1.3-1.6 Ti, 0.15-0.30 Al, 0.02 Zr, 0.003 B, 0.50 Cb, bal Fe.
Heat Treated: 240,000-265,000 TS, 212,000-246,000 YS; 3-5 El.
For rocket motor cases, airframes, airborne equipment, large machinery parts, bolts, cryogenic equipment, high temperature equipment. Maraging steel, shock resistant

ALMAR 362.
M-1; 0.05 max C, 14.0-14.5 Cr, 6.25-7.0 Ni, 0.6-0.9 Ti, bal Fe.
Annealed. 125,000 TS; 108,000 YS, 16 El; C 25 Rock.
Age Hardened: 188,000 TS, 182,000 YS; 13 El, C 41 Rock.
For jet engine, aircraft and missile components, hydraulic and pneumatic equipment, valve and pump parts
Age-hardenable, martensitic, corrosion resistant

ALMAR 363
M-1; 0.04 C, 11.5 Cr, 4 Ni, 0.4 Ti, bal Fe.
Strip Annealed: 123,000 TS; 106,000 YS; 12 El; C 28 Rock.
At 600°F: 97,700 TS; 89,800 YS, 5 El.
For jet engine, missile and space components.
Maraging steel, good fracture toughness.
Corrosion resistant. Good fabricability.

ALMASILIUM.
M-767; 2 Si, 1 Mg, bal Al.
50,000 TS; 6 El; 90 Brin.
For light alloy parts; corrosion resistant.

ALMELEC.
M-979; 0.4-1.2 Mg, 0.5-1.2 Si, 0-0.3 Fe, bal Al.
44,600 TS; 6-8 El; 90 Brin.
For electrical transmission lines, heat treated wrought French alloy.

ALMET 1-8.
M-248; 0.2 max C, 18 Cr, 8 Ni, bal Fe
For stainless wire parts; Type 302 stainless.

ALMET 12
M-248; 0.12 C, 12-14 Cr, bal Fe
For corrosion resistant wire parts; Type 410 stainless.

ALMET 12 M.
M-248, C, 12-14 Cr, bal Fe
For corrosion resistant wire parts, Type 416 stainless, free machining

ALMET 17
M-248; C, 14-18 Cr, bal Fe
For corrosion resistant wire parts, Type 430 stainless

ALMET 17-7 PH.
M-248; 0.09 max C, 17 Cr, 7 Ni, 0.75-1.25 Al, bal Fe
Rolled 200,000-285,000 TS, 185,000-265,000 YS, 400 Brin
Heat treated 244,000-345,000 TS, 234,000-340,000 YS; 7-2 El; 480 Brin
For springs, clips, aircraft parts, age-hardened, stainless

ALMET 17 Cu.
M-248, C, 14-18 Cr, Cu, bal Fe
For corrosion resistant wire parts, Type 434 stainless.

ALMET 18 8 Cb
M-248; C, 18 Cr, 10 Ni, Cb, bal Fe
For stainless wire parts, Type 347 stainles

ALMET 18-8M.
M-248, C, 18 Cr, 8 Ni, bal Fe
For stainless wire parts, Type 303 stainless, free machining

ALMET 18-8S
M 248, 0.08 max C, 18 Cr, 8 Ni, bal Fe
For stainless wire parts, Type 304 stainless.

ALMET 18-8 Ti
M-248, C, 18 Cr, 10 Ni, Ti, bal Fe.
For stainless wire parts; Type 321 stainless.

ALMET 18-12 SMo.
M-248, C, 18 Cr, 12 Ni, 3 Mo, bal Fe.
For stainless wire parts, Type 316 stainless.

ALMET 20-10.
M-248, C, 20 Cr, 10 Ni, bal Fe
For stainless wire parts; Type 308 stainless.

ALMET 21.
M-248, C 21 Cr, bal Fe
For corrosion resistant wire parts; Type 442 stainless

ALMET 25-12
M-248, C, 25 Cr, 12 Ni, bal Fe.
For stainless and heat resistant wire parts; Type 30 stainless.

ALMET 25-20.
M-248; C, 25 Cr, 20 Ni, bal Fe.
For heat resistant wire parts; Type 310 stainless.

ALMET 28.
M-248; C, 25 Cr, bal Fe.
For heat resistant wire parts; Type 446 stainless.

ALMET 35-15.
M-248; C, 15 Cr, 35 Ni, bal Fe.
For heat resistant wire parts; Type 330 stainless.

ALMET 302.
M-248; 0.20 max C, 17-19 Cr, 8-10 Ni, bal Fe.
Soft: 105,000 TS; 70,000 YS; 35 El.
Hard: 330,000 TS; 310,000 YS; 2 El.
For springs, trim, wire parts; stainless, austenitic; Type 302.

ALMET 303.
M-248; 0.15 C, 17-19 Cr, 8-10 Ni, 0.07 min S or Se, bal Fe.
Soft: 100,000 TS; 45,000 YS; 25 El; 159 Brin.
Hard: 150,000 TS; 130,000 YS; 15 El, 240 Brin.
For screw machine products, stainless, austenitic, free-cutting.

ALMET 304.
M-248; 0.08 max C, 18-20 Cr, 8-10 Ni, bal Fe.
Soft: 90,000 TS; 35,000 YS; 55 El; 144 Brin.
Hard: 230,000 TS, 220,000 YS, 2 El, 430 Brin.
For woven wire, cold headed parts; stainless, austenitic, Type 304.

ALMET 305.
M-248; 0.12 max C, 18 Cr, 12 Ni, bal Fe
Annealed: 85,000 TS, 47,000 YS, 60 El; 77 RA; 144 Brin.
Soft: 100,000 TS, 54,000 YS; 58 El; 74 RA; 156 Brin.
For spun, cold drawn and cold headed parts; austenitic, stainless.

ALMET 308
M-249, 0.08 max C, 19-21 Cr, 10-12 Ni, bal Fe.
Soft: 85,000-105,000 TS, 35,000-40,000 YS, 25-55 El; 150 Brin.
Hard: 160,000-190,000 TS, 150-000-185,000 YS; 4-8 El; 380-430 Brin.
For electrical equipment; austenitic, stainless.

ALMET 309.
M-248; 0.20 max C, 22-24 Cr, 12-15 Ni, bal Fe.
Soft 85,000 TS; 35,000 YS, 55 El; 159 Brin
Hard: 190,000 TS; 185,000 YS; 4 El, 430 Brin.
For heat resistant parts, corrosion and heat resistant.

ALMET 310
M-248, 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Soft 85,000 TS, 35,000 YS, 25 El, 139 Brin.
Hard: 190,000 TS, 185,000 YS; 4 El, 430 Brin.
For heat resistant parts, corrosion and heat resistant.

ALMET 314.
M-248; 0.25 max C, 23-26 Cr, 19-22 Ni, 2-3 Si, bal Fe.
Soft: 85,000 TS; 35,000 YS; 25 El; 139 Brin
Hard: 190,000 TS, 185,000 YS; 4 El; 430 Brin.
For heat resistant parts; corrosion and heat resistant

ALMET 316.
M-248; 0.10 max C, 18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Soft: 85,000 TS; 35,000 YS; 25 El, 139 Brin.
Hard: 190,000 TS; 185,000 YS; 4 El; 430 Brin.
For acid and chemical equipment; stainless, austenitic.

ALMET 317.
M-248; 0.10 C, 18 Cr, 12 Ni, 3-4 Mo, bal Fe.
Soft: 85,000 TS; 35,000 YS; 25 El; 139 Brin.
Hard: 190,000 TS; 185,000 YS; 4 El; 430 Brin.
For welded stainless structures; stainless, austenitic.

ALMET 321.
M-248; 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe.
Soft: 90,000 TS; 35,000 YS; 25 El; 137 Brin.
Hard: 230,000 TS; 220,000 YS; 2 El; 430 Brin.
For welded stainless parts; austenitic, stainless, stabilized.

ALMET 330.
M-248; 0.20 max C, 15-17 Cr, 34-36 Ni, bal Fe.
Soft: 85,000 TS; 35,000 YS; 25 El; 139 Brin.
Hard: 190,000 TS, 185,000 YS; 4 El; 430 Brin.
For carburizing and heat treating equipment; heat resistant, austenitic.

ALMET 347
M-248; 0.08 max C, 17-19 Cr, 9-12 Ni, Cb = 10 × C, bal Fe
Soft: 85,000 TS, 35,000 YS; 25 El; 139 Brin.
Hard: 190,000 TS; 185,000 YS; 4 El; 430 Brin.
For welded stainless parts; stainless, austenitic.

ALMET 405.
M-248; 0.05 max C, 11.5-13.5 Cr, 0.10-0.30 Al, bal Fe.
Soft: 75,000 TS; 35,000 YS; 20 El; 150 Brin.
Hard. 190,000 TS; 145,000 YS; 8 El; 300 Brin.
For chemical plant equipment, corrosion resistant.

ALMET 410.
M-248; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Soft. 75,000 TS; 35,000 YS; 15 El, 150 Brin.
Hard: 190,000 TS; 145,000 YS; 8 El, 300 Brin.
For valve trim, cold headed parts; corrosion resistant.

ALMET 416.
M-248, 0.15 max C, 12-14 Cr, 0.07 min S or Se, bal Fe
Soft: 75,000 TS, 35,000 YS, 14 El, 150 Brin
½H-temper: 115,000 TS, 80,000 YS; 16 El; 185 Brin.
For valve trim, cold headed parts, corrosion resistant, free-cutting

ALMET 420.
M-248, 0.15 min C, 12-14 Cr, bal Fe.
Soft: 95,000 TS; 45,000 YS; 14 El; 176 Brin.
Hard: 250,000 TS, 230,000 YS, 5 El, 520 Brin.
For springs, dental instruments; hardenable, corrosion resistant.
Spring: 75,000 TS, 156 Brin
For costume jewelry, ornamental parts; brass.

ALMET 430.
M-248, 0.12 max C, 14-18 Cr, bal Fe
Soft: 75,000 TS; 40,000 YS; 15 El, 156 Brin
Hard. 140,000 TS; 130,000 YS; 4 El, 300 Brin.
For screws, rivets, formed parts; corrosion resistant, good formability

ALMET 434
M-248, 0.10 max C, 15-17 Cr, 0.75-1.10 Cu, bal Fe.
Soft 75,000 TS, 40,000 YS; 15 El; 156 Brin.
Hard: 140,000 TS; 130,000 YS; 4 El; 300 Brin.
For sponge wire, corrosion resistant

ALMET 442.
M-248, 0.35 max C, 18-23 Cr, bal Fe
Soft: 100,000 TS; 50,000 YS; 11 El; 156 Brin.
Hard 165,000 TS; 155,000 YS; 1 El; 260 Brin.
For heat resistant parts; corrosion and heat resistant.

ALMET 446.
M-248; 0.35 max C, 23-27 Cr, 0.25 max Ni, bal Fe.
Soft: 110,000 TS; 50,000 YS; 10 El; 156 Brin.
Hard: 175,000 TS; 160,000 YS; 1 El; 260 Brin.
For heat resistant parts; heat and oxidation resistant.

ALMET 1235.
M-248; 0.35 C, 12-14 Cr, bal Fe.
For corrosion resistant wire parts; Type 420 stainless.

ALMET C-20.
M-248; 0.07 max C, 29 Ni, 20 Cr, 3 min Cu, bal Fe.
Rolled: 85,000 TS; 35,000 YS; 35-50 El; 50-70 RA; 150-180 Brin.
For pump and valve parts; corrosion and heat resistant.

ALMINAL A2.
M-1273, M-1274; 0.02 Cu, 0.15 Si, 0.15 Fe, 99.8 min Al.
M-temper: 8000 TS; 30 El.
For structural members; corrosion resistant.

ALMINAL A3
M-1273, M-1274; 0.05 Cu, 0.3 Si, 0.4 Fe, 0.05 Mn, bal Al.
M-temper: 9000 TS; 25 El.
For structural members, corrosion resistant.

ALMINAL A4.
M-1273, M-1274, 0.1 Cu, 0.5 Si, 0.7 Fe, 0.1 Mn, bal Al.
M-temper: 9000 TS, 20 El.
For structural members, corrosion resistant.

ALMINAL C2
M-1273, M-1274; 0.7-2.5 Cu, 9-11 Si, 0.3 Mg, 1 Fe, 0.5 Mn, 1 Ni, 1.2 Zn, 0.2 Ti, bal Al
Sand cast: 18,000 TS
Permanent mold. 20,000 TS.
For pressure tight castings, corrosion resistant

ALMINAL C4.
M-1273, M-1274, 2-4 Cu, 4-6 Si, 0.15 Mg, 0.8 Fe, 0.6 Mn, 0.3 Ni, 0.5 Zn, 0.2 Ti, bal Al.
Sand cast. 20,000 TS; 2 El
Permanent mold: 22,400 TS; 2 El
For general castings, corrosion resistant.

ALMINAL C5
M-1273, M-1274; 0.1 Cu, 3-6 Mg, 0.3 Si, 0.6 Fe, 0.5 Mn, 0.1 Ni, 0.1 Zn, bal Al
Sand cast: 20,000 TS, 3 El
Permanent mold. 24,600 TS; 5 El
For structural members and castings, corrosion resistant.

ALMINAL C6
M-1273, M-1274; 0.1 Cu, 0.1 Mg, 10-13 Si, 0.5 Mn, 0.1 Ni, 0.1 Zn, bal Al
Sand cast: 23,500 TS, 5 El.
Permanent mold: 27,000 TS, 7 El.
For pressure tight castings, corrosion resistant

ALMINAL C7
M-1273, M-1274; 1.0-2.5 Cu, 0.2 Mg, 1.5-3.5 Si, 0.3-1.4 Fe, 0.5-1.7 Ni, 0.1 Mn, bal Al.
Sand cast: 20,000 TS; 2 El.
Permanent mold: 22,400 TS, 2 El.
For structural members and castings, pressure tight castings

ALMINAL C8.
M-1273, M-1274, 0.1 Cu, 0.4 Mg, 0.6 Fe, 4.5-6.0 Si, 0.4 Mn, 0.1 Ni, 0.1 Zn, bal Al
Sand cast: 24,600 TS; 2.5 El
WP-temper: 38,000 TS; 2.5 El
For pressure tight castings; corrosion resistant, good castability.

ALMINAL C9.
M-1273, M-1274; 0.1 Cu, 0.4 Mg, 0.6 Fe, 10-13 Si, 0.4 Mn, 0.1 Ni, 0.1 Zn, bal Al.
Sand cast: 24,600 TS, 1.5 El.
WP-temper: 42,500 TS.
For pressure tight castings; corrosion resistant, good castability

ALMINAL C10.
M-1273, M-1274; 0.1 Cu, 9.5-11 Mg, 0.35 Si, 0.3 Fe, 0.2 Ti, bal Al.
Sand cast: 40,000 TS; 8 El.
Permanent mold: 44,800 TS; 12 El.
For structural castings; corrosion resistant.

ALMINAL C11.
M-1273, M-1274, 4-5 Cu, 0.25 Si, 0.25 Fe, 0.2 T bal Al.
Sand cast: 40,000 TS; 7 El.
Permanent mold: 44,800 TS, 19 El.
For aircraft engine castings; age-hardened.

ALMINAL C12.
M-1273, M-1274; 9.0-10.5 Cu, 0.4 Mg, 2 Si, 0.5-1 Fe, 0.6 Mn, 0.5 Ni, 0.1 Zn, bal Al.
Sand cast: 100 Brin
Permanent mold: 150 Brin
For structural members and castings, age-harden

ALMINAL C13
M-1273, M-1274, 0.5-1.3 Cu, 0.8-1.5 Mg, 11-13 2-3 Ni, 0.8 Fe, 0.5 Mn, bal Al
Sand cast 24,500 TS; 100 Brin
Permanent mold 36,000 TS, 150 Brin.
For pressure tight castings, age-hardened, corros resistant.

ALMINAL C15.
M-1273, M-1274, 1.3-3.0 Cu, 0.5-1.7 Mg, 0.6-2.0 0.8-1.4 Fe, 0.5-2.0 Ni, 0.2 Ti, bal Al
Sand cast 40,400 TS; 100 Brin
Permanent mold 47,100 TS, 150 Brin
For structural members, age-hardened, high temperature uses

ALMINAL W4
M-1273, M-1274, 0.15 Cu, 1.75-2.25 Mg, 0.6 Si, 0.7 Fe, 0.5 Mn, 0.2 Ti, bal Al
M-temper 24,600 TS, 18 El
For structural members, corrosion resistant

ALMINAL W5
M-1273, M-1274, 3-4 Mg, 0.15 Cu, 0.6 Si, 0.7 1 Mn, 0.2 Ti, bal Al
M temper, 31,400 TS, 12,000 YS, 18 El
For structural members; corrosion resistant

ALMINAL W6.
M-1273, M-1274, 0.15 Cu, 4.5-5.5 Mg, 0.6 Si, 0.7 Fe, 1 Mn, 0.2 Ti, bal Al
M-temper: 36,000 TS; 17,000 YS; 18 El
For structural members, corrosion resistant

ALMINAL W7
M-1273, M-1274, 0.15 Cu, 6.5-7.5 Mg, 0.6 Si, 0.7 Fe, 1 Mn, 0.2 Ti, bal Al
M-temper 44,800 TS, 19,000 YS, 18 El
For structural members, corrosion resistant.

ALMINAL W9
M-1273, M-1274, 0.15 Cu, 0.4-0.9 Mg, 0.3-0.7 Si 0.6 Fe, 0.2 Ti, bal Al
M-temper 15,700 TS, 10,000 YS, 15 El
W-temper 19,500 TS, 11,000 YS, 18 El
WP-temper. 27,000 TS; 22,400 YS, 12 El
For structural members, age-hardened

ALMINAL W10
M-1273, M-1274, 0.15 Cu, 0.4-1.5 Mg, 0.75-1.3 0.6 Fe, 1 Mn, 0.2 Ti, bal Al
W-temper 27,000 TS, 15,700 YS, 18 El
WP-temper 40,400 TS; 33,600 YS; 10 El
For structural members; age-hardened

ALMINAL W11
M-1273, M-1274, 1-2 Cu, 0.5-1.25 Mg, 0.75-1.25 0.75 Fe, 1 Mn, 0.3 Ti, bal Al
W-temper: 38,100 TS; 22,400 YS, 15 El
WP-temper. 56,000 TS; 42,600 YS; 6 El.
For structural members, age-hardened

ALMINAL W12.
M-1273, M-1274; 1.8-2.5 Cu, 0.65-1.2 Mg, 0.55-1.2 Si, 0.6-1.2 Fe, 0.6-1.4 Ni, 0.2 Ti, bal Al
WP-temper: 60,500 TS; 47,100 YS; 10 El.
For aircraft engine components; age-hardened, high strength.

ALMINAL W14.
M-1273, M-1274; 3.5-5.0 Cu, 0.4-1.2 Mg, 0.7 Si, 0.7 Fe, 0.4-1.2 Mn, 0.3 Ti, bal Al.
Heat treated: 53,500-56,000 TS; 31,000-33,600 YS; 15-10 El.
For structural members; age-hardened.

ALMINAL W15.
M-1273, M-1274; 3.5-4.8 Cu, 0.6 Mn, 1.5 Si, 1 Fe, 1.2 Mn, 0.3 Ti, bal Al
W-temper 53,500-56,000 TS, 31,400-33,600 YS, 15-10 El
WP-temper: 62,700-67,200 TS, 53,800-58,000 YS; 8-6 El.
For structural members, age-hardened.

ALMINAL W16.
M-1273, M-1274; 3 Cu, 4 Mg, 0.6 Si, 0.6 Fe, 1 Mn, 0.2 Ti, 4.0-8.5 Zn, bal Al.
WP temper. 78,000-85,000 TS, 67,000-74,000 YS, 5-4 El
For structural members, age-hardened, high strength

ALMINAL W-17
M 1273, M-1274; 3.5-4.5 Cu, 1.2 Mg, 0.6 Fe, 0.6 Si, 0.3 Ti, 1.8-2.3 Ni, bal Al
WP-temper 49,300 TS, 8 El
For aircraft engine components, age-hardened, high temperature uses

ALMINAL W18
M 1273, M-1274, 1.8-2.5 Cu, 1.2-1.8 Mg, 0.5-1.3 Si, 0.6-1.2 Fe, 0.6-1.4 Ni, bal Al
WP-temper 53,800 TS, 6 El
For aircraft engine components, age-hardened, high temperature uses.

ALMINAL W150.
M 1273, M-1274; 4.8 Cu, 0.85 Mg, 0.9 Si, 0.3 Ti, 1.2 Mn, bal Al
W-temper 49,000-56,000 TS; 27,000-33,600 YS, 15-12 El
For structural members; age-hardened

ALMINAL W151
M-1274, 0.4 Si, 0.7 Fe, 5-6 Cu, 0.3 Zn, 0.4 Bi, 0.4 Pb, bal Al
Heat Treated 57,000 TS, 47,000 YS, 17 El, 97 Brin
For screw machine products, fasteners, screws, clips
Free-machining Heat treatable

ALMINAL W160
M-1273, M-1274, 1.5 Cu, 2.0-3.5 Mg, 0.5 Si, 0.5 Fe, 4.5-6.5 Zn, 0.3 Ti, 0.8 Mn, bal Al
WP-temper 72,000-78,500 TS; 60,000-67,000 YS, 7-5 El
For structural members, age-hardened

ALMOLD-20.
M-1, 0.30 C, 0.70 Mn, 0.50 Si, 1.70 Cr, 0.40 Mo, bal Fe
For zinc die casting dies and plastic molds
Type P20 tool steel, mold quality.

ALMOS
M-678; 0.08-0.16 C, 0.8-1.2 Cr, 0.15-0.30 Mo, 0.6-0.9 Mn, bal Fe
Annealed: 78,000 TS, 50,000 YS; 25 El.
Hardened: 170,000 TS, 114,000 YS, 8 El
For shafts, gears; case-hardening steel

ALNEON.
M-283; 70-90 Al, 2-3 Cu, 7-22 Zn, 0.4-1.0 other elements. 28,000-48,500 TS; 10,700-17,000 YS; 1-3 El; 100-150 Brin.
For light alloy parts; age-hardening, high endurance limit.

ALNESIUM
U.S.; 3 Mg, bal Al.
For cases, containers; corrosion resistant.

ALNI
M-271; 11-13 Al, 24-26 Ni, 0-0.5 Co, bal Fe.
For magnets, Alnico III.

ALNI.
Russia, 0.10 max C, 24 Ni, 13 Al, 3.5 Cu, bal Fe.
For permanent magnets, high permeability.

ALNICO
M-373, Al-Ni-Co-Fe.
For magnets

ALNICO.
Russia; 0.10 max C, 17 Ni, 10 Al, 12.5 Co, 6 Cu, bal Fe.
For permanent magnets, high permeability

ALNICO 1
M-38, 0.10 C, 22 Ni, 12 Al, 5 Co, bal Fe.
For permanent magnets, cast

ALNICO 1
M-670, 12 Al, 21 Ni, 5 Co, 3 Cu, bal Fe
Cast permanent magnet material
Cast: 7200 Residual Flux Density Br (gauss)
470 Coercive Force, Hc, (oersteds)
1.40 Max. Energy Product, (BH) max (MGO) (MG.Oe)-Megagauss oersteds.

ALNICO 1
M-1076, 12 Al, 21 Ni, 5 Co, 2 Cu, bal Fe
Cast permanent magnet, heat treated
Peak energy product, $(B_d H_d)$ max X 10^6 1.4
Residual Induction, Br, (kilogauss) 7.0
Coercive force Hc (oersteds) 440

ALNICO II
M-38, 0.10 C, 18.5 Ni, 10 Al, 13 Co, bal Fe
For permanent magnets, cast.

ALNICO 2
M-60; 10 Al, 17 Ni, 12.5 Co, 8 Cu, bal Fe.
Isotropic permanent magnet material
Cast 3100 TS; 450 Brin
Sintered. 6500 TS; 430 Brin
For permanent magnets, cast or sintered

ALNICO 2
M-670, 10 Al, 19 Ni, 13 Co, 3 Cu, bal Fe
Cast permanent magnet material
Cast 7500 Br, 560 Hc.; 170 (BH) max (MGO).

ALNICO 2
M-1076; 10 Al, 18 Ni, 13 Co, 4 Cu, bal Fe
Cast permanent magnet, heat treated
Peak energy product $(B_d H_d)$ max X 10^6 1.6
Residual Induction, Br (kilogauss) 7.2
Coercive force Hc (oersteds) 560

ALNICO 2 SINTERED
M-1076, 10 Al, 18 Ni, 13 Co, 4 Cu, bal Fe
Pressed from powder and sintered.
Peak energy product $(B_d H_d)$ max X 10^6 1.45
Residual Induction, Br, (kilogauss) 6.9
Coercive force Hc (oersteds) 520.
Permanent magnet.

ALNICO 3
M-60, 12 Al, 25 Ni, bal Fe.
Isotropic permanent magnet material
Cast: 1200 TS; 450 Brin.
For permanent magnets; hard, brittle.

ALNICO 3.
M-670; 12 Al, 25 Ni, 3 Cu, bal Fe.
Cast permanent magnet material.
Cast: 7000 Br.; 480 Hc; 1.35 (BH) max (MGO).

ALNICO 3.
M-1076; 12 Al, 25 Ni, 2 Cu, bal Fe.
Cast permanent magnet, heat treated.
Peak energy product (B_d H_d max X 10^6 1.35
Residual Induction, Br (kilogauss) 6.9
Coercive force Hc (oersteds) 470.

ALNICO III.
M-38; 12 Al, 25 Ni, 0.04 Si, bal Fe.
For permanent magnets; cast

ALNICO 4.
M-60; 12 Al, 28 Ni, 5 Co, bal Fe.
Isotropic permanent magnet material.
Cast: 9100 TS, 450 Brin.
For permanent magnets

ALNICO 4.
M-670; 12 Al, 27 Ni, 5 Co, bal Fe.
Cast permanent magnet material.
Cast: 5600 Br.; 720 Hc, 1.35 (BH) max (MGO).

ALNICO 4.
M-1076; 12 Al, 27 Ni, 5 Co, 2 Cu, bal Fe
Cast permanent magnet, heat treated.
Peak energy product (B_d H_d) max X 10^6 1.3
Residual Induction, Br (kilogauss) 5.5
Coercive force Hc (oersteds) 700.

ALNICO IV.
M-38; 8 Al, 15 Ni, 24 Co, 3 Cu, 1 Ti, bal Fe.
For permanent magnets; cast

ALNICO 4 SINTERED.
M-1076, 12 Al, 27 Ni, 5 Co, 2 Cu, bal Fe.
Pressed from powder and sintered.
Peak energy product (B_d H_d max X 10^6 1.2
Residual Induction, Br, (kilogauss) 5.2
Coercive force Hc (oersteds) 700.
Permanent magnet.

ALNICO 5.
M-60; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe
Anisotropic permanent magnet material
Cast. 5400 TS, 500 Brin
Sintered 450 Brin.
Crystal oriented-cast, high energy product.

ALNICO 5.
M-670, 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe
Cast permanent magnet material.
Cast. 12,800 Br., 640 Hc, 5.50 (BH) max (MGO).

ALNICO 5.
M-1076, 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe.
Cast permanent magnet, cooled in magnetic field.
Peak energy product (B_d H_d) max X 10^6 5.25
Residual Induction, Br (kilogauss) 12.5
Coercive force Hc (oersteds) 600.

ALNICO V.
M-38; 8 Al, 14 Ni, 24 Co, bal Fe.
For permanent magnets, cast.

ALNICO 5-7.
M-1076; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe.
Cast permanent magnet, cooled in magnetic field
Peak energy product B_d H_d) max X 10^6 7.50
Residual Induction Br (kilogauss) 13.4
Coercive force Hc (oersteds) 730.

ALNICO 5 Cb.
M-1192, 8 Al, 14 Ni, 24 Co, Cb, bal Fe.
For permanent magnets; high permeability

ALNICO 5 Col.
M-670; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe.
Cast permanent magnet material.
Cast: 13,500 Br; 740 Hc.; 7.55 (BH) max (MGO).

ALNICO 5 DG.
M-670; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe.
Cast permanent magnet material.
Cast: 13,300 Br.; 670 Hc.; 6.50 (BH) max (MGO).

ALNICO 5 SINTERED.
M-1076; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe.
Pressed from powder and sintered.
Peak energy product (B_d H_d) max X 10^6 3.5
Residual Induction, Br, (kilogauss) 10.5
Coercive force Hc (oersteds) 600.
Cooled in magnetic field, permanent magnet.

ALNICO 6
M-60; 8 Al, 15 Ni, 24 Co, 1.2 Ti, bal Fe.
Anisotropic permanent magnet material.
Cast or sintered.
Cast: 2300 TS, 560 Brin.
High coercive force.

ALNICO 6.
M-670, 8 Al, 16 Ni, 24 Co, 3 Cu, 1 Ti, bal Fe
Cast permanent magnet material.
Cast 10,500 Br., 780 Hc; 3.90 (BH) max (MGO).

ALNICO 6
M-1076; 8 Al, 16 Ni, 24 Co, 3 Cu, 1 Ti, bal Fe
Cast permanent magnet, heat treated
Peak energy product (B_d H_d) max X 10^6 3.5
Residual Induction Br (kilogauss) 10.1
Coercive force Hc (oersteds) 750

ALNICO 6 SINTERED.
M-1076, 8 Al, 16 Ni, 24 Co, 3 Cu, 1 Ti, bal Fe.
Pressed from powder and sintered.
Peak energy product (B_d H_d) max X 10^6 2.76
Residual Induction, Br, (kilogauss) 8.8
Coercive force Hc (oersteds) 800
Cooled in magnetic field; permanent magnet

ALNICO VI
M-38, 15 Ni, 8 Al, 22 Co, bal Fe
Cast 20,000 TS.
For permanent magnets, cast, Br 10,100, Hc 750

ALNICO 7
M-60, 8.5 Al, 18 Ni, 24 Co, 3.25 Cu, 5 Ti, bal Fe
Anisotropic permanent magnet material.
Cast 600 Brin
High coercive force

ALNICO 7
M-670, 8.5 Al, 18 Ni, 24 Co, 3.25 Cu, 5 Ti, bal Fe
Cast permanent magnet material.
Cast 7700 Br, 1050 Hc., 2.85 (BH) max (MGO)

ALNICO 7C.
M-1192, Al-Ni-Co, bal Fe.
For magnetic structures and devices, high coercive strength.

ALNICO 7-5 Oriented
M-1076, 7 Al, 14 Ni, 31 Co, 4 Cu, 5 Ti, bal Fe
Cast permanent magnet, cooled in magnetic field
Peak energy product (B_d H_d) max X 10^6 3.7
Residual Induction Br (kilogauss) 8.57
Coercive force Hc (oersteds) 1040

ALNICO 7-5 Unoriented.
M-1076; 7 Al, 14 Ni, 31 Co, 4 Cu, 5 Ti, bal Fe
Cast permanent magnet, heat treated
Peak energy product (B_d H_d) max X 10^6 2.5
Residual Induction Br (kilogauss) 7.45
Coercive force Hc (oersteds) 890.

ALNICO 8.
M-60; Ni, Co, Al, Cu, Ti, Fe.
Anisotropic permanent magnet material.
Cast or sintered.
High energy product; high coercive force.

ALNICO 8.
M-670; 35 Co, 15 Ni, 4 Cu, 5 Ti, 7 Al, bal Fe.
Cast permanent magnet material.
Cast: 8200 Br.; 1650 Hc.; 5.3 (BH) max (MGO).

ALNICO VIII.
M-31, M-38; 7 Al, 15 Ni, 35 Co, 34 Fe, 4 Cu, 5 Ti.
Permanent magnets for motors, generators, focusing of electron beams, magnetic cores; high resistance to demagnitization.

ALNICO 8B.
M-1076; 7 Al, 15 Ni, 35 Co, 3 Cu, 5 Ti, bal Fe.
Cast permanent magnet, cooled in magnetic field.

Peak energy product (B_d H_d) max X 10^6	5.0
Residual Induction Br (kilogauss)	8.5
Coercive force Hc (oersteds)	1600

ALNICO 8H.
M-1076; 7 Al, 15 Ni, 35 Co, 3 Cu, 5 Ti, bal Fe.
Cast permanent magnet, cooled in magnetic field.

Peak energy product (B_d H_d) max X 10^6	5.0
Residual Induction, Br, (kilogauss)	7.0
Coercive force Hc (oersteds)	1900.

ALNICO 8HE.
M-1076; 7 Al, 15 Ni, 35 Co, 3 Cu, 5 Ti, bal Fe.
Cast permanent magnet, cooled in magnetic field.

Peak energy product (B_d H_d) max X 10^6	6.0
Residual Induction, Br, (kilogauss)	9.3
Coercive force Hc (oersteds)	1550

ALNICO 9.
M-60;
Anisotropic permanent magnet material.
Crystal oriented-cast only.
Highest energy product alnico material, high coercive force

ALNICO 9
M-670, 35 Co, 15 Ni, 5 Ti, 4 Cu, 7 Al, bal Fe
Cast permanent magnet material.
Cast: 10,500 Br, 1500 Hc; 9.0 (BH) max (MGO) (tentative properties).

ALNICO 9
M-1076, 33 Co, 15 Ni, 3 Cu, 5 Ti, 7 Al, bal Fe
Cast permanent magnet, cooled in magnetic field.

Peak energy product (B_d H_d) max X 10^6	10.0
Residual Induction, Br, (kilogauss)	10.5
Coercive force Hc (oersteds)	1600

ALNICO 160
M-1246, Al, Ni, Co.
For permanent magnets, sintered

ALNICO 350
M-Germany; 7.8 Al, 15 Ni, 34 Co, 3.5 Cu, 5 Ti, bal Fe
For electrical and magnetic equipment
Permanent magnet, high permeability.

ALNICO 400
M-Poland; 8 Al, 14 Ni, 24 Co, 3 Cu, 0.5 Ti, bal Fe.
For electrical and magnetic equipment.
Permanent magnet, high permeability.

ALNICUS GR. USM75.
M-1534; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe
Cast: 5500 TS, 500 Brin
For magnetic chucks, meters, starting devices, electrocardiographs, permanent magnets, oriented

ALNICUS GR. USM65.
M-1534; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe.
Cast: 5500 TS; 500 Brin.
For magnetic chucks, meters, starting devices, electrocardiographs; permanent magnets, oriented.

ALNIFER
M-926; low C-steel clad with Al on one side and Ni on other side.
For electron tubes.

ALOI.
M-575.
For single plates in textile industry; non-gassing, non-distorting.

ALOYCO 18-8 Mo.
M-1023; 0.2 C, 18 Cr, 8 Ni, 0.2 Mo, bal Fe.
For valves, fittings, corrosion resistant.

ALOYCO 18-8S.
M-1023; 0.07 max C, 0.7 Mn, 19-21 Cr, 8-10 Ni, bal Fe.
For valves, fittings; Type 304; stainless, autenitic.

ALOYCO-20
M-1023; 0.07 max C, 19-21 Cr, 28-30 Ni, 3.5-4.5 Cu, 2.5-3.0 Mo, 1.5 max Si, 0.7 Mn, bal Fe.
Water quenched: 75,000 TS; 35,000 YS; 45 El; 50 RA, 150 Brin.
For valves, castings, chemical equipment; austenitic, to handle H_2SO_4 solutions.

ALOYCO 25-20.
M-1023, C, 25 Cr, 20 Ni, bal Fe.
For valves, fittings; corrosion resistant.

ALOYCO 35
M-1023; 24-26 Cr, 19-21 Ni, 2.75-3.25 Mo, 2.5-3.0 Cu, 0.07 max C, bal Fe.
Water quenched: 75,000 TS; 40,000 YS; 45 El; 45 RA; 160 Brin.
For chemical equipment, to handle hot H_2SO_4 solutions.

ALOYCO 37.
M-1023; 0.07 max C, 20 Ni, 25 Cr, 3 Mo, 2.7 Cu, 3 Si, 0.7 Mn, bal Fe.
Annealed: 70,000 min TS, 40,000 min YS; 30 El; 45 RA; 145 Brin.
For chemical plant equipment; stainless, austenitic castings

ALOYCO N-2
M-1023; 0.07 C, 64 Ni, 28 Mo, 0.6 Mn, bal Fe
Cast: 82,000 TS; 57,000 YS; 9 El, 13 RA; 230 Brin.
For pump parts, valves, acid resistant.

ALOYCO N-3
M-1023, 15.5-17.5 Cr, 16-18 Mo, 3.75-5.25 W, 4.5-7.0 Fe, 0.1 max C, 0.2-0.4 V, 1 max Mn, bal Ni.
Water quenched: 75,000 TS; 45,000 YS, 12 El; 15 RA; 190 Brin
For chemical equipment, corrosion resistant to hot corrosive solutions.

ALOY-NUM
M-549, 4 Si, 2 Cu, bal Al.
For pistons, cylinder heads; age-hardenable.

ALPACCA
Eng; 65.9 Cu, 19.25 Zn, 14.6 Ni, 0.5 Fe.
For base for plated table ware, corrosion resistant.

ALPAKKA (Alpaca).
Eng, 60 Cu, 19 Zn, 15 Ni, 2 Ag.
For base metal for silver plated tableware; resists corrosion.

ALPAX.
M-75; 10-13 Si, 0.2-0.6 Mg, 0.3-0.7 Mn, bal Al.
Sand cast: 24,000 TS; 9,000 YS; 6-8 El; 55 Brin.
Chill cast: 30,500 TS; 12,500 YS; 10-12 El; 65 Brin.
For light corrosion resistant castings; corrosion resistant.

ALPAX
M-106; 10-13 Si, bal Al.
Sand cast, 23,500-26,800 TS; 6,700-7,800 YS; 5-8 El; 45-50 Brin; 4.5 Izod.
For castings of thin sections, hydraulic parts.
Gen. Eng. BS 1490; LM 6-M; BS 4L 33.

ALPAX.
M-137; 10-13 Si, 0.2 max Ti, 0.6 max Fe, 0.5 max Mn, bal Al.
Sand cast: 23,100 TS; 10,000 YS; 5-10 El; 50 RA; 60 Brin.
Permanent mold: 28,000 TS; 12,000 YS; 8-14 El; 60 RA, 65 Brin.
For water pumps, engine parts; corrosion resistant, good castability.

ALPAX.
M-620; 4.5 Cu, 0.5 Mg, 0.4 Ti, bal Al.
36,000-43,000 TS; 29,000-36,000 YS; 2-1 El.
For light alloy parts; age-hardenable.

ALPAX ALPHA.
M-75; 10-13 Si, 0.2-0 6 Mg, 0.3-0.7 Mn, bal Al.
Sand cast· 22,500 TS; 9,000 YS, 2-4 El, 64 Brin.
Chill cast: 3-5 El; 70 Brin.
For light corrosion resistant castings; corrosion resistant.

ALPAX ALPHA
M-137; 10-13 Si, 0 6 Mg, bal Al.
Sand cast· 22,000 TS; 2-4 El, 64 Brin.
Permanent mold: 30,000 TS; 3-5 El, 70 Brin.
For gear cases, instrument housings; corrosion resistant, good castability.

ALPAX "B" (ALPAX BETA).
M-106; 0 2-0.6 Mg, 10-13 Si, 0 3-0.7 Mn, bal Al
Sand cast: 24,600-29,000 TS; 14,500-16,800 YS, 1.5-3 El; 60-70 Brin; 1.5 Izod.
General purpose sand or chill cast aluminum.
Gen. Eng BS 1490: LM 9-P.

ALPAX BETA.
M-75; 10-13 Si, 0 2-0 6 Mg, 0.3-0.7 Mn, bal Al
Sand cast. 24,000 TS, 16,000 YS; 2-3 El; 75 Brin.
Chill cast: 34,000 TS, 20,000 YS, 2-4 El; 85 Brin.
For light corrosion resistant castings; corrosion resistant.

ALPAX BETA
M-137; 10-13 Si, 0 2-0 6 Mg, 0 6 Fe, 0 2 max Ti, bal Al
Sand cast: 26,000 TS; 16,000 YS, 2-3 El, 75 Brin.
Permanent mold: 34,000 TS; 18,000 YS, 2-4 El, 85 Brin.
For gear boxes, housings, general castings; corrosion resistant, good castability.

ALPAX "G" (ALPAX GAMMA)
M-106, 0.2-0 6 Mg, 10-13 Si, 0 3-0 7 Mn, bal Al.
Sand cast 35,000-37,000 TS, 29,000-31,000 YS; 0-2 El; 90-100 Brin; 0 9 Izod.
General purpose sand or chill cast aluminum
Gen Eng. BS 1490: LM 9WP, BS L 75.

ALPAX GAMMA.
M-75; 10-13 Si, 0 2-0.6 Mg, 0.3-0 7 Mn, bal Al
Sand cast: 38,000 TS; 32,000 YS, 1-2 El, 95 Brin
Chill cast: 36,000 TS; 1-3 El; 100 Brin
For light corrosion resistant castings, corrosion resistant

ALPAX GAMMA.
M-137; 10-13 Si, 0 6 Mg, bal Al.
Aged· 36,000 TS; 30,000 YS, 1-2 El; 95 Brin
For engine components, general castings; corrosion resistant, good castability.

ALPAX Hau COBALT.
M-75; 9 3 Si, 0.45 Co, 0.2 Mg, bal Al.
Cast: 48,000 TS; 26,000 YS; 4 El.
For light weight housings, casings, cover plates. Corrosion resistant.

ALFERM.
Japan, 14-16 Al, bal Fe.
For magnetic laminations; high permeability.

ALPHA.
M-1; High C, bal Fe.
For drills.

ALPHA GAMMA.
M-137; 10-13 Si, Mg, bal Al.
For light alloy castings; corrosion resistant.

ALPINE AHD.
M-1314; 0.5 C, 1 Cr, 0.1 V, bal Fe.
For gears, bolts, springs, crankshafts; oil hardened, shock resistant.

ALPINE AHK
M-1314; 0.55 C, 1 Cr, 0.18 V, 1.85 W, bal Fe.
For cold work tools, upsetters; oil hardened.

ALPINE AHKW
M-1314; 0.35 C, 1 Cr, 0 18 V, 1.85 W, bal Fe.
For cold work tools, upsetters, oil hardened.

ALPINE AKL
M-1314, 0 67 C, 1.3 Si, 0 5 Mn, 0.5 Cr, bal Fe.
For riveters, upsetters, springs, tough, oil hardened.

ALPINE ANP3
M-1314; 0 5 C, 1 Cr, 3 25 Ni, bal Fe
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant

ALPINE BEC60
M-1314, 0.15 C, 0 65 Cr, 0.5 Mn, bal Fe
For gears, cams, camshafts, fasteners; case hardened, tough

ALPINE BEC80
M-1314, 0 20 C, 1 25 Mn, 1 15 Cr, bal Fe
For gears, cams, camshafts, fasteners, case hardened, tough.

ALPINE BLH
M-1314, 0 2 C, 1 15 Cr, 1 25 Mn, bal Fe
For gears, cams, camshafts, fasteners; case hardened, tough.

ALPINE BR55
M-1314, 0 56 C, 0 3 Si, 0 55 Mn, bal Fe
Heat treated. 155,000 TS, 110,000 YS; 15 El, 45 RA, 350 Brin
For tools, hammers, shafts, axes, gears, bolts; water hardened.

ALPINE-EC3.
M-1314, 0.13 C, 0 4 Cr, bal Fe.
For gears, bolts, pinions, cams, camshafts
Case hardening, wear resistant

ALPINE ECR15
M-1314; 0 16 C, 1 15 Mn, 0 95 Cr, bal Fe
For gears, bolts, camshafts, shafts, case hardened.

ALPINE ECR20.
M-1314; 0 20 C, 1 25 Mn, 1 15 Cr, bal Fe
For gears, bolts, bearings, camshafts; case hardened.

ALPINE ED.
M-1314; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El, 60 RA, 145 Brin
For gears, shafts, machine tool parts, case hardened

ALPINE EFW.
M-1314, 0.15 C, 0.37 Mn, 0 25 Si, bal Fe.
Annealed. 70,000 TS, 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, shafts, machine tool parts; case hardened.

ALPINE EJR35.
M-1314; 0.13 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, machine tool parts; case hardening steel, shock resistant.

ALPINE EJR45.
M-1314; 0.13 C, 4.5 Ni, 1.1 Cr, bal Fe.
For gears, bolts, cams, pinions, camshafts; case hardening steel, shock resistant.

ALPINE EJRA.
M-1314; 0.13 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, pinions, cams, shafts, camshafts; case hardening steel, shock resistant.

ALPINE EL1.
M-1314, 0.13 C, 1.5 Ni, 0.2 Cr, bal Fe.
For gears, fasteners, crankshafts; case hardening steel, tough.

ALPINE ERJ15.
M-1314; 0.15 C, 1.55 Cr, 1.55 Ni, 0.50 Mn, bal Fe.
For gears, bolts, camshafts, cams; case hardened, shock resistant.

ALPINE ERJ20
M-1314; 0.18 C, 2 Cr, 2 Ni, 0.5 Mn, bal Fe.
For gears, bolts, camshafts; case hardened, shock resistant.

ALPINE ERM15.
M-1314, 0.15 C, Cr, Mo, bal Fe.
For gears, bolts, machine tool parts; case hardened, tough.

ALPINE ERM20.
M-1314; 0.20 C, Cr, Mo, bal Fe
For gears, bolts, machine tool parts; case hardened, tough.

ALPINE EXTRA M.
M-1314; 1.0 C, 0.25 Mn, 0.1 V, bal Fe
For drills, taps, reamers, broaches, Type W2; water hardened

ALPINE EXTRA MH.
M-1314, 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 110,000 TS, 58,000 YS, 19 El, 40 RA; 210 Brin.
For springs, tools, drills, taps, reamers, Type W1; water hardened

ALPINE EXTRA SPEZIAL ZH II
M-1314, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El, 30 RA; 400 Brin
For springs, taps, cutters, drills, Type W1; water hardened

ALPINE EXTRA ZAH.
M-1314, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated. 175,000 TS; 128,000 YS, 12 El; 37 RA, 355 Brin
For rails, springs, axes, punches, Type W1, water hardened

ALPINE EXTRA ZH I.
M-1314; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS, 53,000 YS, 21 El, 42 RA; 200 Brin.
For drills, taps, cutters, hobs, reamers, Type W1; water hardened.

ALPINE EXTRA ZH II.
M-1314; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For cutters, drills, reamers, taps, hobs; Type W1; water hardened.

ALPINE EZH.
M-27; 0.9-1.0 C, bal Fe.
For tools, lathe and planer cutters; water hardened.

ALPINE FAM.
M-1314; 0.46 C, Mn, bal Fe.
Hot rolled: 98,000 TS; 60,000 YS; 24 El; 45 RA; 212 Brin.
For gears, bolts, machine tool parts; water hardened.

ALPINE FRS.
M-1314; 0.67 C, 1.3 Si, 0.5 Cr, bal Fe.
For punches, crimpers, upsetters; water or oil hardened.

ALPINE HIR15 W/H.
M-1314; 0.28-0.35 C, 0.35 Si, 0.6 Mn, 1.5 Ni, 0.5 Cr, bal Fe
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

ALPINE HIR 25.
M-1314, 0.28 C, 0.7 Cr, 2.5 Ni, bal Fe
For gears, bolts, machine tool parts; oil hardened, shock resistant.

ALPINE HIRA 35 W/H
M-1314; 0.22-0.30 C, 0.35 Si, 0.60 Mn, 0.7 Cr, 3.5 Ni, bal Fe
For gears, bolts, machine tool parts; oil hardened, shock resistant.

ALPINE HIRA 45.
M-1314; 0.35 C, 1.3 Cr, 4.5 Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

ALPINE HIRA W/H
M-1314; 0.28-0.35 C, 0.7 Cr, 2.5 Ni, bal Fe
For gears, bolts, machine tool parts; oil hardened, shock resistant

ALPINE HMV15.
M-1314, 0.30 C, 1.35 Mn, 0.25 Si, bal Fe
For punches, crimpers, gears, bolts; oil hardened, tough.

ALPINE HMV25
M-1314, 0.41 C, 0.25 Si, 0.65 Mn, 1.0 Cr, bal Fe
For gears, bolts, machine tool parts; oil hardened, tough.

ALPINE HMV35
M-1314, 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
For punches, springs, upsetters; oil hardened, tough

ALPINE HMV42.
M-1314, 0.42 C, 0.25 Si, 1.75 Mn, 0.1 V, bal Fe.
For gears, punches, dies, tools; oil hardened, tough

ALPINE HMV50
M-1314, 0.50 C, 1.05 Cr, 0.1 V, 0.95 Mn, bal Fe
For springs, tools, gears, bolts, shafts, oil hardened, shock resistant

ALPINE HMV60
M-1314, 0.58 C, 1.0 Cr, 0.09 V, 0.95 Mn, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant

ALPINE HR10.
M-1314, 0.41 C, 1.0 Cr, 0.65 Mn, bal Fe.
For gears, bolts, shafts, fasteners; oil or water hardened.

ALPINE HRIM15
M-1314; 0.34 C, Cr, Ni, Mo, bal Fe.
For gears, bolts crankshafts; oil hardened, tough.

ALPINE HRIM20
M-1314; 0.30 C, 2 Cr, 0.3 Mo, 2 Ni, bal Fe.
For dies, shafts, crankshafts, upsetters; oil hardened, shock resistant.

ALPINE HRM15.
M-1314; 0.25 C, 1.0 Cr, 0.65 Mn, 0.2 Mo, bal Fe.
For gears, bolts, crankshafts;
oil hardened, tough.

ALPINE HRM35.
M-1314; 0.33 C, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, crankshafts, fasteners;
oil hardened, tough.

ALPINE HRM40.
M-1314; 0.42 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, crankshafts, fasteners;
oil hardened, tough.

ALPINE HRM45.
M-1314; 0.42 C, Cr, Mo, bal Fe.
For gears, bolts, crankshafts, axles;
oil hardened, tough.

ALPINE HRMV25.
M-1314; 0.30 C, 2.5 Cr, 0.2 Mo, 0.55 Mn,
bal Fe.
For header dies, upsetters, sprockets;
oil hardened, tough.

ALPINE KL3.
M-1314; 1.0 C, 1.55 Cr, 0.35 Mn, bal Fe.
For bearings, cutters, bushings; water or oil
hardened, wear resistant.

ALPINE MA3.
M-1314; 0.60 C, 0.80 Mn, 0.25 Si, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El;
40 RA; 325 Brin.
For hammers, axes, gears, machine tool parts,
water hardened.

ALPINE MA4.
M-1314; 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn,
bal Fe.
Hot rolled: 98,000 TS; 60,000 YS; 24 El; 45 RA;
215 Brin
For gears, bolts, shafts, fasteners;
water hardened

ALPINE MA5.
M-1314; 0.35 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA;
185 Brin.
For gears, bolts, shafts, fasteners; water hardened

ALPINE MA6
M-1314; 0.32 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled: 83,000 TS; 51,000 YS, 32 El,
55 RA; 180 Brin
For gears, shafts, machine tool parts;
water hardened.

ALPINE MAC
M-1314; 0.41 C, 0.25 Si, 0.65 Mn, 1.0 Cr, bal Fe.
For gears, bolts, crankshafts, machine tool parts;
water hardened.

ALPINE MN13.
M-1314; 1.2 C, 12.5 Mn, 0.4 Si, bal Fe.
For rails, gauges, wear parts; wear and
abrasion resistant.

ALPINE NALH.
M-1314; 0.34 C, 1.4 Cr, 1.1 Al, 0.6 Mn, bal Fe.
For oil refinery equipment; heat and creep resistant.

ALPINE NALJ
M-1314; 0.33 C, 0.5 Mn, 1.1 Al, 1.7 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant.

ALPINE NALM.
M-1314; 0.32 C, 1.1 Cr, 1.1 Al, 0.18 Mo,
bal Fe.
For oil refinery equipment; heat and creep resistant.

ALPINE NALW.
M-1314; 0.27 C, 0.6 Mn, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment, heat and creep resistant.

ALPINE NMV.
M-1314; 0.31 C, 0.18 Mo, 2.35 Cr, 0.13 V,
bal Fe
For gears, bolts, die casting dies,
oil hardened, tough.

ALPINE PRG.
M-1314; 0.90 C, 0.80 Cr, 0.30 Mn, bal Fe
For springs, tools, drills, taps, hammers;
Type Wl, water hardened.

ALPINE PRIMA-H.
M-1314; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For blanking and forming dies; Type Wl;
water hardened.

ALPINE PRIMA ZAH.
M-1314, 0.70 C, 0.25 max Si, 0.25 max Mn,
bal Fe
Heat treated 174,000-122,000 TS,
128,000-82,0000 YS; 12-22 El; 37-52 RA;
352-241 Brin.
For wheels, die blocks, girders, rails;
Type Wl; water hardened

ALPINE RAV
M-1314, 1.15 C, 0.65 Cr, 0.10 V, bal Fe.
For form rolls, blanking dies, bearings, oil hardened,
wear resistant

ALPINE SF
M-1314; 0.65 C, 1.7 Si, 0.70 Mn bal Fe
For springs, chisels, punches, oil hardened,
shock resistant

ALPINE WAM
M-1314; 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75
W, bal Fe
For extrusion dies, rams, liners, punches,
oil hardened, hot work steel

ALPINE WAMV
M-1314, 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe
For extrusion dies, rams, liners, punches;
oil hardened, hot work steel

ALPINE WKL3
M-1314; 1.05 C, Cr, bal Fe
For bearings, cutters, liners; water hardened

ALPINE WMC
M-1314; 0.55 C, 0.7 Cr, 0.18 Mo, 1.65 Ni,
0.10 V, bal Fe
For forging and heading dies, oil hardened, tough.

ALPINE WMC5
M-1314, 0.56 C, 0.90 Cr, 0.10 V, 0.20 Mo,
2.0 Ni, bal Fe.
For forging and heading dies, oil hardened, tough

ALPINE WMW
M-1314, 0.30 C, 2.65 Cr, 8.5 W, 0.35 V, bal Fe
For extrusion dies, rams, liners, punches;
oil hardened, hot work steel.

ALPINE WMWS
M-1314; 0.30 C, 2.0 Co, 2.4 Cr, 0.25 V,
8.5 W, bal Fe
For extrusion dies, rams, liners, punches;
oil hardened, non-deforming

ALPLATE
M-671; Al coated steel wire
For screens, electrical resistance heating elements;
corrosion resistant.

ALPRO NO. 4
M-126
For yellow brass fluidizer; contains small
amount of Al.

ALPRO NO. 11.
M-126.
For deoxidizer for Cu.

ALPRO NO. 12.
M-126; 10 P, 90 Cu.
For Cu deoxidizer.

ALPRO NO. 15.
M-126
For Ni degasifying alloy

ALPRO NO. 19 AX.
M-126; 30 Mn, 70 Cu, C-free.
For adding Mn to alloys.

ALPRO NO. 19 AZ
M-126; 30 Mn, 70 Cu, C-free.
For adding Mn to alloys.

ALPRO NO 19 BX.
M-127, 30 Mn, 0 15 max. C, 2.5 Fe, bal Cu
For adding Mn to alloys

ALPRO NO 19 CX.
M-126; 30 Mn. 0.25 max. C, 4 5 max Fe, bal Cu
For adding Mn to alloys

ALPRO NO 30A.
M-126; 50 Cu, 50 Al
For copper hardener for Al alloys

ALPRO NO. 31
M-126, 75 Al, 25 Mn.
For adding Mn to alloys

ALPRO NO. 34.
M-126, 20 Ni, 80 Al.
For hardeners for Ni-Al alloys

ALPRO NO 35.
M-126, 50 Si, 50 Al.
For Si hardener for Al alloys

ALPRO NO. 39
M-126, 10 Fe, 90 Al
For adding Fe in Al alloys

ALPRO NO 40
M-126; 25 Ni, 25 Cu, 50 Al
For hardeners for Ni-Al alloys

ALPRO NO 41.
M-126, 25 Ni, 25 Mn, 50 Al.
For hardeners for Ni-Al alloys

ALPRO NO 42
M-126, 25 Ni, 25 Sn, 50 Al.
For hardeners for Ni-Al alloys

ALPRO NO 44
M-126; 25 Cu, 50 Al, 25 Mn
For adding Mn to alloys

ALPRO NO 46
M-126, 25 Fe, 50 Al, 25 Mn
For adding Mn to alloys.

ALPRO NO 50 B.
M-126; 50 Ni, 50 Cu.
For addition of Ni to bronzes.

ALPRO NO. 55.
M-126; Ni-Cu
For deoxidizer of Cu alloys; red composition densifying alloy.

ALPRO NO 112.
M-126; 15 P, 85 Cu.
For Cu deoxidizer, for copper alloys.

ALPRO NO. 126 A.
M-126; Ni-Cu.
For hardener of Al bronzes.

ALPRO NO. 126 C.
M-126; Ni-Cu.
For hardener of Al bronzes.

ALPRO NO. 126 D.
M-126; Ni-Cu.
For hardener of Al bronzes.

ALPRO NO 139.
M-126; 20 Fe, 80 Al.
For adding Fe to Al alloys

ALPRO NO 140.
M-126; 20 Ni, 40 Cu, 40 Al.

ALPRO NO. 143.
M-126; 40 Ni, 20 Cu, 40 Al.
For hardener for Ni-Al alloys.

ALPRO NO. 146.
M-126; Ni, Cr, Fe.
For gray iron improver; hardener.

ALPRO NO. 157.
M-126; 50 Ni, 50 Fe
For gray iron improver, hardener.

ALPRO NO 158.
M-126; 50 Ni, 50 Mn
For adding Mn to alloys.

ALPRO NO. 159.
M-126, 75 Ni, 25 Cr.
For gray iron improver; hardener.

ALPRO NO 220.
M-126, 10 Al, 90 Cu
For gears, cams, valves, resists abrasion, wear and shock.

ALPRO NO. 221
M-126; 10 Al, 89 Cu, 1 Fe
For ball bearings; resists abrasion, wear and shock.

ALPRO NO 223
M-126; 10 Al, 87 Cu, 3 Fe.
For bearings

ALPRO NO 224
M-126; 10 Al, 86 Cu, 4 Fe
For bearings.

ALPRO NO 300
M-126; 8 Cu, 92 Al.
For general light alloy castings

ALPRO NO. 301.
M-126, Al alloy.
For castings to be forged or die pressed.

ALPRO NO 302
M-126; 10 Cu, 90 Al
For die castings, non-hardenable

ALPRO NO 304
M-126, 2 Si, 8 Cu, bal Al
For castings.

ALPRO NO 306.
M-126; 4 Si, 6 Cu, bal Al
For castings.

ALPRO NO. 307
M-126; Al alloy
For core boxes

ALPRO NO 308.
M-126; Al alloy.
For cast cooking utensils.

ALPRO NO. 309.
M-126; Al alloy
For pistons.

ALPRO NO. 310.
M-126; 7.5-8 5 Cu, 1 5 max Fe + Si, bal Al.
For castings; non-hardenable.

ALPRO NO. 311.
M-126; 9.5-10.5 Cu, 1.5 max Fe + Si, bal Al.
For die castings; non-hardenable.

ALPRO NO. 312.
M-126; 2 Si, 8 Cu, 2 Zn, bal Al.
For castings; non-hardenable.

ALPRO NO. 314.
M-126; 4 Si, 6 Cu, bal Al.
For castings.

ALPRO NO. 315.
M-126; 7.5-8.5 Cu, 1.75-2.25 Zn, 1.75 max Fe + Si, bal Al.
For castings, non-hardenable

ALPRO NO. 316.
M-126; 4 Si, 4 Cu, bal Al.
For castings.

ALPRO NO. 317
M-126; 2 Si, 6 Cu, bal Al.
For castings

ALPRO NO. 320.
M-126; Zn, bal Al.
For light alloy castings.

ALPRO NO. 330
M-126; Al alloy.
For match plates; low degree of top shrinkage.

ALPRO NO. 331.
M-126; Si, bal Al.
For marine castings, resists sea-water corrosion.

ALPRO NO. 332.
M-126; Si, bal Al.
For general utility castings, resists sea-water corrosion.

ALPRO NO. 333.
M-126; Al alloy.
For high pressure castings; tough, dense, strong.

ALPRO NO. 335.
M-126, 4.5-5.5 Si, 0.75 max. Fe, bal Al.
19,000-21,000 TS; 4-3 El; 37 Brin.
For marine parts, castings; corrosion resistant

ALPRO NO 338
M-126; 11.0-13.5 Si, 0.8 max. Fe, bal Al.
25,000-27,500 TS; 7-6 El, 45 Brin.
For die castings, corrosion resistant.

ALPRO NO. 351.
M-126, 5 Si, bal Al
For castings, sand or die cast.

ALPRO NO. 352.
M-126; 12 Si, bal Al
For castings, die cast

ALPRO NO 360
M-126; 2 Ni, 6 Cu, bal Al.
For castings

ALPRO NO 361
M-126; 2 Ni, 6 Cu, 2 Si, bal Al.
For castings.

ALPRO NO 362.
M-126, 4 Ni, 4 Cu, 92 Al
For pistons, light alloy parts

ALPRO NO. 363.
M-126; 2 Ni, 5 Cu, 2 Si, 91 Al
For castings.

ALPRO NO. 364.
M 126, 2 Ni, 4 Cu, 4 Si, 90 Al.
For castings; age-hardened.

ALPRO NO. 365.
M-126; 3 Ni, 5 Cu, 2 Si, 90 Al
For castings, age-hardened.

ALPRO NO. 370.
M-126, 4 Cu, 2 Ni, 1.5 Mg, 92.5 Al.
At 68°F., 29,000 TS. At 482°F, 25,500 TS
For aeronautical parts; similar to "Y" alloy.

ALPRO NO 371.
M-126, 2 Cu, 1.5 Ni, 1 Mg, 0.6 Si, 94.9 Al.
For pistons; similar to "Magnalite."

ALPRO NO 380.
M-126; Cu, Mn, bal Al.
For light alloy parts; modified duralumin type

ALPRO NO. 385
M-126, 6.5 Cu, 1.5 Ni, 0.1 Cr, 0.5 Mg, 0.5 Mn, 90.9 Al
For sand castings, modified Duralumin

ALPROPAT
M-1265, Cu, Si, bal Al
Cast: 27,000 TS, 15,000 YS, 4 El, 60 Brin
For match plates and patterns, low shrinkage

ALRAY A 8
M-248, 20 Cr, 80 Ni
For electrical resistance, heat resistant

ALRAY C
M-248, 15 Cr, 62 Ni, bal Fe
Annealed 95,000-175,000 TS, 35,000 YS, 35-40 El, 60 RA
For heat and corrosion resistant parts; corrosion and heat resistant

ALRAY D
M-248, 35 Cr, 18 Ni, bal Fe
Annealed 75,000-160,000 TS, 35-40 El, 60 RA
For heat resistant parts, corrosion and heat resistant

ALRONZE 619
M-279, 9.5 Al, 4 Fe 86.5 Cu
Aged 152,000 TS, 145,000 YS
For fuses, clips, springs, fasteners, terminals, diaphragms
High strength aluminum bronze

ALRONZE GUM
M-279, 9-10 Al, 3.5-4.5 Fe, bal Cu
Annealed: 85,000-100,000 TS, 45,000-65,000 YS, 30-35 El
Heat Treated 150,000-170,000 TS, 100,000-150,000 YS, 3 El
For fuses, clips springs
Heat treatable, high strength aluminum bronze, corrosion resistant

ALRONZE R 619
M-279, 86 Cu, 9 Al, 4 Fe
Ann. 85,000-100,000 TS, 45,000-75,000 YS, 25-35 El
Cold rolled 97,000-145,000 TS, 110,000-124,000 YS, 2-30 El
Very high strength after brazing, corrosion resistant

ALRONZE STANDARD.
M-279, 9-10 Al, 3.5-4.5 Fe, 0.8 max Zn, 0.01 max Pb, bal Cu
Annealed 85,000-100,000 TS, 45,000-65,000 YS, 30-35 El, Rock B 80-90
Hard Temper 112,000-130,000 TS, 90,000-110,000 YS; 10 El, Rock B 96-101
For fuses, clips, springs, fasteners
High strength aluminum bronze, corrosion resistant.

ALSEX.
M-621; 0.5 Si, 0.5 Mg, bal Al
Heat treated 29,000-42,500 TS; 25,000-35,000 YS; 7-5 El, 90 Brin
For light alloy parts, forgings; conductivity 52% of copper.

ALSIA.
M-672; 20 Si, 1 Cu, 0.7 Fe, bal Al.
Cast: 20,000 TS; 18,000 YS; 1-2 El; 80-90 Brin.
For pistons, same as "Alusil."

ALSICHROM-1 (CA30).
M-1309; 0.05 C, 0.6 Si, 0.35 Mn, 22.0 Cr, 0.5 Co, 5.2 Al, bal Fe.
For heating elements for electric furnaces.
Heat and oxidation resistant.

ALSICHROM-2 (CAF).
M-1309; 0.10 C, 0,8 Si, 0.3 Mn, 21.0 Cr, 4.6 Al, 0.5 Co, bal Fe
For heating elements for electric furnaces
Heat and oxidation resistant

ALSIFONT 5C
M-1176; 4 Cu, 5.5 Si, bal Al
Heat treated. 28,000-32,000 TS, 20,000-23,000 YS; 4-1.5 El; 55-75 Brin.
For light alloy parts, heat treatable

ALSILOY S-1.
M-158, 11.5-12.0 Si, 2 max Fe, 0.6 max Cu, bal Al.
Die cast 42,000 TS, 19,000 YS, 3.5 El, 80 Brin.
For die castings, corrosion resistant, good castability

ALSILOY S-5
M-158, 4-6 Si, 0.6 max Cu, 2 max Fe, bal Al
Die cast 30,000 TS; 16,000 YS, 9 El, 70 Brin.
For die castings, corrosion resistant, good castability

ALSIPLATE
M-926, Ag clad to 2S aluminum alloy
For electrical contacts, Al alloys plated by lamination with silver

ALSOCO M-1001
M-1158, Zn-Sn-Pb.
For aluminum solder, M.P. 728°F.

ALSOCO M-1002
M-1158, Zn-Sn-Pb
For aluminum solder, M.P. 680°F

ALSOCO M-1003
M-1158
For aluminum solder

ALTAM
M-109, 68-88 Ti, 11 Al, 1.25 Fe, 1.18 Si, bal TiO_2
For making ductile titanium

ALT BLITZ
M-1312, 0.79 C, 4.7 Co, 4.3 Cr, 0.7 Mo, 1.5 V, 18 W, bal Fe
For lathe and planer tools, hobs, reamers, taps; high speed steel

ALTEMP 19-9DL
M-1, 0.28-0.35 C, 18-20 Cr, 8-11 Ni, 1.0-1.7 Mo, 1.0-1.7 W, 0.4 Cb, 0.5 max Ti, bal Fe
Hot rolled 118,000 TS, 69,000 YS; 58 El; 55 RA, 216 Brin
Heat treated. 103,000 TS; 43,000 YS; 54 El; 57 RA; 189 Brin
For jet engine and gas turbine components, austenitic, heat resistant

ALTEMP 19-9DX.
M-1, 0.28-0.35 C, 18-20 Cr, 8-11 Ni, 1.2-2.0 Mo, 1.0-1.7 W, 0.6 Ti, 0.5 max Cu, bal Fe.
Hot rolled: 118,500 TS; 69,000 YS, 58 El; 55 RA; 216 Brin.
Heat treated 103,000 TS; 43,000 YS, 54 El; 57 RA, 189 Brin.
For jet engine and gas turbine components; austenitic, heat resistant.

ALTEMP A-286.
M-1; 0.08 max C, 15 Cr, 26 Ni, 1.2 Mo, 2 Ti, 0.3 V, 0.35 max Al, bal Fe.
Bar: 135,000-160,000 TS, 85,000-115,000 YS; 20-3.0 El; 30-55 RA.
At 1000°F: 131,000 TS; 87,500 YS; 18.5 El; 31.2 RA
At 1500°F: 36,500 TS; 68.5 El; 37.5 RA.
For turbine blades, bolting, jet and super-charger parts, austenitic, heat resistant.

ALTEMP D979
M-1; Fe, Cr, Mo, W, Ti, V, bal Ni
For high temperature applications, heat resistant.

ALTEMP-L605.
M-1; 0.15 C, 1.5 Mn, 20.0 Cr, 10.0 Ni, 15.0 W, bal Co
Annealed: 150,000 TS, 70,000 YS; 50% El, Rock C 23
At 1500°F 50,000 TS; 35,000 YS, 17 El
Uses: jet engine and gas turbine parts, afterburners, exhaust cone assemblies, valves, springs, buckets
High temperature alloy High mechanical, properties to 1800°F Heat and oxidation resistant

ALTEMP M-252
M-1; 0.15 C, 19 Cr, 10 Co, 10 Mo, 2.5 Ti, 0.8 Al, 5 max Fe, bal Ni
At 70°F: 193,000 TS
At 1000°F: 155,000 TS, 93,000 YS.
At 1400°F 122,000 TS, 80,000 YS
For jet engine and gas turbine buckets, heat and oxidation resistant.

ALTEMP S-590
M-1, 0.38-0.47 C, 20 Cr, 20 Ni, 20 Co, 4 Mo, 4 W, 4 Cb, bal Fe
Rolled 152,000 TS, 80,000 YS; 19 El, 25 RA.
Heat treated 140,000 TS, 42,000 YS, 20 El; 19 RA
At 1400°F 61,500 TS, 50,000 YS, 26.6 El; 34.8 RA
For supercharger and jet engine parts, turbine blades, age-hardenable, corrosion and heat resistant

ALTEMP S-816
M-1, 0.32-0.42 C, 20 Cr, 20 Ni, 42 Co, 4 W, 4 Mo, 4 Cb, 1.2 Mn, 5 max Fe
Heat treated 140,000 TS, 67,000 YS, 31 El, 31 RA, 269 Brin
At 1000°F 121,000 TS; 46,000 YS, 27 El, 23 RA.
At 1500°F 73,000 TS, 40,500 YS, 23 El, 24 RA
For jet engine and supercharger parts, turbine blades, age-hardenable, heat resistant.

ALTEMP V-36
M-1, 0.27 C, 24 Cr, 19 Ni, 4 Mo, 1.7 Cb, 2.3 W, 1.8 Fe, bal Co
For supercharger and jet engine components; heat resistant

ALTEN NO 11
M-1040, 1.7 Si, 0.5 Mn, 3.5 T.C., 2.7 Gr., 0.07 Cr, 0.03 Mo, bal Fe
For castings, gears, housings, cast iron.

ALTEN NO 15.
M-1040, 1.8 Si, 0.6 Mn, 3.5 T.C., 3.1 Gr., 1.4 Cr, 0.16 Ni, 0.6 Mo, 0.08 V, 0.04 Cu, bal Fe.
For castings, gears, housings; cast iron

ALTEN NO 18.
M-1040, 1.8 Si, 0.5 Mn, 3.7 T.C., 3 Gr., 1 Cr, 0.18 Ni, 0.04 Mo, 0.09 V, bal Fe.
For castings, stokers, grate bars; cast iron.

ALTEN TYPE 30.
M-1040, 3.3 C, 2.2 Si, 0.8 Mn, 0.2 max Ni, 0.1 max Cr, 0.1 max Mo, bal Fe.

Cast: 30,000 TS; 170-223 Brin.
For valve components, machinery castings;
cast iron; Tr.S. 2200; SAE 111.

ALTEN TYPE 35 HR.
M-1040; 3.4 C, 2 Si, 0.8 Mn, 1 Ni, 0.10 max Cr,
0.4 Mo, bal Fe.
Cast: 35,000 TS; 190-210 Brin.
For glass molds, stop cocks, heat resistant parts;
cast iron, heat resistant.

ALTENTYPE 45 HR.
M-1040; 3.4 C, 1.9 Si, 0.8 Mn, 1.2 Cr, 0.3 Mo,
0.2 max Ni, bal Fe.
Cast: 50,000 TS; 300-330 Brin.
For furnace parts, heat resistant parts;
cast iron, heat resistant.

ALTEN TYPE 45 WR
M-1040; 3.1 C, 2 Si, 0.7 Mn, 0.5 min Ni,
0.3 min Cr, 0.25 min Mo, bal Fe.
Cast: 45,000 TS; 205-230 Brin.
For valves, pressure castings, wear resistant parts;
cast iron, wear resistant; SAE 122.

ALTEN TYPE 50WR.
M-1040; 3.2 T.C., 0.7 C.C., 1.8 Si, 0.7 Mn,
0.2 Ni, 0.5 Cr, 0.5 Mo, 0.09 Cu, bal Fe.
Cast: 50,000 TS; 215 Brin
For valves, wear plates, superheaters,
wear and corrosion resistant; C.I.

ALTIOR BRAND ALUMINUM SOLDER.
M-577; Pb, bal Sn
Al solder

ALTIOR BRAND ANTIFRICTION METAL
M-577; Pb, Sb, bal Sn.
For bearings; white antifriction metal.

ALTMAG.
Russian; 5-8 Mg, 0.5-1.0 Mn, 0.1-0.5 Ti, bal Al.
For light alloy parts; age-hardenable.

ALTO.
M-15; C, alloy, bal Fe
Rolled: 151,000 TS; 98,000 YS, 51 El;
50 RA; 220 Brin.
Heat treated: 271,000 TS, 220,000 YS;
16 El; 49 RA; 555 Brin.
For axes, axles, drills, chisels, crowbars;
non-tempering, shock resistant, water hardened

ALTOLOY A.
M-15; C, alloy, bal Fe.
For pneumatic tools, chisels; shock resistant,
non-tempering, water hardening.

ALTOLOY B.
M-15; C, alloy, bal Fe.
For pneumatic tools, chisels; tough, oil hardening

ALUAL.
M-551; 99.9 Al.
For wire, strip; Al-products.

ALUCABLE.
M-673; 0.55 Si, 0.4 Mg, bal Al.
For light alloy parts; non-hardenable.

ALUCHROM O.
M-297, 30 Cr, 5 Al, bal Fe.
Annealed: 99,500-106,000 TS; 25 El.
For heat resistant parts, max operating
temp. 1300°C.

ALUCHROM I.
M-297; 22 Cr, 5 Al, bal Fe.
Annealed: 92,400-99,500 TS; 30-25 El.
For heat resistant parts; max operating
temp. 1250°C.

ALUCHROM II.
M-297; 8 Cr, 6 Al, bal Fe.
Annealed: 85,200-88,500 TS; 30-25 El.
For heat resistant parts;
max operating temp. 1100°C.

ALUDUR.
M-284; 0.5 Mg, 0.7 Si, 0.45 Fe, bal Al.
Heat treated: 50,000 TS, 6 El; 90 Brin.
For overhead transmission lines; self-aging alloy;
high corrosion resistant.

ALUDUR 275.
M-1376; 1.5-3.0 Mg, 0.5-1.5 Mn, 0.3 max Cr, bal Al.
For aircraft structural parts.

ALUDUR 300.
M-1376, 2-4 Mg, 0.4 max Mn, 0.4 max Cr, bal Al.
For aircraft structural parts.

ALUDUR 500
M-1376, 4-5 Mg, 0.8 max Mn, 0.3 max Cr,
bal Al.
Soft 42,000 TS, 22,000 YS; 35 El, 65 Brin.
Hard: 60,000 TS; 50,000 YS; 15 El; 100 Brin
For aircraft structures, light alloy parts;
corrosion resistant.

ALUDUR-533
M-1548, 0.3-1.0 Si, 0.3-0.8 Mn, 0.5-1.3 Mg, bal Al.
Soft 16,000-18,500 TS, 8,500-11,300 YS;
20-27 El; 30-40 Brin.
For structural fittings, hardware, aircraft
components Age-hardenable

ALUDUR NO. 533D
M-284, 0.8 Mg, 0.7 Si, bal Al.
Heat treated 45,000-50,000 TS; 10-8 El,
90-100 Brin
For overhead transmission lines, corrosion resistant

ALUDUR 570
M-1376, 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al
For light alloy parts, age hardenable

ALUDUR-570
M-1548, 3.5-5.5 Cu, 0.3-0.6 Si, 0.3-1.0 Mn,
0.3-0.7 Mg, bal Al
Annealed. 26,000 TS, 10,000 YS, 22 El; 45 Brin
Hardened 60,000 TS, 40,000 YS, 20 El, 105 Brin.
For construction and transportation equipment,
fittings, screw machine products
High strength, age-hardenable

ALUDUR NO 570D.
M-284, 0.8 Mg, 1.0 Si, bal Al
Heat treated 60,000 TS, 17 El, 90-100 Brin.
For overhead transmission lines, corrosion
resistant; self-aging alloy

ALUDUR-580.
M-1548, 3.5-5.5 Cu, 0.3-0.6 Si, 0.3-1.0 Mn,
0.3-0.7 Mg, bal Al
Annealed. 26,000 TS, 10,000 YS; 22 El; 45 Brin.
Hardened· 62,000 TS, 40,000 YS, 20 El, 105 Brin.
For construction and transportation equipment,
fittings, hardware, screw machine products,
fasteners.
High strength, age-hardenable.

ALUDUR 580
M-1376; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
For light alloy parts; age hardenable.

ALUDUR-630
M-1548; 3.5-5.5 Cu, 0.3-0.6 Si, 0.3-1.0 Mn,
0.3-0.7 Mg, bal Al.
Annealed· 26,000 TS; 10,000 YS; 22 El; 45 Brin.
Age-Hardened: 60,000 TS; 40,000 YS; 20 El;
105 Brin.
For fittings, hardware, screw machined
products, fasteners.
Age-hardenable, high strength.

ALUDUR 630/OM.
M-1376; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
For light alloy parts; age hardenable.

ALUDUR 700.
M-1376; 5.5-7.5 Mg, 0.8 max Mn, 0.3 max Cr, bal Al.
For light alloy parts, corrosion resistant.

ALUFER.
German: Al alloy.
For light alloy parts; non-hardenable.

ALUFLEX.
M-1444; 0.75 Mg, bal Al.
For electric conductors, electrical wires, and cable for braiding.
High electrical conductivity.

ALUFONT II.
M-249; 4 Cu, 2.0 Si, 0.6 Mn, 0.2 Mg, 0.15 Ti, bal Al
Heat treated: 33,000-55,000 TS; 27,000-45,000 YS
For castings where high strength, but no high corrosion resistance is required; high fluidity.

ALUFONT-II.
M-1548, 3.7-4.3 Cu, 2.0 Si, 0.5-0.7 Mn, 0.2 Mg, bal Al
Cast: 21,000 TS; 14,000 YS, 2.5 El; 55 Brin.
For manifold and valve bodies, machine frames, oil pans.
Good castability and machinability

ALUFONT 3
M-249, M-1605, M-1634, 4-5 Cu, 0.2-0.5 Ti, bal Al.
Sand cast: 41,000 TS; 28,000 YS; 6 El, 85 Brin.
Chill cast. 53,000 TS, 37,000 YS, 6 El, 100 Brin
For auto and aircraft construction; heat treatable

ALUFONT "H"
M-249, <0.4 Si, 1.4 Fe, 0.15 Mg, 2.0 Cu, 12 Zn, bal Al
Sand cast: 43,000 TS, 36,000 YS; 0.5 El
Chill cast: 44,000 TS, 42,000 YS, 1.5 El
For large castings for general purposes, corrosion resisting

ALUFONT "W"
M-249, 2.0 Si, 0.6 Fe, 0.5 Mn, 2.0 Cu, 12 Zn, bal Al.
Sand cast: 35,000 TS, 20,000 YS, 3.5 El
Chill cast: 40,000 TS, 35,000 YS; 3.5 El
For large castings, light alloy parts

ALUGIR
M-674, 3 Cu, 0.8 Mg, 1.2 Ni, bal Al.
57,000-64,000 TS, 16-22 El.
For light alloy parts, heat treatable

ALUMA
M-622, 1.5 Mn, bal Al.
14,500-18,500 TS, 7,000-9,000 YS; 40-30 El.
For light alloy parts, corrosion resistant.

ALUMAG
French; 4.5 Mg, 95.5 Al
For light alloy parts; superseded by "Duralinox"

ALUMAG 15
M-770, 1.5 Mg, 0.4 Mn, bal Al.
Annealed: 23,000 TS; 10,000 YS, 20 El; 32 Brin.
Hardened: 40,000 TS; 35,000 YS; 55 Brin
For light alloy parts; corrosion resistant.

ALUMAG 25.
M-770; 2.5 Mg, 0.4 Mn, bal Al.
Soft: 43,000 TS; 14,000 YS; 22 El; 40 Brin.
Hard: 60,000 TS; 39,000 YS; 67 Brin
For light alloy parts; corrosion resistant.

ALUMAG 35.
M-770; 3.5 Mg, 0.4 Mn, bal Al.
Soft: 36,000 TS; 17,000 YS; 25 El; 47 Brin.
Hard: 55,000 TS; 46,000 YS; 78 Brin.
For light alloy parts; corrosion resistant.

ALUAG 50.
M-770; 5 Mg, 0.4 Mn, bal Al.
Soft: 43,000 TS; 22,000 YS; 25 El; 53 Brin.
Hard: 64,000 TS; 54,000 YS; 95 Brin.
For light alloy parts; corrosion resistant.

ALUMAG 65.
M-770; 6.5 Mg, 0.4 Mn, bal Al.
Soft: 49,000 TS; 27,000 YS; 27 El.
Hard: 69,000 TS; 57,000 YS.
For high temperature applications; high temp. properties.

ALUMAG GRADE 1.
M-675; 4-5 Mg, bal Al.
For light alloy parts; high resistance to corrosion.

ALUMAG GRADE 2.
M-675, 8-10 Mg, bal Al.
For light alloy parts; high resistance to corrosion.

ALUMAGNESE 10
M-1444; Cu, Mg, Si, Fe, Mn, Ti, bal Al.
For light alloy parts; suitable for welding.

ALUMAGNESE 20
M-1275, 0.15 Cu, 1.75-2.25 Mg, 0.6 Si, 0.75 Fe, 0.5 Mn, 0.2 Ti, bal Al
M-temper. 24,600 TS; 18 El.
For structural members; corrosion resistant.

ALUMAGNESE 20
M-1444, 0.15 Cu, 1.75-2.75 Mg, 0.6 Si, 0.75 Fe, 0.5 Mn, 0.2 Ti, bal Al.
M-temper: 29,200 TS, 23 El.
For light alloy parts; corrosion resistant.

ALUMAGNESE 35
M-1275; 0.15 Cu, 3-4 Mg, 0.6 Si, 0.75 Fe, 1 Mn, 0.2 Ti, bal Al
M-temper: 31,400 TS, 11,200-13,500 YS; 18 El.
For structural members; corrosion resistant.

ALUMAGNESE 35
M-1444; 0.15 Cu, 3-4 Mg, 0.75 Fe, 0.6 Si, 1 Mn, 0.2 Ti, bal Al
M-temper. 36,000 TS; 18,000 YS; 23 El.
For light alloy parts; corrosion resistant.

ALUMAGNESE 50.
M-1275, 0.15 Cu, 4.5-5.5 Mg, 0.6 Si, 0.75 Fe, 1 Mn, 0.2 Ti, bal Al
M-temper: 36,000 TS; 15,700-18,000 YS; 16 El.
For structural members; corrosion resistant

ALUMAGNESE 50.
M-1444, 0.15 Cu, 4.5-5.5 Mg, 0.6 Si, 0.75 Fe, 1 Mn, 0.2 Ti, bal Al
M-temper: 42,600 TS, 27,000 YS; 21 El.
For light alloy parts; corrosion resistant.

ALUMALUN.
M-250; Al, Si alloy plus abrasive grains imbedded in wearing surface
For floor plates, stair treads, car steps; wear resistant; anti-slip.

ALUMAN.
M-249; M-624, M-493; 1.5 Mn, 0.25 max Si, 0.25 max Fe, 0.1 max Cu, bal Al.
Soft: 15,000 TS; 7000 YS; 30 El; 30 Brin.
Hard: 36,000 TS; 29,000 YS; 7 El; 50 Brin.
Extruded: 17,000 TS; 10,000 YS; 24 El; 35 Brin.
For panelling, roofing, containers, welded structurres; corrosion resistant, non-hardenable.

ALUMAN (AW15).
M-1548; 1.4-1.6 Mn, bal Al.
Soft: 17,000 TS; 7,000 YS; 35 El; 30 Brin.
Hard: 32,000 TS; 30,000 YS; 4 El; 60 Brin.
For heat exchangers, truck panels, tanks, reflectors, ducts.
Hardened by cold work only.

ALUMAN-30.
M-624, M-541; 1.0-1.5 Mn, 0.1 max Cu, 0.5 max Fe, 0.5 max Si, 0.05 max Ti, bal Al.
Annealed: 11,400-18,500 TS; 5,700-10,000 YS; 25-45 El; 25-35 Brin.
Hard: 27,000-35,600 TS; 24,200-35,600 YS; 3-8 El; 50-65 Brin.
For cooking utesils, heat exchangers, storage tanks, plumbing fixtures

ALUMAR 4043 etc. (15 alloys).
M-677; Aluminum Association Type 4043 and 15 other AA Type compositions.
Bare aluminum welding wire;-for welding similar aluminum alloys.

ALUMASOD
M-676; 76 Sn, 23 Zn, 1 Cd.
For Al solder.

ALUMAWELD.
M-393; Sn, Zn, Pb, and chemical catalyzer.
12,000 TS.
For soldering of all metals, especially Al and white metals.

ALUMAWELD ALL METAL SOLDER
M-393, Sn, Zn, Pb
For soldering Al and Mg alloys, M.P. 550°F, no flux required for Mg.

ALUMAWELD NO 1.
M-393
For solder for Al and Mg alloys; M.P. 364-620°F.

ALUMAWELD NO 2
M-393
For solder for Al and Mg foil capacitors, M.P 393-563°F.

ALUMAWELD H-3.
M-393.
For solder for Al, Mg, foil capacitors, M.P. 510-650°F.

ALUMAWELD H-6.
M-393.
For solder for Al and other metals; M.P 775-785°F, hard and strong.

ALUMAWELD NO. 7.
M-393.
For solder for Al-bronze, Mg, and cast iron, M.P. 333-620°F.

ALUMAWELD H-8.
M-393.
For solder for Al and other metals, M.P. 715-740°F; good for friction soldering.

ALUMAWELD NO. 22.
M-393
For solder for Al, Mg, foil capacitors; M.P. 393-635°F.

ALUMAWELD NO 23.
M-393.
For solder for Al, Mg, foil capacitors, M.P 336-414°F; good wetting power.

ALUMAWELD SPECIAL.
M-393; Sn, Zn, Pb.
For soldering Al and Mg alloys; M.P. 550°F.

ALUMBRO.
M-188, M-282; 76 Cu, 22 Zn, 2 Al.
Drawn: 88,000 TS; 67,000 YS; 10 El; 175 Brin.
Annealed: 54,000 TS; 50 El; 65 Brin.
For condenser tubing to resist sea water corrosion, plates; high resistance to corrosion.

ALUMEL.
M-65; 95 Ni, 2 Mn, 2 Al (plus 8 minor constituents).
Ann: 85,000 TS.
EMF: Negative.
Thermocouple wire,-used with Chromel P for temperature measurement to 2400°F.
Corrosion and heat resistant.

ALUMEND 1100.
M-677, 1.0 max Si + Fe, 0.2 max Cu, 99.0 min Al
For coated aluminum welding rod

ALUMEND 4043.
M-677; 4.5-6.0 Si, 0.8 max Fe, 0.3 max Cu, 0.2 max Ti, 0.1 max Zn, 0.05 max Mn, 0.05 max Mg, bal Al.
For coated aluminum welding rod

ALUMETAL.
M-597; 5 Si, bal Al
For Al solder; corrosion resistant.

ALUMINARK
M-118; 5 Si, bal Al.
For Al welding electrodes; coated

ALUMINITE
U.S., 73 Al, 23 Zn, 2.7 Cu, 0.4 Fe, 0.2 Si
For light alloy castings; non-hardenable

ALUMINUM CD1S
M-4, 99.6 min Al
O-temper 10,000 TS, 43 El, 19 Brin
H 14-temper: 14,000 TS, 12 El, 26 Brin
H 18-temper 19,000 TS, 18,000 YS, 6 El; 35 Brin
For pressure vessels, chemical plant equipment, corrosion resistant, good formability

ALUMINUM KO-1.
4.5-5.2 Cu, 0.4-1.0 Ag, 0.18-0.35 Mg, 0.15-0.35 Ti, 0.4 max Mn, 0.4 max Zn, bal Al.
Cast 62,000-66,000 YS, 72,300-73,000 TS, 10-11 El
At 350°F. 60,000 TS, 57,00 YS, 11 El.
At 500°F. 46,000 TS, 44,000 YS; 13 El.
Heat treated 65,000 TS, 55,000 YS, 3 El.
For impellers, throttle levers, fins
Age hardenable

ALUMINUM No 2EC.
M-4, 0.3-0.6 Si, 0.4-0.8 Mg, 0.3 max Fe, 0.05 max Cu, 0.01 max Mn, 0.05 max Zn, bal Al.
Annealed: 17,000 TS, 7500 YS, 35 El; 30 Brin
T6 Temper 29,000 TS, 25,000 YS
T61 Temper: 15,000-20,000 TS; 8000-15,000 YS.
T62 Temper. 27,000 TS, 22,000 YS
For electrical buses.
High strength and electrical conductivity.
Age hardenable. Corrosion resistant.

ALUMINUM 2EC.
M-1147, 99.45 min Al
T8-temper: 28,000 TS, 25,000 YS
For busways, conductors, 57% conductivity

ALUMINUM 3L-8.
M-86, M-28, 11-13 Si, bal Al.
Die cast. 24,500 TS; 15,500 YS; 1 El, 80 Brin.
Sand cast: 20,000 TS; 1 El; 75 Brin.
For housings, cases, general engineering castings; corrosion resistant, good castability.

ALUMINUM 4L-11.
M-28; 7 Cu, 0-2 Sn, 0-1 Zn, bal Al.
Sand cast: 17,000-20,000 TS; 12,000-14,500 YS; 2.5-1.5 El; 60-70 Brin.
For auto parts, general purpose castings; not hardenable.

ALUMINUM AS-5.
M-1219, M-1220, M-541; 0.6-0.9 Cu, 4.5-5.5 Si, 0.5 Mg, bal Al.
Cast: 35,600-45,600 TS; 25,600-29,900 YS; 4-5 El, 90-100 Brin.
For instrument housings, oil pans, crankcases, high fluidity and corrosion resistant.

ALUMINUM ALLOY BRITISH L-5.
M-92, 85 Al, 13-15 Zn, 2.5-3.0 Cu, traces Fe, Si
Sand cast: 24,500 TS, 3 El, 80 Brin.
For light alloy, parts, regular and intricate castings, sand castings.

ALUMINUM-G8A
M-158, M-4, M-671; 0.44 Si, 0.14 Cu, 1.72 Fe, 8.80 Mg, 0.02 Mn, 0.01 Ni, bal Al.
As Cast: 47,900 TS; 28,500 YS; 4.2 El
For die castings, instrument cases, housings
Corrosion resistant.

ALUMINUM ALLOY BRITISH L-8.
M-92; 89 Al, 10 Cu, 1 Sn.
20,000 TS,
For light alloys, parts; non-hardenable.

ALUMINUM L8N
M-1219, M-541, 11.0-12.5 Cu, 0.7 Fe, 0.5 Ni, bal Al
Cast: 38,400-42,700 TS; 22,800-25,600 YS; 1-2 El; 110-125 Brin
For light alloy castings, general purpose

ALUMINUM L8T
M-1219, M 541, 11.0 12.5 Cu, 1 Fe, 0.5 Si, 0.2 Ti, bal Al
Cast 38,400 42 700 TS; 22,800-25,600 YS, 1-1.5 El, 110-125 Brin
For light alloy castings; general purpose

ALUMINUM AS-10
M-1219, M-1220, M-541, 2.2 Cu, 10 Si, 1.4 Mg, 1 Ni, bal Al
Cast 32,700-35,600 TS, 27,000-32,700 YS; 0.5-0.7 El, 100 120 Brin
For pistons; high temperature resistance

ALUMINUM LAC 10.
M-28, 9.8 Cu, 0.25 Mg, 0.7 Fe, bal Al
Sand cast: 18,000 TS, 13,500 YS, 75 Brin.
WP-temper 31,400 TS, 25,400 YS, 120 Brin.
For general castings; age-hardened

ALUMINIUM H10
England, 0.07 Cu, 0.20 Fe, 0.58 Mn, 0.61 Mg, 0.94 Si, Ti, bal Al

ALUMINUM HD-11.
M-1389, Al alloy.
For impact extrusions; ductile.

ALUMINUM LM11.
M-England, 4.2-5.0 Cu, 0.15-0.35 Mg, 0.5 max Fe, 0.3 max Si, 0.3 max Ti, 0.1 max Zn, bal Al.
Chill cast. 40,000 TS, 9 El.
For pressure die castings, cases, housings
Heat treatable.

ALUMINUM-S-12A
M-158; 11.76 Si, 0.53 Cu, 0.81 Fe, 0.01 Mg, 0.19 C, Mn, 0.04 Ni, bal Al.
As Cast: 39,200 TS; 21,300 YS; 3.5 El
For die castings, instrument cases, housings.
High corrosion resistant, pressure tight

ALUMINUM-A13.
M-671; M-4; 1.0 Cu, 12 Si, bal Al.
Die Cast: 35,000 TS; 16,000 YS; 3.7 El; 80 Brin.
For general purpose high strength castings, typewriter frames, outboard motor pistons, dental equipment.
Excellent castability, pressure tight.

ALUMINIUM AW-15.
M-493; 1.5 Mn, bal Al.
Hard worked: 37,000 TS; 3 El; 59 Brin.
Annealed: 17,000 TS, 27 El; 32 Brin.
For deep drawing, stamping and pressing; weldable, corrosion resistant.

ALUMINIUM L-15.
Eng; 2-4 Mg, 1.2-1.5 Mn, 0-0.2 Sb or Ti, bal Al
For light alloy castings, resists sea water corrosion

ALUMINUM NO 16.
M-514; 4.5-5.5 Ni, 1.0 max Si, bal Al.
Die cast: 37,000 TS; 21,000 YS, 4.5 El, 80 Brin.
For die castings, stove burner heads; heat resistant.

ALUMINUM-D16T.
M-Russia, 4.4-4.52 Cu, 1.6 Mg, 0.7 Mn, 0.38 Fe, 0.26 Si, 0.01 Ni, 0.2 Zn, 0.03 Ti, bal Al.
Ht Tr: 70,000 TS; 56,000 YS; 130 Brin.
For aircraft structures, fittings, hardware, fasteners.
Heat treatable, high strength

ALUMINUM ECH17
M-4, 99.45 min Al
17,000 TS; 15,000 YS
For bus bars, special parts, 61% electrical cond

ALUMINUM DTD-25
England, 5 Si, bal Al
For instrument housings, gear cases, general castings; corrosion resistant.

ALUMINUM HS30
M-England, 0.1 Cu, 0.4-1.5 Mg, 0.6-1.3 Si, 0.6 Fe, 0.1 Zn, 0.4-1.0 Mn, 0.5 Cr, 0.2 Ti, bal Al.
W.P Temper 46,000 TS, 42,800 YS, 11 El.
At --320°F 61,600 TS, 51,100 YS, 17.8 El.
For aircraft and space vehicle structures and components.
Heat treatable Good weldability

ALUMINUM P35
M-624, 3.2-3.8 Mg, 0.5 Mn, 0.3 max Si, 0.4 max Fe, bal Al
For light alloy parts for marine service, corrosion resistant

ALUMINUM NO 37
M-514, 6.5-7.5 Si, 0.2-0.4 Mg, bal Al
Cast. 40 000 TS, 27,000 YS, 5 El, 90 Brin
For permanent mold castings, dense, C S. 24000.

ALUMINUM A-43
M-815, M 238, 5.3 Si, bal Al
Die cast 33,000 TS, 14,000 YS, 9 El, 50 Brin; 19,000 SS, 17,000 Fatigue St
For marine castings, water jackets, meter housings, carburetor bodies
High fluidity and castability Corrosion resistant Die casting alloy

ALUMINUM NO 46
M 514, 3.5-4.5 Cu, 2.5-3.5 Si, bal Al.
Cast: 28,000 TS, 16,000 YS, 2 El, 70 Brin.
For permanent mold castings, C.S. 16,000

ALUMINUM BA46
M-28; 0.1 Cu, 0.2-0.6 Mg, 4.5-6.0 Si, 0.4 Mn, 0.1 Ni, 0.6 Fe, bal Al
Heat treated: 33,600-39,000 TS; 31,400 YS; 70-75 Brin.
For crankcases, gear cases, covers, housings; age-hardenable, good castability.

ALUMINUM C46.
M-1219, M-541; 9.5-10.5 Cu, 0.8-1.2 Si, 0.3 Mg, 0.2 Ti, 1.5 Ni, bal Al.
Cast: 51,200-54,100 TS; 42,700-48,400 YS; 0.5-1.0 El; 125-140 Brin.
For light alloy castings; general purpose.

ALUMINUM 50S.
M-1147; 1.5 Mg, bal Al.
S-D Temper: 21,000 TS; 8500 YS; 25 El.
S-H 22 Temper: 23,500 TS; 16,500 YS; 13 El.
S-H 34 Temper: 28,000 TS; 24,500 YS; 6 El.
For kitchen utensils, deep drawn parts, commercial appliances; good finishing characteristics.

ALUMINUM 55EC.
M-1147; 99.45 min Al.
T8-temper: 29,000 TS; 25,000 YS.
For busways, conductor; 55% conductivity.

ALUMINUM A-57G.
M-France; 6.5-7 0 Si, bal Al.
Cast: 44,000 TS; 7 El; 100 Brin.
For sand and permanent mold castings, housings, casings
Corrosion resistant.

ALUMINUM C58.
M-4; 0.15-0 40 Cu, 0.40-0 80 Si, 0 80-1.20 Mg, 0 15-0.35 Cr, 0.70 max Fe, 0.15 max Mn, 0.20 max Zn, 0.15 max Ti, bal Al.
O-Temper: 18,000 TS, 8000 YS; 30% El; 30 Brin.
T4-Temper: 34,000 TS; 21,000 YS; 25% El; 65 Brin.
T6-Temper: 45,000 TS; 40,000 YS; 17% El; 90 Brin.
Uses: Porcelain enameled extruded parts.
Heat Treatable. Extrusion alloy.

ALUMINUM-AS62.
M-541, M-1219, M-1220; 6 Si, 2 Cu, 0.3 Mg, bal Al.
Cast: 27,000 TS, 18,000 YS; 70 Brin.
Ht.Tr.: 36,000 TS; 24,000 YS; 80 Brin.
For automobile cylinder heads, crankcases, housings.
Permanent molds, age-hardening

ALUMINUM XC65S.
M-4; Al alloy.
For ship structures, trailer truck frames; high rigidity and strength.

ALUMINUM CH-70.
M-4; 4 7 Cu, 0.79 Ag, 0.27 Mg, 0.27 Mn, 0 21 Ti, bal Al.
Ht.Tr: 60,000 TS; 50,000 YS, 5 El.
For wing-spar castings, aerospace and undersea equipment
Cast alloy, heat treatable.

ALUMINUM C81.
M-671; 99.8 Al.
For cladding uranium fuel plates in nuclear reactor units.

ALUMINUM SG-81.
M-158; 8.6 Si, 0 42 Cu, 0.75 Fe, 0 62 Mg, 0.46 Ni, 0.07 Zn, 0 16 Ti, 0.15 Be, bal Al
Die Cast. 46,300 TS, 49,200 YS; 4.8 El.
As Aged. 54,500 TS; 46,100 YS; 2.5 El.
At 500°F: 28,800 TS, 28,400 YS, 7 El.
For die castings, missiles, housings, cases
Good high temperature properties, corrosion resistant.

ALUMINUM-SC84A
M-158; 8 87 Si, 3.68 Cu, 1.05 Fe, 0.34 Mn, 0.14 Ni, 0.01 Mg, bal Al.
As Cast: 50,600 TS, 25,000 YS; 3.8 El.
At 500°F: 19,000 TS; 14,600 YS; 11.2 El.
For die castings, pistons, sole plates.
Corrosion resistant, pressure tight.
Good high temperature properties

ALUMINUM SC84A + Mg.
M-158; 8.8 Si, 4.4 Cu, 0.82 Fe, 0.27 Mg, 0.25 Mn, 0.01 Ni, bal Al.
Die Cast: 48,600 TS; 25,000 YS; 3 El.
At 400°F: 24,800 TS; 15,700 YS; 6 El.
For die castings, pistons, sole plates, housings.
Corrosion resistant, pressure tight.

ALUMINUM-CG86.
M-158; 0.20 Si, 8.28 Cu, 0.94 Fe, 6.13 Mg, 0.63 Mn, 0.48 Ni, bal Al.
As Cast: 53,000 TS; 42,100 YS; 1.0 El.
At 400°F: 44,500 TS; 31,800 YS; 1.5 El.
For die castings, pistons, housings.
Good high temperature properties.

ALUMINUM-CH91.
M-4; 6-8 Cu, 1-3 Si, 2 2 max Zn, 1.4 max Fe, bal Al.
Die Cast: 44,000 TS; 22,000 YS; 4 El; 28,000 SS.
For commercial die castings, large pressure tight engine covers, grills.
High strength. Similar to Aluminum 13.

ALUMINUM B-95.
Russia, 5-7 Zn, 1.8-2 8 Mg, 1 4-2 0 Cu, 0.2-0.6 Mn, 0 1-0.25 Cr, bal Al.
For high strength castings; age-hardenable.

ALUMINUM V-95.
Russian, Mg, Zn, Cu, bal Al
For aircraft parts; age-hardenable.

ALUMINUM-100
M-297; Mg, Zn, bal Al.
For light alloy parts; corrosion resistant.

ALUMINUM-100.
M-1565; 0.1 Cu, Fe = 1 5 × Si, min, bal Al.
Electric motor rotors.
High purity, corrosion resistant

ALUMINUM HZM-100.
M-1235, 7.3 Zn, 3 Mg, 2 Cu, 0 2 Cr, bal Al.
T-6 temper: 100,000 TS, 92,000 YS, 9 El, 160 Brin.
O-temper 40,000 TS; 26,000 YS, 10 El.
For aircraft parts and structures; age hardenable.

ALUMINUM XZM-100.
M-1235; Al alloy
Extruded 92,000 TS; 11 El
For light alloy parts

ALUMINUM-A108
M-671, M-4, 4 5 Cu, 5 5 Si, bal Al.
Cast. 28,000 TS, 16,000 YS, 2 El, 70 Brin.
For ornamental grilles, reflectors, general purpose castings.
Fair corrosion resistance

ALUMINUM 108-Z.
M-1279, 3-4 Cu, 2.5-3 5 Si, 2-3 Zn, 1 max Fe, 0.5 max Ni, 0 25 max Ti, 0.5 max Mn, bal Al.
For valve bodies, manifolds, truck wheels, piano frames, oil pans
Non-heat treatable

ALUMINUM LAC112A TYPE 1.
M-28; 1 1 Cu, 10 3 Si, bal Al.
Sand cast: 21,300 TS; 11,000 YS; 2 El; 70 Brin.
For pressure tight castings; corrosion resistant.

ALUMINUM LAC 112A TYPE 2.
M-28; 2.1 Cu, 10 3 Si, 0.9 Zn, bal Al.
Permanent mold: 25,300 TS, 12,000 YS; 2 El; 78 Brin
For pressure tight castings; corrosion resistant.

ALUMINUM C-113.
M-4; 6-8 Cu, 3-4 Si, 2.5 max Zn, 1 Fe, bal Al.
Permanent Mold: 30,000 TS; 2400 YS; 1.5 El; 85 Brin.

For washing machine agitators, automotive cylinder heads, timing gears.
Permanent mold, pressure tight.

ALUMINUM LAC 113B.
M-28; 3.5 Cu, 11 Zn, bal Al.
Sand cast: 24,600 TS; 13,500 YS; 1.5 El; 85 Brin.
For general castings; good corrosion resistance.

ALUMINUM-SC114A.
M-158; 11.42 Si, 3.25 Cu, 1.10 Fe, 0.04 Mg, 0.20 Mn, 0.38 Ni, bal Al.
As Cast: 49,700 TS; 25,300 YS; 3.4 El.
For die castings, instrument cases, housings, oil pans.
Corrosion resistant, pressure tight.

ALUMINUM-SC114A + Mg
M-158; 12.0 Si, 3.94 Cu, 0.97 Fe, 0.51 Mg, 0.30 Mn, 0.01 Ni, bal Al.
Die Cast: 48,200 TS; 27,400 YS; 2.0 El.
For die castings, instrument cases, housings, grills.
Corrosion resistant.

ALUMINUM-SN122A.
M-158; 12.0 Si, 0.79 Cu, 1.12 Fe, 1.23 Mg, 0.07 Mn, 2.5 Ni, bal Al.
As Cast: 46,600 TS; 34,700 YS; 0.9 El.
At 300°F 43,500 TS; 39,400 YS; 1.0 El.
For die castings, auto and diesel engine pistons, pulleys, sheaves.
Good high temperature strength.

ALUMINUM-A132.
M-1147, M-4, 0.8 Cu, 12.0 Si, 1.2 Mg, 2.5 Ni, bal Al.
T551: 36,000 TS; 28,000 YS; 0.5 El; 105 Brin.
T65: 47,000 TS; 43,000 YS; 0.5 El; 125 Brin.
For permanent mold castings, automotive and diesel engine pistons, pulleys, sheaves.
Age-hardenable Good high temperature properties.

ALUMINUM-AS132
M-541, M-1219, M-1220; 12 Si, 2 Cu, 0.3 Mn, 0.7 Fe, bal Al.
For crankcases, oil pump bodies, die castings for automobile components.
Die cast alloy

ALUMINUM D132
M-4; 2-4 Cu, 1.2 max Fe, 8.5-10.5 Si, 0.5-1.5 Mg, 0.5-1.5 Ni, 0.2 Ti, bal Al.
T5-temper: 36,000 TS; 28,000 YS; 1 El, 105 Brin.
For pistons, cylinder heads; age-hardenable.

ALUMINUM-D132.
M-1147; 3.5 Cu, 9.0 Si, 0.8 Mg, 0.8 Ni, bal Al.
T5: 36,000 TS; 28,000 YS, 1.0 El; 105 Brin
For permanent mold castings, pistons, crankcases, oil pans.
Age hardenable, corrosion resistant.

ALUMINUM-F132.
M-4; 9.3 Si, 2.9 Cu, 1.1 Mg, 0.3 Fe, bal Al.
Permanent Mold: 36,000 TS; 28,000 YS; 1 El; 105 Brin.
For automotive and diesel engine pistons, permanent mold castings, oil pans, crankcases.
Good casting qualities, pressure tight, corrosion resistant.

ALUMINUM-B133.
M-297; Mg, Zn, bal Al.
For light alloy parts; corrosion resistant.

ALUMINUM-A140.
M-4; 7-9 Cu, 5.5-6.5 Mg, 0.3-0.7 Mn, 0.3-07 Ni, 0.5 max Si, 0.5 max Fe, 0.1 max Zn, 0.2 max Ti, bal Al.
Cast: 33,000 TS; 28,000 YS; 1 El; 90 Brin.
At 600°F: 17,000 TS; 12,000 YS; 40 El.
For aircraft and missile components, cases, housings.
Non-heat treatable casting alloy.

ALUMINUM XA140.
M-4; 8 Cu, 6 Mg, 0.05 Mn, 0.5 Ni, B, Be, Ti, bal Al.
For components for aircraft and gas turbine engines; high strength at 400-600°F.

ALUMINUM-X149.
M-4; 4.25 Cu, 0.35 Mg, 3.0 Zn, 0.4 Mn, 0.25 Ti, bal Al.
Cast: 60,000 TS; 50,000 YS; 5 El.
For structural applications in aerospace and ordnance.
Good resistance to stress corrosion cracking in saline environment.

ALUMINUM K-155.
M-1147; 0.8 Mg, bal Al.
O-Temper: 18,000 TS; 6000 YS; 30 El; 28 Brin.
H18-temper: 29,000 TS; 28,000 YS; 4 El; 41 Brin.
H38-temper: 29,000 TS; 27,000 YS; 5 El; 51 Brin.
For light reflectors, refrigerator shelves; now Aluminum 5005.

ALUMINUM A.W. 160.
M-493; 1.0 Si, 0.7 Mn, 0.65 Mg, bal Al.
For light alloy parts; same as Anticorodal.

ALUMINUM K 183.
M-1147; 0.4 Si, 0.4 Fe, 0.1 Cu, 0.5-1.0 Mn, 4.0-4.9 Mg, 0.25 Cr, 0.25 Zn, 0.15 Ti, bal Al.
O-temper: 44,000 TS; 22,000 YS; 21 El; 73 Brin.
H 113-temper: 46,000 TS, 33,000 YS; 16 El.
For welded structures and girders; good weldability.

ALUMINUM K 186.
M-1147; 4 Mg, 0.45 Mn, 0.1 Cr, bal Al.
O-temper: 38,000 TS; 17,000 YS; 22 El.
H 112-temper. 39,000 TS; 19,000 YS; 14 El.
H 34-temper 47,000 TS; 37,000 YS; 10 El.
For pressure vessels, truck and trailer frames; good formability and weldability.

ALUMINUM A214.
M-4; 3.8 Mg, 1.8 Zn, bal Al
Permanent mold 27,000 TS, 16,000 YS; 7 El; 60 Brin.
Die cast: 40,000 TS; 22,000 YS; 10 El.
For cooking utensils; corrosion resistant.

ALUMINUM-A214
M-671; 4 Mg, 1.8 Zn, bal Al.
Cast: 27,000 TS, 16,000 YS; 7 El; 60 Brin.
For cooking utensils, architectural fittings.
Fair resistance to hot cracking.
Good corrosion resistance

ALUMINUM-F214.
M-671, M-4; 4 Mg, 0.5 Si, bal Al.
Cast. 21,000 TS; 12,000 YS; 3 El; 50 Brin.
For dairy and food handling equipment, cooking utensils, fittings for chemical and sewerage use.
Corrosion resistant. Resists hot cracking.

ALUMINUM-L214.
M-671, M-4; 0.10 Cu, 0.75 Si, 0.75 Fe, 0.5 Mn, 3.3 Mg, 0.1 Zn, 0.1 Ni, bal Al.
Cast: 41,000 TS; 10 El.
For hardware, support brackets.
Fair resistance to hot cracking.
Good corrosion resistance.

ALUMINUM B218.
M-4; 0.10 max Si, 0.12 max Fe, 0.05 max Cu, 6.5-7.5 Mg, 0.10-0.25 Ti, bal Al.
Cast: 38,000 TS; 19,000 YS; 10 El; 65 Brin.
For non-heat treatable sand and permanent mold castings
Fair resistance to hot cracking and fair fluidity.

ALUMINUM 218SP.
M-671, M-4; 6.7 Mg, 0.2 Si, 0.1 Mn, bal Al.
Cast: 36,000 TS; 18,000 YS; 9 El.

For dairy and food handling equipment, fittings for chemical and sewerage use, cooking utensils.
Corrosion resistant.

ALUMINUM X250.
M-4; 8 Mg, 0 15 Cu, 0.25 Mn, 1.5 Zn, bal Al.
T4-temper: 50,000 TS, 28,000 YS; 16 El, 85 Brin.
Aged: 58,100 TS, 33,500 YS; 18 El
For castings, aircraft engine cases and parts, age-hardenable, stress corrosion resistant.

ALUMINUM KS280
Germany; 21-22 Si, 1 5 Cu, 1 5 Ni, 0 6 Mn, 0 5 Mg, 1.2 Co, bal Al.
For bearings

ALUMINUM BA305
M-28, 3 5-4.8 Cu, 0.8 Mg, 0 9 Si, 1 Fe, 1.2 Mn, 0.3 Ti, bal Al.
Heat treated. 53,800-62,700 TS, 38,400-58,300 YS, 20-9 El, 115-135 Brin.
For aircraft parts; high strength, good ductility, heat treatable.

ALUMINUM 310
M-4; 10 5 Si, 1.0 Cr, 0.3 Mg, 1 0 Pb, 0 5 Bi, bal Al
Cast: 43,000 TS; 25,000 YS, 2 5 El, 80 Brin
For die castings, housings, containers, machine tools. Free-cutting.
Good strength, weldability and corrosion resistance

ALUMINUM 333.
Eng; Cu, Si, bal Al
Cast. 34,000 TS, 19,000 YS; 2 El, 90 Brin
For castings, pistons, sole plates; permanent molds

ALUMINUM 335
M-4, 8.0 Si, 0 5 Cu, 0.5 Mg, 1 0 Pb, 1 0 Bi, bal Al
Cast Sand 25,000 TS, 16,000 YS, 25 El: 64 Brin
T5 Temper 30,000 TS, 26,000 YS, 1 5 El, 80 Brin
T6 Temper: 35,000 TS, 25,000 YS, 3 El, 88 Brin
T61 Temper 40,000 TS, 30,000 YS, 3El, 90 Brin.
For permanent molds and sand castings in machine tools. Free machining
Good strength, weldability and corrosion resistance

ALUMINUM 344.
M-4, 7 Si, bal Al
For cooking utensils, corrosion resistant

ALUMINUM-A344
M-4; 6 5-7 5 Si, 0.5 max Fe, 0 3 max Mn, 0.2 max Cu, bal Al
Sand Cast 21,000 TS, 9,000 YS; 9 El
Permanent Mold 24,000 TS, 11,000 YS; 13 El
For bridge railing posts, permanent mold general castings.
High resistance to impact and to hot cracking Pressure tight.

ALUMINUM 354
M-4, 9 Si, 1.8 Cu, 0.5 Mg, bal Al
T61 Temper. 52,000 TS; 39,000 YS, 6 El.
T62 Temper· 55,000 TS, 45,000 YS, 3 El.
T61 P M., 55,000 TS, 41,000 YS; 6 El, 100 Brin.
For aircraft and missile applications
Sand, permanent mold or plaster castings
Good strength, weldability and corrosion resistance Heat treatable.

ALUMINUM BA355.
M-28, 3.5-4 8 Cu, 0 8 Mg, 0 9 Si, 1 Fe, 1 2 Mn, 0.3 Ti, bal Al
Heat treated: 53,800-58,200 TS, 34,400-52,800 YS; 20-9 El; 115-135 Brin
For aircraft parts, heat treatable, high strength

ALUMINUM-C355.
M-4; 1 3 Cu, 0.2 max Zn, 0.6 max Fe, 0 5 Mg, 5.0 Si, bal Al.
T6: 45,000 TS; 33,000 YS; 2 El; 90 Brin.
T62· 52,000 TS; 44,000 YS; 4 El; 100 Brin.
For general purpose castings; casings, housings, fittings, gear boxes.
Heat treatable. High strength and corrosion resistant.

ALUMINUM-A356.
M-4; 0 2 Cu, 7.5 Si, 0.4 Mg, 0.1 Zn, 0.2 Ti, 0.2 Fe, bal Al.
Permanent Mold (T6) 40,000 TS, 28,000 YS, 10 El.
For aircraft and jet engine castings.
Heat treatable Shock resistant

ALUMINUM HP356.
M-1147, M-4, 6 75-7.5 Si, 0 3 Mg, 0 2 max Cu, 0.15 max Fe, 0 3 max Mn, bal Al.
For aircraft fittings, pump parts, cylinder blocks, age-hardenable, good castability.

ALUMINUM 357
M-4, M-1147, 6 5-7 5 Si, 0 45-0 60 Mg, 0.10-0 20 Ti, 0 03 max Zn, 0 15 max Fe, bal Al
F-Temper 28,000 TS, 15,000 YS, 6 El.
Sand Cast (T6)· 50,000 TS, 43,000 YS, 2 El
Permnent Mold (T6) 52,000 TS, 43,000 YS, 5 El
For aircraft and missile structures, high velocity blowers and impellers
Heat treatable, corrosion resistant

ALUMINUM A357
M-4, M-1147, 0 2 Cu, 7 5 Si, 0 6 Mg, 0 1 Zn, 0 2 Ti, 0 2 Fe, bal Al
T6 Sand Cast 46,000 TS, 36,000 YS, 3 El, 85 Brin
T6 Permanent Mold 50,000 TS, 40,000 YS, 10 El, 100 Brin, 43000 S S
For cylinder heads gear cases, oil pans, super chargers, transmission cases
High strength pressure tight

ALUMINUM X357
M 1147, 6 5 7 5 Si, 0 45-0 60 Mg, 0 1-0 2 Ti, bal Al
Permanent mold 50,000 TS, 43,000 YS, 5 El, 100 Brin
Sand cast 52,000 TS, 43,000 YS, 2 El, 90 Brin
For aircraft and missile structures, impellers, age-hardenable

ALUMINUM 359
M-4, M-1147, 9 Si, 0 6 Mg, bal Al
T61 Temper 48,000 TS, 37,000 YS, 6 El
T62 Temper 50,000 TS, 42,000 YS, 5 El
For aircraft and missile applications
Sand, permanent mold or plaster casting
Good strength, weldability and corrosion resistant Heat treatable

ALUMINUM 360
M-4, M-1147, 9 5 Si, 0 5 Mg, bal Al
Die Cast 47,000 TS, 25,000 YS, 11 El
For general purpose die castings, marine and outboard motor parts.
High corrosion resistance and good mechanical properties

ALUMINUM A360
M-4, M-1147; 9-10 Si, 0 45-0 60 Mg, 0.6 max Fe, bal Al
Die Cast· 41,000 TS, 23,000 YS, 5 El, 75 Brin
For general die castings, instrument housings and cases, outboard motor and marine castings.
Corrosion resistant. Die cast.

ALUMINUM ALLOY B.E.S A. NO. 361
Eng, 6 8 Cu, 0 1 Zn, 1 0 max Fe, 1.0 max Si, bal Al
Chill cast· 20,160 YS, 3 El, 60 Brin.
Sand cast· 18,000 TS, 1-2 El
For general castings, cylinder heads; good machinability.

ALUMINUM ALLOY B.E.S.A NO. 362.
- Eng.; 11-13 Cu, 0.1 Zn, 1.0 max Fe, 1.0 max Si, bal Al.
- Chill cast: 20,160 TS; 80 Brin
- For permanent mold castings, pistons; non-hardenable.

ALUMINUM 363
- M-1147; 2.5-3.5 Cu, 4.5-6.0 Si, 0.6 Mn, 0.3 Mg, 3.0-4.5 Zn, bal Al.
- Sand cast: 30,000 TS; 20,000 YS; 3 El; 75 Brin
- T6-temper. 46,000 TS, 28,000 YS, 5 El, 90 Brin.
- For pressure tight castings; age-hardened, good castability.

ALUMINUM ALLOY B.E.S.A. NO. 363.
- Eng., 2.5-3.0 Cu, 12.5-14.5 Zn, 1.0 max Fe, 1.0 max Si, bal Al
- Sand cast 25,000-30,000 TS, 1 El, 70 Brin
- For sand castings, crankcases, non-hardenable

ALUMINUM-A380.
- M-4, M-1147, 7.5-9.5 Si, 3-4 Cu, 0.6 max Fe
- Die Cast 47,000 TS, 23,000 YS, 4 El, 80 Brin
- For general purpose die castings, instrument housings and cases
- Corrosion resistant

ALUMINUM 380B
- 3.5 Cu, 9.0 Si, 1.0 Fe, 0.5 Mn, 0.10 Mg, 2.0 Zn, 0.5 Ni, bal Al
- Cast 40,000 TS, 17,000 YS, 2.5 El
- For general purpose die castings.
- Corrosion resistant, high strength

ALUMINUM 380Z
- 3.5 Cu, 9.0 Si, 1.0 Fe, 0.5 Mn, 0.10 Mg, 3.0 Zn, 0.5 Ni, bal Al
- Cast 40,000 TS, 17,000 YS, 2.5 El
- For general purpose die castings
- Corrosion resistant, pressure tight

ALUMINUM 384
- M-4, 2.4 Cu, 11-13 Si bal Al
- Die Cast 47,000 TS, 25,000 YS, 1 El.
- At 400°F 28,000 TS, 20,000 YS, 8 El
- For large thin-walled castings
- Pressure tight die castings Good resistance to hot cracking

ALUMINUM 385
- M-4 5 Si, 3.7 Cu, 0.7 Sn, 0.7 Pb, 0.7 Cd, bal Al
- Die Cast 36,000 TS, 20,000 YS, 3 El 75 Brin
- For connecting rods, gear housings.
- High fatigue properties Good bearing surface

ALUMINUM 390
- M-4, M-671, 16-18 Si, 4.5 Cu, 0.45-0.65 Mg 0.6-1.1 Fe, 0.2 max Ti, bal Al
- -F Temper 40,500 TS, 35,000 YS, 1 El, 120 Brin
- T5 Temper 43,000 TS, 38,500 YS, 1 El
- For die cast engine blocks, pistons, cylinders
- Pressure-tight die casting, wear and corrosion resistant

ALUMINUM-A390
- M-4, M-671, 16-18 Si, 4-5 Cu, 0.45-0.65 Mg, 0.5 max Fe, 0.2 max Ti, bal Al.
- Permanent Mold T6 Temper 45,000 TS, 45,000 YS, 1 max El, 145 Brin
- As Cast 29,000 TS, 29,000 YS, 1 max El, 110 Brin
- For high strength castings, engine blocks, cylinders, pistons
- Heat treatable, good resistance to heat cracking, excellent fluidity

ALUMINUM 392
- M-4, 16 Si, bal Al
- Cast: 45,000 TS; 43,000 YS; 1 El
- For auto engine blocks, cylinders, pistons
- Wear resistant.
- Hard surface as cast. Die cast.

ALUMINUM DTD 424.
- M-28; 3 Cu, 5 Si, 0.5 Mn, bal Al.
- Sand cast: 20,200 TS, 12,300 YS; 2.5 El; 65 Brin.
- Permanent mold: 22,400 TS; 12,300 YS; 2.5 El, 70 Brin.
- For general castings, corrosion resistant.

ALUMINUM DTD428.
- M-28, 7 Cu, 3 Si, 3 Zn, bal Al
- Sand cast: 19,100 TS, 12,200 YS; 1 El, 73 Brin.
- Permanent mold 24,600 TS, 15,700 YS, 1 El, 80 Brin
- For general castings; pressure tight

ALUMINUM S457
- M-4; 0.05-0.20 Cu, 0.15-0.45 Mn, 0.8-1.2 Mg, bal Al
- For decorative trim, appliances, mirror-like finish

ALUMINUM-A612.
- M-4; 0.35-0.60 Cu, 7.0 Zn, 0.2 max Ti, 0.65-0.80 Mg, bal Al
- F-Temper: 35,000 TS, 25,000 YS; 5 El; 75 Brin
- For housings, fittings, machinery parts, airplane and and automobile structures.
- Cast alloy, excellent brazability.

ALUMINUM-C612
- M-671, M-4, 0.5 Cu, 6.5 Zn, 1.4 max Fe, 0.35 Mg, 0.35 max Si, 0.25 max Ti, bal Al
- Cast and Room Aged: 35,000 TS, 18,000 YS, 8 El, 70 Brin
- T5 34,000 TS, 18,000 YS, 7 El
- For general purpose castings Brazed assemblies.
- Good brazing properties, high strength and ductility.

ALUMINUM-D612
- M-671, M-1147, M-4, 0.15 max Si, 0.4 max Fe, 0.5-0.65 Mg, 0.1 max Mn, 0.4-0.6 Cr, 5.0-6.5 Zn, 0.15-0.25 Ti, 0.2 max Cu, bal Al
- Sand cast and aged 35,000 TS, 25,000 YS, 9 El, 75 Brin
- For general castings, transmission housings, manifolds, cylinder heads, ventilating fans.
- Self-aging No heat treatment required

ALUMINUM 613
- M-671, M-4, M-1147, 0.25 max Si, 0.8 max Fe, 0.25-0.50 Mg, 0.35 max Cr, 7-8 Zn, 0.2 max Ti, 0.4-1.0 Cu, 0.6 max Mn, bal Al
- Sand cast and aged 35,000 TS, 25,000 YS, 5 El, 74 Brin
- For general castings, machinery parts, fittings, brackets, auto and airplane parts
- Self-aging No heat treatment required

ALUMINUM 718
- M-4, M-1147, 0.3 max Cu, 0.8 max Fe, 11-13 Si, 0.2 max Zn, bal Al
- For brazing alloy, M.P 1070-1080°F

ALUMINUM A750
- M-4, M-1147, 2-3 Si, 0.7-1.3 Cu, 0.3-0.7 Ni, 5.5-7 Sn, bal Al
- Cast (T 5 Temper) 20,000 TS, 11,000 YS; 5 El, 45 Brin
- For bearings, large bearing for rolling mills.
- Resists galling and seizing Less hot-short than Aluminum 750

ALUMINUM B750
- M-4, M-1147, 1.7-2.3 Cu, 0.6-0.9 Mg, 0.9-1.5 Ni, 5.5-7.0 Sn, 0.4 max Si, 0.5 max Fe, bal Al.
- Cast (T 5 Temper): 27,000-32,000 TS, 22,000-23,000 YS, 2-5 El, 65-70 Brin
- For bearings and bushings carrying heavy loads.
- Resists galling and seizing
- Higher compressive strength than Aluminum 750.

ALUMINUM XB 805
- England, 6.5 Sn, 1 Ni, 1 Cu, bal Al
- For bearings; requires steel backing.

ALUMINUM C872.

M-4; 0.20-0.6 Si, 0.45-0.9 Mg, 0.35 max Fe, 0.10 max Cu, 0.10 max Ti, bal Al.
T42 Temper (min): 17,000 TS; 9000 YS, 12% El.
T5 Temper (min): 22,000 TS; 16,000 YS; 8% El.
T6 Temper (min): 30,000 TS; 25,000 YS; 8-10% El
For trim, architectural, decorations.
Extrusion alloy.

ALUMINUM C914.

M-4, 0 20-0.6 Si, 0.45-0 9 Mg, 0 35 max Fe, 0.10 max Cu, 0.10 max Mn, 0.10 max Zn, 0.10 max Cr, 0.10 max Ti, bal Al.
T5-Temper: 27,000 TS; 21,000 YS, 12% El, 60 Brin
T6-Temper: 35,000 TS; 31,000 YS; 10-12% El; 73 Brin.
O-Temper: 13,000 TS; 7000 YS; 25 Brin
For Constructional equipment and components.
Heat treatable extrusion alloy.

ALUMINUM C-960.

M-4; 16 Si, bal Al.
For automotive engines, pistons.
Cast: 45,000 TS; 42,000 YS; 1 El.
High corrosion resistance.

ALUMINUM C989.

M-4; 0.20-0.6 Si, 0.45-0.9 Mg, 0.35 max Fe, 0 10 max Cu, 0.10 max Ti, bal Al.
T42 Temper (min): 17,000 TS; 9000 YS, 12% El
T5 Temper (min): 22,000 TS, 16,000 YS; 8% El.
T6 Temper (min) 30,000 TS, 25,000 YS, 8-10 El
For trim, architectural, decorative applications.
Extrusion alloy, heat treatable.

ALUMINUM 1060.

M-4; 99 6 min Al, 0.25 max Si, 0 35 max Fe, 0 05 max Cu.
H12-temper: 12,000 TS; 11,000 YS; 16 El; 23 Brin
H18-temper 19,000 TS; 18,000 YS, 6 El; 35 Brin.
For conductors, parts for hydrogen peroxide service, high purity.

ALUMINUM-1145

M-4, M-671, 99 45 min Al, 0.55 Si + Fe
O-Temper. 11,000 TS, 5000 YS, 40 El, 20 Brin
H18 Temper: 24,000 TS; 21,000 YS, 4 El; 44 Brin.
For light sheet metal work, foil
Good corrosion resistance and weldability.

ALUMINUM 1180.

M-671; 0 09 Si, 0 09 max Fe, 0 01 max Cu, 0 02 max Ti, 99 80 min Al
For capacitor foil

ALUMINUM 1188

M-671, 0.06 Si, 0 06 Fe, 0 01 max Mn, 99.88 min Al.
For capacitor foil

ALUMINUM 1199

M-671; 0.006 Si, 0.006 Fe, 0 006 Cu, 99 99 min Al
For capacitor foils.

ALUMINUM 1230

M-671, 0 07 Si + Fe,, 0 10 max Cu, 99 30 min Al.
For cladding on Aluminum 2024.

ALUMINUM 1235

M-671; 0 65 Si + Fe, 0 05 max Cu, 99.35 min Al
For foil

ALUMINUM 1345

M-4, 0.30 max Si, 0.40 max Fe, 0 10 max Cu, bal Al
O-Temper. 12,000 TS, 4000 YS; 40 El, 22 Brin
H14-Temper 16,000 TS, 14,000 YS; 11 El, 30 Brin.
H19-Temper; 28,000 TS; 25,000 YS, 4 El, 52 Brin.
For non-electrical wire applications.
Wire, non-heat treatable

ALUMINUM 2020

M-4; 1 1 Li, 4.5 Cu, 0 5 Mn, 0 2 Cd, bal Al.
T-6 temper: 86,000 TS; 79,000 YS, 6 El, 150 Brin.
At 400°F: 61,000 TS; 57,000 YS; 7 El.
For aircraft components; for high temperature service.

ALUMINUM 2021.

M-4; 5 8-6.8 Cu, 0.2-0 4 Mn, 0 02-0 10 Ti, 0.1-0.25 Zr, 0.05-0.15 V, 0 05-0 20 Cd, 0 03-0.08 Sn, bal Al.
T8E31 Temper:(At RT)75,000 TS, 66,000 YS, 9 El.
(At-320°F) 90,000 TS, 80,000 YS; 9 El.
(At-423°F) 102,000 TS; 84,000 YS; 9 El
For cryogenic services, space vehicles, liquid-fueled low temp tanks
Tough, weldable, good corrosion resistance.

ALUMINUM 2219

M-4, M-671, 5.8-6.8 Cu, 0.2-0.4 Mn, 0 02-0 10 Ti, 0 20 max Si, 0.30 max Fe, bal Al
O-temper: 25,000 TS; 10,000 YS, 20 El
T62-Temper 61,000 TS, 42,000 YS, 11 El; 115 Brin.
T87-Temper: 70,000 TS, 58,000 YS, 10 El, 130 Brin.
For aircraft and automotive engine parts, missiles, space vehicles.
Heat treatable High creep resistance.

ALUMINUM X2219

M-4, 6 Cu, 0 3 Mn, 0 1 V, 0.15 Zr, bal Al.
Heat treated 62,000-38,000 TS, 43,000 YS, 16 El.
For aircraft and auto engine components, age-hardenable, high temperature use.

ALUMINUM 2319

M-4, 0 2 Si, 0 3 Fe, 5 8-6 8 Cu, 0 2-0.4 Mn, 0 02 Mg, 0 10 Zn, 0 1-0 2 Ti, 0 05 0 15 V, 0 10-0 20 Zr, bal Al
For filler wire for both gas metal-arc and gas tungsten arc welding of Aluminum 2021 Alloy
(Almigweld electrode)

ALUMINIUM 2364

M-1147, 3 5-5 0 Cu, 5 5-7 5 Si, 0 6 max Fe bal Al.
For general castings, corrosion resistant, cast

ALUMINIUM 2393

M-1147, 3-4 Cu, 7-9 Si, 0 6-1 0 Fe, bal Al
For pressure tight die castings, good castability, corrosion resistant

ALUMINUM 2618

M-1147, 2 5 Cu, 1 5 Mg, 0 15 0 25 Si, 1 2 Ni, 1 Fe 0 1 Ti, bal Al
T61 temper 64,000 TS, 54,000 YS, 11 El
For large engine components, for use up to 500°F, age-hardened

ALUMINUM 3002

M-4, 0 08 max Si, 0 1-0 25 Mn, 0 05-0 20 Mg, bal Al
O-Temper 14,000 TS, 6000 YS, 35 El, 25 Brin
H25-Temper 22,000 TS, 20,000 YS, 14 El
For Reflectors
High reflectivity

ALUMINUM 3005

M-4, 0 6 Si, 0 7 Fe, 0 3 Cu, 1 0-1 5 Mn, 0.2-0 6 Mg, 0 1 Cr, 0 25 Zn, bal Al
O-Temper 20,000 TS, 8000 YS, 25 El.
H-14 Temper 26,000 TS, 25,000 YS, 5 El
For sheet metal structures, commercial vehicles
Non hardenable, corrosion resistant.

ALUMINUM 3005.

M-238, 1 0-1 5 Mn, 0 06-0 20 Mg, 0.03 Ti, bal Al.
O-Temper 20,000 TS, 8000 YS, 25 El.
H14-Temper 26,000 TS; 25,000 YS, 5 El.
For reflectors. High reflectivity.

ALUMINUM 3105.
M-4, M-671; 0.30-1.5 Mn, 0.2-0.8 Mg, 0.6 max Si, 0.7 max Fe, 0.4 max Cu, 0.25 max Cr, 0.4 max Zn, 0.10 max Ti, bal Al.
H25 Temper: 26,000 TS; 24,000 YS; 8 El; 47 Brin.
For building products, boxes, covers, containers.
Good corrosion resistance and formability.
Non-heat treatable

ALUMINUM GM-3889M.
M-165; 4 Si, 1 Cd, bal Al.
For bearings; requires steel backing.

ALUMINUM 4043.
M-4; 4.5-6.0 Si, 0.8 max Fe, bal Al
Annealed: 19,000 TS; 25 El.
Cast Filler Metal: 19,000 TS; 8000 YS; 8 El; 40 Brin.
For welding wire, marine castings, filler metal
Corrosion resistant, low melting point.

ALUMINUM 4045.
M-4, M-671; 9.0-11.0 Si, 0.8 max Fe, 0.3 max Cu, 0.1 max Zn, 0.05 max Mn, 0.20 max Ti, bal Al
For brazing aluminum alloys, filler metal, for cladding Aluminum 6951 Alloy.
M P 1070-1100°F
AWS-ASTM BAlSi-5

ALUMINUM 4047.
M-4, M-671; 11.0-13.0 Si, 0.8 max Fe, 0.3 max Cu, 0.15 max Mn, 0.10 max Mg, 0.2 max Zn, bal Al.
For brazing aluminum alloys, filler metal.
M P 1070-1080°F
AWS-ASTM BAlSi-4.

ALUMINUM 4145
M-4, 9.3-10.7 Si, 0.8 Fe, 3.3-4.7 Cu, 0.15 Mn, 0.15 Mg, 0.2 Zn, 0.15 Cr, bal Al
For filler brazing aluminum alloys
M P 970-1085°F
AWS-ASTM BAlSi 3

ALUMINUM 4245
M-4, 9.3-10.7 Si, 0.8 max Fe, 3.3-4.7 Cu, 0.07 max Mn, 0.07 max Cr, 9.3-10.7 Zn, bal Al
For brazing aluminum alloys, filler metal
M P 960-1040°F

ALUMINUM 4543
M-4, M-671, 5-7 Si, 0.5 max Fe, 0.10-0.40 Mg, 0.10 max Ti, 0.10 max Cu, 0.05 max Cr, 0.10 max Zn, bal Al
T61 Temper 28,000 TS, 17,000 YS, 15 El
For extruded products, architectural trim and shapes
Age-hardenable, corrosion resistant

ALUMINUM 4643
M-4, 3.6-4.6 Si, 0.8 Fe, 0.1 max Cu, 0.05 Mn, 0.1-0.3 Mg, 0.15 Cr, 0.1 Zn, 0.15 Ti, bal Al
For weld filler metal in welding Aluminum 6061 T6 thick plates
Heat treatable

ALUMINUM 5039.
M-1147; 0.13 Si, 0.17 Fe, 0.06 Cu, 0.25 Mn, 3.75 Mg, 3.1 Zn, 0.08 Ti, 0.1 Cr, bal Al.
For weld filler alloy to join 7039 Aluminum Alloy
Self aging

ALUMINUM 5040.
M-4, 0.3 max Si, 0.7 max Fe, 0.25 max Cu, 0.9-1.4 Mn, 1.0-1.5 Mg, 0.1-0.3 Cr, 0.2 max Zn, bal Al.
O temper: 26,000 TS; 10,000 YS; 20 El, 45 Brin
H34-temper 35,000 TS, 29,000 YS, 9 El; 63 Brin.
For lamp bases, light gage sheet.

ALUMINUM 5056.
M-1147; 6 Mg, 0.05 Cu, 0.13 Fe, 0.08 Si, bal Al
O-temper: 42,000 TS; 22,000 YS, 35 El; 65 Brin.
H-38 temper: 60,000 TS; 50,000 YS; 15 El; 100 Brin.
For light alloy parts, marine hardware; corrosion resistant.

ALUMINUM 5080.
M-4; 0.5 Mn, 4.0 Mg, 0.1 Cr, 2.0 Zn, 0.1 Ti, bal Al.
For welding filler metal.
For use with Aluminum 7006.

ALUMINUM 5082.
M-4, 4.5 Mg, Mn, Cr, bal Al.
Rolled: 56,000 TS.
For packaging and decorating, beer cans, tab top can.
Sheet stock, corrosion resistant.

ALUMINUM 5083
M-1147; 0.4 Si, 0.4 Fe, 0.1 Cu, 0.5-1.0 Mn, 4-5 Mg, 0.25 Cr, 0.25 Zn, 0.15 Ti, bal Al.
O-temper: 44,000 TS; 22,000 YS; 21 El; 73 Brin.
H 113-temper: 46,000 TS; 33,000 YS; 16 El
For girders, marine assemblies, scaffolding; good weldability

ALUMINUM 5086.
M-1147; 0.4 Si, 0.4 Fe, 0.1 Cu, 0.2-0.7 Mn, 3.5-4.5 Mg, 0.25 Cr, 0.25 Zn, bal Al.
O-temper 38,000 TS; 17,000 YS, 22 El.
H 36-temper: 47,000 TS; 37,000 YS; 10 El.
H 112-temper: 39,000 TS; 19,000 YS; 14 El
For welded assemblies, pressure vessels, boat hulls, good formability and weldability

ALUMINUM 5154
M-1147, 3.5 Mg, 0.25 Cr, bal Al.
O-temper 34,000 TS; 16,000 YS, 27 El
H38-temper: 48,000 TS; 39,000 YS; 8 El.
For welded assemblies, pressure vessels, tanks, corrosion resistant; formerly A54S

ALUMINUM 5180
M-4, 2 Zn, 4 Mg, bal Al
For filler metal in welding Aluminum 7106, for low temperature applications High weld strength

ALUMINUM 5183
M-1147, M-4, 0.4 Si, 0.4 Fe, 0.1 Cu, 0.3-1.0 Mn, 4.5-5.2 Mg, 0.05-0.25 Cr, 0.15 max Ti, 0.0005 max Be, bal Al
For structural and marine applications, truck and trailer bodies, power shovels, good formability and weldability, welding electrodes

ALUMINUM 5205
M-4, M-671, 0.15 max Si, 0.7 max Fe, 0.03-0.10 Cu, 0.10 max Mn, 0.6-0.1 Mg, 0.1 max Cr, bal Al.
For auto trim, instrument panels
Sheet alloy, excellent formability, antiglare sheet.

ALUMINUM 5252
M-4, 2.2-2.8 Mg, 0.10 max Mn, 0.10 max Cu, 0.10 max Fe, 0.08 max Si, bal Al
H25 Temper 35,000 TS, 27,000 YS, 12 El.
H28 Temper 41,000 TS; 35,000 YS, 8 El
For auto exterior rolled moldings and stampings and trim
Non hardenable, corrosion resistant

ALUMINUM 5252.
M-1147, 2.2-2.8 Mg, 0.1 max Mn, 0.1 max Cu, 0.1 max Fe, 0.08 max Si, bal Al
For light weight parts, auto trim, good dent resistance

ALUMINUM 5257
M-4; 0.08 max Si, 0.2-0.6 Mg, 0.03 max Mn, bal Al.
H25 Temper: 19,000 TS; 16,000 YS; 14 El; 32 Brin
H28 Temper: 23,000 TS; 19,000 YS; 8 El; 43 Brin.
For deeply drawn parts, headlamps, tail lamp bezels, anodized auto trim.
Good formability.

ALUMINUM 5356.
M-4; 0.05-0.2 Mn, 4.5-5.5 Mg, 0.05-0.2 Cr, 0.06-0.2 Ti, bal Al.
For welding wire.

ALUMINUM 5357.
M-1147; 0.17 Fe, 0.15-0.45 Mn, 0.8-1.2 Mg, 0.12 max Si, bal Al.
O-temper: 19,000 TS; 7,000 YS; 25 El; 32 Brin.
H34-temper: 24,000 TS; 22,000 YS; 8 El; 45 Brin.
H38-temper: 32,000 TS; 30,000 YS; 6 El; 55 Brin.
For automobile trim, gift ware; formerly C57 alloy; takes bright polish.

ALUMINUM 5457.
M-4; 0.15-0 45 Mn, 0.8-1.2 Mg, 0.20 max Cu, 0.10 max Fe, bal Al.
Annealed: 16,000-22,000 TS; 16-20 El.
H38 Temper: 27,000 min TS; 2 min El.
For stampings and auto grills, automotive and appliance components.
Super bright anodized finished. Not heat treatable.

ALUMINUM 5556
M-4; 0.8 Mn, 5.25 Mg, 0.1 Cr, 0 1 Ti, bal Al.
For welding wire.

ALUMINUM 5557.
M-4; 0.10-0.40 Mn, 0.40-0 8 Mg, 0.10 max Si, 0.12 max Fe, 0.15 max Cu, bal Al.
O Temper· 16,000 TS; 6000 YS, 25 El; 27 Brin.
H25 Temper: 25,000 TS, 21,000 YS; 10 El; 46 Brin
H28 Temper· 30,000 TS, 28,000 YS, 8 El, 55 Brin.
For stampings and auto grills, automotive and appliance trim.
Good bright finish, corrosion resistant
Good formability and weldability.

ALUMINUM 5652.
M-4, M-671; 0 04 Cu, 0 01 Mn, 0 40 Fe + Si, 2 2-2 8 Mg, 0 10 Zn, 0 15-0 35 Cr, bal Al.
For hydrogen peroxide equipment.
Good corrosion resistance.

ALUMINUM 5657.
M-4, M-671; 0.6-1 0 Mg, 0 08 max Si, 0 10 max Fe, 0 10 max Cu, 0.03 max Zn, bal Al
H25 Temper: 23,000 TS; 20,000 YS, 12 El, 40 Brin.
H38 Temper: 28,000 TS, 24,000 YS; 7 El; 50 Brin
For deep drawn parts and stampings, interior and exterior trim for automobiles and appliances.
Bright, corrosion resistant.

ALUMINUM 5757.
M-4, 0.05-0 15 Cu, 0 6-1.0 Mg, 0 05-0 15 Cr, bal Al
For automobile and appliance grills, trim, auto bumpers, bright finish, fabricating trim

ALUMINUM 6003
M-671, 0 35-1 0 Si, 0.8-1.5 Mg, 0 6 max Fe, 0 35 max Cr, bal Al
For cladding on Alclad 2014 sheet and plate.
Corrosion resistant

ALUMINUM 6011
M-4, M-671; 0.9 Si, 0 6 Cu, 0 9 Mg, 1 5 Zn, bal Al
For moderate strength structural applications.
Sheet or plate. Corrosion resistant.

ALUMINUM 6051.
M-1147, M-4, 0.05 Cu, 0.6 Mg, 0 01 Mn, 0.4 Fe, 1 Si, bal Al
For light alloy parts; heat treatable

ALUMINUM 6063.
M-671, M-4, M-1147, 0 2-0 6 Si, 0.45-0.9 Mg, 0.35 max Fe, bal Al.
T5. 27,000 TS; 21,000 YS; 12 El, 60 Brin.
T6: 35,000 TS; 31,000 YS, 12 El; 73 Brin.
For architectural applications, portable irrigation systems, moldings and trim.
Heat treatable. Extrusion alloy AA-6063.

ALUMINUM S6063.
M-671; 0 5 Si, 0.8 Mg, 0.35 max Fe, bal Al.
T5: 27,000 TS; 21,000 YS; 12 El; 60 Brin.
T42: 25,000 TS; 13,000 YS; 22 El.
For architectural applications, portable irrigation systems, moldings and trim.
Heat treatable extrusion alloy.

ALUMINUM SS6063.
M-671; 0.5 Si, 0 8 Mg, 0.35 max Fe, bal Al.
T5 27,000 TS, 21,000 YS; 12 El; 60 Brin.
For architecctural applications, portable, irrigation systems, moldings and trim
Heat treatable extrusion alloy.

ALUMINUM T6063.
M-671; 0 5 Si, 0.8 Mg, 0 35 max Fe, bal Al.
T5: 27,000 TS, 21,000 YS, 12 El, 60 Brin.
For architectural applications, portable irrigation systems, molding and trim.
Heat treatable extrusion alloy.

ALUMINUM 6066
M-4, M-1235, 0 7-1,2 Cu, 0 9-1 8 Si, 0 8-1.4 Mg, 0 6-1.1 Mn, 0 2 Ti, 0 4 Cr, bal Al
O-temper· 22,000 TS, 12,000 YS; 18 El; 43 Brin
T-6 temper 62,000 TS, 55,000 YS, 12 El; 120 Brin
For truck and trailer bodies, aircraft construction; age hardened, good forming and welding properties

ALUMINUM 6070
M-4, 1 0-1.7 Si, 0 50 Fe, 0 15-0 40 Cu, 0.4-1 0 Mn, 0.50-1 2 Mg, 0 10 Cr, 0 25 Zn, 0 15 Ti, bal Al.
Extrusion (T6) 57,000 TS, 52,000 YS; 12 El
For light weight structural weldments, bridges, electrical towers
High strength extrusion alloy Heat treatable, corrosion resistant

ALUMINUM 6071
M 4, 1 1-1.9 Si, 0 50 Fe, 0.15-0 4 Cu, 0 40-1 0 Mn, 0 80-1 4 Mg, 0 10 Cr, 0 25 Zn, 0 15 Ti, bal Al
Rolled (T6) 50,000 TS, 48,000 YS, 6 El. (min)
For light weight structural weldments, commercial vehicles, process tanks
High strength sheet and plate
Heat treatable, corrosion resistant

ALUMINUM 6101
M-4, M-671, M-1147, 0 5 Mg, 0 5 Si, bal Al
T6 32,000 TS; 28,000 YS, 19 El, 70 Brin.
T63· 30,000 TS, 25,000 YS, 20 El, 65 Brin
T61: 25,000 TS, 20,000 YS, 22 El, 55 Brin
For bus conductors, electrical conductors
Maximum electrical conductivity with moderately high strength 55-59 5%

ALUMINUM 6151
M-1147, M-4, 0 05 Cu, 0 5 Mg, 0 01 Mn, 0 5 Fe, 1 1 Si, 0 2 Cr, bal Al
T-6 temper· 48,000 TS, 43,000 YS, 17 El; 100 Brin
For crankcases, fuse parts, marine and structural parts, heat treatable, good hot workability

ALUMINUM 6201
M-671, M-1147, 0.5-0.9 Si, 0.6-0 9 Mg, 0 5 max Fe, 0.3 max Mn, bal Al
T-81 Temper· 46,000-48,000 TS; 3 El
For electrical conductors
52 5% elect cond

ALUMINUM 6253.
M-671, 1.0-1.5 Mg, 0 15-0.35 Cr, 0.5 max Fe, 1.6-2.4 Zn, bal Al.
For cladding Aluminum 5056.

ALUMINUM 6262.
M-4; 0.4-0.8 Si, 0 15-0.40 Cu, 0.8-1.2 Mg, 0.04-0.14 Cr, 0 40-0.7 Pb, 0.40-0.7 Bi, bal Al.

T-9 Temper: 58,000 TS; 55,000 YS; 10 El; 120 Brin.
T-651 Temper: 45,000 TS, 40,000 YS; 17 El; 95 Brin.
For screw machine products, hardware, fittings, valves, camera and optcial parts.
Excellent resistance to general corrosion and stress corrosion Good weldability.

ALUMINUM 6351.
M-4, M-671; 0.6 Mg, 1.0 Si, 0.6 Mn, bal Al.
For heavy duty structures.
Corrosion resistant.

ALUMINUM 6463
M-1147, M-4; 0.20-0.6 Si, 0.45-0.9 Mg, 0.2 max Cu, 0.15 max Fe, 0.05 max Mn, bal Al.
T6 Temper 35,000 TS; 31,000 YS, 12 El, 74 Brin.
T5 Temper 27,000 TS, 21,000 YS; 12 El, 60 Brin.
For extruded trim and architectural components, window frames, panels. Age-hardenable.

ALUMINUM 6563
M-4, 0.20-0.45 Si, 0.35-0.70 Mg, 0.15 max Fe, 0.15 max Cu, 0.05 max Mn, bal Al
T6-temper. 28,000 TS; 21,000 YS, 12 El
For trim applications; heat treatable extrusions, bright luster for anodizing

ALUMINUM 6951
M-4, 0.2-0.5 Si, 0.15-0.40 Cu, 0.8 max Fe, 0.2 max Mn, 0.1 max Fe, bal Al.
O-Temper: 16,000 TS, 6000 YS, 30 El, 28 Brin.
T6-Temper 39,000 TS, 33,000 YS, 13 El, 82 Brin.
For brazed assemblies.
Heat treatable, clad with aluminum, 4343 or 4045 on one or both sides

ALUMINUM 7001
M-1235, M-4, 0.35 Si, 0.4 Fe, 1.2-2.6 Cu, 2.6-3.4 Mg, 0.18 0.40 Cr, 6.8-8.0 Zn, bal Al
T6-Temper. 98,000 TS, 88,000 YS, 10 El
For missile bodies, trailers, airframes, curtain walls; high strength

ALUMINUM 7002
M-671, M-4, 2.5 Mg, 3.5 Zn, 0.75 Cu, 0.20 Cr, bal Al
Heat Treated 67,000 TS, 57,000 YS; 12 El
For components of space equipment, armor plate for military vehicles and cryogenic uses
Heat treatable, weldable.

ALUMINUM 7004.
M-4, M-671, 1.4-2.0 Mg, 0.2-0.4 Mn, 4.0-4.6 Zn, 0.10 max Cu, 0.40 max Fe, 0.25 max Si, bal Al
Heat Treated 56,000 TS, 51,000 YS, 14 El
For large structures, dump truck bodies, railroad tank hopper cars
Heat treatable thru natural or artificial aging

ALUMINUM 7005
M-4, M-671, 0.20-0.70 Mn, 1.0 1.8 Mg, 4.2-5.0 Zn, 0.04 Ti, 0.1 Cr, O.1 Zr, bal Al.
T62-Temper 53,000, 45,000 YS, 14 El.
T53-Temper: 57,000 TS, 50,000 YS, 15 El.
T6-Temper 54,000 TS; 46,000 YS; 12 El
For brazing or soldering applications, and for extruded products, radiators and heat exchangers
Excellent resistance to stress corrosion.
Age-hardenable Readily brazable.

ALUMINUM 7006
M-4; 0.10 Si, 0.17 Fe, 0.04 Cu, 0.22 Mn, 2.24 Mg, 0.12 Cr, 4.10 Zn, 0.01 Ti, bal Al.
T-6 Temper: 65,200 TS, 58,600 YS; 10.5 El
T-63 Temper 62,000 TS, 57,000 YS; 15 El.
For welded structures, flight weight and cryogenic applications, missiles.
Excellent resistance to stress corrosion
Age-hardenable. Good weldability.

ALUMINUM 7007.
M-4; 1.4-2.2 Mg, 0.05-0.25 Cr, 6.0-7.0 Zn, 0.01-0.06 Ti, 0.05-0.25 Zr, bal Al.
T6 Temper: (At RT) 77,000 TS; 69,000 YS; 12 El.
(At -320°F) 93,000 TS; 83,000 YS; 5 El.
(At -423°F) 104,000 TS; 90,000 YS; 4 El.
For cryogenic services
Tough, weldable, good corrosion resistance, heat treatable

ALUMINUM 7038.
M-1147; 4-5 Zn, 3-4 Mg, 0.2 Si, 0.35 Fe, 0.10 Cu, 0.1-0.35 Mn, 0.5 Cr, 0.1 Ti, bal Al.
For cryogenic equipment, armor plate and aerospace equipment
High strength and good welding qualities.

ALUMINUM 7039
M-1147, M-4; 3.5-4.5 Zn, 2.3-3.3 Mg, 0.10-0.40 Mn, 0.15-0.25 Cr, 0.3 max Si, 0.4 max Fe, bal Al.
T6 Temper: 66,000 TS, 55,000 YS, 14 El; 145 Brin.
T61 Temper. 60,000 TS, 50,000 YS, 14 El, 140 Brin
For cryogenic equipment Armor plate on vehicle hulls, aerospace equipment.
Heat treatable
High strength and good welding qualities.

ALUMINUM 7072
M-4, 0.75 1.25 Zn, 0.1 max Cu, 0.1 max Mn, 0.6 max Fe, bal Al
For surface layer for clad alloys

ALUMINUM 7076
M 4, 0.4 max Si, 0.6 max Fe, 0.3-1.0 Cu, 0.3-0.8 Mn, 1.2-2.0 Mg, 0.2 Ti, 7.0-8.0 Zn, bal Al.
T6-tempered min 70,000 TS, 60,000 YS, 14 El, 140 Brin
For propellers, age hardenable, formerly 76S alloy.

ALUMINUM 7079
M-4, 0.3 Si, 0.4 Fe, 0.4-0.8 Cu, 0.1-0.8 Mn, 2.9-3.7 Mg, 0.1-0.25 Cr, 3.8-4.8 Zn, 0.1 Ti, bal Al
Plate T6 78,000 TS; 68,000 YS, 14 El, 145 Brin
For aircraft structures, mobile equipment, hydraulic units, bulkheads
Weldable, high strength forging alloy, age-hardenable

ALUMINUM 7080
M-4, 0.5-1.5 Cu, 1.5-3.0 Mg, 5.0-7.0 Zn, 0.1-0.7 Mn, 0.20 max Ti, bal Al
Forged T7 Temper 68,000 TS, 60,000 YS; 14 El.
For large airframe parts, aircraft landing components
Heat treatable, resists stress corrosion

ALUMINUM 7106.
M-4, 4.2 Zn, 2.2 Mg, 0.2 Mn, 0.1 Cr, bal Al
At 75°F 61,000 TS; 55,000 YS, 15 El
At −112°F. 64,000 TS; 60,000 YS, 15 El
For missile cases, space vehicle fuel and oxidizer tankage, large rocket motor cases.
Heat treatable. High fatigue strength.
Good weldability Good cryogenic toughness

ALUMINUM 7175.
M-4; 1.2-2.0 Cu, 2.1-2.9 Mg, 0.18-0.30 Cr, 5.1-6.1 Zn, 0.10 max Ti, bal Al.
For light weight structures; age-hardenable.

ALUMINUM 7178.
M-1147, M-4, 1.6-2.4 Cu, 2.4-3.1 Mg, 0.18-0.40 Cr, 6.3-7.3 Zn, 0.2 Ti, bal Al
Rolled. 84,000 TS; 73,000 YS; 8 El.
T6 Temper: 88,000 TS; 78,000 YS.
For aircraft structural members.
High strength, age-hardenable.

ALUMINUM 7179.
M-4; 0.4-0.8 Cu, 0.1-0.3 Mn, 2.9-3.7 Mg, 0.10-0.25 Cr, 3.8-4.8 Zn, bal Al. .
For aircraft components; age-hardenable.

ALUMINUM 7275.
M-1147; 1.2-2.0 Cu, 2.1-2.9 Mg, 0.18-0.40 Cr, 5.1-6.1 Zn, 0.10 max Ti, bal Al.
Age hardenable aluminum alloy for light weight construction.
T-6: 87,000 TS; 76,000 YS.

ALUMINUM 7277.
M-4; 1.25 Cu, 2.0 Mg, 4.0 Zn, 0.25 Cr, bal Al.
For light alloy parts, rivets; age-hardenable.

ALUMINUM 7279.
M-1147; 0.4-0.8 Cu, 0.1-0.3 Mn, 2.9-3.7 Mg, 0.10-0.25 Cr, 3.8-4.8 Zn, bal Al.
For aircraft components; age-hardenable.

ALUMINUM 8001.
M-4; 1.2 Ni, 0.6 Fe, 0.15 max Cu, 17 max Si, bal Al.
O-temper: 16,000 TS: 6000 YS, 40 El, 28 Brin.
H14-temper: 22,000 TS; 21,000 YS, 16 El; 40 Brin.
H18-temper· 29,000 TS; 27,000 YS; 10 El; 55 Brin.
For atomic energy reactor components, resists corrosive effects of high temperature water.

ALUMINUM 8002.
M-4, 1.2-1.6 Fe, 1.2-1.6 Ni, 0.05 max Cu, 0.25 max Si, bal Al
For light alloy parts.

ALUMINUM 8013.
M-1147; 0.20-0.50 Cr, 0.10 max Ti, 0.25 max Si + Fe, bal Al.
For light weight parts; corrosion resistant.

ALUMINUM 8081.
M-4, M-1625; 18-22 Sn, 0.7 max Si, 0.10 max Mn, 0.7 max Fe, 0.7-1.3 Cu, 0.10 max Ti, 0.15 max others, bal Al.
H25 Temper: 24,000 TS, 21,500 YS; 13 El
H112 Temper: 28,000 TS, 25,000 YS; 10 El.
For bearings. Steel backed automotive bearings, bearings for light duty diesel engines, gas turbines, farm tractors, improved corrosion resistance.

ALUMINUM 8212
M-1147, 0.10-0.40 Cu, 0.15-0.50 Mn, 0.05-0.35 Mg, 1.0 max Si, 1.0 max Fe, 1.0 max Zn, bal Al.
For light weight parts.

ALUMINUM 8280.
M-4, 6.5 Sn, 1.0 Cu, 0.5 Ni, 1.5 Si, bal Al.
O-temper. 21,000 TS; 8000 YS, 25 El; 75 Brin
H12-temper· 25,000 TS; 23,000 YS; 6 El; 95 Brin.
For bearings; cast alloy, maximum operating temperature of 300°F.

ALUMINUM 8280.
M-1625; 0.7-1.3 Cu, 0.2-0.7 Ni, 1.0-2.0 Si, 5.5-7.0 Sn, bal Al.
Annealed: 17,000 TS, 70,000 YS, 28 El; H 65 Rock.
H16 Temper 27,000 TS, 25,000 YS; 5 El; H 92 Rock.
For bearings made from continuous coils for automotive engines.
High load carrying capacity, excellent fatigue strength.

ALUMINUM ASCR.
M-1147; 99.9 Al.
For cables: high conductivity.

ALUMINUM BRASS.
M-33; 76 Cu, 22 Zn, 2 Al, 0.03 Sb.
Annealed: 57,000 TS; 23,000 YS; 53 El.
For condenser and heat exchanger tubes; corrosion resisting.

ALUMINUM BRASS.
M-102; 76 min Cu, 1.75-2.50 Al, bal Zn.
Annealed: 60,000 TS; 50 El.
Hard· 85,000 TS; 15 El.
For condenser tubes; corrosion resistant.

ALUMINUM BRONZE.
M-129; 87.5 Cu, 4.1 Al, 1.7 Fe, 6.6 Zn.
Hot rolled: 63,900 TS; 35,000 YS; 6.5 El.
Cold drawn: 98,000 TS; 90,500 YS; 13.0 El; 14.0 RA.
For bearings, gears; heavy duty.

ALUMINUM BRONZE.
M-508; 86-90 Cu, 1-4 Fe, 8-12 Al, 1-4 Mn.
Cast: 60,000-90,000 TS; 20-4 El; 150-250 Brin.
For centrifugal castings, valve seat rings, heat treatable.

ALUMINUM BRONZE NO. 1
M-1518, Al, Fe, bal Cu.
Cast. 71,700 TS, 20 El; 90-140 Brin.
For high strength castings, corrosion resistant, good strength at high temperature.

ALUMINUM BRONZE NO 2.
M-1518, Al, Fe, bal Cu.
Cast· 89,600 TS; 12 El; 156-187 Brin
For high strength castings; corrosion resistant, retains strength at high temperature.

ALUMINUM BRONZE 5%
M-8, 95 Cu, 5 Al
Hard· 105,000 TS, 5 El
Soft: 52,000 TS, 70 El
For diaphragms to withstand pressure, condenser tubes, M P 1060°C

ALUMINUM BRONZE 135
M-177, 10 Al, bal Cu
For hardware, Al-bronze

ALUMINUM BRONZE 136
M-177, 10 Al, 1 Fe, bal Cu.
For propellers, Al-bronze

ALUMINUM BRONZE 707.
M-141, 7.15 Al, 2 Si, bal Cu
Soft· 90,000 TS, 50,000 YS; 30 El, 165 Brin
For boat shafting, pump rods, gears, Al-bronze, corrosion resistant

ALUMINUM BRONZE E-707
M-1191, 6.2-8.0 Al, 1.6-2.2 Si, bal Cu
Forged 85,000-90,000 TS; 30,000-40,000 YS; 25-20 El; 120-142 Brin.
For marine hardware, propellers, gears, fasteners, bolts, high strength; corrosion resistant.

ALUMINUM BRONZE 712
M-141, 95.5 Cu, 1.0 Si, 3.5 Al
Spring: 114,000 TS, 80,000 YS, 3 El; B97 Brin.
Soft: 65,000 TS; 24,000 YS, 55 El, B60 Brin.
For spring contacts, diaphragms, bellows, spring properties, tough, 12% conductivity.

ALUMINUM BRONZE 715.
M-141, 2.9 Al, 0.35 Si, bal Cu.
Hard: 75,000 TS; 15 El
Soft· 40,000 TS; 55 El.
For bolts, nuts, screws, aluminum bronze, corrosion resistant.

ALUMINUM-EC.
M-4, M-671; 99.45 min Al
O-Temper: 12,000 TS, 4000 YS; 8000 SS.
H14 Temper: 16,000 TS, 14,000 YS, 10,000 SS.
H19 Temper: 27,000 TS; 24,000 YS; 15,000 SS.
For bus bars, electrical conductors.
High electrical conductivity.

ALUMINUM GENUINE.
M-565; Pb, Sb, bal Sn.
For bearings; Babbitt metal.

ALUMINUM IRON BRONZE "B."
85.16 Cu, 9.43 Al, 4.74 Fe, 0.38 Pb, 0.09 P.
For strong corrosion resistant structural parts;
corrosion resistant.

ALUMINUM IRON BRONZE "H."
89.43 Cu, 6.97 Al, 3.41 Fe.
For strong corrosion resistant structural parts;
corrosion resistant.

ALUMINUM IRON BRONZE "R."
85.16 Cu, 6.6 Al, 7.52 Fe, 0.5 Mn.
For strong corrosion resistant structural parts,
corrosion resistant

ALUMINUM-K
M-297; 11.5-13.5 Si, 0.4-1.5 Cu, 0.8-1.5 Mg,
1-2 Ni, 0.5 max Mn, bal Al.
At 75°F. 55,000 TS; 46,000 YS; 9 El; 120 Brin
At 700°F: 35,000 TS; 2000 YS, 90 El.
For forged pistons; for elevated temperature use.

ALUMINUM KSS
M-624, 1.7-2.3 Mg, 1.0-1.4 Mn, bal Al.
For light alloy parts for marine service;
corrosion resistant

ALUMINUM-NICKEL NiAl-14Ti
M-297; 4-5 Al, 0.5 Ti, bal Ni.
For heating elements, heat and corrosion resistant.

ALUMINUM OILITE.
M-211; Al alloy
For bearings, self-lubricating, porous

ALUMINUM-OY
Eng; 4 Cu, bal Al
For light alloy parts, age-hardened.

ALUMINUM RABC
M-671, Al
29,000 TS, 25,000 YS
For bus conductors, 55% electrical conductivity.

ALUMINUM "S"
M-963,
Silicon aluminum wire for metallizing gun,
for build up on aluminum parts

ALUMINUM SILICON BRONZE,
Copper Alloy No 637
M-33, 91 Cu, 7 Al, 2 Si
Light annealed 92,000 TS, 53,000 YS, 35 El,
51,000 shear, 93 Rock B
For bolts, connectors, sleeves, gears,
marine hardware, studs, pump parts.
ASTM B150 Alloy 1, CDA 637

ALUMINUM SOLDER (A).
30 Zn, 65 Sn, 5 Bi
For Al solder

ALUMINUM SOLDER (B).
50 Zn, 1.5 Cu, 33 Sn, 2 Sb, 12.5 Pb. Al solder.

ALUMINUM SOLDER (C).
57 Zn, 43 Cd.
For Al solder.

ALUMINUM SOLDER (D).
Eng; 67.5 Sn, 1 Cu, 16.5 Zn, bal Al
7,100 TS
For Al solder

ALUMINUM SOLDER (E).
Eng.; 53 Sn, 40 Zn, 7 Al.
6,700 TS
For Al solder.

ALUMINUM SOLDER, FRISMUTH (A).
47.5 Zn, 5.5 Cu, 31.5 Sn, 10.5 Al, 5.5 Ag.
For Al solder.

ALUMINUM SOLDER, FRISMUTH(B).
47.4 Zn, 5.3 Cu, 36.8 Sn, 10.5 Al.
For Al solder.

ALUMINUM SOLDER, FRISMUTH (C).
67 Sn, 27 Pb, 3 Al.
For Al solder.

ALUMINUM SOLDER, GRIMM'S (A).
69.1 Sn, 28.8 Pb, 1.44 Zn, 0.72 Ag.
For Al solder

ALUMINUM SOLDER, GRIMM'S (B).
50 Sn, 25 Pb, 25 Zn
For Al solder

ALUMINUM SOLDER RICHARDS
25 Zn, 71.5 Sn, 3.5 Al.
For Al solder

ALUMINUM TITANIUM BRONZE
U S; 90-89 Cu, 9-10 Al, 1 Fe, Ti
For propellers, strong, tough

ALUMINUM UNION NO. 3S.
M-644, 1.5 max Mn, bal Al.
Hard: 25,000 TS, 22,000 YS.
Soft: 14,000 TS, 5,000 YS
For light alloy body paneling and molding;
corrosion resistant.

ALUMINUM UNION NO 14S
M-644, 4.4 Cu, 0.35 Mg, 0.75 Mn, 0.8 Si, bal Al
Heat treated 62,000 TS; 18 El; 130 Brin.
For forged aircraft light alloy parts; heat treatable.

ALUMINUM UNION 17S.
M-644, 3.5-4.5 Cu, 0.4-0.7 Mn, 0.4-0.7 Mg,
bal Al.
For light alloy parts, aircraft, heat treatable

ALUMINUM UNION 22S
M-644, 3.5-4.7 Cu, 0.7-1.5 Si, 0.4-1.0 Mg,
0.4-1.5 Mn, bal Al.
Heat treated. 56,000 TS, 44,000 YS; 8 El.
For light alloy parts, aircraft, heat treatable

ALUMINUM UNION 24S
M-644, 3.5-4.8 Cu, 0.8-1.8 Mg, 0.3-1.5 Mn, bal Al.
Heat treated 56,000 TS, 35,000 YS, 15 El.
For light alloy parts, aircraft, heat treatable

ALUMINUM UNION 27S
M-644; 4.5 Cu, 0.8 Mn, 0.8 Si, 0.05 Sn, bal Al
Heat treated: 58,000 TS, 30,000 YS.
For forged aircraft parts, heat treatable

ALUMINUM UNION 35S
M-644, 10-13 Si, bal Al.
For light alloy paneling, non heat treatable.

ALUMINUM UNION 51S
M-644, 0.5-1.5 Si, O.5-1.5 Mg, bal Al
Heat treated: 40,000 TS, 31,000 YS, 8 El.
For light alloy architectural structure, heat treatable.

ALUMINUM UNION A51S
M-644; 0.6 Mg, 1.0 Si, 0.25 Cr, bal Al.
Heat treated: 40,000 TS; 15 El
For light alloy forgings; non-hardenable.

ALUMINUM UNION 57S.
M-644, 1.5-3.0 Mg, 0.1-0.35 Cr, bal Al.
Heat treated: 32,000 TS; 28,000 YS; 5 El.
For light alloy paneling, aircraft;
heat treatable.

ALUMINUM UNION 123.
M-644; 5 Si, bal Al.
Cast: 16,000 TS; 4 El; 40 Brin.
For light alloy castings, aircraft, corrosion resistant.

ALUMINUM UNION 125.
M-644; 4.5-5.5 Si, 1.0-1.5 Cu, 0.4-0.6 Mg, bal Al.
Heat treated: 30,000 TS; 22,000 YS.
For cylinder heads, valve bodies;
pressure proof castings.

ALUMINUM UNION 126.
M-644; 1.4 Cu, 0.5 Mg, 0.75 Mn, 0.75 Ni,
5.0 Si, bal Al.
Heat treated: 26,000-32,000 TS; 3-1 El.
For aircooled cylinder heads; heat treatable

ALUMINUM UNION 135.
M-644; 0.3 Mg, 7.0 Si, bal Al
Heat treated: 26,000-32,000 TS, 6-12 El.
For light alloy castings; corrosion resistant.

ALUMINUM UNION 160.
M-644; 12 Si, bal Al.
For light alloy castings, high fluidity

ALUMINUM UNION 162.
M-664; 12-15 Si, 1.5-2.5 Ni, 0.75-1.25 Mg,
0.5-1.0 Cu, bal Al
For pistons; low thermal expansion

ALUMINUM UNION 218
M-664; 4.0 Cu, 1.5 Mg, 2.0 Ni, bal Al
For pistons, cylinder heads, "Y" alloy

ALUMINUM UNION 225
M-664, 4 Cu, bal Al.
Heat treated: 36,000 TS, 4 El.
For aircraft light alloy castings, age-hardenable

ALUMINUM UNION 350
M-664; 8.5-11.5 Mg, bal Al.
Cast: 36,000 TS, 22,000 YS, 14 El
Heat treated 44,000 TS, 28,000 YS, 12 El.
For light alloy castings; highest strength,
ductility and impact.

ALUMINUM Y Ti
M-1219, M-1220, M-549, 3.8-4.2 Cu, 1.3-1.7 Mg,
0.2 Ti, 1.8-2.3 Ni, bal Fe
For pistons, cylinder heads, age hardenable,
heat resistant.

ALUMINWELD
M-578, 4.5 Si, 0.8 Fe, 0.3 Cu, 0.5 Mg,
0.10 Zn, 0.20 Ti, bal Al.
Aluminum alloy arc welding electrodes
AWS Class Al-43.

ALUNEON.
Al alloy
For light alloy parts.

ALUSIL
M-1548; 1.0-2.0 Cu, 20-21 Si, 0.7 max Ni,
0.7 max Fe, bal Al
For engine pistons, cylinder liners, pumps.
Low density and low expansivity.

ALUSIL N. 280
M-1548, 22 Si, 1 Cu, 1 Ni, 1 Co, 1 Mg,
0.5 Cr, bal Al
Cast. 25,000-35,000 TS, 100-140 Brin
For pistons in engines, pumps, cylinder liners
Low density and low expansivity.

ALUTIN 51-S.
M-717;
For soldering aluminum and other metals
Melts 320; 7,000 TS

ALUVAC.
M-679, 4 Cu, bal Al.
For light alloy parts; heat treatable.

ALUWANGAN.
M-1372; 0.5-1.5 Mn, 0.3 max Cr, bal Al.
Soft: 16,000 TS; 6000 YS; 40 El.
Hard. 29,000 TS; 27,000 YS; 10 El.
For cooking utensils, heat exchangers, tanks,
furniture; good welding and forming properties.

ALUWE-1.
M-1373, Al alloy.
For light alloy parts.

ALUWE-4.
M-1373; Al alloy.
For light alloy parts

ALUWE-6
M-1373, Al alloy.
For light alloy parts.

ALUWE-8.
M-1373, Al alloy
For light alloy parts

ALUWE-22
M-1373, Al alloy.
For light alloy parts

ALUWE-53
M-1373; Al alloy.
For light alloy parts

ALUWE-55
M-1373, Al alloy
For light alloy parts

ALUWE-57
M-1373, Al alloy
For light alloy parts

ALVA 36
German; 3 Pb, 3 Sb, 2 Cu, Mn, bal Al
Wrought 30-80 Brin
For bearings

ALVA ALLOY HOLLOW DRILL STEEL
M-38, 0.8 C, 0.3 Mn, 0.15 Si, 0.2 V, bal Fe
For hollow drill rod for detachable bits,
fatigue resistant

ALVA DUPLEX FORGING
M-38 0.40 C, 1.2 Cr, 0.2 V, bal Fe
Heat treated 130,000 TS, 112,000 YS, 20 El,
52 RA; 290 Brin
For axles, pins, shafts

ALVA EXTRA
M-38, 1.0 C 0.25 V, bal Fe
For blanking, threading, forming dies, taps,
1150°C max, water hardening W2

ALX CAST ALLOY.
M-1; 2 C, 17 W, 33 Cr, 40 Co, B, bal Fe
For cutting tool bits, fast cutting, centrifugally cast

ALZEN
French, 66.6 Al, 33.4 Zn
For strong light alloy parts, not hardenable

ALZEN 305
French, Zn, Al, bal Cu.
For bearings, bronze

ALZIN.
French; 20 Zn, bal Al
Cast. 18,000-28,000 TS, 2-3 El; 62-65 Brin
For light alloy parts, non-hardenable

ALZINC
French, 20 Zn, 80 Al.
21,000 TS; 2 El, 80 Brin.
For light castings; Sibley casting alloy

A M 1 SPECIAL.
M-210; 0.35 C, 1.0 Si, 1.35 W, 5.0 Cr, 1.5 Mo,
0.45 V, bal Fe.
For extrusion dies, heading dies, mandrels;
hot work steel, resists heat checking.

A.M. 3 DIE STEEL.
M-210; 0.40 C, 1.05 Si, 5.0 Cr, 1.35 Mo, 1.1 V, bal Fe.
For die casting dies, extrusion dies, upsetters; air hardened, resists heat checking

AM6.
German, 6 Ce, 2 Mn, bal Mg.
For light alloy parts for high temperature use; ASTM-EM62; cast and wrought.

AM10.
German; 10 Ce, bal Mg.
For pistons, supercharger impeller, ASTM-E10.

AM100A.
Various foundries; 10.0 Al, 0.10 min Mn, bal Mg
F-Temper. 20,000-22,000 TS, 10,000-12,000 YS, 0-2 El
T4-Temper· 34,000-40,000 TS; 10,000-13,000 YS; 6-10 El.
T6-Temper· 34,000-40,000 TS; 17,000-22,000 YS, 0-1 El
Magnesium permanent mold casting with good pressure tightness and strength and good weldability.
For housings for motors and power tools
ASTM B199-68; AMS 4483; QQ-M-55, SAE 502

AM503
M-325, 1.5 Mn, bal Mg
Plate, sheet, strip, extrusions
24,000-30,000 TS; 8,000-14,000 YS(est); 4-5 El, 35-55 VDH
Low strength alloy with very good welding characteristics, for fuel and oil tanks,

AM-537
German, Al, Zn, bal Mg
For light alloy parts, heat treatable

AMALLOY
M-1638, 7 Mg, 0.1 Mn, 0.15 Fe, 0.14 Ti, 0.01 Cu, bal Al
As Cast 34,000-38,000 TS, 19,000 YS, 7-10 El, 70 Brin
For dairy, agricultural, cookware, hardware, aircraft, transportation and oil field equipment
Corrosion and impact resistant
Sand, permanent mold and die castings

AMALOY.
M-132, 0.60-0.70 C, 0.70-0.90 Mn, Mo, bal Fe
For tools, dies, water hardened

AMALOY-1.
M-524, 97.5 Pb, 2.5 Sn
For protective coating against corrosion, applied to ferrous and copper alloys

AMALOY-2
M-524; 90-97.5 Pb, 2.5-10 Sn
For protective coating against corrosion, applied to ferrous and copper alloys

AMALOY-3.
U.S., Ni, Cr, W
For corrosion and heat resistant parts; corrosion and heat resistant

AMANIMPHY.
M-771; nickel alloy
For motors, electrical equipment, non-magnetic.

AMAX METAL
U.S.; 81 Cu, 11 Sn, 7.4 Pb, 0.3 P.
For bearings; heavy duty.

AMBEROID
M-135, 15 Ni, 23 Zn, bal Cu.
Annealed: 50,000 TS; 20,000 YS; 60 El; 63 Brin.
Hard: 114,000 TS; 110,000 YS; 2 El; 228 Brin.
For costume jewelry, hollowware, optical equipment; nickel silver.

AMBO AST.
M-1315, 0.45 C, Cr, Ni, W, bal Fe.
For machinery parts, tools and dies; oil hardening, tough.

AMBO BW1.
M-1315; 1.05 C, 1.0 Cr, 0.3 Mn, bal Fe.
For bearings, sleeves, liners, water hardened, wear resistant

AMBO BWC
M-1315, 1.0 C, 1.55 Cr, 0.35 Mn, bal Fe.
For bearings, sleeves, liners, water hardened, wear resistant.

AMBO BWG
M-1315; 0.90 C, 0.80 Cr, 0.3 Mn, bal Fe.
For bearings, cutters, dies, sleeves, water hardened, wear resistant.

AMBO BWW
M-1315, 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For forming and blanking dies, bearings, water hardened, wear resistant

AMBO C15W3
M-1315, 0.15 C, 0.25 Si, 0.37 Mn, bal Fe
Annealed 70,000 TS, 40,000 YS, 25 El; 60 RA; 145 Brin
For gears, pinions, camshafts, cams; case hardening steel

AMBO C22W3
M-1315, 0.22 C, 0.25 Si, 0.45 Mn, bal Fe
Annealed. 75,000 TS, 43,000 YS, 20 El, 55 RA; 150 Brin
For gears, pinions, camshafts, cams, case hardening steel

AMBO C35W3
M-1315, 0.35 C, 0.25 Si, 0.55 Mn, bal Fe.
Hot rolled 85,000 TS, 54,000 YS, 30 El; 53 RA; 185 Brin
For gears, pinions, shafts, bolts, water hardened

AMBO C45W3
M-1315, 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled 98,000 TS, 59,000 YS, 24 El, 45 RA, 212 Brin
For gears, pinions, shafts, bolts, fasteners; water hardened.

AMBO C53W3
M-1315, 0.53 C, 0.38 Si, 0.55 Mn, bal Fe.
Normalized 100,000 TS, 55,000 YS, 18 El, 26 RA; 200 Brin.
For gears, pinions, shafts, axles, bolts, fasteners, water hardened

AMBO C60W3.
M-1315, 0.60 C, 0.25 Si, 0.65 Mn, bal Fe
Heat treated· 160,000 TS, 115,000 YS, 12 El; 40 RA; 325 Brin.
For springs, rails, machine tool parts, axes; water hardened

AMBO CMO
M-1315, 0.20 C, 1.25 Mn, 1.25 Cr, bal Fe.
For gears, cams, camshafts; case hardened, tough.

AMBO CMO4E
M-1315; 0.15 C, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, machine tool parts; case hardened, tough.

AMBO CMO5E.
M-1315, 0.20 C, 1.0 Cr, 0.2 Mo, 0.25 Si, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; case hardened, tough.

AMBO CMV.
M-1315; 0.25 C, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, fasteners, machine tool parts; oil hardened, tough.

AMBO CMV25.
M-1315; 0.33 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

AMBO CMV30.
M-1315; 0.42 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, studs, bolts, shafts, oil hardened, tough.

AMBO CMV50.
M-1315; 0.50 C, 1.0 Cr, 0.2 Mo, bal Fe
For gears, bolts, studs, shafts; oil hardened, tough.

AMBO CNM6
M-1315; 0.56 C, Ni, Cr, Mo, V, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

AMBO CNMV.
M-1315, 0.55 C, 1.65 Ni, 0.9 Cr, 0.18 Mo, 0.1 V, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

AMBO Cr13.
M-1315; 1.65 C, 11.5 Cr, 0.10 V, bal Fe.
For blanking and forming dies, punches, *air hardening, non-deforming.*

AMBO Cr13Co.
M-1315, 1.65 C, 11.5 Cr, Co, bal Fe
For blanking and forming dies, punches; air hardened, non-deforming.

AMBO Cr13MW.
M-1315, 1.65 C, 11.5 Cr, Mo, V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

AMBO CRT
M-1315; 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, dies, upsetters, crimpers, oil hardened, non-deforming.

AMBO CrV50.
M-1315; 0.50 C, 0.95 Mn, 1.05 Cr, 0.1 V, bal Fe
For gears, springs, crankshafts, bolts, studs; oil hardened, shock resistant.

AMBO CrZ.
M-1315, 2.1 C, 11.5 Cr, 0.3 Mn, bal Fe
For blanking and forming dies, punches, oil hardened, non-deforming

AMBO CrZW.
M-1315, 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For blanking and forming dies, punches, oil hardened, non-deforming.

AMBO CSJ.
M-1315, 0.61 C, 1.18 Cr, 0.1 V, 0.7 Mn, 0.85 Si, bal Fe
For springs, valves, countershafts, oil hardened, shock resistant.

AMBO DCM.
M-1315; 0.40 C, Cr, Mo, Mn, bal Fe
For gears, bolts, crankshafts, fasteners, oil hardened, tough.

AMBO DCN3.
M-1315; 0.50 C, 1.05 Cr, 3.25 Ni, 0.50 Mn, bal Fe.
For gears, bolts, crankshafts, studs; oil hardened, shock resistant.

AMBO DCN4.
M-1315, 0.31 C, 0.7 Cr, 3.5 Ni, 0.6 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, shock resistant.

AMBO DCN4E.
M-1315; 0.4 C, 0.7 Cr, 3.5 Ni, 0.6 Mn, bal Fe.
For gears, bolts, crankshafts, fasteners, oil hardened, shock resistant

AMBO DCN5.
M-1315; 0.35 C, 1.1 Cr, 4.5 Ni, 0.6 Mn, bal Fe
For gears, bolts, crankshafts; oil hardened, shock resistant

AMBO DCN5E.
M-1315, 0.40 C, Cr, Mn, Mo, bal Fe
For gears, bolts, machine tool parts, oil hardened, tough

AMBO DCNV
M-1315, 0.36 C, 0.6 Mn, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant

AMBO DCZ
M-1315, 0.40 C, Cr, Mn, Mo, bal Fe
For gears, bolts, machine tool parts, oil hardened, tough.

AMBO DM2
M-1315, 0.15 C, 0.37 Mn, 0.25 Si, bal Fe.
Annealed 70,000 TS, 40,000 YS, 25 El; 60 RA, 145 Brin For gears, shafts, cams, camshafts; case hardening steel

AMBO DM3
M-1315, 0.35 C, 0.55 Mn, 0.25 Si, bal Fe
Hot rolled 85,000 TS, 54,000 YS, 30 El, 53 RA; 185 Brin
For gears, pinions, shafts, water hardened

AMBO DM4
M-1315, 0.45 C, 0.25 Si, 0.65 Mn, bal Fe
Hot rolled 98,000 TS, 59,000 YS, 24 El, 45 RA, 212 Brin
For gears, pinions, shafts, axles, countershafts, water hardened

AMBO DM5
M-1315, 0.60 C, 0.25 Si, 0.65 Mn, bal Fe
Heat treated. 160,000 TS, 113,000 YS, 12 El, 40 RA; 321 Brin
For axles, guides, punches, crimpers; water hardened

AMBO DM6
M-1315, 0.75 C, 0.38 Si, 0.70 Mn, bal Fe.
Heat treated: 175,000 TS, 130,000 YS, 12 El, 37 RA, 355 Brin.
For springs, tools, dies, punches, crimpers, Type WI; water hardened

AMBO DR5
M-1315; 1.3 C, 4.75 W, bal Fe
For cutters, form tools, fast finishing steel, water hardened.

AMBO EM3CV
M-1315; 1.0 C, 0.07 Mn, 1.1 Cr, bal Fe.
For bearings, liners, bushings, water hardened, wear resistant.

AMBO EM3 EXTRA.
M-1315; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed. 110,000 TS; 56,000 YS; 20 El; 40 RA; 210 Brin
For springs, cutters, reamers, taps, drills, hobs; water hardened, Type WI.

AMBO EM3 EXTRA EXTRA
M-1315, 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 56,000 YS; 20 El;
40 RA; 210 Brin.
For springs, cutters, reamers, taps, drills,
hobs; Type Wl; water hardened.

AMBO EM3 PRIMA.
M 1315; 0.75 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated: 180,000 TS; 135,000 YS;
12 El; 35 RA; 375 Brin.
For springs, rails, punches, upsetters,
Type Wl; water hardened.

AMBO EM3W.
M-1315, 1.2 C, 0.1 V, 0.2 Cr, 1.0 W, bal Fe
For bearings, cutters, tools, dies;
water or oil hardened, wear resistant

AMBO EM4 EXTRA
M-1315, 1.0 C, 0.25 Si, 0.25 Mn, bal Fe
Annealed 100,000 TS, 53,000 YS;
21 El, 42 RA; 200 Brin.
For drills, taps, springs, reamers, hobs,
Type W1, water hardened.

AMBO EM4 EXTRA EXTRA.
M-1315, 1.0 C, 0.25 Si, 0.25 Mn, bal Fe
Annealed 100,000 TS; 53,000 YS,
21 El, 42 RA; 200 Brin
For springs, drills, reamers, taps, Type Wl,
water hardened

AMBO EM4 PRIMA
M 1315, 0.60 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Heat treated 160,000 TS, 113,000 YS, 12 El,
40 RA, 325 Brin
For gears, bolts, crankshafts, rails, springs,
water hardened.

AMBO EM5 EXTRA
M-1315, 0.85 C, 0.25 Si, 0.25 Mn, bal Fe
Heat treated· 190,000 TS; 145,000 YS, 10 El;
30 RA, 400 Brin
For springs, tools, drills, dies, cutters;
Type Wl, water hardened

AMBO EM5 EXTRA EXTRA
M-1315, 0.85 C, 0.25 Si, 0.25 Mn, bal Fe
Heat treated. 190,000 TS, 145,000 YS, 10 El,
30 RA, 400 Brin
For springs, tools, drills, dies, cutters,
Type Wl, water hardened

AMBO EM5 PRIMA
M-1315, 0.45 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled. 98,000 TS, 59,000 YS,
24 El, 45 RA, 215 Brin.
For gears, pinions, bolts, fasteners, shafts,
water hardened

AMBO EM6 EXTRA
M-1315, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 175,000 TS, 128,000 YS, 12 El;
37 RA, 355 Brin.
For springs, rails, hammers, machine tool parts,
Type Wl; water hardened.

AMBO EM6 EXTRA EXTRA.
M-1315; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 175,000 TS, 128,000 YS,
12 El; 37 RA, 355 Brin.
For springs, rails, hammers, cutters, punches;
Type Wl, water hardened

AMBO EM6 PRIMA.
M-1315; 0.35 C, 0.25-0.50 Si, 0.3-0.8 Mn,
bal Fe
Hot rolled: 85,000 TS; 54,000 YS,
30 El; 53 RA; 185 Brin
For gears, bolts, fasteners, machine tool parts;
water hardened.

AMBO EMV.
M-1315; 1.0 C, 0.20 Si, 0.25 Mn, 0.1 V, bal Fe.
For drills, taps, reamers, broaches; Type W2;
water hardened.

AMBO HHCA8.
M-1315, 0.12 max C, 0.8 Al, 6.5 Cr, bal Fe.
For oil refinery equipment; creep and
heat resistant.

AMBO HHCA10.
M 1315; 0.12 max C, 1 Si, 1 Al, 18 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

AMBO HHCA12.
M-1315; 0.12 max C, 1.5 Si, 1.5 Al, 24 Cr,
bal Fe
For oil refinery equipment, creep and
heat resistant.

AMBO HHCN100
M-1315, 0.15 C, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed. 80,000 TS; 35,000 YS;
55 El; 75 RA; 150 Brin
For chemical plant equipment, tanks, mixers;
Type 302, stainless, austenitic.

AMBO HHCN120
M-1315, 0.15 C, 24 Cr, 19 Ni, bal Fe.
Annealed 100,000 TS, 45,000 YS, 50 El, 65 RA;
185 Brin
For valves, pumps, turbine and jet parts;
Type 310, corrosion and heat resistant

AMBO HHCN120S
M-1315, 0.2 C, 25 Cr, 4 Ni, 1.2 Si, bal Fe.
Cast 90,000 TS, 65,000 YS, 2 El, 212 Brin.
For cylinder linings, bushings, valve seats
and bodies, Type CC-50

AMBO Mn 12
M-1315, 1.2 C, 12.5 Mn, bal Fe
For wear plates, dipper teeth, rail frogs;
wear and abrasion resistant

AMBO MS4
M 1315, 0.53 C, 0.90 Si, 0.90 Mn, bal Fe
For punches, chisels, pneumatic tools, oil
hardened, tough

AMBO MS5
M-1315, 0.55 C, 1.7 Si, 0.70 Mn, bal Fe
For springs, chisels, punches, pneumatic tools,
oil hardened, shock resistant.

AMBO MSIN
M-1315, 0.65 C, 1.7 Si, 0.7 Mn, bal Fe.
For springs, punches, pneumatic tools; oil
hardened, shock resistant.

AMBO MSJ
M-1315, 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
Annealed· 96,000 TS; 52,000 YS, 16 El; 23 RA;
170 Brin
For axles, gears, bolts, tie-rods, bushings;
water hardened

AMBO MSO
M-1315; 0.90 C, 1.9 Mn, 0.10 V, bal Fe.
For blanking and forming dies, thread rolling dies;
oil hardened, non-deforming

AMBO NR2A.
M-1315; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed 80,000 TS; 35,000 YS; 55 El; 75 RA;
160 Brin.
For chemical plant equipment, tanks, fermenters;
Type 302; stainless, austenitic.

AMBO NR2AE.
M-1315, 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C,
bal Fe.

Annealed: 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
Cold drawn: 100,000 TS, 65,000 YS; 45 El; 60 RA; 205 Brin.
For welded chemical plant equipment, tanks, fixtures; Type 347, stainless, austenitic.

AMBO NR2AS.
M-1315; 0.07 C, 18 Cr, 9.5 Ni, bal Fe
Annealed: 85,000 TS, 35,000 YS; 60 El; 70 RA; 150 Brin
Cold drawn 180,000 TS, 125,000 YS; 10 El, 330 Brin.
For welded chemical plant equipment, tanks; Type 304; stainless, austenitic

AMBO NR2ATE.
M-1315, 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 55 El; 65 RA; 150 Brin.
Cold drawn: 95,000 TS, 60,000 YS; 40 El; 60 RA; 185 Brin.
For welded chemical plant equipment, tanks; Type 321, stainless, austenitic.

AMBO NR4AE
M-1315; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe
Annealed. 85,000 TS, 35,000 YS, 50 El, 65 RA, 160 Brin.
Cold drawn: 150,000 TS, 135,000 YS, 6 El, 300 Brin
For acid resistant equipment, welded, Type 316 Ti, stainless, austenitic.

AMBO NR4AS.
M-1315, 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe
Annealed 85,000 TS, 35,000 YS, 50 El, 65 RA, 160 Brin
Cold drawn: 150,000 TS, 135,000 YS, 6 El; 300 Brin
For acid resistant equipment, Type 316, stainless, austenitic.

AMBO PD4
M-1315, 0.28 C, Ni, Mo, bal Fe.
For gears, bolts, fasteners, shafts; oil hardened, tough

AMBO PDZ
M-1315, 0.28 C, Ni, Cr, Mo, V, bal Fe
For gears, bolts, shafts, crankshafts; oil hardened, shock resistant

AMBO SP1V
M-1315, 0.38 C, Si, Cr, V, bal Fe.
For springs, gears, crankshafts; oil hardened, shock resistant.

AMBO SP2V.
M-1315; 0.45 C, Si, Cr, V, bal Fe
For springs, gears, crankshafts, oil hardened, shock resistant.

AMBO SPW3.
M-1315, 1.42 C, W, V, bal Fe.
For blanking and forming dies, engravers' tools; water or oil hardened, wear resistant

AMBO SPW4.
M-1315, 0.45 C, 1.4 Cr, 0.70 Mo, 0.30 V, 0.7 Mn, bal Fe.
For forging and heading dies, upsetters, punches, oil hardened, tough.

AMBO SPW5
M-1315; 0.30 C, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For chisels, punches, pneumatic tools; oil hardened, shock resistant.

AMBO SPW6.
M-1315; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, 0.3 Mn, bal Fe
For pneumatic tools, extrusion rams and dies, upsetters, oil hardened, shock resistant.

AMBO SPWD.
M-1315, 0.35 C, 0.90 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For pneumatic tools, punches, upsetters; oil hardened, shock resistant.

AMBO SPWH.
M-1315, 0.55 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For pneumatic tools, upsetters, rivet sets; oil hardened, shock resistant.

AMBO V25.
M-1315; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers; high speed steel.

AMBO V35.
M-1315, 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, high speed steel.

AMBO V50
M-1315, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe
For blanking and forming dies, engravers' tools, high speed steel

AMBO V66.
M 1315, 0.85 C, W, Mo, Cr, V, bal Fe
For lathe and planer tools, reamers, taps, drills, high speed steel

AMBO V111
M-1315, 0.95 C, 4 Cr, V, W, Mo, bal Fe
For lathe and planer tools, reamers, broaches; high speed steel

AMBO VANADIUM
M 1315; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe
For lathe and planer tools, drills, taps, hobs, high speed steel

AMBO WCM1.
M-1315, 1.05 C, 1.0 Cr, 0.90 Mn, 1.15 W, bal Fe.
For cold work tools, cutters, form dies, oil hardened, tough

AMBO WMA
M-1315, 0.45 C, Cr, Ni, W, bal Fe
For upsetters, chisels, punches, pneumatic tools, oil hardened, tough

AMBO WMOV
M-1315, 0.45 C, 0.45 Mo, 1.35 Cr, 0.8 V, 0.45 W, bal Fe
For forging and heading dies, oil hardened, tough.

AMBO WOF
M-1315; C, Cr, Mo, bal Fe.
For machine tool parts, oil hardened, tough.

AMBRAC 850
M-8; 20 Ni, 4.4 Zn, 0.6 Mn, bal Cu.
Soft. 50,000 TS; 18,000 YS, 35 El
Hard. 70,000 TS; 60,000 YS; 20 El.
For plumbing, hardware, corrosion resistant

AMBRALLOY
M-292, 0.40 C, 0.7 Mn, 1.8 Ni, 0.8 Cr, 0.2 Mo, bal Fe.
Heat treated: 274,000 TS, 237,000 YS, 11 El; 35.4 RA.
For structural members, cranes, derricks, bridges; high strength plate, heat treated at mill.

AMBRALOY 606.
M-8; 5 Al, 95 Cu.
Soft: 55,000 TS; 22,000 YS; 65 El.
Hard: 92,000 TS; 65,000 YS; 7 El.
For condenser tubes, forged parts; corrosion resistant.

AMBRALOY 612.
M-8; 8 Al, 92 Cu.
Soft: 65,000 TS; 25,000 YS; 65 El.
Hard: 80,000 TS, 50,000 YS; 30 El.
For screw machine parts, wire, rod; corrosion resistant

AMBRALOY 614.
M-8; 7 Al, 2.75 Fe, bal Cu.
Plate 70,000 TS; 30,000 YS; 35 El.
For condenser tubes, heat exchangers; high corrosion resistance ABRALOY 930.

AMBRALOY 630
M-8, 82 Cu, 9.5 Al, 1.0 Mn, 5 Ni, 2.5 Fe.
Soft: 90,000 TS, 12 El
Hard: 105,000 TS, 12 El.
For forgings, heat treatable

AMBRALOY-687
M-8, 22 Zn, 2 Al, 0.04 As, bal Cu
Soft: 52,000 TS, 20,000 YS, 65 El
Hard 85,000 TS, 60,000 YS, 10 El.
For condenser tubes, ferrules; corrosion resistant.

AMBRAZE 35.
M-1483, 35 Ag, 26 Cu, 21 Zn, 18 Cd
For brazing alloy for torch brazing, BAg-2

AMBRAZE 45
M-1483; 45 Ag, 15 Cu, 16 Zn, 24 Cd
For brazing alloy for dissimilar metals, BAg-1, M.P. 1125°-1145°F.

AMBRAZE 50
M-1483, 50 Ag, 15.5 Cu, 16.5 Zn, 18 Cd
For general purpose brazing alloy for ferrous and non ferrous alloys, BAg-1A, M.P. 1160-1175°F

AMBRAZE 111
M-1483, Ni, Zn, bal Cu
Cast 80,000 TS
For brazing alloy, nickel silver, M.P. 1700°F, corrosion resistant

AMBRAZE 111FC
M-1483, Ni, Zn, bal Cu
For brazing alloy, nickel silver

AMBRAZE 131
M-1483, Ni, Zn, bal Cu
For brazing alloy, nickel silver

AMBRAZE 131 FC
M-1483, Ni, Zn, bal Cu
For brazing alloy; nickel silver

AMBRAZE 181
M-1483, 5 P, 15 Ag, bal Cu
For brazing alloy, self-fluxing

AMBRAZE-211
M-1483, 7 P, bal Cu.
For brazing copper.
Phos-copper, self fluxing

AMBRAZE-231.
M-1483; 7.3 P, 2 Ag, bal Cu
For brazing alloy
Self-fluxing.

AMBRAZE-311
M-1483; 12 Si, 4 Cu, 1 Fe, bal Al.
For brazing aluminum alloys, filler metal.
Corrosion resistant.

AMBRAZE-331
M-1483; 10 Si, 4 Cu, 0.5 Fe, bal Al.
For brazing cast aluminum alloy.

AMBRAZE-411
M-1483; 58 Cu, 1 Sn, 1 Fe, bal Zn.
For brazing bronzes, filler metal.
Corrosion resistant.

AMBRAZE-411FC.
M-1483; 58 Cu, 1 Sn, 1 Fe, bal Zn.
For brazing bronzes.
Flux coated, corrosion resistant.

AMBRAZE 430.
M-1483; Ag alloy.
For silver solder for stainless steel, M.P. 425°F.

AMBRAZE-611
M-1483; 9 Al, 0.15 Mn, 2 Zn, bal Mg.
For brazing magnesium alloys, filler metal.

AMBRAZE-1001
M-1483; 40 Ag, 30 Cu, 28 Zn, 2 Ni.
For brazing alloy, filler metal.
Corrosion resistant

AMBRAZE-1010.
M-1483; 45 Ag, 18 Cu, 18 Zn, 19 Cd
For brazing, filler metal.
Corrosion resistant

AMBRAZE-1110
M-1483, 41 Ag, 18 Cu, 15 Zn, 27 Cd.
For brazing, filler metal.
Corrosion resistant.

AMBRAZE-1201
M-1483, 20 Ag, 45 Cu, 30 Zn, 5 Cd
For brazing, filler metal
Corrosion resistant

AMBRAZE-1551
M-1483, 56 Ag, 22 Cu, 17 Zn, 5 Sn.
For brazing, filler metal
Corrosion resistant

AMBRO
2 Al, 76 Cu, 22 Zn
For condenser tubes, corrosion resistant

AMBRONZE 405
M-8, 4 Zn, 1 Sn, 0.03 P, bal Cu
Hard: 60,000 TS; 50,000 YS; 6 El, 125 Brin
Soft 40,000 TS, 15,000 YS; 40 El, 55 Brin.
For electrical springs, corrosion resistant

AMBRONZE 413
M-8; 7 Zn, 1 Sn, bal Cu
Hard. 63,000 TS; 55,000 YS, 7 El; 137 Brin
Soft. 42,000 TS, 16,000 YS; 40 El, 57 Brin
For strips, tubes, corrosion resistant

AMBRONZE 430
M-8, 11 Zn, 2 Pb, bal Cu.
Hard 73,000 TS; 65,000 YS; 10 El; 160 Brin.
Soft 46,000 TS, 18,000 YS, 50 El, 59 Brin
For springs, corrosion resistant

AMBRONZE-4222
M-8, 11 Zn, 1 Sn, bal Cu
Soft: 43,000 TS, 16,000 YS, 47 El
Hard 72,000 TS, 60,000 YS, 8 El
For weather strip; corrosion resistant.

AMBRONZE 4301
M-8, 10 Zn, 2 Pb, bal Cu.
Soft: 20,000-46,000 TS, 55 El; 59 Brin.
For condenser and heat exchanger tubes, corrosion resistant to mine waters.

A M C
M-365; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe
For tools, cutters, broaches; high speed steel.

AM C52S.
M-4; 3 Al, 1 Zn, bal Mg.
Extruded: 35,000 TS; 60 Brin.
For light alloy parts; sheets and extrusions.

AMCARB D-5.
M-1564; 3.5 Co, 96.5 WC.
Sintered: A 92.5 Rock, 170,000 Tr. S.
For extrusion and drawing dies, cutting tools.
Sintered carbide, wear and abrasion resistant.

AMCARB D-10.
M-1564; 95.5 WC, 4.5 Co.
Sintered: Rockwell A 92; 180,000 Tr. S.
For extrusion press nibs, drawing dies, cutting tools.
Sintered carbide, wear and abrasion resistant

AMCARB D-15.
M-1564; 6 Co, 94 WC.
Sintered: Rock 91.5 A, 225,000 Tr. S.
For drawing and extrusion dies, cutting tools.
Sintered carbides Wear and abrasion resistant.

AMCARB D-20.
M-1564; 6.0 Co, 94.0 WC.
Sintered: A 90.8 Rock, 275,000 Tr. S
For extrusion and drawing dies, cutting tools.
Sintered carbide, wear and abrasion resistant.

AMCARB D-30.
M-1564; 9.0 Co, 91.0 WC.
Sintered: A 89.5 Rock, 325,000 Tr. S
For extrusion and drawing dies, header punches, cutting tools.
Sintered carbide, wear and abrasion resistant.

AMCARB D-35
M-1564, 9.0 Co, 81.0 WC, 10.0 TaC.
Sintered: A 89.0 Rock, 325,000 Tr. S.
For extrusion and drawing dies, header punches, and inserts, cutters
Sintered carbide, wear and abrasion resistant

AMCARB D-40.
M-1564; 13 Co, 87 WC.
Sintered: A 88.5 Rock, 400,000 Tr. S.
For extrusion, drawing and header dies, cutters.
Sintered carbide, wear and abrasion resistant.

AMCARB D-43.
M-1564; 13 Co, 27 TaC, 60 WC
Sintered: A 88 Rock, 350,000 Tr S.
For extrusion and drawing dies.
Wear and abrasion resistant. Sintered carbide.

AMCARB D-50
M-1564; 15 Co, 85 WC.
Sintered: A 87 Rock, 425,000 Tr. S.
For extrusion, drawing and header dies, cutters.
Sintered carbide, wear and abrasion resistant.

AMCARB D-55.
M-1564; 16 Co. 57 WC, 27 TaC.
Sintered. A 86 Rock, 360,000 Tr. S
For extrusion, drawing and header dies, punches.
Sintered carbides, wear and abrasion resistant.

AMCARB D-57.
M-1564, 15.0 Co, 78.0 WC, 7.0 TaC.
Sintered: A 86.5 Rock, 350,000 Tr S.
For extrusion, drawing and header dies.
Sintered carbides, wear and abrasion resistant.

AMCARB D-60.
M-1564; 20 Co, 5 TaC, 75 WC.
Sintered: A 85 Rock, 390,000 Tr. S.
For extrusion, drawing and header dies-light impact.
Sintered carbides, wear and abrasion resistant.

AMCARB D-65.
M-1564; 20 Co, 80 WC.
Sintered: A 85 Rock, 400,000 Tr. S.
For extrusion, drawing and header dies-light impact.
Sintered carbides, wear and abrasion resistant.

AMCARB D-70.
M-1564; 25 Co, 5 TaC, 70 WC.
Sintered: A 83 Rock, 380,000 Tr. S.
For extrusion, drawing and header dies-normal impact.
Sintered carbides, wear and abrasion resistant.

AMCARB D-75.
M-1564; 25 Co, 75 WC.
Sintered: A 83 Rock, 390,000 Tr. S.
For extrusion, drawing and header dies.
Sintered carbides, wear and abrasion resistant.

AMCARB D-80.
M-1564; 27 Co, 5 TaC, 68 WC
Sintered: A 82 Rock, 375,000 Tr. S.
For extrusion, drawing and header dies-heavy impact.
Sintered carbides, wear and abrasion resistant.

AMCARB D-85.
M-1564; 30 Co, 5 TaC, 65 WC.
Sintered: A 81 Rock, 360,000 Tr. S.
For extrusion, drawing and header dies-very heavy impact.
Sintered carbides, wear and abrasion resistant.

AMCARB T-38
M-1564, 71 WC, 12 TaC, 8 TiC, 9 Co
Sintered: Rockwell A 92.5
For extrusion press nibs, drawing and header dies.
Sintered carbide, wear and abrasion resistant

AMCO COPPER.
M-558, Electrolytic tough pitch copper.
For electrical applications and general usage in sheet, strip and rod applications

AMCOH
M-365, 0.90 C, 1.15 Mn, 0.5 Cr, 0.5 W, bal Fe
Oil hardening tool steel, AISI 01

AMCOH EXTRA SPECIAL.
M-365, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe
For tools, cutters, hobs, high speed steel

AMCOH HOLLOW DIE
M-365, 0.8 C, 0.9 Cr, bal Fe
For hollow dies; oil hardening

AMCOH OIL HARDENING.
M-365, 0.9 C, 0.5 Cr, 0.5 W, 1.0-1.25 Mn, bal Fe
For tools, dies, punches, oil hardening

A M C.O H. SPECIAL
M-365, 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For die, punches; non-deforming

AMCOLOY.
M-365, 0.75 C, 0.75 Mn, 0.90 Cr, 1.75 Ni, 0.35 Mo, bal Fe.
Oil hardening steel for shafts, arbors, lathe centers, AISI L6

AMCOLOY 70
M-365; 0.75 C, 1.25 Ni, 0.80 Cr, 0.25 Mo, 0.15 V, bal Fe.
Heat Treated: 121,000-208,000 TS, 90,000-180,000 PL, C 29-45 Rock.
For brake dies, bushings, cams, shear blades, gears, set screws, forming and swaging dies, punches.
Type L 6, tough, oil hardening.

AMCO OFHC.
M-1508; 99.99 Cu.
For electronic and electrical equipment, magnetrons, triodes; oxygen free high conductivity copper.

AMCROM.
M-558a; 0.4-1.2 Cr, bal Cu.
Aged: 80,000 TS.
For electrical contacts, rocket nozzles, resistance welding tips, current carrying components.
80-90% elect, cond., age-hardenable, good resistance to softening at high temperatures.

A.M.D.
M-822; 0.34 C, 0.4 Mn, 4.75 Cr, 1.10 W, 1.45 Mo, bal Fe.
For hot work dies, hot work steel.

AMERA-MAG.
M-1057; 0.08-0.15 C, 1.2 Mn, 0.12 P, 0.05 Al, 0.1 max Ni, 0.1 max Mo, bal Fe.
Rolled: 70,000 TS; 50,000 YS; 34 El; 53 RA, 147 Brin.
For tanks, bodies; high tensile.

AMERCUT B-28
M-12; 0.08-0.13 C, 0.6-0.9 Mn, 0.09-0.13 P, 0.2-0.3 S, bal Fe.
Cold finish: 80,000-100,000 TS; 65,000-85,000 YS, 20-10 El; 50-40 RA; 170-200 Brin.
For automatic screw machine operations; approx machinability 215 ft/min

AMERCUT 1020
M-12; 0.18-0.23 C, bal Fe.
65,000-85,000 TS; 50,000-70,000 YS; 20-30 El, 45-55 RA; 155-185 Brin
For screw products, S.A.E 1020.

AMERCUT B-1111.
M-12; 0.08-0.13 C, 0.6-0.9 Mn, 0.09-0.13 P, 0.1-0.2 S, bal Fe
Cold finish 70,000-90,000 TS, 60,000-80,000 YS; 25-15 El; 50-40 RA; 160-190 Brin
For automatic screw machine operations, approx machinability 125 ft/min

AMERCUT B 1112
M-12, 0.08-0.13 C, 0.6-0.9 Mn, 0.09-0.13 P, 0.16-0.23 S, bal Fe
Cold finish. 80,000-100,000 TS, 65,000-85,000 YS, 20-10 El, 50-40 RA, 170-200 Brin
For automatic screw machine operations, approx machinability 180 ft/min

AMERCUT C-1115.
M-12, 0.13-0.18 C, 0.7-1.0 Mn, 0.13 P, bal Fe.
Rolled 10-20 El
For screw machine parts, bolts, nuts, screw, free-cutting

AMERCUT C-1117.
M-12, 0.14 0.20 C, 1.0-1.3 Mn, 0.08-0.13 S, bal Fe
Rolled: 15-25 El
For screw machine parts, bolts, nuts, screws; free-cutting.

AMERCUT C-1118
M-12, 0.14-0.20 1.3-1.6 Mn, 0.08-0.13 S, bal Fe.
Rolled: 15-25 El
For screw machine parts, bolts, nuts, screws, free-cutting

AMERCUT C-1120.
M-12, 0.18-0.23 C, 0.7-1.0 Mn, 0.08-0.13 S, bal Fe.
Rolled: 15-25 El.
For screw machine parts, bolts, nuts, screws, free-cutting.

AMERCUT C-1132.
M-12; 0.27-0.34 C, 1.35-1.65 Mn, 0.08-0.13 S, bal Fe.
Rolled: 15-25 El.
For screw machine parts, bolts, nuts, screws, free-cutting.

AMERCUT C-1137.
M-12; 0.32-0.39 C, 1.35-1.65 Mn, 0.08-0.13 S, bal Fe.
Rolled: 15-25 El.
For screw machine parts, bolts, gears, nuts, screws; free-cutting.

AMERCUT C-1141.
M-12; 0.37-0.45 C, 1.35-1.65 Mn, 0.08-0.13 S, bal Fe.
Rolled: 15-25 El.
For screw machine parts, bolts, gears, nuts, screws; free-cutting.

AMERHEAD C-1018.
M-12; 0.15-0.20 C, 0.6-0.9 Mn, 0.04 max P, 0.05 max S, bal Fe.
For screw machine parts, cold headed parts; wire.

AMERHEAD 1330.
M-12; 0.28-0.33 C, 1.6-1.9 Mn, 0.04 max P, 0.04 max S, bal Fe
For screw machine parts, cold headed parts; wire.

AMERHEAD 1335
M-12; 0.33-0.38 C, 1.6-1.9 Mn, 0.04 max S, 0.04 max P, bal Fe
For screw machine parts, cold headed parts; wire

AMERHEAD A-2317.
M-12; 0.15-0.20 C, 0.4-0.6 Mn, 3.25-3.75 Ni, bal Fe.
For screw machine parts, fasteners; wire.

AMERHEAD A-2330.
M-12, 0.28-0.33 C, 3.25-3.75 Ni, 0.6-0.8 Mn, bal Fe.
For screw machine parts, fasteners, wire.

AMERHEAD A-3115.
M-12, 0.13-0.18 C, 0.4-0.6 Mn, 0.55-0.75 Cr, 1.1-1.4 Ni, bal Fe
For screw machine parts, fasteners; wire.

AMERHEAD 4037
M-12, 0.35-0.40 C, 0.75-1.00 Mn, 0.2-0.3 Mo, bal Fe.
Drawn 85-000-100,000 TS, 75,000-85,000 YS, 15-25 El; 50-65 RA
For bolts, shafts, screws, water hardened

AMERHEAD 4140.
M-12, 0.38-0.43 C, 0.7-1.0 Mn, 0.8-1.1 Cr,, 0.15-0.25 Mo, bal Fe
For screw machine parts, cold headed parts; wire.

AMERHEAD 4615.
M-12, 0.13-0.18 C, 1.65-2.0 Ni, 0.2-0.3 Mo, bal Fe.
For screw machine parts, cold headed parts, wire

AMERHEAD 8620.
M-12, 0.18-0.23 C, 0.7-0.9 Mn, 0.4-0.6 Cr, 0.4-0.7 Ni, 0.15-0.25 Mo, bal Fe.
Drawn 78,000-93,000 TS, 68,000-80,000 YS; 15-25 El, 50-65 RA.
For bolts, shafts; case hardened

AMERICAN 10
M-991; 0.25 max C, 0.5-0.7 Mn, 0.2-0.6 Si, 0.4-0.6 Mo, bal Fe
Cast N-T: 65,000 TS; 35,000 YS, 20 El, 30 RA; 160-225 Brin
For high pressure and valve castings, high temperature steam resisting.

AMERICAN ALLOY
U S.; 95 Al, 3 Cu, 1 Mg, 1 Mn
For light alloy parts; heat treated.

AMERICAN BLACK HEART MALLEABLE IRON
M-113, M-24; 2.8-3.5 C, 0.6-0.8 Si, Mn, bal Fe.
20,000-46,000 TS; 0.2-15 El; 105-220 Brin
For plumbing, hardware, fittings, pipes, castings.

AMERICAN CA-14.
M-991, 0.15 max C, 0.85 max Mn, 1.0 max Si, 11.5-15.0 Cr, bal Fe.
Cast: 80,000 TS; 50,000 YS; 20 El; 30 RA.
For valve seats, chemical apparatus castings; corrosion resistant.

AMERICAN CA-15.
M-991; 0.15 max. C, 0.85 max. Mn, 1 max. Si, 11.5-14.0 Cr, bal Fe.
Cast: 90,000 TS; 65,000 YS; 18 El; 30 RA; 220 Brin.
For valve seats, chemical equipment; corrosion resistant.

AMERICAN CA-40.
M-991; 0.20-0.40 C, 0.85 max Mn, 1.0 max Si, 11-14 Cr, bal Fe.
Cast.
For valve seats, castings; corrosion resistant.

AMERICAN CB-30.
M-991; 0.30 max C, 18-22 Cr, bal Fe.
Normalized: 90,000 TS; 65,000 YS; 7 El; 8 RA; 130 Brin.
For heat resisting castings, valves, fittings; heat resistant.

AMERICAN CE-30.
M-991, 0.30 max C, 26-30 Cr, 8-11 Ni, bal Fe.
Cast W.Q.: 85,000 TS; 45,000 YS, 15 El; 15 RA; 170 Brin.
For paper mill and copper mine castings; corrosion resistant.

AMERICAN CF-7
M-991; 0.07 max C, 18-21 Cr, 8-11 Ni, bal Fe
Cast W.Q.: 70,000 TS; 30,000 YS; 45 El; 50 RA, 150 Brin.
For valves, fittings, pumps, castings; corrosion resisting to acetic acid.

AMERICAN CF-7C
M-991, 0.07 max C, 18-21 Cr, 9-12 Ni, Cb = 10 × C, bal Fe
Water quenched 2000°F. 71,000 TS, 35,000 YS; 45 El; 50 RA, 150 Brin
For stainless castings, valves, fittings; corrosion resistant, austenitic.

AMERICAN CF-7-M.
M-991; 0.07 max C, 18-21 Cr, 9-12 Ni, 1.7-3.1 Mo, bal Fe.
Cast W.Q.: 72,000 TS; 35,000 YS, 45 El, 50 RA, 160 Brin.
For valves, fittings, pumps, castings, corrosion resisting.

AMERICAN CF-7MC.
M-991, 0.07 max C, 18-20 Cr, 8-10 Ni, 2.5 Mo, Cb = 10 × C, bal Fe
Water quenched, 2000°F: 72,000 TS; 35,000 YS, 45 El, 50 RA, 160 Brin.
For stainless castings, corrosion and heat resistant, austenitic.

AMERICAN CF-20.
M-991; 0.20 max C, 18-21 Cr, 8-11 Ni, bal Fe.
Cast W.Q.: 70,000 TS, 30,000 YS, 40 El; 45 RA, 160 Brin
For corrosion resistant castings, valves, fittings; corrosion resisting.

AMERICAN CH-20.
M-991; 0.20 max C, 22-26 Cr, 12-15 Ni, bal Fe.
Cast W.Q.: 75,000 TS; 35,000 YS; 25 El; 25 RA; 160 Brin
For furnace castings, sulphide pumps; corrosion and heat resisting.

AMERICAN CK-20.
M-991; 0.2 max. C, 19-22 Ni, 23-27 Cr, bal Fe.
Cast: 72,000 TS; 33,000 YS; 25 El; 25 RA; 170 Brin.
For boiler feed pumps; corrosion resistant.

AMERICAN CK-25.
M-991; 0.25 max C, 23-27 Cr, 19-22 Ni, bal Fe.
Cooled from 1900°F: 70,000 TS; 30,000 YS; 25 El; 25 RA; 170 Brin.
For heat resistant castings; heat resistant.

AMERICAN CN-7.
M-991; 0.07 max C, 18-20 Cr, 23-26 Ni, Mo, bal Fe.
Water quenched, 2000°F: 70,000 TS; 35,000 YS; 45 El; 45 RA; 150 Brin.
For heat resisting castings; heat and corrosion resistant.

AMERICAN CT-7M.
M-991; 0.07 max C, 13-17 Cr, 34-37 Ni, 2.5 Mo, bal Fe.
Water quenched, 2000°F 65,000 TS; 35,000 YS; 45 El, 45 RA; 150 Brin.
For heat resisting castings, valves, fittings, pumps; heat and corrosion resistant to hot sulfuric and caustic solutions

AMERICAN HH.
M-991; 0.2-0.5 C, 24-28 Cr, 11-14 Ni, bal Fe.
For heat resisting castings, furnace parts; corrosion and heat resistant, austenitic.

AMERICAN HT.
M-991, 0.35-0.75 C, 33-37 Ni, 13-17 Cr, bal Fe.
Cast: 60,000 TS, 30,000 YS, 5 El, 5 RA
For furnace parts, heat treating pots, heat resisting

AMERICAN HYLASTIC
M-991, 0.26-0.36 C, 1.4-1.70 Mn, 0.1 V, bal Fe
Cast N-T 90,000 TS, 60,000 YS, 22 El, 45 RA; 180 Brin
For railroad and structural castings, tempered

AMERICAN MARINE
M-565; Pb-Sn-Sb
Cast 8,750 TS; 8,000 YS, 1.0 El; 0.7 RA, 30 Brin
For Babbitts, bearings; Babbitt metal

AMERICAN MARINE GENUINE
M-565
For bearings for marine engines and locomotives, Babbitt, shock resistant.

AMERICAN SILVER-1
U.S., 49.4 Cu, 20.7 Zn, 24.2 Ni, 1.3 Fe, 3.8 Mn, 0.5 Sn
For ornaments, hardware, corrosion resistant

AMERICAN SILVER-2
U.S., 59 Cu, 23 Zn, 11 Ni, 3 Pb, 1.5 Al, 5 P + Sn
For ornaments, hardware, corrosion resistant

AMERICAN SILVER-3
U.S., 58-49 Cu, 21-24 Zn, 15-24 Ni, <4 Mn + Sn + Fe + Al + Pb
For ornaments, hardware, corrosion resistant

AMERICAN SUPER-TENS.
M-12, 0.72-0.93 C, 0.4-1.1 Mn, 0.10-0.35 Si, bal Fe
Drawn: 250,000 min TS
For prestressed concrete

AMERICAN TYPE 12
M-991, 0.10-0.20 C, 0.6-0.8 Mn, 0.6 max Si, 2.5-3.0 Ni, bal Fe
Cast 70,000 TS; 40,000 YS; 26 El, 35 RA
For valves, fittings, pumps; high impact valve at low temperature.

AMERICAN TYPE 20
M-991; 0.20-0.25 C, 0.65-0.85 Mn, 0.20-0.50 Si, 0.65-0.85 Cr, 0.25-0.35 Mo, bal Fe
Cast N-T: 100,000 TS; 70,000 YS; 22 El, 35 RA; 202 Brin.
For valves, fittings, structural castings; in welded structures.

AMERICAN TYPE 22.

M-991; 0.15-0.30 C, 0.65-0.85 Mn, 0.6 max Si, 4.0-6.5 Cr, 0.4-0.6 Mo, bal Fe.

Cast N-T: 100,000 TS; 65,000 YS; 18 El; 30 RA; 250-300 Brin.

For oil refinery valves and fittings, pumps; high temperature steam and oil services.

AMERICAN TYPE 23

M-991; 0.25-0.35 C, 0.6-0.8 Mn, 0.6 max. C, 1.0-1.5 Ni, 0.5-0.8 Cr, bal Fe

Cast: 99,000 TS, 57,000 YS; 22 El; 40 RA; 200 Brin.

For gears, pinions, shafts, tough.

AMERICAN TYPE 31.

M-991; 0.20-0.30 C, 0.7-1.0 Mn, 2.5-3.0 Ni, 1.0-1.5 Cr, 0.2-0.4 Mo, bal Fe.

Cast N-T: 150,000 TS; 130,000 YS; 10 El, 20 RA; 300 Brin

For structural and aircraft castings; tough.

AMERICAN VALVE SPRING.

M-12; 0.6-0.75 C, 0.5-0.9 Mn, 0.12-0.30 Si, bal Fe.

Heat treated 195-000-300,000 TS, 48 El; 450 Brin.

For valve springs; oil tempered wire

AMER-LED A

M-12, 0.15 max C, 0.75-1.25 Mn, 0.15-0.35 Pb, 0.25 S, bal Fe

For screw machine products, screws, bolts; free-cutting

AMER-LED B

M-12, 0.15 max C, 0.85-1.35 Mn, 0.36 S, 0.15-0.35 Pb, bal Fe

For screw machine products, screws, bolts; free-cutting

AMERSTITCH

M-12, 0.40 0.95 C, 0.5-1.2 Mn, 0.1-0.3 Si, bal Fe

Drawn 190,000-360,000 TS

For metal stitching wire

AMERSTRIP

M-12, 0.05-1.35 C, bal Fe

For springs; water hardening

AMERVAN.

U.S., 63.5 Fe, 35 V, 1.5 Si

For alloy steel making, vanadium additions

A-METAL

Eng., 5-7 Cu, 44 Ni, bal Fe

For sound transmitting devices

A M I

M-210, C, alloy, bal Fe

For dies, tough and abrasion resistant.

AMINO 3

M-72, 0.38 0.43 C, 12.5-13.5 Cr, 0.6 Ni, bal Fe

For tools, cutlery, knives, corrosion resistant, hardenable

AMNIC.

M-558, M-238, 29-33 Ni, bal Cu

Hard 75,000 TS, 72,000 YS, 15 El; B 80 Rock

Soft. 54,000 TS, 180,000 YS, 45 El, B 35 Rock

For electronic equipment and high vacuum applications, electronic tubes.

High purity cupro-nickel, corrosion resistant

AMOL

M-1049; 0.8-0.9 C, bal Fe

For tools, cutters, water hardening.

AMOLA

M-680; 0.20-0.70 C, 0.70-0.90 Mn, 0.15-0.25 Mo, bal Fe

For gears, axles, shafts

AMOTUN.

M-353; 0.85 C, 4 Cr, 6 Co, 1.75 V, 1.5 W, 8 Mo, bal Fe.

For cutting tools; high speed steel.

AMOUTUN.

M-353; 0.80 C, 4 Cr, 8 Mo, 1.5 W, 1 V, bal Fe.

Hardened: C 64-66 Rock.

For lathe and planer cutters, drills, reamers, broaches, hobs, form cutters, taps.

Type M 1 high speed steel, high red-hardness.

AMPCO 12.

M-13; 8.0-9.5 Al, 2.25-3.25 Fe, bal Cu.

Cast: 60,000 TS; 30,000 YS; 40 El; 130 Brin.

For bushings, adjusting nuts, fittings, inlet hoppers, machinery parts.

Corrosion resistant.

AMPCO 16.

M-13; 9.3-10.3 Al, 2.75-4.0 Fe, bal Cu

Cast: 90,000 TS; 32,000 YS; 22 El; 155 Brin.

For bushings, gears, worm wheels, machinery parts, trolley shoes, trolley wheels.

Corrosion and shock resistant.

AMPCO 18.

M-13, 10.0-11.2 Al, 3.0-4.2 Fe, 0.5 max others, bal Cu

Cast. 77,000-90,000 TS, 37,000-42,000 YS, 10-14 El; 6-12 RA, 165-185 Brin

For acid equipment, gears, worm wheels, trolley shoes, piston rods, valve seats

Corrosion and shock resistant.

AMPCO 18-22

M-13, 10.0-11.2 Al, 3.0-4.2 Fe, bal Cu.

Heat treated 90,000-100,000 TS; 45,000-55,000 YS; 3-7 El, 3-7 RA; 202-223 Brin

For bearings, heat treatable, wear resistant, impact resistant.

AMPCO 18-23

M-13, 10.0-11.2 Al, 3.0-4.2 Fe, bal Cu

Heat treated 100,000 TS, 50,000 YS, 14 El; 14 RA; 179-207 Brin

For aircraft, propellers, motors, heavy duty worm gears, castings.

AMPCO 20

M-13, 11.0-12.2 Al, 3.2-4.5 Fe, bal Cu

Cast 83,000-90,000 TS, 40,000-43,000 YS, 4-6 El; 3.5 RA, 212-241 Brin

For cams, rollers, safety tools, welding jaws, worm gears, valve bodies

Corrosion and wear resistant

AMPCO 20-13

M-13, 11.0-12.2 Al, 3.2-4.5 Fe, bal Cu

Heat treated. 85,000-102,000 TS, 35,000-50,000 YS; 6-12 El, 192-207 Brin

For bearings, bushings, corrosion and wear resistant, non-seizing

AMPCO 21

M-13, 12.5-13.6 Al, 3.5-5.0 Fe, 0.5 max others, bal Cu.

Cast 75,000-95,000 TS, 55,000-60,000 YS; 1.5 El; 0.5 RA, 285-302 Brin

For valves, bushings, forming dies, slides, roller bushings, gears, worm gears.

Corrosion and wear resistant.

AMPCO 22

M-13, 13.6-14.6 Al, 4.0-5.2 Fe, 0.5 max others, bal Cu.

Cast: 85,000 TS, 70,000 YS; 0.5 El; 321-341 Brin.

For forming and drawing dies

Corrosion and wear resistant.

High compressive strength

AMPCO BERYLLIUM COPPER.
M-13; 97.5 Cu, 2.5 Be
90,000-125,000 TS; 85,000-100,000 YS; 1-0 El; 350-420 Brin.
For wire springs, forming dies, plastic dies, nonsparking tools, airplane propeller bushings; age hardening.

AMPCOLOY 3W1.
M-13; 64W, bal Cu.
Bars: 67,00-135,000 TS; 130-165 Brin.
For resistance welding electrodes in welding yellow brass and stainless steel.
43% elect. cond., corrosion and wear resistant.

AMPCOLOY 3W10.
M-13; 70 W, bal Cu.
Bars: 90,000-160,000 TS, 205-208 Brin
For resistance welding electrodes, for flash welding.
38% elect. cond., wear and corrosion resistant

AMPCOLOY 3W20.
M-13; 74 W, bal Cu.
Bars. 95,000-170,000 TS, 228-250 Brin.
For resistance welding electrodes, for heavy projection welding
30% elect cond., wear and corrosion resistance.

AMPCOLOY 3W-86.
M-13, Cu-W
120,000 TS, 210 Brin
For resistance welding electrode, heat treatable.

AMPCOLOY 10W-86.
M-13; Cu-W.
160,000 TS, 260 Brin
For resistance welding electrode; heat treatable.

AMPCOLOY 30
M-13; 9.1 Al, 9.1 Pb, bal Cu
45,000-50,000 TS, 18,000-20,000 YS; 32-35 El, 25-30 RA, 50-60 Brin
For bearings, formerly "Atlas 10"

AMPCOLOY 31.
M-13; 7.0-9.0 Pb, 7.0-9.0 Sn, 0-1 Ni, 0.65 max others, bal Cu.
Cast. 35,000 TS, 18,000 YS; 15 El, 10 RA, 55 Brin
For bearings and bushings in high speed and pressure services.
Resists mild acids

AMPCOLOY 32
M-13; 9-11 Sn, 8-11 Pb, 0-1 Ni, bal Cu
Cast 28,000-35,000 TS, 14,000-18,000 YS, 8-12 El, 8-12 RA, 50-65 Brin.
For spindle bearings, thrust rings, bushings, elevator nuts
Wear and corrosion resistant.

AMPCOLOY 34
M-13, 71.5 Cu, 23 Pb, 5.5 Sn
25,000-30,000 TS, 14,000-16,000 YS, 14-18 El; 12-14 RA; 50-60 Brin
For bearings, bushings; formerly "Atlas 20."

AMPCOLOY 35.
M-13; 6.25-7.5 Sn, 6.0-8.0 Pb, 2.0-4.0 Zn, 1.0 max others, bal Cu.
Cast: 45,000 TS; 20,000 YS, 20 El; 15 RA, 65 Brin
For lead screw nuts, bearings.
Low strength bearing alloy

AMPCOLOY 38
M-13; 6 Sn, 20 Pb, bal Cu.
Cast: 30,000 TS, 12,000 YS; 12 El; F 66 Rock.
For bearings, mine water pump parts, roll neck bearings.
Corrosion resistant, good embeddability.

AMPCOLOY 40.
M-13; 9.5-10.5 Al, 0.2 max Fe, bal Cu.
Cast: 65,000-70,000 TS; 24,000-28,000 YS; 15-30 El; 12-30 RA; 110-140 Brin.
For bushings, pump valves, resists H_2SO_4.

AMPCOLOY 42
M-13; 89 Cu, 10 Al, 1 Fe.
60,000-75,000 TS; 22,000-28,000 YS; 25-32 El; 25-30 RA; 110-135 Brin.
For propellers, nuts; corrosion resistant.

AMPCOLOY 43
M-13, 89 Cu, 10 Al, 1 Fe.
62,000-72,000 TS, 35,000-40,000 YS; 8-15 El; 9-16 RA, 126-156 Brin
For propellers, nuts, corrosion resistant.

AMPCOLOY 44.
M-13, 11-12 Al, 0.2 max Fe, bal Cu.
Cast: 60,000-70,000 TS, 30,000-50,000 YS; 3-5 El, 3 RA; 190-229 Brin
For welding dies, electrode holders, good electrical conductivity

AMPCOLOY 45
M-13, 9.7-10.9 Al, 2.0-3.5 Fe, 4.5-5.5 Ni, 1.5 max Mn, bal Cu, 0.6 max others.
Extruded: 118,000 TS; 75,000 YS, 15 El; 15 RA; 220 Brin
For bearings, sleeves, valve guides, shafts, heat treatable, corrosion resistant

AMPCOLOY 45-22
M-13, 9.7-10.9 Al, 2.0-3.5 Fe, 4.5-5.5 Ni, 1.5 max Mn, 0.6 max others, bal Cu
Wrought 115,000 TS, 66,000 YS, 15 El, 15 RA, 223 Brin.
For plunger tips, valve guides, shafts.
Corrosion resistant

AMPCOLOY 46
M-13, 2-6 Fe, 8-12 Al, 2-6 Ni, bal Cu
Ht Tr: 90,000-96,000 TS, 43,000-55,000 YS, 3-12 El, 10 RA, 180-235 Brin
For valve bodies, gears, sleeves, liners
Heat treatable castings

AMPCOLOY 46-22
M-13; 8-12 Al, 2-6 Fe, 2-6 Ni, 0-2 Mn, bal Cu
Cast 95,000 TS, 43,000 YS, 16 El, 16 RA; 234 Brin
For gears, shafts, valve bodies, shaft sleeves, liners, heat treatable, corrosion resistant

AMPCOLOY 50
M-13, 84 Cu, 10 Sn, 3.5 Ni, 2.5 Pb
Cast 47,000 TS, 24,000 YS, 10 El, 20 RA, 80 Brin
For worm gears, bushings, nuts, gears, elevating screw units

AMPCOLOY 53.
M-13, 5 Ni, 5 Sn, 2 Pb, bal Cu
Cast: 55,000 TS, 28,000 YS, 45 El, 100 Brin.
Ht. Tr. 95,000 TS, 65,000 YS, 15 El; 207 Brin.
For gate valves, bell bodies, valves, utility waterworks, pump impellers
Heat treatable, high strength
Good corrosion resistance

AMPCOLOY 54.
M-13; 10-11 Sn, 1.2 Ni, bal Cu
Cast: 47,000 TS; 24,000 YS; 15 El; 12 RA; 93 Brin
For rims.

AMPCOLOY 62.
M-13; 38-42 Zn, 1.5 Mn, 1.5 max Al, 1.0 Sn, 0.4-2.0 Fe, bal Cu, 1.4 max others.
Cast: 65,000-75,000 TS; 28,000-38,000 YS; 20-35 El; 20-35 RA; 110-135 Brin.
For castings, gears, cams; low tensile bronze.

AMPCOLOY 64.
M-13; 60-68 Cu, 3-7 Al, 2-4 Fe, 5 max Mn, bal Zn.
Cast: 95,000 TS, 50,000 YS; 25 El, 192 Brin.
For cast gears, gear cases, scrapers, housings.
Medium strength bronze.

AMPCOLOY 66.
M-13; 3-7 Al, 1-4 Fe, 5 max Mn, 20-30 Zn, 60-68 Cu.
Cast: 110,000-120,000 TS; 60,000-70,000 YS; 10-15 El; 8-14 RA; 217-235 Brin.
For castings; gears, high tensile bronze, nuts.

AMPCOLOY 71.
M-13; 86-90 Cu, 5.5-6.5 Sn, 1-2 Pb, 3-5 Zn, 1.0 max Ni.
Cast: 40,000 TS; 20,000 YS; 30 El; 30 RA; 70 Brin.
For pressure castings, gears, bearings, bushings; "Navy M" alloy.

AMPCOLOY 72.
M-13; 7.5-9 Sn, 3-5 Zn, bal Cu.
Cast: 46,000 TS; 24,000 YS; 26 El; 24 RA; 66 Brin
For castings; venturi meter bodies, slip rings.

AMPCOLOY 74.
M-13; 84-86, 4-6 Sn, 4-6 Pb, 4-6 Zn, 1.5 max Ni.
Cast. 38,000 TS; 20,000 YS; 26 El; 24 RA; 65 Brin.
For valves, pipe elbows, hydraulic parts; "Ounce Metal"; for high pressure service.

AMPCOLOY 79
M-13; 86-89 Cu, 9-11 Sn, 1-3 Zn.
Cast 46,000 TS; 22,000 YS; 24 El, 22 RA; 105 Brin
For gears, shafts, bearings, sleeves.
Hard bronze, wear and corrosion resistant.

AMPCOLOY 80
M-13, 2.0-2.75 Be, 0-1.25 Ni, bal Cu.
Heat treated 90,000-125,000 TS, 85,000-100,000 YS, 0-4 El, 0-4 RA; 350-420 Brin.
For castings.

AMPCOLOY 83
M-13, 0.25 Co, 1.8 Be, bal Cu
Wrought 190,000 TS, 120,000 YS, 2.5 El
For resistance welding parts, shafts, bushings.
Age-hardenable, high strength

AMPCOLOY 83-20
M-13; 1.70-2.05 Be, 0.10-0.35 Co, 0.60 max others, bal Cu
Extruded 190,000 TS, 120,000 YS; 2.5 El; 2.5 RA; 350 Brin
For plunger tips.
Age-hardenable, corrosion resistant.

AMPCOLOY 84
M-13, 2.0 Be, 1.0 others, bal Cu.
Cast 150,000 TS, 98,000 YS; 2 El.
For resistance welding parts, shafts, bushings, die inserts.
Age hardenable, wear resistant.

AMPCOLOY 84-20.
M-13; 1.5-2.0 Be, 1.5 max Co, 2.5 max others, bal Cu.
Cast 135,000 TS, 90,000 YS, 2 El; 2.5 RA, 351 Brin.
For plunger tips, die inserts, shafts, bushings.
Age hardenable, corrosion resistant.

AMPCOLOY 86.
M-13, 1.1-1.5 Ni, 2.25-3.0 Be, bal Cu.
Sand cast: 160,000 TS; 100,000 YS; 2.5 El; 2.5 RA; 393 Brin.
Centrifugal cast. 170,000 TS; 100,000 YS; 2.5 El; 2.5 RA; 393 Brin.
For welding dies, non-sparking safety tools; see "Ampco Beryllium Copper."

AMPCOLOY 86-20.
M-13; 1.1-1.5 Ni, 2.25-3.0 Be, bal Cu.
Sand cast: 160,000 TS; 100,000 YS; 2.5 El; 2.5 RA; 393 Brin.
For welding dies, safety tools; age-hardenable.

AMPCOLOY 90.
M-13; 0.25 max others, bal Cu.
Cast: 25,000 TS; 9,000 YS; 40 El; 40 RA; 45 Brin.
For transformer secondaries; cable attachments, bus bars; high conductivity.

AMPCOLOY 91.
M-13; 97 Cu, 2.6 Co, 0.4 Be.
Heat treated: 90,000-115,000 TS; 45,000-55,000 YS; 10-20 El; 200-240 Brin.
For welding electrodes; same as Ampco Trodaloy 1.

AMPCOLOY 92.
M-13; 11.6-12.2 Al, 0.35 max others, bal Cu.
Cast: 70,000 TS; 34,000 YS; 6 El; 150 Brin.
For resistance welding electrodes, hinges, bushings, shafts.
10-15% elect cond., corrosion resistant.

AMPCOLOY 92-H.
M-13; Al, bal Cu.
Cast. 75,000 TS; 2 El; 240 Brin.
For resistance welding electrode; 20% conductivity.

AMPCOLOY 92-S.
M-13; Al, bal Cu
Cast: 75,000 TS; 25 El, 137 Brin.
For resistance welding electrode; 20% conductivity

AMPCOLOY 94.
M-13, 1.5-2.5 Ni, 0.5 Si, 0.75 Al, bal Cu
Cast 65,000 TS, 45,000 YS, 15 El, 146 Brin
For resistance welding parts, shafts, bushings, plunger tips.
Medium conductivity, wear resistant.

AMPCOLOY 95.
M-13, 0.1-1.0 Be, 1.5-3 Co, bal Cu
Cast. 95,000 TS, 15 El; 396 Brin.
Wrought: 105,000 TS; 15 El.
For welding electrodes, age-hardenable.

AMPCOLOY 95-20.
M-13, 1.3-3.0 Co, 0.1-1.0 Be, bal Cu.
Cast 92,000 TS, 68,000 YS, 8 El, 9 RA; 217 Brin
For welding electrodes, shafts, bushings, age-hardenable, good electrical conductivity.

AMPCOLOY 97
M-13, 99.5 Cu, 4 Cr, 1 Be.
Cast. 40,000-50,000 TS; 35,000-40,000 YS, 10-15 El; 140-150 Brin.
For welding electrodes; same as Ampco Trodaloy 7.

AMPCOLOY 97-20.
M-13; 1.5 Cr, bal Cu, 0.5 max others.
Cast: 51,000 TS; 40,000 YS; 17 El, 35 RA; 105 Brin.
For welding electrodes, bushings, inserts; age hardenable, high electrical conductivity.

AMPCOLOY 99.
M-13, Cu alloy
Bars: 60,000-50,000 TS; 20,000-15,000 YS; 20-25 El; 100-115 Brin.
For resistance welding electrode, for terneplate and galvanized stock.

AMPCOLOY A-323.
M-13; 89 Cu, 10 Al, 1 Fe.
Heat treated: 80,000-90,000 TS; 40,000-50,000 YS; 22-30 El; 24-32 RA; 143-156 Brin.
For hardware; heat treatable; formerly "Atlas 89A323."

AMPCOLOY 342.
M-13; 4.25-5.5 Sn, 18-22 Pb, 0.5 max Zn, bal Cu.
For bearings, bushings; continuous cast rod.

AMPCOLOY 382.
M-13; 81-85 Cu, 6.2-7.5 Sn, 2-4 Zn, 6-8 Pb.
Cast: 30,000 TS; 14,000 YS; 12 El.
For bearings, bushings; continuous cast rod.

AMPCOLOY 405.
M-13; 7 Al, 2 Si, bal Cu.
Extruded: 85,000-87,000 TS; 50,000-53,000 YS; 30-28 El; Rockwell B86-84.
For valve stems, valve seats, gears, hardware, high strength, high ductility, wear resistant.

AMPCOLOY 483.
M-13; 9.0 Al, 4.5 Fe, 4.5 Ni, 1.0 Mn, bal Cu.
Cast: 100,000 TS; 43,000 YS; 25 El; 163 Brin.
For marine propellers, worm wheels, marine hardware.
Tough, strong, corrosion resistant.

AMPCOLOY 495.
M-13; 8 Al, 2.5 Fe, 2 Ni, 12.5 Mn, bal Cu.
Bar: 100,000 TS; 50,000 YS, 30 El; 187 Brin.
For pump and valve parts, propellers, hydraulic equipment
Corrosion resistant, tough, shock resistant.

AMPCOLOY 501
M-13, 0.7 Mn, 1.5 Si, bal Ni
Cast: 50,000 TS, 25,000 YS, 25 El; 100 Brin
For valve and pump bodies, food and drug handling equipment
Corrosion and heat resistant

AMPCOLOY 502.
M-13; 0.3 Mn, bal Ni
Forged: 75,000 TS; 35,000 YS, 30 El, 130 Brin
For valve trim, food and drug handling equipment
Corrosion and heat resistant.

AMPCOLOY 521
M-13; 30 Ni, 1 Mn, 0.5 Fe, 0.5 Si, bal Cu.
Cast: 63,000 TS; 32,000 YS; 35 El; 120 Brin.
For valve bodies and trim, valve stems for pipe fittings, propeller sleeves, pump impellers
Good corrosion resistance to 700°F.

AMPCOLOY 522
M-13, 0.5 Fe, 30 Ni, 0.5 Mn, bal Cu
Forged: 55,000 TS, 23,000 YS; 40 El, 85 Brin.
For valve bodies and trim, valve stems for pipe fittings, propeller sleeves, pump impellers
Corrosion resistant to 700°F.

AMPCOLOY 525.
M-13; 1.5 Fe, 10 Ni, 1 Mn, 0.1 Si, bal Cu
Cast. 42,000 TS, 19,000 YS; 35 El, 100 Brin
For oil refinery equipment, propeller sleeves, pump impellers, marine hardware
Corrosion resistant to 600°F.

AMPCOLOY 526.
M-13, 1.5 Fe, 10 Ni, bal Cu.
Forged: 40,000 TS; 18,000 YS, 45 El, B 35 Rock
For oil refinery equipment, propeller sleeves, pump impellers, marine hardware
Corrosion resistant to 600°F

AMPCOLOY 531.
M-13, 8 Fe, 1 Mn, 15 Cr, bal Ni.
Rolled. 100,000 TS; 60,000 YS, 35 El; 180 Brin.
For exhaust manifolds, furnace and heat treating equipment, jet engine parts, oil and gas burners.
For subzero and high temperature service.

AMPCOLOY 551.
M-13; 29 Cu, 3 Al, 1 Mn, bal Ni.
Rolled: 150,000 TS; 105,000 YS; 25 El; 280 Brin.
For pump and valve parts, scrapers.
High strength, wear and corrosion resistant. (K-Monel).

AMPCOLOY 552.
M-13; 30 Cu, 1.4 Fe, 1.0 Mn, bal Ni.
Forged: 80,000 TS; 45,000 YS; 35 El; 140 Brin.
For propeller shafts, valve seats and stems, pump and compressor parts.
Resists corrosion and elevated temperature (Monel).

AMPCOLOY 553.
M-13; 30 Cu, 2 Fe, 0.75 Mn, 4 Si, bal Ni
Cast: 125,000 TS; 100,000 YS; 2 El; 300 Brin.
For pump wear rings, valve trim, steam nozzles.
Non-magnetic, non-galling, corrosion resistant
Similar to S-Monel.

AMPCOLOY 557
M-13; 31 Cu, 2 Fe, 0.75 Mn, 3 Si, bal Ni
Cast: 100,000 TS; 65,000 YS, 8 El, 200 Brin.
For pump wear rings, valve trim, steam nozzles.
Corrosion resistant, non-magnetic.
Similar to H-Monel

AMPCOLOY 558
M-13; 33 Cu, 1.2 Fe, 0.8 Mn, 1.7 Si, bal Ni
Cast 75,000 TS; 35,000 YS; 30 El; 130 Brin
For pump impellers, valve bodies and trim, bubble caps, food machinery, steam ejectors
Weldable, corrosion resistant.

AMPCOLOY 559
M-13, 33 Cu, 1.2 Fe, 0.8 Mn, 1.7 Si, bal Ni
Cast 75,000 TS, 35,000 YS; 30 El; 130 Brin
For pump impellers, valve bodies, bubble caps, food machinery, steam ejectors.
Corrosion resistant, strong and tough

AMPCOLOY 561
M-13, 2 Cu, 30 Fe, 1 Mn, 3 Mo, 1 Ti, 1 Cr, bal Ni
Forged 95,000 TS, 48,000 YS, 43 El, 156 Brin
For agitators, valves, pump fittings, heat exchangers
Resists sulphuric and phosphoric acids
Corrosion resistant (Ni-O-Nel)

AMPCOLOY 570
M-13, 10 Al, 0.7 Fe, 15 Ni, 1.5 Co, bal Cu
Cast 94,500 TS, 55,000 YS, 5 El, 202 Brin
For glass mold service
Heat and corrosion resistant.

AMPCOLOY 666
M-13, 1.45-1.75 Al, 2.8 max Mn, 57-60 Cu, bal Zn, 1.7 max others.
Extruded 82,000-88,000 TS; 42,000-55,000 YS; 18-12 El; 170-187 Brin
For bushings, gears, bearings, cams, valve stems, connecting rods, high strength bearing bronze.

AMPCOLOY 668
M-13, 61 Cu, 2.5 Pb, 2.5 Mn, 1.0 Si, bal Zn.
Extruded 72,000-75,000 TS, 58,000-60,000 YS; 18-20 El, 162-144 Brin
For bushings, bearings, gears, cams, valve stems, lead screw nuts; free-cutting, leaded manganese bearing bronze.

AMPCOLOY 711
M-13; 11 Sn, 0.2 P, bal Cu.
Cast 55,000 TS, 30,000 YS; 16 El, 102 Brin.
For gears, worm wheels.
Gear bronze. Tough.

AMPCOLOY 712.
M-13, 1.5 Ni, 11.75 Sn, 0.2 P, bal Cu.
Cast: 60,000 TS; 32,000 YS; 16 El; 106 Brin.
For gears, worm wheels.
Gear bronze, tough.

AMPCOLOY 715.
M-13; 12 Sn, 0.2 P, bal Cu.
Cast: 60,000 TS; 32,000 YS; 16 El; 106 Brin.
For gears, worm wheels.
Gear bronze, tough, wear resistant.

AMPCOLOY 742.
M-13; 86-89 Cu, 9-11 Sn, 1-3 Zn, 0.3 max Pb.
Cast: 40,000 TS, 18,000 YS; 14 El; R80F Brin.
For gears, shafts; continuous cast rod.

AMPCOLOY 900.
M-13; 99.98 Cu.
Extruded: 30,000 TS; 10,000 YS; 40 El, 40 Brin.
For electric motor components, conductors.
Electrical cond 100 min
OFHC Copper.

AMPCOLOY 901.
M-13; 99.9 Cu, 30-oz/ton Ag
Cast: 26,000 TS; 8,000 YS, 40 El; 44 Brin.
Forged. 31,000 TS, 10,000 YS, 45 El; 47 Brin
For high temperature (600°F) electrical and acid resistant applications, heat exchangers, computor segments.
Electrical conductivity 95 min

AMPCOLOY 910
M-13, 0.12 Zr, 99.88 Cu
Forged 55,000 TS, 47,000 YS, 14 El, 100 Brin
Extruded 65,000 TS, 60,000 YS; 16 El; 119 Brin
For rotor wedges, commutators, collector rings, switch gears, soldering tips, welding electrodes
90% electrical conductivity.

AMPCOLOY A-1
M-13; 8.5 Al, 3.0 Fe, bal Cu
Cast 80,000 TS, 29,000 YS, 30 El, 135 Brin
For bushings, bearings, gears, wear plates, connecting rods.
Medium strength, light loads

AMPCOLOY A-2
M-13; 7.0-10.0 Al, 0.5-2.0 Fe, 0.6 max others, bal Cu
Cast 62,000 TS, 23,000 YS, 30 El, 30 RA, 101 Brin
For pickling hooks, bushings, marine hardware
Corrosion resistant

AMPCOLOY A-3
M-13, 9-10 Al, 1.3 max Fe, bal Cu
Cast 70,000-75,000 TS, 25,000-32,000 YS, 25-40 El, 25-40 RA, 115-140 Brin.
For gears, pumps, impellers, bearings, corrosion resistant

AMPCOLOY B2
M-13, 10 Al, 1 Fe, bal Cu.
Bar: 85,000 TS, 42,000 YS, 23 El, 170 Brin
Cast 77,000 TS, 29,000 YS, 30 El, 140 Brin.
For bearings, liners, pump parts, pump impellers, bushings Heat treatable, high strength.
Aluminum bronze. For use with medium loads and average speeds Corrosion resistant

AMPCOLOY C3
M-13, 10.5 Al, 3.0 Fe, bal Cu
Bar 100,000 TS, 48,000 YS; 12 El; 192 Brin.
Cast: 85,000 TS; 35,000 YS; 12 El, 183 Brin.
For bearings, bushings, gears, valve guides and seats, pump and hydraulic valves.
Aluminum bronze. Tough, corrosion and wear resistant.

AMPCOLOY D-4.
M-13; 10 Al, 5 Fe, 5 Ni, bal Cu
Bar: 105,000 TS; 46,000 YS; 18 El; 195 Brin.
Ht. Tr.. 120,000 TS; 70,000 YS, 18 El; 240 Brin.
For piston guides, valve seats, glands, pump fluid ends.
High strength, tough Al-bronze, heat treatable.

AMPCOLOY E-1.
M-13; 9.5-11 Al, 1.5 max Fe, bal Cu.
Cast: 70,000-80,000 TS; 40,000-45,000 YS; 12-20 El; 14-20 RA; 131-143 Brin.
For castings, power shovels, worm wheels, pistons, bushings; corrosion resistant.

AMPCOLOY E-5.
M-13; 9.0 Al, 3.0 Fe, bal Cu.
Bar: 90,000 TS, 48,000 YS; 18 El; 174 Brin.
For valve seats, guides, stems, gears, bearings.
Wear and corrosion resistant aluminum bronze. Tough.

AMPCOLOY E-117
M-13; 9-11 Al, 1.5 max Fe, bal Cu.
Cast 80,000 TS; 48,000 YS, 2-6 El, 3-7 RA; 227-255 Brin.
For propellers, bushings, slides.

AMPCOLOY E-123.
M-13, 9.5-11 Al, 1.5 Fe, bal Cu.
Cast: 85,000 TS, 42,000 YS, 15 El, 15 RA, 174 Brin
For propellers, liners, worm wheels, ball seats, bushings

AMPCOLOY F-6
M-13, 10 Al, 3 Fe, bal Cu
Cast: 85,000 TS, 31,000 YS, 20 El; 170 Brin
For bushings, bearings, gears, worm wheels, shifters.
Resists squashing under load

AMPCOLOY M-100
M 13, 100 Mo
Sintered 80,000 TS, 30 El; B 90 Rock.
For facings on spot welder tips.
High heat resistance

AMPCOLOY W-100
M-13;
Bars 50,000-200,000 TS, A 76 Rock.
For resistance welding electrodes for Red Brass weldings
RWMA Class B-13
30% elect cond, corrosion and wear resistance

AMPCO METAL
M-285; 82-88 Cu, 9-12 Al, 3.4-5.3 Fe.
Cast 75,000 TS, 20 El; 18 RA, 149 Brin
Forged 116,000 TS, 4 El, 16 RA, 340 Brin.
Hot rolled 100,000 TS, 20 El, 18 RA; 149 Brin.
For gears, forming dies, valves, bushings, tools, trolley shoes, and wheels, resists corrosion; shock resisting.

AMPCO METAL 8.
M-13, 6-8 Al, 1.5-3.0 Fe, bal Cu
Plate: 72,000 TS, 35,000 YS, 34 El, 130 Brin.
Extruded: 82,000 TS; 55,000 YS, 35 El, 149 Brin
For wear plate service, slides, gibs, bushings, bearings, bolts, fittings
Alpha phase, corrosion resistant.
High impact and fatigue strength

AMPCO METAL 15
M-13, 8.5-10.0 Al, 2.5-3.75 Fe, 0.5 max others, bal Cu.
Wrought. 92,000 TS; 46,000 YS; 25 El; 25 RA, 174 Brin
For valve stems, washers, worm gears, cam rollers, bushings, shear pins, studs.
Good bearing qualities, wear and corrosion resistant.

AMPCO-TRODE 10.
M-13; 9.0-11.0 Al, 1.5 max Fe, bal Cu.
Cast: 60,000-77,000 TS; 25,000-35,000 YS; 25-30 El; 28-30 RA; 110-130 Brin.
For bronze welding rod: aluminum bronze.

AMPCO-TRODE 12.
M-13; 10 Al, 1 Fe, bal Cu.
Cast: 50,000-60,000 TS; 100-115 Brin.
For bronze welding rod for cast iron;
now Ampco-Trode 10.

AMPCO-TRODE 16.
M-13; 9.2 Al, 4.8 Fe, bal Cu.
Cast: 60,000-70,000 TS; 10-20 El; 147-160 Brin.
For bronze welding rod; now Ampco-Trode 160.

AMPCO-TRODE 18.
M-13; 10.3 Al, 5.8 Fe, bal Cu
Cast: 70,000-80,000 TS; 8-14 El; 160-180 Brin.
For bronze welding rod; building up worn parts;
now Ampco-Trode 200.

AMPCO-TRODE 20.
M-13; 11.8 Al, 5.9 Fe, bal Cu.
Cast: 75,000-85,000 TS; 200-250 Brin.
For bronze welding rod; building up worn parts;
now Ampco-Trode 250.

AMPCO-TRODE 21.
M-13; 10 Al, 3 Fe, bal Cu.
Cast: 60,000-70,000 TS; 1.5-3 0 El; 275-310 Brin.
For bronze welding rods; building up worn parts

AMPCO-TRODE 22.
M-13; 11 Al, 2 Fe, bal Cu.
Cast: 65,000-75,0000 TS; 294-342 Brin.
For bronze welding rod; building up worn parts.

AMPCO TRODE 40
M-13; 7 0-8.0 Al, 2.0-3.0 Fe, 2.0-3.0 Ni,
11 0-12 0 Mn, 0.6 max others, bal Cu.
Wrought: 95,500 TS, 56,000 YS; 27 El;
38 RA; 185 Brin
For manganese bronze welding rod.
Wear resistant.

AMPCO-TRODE 160.
M-13; 11-12 Al, 3.0-4 25 Fe, bal Cu, 0.6 max others
Cast: 89,000 TS; 47,000 YS; 15 El; 17 RA;
177 Brin.
For welding electrodes, bearing overlay;
resists salt water and commercial acids.

AMPCO-TRODE 200.
M-13; 12-13 Al, 3-5 Fe, bal Cu, 0.6 max others.
Cast: 90,500 TS; 46,000 YS; 4 El; 5 RA; 212 Brin.
For welding electrodes, surfacing, overlays;
corrosion and acid resistant.

AMPCO-TRODE 250.
M-13, 13-14 Al, 3-5 Fe, bal Cu,
0 6 max others.
Cast: 77,000 TS; 54,000 YS; 1 El; 260 Brin
For welding electrodes, bushings, bearings, gears,
slides; free from galling and scuffing.

AMPCO-TRODE 300.
M-13; 14-15 Al, 3-5 Fe, bal Cu, 0.6 max others.
Cast: 80,000 TS, 69,000 YS; 0 El; 316 Brin.
For welding electrodes, for overlaying, drawing
and forming dies; wear resistant;
good bearing qualities

AMPHOS.
M-1508; 0.03 P, bal Cu.
For condenser tubes, heat exchangers, piping;
good hot and cold workability.

AMPHOS-40.
M-558; Oxygen free copper with added phosphorus.
For plating anodes.

AMS.
M-459, 0.55 C, 0.7 Cr, 1.7 Ni, 0 3 Mo,
0.1 V, bal Fe.
Oil hardening steel for drop forging dies;
tough, through hardening.

AMS EXTRA.
M-459; 0.55 C, 1.1 Cr, 1.7 Ni, 0.5 Mo,
0.1 V, bal Fe.
Oil hardening steel for drop forging dies;
tough, high red hardness.

AMSCO NO. 1.
M-9; 2.5 C, 31 Cr, 50 Co, 13 W.
Welded: 500-540 Brin.
For hard facing rod, valves and valve seats;
heat and corrosion resistant to 1200°F.

AMSCO NO. 6.
M-9; 1 C, 28 Cr, 60 Co, 5 W, bal Fe.
Welded: 3 El; 450 Brin.
For hard facing rod, valves and valve seats;
corrosion and heat resistant to 1200°F.

AMSCO 40.
M-9; 3.5 C, 2 Cr, 5 Mo, bal Fe.
Welded: 540 Brin.
For hard facing electrode; abrasion resistant.

AMSCO 53.
M-9, 3 C, 15 Cr, Mo, bal Fe.
Welded: 540 Brin.
For hard facing electrode; abrasion and
impact resistant

AMSCO 60
M-9, 2 C, 4 Cr, bal Fe.
Welded: 500 Brin
For hard facing electrode; abrasion and
impact resistant.

AMSCO NO 217.
M-9, 3 C, 15 W, 8 Cr, bal Fe.
Cast: 650 Brin
For welding rod for hard surfacing,
abrasion resistant to 1000°F.

AMSCO NO 459
M-9, 3 0 C, 4 Cr, 4 Mo, 1 Ni, bal Fe
Cast 600 Brin.
For hard facing rod for dipper teeth,
abrasion and impact resistant

AMSCO AIR HARDENING
M-9, 1 0-1 5 C, 2 Cr, 1 Mo, bal Fe
Cast. 450-550 Brin
For welding rod, abrasion and impact resistant
to 400°F, air hardening

AMSCO AW-79
M-9, 0 3 C, 4 Cr, 1 Mo, bal Fe.
Welded: 420 Brin.
For automatic submerged melt electrode,
hard facing tractor rollers and idlers.

AMSCO AW-THERMALLOY 4.
M-9, 0 8 C, 20 Cr, 8 Ni, Mo, bal Fe
Welded: 250 Brin
For automatic submerged melt electrode,
impact resistant at high temperature,
work hardens

AMSCO CHROMANAL.
M-9; 1-1 4 C, 10-14 Mn, 0 2-1.0 Si,
1 3 Cr, bal Fe.
Heat treated 95,000-145,000 TS, 53,000-65,000 YS;
63-27 El, 40-30 RA; 195-220 Brin.
For crushers, hammer mills, liners, castings;
work hardens up to 550 Brin.

AMSCO CHROMEFACE.
M-9; 4 C, 6 Mn, 2 Si, 30 Cr, bal Fe
Cast: 500-600 Brin.
For hardfacing electrodes; abrasion resistant
to 600°F, austenitic.

AMSCO CHROME MOLY BALL MILL GRATE STEEL.
M-9; 0 5-0.7 C, 0 5-1.5 Mn, 0.2-0 8 Si, 1.8-2.8 Cr, 0.2-0.5 Mo, bal Fe.
Heat treated: 145,000-175,000 TS; 90,000-130,000 YS; 11-8 El; 20-12 RA; 300-350 Brin
For ball mill grates, abrasion resistant

AMSCO CHROME MOLY BALL MILL LINER STEEL
M-9; 0.7-1 0 C, 0 5-1.5 Mn, 0 2-0 8 Si, 1.8-2 8 Cr, 0 2-0 5 Mo, bal Fe
Heat treated: 150,000-185,000 TS; 95,000-140,000 YS; 8-4 El, 10-4 RA; 300 350 Brin
For ball mill liners; abrasion resistant

AMSCO CM
M-9, 0 5-1 0 C, 0 5-1 5 Mn, 0 2-1.0 Si, 1 8-2 8 Cr, 0 2-0.5 Mo, bal Fe
Heat treated 125,000-185,000 TS; 80,000-150,000 YS; 13-2 El; 25-2 RA, 300-400 Brin
For rod and ball mill grates and liners, crushers, high abrasion and moderate impact resistance.

AMSCO-CMH
M-9, C, Cr, Mo, bal Fe
Heat treated· 155,000 TS; 130,000 YS, 6 El; 7 RA, 300-400 Brin
For castings, ball and rod mill shell liners, air hardened, wear resistant

AMSCO-CMI
M-9, C, Cr, Mo, bal Fe
Heat treated· 155,000 TS, 130,000 YS; 10 El, 15 RA, 275-375 Brin
For castings, trunnion liners, feeder scoops; air hardened, abrasion resistant

AMSCO CO MANG
M-9, 0 6 C, 13 Mn, 0 7 Mo, bal Fe
Welded 180 Brin
Worked 500 Brin
For welding electrodes for austenitic Mn steel, coating of Mn compounds and other alloys, composite electrode

AMSCO CS
M 9, 0 2-0 35 C, 0 7-1 5 Cr, 0 8-1 5 Mn, 0 2-0.8 Si, 0 3 0 8 Ni, 0 2-0.6 Mo, bal Fe
Heat treated 200,000-240,000 TS, 170,000-210,000 YS, 10-6 El, 30-10 RA; 300-500 Brin
For castings, dipper teeth, abrasion and wear resistant

AMSCO DIEWELD
M-9, 1 C, 3 5 Cr, 2 3 Mo, bal Fe
500-600 Brin
For welding rod for forging dies, punches, hard facing, coated, air hardened

AMSCO F-1
M-9, 15-18 Cr, 34-37 Ni, bal Fe
For electric furnace grids, hearth plates, rails, furnace chains, heat resisting, max operating temperature 2000°F

AMSCO F-1H
M-9; 0 4-0 6 C, 16 Cr, 35 Ni, bal Fe
For furnace parts, heat resisting

AMSCO F-1HH.
M-9; 0 60-0 85 C, 16 Cr, 35 Ni, bal Fe.
For furnace parts; heat resisting

AMSCO F-1-N
M-9, C, 15-18 Cr, 38-40 Ni, bal Fe
For retorts, muffles, furnace castings, hearth plates; heat and corrosion and shock resistant.

AMSCO F-2.
M-9, 21-24 Cr, 3-6 Ni, bal Fe
For furnace lead pots; heat resisting, max operating temperature 1800°F.

AMSCO F-3.
M-9, 26-29 Cr, 0-3 Ni, bal Fe.
For rabble arms, rabble blades, corrosion and heat resisting

AMSCO F-3H.
M-9; 0.4-0 6 C, 28 Cr, 2 Ni, bal Fe
For furnace parts, heat resisting.

AMSCO F-3HH.
M-9, 0.6-0 85 C, 28 Cr, 2 Ni, bal Fe
For furnace parts; heat resisting

AMSCO F-4
M-9; 6-9 Cr, 18-21 Ni, bal Fe
For high strength castings, corrosion resisting

AMSCO F-5
M-9; 16-19 Cr, 65-70 Ni, bal Fe
For carburizing boxes, oil burner parts; heat resisting, very tough

AMSCO F-6
M-9, C, 12-15 Cr, 58-64 Ni, bal Fe
For furnace parts, heat treating boxes, retorts, corrosion and heat resistant

AMSCO F-7H
M-9, 0 5 C, 25 Cr, 12 Ni, bal Fe
For furnace parts, heat resistant

AMSCO F 8
M-9, 17-22 Cr, 7-10 Ni, bal Fe
For pots in chemical plants, acid pumps, corrosion resisting

AMSCO F-10
M-9, 0 4 C, 28 Cr, 12 Ni, bal Fe
For furnace parts, dampers, valves, beams, heat resistant.

AMSCO F-10H.
M-9, 0 4-0 6 C, 28 Cr, 12 Ni, bal Fe.
For furnace parts; heat resistant.

AMSCO F-10HH
M-9, 0 6 0 85 C, 28 Cr, 12 Ni, bal Fe
For furnace parts, heat resistant

AMSCO F-12.
M-9, C, 27-30 Cr, 7-10 Ni, bal Fe
For heat treating furnaces, valves, creep resisting.

AMSCO F-13
M-9, C, 25-28 Cr, 34-37 Ni, bal Fe
For furnace parts, retorts, muffles, resists heat and S atmosphere to 2100°F.

AMSCO F-14
M-9, C, 24-27 Cr, 19-22 Ni, bal Fe
Cast
For furnace parts; heat resistant

AMSCO HC
M-9, C, Cr, Si, Mn, bal Fe.
Heat treated 60,000 TS, 7000 YS; 400-600 Brin.
For castings, chute plates, liners; cast iron, abrasion and wear resistant

AMSCO HC-250.
M-9, 2 0-3 0 C, 0 5-1 8 Mn, 0.2-1.0 Si, 22-30 Cr, 0.2-0 6 Mo, bal Fe
Heat treated. 60,000-100,000 TS; 50,000-75,000 YS; 450-550 Brin
For pump parts, liners; erosion and abrasion resistant.

AMSCO HF20.
M-9; steel core wire, coated with Cr, Mn, Mo, Si, V.
Welded: 600 Brin,
For hard facing electrode; hot wear resistant.

AMSCO HF-40.
M-9; 3.5 C, 0.5 Mn, 5.0 Cr, 4.0 Mo, bal Fe.
Cast: 500-580 Brin.
For hard facing electrode; martensitic cast iron, wear resistant.

AMSCO HF-60.
M-9; 1.6 C, 1.0 Mn, 3.0 Cr, bal Fe.
Cast. 450-555 Brin.
For hard facing electrode; abrasion resistant.

AMSCO-M.
M-9; 1.0-1.4 C, 10-14 Mn, 0.2-1.0 Si, bal Fe
Heat treated: 100,000-145,000 TS; 50,000-57,000 YS, 60-30 El, 40-30 RA; 195 Brin
For dipper buckets, crawler shoes, mill liners, screens, austenitic, work hardens, wear resistant

AMSCO MACHINE-FACE.
M-9; 0.4 C, 1 Cr, 0.2 Mo, bal Fe
Welded: 293-331 Brin
For hard surfacing electrodes, coated.

AMSCO MANGANESE STEEL
M-9, M-231, 10-14 Mn, 1-1.4 C, 0.2-1.0 Si, bal Fe
Heat treated 100,000-145,000 TS; 50,000-57,000 YS, 60-30 El; 40-30 RA; 155-200 Brin.
For steam shovel teeth rolls, ball mill liners, wheels, gears and pinions, tough and shock resisting, resists abrasion

AMSCO MM
M-9, 0.70-1.4 C, 10-14 Mn, 0.2-1.0 Si, Mo, bal Fe
Heat treated 90,000-160,000 TS, 45,000-75,000 YS; 65-30 El; 40-30 RA, 200 Brin.
For mining and construction equipment; abrasion and impact resistance with toughness, work hardens

AMSCO-MMH
M-9; C, Mo, Mn, bal Fe
Heat treated: 120,000 TS, 65,000 YS, 20 El, 18 RA
For castings, rolls, jaws, hammers, dipper teeth, wear resistant, austenitic

AMSCO-MML.
M-9, C, Mo, Mn, bal Fe.
Heat treated. 120,000 TS, 52,000 YS, 50 El, 40 RA
For castings, railroad frogs and crossings; austenitic, wear resistant

AMSCO-MNI.
M-9; C, Mn, Ni, bal Fe
Heat treated: 110,000 TS, 48,000 YS, 55 El, 40 RA
For railroad frogs and crossings, austenitic, wear resistant

AMSCO Mo-MANG.
M-9; 0.8 C, 14 Mn, 0.2 Mo, bal Fe.
Welded 200 Brin
For welding rod for building up worn parts, abrasion resistant, work hardens to 500 Brinell, austenitic

AMSCO-MY.
M-9, 1.0-1.4 C, 2.0 Cr, 10-14 Mn, bal Fe
Cast: 120,000 TS, 56,000 YS, 45 El; 30 RA, 200 Brin.
Heat treated. 150,000 TS, 65,000 YS; 30 El; 30 RA.
For castings, mill liners, screens, dipper teeth jaws,, hammers, austenitic, wear resistant

AMSCO NICKEL MANGANESE.
M-9; 0.7 C, 13-15 Mn, 0.9-1.2 Si, 2.5-3.5 Ni, bal Fe.
Welded: 200 Brin.
Hardened 550 Brin.
For crusher rolls, dipper teeth, dredge parts, austenitic, high work hardenability

AMSCO NICROMANG.
M-9, 0.8 C, 14 Mn, Ni, Cr, bal Fe
Welded: 120,000 TS, 70,000 YS; 40 El; 35 RA; 180 Brin
For weld electrode for Mn-steels; work hardens, high strength and ductility

AMSCO Ni-HARD
M-9, 3.5 C, 4.5 Ni, 1.5 Cr, bal Fe.
Welded 600-700 Brin
For welding rod for hard facing; abrasive resistant to 600°F.

AMSCO Ni-Mn STEEL
M-9, 0.75-0.95 C, 13-15 Mn, 0.90-1.20 Si, 3.5-4.5 Ni, bal Fe.
For welding rod for welding austenitic-manganese steel parts; abrasion resistant

AMSCO RAILFACE
M-9, 0.5 C, 1.5 Cr, 0.2 Mo, bal Fe
Welded: 325-380 Brin
For welding electrode for rails, composite coated electrodes, abrasion and impact resistant

AMSCO RESISTWEAR
M 9, 0.6 C, 6 Cr, 0.5 Mo, Mn, bal Fe
Welded 450-550 Brin
For welding electrode, hard surfacing, coated, composite electrode

AMSCO SA-33
M-9, 3 C, 12 Cr, Mo, V, bal Fe
Welded 550 Brin
For hard facing electrode, severe abrasion resistance

AMSCO SA-53
M-9, 3 C, 15 Cr, Mo, bal Fe
Welded: 460 Brin
For hard facing electrode, impact and abrasion resistant

AMSCO SA-BUILD UP
M-9, 0.5 C, Cr, V bal Fe
Welded 260 Brin
For electrode for carbon and low alloy steel build up

AMSCO SA MANGANESE
M-9, 0.6 C, 14 Mn, Mo, bal Fe
Welded 175 Brin
For electrode for Mn-steel repair, work hardens

AMSCO SUPER 20
M 9, 5 C, 20 Cr, 7 Mo, 5 W, bal Fe.
Welded 650 Brin
For hard facing electrode, abrasion resistant at normal and elevated temperature

AMSCO THERMALLOY 4
M-9, 0.6 C, 20 Cr, 8 Ni, Mo, bal Fe.
Welded 250 Brin.
For hard facing electrode, work hardens, impact resistant at high temperature

AMSCO TOOLFACE
M-9, 0.8 C, 4 Cr, 9 Mo, 1.5 W, 1 V, bal Fe
Welded: 575-675 Brin.
For welding rod, composite cutting tools; abrasion and impact resistant to 1000°F

AMSCO TRACKRAIL.
M-9; 0.5 C, Cr, V, bal Fe.
Welded: 295 Brin.
For automatic submerged melt electrode; build up for tractor track links.

AMSCO TUBE TUNGSITE
M-9, WC particles in matrix of W-steel or W-cast iron.
For hard facing welding rod for tipping tools; wear and abrasion resistant

AMSCO V-MANG
M-9; 0.8 C, 14 Mn, 1 Mo, bal Fe
Cast 200 Brin.
Heat treated 550 Brin
For hard surfacing electrode, for build up on Mn steels, austenitic

AMSIL.
M-558, 0.05 Ag, bal Cu.
Elect cond 101%
Wire 48,000 TS, 40,000 YP, 15 El, B 50 Rock
For rotor and stator windings in high speed generators, commutators
High creep resistance, freedom from embrittlement

AMSULF
M 1508, 0.3 S, bal Cu
Extruded 32,000 TS, 47 El; 60 RA
Cold drawn 57,000 TS, 6 El, 23 RA
For screw machine products, clamps, connectors, clips, high electrical conductivity, free cutting

AMTEL
M-558, 0.5 Te, bal Cu
Bar 50,000 TS, 40,000 YP, 12 El
For screw machine products, hardware, fasteners, welding tips and nozzles
Free machining, immune to hydrogen embrittlement

AMUTIT
M 27, 1.05 C, 0.9 Mn, 1.5 W, 1 Cr, bal Fe
For stay bolt taps, screw taps gages, broaches, reamers, milling cutters, oil hardened AISI 07

AMUTIT S
M-27, M-1182, 1C, 1 Mn, 0.5 Cr, 0.6 W, 0.1 V, bal Fe
For cold forming, blanking and bending dies, non deforming, oil hardening AISI 01

AMVILOY 1000
M 265, W, Ni, Cu
Sintered 112,000 TS, 270 Brin
For electrical upsets, 14% electrical conductivity

AMVILOY 2000
M-265, W, Ni, Cu
Sintered 110,000 TS; 290 Brin
For electrical upsets, 16% electrical conductivity

AMZIRC
M-1508, 0.7 Zr, bal Cu.
At 70°F, 72,000 TS, 62,000 YS, 12 El
At 750°F, 51,600 TS, 15 El
At 900°F 39,400 TS, 19 El
For rectifier bases, rotor wedges, resistance welding wheels and tips, high conductivity, good high temperature strength

AMZIRC-150
M-8, 0.17 Zr, 99.83 Cu.
At RT: 71,000 TS, 62,000 YS
At 752°F: 52,000 TS, 45,000 YS, 8 El
At 932°F 35,200 TS; 25,800 YS; 9 El
For resistance welding wheels and tips, commutators, contacts, switch blades
92% elect. cond. annealed.
Precipitation-hardening.

ANACONDA 61.
M-8; 63 Cu, 37 Zn.
Hard: 65,000 TS; 50,000 YS; 20 El; B75 Brin.
Soft: 46,000 TS; 17,000 YS; 60 El; B20 Brin.
For screw machine parts; yellow brass.

ANACONDA 66.
M-8; 60 Cu, 40 Zn.
Soft: 54,000 TS, 20,000 YS, 40 El, B45 Brin.
For hardware, condenser tubes, high strength.

ANACONDA 271
M-8, 62 Cu, 35 Zn, 3 Pb
Hard, 62,000 TS, 50,000 YS; 20 El, 77 RB
Soft: 47,000 TS, 32,000 YS, 60 El; 16 RB
For machined parts, hardware, free cutting.

ANACONDA 293
M-8, 39 Zn, 1 Pb, bal Cu.
Hard 80,000 TS, 60,000 YS, 6 El; 142 Brin
Soft 54,000 TS, 20,000 YS; 40 El, 79 Brin.
For hardware, architectural uses, leaded Muntz metal

ANACONDA 605.
M-8, 38.55 Zn, 0.75 Sn, 0.70 Pb, bal Cu.
Hard 63,000 TS; 35,000 YS; 28 El; 102 Brin.
Soft. 56,000 TS, 22,000 YS, 38 El; 83 Brin.
For hardware, screw machine products, Leaded Naval Brass.

ANACONDA 612
M-8, 60 Cu, 29.5 Zn, 2 Pb, 0.75 Sn
Hard 63,000 TS, 35,000 YS, 25 El, B65 Brin
Soft 56,000 TS, 22,000 YS, 35 El, B50 Brin
For screw machine parts, free cutting

ANACONDA 624
M-8, 60 Cu, 1 Sn, 1 Pb, 0.1 Al, 0.15 Si, bal Zn.
Die cast 55,000 TS, 35,000 YS, 8 El
For hardware, fixtures, free-cutting

ANACONDA 681
M-8, 57.8 Cu, 40.27 Zn, 0.95 Sn, 0.85 Fe, 0.10 Si, 0.03 Mn.
For oxyacetylene braze welding of steel, cast iron and copper alloys, and for bearing surfaces. Welding rods.
Low fuming bronze Melting point 870°C, corrosion resistant

ANACONDA-831.
M-8, 1 Pb, 1 Ni, 0.2 bal Cu
Bar 85,000 TS, 75,000 YS, 5 El
For fasteners, screw machine products, electrical contacts, connectors, free-cutting, corrosion resistant

ANACONDA 997
M-8; 40.3 Zn, 0.95 Sn, 0.85 Fe, bal Cu
For welding rod, low fuming

ANACONDA 1026
M-8, 81.5 Cu, 4.25 Sn, 0.15 Mn, bal Zn.
Die cast 85,000 TS, 50,000 YS, 8 El.
For hardware, fixtures; corrosion resistant

ANACONDA COPPER 189
M-8, 98.80 Cu, 0.75 Sn, 0.25 Si, 0.20 Mn.
For inert-gas and oxyacetylene welding of copper for ductile and strong welds, welding rods
Melting range 1075°C, corrosion resistant.

ANACONDA COPPER 372
M-8; 98.8 Cu, 0.75 Sn, 0.25 Si, 0.20 Mn
For welding rod, oxy-acetylene and inert gas arc welding of copper, M.P. 1967°F.

ANACONDA ELECTRO SHEET COPPER.
M-8; Cu
For weather proofing, printed circuits; furnace brazing.

ANATOMICAL ALLOY.
U.S.; 54 Bi, 19 Sn, 17 Pb, 11 Hg, Cd.
For fusible alloy for anatomical impressions and casts; fusible.

ANCHOR ALLOY NO 95/5.
M-1468; A refrigeration solder, contains Sn and Sb; used with copper sweat fittings; M.P.; 450°F.

ANCHOR ALLOY NO. 250.
M-1468; Aluminum solder; M.P.: 390°F.
For joining aluminum to aluminum.

ANCHOR ALLOY NO. 260.
M-1468; Aluminum solder; M.P.; 650°F
For joining aluminum to aluminum or to dissimilar metals, including castings, die cast parts and aluminum foil

ANCHOR ALLOY NO. 270
M-1468; Solder, M.P.: 507°F.
All purpose solder for all metals except magnesium, including aluminum, zinc die casting, copper, etc

ANCHOR ALLOY NO. 304
M-1468; Solder, contains Ag, no Cd.
M.P 430°F; 14,000-20,000 TS.
For joining stainless steels to dissimilar metals.

ANCHOR ALLOY NO. 520.
M-1468, Solder for repairing, sealing and filling cracks and blow holes in cast iron, M P . 500°F.

ANCHOR ALLOY NO. 530
M-1468, Solder for repairing zinc die castings as radiator grills, door handles M P . 700°F.

ANCHOR GALVANIZED BAR.
M-1468; Galvanizing repair solder, M P 550°F
For repairing damaged or burned galvanized surface; no flux required

ANCHOR REDIMIX SOLDER PASTE
M-1468, Solder paste for all metals except aluminum; contains solder and flux
M P · 370°F

ANCHOR-TITE.
M-598, WC
For tools, dies; cemented WC.

ANCOLOY.
M-1526; 1.75 Ni, 0.5 Mo, 0.02 C, 1.5 Cu, bal Fe.
Sintered· 54,400 TS, 41,500 YS; 1-2 El.
Heat Treated 115,000 TS, 104,000 YS, 0.3 El.
For general machinery parts
Heat treatable Prealloyed powder, high strength

ANDARD.
M-358; 1.1 C, bal Fe.
For tools, drills, water hardening.

ANGEL.
M-485, C, alloy, bal Fe.
For high speed tools; high speed steel.

ANGSBURG.
71.9 Cu, 27.6 Zn.
For tubes, fittings; brass.

ANHYSTER A.
M-771; 35 Ni, bal Fe.
For magnets; high permeability.

ANHYSTER B.
M-771; 35 Ni, bal Fe.
For magnets; high permeability.

ANHYSTER C.
M-104; 45-50 Ni, bal Fe.
For magnets, relays, transformers; high permeability.

ANHYSTER D.
M-104; 45-50 Ni, bal Fe.
For magnets, relays, transformers; high permeability.

ANHYSTER M.
M-104; 77 Ni, 1.6 Cr, 5 Cu, bal Fe.
For relays, transformers, magnetic amplifiers; high permeability.

ANHYSTER MAU MOLYBDENE.
M-104, 77 Ni, 3.9 Mo, 4 Cu, bal Fe
For relays, magnetic amplifiers; high permeability.

ANIBAL.
M-104, C, 42 Ni, 2 Cr, bal Fe.
For clocks, balance wheels, corrosion resistant

"A" NICKEL, ELECTRON GRADE replaced by NICKEL 205.

ANKA "H."
M-472, 0.13-0.20 C, 16-23 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts; stainless; heat and corrosion resistant

ANKA STEEL
M-472; 0.2 C, 0.6 Si, 0.6 Mn, 6-10 Ni, 16-20 Cr, bal Fe.
Annealed 85,000 TS, 35,000 YS, 60 El, 70 RA; 150 Brin
Cold drawn 125,000 TS, 95,000 YS; 25 El, 55 RA; 277 Brin
For chemical plant equipment, tanks, vessels, fittings; Type 301, stainless, austenitic.

ANODE METAL-1
U S , 94 Pb, 6 Sb
For batteries, plates; hard

ANODE METAL-2
U S , 98.8 Pb, 1 Ag, 0.2 As
For lead storage battery parts, hard

ANOXIN 1
M-501: 0.15 max C, 18 Cr, 8.5 Ni, bal Fe
Annealed 80,000 TS, 35,000 YS; 55 El, 75 RA, 150 Brin
Cold drawn· 180,000 TS, 150,000 YS, 10 El, 250 Brin
For chemical plant equipment, tanks, mixers, agitators, filters, Type 302, stainless, austenitic.

ANOXIN-1F.
M-912, 0.15 max C, 16-18 Cr, 6-8 Ni, bal Fe.
Annealed 110,000 TS, 40,000 YS, 60 El, B 85 Rock.
Hard. 185,000 TS; 140,000 YS, 8 El, C 41 Rock.
For aircraft structural members, trailer bodies, auto wheel covers, household utensils.
Type 301 stainless steel, austenitic.
Work hardens rapidly.

ANOXIN 2
M-501; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS; 60 El, 70 RA; 150 Brin
Cold drawn· 180,000 TS, 125,000 YS, 10 El; 330 Brin.
For welded structures, chemical plant equipment, tanks; Type 304, stainless, austenitic.

ANOXIN 2G.
M-501, 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed. 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
Cold drawn 95,000 TS, 60,000 YS; 40 El, 60 RA; 185 Brin.
For welded structures, chemical plant equipment, Type 321; stainless, austenitic.

ANOXIN-2P.
M-1421; 0.08 max C, 18-20 Cr, 8-12 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 150 Brin.
Cold Drawn: 100,000-180,000 TS; 50,000-125,000 YS; 180-330 Brin
For architectural trim, chemical and pharmaceutical plant equipment.
Type 304 stainless steel, austenitic Good formability and weldability.

ANOXIN 3.
M-501; 0.08 C, 18 Cr, 8 Ni, bal Fe
Annealed. 85,000 TS; 35,000 YS; 60 El, 70 RA; 150 Brin.
Cold drawn· 180,000 TS, 125,000 YS; 10 El; 330 Brin.
For welded structures, chemical plant equipment, tanks, Type 304, stainless, austenitic

ANOXIN 4
M-501, 0.05 C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed 85,000 TS, 35,000 YS, 50 El, 60 RA; 160 Brin.
For welded acid resistant chemical equipment, tanks, Type 316Ti, stainless, austenitic

ANOXIN 4G
M-501; 0.15 C, 18 Cr, 8.5 Ni, 2 Mo, bal Fe
Annealed 85,000 TS, 35,000 YS; 50 El; 65 RA, 160 Brin.
Cold drawn 150,000 TS; 135,000 YS, 6 El; 300 Brin
For acid resistant chemical plant equipment, tanks, Type 316, stainless, austenitic.

ANOXIN-4P.
M-1421, 0.08 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed. 80,000 TS, 30,000 YS, 60 El, B 78 Rock
Cold Rolled 150,000 TS, 135,000 YS, 6 El, C 32 Rock
For chemical and textile plant equipment, agitators, kettles, valve trim, acid tanks and vessels
Type 316 stainless steel, austenitic, acid resistant

ANOXIN 5
M-501; 0.07 max C, 17.5 Cr, 17.5 Ni, 2 Mo, 2 Cu, Ti = 4 × C, bal Fe
For valves, pumps, chemical plant equipment; stainless, austenitic

ANOZIN 5G
M-501, 0.10 C, 18 Cr, 9 Ni, 2 Mo, Cu, bal Fe
Annealed 85,000 TS, 35,000 YS, 50 El, 65 RA, 160 Brin
For chemical plant equipment, tanks, Type 316, stainless, austenitic

ANOXIN 8
M-501, 0.10 C, 18 Cr, 9 Ni, 2 Mo, Ti = 7 × C, bal Fe
Annealed 85,000 TS, 35,000 YS, 50 El, 65 RA; 160 Brin
For acid resistant chemical plant equipment, welded structures, Type 316Ti, stainless, austenitic

ANOXIN 20
M-501, 0.07 max C, 18 Cr, 9.5 Ni bal Fe.
Annealed· 85,000 TS; 35,000 YS; 60 El, 70 RA; 150 Brin
Cold drawn· 180,000 TS, 125,000 YS, 10 El, 330 Brin
For welded chemical plant equipment, tanks, mixers, Type 304, stainless, austenitic.

ANOXIN 22.
M-501; 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
Cold drawn: 100,000 TS; 65,000 YS; 40 El; 60 RA; 202 Brin
For welded chemical plant equipment, tanks, mixers; Type 347; stainless, austenitic.

ANOXIN 40
M-501; 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA, 160 Brin.
Cold drawn: 150,000 TS; 135,000 YS, 6 El; 300 Brin
For acid resistant chemical plant equipment, tanks Type 316; stainless, austenitic.

ANOXIN 44
M-501; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Cb = 8 × C, bal Fe.
Annealed 85,000 TS; 35,000 YS, 50 El; 65 RA, 160 Brin.
For welded chemical plant equipment, tanks, mixers, Type 316 Cb; stainless, austenitic.

ANOXIN 66
M-501, 0.05 C, 18 Cr, 9 Ni, Cu, bal Fe.
Annealed. 85,000 TS, 35,000 YS, 60 El; 70 RA, 150 Brin
For chemical plant equipment, pump parts, mixers; stainless, austenitic

ANOXIN 70.
M-912, 0.08 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Annealed 80,000 TS, 30,000 YS, 60 El; B 78 Rock.
Cold Rolled· 150,000 TS; 135,000 YS, 6 El, C 32 Rock
For chemical and textile plant equipment, agitators, kettles, acid tanks and vessels.
Type 316 stainless steel, austenitic, acid resistant

ANOXIN 77.
M-912, 0.10 C, 17.5 Cr, 13 Ni, 2.5 Mo, 0.8 Cb, bal Fe
Annealed. 84,000 TS, 40,000 YS, 50 El, B 82 Rock
For welded structures and tanks, mixers, agitators, digesters Welding grade, stabilized
Type 318 stainless steel, austenitic.

ANOXIN 200.
M-912, 0.03 max C, 18-20 Cr, 8-12 Ni, bal Fe.
Annealed 85,000 TS, 30,000 YS, 60 El, B 80 Rock
Cold Drawn. 150,000 TS, 90,000 YS; 30 El, C 25 Rock.
For welded structures, chemical plant equipment, vessels, tanks, trim
Type 304L stainless steel, austenitic, welding grade.

ANOXIN G
M-501, 0.15 C, 18 Cr, 8.5 Ni, bal Fe.
Annealed 80,000 TS, 35,000 YS, 55 El, 75 RA; 150 Brin
Cold drawn 180,000 TS, 150,000 YS, 10 El, 250 Brin
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

ANOXIN ULTRA-C
M-501, 55 Ni, 16 Cr, 17 Mo, 6 Fe, 4 W
For pumps, valves, pharmaceutical and chemical plant equipment
Heat and corrosion resistant.

ANSCOL 45.
M-568; 0.16 C, 0.70 Mn, 0.015 min Cb, bal Fe.
Plate: 60,000 TS; 45,000 YS, 30 El.
For railroad and mine cars, bridges, booms, pressure vessels, derricks.
Good fabricability and weldability.

ANSCOL 50.
M-568; 0.18 C, 0.70 Mn, 0.04 Si, 0.015 min Cb, bal Fe.
Plate: 63,000 TS; 50,000 YS; 30 El, 140 Brin.
For railroad and mine cars, bridges, booms, pressure vessels, derricks.
Good fabricability and weldability.

ANTACIRON.
M-639; 14.5 Si, 84.5 Fe.
Cast: 15,000-18,000 TS; 15,000-18,000 YS; 0 El; 0 RA; 450-475 Brin.
For equipment to resist corrosion acids carrying abrasive solids; finished by grinding

ANTI-ACID METAL
M-346, 75 Cu, 10 Sn, 15 Pb
For chemical apparatus; acid resistant.

ANTICORODAL.
M-493, 0.6-1.4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, bal Al
Annealed: 21,000 TS; 8000 YS, 24 El.
For window frames, fan blades, gutters, boats; good forming and welding properties

ANTICORODAL-5 Si.
M-249, M-1605, M-1634, 4-6 Si, 0.4-1.0 Mg, 0.5-1.0 Mn, bal Al.
Sand cast 30,000 TS, 23,000 YS; 3.5 El, 75 Brin.
Chilled cast. 40,000 TS, 37,000 YS; 2 El; 95 Brin
For architecture, ship and auto construction, chemical plants, heat treatable

ANTICORODAL-11
M-541, M-624, 0.6-1.2 Si, 0.5-0.85 Mg, 0.25-0.70 Mn, 0.45 max Fe, bal Al
TA16 Temper 42,000-50,000 TS, 36,000-46,000 YS, 12-20 El, 90-120 Brin.
For decorative parts, auto trim, metal furniture, marine structures
Corrosion resistant

ANTICORODAL 15
M-249, 0.5-1.5 Si, 0.2-1.0 Mn, 0.5-1.0 Mg, 0.5-1.5 Cd, bal Al
Heat treated 45,000-61,000 TS, 38,000-58,000 YS, 12-20 El, 90-120 Brin
For aircraft structures, highly stressed parts, corrosion resistant, for forgings and extrusions

ANTICORODAL 15.
M-1220, M-541, 4.2-5.2 Si, 0.6 Mg, 0.7 Mn, 0.15 Ti, bal Al
Cast 35,000-45,500 TS, 28,500-38,400 YS, 1-2 El, 90-105 Brin
For instrument housings, oil pans, crankcases, high fluidity and corrosion resistant

ANTICORODAL 15
M-1176; 4.5 Si, 0.65 Mg, 0.7 Mn, bal Al
Heat treated 36,000-46,000 TS, 26,000-36,000 YS, 2-1 El, 90-105 Brin
For light alloy parts, corrosion resistant.

ANTICORODAL-63
M-624, M-541, 0.2-0.6 Si, 0.45-0.85 Mg, 0.35 max Fe, 0.1 max Ti, bal Al.
Annealed 11,400-17,000 TS; 5700 10,000 YS; 25-40 El; 25-35 Brin
TA1[illegible]20 Temper: 37,000-42,700 TS, 32,700-40,000 YS; 2-6 El, 80 90 Brin
For marine structures and hardware Corrosion resistant.

ANTICORODAL—CASTING.
M-249; 2.25 Si, 0.45 Fe, 0.70 Mn, 0.70 Mg, 0.15 Ti, bal Al.
Chill cast: 20,000-28,000 TS; 16,000-22,000 YS; 1.5-5.0 El
Heat treated: 28,000-40,000 TS; 22,000-30,000 YS; 1.0-5.0 El.
For window frames, chemical industry, architecture; high corrosion resistance

ANTICORODAL G.
M-1176; 2 Si, 0.65 Mg, 0.7 Mn, bal Al.
Heat treated: 36,000-42,000 TS; 29,000-39,000 YS; 3-1 El, 90-105 Brin
For light alloy parts

ANTICORODAL G.
M-1220, M-541; 1.8-2.3 Si, 0.7 Mg, 0.7 Mn, bal Al
Cast: 35,600-42,700 TS; 31,300-39,900 YS; 1-3 El; 90-105 Brin.
For light alloy castings; general purpose.

ANTICORODAL SPECIAL.
M-249; 2 Mg, 1.5 Mn, bal Al.
Soft. 36,000 TS, 21,000 YS, 20 El
For punchings; same as Peraluman.

ANTICORODAL—WROUGHT
M-249; M-624; 0.5-1.5 Si, 0.2-1.0 Mn, 0.5-1 Mg, 0.3 Fe, bal Al
Soft. 17,000 TS, 9000 YS, 30 El; 35 Brin.
Hard 55,000 TS, 45,000 YS, 15 El, 105 Brin
For architecture, window frames, chemical plants; heat treatable

ANTIFRICTION METAL-A
M-561, 8 Cu, 83 Sn, 9 Sb
For special Admiralty bearings for heavy loads; Babbitt

ANTIFRICTION METAL-B
M-561, 1.4 Cu, 69 Sn, 29.6 Sb.
For special Admiralty bearings for under water, Babbitt

ANTIKLOR
Russia, 0.5 0.7 C, 13-16 Si, bal Fe
For cast pumps and conduits; acid resistant, cast

ANTIKORRO
M-1322, 0.9 C, 18 Cr, 1.1 Mo, 1 V, bal Fe
Annealed 107,000 TS, 62,000 YS, 18 El, 35 RA, 220 Brin
Heat treated 280,000 TS, 270,000 YS, 3 El, 15 RA, 555 Brin
For ball bearings, races, liners, sleeves, stainless, wear resistant

ANTIKORRO AK1B
M-1322; 0.1 max C, 17.5, Ti − 7 × C, bal Fe
Annealed 80,000 TS, 50,000 YS, 25 El, 50 RA, 150 Brin
For welded structures in chemical plants and oil refineries, corrosion and heat resistant

ANTIKORRO AK1W
M-1322, 0.12 max C, 13 Cr, 0.4 Si, bal Fe
Annealed 75,000 TS, 40,000 YS, 35 El, 70 RA, 155 Brin
Cold drawn 100,000 TS; 85,000 YS, 17 El, 60 RA; 205 Brin
For turbine blades, chemical plant equipment, cutlery, Type 410, corrosion resistant

ANTIKORRO AK2.
M-1322, 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS, 20 El, 55 RA, 260 Brin
For oil refinery equipment; Type 431, corrosion resistant

ANTIKORRO AK2S.
M-1322; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For turbine blades, cutlery, gauges, instruments; Type 420; corrosion resistant.

ANTIKORRO AK4.
M-1322; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El; 55 RA; 200 Brin.
For cutlery, valves, surgical and dental instruments; Type 420; corrosion resistant.

ANTIKORRO AK5.
M-1322; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El, 55 RA; 200 Brin.
For cutlery, valves, surgical instruments; Type 420; stainless.

ANTIKORRO AKC.
M-1322; 0.15 C, 24 Cr, 19 Ni, bal Fe.
Annealed: 100,000 TS, 45,000 YS; 50 El; 65 RA; 185 Brin.
For furnace parts, valves, pumps, turbine parts; Type 310, stainless, austenitic

ANTIKORRO AKC2
M-1322; 0 15 C, 19.5 Cr, 9.5 Ni, bal Fe
Annealed: 80,000 TS, 35,000 YS, 55 El; 75 RA, 150 Brin
For chemical plant equipment, tanks, vessels, Type 302; stainless, austenitic.

ANTIKORRO AKH
M-1322, 0 85 C, Cr, V, bal Fe
For cutting tools, bearings, dies, liners, water or oil hardened.

ANTIKORRO AKL
M-1322, 0 1 max C, 12 5 Cr, 12 Ni, bal Fe.
For valves, oil refinery equipment; corrosion resistant

ANTIKORRO AKSZ.
M-1322, 0 05 C, 18 Cr, 10 Ni, Cu, bal Fe
Annealed: 85,000 TS, 35,000 YS; 60 El, 70 RA, 150 Brin
For chemical plant equipment; stainless, austenitic.

ANTIKORRO AKV.
M-1322, 0 15 max C, 18 Cr, 8 5 Ni, bal Fe
Annealed 80,000 TS; 35,000 YS, 55 El, 75 RA; 160 Brin
For chemical plant equipment, tanks, mixers; Type 302, stainless, austenitic.

ANTIKORRO AKV EXTRA
M-1322, 0 12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed· 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin
Cold drawn· 150,000 TS; 135,000 YS, 6 El; 300 Brin.
For welded chemical plant equipment; Type 316 Ti; stainless, austenitic.

ANTIKORRO AKVM.
M-1322; 0 15 max C, 18 Cr, 8 5 Ni, bal Fe.
Annealed· 80,000 TS; 35,000 YS; 55 El, 75 RA; 160 Brin.
For chemical plant equipment, tanks; Type 302; stainless, austenitic.

ANTIKORRO AKVS.
M-1322; 0 12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe
Annealed: 90,000 TS; 45,000 YS; 56 El; 65 RA, 160 Brin.
Cold drawn: 100,000 TS; 65,000 YS; 45 El; 60 RA; 205 Brin.
For welded chemical plant equipment, tanks, fermenters; Type 347; stainless, austenitic.

ANTIKORRO AKX10.
M-1322; 0.12 max C, 18 Cr, 1 Al, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery and chemical plant equipment; corrosion resistant.

ANTIKORRO AKX12.
M-1322, 0.12 max C, 1.5 Al, 24 Cr, bal Fe.
Annealed: 90,000 TS; 50,000 YS, 30 El; 55 RA; 180 Brin.
For furnace parts, heat treating boxes, corrosion and heat resistant.

ANTIKORRO AKX SPEZIAL
M-1322; 0 2 C, 25 Cr, 4 Ni, bal Fe
Cast· 90,000 TS; 65,000 YS; 2 El; 212 Brin.
For furnace parts, grids, conveyors, heat treating boxes, corrosion and heat resistant

ANTIMONIAL ADMIRALTY.
M-33; 71 Cu, 1 Sn, 0 04 Sb, 27.96 Zn.
Annealed: 54,000 TS, 23,000 YS, 60 El
For condensers, tubes; Admiralty Brass.

ANTIMONIAL LEAD
M-88, 0-25 Sb, 75-100 Pb
For storage battery plates, fuses, bullets, type metal, pipes

ANTINIT 1KB2
M-27; 0 1 max C, 18 Cr, 8 5 Ni, bal Fe.
Annealed· 80,000 TS, 35,000 YS. 55 El, 75 RA, 150 Brin
For chemical plant equipment, tanks, Type 302; stainless, austenitic

ANTINIT 1KB4
M-27, 0 1 max C, 18 Cr, 9 5 Ni, 2 Mo, bal Fe
Annealed· 85,000 TS, 35,000 YS; 50 El, 65 RA; 160 Brin.
Cold drawn· 150,000 TS; 135,000 YS, 6 El; 300 Brin
For acid resistant chemical plant equipment, tanks, mixers, pumps, Type 316, stainless, austenitic.

ANTINIT AS2
M 27, 0 12 C, 17-19 Cr, 10-13 Ni, bal Fe
Annealed· 90,000 TS, 40,000 YS, 50 El; B 85 Rock
Cold Rolled: 180,000 TS; 150,000 YS; 10 El; C 42 Rock
For handling chemicals, vessels, tanks, valve trim, oil refinery and chemical plant equipment.
Type 302 stainless, austenitic, nonmagnetic

ANTINIT-AS2F
M-27; 0 15 C, 16-18 Cr, 6-8 Ni, bal Fe.
Annealed· 110,000 TS, 40,000 YS, 60 El, B 85 Rock.
Half Hard 150,000 TS; 110,000 YS, 15 El, C 32 Rock
For aircraft structures, railroad cars, trailer bodies, auto wheel covers, wire springs
Type 301 stainless steel, austenitic, nonmagnetic

ANTINIT AS2G.
M-27; 0.15 C, 18 Cr, 8.5 Ni, bal Fe
Annealed 80,000 TS, 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302, stainless, austenitic

ANTINIT AS2(H).
M-27; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS, 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302, stainless, austenitic.

ANTINIT AS2H.
M-27; 0.20 C, 19.5 Cr, 7.5 Ni, bal Fe.
Annealed: 92,500 TS; 49,800 YS; 180 Brin.
For rotating knives, from pulping engines, stainless, austenitic.

ANTINIT AS2K.
M-27; 0.20 C, 1.25 Mn, 18 Cr, 12 Ni, bal Fe.
Annealed: 78,300 TS; 35,600 YS; 160 Brin.
For bone surgery nails and wire; corrosion resistant.

ANTINIT AS 2 W.
M-27; 0.8 max C, 18 Cr, 10 Ni, bal Fe.
Water quenched: 80,000-102,000 TS; 32,000 YS; 55 El; 150 Brin.
For household utensils, trim; weldable, stainless, austenitic.

ANTINIT AS2Z.
M-27; 0.12 max C, 18 Cr, 8.5 Ni, 0.15 S, bal Fe.
Annealed: 78,300 TS; 35,600 YS; 160 Brin.
For bolts, screws, nuts, shafts, stainless, free-cutting.

ANTINIT AS3W.
M-27, 0.06 max C, 18 Cr, 8.5 Ni, 1.6 Mo, bal Fe.
Annealed: 78,300 TS; 31,300 YS; 160 Brin
For fittings for chemical plant equipment, stainless, austenitic.

ANTINIT AS4K.
M-27; 0.2 C, 18 Cr, 12 Ni, 2.1 Mo, bal Fe
Annealed: 78,300 TS, 35,600 YS; 160 Brin.
For parts for bone surgery; stainless, austenitic

ANTINIT AS4M.
M-27; 0.06 C, 17.5 Cr, 12.5 Ni, 2.8 Mo, bal Fe
Annealed: 78,300 TS, 31,300 YS, 160 Brin
For chemical plant equipment; stainless, austenitic

ANTINIT AS4W.
M-27, 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe
Annealed: 85,000 TS, 35,000 YS; 50 El, 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks; Type 316, stainless, austenitic.

ANTINIT AS5W.
M-27; 0.05 max C, 17 Cr, 13.5 Ni, 4.7 Mo, bal Fe
Annealed: 92,500 TS; 32,800 YS, 180 Brin.
For chemical plant equipment; stainless, austenitic

ANTINIT ASA.
M-27, 0.1 C, 12 Cr, 12 Ni, bal Fe.
Water quenched, 78,000-100,000 TS; 31,000 YS; 56 El; 68 RA; 150 Brin
For tableware, cutlery, austenitic, stainless

ANTINIT EAS2
M-27; 0.03 C, 18-20 Cr, 9-12 Ni, bal Fe
Annealed: 85,000 TS, 35,000 YS, 60 El; 150 Brin
Cold Drawn 180,000 TS; 125,000 YS, 10 El, C 35 Rock
For welded equipment, tanks, vessels, architectural molding, processing equipment in food and chemical plants.
Type 304L stainless, austenitic, nonmagnetic.

ANTINIT EAS4
M-27; 0.03 C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 85,000 TS, 35,000 YS, 50 El; 165 Brin.
Cold Rolled: 150,000 TS; 135,000 YS, 6 El, 300 Brin.
For chemical plant equipment, evaporators, agitators, kettles, tanks,
Type 316L stainless, austenitic, nonmagnetic.

ANTINIT EAS4M.
M-27; 0.03 C, 16.5-18.5 Cr, 12.5-15 Ni, 2.5-3 Mo, bal Fe.
Annealed: 80-000-90,000 TS; 30,000-40,000 YS; 40-60 El; 70-80 RA; 135-185 Brin.
For chemical plant equipment, tanks, evaporators, digesters, and vessels.
Type 316L stainless steel, austenitic, nonmagnetic.

ANTINIT KW5.
M-27; 0.10 C, 14 Cr, bal Fe
Annealed: 64,000-80,000 TS; 42,700-50,000 YS; 25 El; 50 RA; 150-160 Brin.
For chemical plant equipment, shafts, fasteners; corrosion resistant; Type 430.

ANTINIT KW8.
M-27; 0.08 C, 12-14 Cr, bal Fe.
Annealed: 70,000 TS, 35,000 YS; 30 El; B 80 Rock.
Oil hardened: 110,000-190,000 TS, 85,000-145,000 YS; 15-23 El, 55-65 RA, 225-390 Brin.
For flat springs, knives, table flatware.
AISI Type 410 stainless, magnetic.

ANTINIT KW-10
M-27, 0.1 C, 14 Cr, 0.4 Ni, bal Fe.
Heat treated 85,400 TS; 64,000 YS; 200 Brin
For turbine blades, valve seats, pumps, shafts, piston rods, connecting rods; rust and abrasion resisting.

ANTINIT KW10Al
M-27, 0.07 max C, 14 Cr, 0.2 Al, bal Fe
Annealed: 64,000 TS, 42,700 YS; 150 Brin.
For turbine blades; corrosion and creep resistant

ANTINIT KW10M.
M-27; 0.10 C, 14 Cr, 1.2 Mo, bal Fe.
Heat treated: 99,600 TS; 71,200 YS; 230 Brin.
For steam turbine blades, used up to 930°F.

ANTINIT KW10 SPEZIAL
M-27; 0.20 C, 13 Cr, 1.15 Mo, bal Fe
Annealed. 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, cutlery, valves, pumps, knives; corrosion resistant, Type 420 Mo

ANTINIT KW10Z
M-27, 0.15 C, 12-14 Cr, 0.6 max Mo, 0.15 max S, bal Fe.
Annealed: 80,000 TS, 45,000 YS, 30 El, 165 Brin
Cold Drawn: 100,000 TS, 85,000 YS; 13 El, 205 Brin.
Heat Treated 160,000 TS, 130,000 YS, 15 El, 300 Brin
For screw machine products, fasteners, pump shafts, gears, valve seats.
Type 416 Stainless, magnetic.

ANTINIT KW15
M-27, 0.15 C, 14 Cr, bal Fe.
Heat treated: 99,600 TS, 71,200 YS; 225 Brin
For steam turbine blades, corrosion resistant

ANTINIT KW15M
M-27, 0.15 C, 13.5 Cr, 1.1 Mo, bal Fe
Heat treated: 106,700 TS; 78,300 YS; 245 Brin.
For steam turbine blades, used up to 1020°F

ANTINIT KW15Z.
M-27, 0.13 C, 13.5 Cr, 0.2 S, bal Fe.
Heat treated: 99,600 TS, 71,200 YS; 230 Brin.
For bolts, screws, nuts, shafts; stainless, free-cutting.

ANTINIT KW20.
M-27; 0.2 C, 13 Cr, 0.4 Si, bal Fe.
Annealed: 95,000 TS, 50,000 YS; 25 El; 55 RA; 195 Brin.
Heat treated: 107,000 TS; 78,000 YS; 245 Brin.
For turbine blades, surgical and dental instruments; corrosion resistant; Type 420.

ANTINIT KW20M.
M-27; 0.20 C, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.

Heat treated: 106,700 TS; 78,300 YS; 245 Brin.
For pumps, valves, turbine blades; corrosion resistant, used up to 1100°F.

ANTINIT KW30.
M-27; 0.30 C, 13.5 Cr, bal Fe.
Heat treated: 106,700 TS; 78,300 YS; 245 Brin.
For knife blades, scissors; corrosion resistant.

ANTINIT KW35M.
M-27; 0.35 C, 16.5 Cr, 1.15 Mo, bal Fe.
Heat treated: 113,800 TS; 85,400 YS; 260 Brin.
For heat treating boxes, furnace parts, corrosion resistant.

ANTINIT KW 40.
M-27; 0.4 C, 14 Cr, bal Fe.
For cutlery, surgical instruments; corrosion resistant, hardenable.

ANTINIT KW40M.
M-27, 0.40 C, 14.5 Cr, 0.6 Mo, bal Fe.
For surgical instruments, valves, corrosion resistant

ANTINIT KW50.
M-27; 0.50 C, 14.5 Cr, bal Fe
For surgical instruments, cutlery; corrosion resistant.

ANTINIT KW50M.
M-27, 0.54 C, 14.5 Cr, 0.55 Mo, bal Fe
For surgical instruments, cutlery, corrosion resistant.

ANTINIT KW 80
M-27, 0.8 C, 16 Cr, 1 Mo, 0.1 V, bal Fe.
For cutlery, ball bearings, surgical instruments, hardenable, stainless.

ANTINIT KW100.
M-27, 1.06 C, 18 Cr, 1.15 Mo, 1 V, 1.5 Co, bal Fe
Annealed: 110,000 TS, 65,000 YS, 18 El; 35 RA; 220 Brin
For bearings, valves, cutlery, surgical instruments, corrosion and wear resistant

ANTINIT KWA
M-27, 0.08 max C, 18 Cr, bal Fe
Annealed 75,000 TS, 43,000 YS, 30 El, 70 RA, 223 Brin
For tableware, auto trim, stainless, ferritic

ANTINIT KWB
M-27, 0.2 C, 18 Cr, 2 Ni, bal Fe.
Heat treated 142,000-170,000 TS; 92,000 YS, 17 El, 40 RA, 260-320 Brin.
For marine hardware, resists sea water corrosion

ANTINIT KWG.
M-27; 0.25 C, 14 Cr, 0.5 Ni, bal Fe
Annealed: 100,000-120,000 TS, 64,000 YS, 20 El; 190 Brin
For armature and turbine parts, resists oxidation and erosion

ANTINIT KWMZ
M-27, 0.18 C, 17.5 Cr, 1.8 Mo, 0.2 S, bal Fe
Annealed: 85,400 TS, 56,900 YS, 190 Brin
For bolts, nuts, screws, shafts, stainless, free-cutting.

ANTINIT KWZ.
M-27, 0.15 C, 17 Cr, 0.2 S, bal Fe
Annealed: 100,000-122,000 TS, 62,000 YS, 22 El, 60 RA; 235 Brin.
For screw machine products, free-cutting, stainless.

ANTINIT KWZA
M-27; 0.15 C, 16.5 Cr, 0.2 S, bal Fe.
Annealed 99,600 TS; 64,000 YS, 200 Brin.
For screw machine products, bolts, screws; corrosion resistant, free-cutting.

ANTINIT NG.
M-27; 0.15 C, 8.5 Ni, bal Fe.
Heat treated: 121,000 TS; 99,600 YS; 20 El; 55 RA; 280 Brin.
For rifle barrels; resists rusting.

ANTINIT RAM.
M-27; 0.10 max C, 27 Cr, 4.8 Ni, 1.5 Mo, bal Fe.
Annealed: 99,600 TS; 64,000 YS, 230 Brin.
For acetic acid plant equipment; resists acetic acid.

ANTINIT RS30.
M-27; 1.2 C, 29 Cr, bal Fe.
For crushers, ball mills, grates, baffles; heat and wear resistant.

ANTINIT RS 30 M.
M-27; 1 C, 30 Cr, 2 Mo, bal Fe.
Annealed: 64,000-85,000 TS.
For corrosion resistant castings; for bleaching equipment

ANTINIT SAS 2.
M-27, 0.1 max C, 18 Cr, 9 Ni, 1 Ta, Nb.
Water quenched: 85,000-106,000 TS; 35,000 YS; 50 El, 70 RA, 192 Brin
For stainless parts, sugar and food processing equipment; corrosion resistant, stabilized

ANTINIT SAS2 EXTRA
M-27, 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe.
Annealed 90,000 TS, 45,000 YS; 56 El; 65 RA; 160 Brin.
For welded structures, chemical plant equipment, tanks, Type 347; stainless, austenitic.

ANTINIT SAS4.
M-27, 0.1 max C, 18 Cr, 12 Ni, 1 TaNb, 2.2 Mo, bal Fe
Water quenched 85,000-106,000 TS, 40,000 YS, 46 El, 68 RA
For the paper and textile industry, stainless, austenitic

ANTINIT SAS4 EXTRA
M-27, 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Cb = 8 × C, bal Fe
Annealed 95,000 TS, 50,000 YS; 52 El, 60 RA; 180 Brin
For welded acid resistant chemical plant equipment; Type 316Cb, stainless, austenitic

ANTINIT SAS4M
M-27, 0.10 C, 16.5-18.5 Cr, 12-14 Ni, 2.5-3.0 Mo, Cb = 8 × C, bal Fe.
Annealed 85,000 TS; 40,000 YS, 50 El, B 82 Rock.
For welded structures, tanks, mixers, digesters, evaporators.
Welding grade, stabilized
Type 318 stainless, austenitic

ANTINIT SAS5.
M-27, 0.08 C, 17 Cr, 10 Ni, 2 Mo, bal Fe.
Annealed: 80,000 TS, 30,000 YS, 60 El; B 78 Rock.
For chemical plant equipment, acid containers, vessels, valve trim, digesters
Stainless steel Type 18-10 Mo, acid resistant

ANTINIT SAS5G
M-27, 0.07 max C, 17 Cr, 13 Ni, 4.7 Mo, bal Fe.
Annealed 95,000 TS, 50,000 YS, 50 El; 55 RA; 190 Brin.
For acid resistant chemical plant equipment, mixers; Type 317; stainless, austenitic.

ANTINIT SAS8
M-27, 0.1 max C, 17 Cr, 18 Ni, 2 Mo, 1 TaNb, 2 Cu, bal Fe.
Water quenched 85,-000-106,000 TS, 37,000 YS; 46 El; 68 RA.
For parts to resist reducing acids; austenitic, stainless.

ANTINIT SAS10.
M-27, 0.07 C, 17.5 Cr, 22 Ni, 3.5 Mo, 0.7 Cb, 1.8 Cu, bal Fe
Annealed: 78,300 TS, 39,900 YS; 160 Brin
For chemical plant equipment; corrosion resistant.

ANTINIT SAST2.
M-27; 0.08 max C, 18 Cr, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded structures, chemical plant equipment, tanks; Type 321; austenitic, stainless.

ANTINIT SAST4
M-27; 0.08 max C, 18 Cr, 10.5 Ni, 2 Mo, Ti = 4 × C, bal Fe.
Annealed. 78,000-95,000 TS; 38,000-50,000 YS; 52 El; 60 RA; 160-180 Brin.
For welded chemical plant equipment, tanks, filters, Type 316 Ti; stainless, austenitic.

ANTINIT SAST4M
M-27; 0.10 C, 16.5-18.5 Cr, 12-14.5 Ni, 2.5-3.0 Mo, Ti = 5 × C, bal Fe
Annealed: 80,000-90,000 TS, 30,000-40,000 YS, 40-60 El; 135-185 Brin.
For welded structures and equipment, tanks, digesters, evaporators
Type 316 Ti stainless, welding grade, austenitic, nonmagnetic

ANTINIT--SIL18
M-27, 0.15 C, 7.5-10.0 Mn, 17-19 Cr, 4-6 Ni, bal Fe
Annealed 100,000 TS, 50,000 YS, 60 El; B 90 Rock
For sinks, cooking utensils, dairy and hospital equipment, chemical handling equipment, springs, tubular furniture.
Type 202 stainless steel, austenitic, nonmagnetic

ANTINIT SKWA
M-27; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe
Annealed 71,000-80,000 TS; 42,700-50,000 YS, 25 El, 50 RA, 160-180 Brin.
For furnace parts, welded heat treating boxes; corrosion resistant.

ANTINIT SKWL
M-27; 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe.
Annealed: 71,200-80,000 TS, 42,700-50,000 YS; 25 El, 50 RA; 160-180 Brin
For chemical plant equipment, heat treating boxes, corrosion resistant

ANTINIT SKWN
M-27, 0.06 C, 17 Cr, 8 Ni, Cb, bal Fe.
Annealed 85,000 TS, 35,000 YP, 50 El, B 82 Rock
For welded structures, tanks, vessels, chemical plant equipment
Type 17-8 Cb stainless steel, stabilized, welding grade.

ANTIOX-1.
M-1117; 0.15 min C, 12-14 Cr, bal Fe
Annealed 95,000 TS; 45,000 YS; 25 El; 196 Brin
Oil Hardened: 250,000 TS, 215,000 YS; 8 El; 512 Brin
For cutlery, surgical instruments, gears, shafts, gauges, needle valves.
Type 420 stainless steel, hardenable

ANTIOX-2.
M-1117; 0.15 min C, 12-14 Cr; bal Fe
Annealed 95,000 TS, 45,000 YS, 25 El, 196 Brin
Heat Treated. 250,000 TS; 215,000 YS, 8 El, 512 Brin.
For cutlery, surgical instruments, gears, needle valves, gauges, shafts.
Type 420 stainless steel, heat treatable.

ANTIOX-3.
M-1117; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Annealed: 75,000 TS, 40,000 YS; 30 El; B 82 Rock.
Cold Drawn: 95,000 TS; 80,000 YS; 15 El; B 92 Rock.
For flat springs, knives, tableware.
Type 410 stainless steel, hardenable.

ANTITHERM F
M-27; 0.08 max C, 18.5 Cr, 10.5 Ni, 0.5 Ti, bal Fe
Annealed. 85,400 TS, 38,400 YS; 165 Brin
For heat and corrosion resistant parts; used up to 1470°F.

ANTITHERM FA
M-27; 0.20 C, 1.1 Si, 25 Cr, 4.5 Ni, N, bal Fe.
Annealed: 92,500 TS; 57,000 YS; 200 Brin.
For heat resistant parts, furnace equipment; used up to 2010°F.

ANTITHERM FB7
M-27, 0.12 C, 2 Si, 3 Cr, bal Fe.
Annealed 71,200 TS, 50,000 YS, 165 Brin.
For heat resistant parts, used up to 1300°F.

ANTITHERM FB8
M-27, 0.08 max C, 0.5 Al, 6.5 Cr, bal Fe
Annealed: 70,000 TS, 50,000 YS, 28 El, 65 RA; 160 Brin.
For oil refinery equipment, heat and creep resistant, used up to 1470°F

ANTITHERM FB8G
M-27; 0.3 C, 6 Cr, 2.2 Si, bal Fe.
Annealed 80,000 TS; 40,000 YS, 20 El, 55 RA, 200 Brin
For oil refinery equipment, heat and creep resistant.

ANTITHERM FB9
M-27, 0.12 C, 1.2 Si, 1.0 Al, 13 Cr, bal Fe
Annealed 71,200 TS, 50,000 YS, 35 El, 70 RA, 190 Brin
For oil refinery equipment, heat and creep resistant, used up to 1740°F

ANTITHERM FB10
M-27, 0.1 C, 1 Si, 18 Cr, 1 Al, bal Fe
Annealed 100,000 TS, 50,000 YS, 200 Brin
For parts to resist SO_2 and H_2S atmosphere, heat resistant

ANTITHERM FB10G
M-27; 0.5 C, 1.5 Si, 17 Cr, bal Fe
For furnace parts, heat treating boxes, corrosion and heat resistant

ANTITHERM FB12
M-27, 0.12 max C, 1.5 Al, 24 Cr, bal Fe
Annealed 85,000 TS, 50,000 YS, 30 El, 55 RA, 180 Brin
For furnace parts, grates, baffles, heat resistant

ANTITHERM FB30G
M-27, 1 C, 28 Cr, bal Fe
For heat resistant castings, heat resistant to 2200°F

ANTITHERM FB 30 S
M-27, 0.20 C, 25 Cr, 3 Ni, 1 Si, bal Fe.
Water quenched 92,000-113,000 TS, 56,000 YS
For SO_2 and H_2S resistance to 2200°F, heat resistant.

ANTITHERM FB30SG
M-27; 0.4 C, 27 Cr, 4 Ni, bal Fe
Cast. 90,000 TS, 65,000 YS, 2 El, 212 Brin
For cylinders, liners, valve seats and bodies, furnace parts; heat and corrosion resistant

ANTITHERM FB95
M-27, 0.12 max C, 2.2 Si, 13 Cr, bal Fe
Annealed: 78,300 TS, 49,800 YS, 200 Brin
For heat resistant parts, used up to 1740°F.

ANTITHERM FB105
M-27, 0.12 C, 2 Si, 18 Cr, bal Fe
Annealed 80,000 TS; 50,000 YS; 25 El, 50 RA, 150 Brin.

For kitchen sinks, valves, pumps, furnace parts;
Type 430; corrosion resistant

ANTITHERM FBS90.
M-27, 0.12 max C, 2.3 Si, 6 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

ANTITHERM FBS95.
M-27, 0.12 max C, 2.2 Si, 13 Cr, bal Fe
Annealed: 75,000 TS, 40,000 YS; 35 El; 70 RA, 155 Brin.
For oil refinery and chemical plant equipment; corrosion and heat resistant

ANTITHERM-FBS105.
M-27, 0.06 C, 17 Cr, 10 Ni, bal Fe.
Annealed: 80,000 TS; 30,000 YP; 60 El; B 78 Rock
Cold Rolled 150,000 TS, 135,000 YP, 6 El, C 32 Rock
For chemical and textile plant equipment, digesters, tanks, filters, vessels
Type 17-10 stainless steel, austenitic

ANTITHERM FF
M-27, 0.15 C, 20 Cr, 12 Ni, bal Fe
Water quenched: 85,000-113,000 TS, 35,000 YS; 165 Brin
For heat resistant parts, heat resistant to 1920°F

ANTITHERM FFB
M-27, 0.2 C, 24 Cr, 20 Ni, 2 Si, 0.1 Ti, bal Fe
Water quenched 85,000-113,000 TS, 38,000 YS, 165 Brin
For heat resistant parts, heat resistant to 2200°F

ANTITHERM FFB 400
M-27, 0.12 max C, 2 Si, 21 Cr, 34 Ni, bal Fe
Annealed 92,500 TS, 38,500 YS, 165 Brin
For heat resistant parts, used up to 2200°F.

ANTITHERM FFBG
M-27; 0.4 C 2 Si, 26 Cr, 14 Ni, bal Fe
Cast 75,000 TS, 47,000 YS, 17 El, 25 RA, 200 Brin
For furnace parts, heat treating boxes, pump bodies, corrosion and heat resistant

ANTITHERM FFG
M-27, 0.4 C, 2 Si, 22 Cr, 9.5 Ni, bal Fe
Cast 85,000 TS, 45,000 YS, 35 El, 165 Brin.
For heat treating boxes, baskets, chains, burner tips, furnaces, Type HF, corrosion and heat resistant

ANTOXYD
M-96, 0.20 C, 21 Cr, 38.5 Ni, bal Fe
For heat and corrosion resistant parts, corrosion and heat resistant

ANVIL BRASS
U.S., 62.5 Cu, 37.5 Zn
For hardware, tubes, yellow brass

ANVIL HEADING DIE
M-387, 0.6 C, 0.8 Cr, 0.2 Mo, bal Fe
For tools, heading dies, oil hardened

ANVILOY 1100
M-265, 90 W, 4 Ni, 2 Fe, 4 Mo
Sintered, R.T. 125,000 TS, 95,000 YS, 5 El
1500°F 63,300 TS, 7 El
2000°F 25,000 TS; 3.6 El
Density 17.25; R.T. hardness: 30 Rc
For die casting dies; machinable

ANVILOY 1150
M-265, 90 W, 4 Ni, 2 Fe, 4 Mo
Sintered, R.T. 140,000 TS, 125,000 YS, 3 El
1500°F: 75,500 TS; 6.4 El.
2000°F 28,500 TS, 3.5 El.
Density: 17.25, R.T. hardness. 34 Rc
For die casting dies; machinable.

ANVILOY 1200.
M-265; 90 W, 4 Ni, 2 Fe, 4 Mo.
Sintered, R.T.: 150,000 TS; 140,000 YS; 2 El.
1500°F: 96,600 TS; 3 El.
2000°F. 34,600 TS; 3.5 El.
Density: 17.25, R.T. Hardness 36 Rc.
For die casting dies; machinable

A020 CHISEL and PUNCH.
M-365; 0.50 C, 1.5 Cr, 2.25 W, 0.25 V, bal Fe.
For tools, chisels, punches; hot work steel.

"AO" QUALITY.
M-179, Cu, bal Zn
Extruded. 55,000 TS, 35 El, 40 RA, 100 Brin
Drawn 65,000 TS, 30 El, 30 RA, 110 Brin.
For cold worked products.

A P 33
M-620, 4.5 Cu, 0.5 Mg, 0.4 Ti, bal Al
36,000-43,000 TS, 29,000-36,000 YS; 2-1 El
For light alloy parts, age-hardenable

AP33
French, 4 Cu, 0.25 Ti, bal Al
Heat treated 45,000-52,000 TS, 6-10 El
For light metal parts, gear cases, housings, heat treatable.

AP33M
French, 4-6 Cu, 0.5 Mg, 0.4 Ti, bal Al.
Heat treated 47,000 TS
For light metal parts, gear cases, heat treatable

APACHE
M-1, 0.70 C, 2.0 Mn, 0.3 Si, 1.0 Cr, 1.35 Mo, bal Fe
Heat treated 293,000 TS, 265,000 YS, 1 El; C 55 Rock
For dies and punches, blanking and forming dies, gages, shear blades, bending tools, stripper plates, master hubs, air hardening
Type A6 tool steel, wear resistant

APEX
M-688, 0.9 C, bal Fe
For tools, drills, punches, drill rod, water hardened.

APEX AS-1
M-130, 95 min Al
For deoxidizing steel

APEX ALLOY NO 2
M-130, 3.9-4.3 Al, 2.5-2.9 Cu, 0.02-0.05 Mg, 0.075 max Fe, 0.004 max Pb, 0.003 max Cd, bal Zn
Die cast 52,000 TS, 93,000 Com S, 7 El, 100 Brin, 46,000 SS
General purpose die casting, motor frames, household hardware, novelties

APEX AS-2
M-130, 92 min Al
For deoxidizing steel

APEX ALLOY NO 3.
M-130, 3.9-4.3 Al, 0.10 Cu, 0.025-0.05 Mg, 0.075 max Fe, 0.004 max Pb, 0.003 max Sn, bal Zn
Die cast. 41,000 TS; 60,000 Com S, 10 El; 76 Brin; 31,000 SS
For housings, cases, general die castings, motor frames, household hardware
ASTM B240-64, AG40A.

APEX AS-3
M-130, 90 min Al
For deoxidizing steel

APEX AS-4
M-130, 85 min Al.
For deoxidizing steel.

APEX ALLOY NO. 5.
M-130; 3.9-4.3 Al, 0.75-1.25 Cu, 0.03-0.06 Mg, 0.075 max Fe, 0.004 max Pb, 0.003 max Cd, bal Zn.
Die cast: 47,000 TS; 87,000 Com S; 7 El; 88 Brin; 38,000 SS
For housings, cases, general die castings, motor frames, radio parts, hardware.
ASTM· B240-64, AC41

APEX NO 6
M-130; 4.1 Al, 1 Cu, bal Zn.
DC-F temper: 43,500 TS; 7.3 El; 90 Brin
For die castings.

APEX ALLOY NO. 7.
M-130; 3.9-4.3 Al, 0.10 max Cu, 0.10-0.20 Mg, 0.075 max Fe, 0.004 max Pb, 0.003 max Cd, 0.005-0.020 Ni, bal Zn
Die cast 41,000 TS; 87,000 Com S, 14 El, 76 Brin, 31,000 SS.
General die casting, automotive.
SAE 903.

APEX NO. 7 ZINC BASE ALLOY
M-130; 4.1 Al, 2.7 Cu, bal Zn
Cast: 47,000 TS, 8 El; 83 Brin.
For die castings, housings, Iz-15

APEX 12.
M-130, 6.5 Cu, 3 Si, 2 Zn, bal Al
Sand cast 17,000-23,000 TS, 14,000-15,000 YS, 3-1 El, 65-70 Brin
For general castings, sand and permanent mold castings, non-hardenable.

APEX 12
M-564, 85 Cu, 5 Sn, 5 Zn, 5 Pb
24,000 TS; 12,000 YS, 16 El, 48 Brin
For pump bodies, valves, pressure or steam parts; "Ounce Metal"

APEX 12 PM.
M-130, 6.5 Cu, 3 Si, 2 Zn, bal Al
Sand cast 23,000 TS; 15,000 YS, 1.5 El, 70 Brin
Permanent mold· 29,000 TS, 22,000 YS, 1.0 El, 70 Brin
For sand and permanent mold castings, good machinability

APEX 13.
M-130; 11-13 Si, bal Al
Die cast· 45,000 TS, 25,000 YS, 4 El, 70 Brin
For die castings, housings, corrosion resistant

APEX 14.
M-564; 85 Cu, 15 Zn
For flanges which are brazed onto copper pipe, "Brazing Brass"

APEX 16.
M-564; 56 Cu, 41 Zn, 1 Fe, 1 Al, 0.5 Mn, 0.5 Sn
65,000 TS, 32,000 YS, 25 El, 110 Brin
For valve stems, gears, ship propellers, "Manganese Bronze"; tough

APEX 22
M-564, 86 Cu, 8 Sn, 2 Zn, 4 Pb.
28,000 TS, 15,000 YS, 17 El
For bearings for industrial equipment, heavy duty.

APEX 24 (COMPOSITION G).
M-564; 88 Cu, 10 Sn, 2 Zn.
40,000 TS; 22,000 YS; 24 El
For superheated steam or hydraulic castings, gears, heavy pressure bearings; pressure tight.

APEX 28
M-130; 1.7-2.3 Cu, 10.0 Si, bal Al.
For light alloy castings; high fluidity.

APEX Z28.
M-130; 1.7-2.3 Cu, 9.5-10.5 Si, 0.10 Mg, 2.0-3.0 Zn, 0.50 Mn, 0.50 Ni, bal Al.
Aluminum die casting.
As cast: 44,000 TS; 23,000 YS; 4.0 El; 75 Brin; 26,000 SS.
For housings, motor frames, radio parts, hardware.

APEX 32.
M-130; 1 Cu, 12 Si, 1.1 Mg, bal Al.
PM-F temper: 27,000 TS; 19,000 YS; 1.0 El; 88 Brin.
PM-T 65 temper 47,000 TS, 43,000 YS, 0.5 El, 125 Brin
PM-T 551 temper: 36,000 TS, 28,000 YS, 0.5 El; 105 Brin.
For pistons, high temperature uses; permanent mold, heat treatable.

APEX Z-33
M-130; 4 Si, 3 Cu, 3 Zn, bal Al
F-temper 24,000 TS, 13,000 YS; 3.5 El; 55 Brin.
T6-temper 30,000 TS, 16,000 YS, 3.0 El; 65 Brin
For sand and permanent mold castings; good castability

APEX 34
M-130, 3 Cu, 9 Si, 1 Mg, 1 Ni, bal Al
PM-F temper 35,000 TS, 26,000 YS; 1 El, 85 Brin.
PM-T 5 temper 36,000 TS, 28,000 YS, 1 El; 100 Brin
For pistons, permanent mold

APEX 35
M-130, 10 Cu, 0.3 Mg, bal Al
SC-F temper 26,000 TS, 21,000 YS, 0.5 El, 85 Brin
SC-T 6 temper. 40,000 TS, 30,000 YS, 0.5 El; 115 Brin.
PM-T 65 temper 48,000 TS, 36,000 YS, 0.5 El, 140 Brin
For sand and permanent mold castings, wear resistant.

APEX 36
M-130, 0.6 max Cu, 9-10 Si, 0.4-0.6 Mg, bal Al
Cast· 46,000 TS, 27,000 YS, 3.5 El, 75 Brin
For light alloy castings, high fluidity

APEX 37
M-130, 4.5 Cu, 4.5 Si, bal Al
SC-F temper 25,000 TS, 15,000 YS, 2 El, 65 Brin
PM-F temper 27,000 TS, 13,000 YS, 2.5 El, 70 Brin
For castings, sand and permanent mold

APEX 38
M-130, 10 Cu, 4 Si, 0.25 Mg, bal Al
PM-F temper 32,000 TS, 24,000 YS, 1.5 El, 100 Brin
For sole plates, permanent mold castings, retains hardness at elevated temperatures

APEX 39
M-130, 3.5 Cu, 9 Si, bal Al
DC-F temper 47,000 TS, 27,000 YS, 3.5 El, 80 Brin.
For die castings, good machinability

APEX 39-11
M-130, 3-4 Cu, 10.5-11.5 Si, 1 max Zn, 1 max Fe, 0.5 max Ni, bal Al
Die cast 44,000-46,000 TS; 23,000-27,000 YS; 2 El, 85 Brin
For general die castings; S.S. 28,000; Charpy 2.2.

APEX Z-39
M-130, 3-4 Cu, 8.5-9.5 Si, 2-3 Zn, 1 max Fe, bal Al
Die cast: 46,000 TS, 25,000 YS; 3 El; 80 Brin.
For general die castings, S.S. 29,000.

APEX Z-39-11
M-130, 3-4 Cu, 10.5-11.5 Si, 2-3 Zn, 1 max Fe, bal Al.
Die cast 46,000 TS; 27,000 YS, 2 El; 85 Brin.
For general die castings; S.S. 28,000.

APEX 39A.
M-130; 3-4 Cu, 8.5-9.5 Si, bal Al.
Cast: 44,000 TS, 26,000 YS; 3 El; 80 Brin.
For light alloy castings; high fluidity.

APEX 39-B.
M-130; 3.5-4.5 Cu, 8.9-9.5 Si, 1.5-2.5 Zn, 1.2 max Fe, 0.1 max Mg, bal Al.
Die cast: 43,000 TS; 22,000 YS; 3 El; 80 Brin.
For general die castings; corrosion resistant.

APEX 39 P.
M-130; 4 Cu, 8 Si, bal Al.
SC-F temper: 26,000 TS, 15,000 YS; 2 El; 65 Brin
PM-F temper: 32,000 TS; 20,000 YS; 2.5 El, 75 Brin.
PM-T 6 temper: 40,000 TS, 27,000 YS; 3.5 El, 95 Brin.
For sand and permanent mold castings; for thin sections

APEX 41.
M-130; 1.5 Cu, 5 Si, 0.5 Mg, bal Al.
SC-F temper: 25,000 TS; 12,000 YS, 2.5 El; 65 Brin
SC-T 6 temper: 35,000 TS, 25,000 YS; 2.5 El; 80 Brin
PM-T 6 temper: 43,000 TS, 27,000 YS; 4 El; 90 Brin.
For sand and permanent mold castings; heat treatable

APEX 41-10.
M-130, 1.0 1.5 Cu, 4.5-5.5 Si, 0.45-0.6 Mg, 0.1 Zn, 0.1 Mn, bal Al
Sand cast: 27,000 TS, 18,000 YS; 2.5 El; 65 Brin.
T6 temper 42,000 TS, 30,000 YS; 4.0 El; 90 Brin
Good pressure tightness, good resistance to hot cracking.
SAE 335, AMS 4215; ASTM B26-68 SC51B, ASTM B108-68 SC51B

APEX 41A
M-130, 1-1.5 Cu, 4.5-5.5 Si, 0.4-0.6 Mg, 0.25 max Cr, bal Al
T4-Temper: 25,000 TS, 14,000 YS, 3.5 El; 75 Brin
T6-Temper 35,000 TS, 25,000 YS, 2.5 El, 80 Brin
For light alloy castings, age-hardenable.

APEX 43
M-130, 5 Si, bal Al.
SC F temper: 21,000 TS, 10,000 YS, 5 El, 45 Brin.
PM-F temper: 25,000 TS, 9000 YS, 5 El; 45 Brin.
DC-F temper 30,000 TS; 14,000 YS, 7 El, 60 Brin
For castings; pressure tight, corrosion resistant.

APEX 43A
M-130, 0.10 max Cu, 4.5-6 Si, 0.3 max Zn, bal Al
Sand cast: 19,000 TS, 9000 YS, 7 El, 40 Brin
Permanent mold. 24,000 TS, 9000 YS, 9 El, 45 Brin.
For castings, corrosion resistant.

APEX 43C
M-130; 0.3 max Cu, 4.5-6 Si, 0.3 max Zn, bal Al
Sand cast. 19,000 TS; 9000 YS, 7 El; 40 Brin
Permanent mold: 24,000 TS; 9000 YS, 5 El, 65 Brin.
For castings, high fluidity.

APEX 44.
M-564, 70 Cu, 4 Sn, 26 Pb
For self-lubricating bearing bronze, heavy duty

APEX 45 ALLOY TERNALLOY.
M-130; 0.3 Cr, 1.5-2.5 Mg, 3.5-4.5 Zn, bal Al.
For light alloy parts

APEX 46-10.
M-130; 0.1 Cu, 6.5-7.5 Si, 0.28-0.4 Mg, 0.1 Zn, 0.1 Mn, bal Al.
Sand cast: 24,000 TS; 14,000 YS; 4 El, 55 Brin.
T6 temper: 40,000 TS; 30,000 YS; 5 El; 85 Brin
Good pressure tightness, good resistance to hot cracking.
SAE 336; ASTM B26-68 SG70B, ASTM B108-68 SG70B.

APEX 46 A.
M-130; 7 Si, 0.3 Mg, bal Al.
SC-F temper: 23,000 TS, 12,000 YS, 3.5 El; 55 Brin.
SC-T 6 temper: 33,000 TS; 24,000 YS; 4 El; 70 Brin
PM-T 6 temper 40,000 TS, 27,000 YS; 5 El, 90 Brin
For sand and permanent mold castings; pressure tight

APEX 50
M-130; 3.7-4.7 Cu, 2.5-3.5 Si, bal Al
SC-F-temper: 24,000 TS; 14,000 YS; 2.5 El, 60 Brin.
SC-T6-temper: 36,000 TS; 26,000 YS, 1.5 El, 85 Brin
PM-T6-temper 40,000 TS; 26,000 YS, 4 El; 85 Brin
For light castings; sand and permanent mold

APEX 50-50 COPPER ALLOY.
M-130, 50 Al, 50 Cu
For rich hardener; for alloying.

APEX Z 50
M-130, 3.5-4.5 Cu, 2.5-3.5 Si, 2.5 Zn, bal Al.
F-temper: 24,000 TS, 14,000 YS; 2.5 El, 60 Brin
T4 temper 30,000 TS; 18,000 YS, 4 El, 65 Brin.
T6-temper 36,000 TS, 26,000 YS; 1.5 El, 85 Brin
For sand and permanent mold castings, heat treatable

APEX 51.
M-130; 4.0 Cu, 6.0 Si, bal Al
SC-F temper 23,000 TS, 13,000 YS, 2 El; 55 Brin
PM-F temper 28,000 TS, 16,000 YS; 2 El; 70 Brin
PM-T 6 temper 45 000 TS, 28,000 YS; 4 El, 105 Brin.
For castings, sand and permanent mold

APEX Z-51.
M-130, 4-5 Cu, 5-6 Si, 1.5-2.5 Zn, 1 max Fe, 0.6 max Mn, bal Al
Cast 23,000 TS, 13,000 YS, 2 El, 55 Brin
Aged 24,000 TS, 16,000 YS, 1 El, 75 Brin
For gear cases, housings, machine tool castings, age hardenable

APEX 52
M-130, 4.4 Cu, bal Al
SC-F temper 22,000 TS, 10,000 YS, 3 El, 50 Brin
SC T 6 temper 36,000 TS; 24,000 YS, 5 El; 75 Brin.
SC-T 6Z temper 40,000 TS, 30,000 YS, 2 El, 95 Brin
For sand castings, age hardenable

APEX 52A
M-130, 4-4.8 Cu, 1.5 max Si, 0.2 max Ti, bal Al
T4-Temper 32,000 TS, 16,000 YS, 8.5 El, 60 Brin
T6-Temper: 36,000 TS, 24,000 YS, 5 El, 75 Brin
For castings, age-hardenable

APEX 53.
M-130, 4.5 Cu, 2.5 Si, bal Al.
PM-F temper 30,000 TS, 14,000 YS; 3.5 El, 70 Brin.
PM-T 6 temper. 40,000 TS, 26,000 YS, 5 El; 90 Brin.
For permanent mold castings, age-hardenable.

APEX 56.
M-130; 4 Cu, 5 Si, bal Al.
DC-F temper: 38,000 TS; 22,000 YS; 3 El; 70 Brin.
For die castings; good machinability.

APEX 56A.
M-130; 3-4 Cu, 4.5-5.5 Si, bal Al.
For castings; age-hardenable.

APEX 59.
M-130; 4 Cu, 2 Ni, 1.5 Mg, bal Al.
F-temper: 28,000 TS, 24,000 YS, 1 El; 80 Brin.
T6-temper: 54,000 TS, 51,000 YS, 0.8 El, 120 Brin.
For high temperature castings; heat treatable

APEX 59A.
M-130; 3.5-4.5 Cu, 0.6 max Si, 1.3-1.8 Mg, 1.7-2.3 Ni, 0.2 max Ti, bal Al
T4-Temper: 37,000 TS, 30,000 YS; 1 El; 95 Brin.
T6-Temper: 38,000 TS, 100 Brin
For castings, age-hardenable.

APEX 60
M-130; 3.0-4.0 Cu, 5.5-6.5 Si, 0.15 Mg, 1.0 Zn, 0.5 Mn, 0.3 Ni, bal Al
Sand cast, T6: 32,000-38,000 TS, 20,000-28,000 YS, 2.5-3.0 El; 90 Brin
Per mold cast, T61. 40,000-50,000 TS, 24,000-42,000 YS, 2 El; 100 Brin.
ASTM B 108-68 SC64D; ASTM B 26-68 SC64D.

APEX 60-40 COPPER ALLOY
M-130, 60 Al, 40 Cu.
For rich hardeners for Zn base die cast alloys

APEX 62
M-130, 11 Zn, 2.7 Cu, 0.3 Mg, bal Al
Sand cast 29,000 TS, 17,000 YS, 2.5 El, 70 Brin
Permanent mold. 35,000 TS, 30,000 YS, 1.0 El; 105 Brin
For castings, light alloy parts

APEX 66.
M-130; 5.5-5.7 Cu, 5.0-6.0 Si, 0.25-0.6 Mg, 0.8 Zn, 0.8 Mn, bal Al.
Per mold cast; T5 32,000-35,000 TS; 25,000-30,000 YS; 95 Brin.
Good fluidity, resistance to hot cracking
SAE 300, ASTM B108-68 CS66A.

APEX 66
M-564, 86 Cu 10 Al, 4 Fe
85,000 TS, 44,000 YS, 18 El.
For gears, bearings, non-sparking tools, strong, tough

APEX 70
M-130; 3.0-4.0 Cu, 5.5-6.5 Si, 0.1 Mg, 1.0 Zn, 0.5 Mn, 0.35 Ni, bal Al
Sand cast, T6 36,000 TS; 24,000 YS, 2.0 El, 80 Brin, 22,000 SS
Per mold cast, T6. 40,000 TS, 27,000 YS; 3.0 El; 99 Brin.
Good, strong, general purpose aluminum casting.
SAE 326, 329, ASTM B108-68 SC64D
ASTM B26-68 SC64D.

APEX 75.
M-130, 7 Cu, 5.5 Si, 0.5 Mg, bal Al
PM-T 6 temper: 35,000 TS; 27,000 YS; 90 Brin.
PM-T 51 temper 40,000 TS; 31,000 YS, 1.0 El; 100 Brin.
For pistons; permanent mold.

APEX 75-25 SILICON HARDENER.
M-130; 75 Al, 25 Si.
For rich hardener for alloying.

APEX 77.
M-130; 7 Cu, 2.5 Si, bal Al.
SC-F temper: 23,000 TS; 15,000 YS; 1.5 El; 70 Brin.
For patterns; sand cast.

APEX 78.
M-130; 4 Cu, 8 Si, bal Al
For match plates; plaster mold casting.

APEX 80/20 COPPER HARDENER.
M-130; 20 Cu, bal Al
For alloying hardener.

APEX 95-5 ALUMINUM SILICON ALLOY.
M-130, 4.5-6.0 Si, 1.0 Fe-Cu, 0.2 max Zn, bal Al.
17,000-21,000 TS; 9,000 YS, 4-2 El; 40 Brin.
For thin, intricate dense castings, easy to cast.

APEX 97 DC
M-130, 1 Mg, 97 min Al.
For alloying to zinc, shot

APEX 97 DCZ
M-130,
Zinc hardener.
ASTM ZG71A.

APEX 110
M-130, 10 Cu, bal Al.
SC-F temper: 23,000 TS, 16,000 YS; 1 El, 85 Brin
SC-T 61 temper. 36,000 TS; 32,000 YS, 0.5 El, 110 Brin
PM-F temper 27,000 TS, 19,000 YS, 1.5 El, 90 Brin.
For bearings, sand and permanent mold.

APEX 125
M-130, 9.7-10.5 Mg, 0.10 max Si, 0.25 max Ti, bal Al
T4 Temper 57,000 TS, 29,000 YS, 30 El, 80 Brin
For sand castings, instrument cases, housings, oil pans
Age-hardenable, corrosion resistant

APEX 400
M-130, 0.1 max Cu, 3.6-4.2 Mg, bal Al.
24,000-26,000 TS, 10,000 YS, 8-6 El, 50-60 Brin
For light alloy parts, cooking utensils, marine castings, similar to "Permbrite."

APEX D 400
M-130, 4 Mg, 1.8 Si, bal Al
DC-F temper 41,000 TS, 20,000 YS, 10 El
For die castings, corrosion resistant

APEX P 400
M-130, 4 Mg, 1.8 Zn, bal Al
PM-F temper: 27,000 TS, 16,000 YS, 7 El, 60 Brin
For castings, permanent mold

APEX 405
M-130, 5 Zn, 0.4 Mg, 0.2 Mn, bal Al.
For die castings.

APEX NO 405 ZINC BASE ALLOY.
M-130, 4.1 Al, 0.03 Mg, bal Zn
Cast. 36,000 TS, 4 El, 62 Brin.
For die castings, housings; 17-18.

APEX 417
M-130, 0.1 max Cu, 0.15 max Si, 6.0-7.5 Mg, 0.2 Ti, bal Al.
Cast. 40,000 TS; 21,000 YS; 13 El; 70 Brin.
For agricultural and aircraft castings, marine parts, corrosion and impact resistant.

APEX 418.
M-130; 8 Mg, bal Al.
DC-F temper: 43,000 TS; 27,000 YS, 8 El; 80 Brin.
For die castings; corrosion resistant.

APEX 420.
M-130; 10 Mg, bal Al.
SC-T 4 temper: 46,000 TS; 25,000 YS; 14 El; 75 Brin.
For sand castings; high strength, corrosion resistant.

APEX 440.
M-130, 0.20 max Cu, 0.50-0.65 Mg, 5.2-6.0 Zn, 0.4-0.6 Cr, 0.15-0.25 Ti, bal Al.
Cast: 28,000 TS; 16,000 YS; 12 El; 55 Brin.
Aged: 36,000 TS; 25,000 YS; 6 El, 75 Brin
For sand castings, housings, oil pans, instrument cases, gear cases. Self aging.

APEX 461.
M-130, 5.5 Zn, 1.4 Cu, 0.2 Mg, bal Al.
For general purpose castings, room temperature aging.

APEX 470.
M-130; 0.7 Cu, 0.4 Mg, 7.5 Zn, bal Al
For general purpose castings; room temperature aging

APEX 630
M-130; 6 Al, 3 Zn, bal Mg.
SC-F temper· 29,000 TS; 14,000 YS, 6 El; 50 Brin.
SC-T 4 temper 40,000 TS, 14,000 YS; 12 El, 55 Brin.
SC-T 6 temper 40,000 TS; 19,000 YS; 5 El, 70 Brin
For sand castings, heat treatable.

APEX 700
M-130, 2.5 Cu, 1.2 Ni, 7.5 Si, bal Al
PM-T 5 temper 20,000 TS, 85,000 YS; 10 El, 45 Brin
For bearings, permanent mold.

APEX 700A
M-130, 6.2 Sn, 1.0 Cu, 1.0 Ni, bal Al.
T5-temper· 20,000 TS, 8500 YS, 10 El, 55 Brin
For bearings; age-hardened

APEX 750
M 130, 0.7-1.3 Cu, 0.7 max Si, 0.10 max Mn, 0.7-1.3 Ni, 5.5-7.0 Sn, bal Al.
Sand or permanent mold cast
T5 Cond· 23,000 TS; 11,000 YS, 12 El, 45 Brin, 15,000 SS.
AA No 850.0 T5.

APEX A 750
M-130, 0.7-1.3 Cu, 2.0-3.0 Si, 0.10 max Mn, 0.3-0.7 Ni, 5.5-7.0 Sn, bal Al
Sand or permanent mold cast
T5 Cond 20,000 TS, 11,000 YS, 5.0 El, 45 Brin, 14,000 SS
AA No 850.OT5

APEX B750.
M-130, 1.7-2.3 Cu, 0.4 max Si, 0.6-0.9 Mg, 0.10 max Mn, 0.9-1.5 Ni, 5.5-7.0 Sn, bal Al
Sand or permanent mold cast
T5 Cond 32,000 TS, 23,000 YS; 5.0 El, 70 Brin, 21,000 SS 11,000 End Limit.
AA No. B850.OT5.

APEX NO 810.
M-130, 7.5 Al, 0.7 Zn, bal Mg.
For light alloy castings; heat treatable.

APEX 910.
M-130; 9 Al, 0.6 Zn, bal Mg
DC-F temper: 33,000 TS; 22,000 YS; 3 El; 60 Brin.
For die castings.

APEX 920.
M-130; 9 Al, 2 Zn, bal Mg.
SC-F temper· 24,000 TS, 14,000 YS; 2 El; 65 Brin.
SC-T 4 temper: 40,000 TS, 16,000 YS; 10 El, 65 Brin.
SC-T 6 temper: 40,000 TS, 23,000 YS; 2 El; 85 Brin
For castings; heat treatable.

APEX NO. 4100 ZINC BASE ALLOY.
M-130; 4.1 Al, 1.25 Cu, bal Zn
Cast 39,000 TS; 10 El; 71 Brin
For die castings, housings; Iz-18

APEX NO 4102 ZINC BASE ALLOY.
M-130, 4.1 Al, 1.0 Cu, bal Zn
Cast 41,000 TS, 4 El, 73 Brin
For die castings, housings; Iz-17.

APEX BRONZE.
M-545, 86 Cu, 9.5 Al, bal Fe.
For marine parts, hardware; Sillman Bronze

APEX DRILL RODS
M-688, 1.0 C, Mn, bal Fe
Type AISI W1 Water hardening tool steel.

APEX PATTERN ALUMINUM ALLOY.
M-130, 4.6 Cu, 2-3.5 Si, 1.5 Zn + Fe, bal Al.
16,000-22,000 TS, 16,000 YS, 3-1 El; 68 Brin
For matchplate and patterns, age-hardenable

APEX PISTON ALLOY.
M-130; 9.25-10.75 Cu, 0.2 max Zn, 0.15-0.35 Mg, 1.0-1.25 Fe, bal Al
Chill cast 34,000 TS, 1 El; 95-125 Brin
For pistons, heat treated.

APEX PRESSURE ALUMINUM ALLOY
M-130, 3.5 Cu, 2-4 Si, 1.2 Fe + Zn, bal Al
17,000-21,000 TS, 17,000 YS, 2 El, 60 Brin.
For castings requiring extreme density; age-hardenable

APEX "T" SERIES ZINC BASE ALLOY
M-130, Al, Cu, bal Zn
For castings, die casting.

APHIT.
70 Cu, 20 Ni, 5.5 Zn, 4.5 Cd
For condenser tubes, chemical equipment; corrosion resistant

APHTIT
Eng., 75.70 Cu, 20-21 Ni, 2.4-5.5 Zn, 1.8-4.5 Cd
For corrosion resistant parts; (Aphtit), corrosion resistant

APIS
M-501, 1.65 C, 12 Cr, Co, bal Fe
For blanking and forming dies, punches, cutters; air hardened, non-deforming.

APM M-257
M-4, 6 Al_2O_3, bal Al
Sintered 37,000 TS, 24,000 YS, 17 El, 70 Brin
For fasteners, fan blades, bolts, cylinder heads.
Sintered, dispersion hardening, high strength at 1000°F

APM-M-276
M-4, Al, Al_2O_3.
Sintered 51,000 TS, 34,000 YS, 7 El; 92 Brin.
For fasteners, fan blades, bolts, sintered, high strength at 1000°F.

APM M-430.
M-4, 14 Al_2O_3, bal Al.
For high temperature applications.
Dispersion hardened, heat resistant.

APM M-470.
M-4; 10 Al_2O_3, bal Al.
For high temperature applications.
Dispersion hardened. Heat resistant to 930°F.

APOLLO.
M-114; 0.45 C, 2.0 Cr, 0.20 V, bal Fe.
For die casting dies, flying shears; oil hardening.

APOLLO.
M-1705; 2.5 C, 12.0 Cr, 4.0 V, 0.8 Mo, bal Fe.
High carbon, high chromium tool and die steel; air or oil hardening. AISI D7.

APOLLO CHROMSTEEL.
M-687; Ni-Cr plated steel.
For heat resistant parts; heat resistant to 800°F.

APOLLOY.
M-131, 0.08 C, 0.25 Cu, bal Fe.
For building construction; corrosion resisting to weather

APOLLO CROM.
Eng ; Cr plated sheet Zn
For corrosion resistant parts; stainless and corrosion resistant

APS-10 M 4
M-884; 0.12 C, 2 Cr, 0.3 Mo, 0.3 Al, bal Fe.
Tube· 100,000 min TS, 80,000 min YS.
For gas well piping.
Resists H_2S corrosion and stress cracking

APW NO 129.
M-686, 60 Pd, 40 Ni.
For high temperature brazing; M P. 2260°F; good oxidation resistance

APW NO 133.
M-686, 80 Pd, 14.5 Ag, 5.5 Al
For high temperature brazing; M P 1925-2050°F, good oxidation resistance.

APW NO 200
M-686; 100 Au.
For brazing filler metal; M.P. 1945°F.

APW-B-217
M-686; 45 Ag, 17.6 Cu, 19.4 Zn, 18 Cd.
For silver brazing; M P. 1140°F-1190°F, obsolete

APW NO 238
M-686, 80 Au, 20 Cu
For brazing filler metal, M P 1620-1630°F.

APW NO. 241.
M-686, 50 Au, 50 Cu.
For brazing filler metal, M.P. 1697-1733°F

APW NO. 242.
M-686; 37.5 Au, 62.5 Cu
For brazing filler metal; M.P 1755-1815°F.

APW NO. 243.
M-686; 35 Au, 62 Cu, 3 Ni
For brazing filler metal, M P. 1815-1875°F

APW-C-250.
M-686, 40 Ag, 30 Cu, 28 Zn, 2 Ni
For silver solder for brazing carbide tips; M.P. 1220-1435°F; obsolete.

APW NO. 253.
M-686; 20 Au, 80 Cu.
For brazing filler metal; M.P. 1850-1880°F.

APW NO. 255
M-686; 82 Au, 18 Ni.
For brazing filler metal; M.P. 1742°F.

APW NO. 259.
M-686, 94 Au, 6 Cu.
For brazing filler metal; M.P. 1742-1796°F.

APW NO. 260.
M-686; 35 Au, 65 Cu.
For brazing filler metal; M.P. 1778-1850°F.

APW NO. 261.
M-686; 75 Au, 20 Cu, 5 Ag.
For brazing filler metal, M.P. 1640-1650°F.

APW NO. 265.
M-686; 72 Au, 22 Ni, 6 Cr.
For brazing filler metal; M.P. 1785-1835°F.

APW-G-355.
M-686; 56 Ag, 22 Cu, 17 Zn, 5 Sn
For silver solder, brazing, M.P 1145-1205°F;

APW 431.
M-686; 90 Ag, 10 Pd.
For high temperature brazing for honeycomb assemblies; M P 1850-1975°F; high oxidation resistance.

APW NO. 440.
M-686, 75 Ag, 20 Pd, 5 Mn
For high temperature brazing; M.P 1960-2050°F; high strength.

APW NO 441.
M-686, 64 Ag, 33 Pd, 3 Mn
For high temperature brazing, M.P. 2100-2250°F, high strength.

AQUATOUGH 70.
M 1724, 0.70 C, 0.30 Mn, bal Fe
Water hardening tool steel; for chisels, caulking tools, cold heading dies, rivet snaps.

AQUATOUGH 100
M-1724, 0.95 C, 0.30 Mn, bal Fe.
Water hardening tool steel, for arbors, dowel pins, files, lathe centers, knurling and engraving tools.

AQUATOUGH 100
M-1569; 0.95 C, 0.3 Mn, bal Fe.
Heat treated 184,000 TS, 118,000 YS; 10 El; 30 RA; 375 Brin.
For arbors, axes, forming dies, springs; water hardened, Type W1.

AQUILA.
M-1322; 0.15 C, Cr, Mo, bal Fe.
For cams, gears, camshafts; case hardening steel, tough

AR-213
M-U S ; 0.12 C, 20.3 Cr, 4.5 W, 4.8 Al, 2.3 Ta, 0.6 Fe, 0.34 Zr, bal Co
Age-hardened. C 47 Rock
For gas turbine components.
Age-hardenable, corrosion and heat resistant
Sulphidation and oxidation resistant.

A.R. ALLOY.
M-2a; 10 Sn, 2 Pb, bal Cu
10-5 El; 50-60 Brin
For bearings for cold rolling mills, landing gears for airplanes; tough, strong.

ARBOGA.
Eng; Tungsten carbide.
For tools, hard cutting tools; sintered alloy.

ARC M 990.
M-104; 0.70 C, 22 Cr, 5 Ni, Cu, bal Fe.
For nozzles, wear and heat resistant parts; heat and wear resistant.

ARC M1628.
M-104; 0.12 max C, 1 Cr, 65 Ni, 25 Mo, bal Fe.
For chemical plant equipment; corrosion and heat resistant.

ARC.2233 A2.
M-771; 0.03 max C, 1.8 Mn, 14 Ni, 17 Cr, 2.5 Mo, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 40 El; B 78 Rock.
Cold Rolled. 130,000 TS; 75,000 YS, 30 El; C 27 Rock
For chemical and pharmaceutical plant equipment, tanks, digesters, vessels
Stainless, austenitic, acid resistant
AISI Type 316L.

ARC.2233 A8.
M-771; 0.08 max C, 1.8 Mn, 14 Ni, 17 Cr, 2.5 Mo, bal Fe
Annealed: 85,000 TS; 35,000 YS, 50 El, B 82 Rock.
Cold Rolled 140,000 TS, 120,000 YS, 10 El, C 28 Rock
For chemical and pharmaceutical plant equipment, valve trim, tanks, digesters, evaporators
Stainless, austenitic, acid resistant
AISI Type 316.

ARC 2233 B6
M-771, 0.06 max C, 11.5 Ni, 19 Cr, 2.2 Mo, 0.5 Ti, bal Fe
Annealed 85,000 TS, 35,000 YS, 50 El, B 82 Rock
Cold Rolled 140,000 TS; 120,000 YS, 10 El, C 28 Rock
For welded chemical and plastic plant equipment, digesters, tanks
Stabilized for welding, stainless, austenitic
AISI Type 316 Ti

ARC.2233 C8
M-771, 0.08 max C, 14 Ni, 18 Cr, 2.5 Mo, Cb = 10 × C, bal Fe
Annealed 85,000 TS, 35,000 YS, 50 El, B 82 Rock
Cold Rolled 140,000 TS, 120,000 YS, 10 El, C 28 Rock
For welded chemical and plastic plant equipment, digesters, tanks
Stabilized for welding, stainless, austenitic
AISI Type 316 Cb

ARC 2266 A2
M-771, 0.03 max C, 1.2 Mn, 13 Ni, 19 Cr, 3 Mo, bal Fe
Annealed 85,000 TS, 40,000 YS, 60 El, 70 RA, 135 Brin.
Cold Rolled: 150,000 TS; 125,000 YS; 15 El, 300 Brin
For chemical and plastic plant equipment, digesters, mixers, agitators, valve trim, kettles, tanks.
Acid resistant, austenitic
AISI Type 317 L, weldable

ARC 2266 A6
M-771, 0.06 max C, 1.2 Mn, 13 Ni, 19 Cr, 3 Mo, bal Fe.
Annealed: 85,000 TS; 40,000 YS, 60 El, 135 Brin
Cold Rolled 150,000 TS, 125,000 YS; 15 El, 300 Brin
For chemical and plastic plant equipment, digesters, agitators, valve trim, tanks, vessels
Austenitic, acid resistant
AISI Type 317 Non-hardenable

ARC.2266 A8
M-771; 0.08 max C, 1.2 Mn, 12 Ni, 19 Cr, 3 Mo, bal Fe.
Annealed. 85,000 TS; 40,000 YS; 69 El; 135 Brin.
Cold Rolled: 150,000 TS; 125,000 YS, 15 El; 300 Brin.
For chemical and plastic plant equipment, digesters, agitators, valve trim.
Austenitic, acid resistant. Non-hardenable.
AISI Type 317.

ARC.2266 B6.
M-771, 0.06 max C, 12 Ni, 18.5 Cr, 3 Mo, 0.4 Ti, bal Fe.
Annealed 85,000 TS; 35,000 YS; 50 El; 160 Brin
Cold Rolled: 125,000 TS; 85,000 YS, 30 El; 240 Brin
For welded structures, chemical and plastic plant equipment, tanks, agitators
Stabilized welding grade, austenitic, stainless
AISI Type 316 Ti

ARC 2266 Cb
M-104, 0.10 max C, 18 Cr, 13 Ni, Mo, Cb, bal Fe.
For chemical plant equipment; Type 318; stainless, austenitic.

ARC 2266 TRS
M-104, 0.06 max C, 17 Cr, 12 Ni, 3 Mo, bal Fe.
Annealed. 85,000 TS, 35,000 YS, 50 El, 65 RA, 160 Brin
For chemiccal plant equipment, Type 316L, stainless, austenitic

ARC 2702 A2
M-771, 0.03 max C, 1.8 MN, 11 Ni, 19 Cr, bal Fe
Annealed 85,000 TS, 35,000 YS, 60 El; 150 Brin
Cold Drawn 140,000 TS, 90,000 YS, 30 El, 250 Brin
For architectural trim, kitchen equipment, chemical and pharmaceutical plant equipment.
Stainless, austenitic, good weldability
AISI Type 304L

ARC 2702 A8
M-771, 0.08 max C, 11 Ni, 18 Cr, bal Fe
Annealed 86,000 TS, 36,000 YS, 60 El, 150 Brin
Cold Drawn. 140,000 TS, 90,000 YS, 30 El, 250 Brin
For architectural trim, kitchen equipment, chemical and pharmaceutical plant equipment
Stainless, austenitic, nonmagnetic
AISI Type 304

ARC 2702 A12
M-771, 0.12 C, 9 Ni, 18.5 Cr, bal Fe
Annealed 90,000 TS, 40,000 YS, 50 El, B 85 min Rock
Cold Rolled 180,000 TS, 150,000 YS; 12 El, C 25 Rock
For food handling and chemical plant equipment, valve trim, fasteners
Stainless, austenitic, nonmagnetic
AISI Type 302.

ARC 2702B
M-771, 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe.
Normalized 93,000 TS, 36,000 YS, 45 El, 60 RA, 165 Brin
Annealed. 87,000 TS, 33,000 YS, 57 El, 73 RA; 155 Brin
For chemical plant equipment, Type 321; stainless, austenitic

ARC 2702 B2
M-771, 0.03 max C, 11 Ni, 18 Cr, 0.2 Ti, bal Fe.
Annealed 85,000 TS, 35,000 YS, 55 El; 150 Brin.
Cold Drawn 95,000 TS, 60,000 YS; 40 El, 185 Brin.
For welded structures, oil refinery and chemical plant equipment, exhaust systems.
Stabilized stainless steel, welding grade, austenitic.
AISI Type 321.

ARC.2702 B6.
M-771; 0.06 max C, 10 Ni, 18 Cr, 0.4 Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 150 Brin.
Cold Drawn· 95,000 TS; 60,000 YS; 40 El; 185 Brin.
For welded structures, chemical and oil refinery equipment, tanks, exhaust systems.
Stabilized stainless steel austenitic, nonmagnetic.
AISI Type 321.

ARC.2702 B8.
M-771, 0.08 max C, 10 Ni, 18 Cr, Ti = 5 × C, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 55 El, 150 Brin
Cold Drawn· 95,000 TS, 60,000 YS, 40 El; 185 Brin.
For welding structures, chemical and oil refinery equipment, tanks, vessels, shafts.
Stabilized, stainless steel, austenitic, nonmagnetic.
AISI Type 321.

ARC 2702 C8
M-771, 0.08 max C, 11 Ni, 18 Cr, Cb = 10 × C, bal Fe
Annealed. 85,000 TS, 35,000 YS; 60 El; B 80 Rock.
Cold Drawn 100,000 TS, 65,000 YS, 40 El, B 95 Rock.
For exhaust manifold, boiler and oil refinery tubes, radiant superheaters, aircraft collector rings, welded structures, stainless, austenitic
AISI Type 347.

ARC 2702 Cb
M-104, 0.10 max C, 18 Cr, 10 Ni, Cb, bal Fe
Annealed 90,000 TS; 45,000 YS, 56 El, 65 RA; 160 Brin
For welded, chemical plant equipment, Type 347, stainless, austenitic

ARC 2702 M
M-104, 0.03 max C, 18 Cr, 10 Ni, Ti, bal Fe
Annealed: 85,000 TS; 35,000 YS, 55 El, 65 RA, 150 Brin.
For welded, chemical plant equipment, Type 321, stainless, austenitic

ARC 2702 SP.
M-104, 0.06 max C, 18 Cr, 10 Ni, Ti, bal Fe
Annealed 85,000 TS, 35,000 YS, 55 El, 65 RA, 150 Brin
For welded, chemical plant equipment, Type 321; stainless, austenitic

A R.C 2702T
M-771, 0.08 max C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe
Annealed. 90,000 TS, 45,000 YS, 60 El, 135 Brin
Cold drawn. 180,000 TS, 150,000 YS, 10 El, 330 Brin
For chemical plant equipment, welded structures; Type 304; stainless, austenitic.

ARC 2702 TRS.
M-104; 0.04 max C, 18 Cr, 10 Ni, bal Fe.
Annealed: 85,000 TS, 35,000 YS, 65 El; 75 RA; 145 Brin
For chemical plant equipment; Type 304L, stainless, austenitic.

ARC-6015.
M-771, 60 Ni, 15 Cr, 15 Mo, 5 Fe, 5 W.
For pumps, valves, chemical and plastic plant equipment.
Heat and corrosion resistant.

ARC 6015.
M-104, 0.15 max C, 15 Cr, 60 Ni, 17 Mo, W, bal Fe
For chemical plant equipment; corrosion and heat resistant

ARC 7915.
M-104, 0.10-0.25 C, 15 Cr, 78 Ni, bal Fe
For chemical plant equipment, corrosion and heat resistant.

ARCALOY 308
M-1713, 0.07 C, 19 Cr, 9 Ni, bal Fe.
Welded 90,000 TS, 45 El.
For stainless welding electrodes, stainless steel

ARCALOY TYPE 316-ELC
M-1713, 0.04 max C, 18 Cr, 13 Ni, bal Fe.
Welded 85,000 TS, 45 El
For welding rod, stainless

ARCAST.
M-685, 3 C, 2 Si, bal Fe
For welding electrode, for cast iron.

ARCAST-67.
M-1662, 5-9 Zn, 0.96-1.4 Mg, 0.1-0.4 Ti, 0.025-0.15 Cr, bal Al
Cast, 67,000 TS, 57,000 YS; 7 El
For general purpose castings, casings, housings, hardware.
Good castability, heat treatable

ARCHANGEL
M-485, C, alloy, bal Fe
For high speed tools, high speed steel

ARCHITECTURAL BRONZE C 94
M-179, Mn, Zn, bal Cu
Extruded 86,000 TS, 38,000 YS, 25 El, 145 Brin
For casements, hand rails, show cases, panels, architectural, corrosion resistant

ARCHITECTURAL BRONZE 385
M-8, 56.0 Cu, 41.5 Zn, 2.5 Pb
Soft Rod 60,000 TS, 20,000 YS, 25 El, B 65 Rock
For ornamental hardware, architectural applications hinges, lock bodies, hardware
Free cutting, corrosion resistant

ARCHITECTURAL BRONZE-385
M-33, 58.5 Cu, 38.25 Zn, 3.25 Pb
As extruded 54,000 TS, 18,000 YS, 35 El, 32,000 shear, 54 Rock B
As extruded and stretcher straightened. 60,000 TS; 30,000 YS, 25 El, 35,000 Shear, 60 Rock B
For architectural parts and fittings, hinges, lock bodies, valve stems

ARCOLOY
M-684, 95 Cu, Si, P
55,000 TS
For range boilers, storage tanks, corrosion resistant

ARCOSARC 70
M-677, mild steel 70,000 psi
For flux-cored welding wire, class F70T-2

ARCOSARC 71
M-677, mild steel 70,000 psi
For flux-cored welding wire, class E70T-1

ARCOSARC 72
M-677, mild steel 70,000 psi, high impact strength.
For flux-cored welding wire, class F70T-1

ARCOSARC 70X.
M-677, mild steel 70,000 psi
For flux cored welding wire, multi-pass deposition without slag removal, class F70T-2

ARCOSARC 80.
M-677; 1.0 Ni steel, 80,000 psi, high impact strength
For flux-cored welding wire.

ARCOSARC 100.
M-677, 1.5 Mn, 0.5 Mo steel, 100,000 psi.
For flux-cored welding wire.

ARCOSARC 110T
M-677, 2.0 Ni, 1.0 Cr, 0.5 Mo steel, 110,000 psi.
For flux-cored welding wire.

ARCOSARC 1CM
M-677; 1.25 Cr, 0.5 Mo steel.
For flux-cored welding wire

ARCOSARC 2CM
M-677, 2.25 Cr, 1.0 Mo steel
For flux-cored welding wire

ARCOSARC 5M
M-677, 5 Cr, 0.5 Mo steel
For flux-cored welding wire.

ARCOSARC CI
M-677; cast iron.
For flux-cored welding wire.

ARCOSARC SS-1
M-677, type 308 stainless steel
For flux-cored welding wire.

ARCOSARC SS-2
M-677, type 309 stainless steel
For flux-cored welding wire

ARCOSARC SS 3
M 677 type 316 stainless steel
For flux-cored welding wire

ARCOSARC 410 Ni
M 677, 0.04 C, 0.6 Mn, 0.4 Si, 12 Cr,
4 Ni, 0.8 Mo, bal Fe
For flux-cored welding wire, welding
CA6NM castings

ARCTIC
M-748, 3.5-4 Ni, 0.4-0.7 Mn, 0.10 max C, bal Fe
Cast 60,000 TS, 40,000 YS, 35 El, 60 RA
For valves, fittings, for low temperature
service, Charpy 30

ARC WEL
M 683, Zn, bal Cu
For welding rod

ARC ZCr
M 104, 0.10 max C, 24 Cr, 5 Ni, Mo, bal Fe
For furnace parts and equipment, heat resistant

ARDAL METAL
M-581, 2 Cu, 1.7 Fe, 0.6 Ni, bal Al
31,000 TS, 17,000 YS, 15 El, 60 Bhn
For bearings, pistons, wire, tubes;
cannot be hardened by heat treatment

ARDENT
M 1411, 1.5 C, 4 W, 0.5 Cr, bal Fe
For upsetters, forging dies, high abrasion
resistance, cold work steel

ARDOLOY 1A
M-482, Sintered carbide tool material
Cutting tool for semi-finishing and finishing
cast iron and non ferrous materials, suitable for
milling For turning and reaming all
aluminum alloys
ISO K10

ARDOLOY 2A
M-482; Sintered carbide tool material.
Shock resistant grade of cutting tool
used largely for planing cast iron; and for
general wear resistant application
ISO K30.

ARDOLOY AD.
M-482, Sintered carbide tool material.
General purpose cutting tool for machining
cast iron and non-ferrous materials at
medium feeds and speeds.
ISO M10, M20

ARDOLOY AF.
M-482; Sintered carbide tool material.
Very hard grade of straight tungsten carbide,
particularly for finishing cast iron,
non-ferrous, plastics and abrasive non-metallics.
ISO KO5.

ARDOLOY AK.
M-482, Sintered carbide tool material
Very tough cutting tool for heavy roughing cuts
at slow speeds,-good on interrupted cuts
ISO P40, P50

ARDOLOY CNO1(B)
M-482, Sintered carbide tool material
Very hard and wear resistant straight tungsten
grade due to low cobalt content and fine grain
structure, for finishing and boring cast iron and
non-ferrous
ISO KO1

ARDOLOY CN10
M-482, Sintered carbide tool material
Hard and wear resistant grade of straight
tungsten carbide, for finish turning and boring
of cast iron and non-ferrous metals.
ISO K10

ARDOLOY CN20(K)
M-482, Sintered carbide tool material
General purpose cutting tool for use on
cast iron, non ferrous metals and on
stainless steel
ISO K20

ARDOLOY CN30(M)
M-482, Sintered carbide tool material
Tough, shock-resisting grade, used mainly
for planing cast iron
ISO K30

ARDOLOY CR10
M-482, Sintered carbide tool material.
High crater and wear resistant grades for
medium and high speed cutting speeds,
and finishing steel.
ISO P10.

ARDOLOY CR 20
M-482, Sintered carbide tool material
For general purpose, semi-finishing of steels,
good crater and wear resistance
ISO P20

ARDOLOY CR25(T)
M 482, Sintered carbide tool material
General purpose cutting grade for all types of steel
at medium speeds and feeds
ISO P20.

ARDOLOY CR30
M 482, Sintered carbide tool material
General purpose grade for roughing and
semi finishing all types of steel at
medium feeds and speeds
ISO P30.

ARDOLOY CR40(R)
M-482, Sintered carbide tool material.
Tough grade of cutting tool for roughing cuts
at slow speeds and heavy loads.
ISO P40

ARDOLOY ICC.
M-482; Sintered carbide tool material.
Grade of cutting tool for semi-finishing and finishing of cast iron and non-ferrous material; used on all aluminum alloys.
ISO K10.

ARDOLOY S3.
M-482; Sintered carbide tool material.
General purpose cutting tool for all types of steels at medium speeds and feeds
ISO P30.

ARDOLOY S48
M-482, Sintered carbide tool material.
Tough cutting tool for roughing operations, particularly on steel.
ISO P40.

ARDOLOY S200.
M-482; Sintered carbide tool material.
General purpose cutting tool particularly for lathe turning most metals. Resistant to wear and cratering.
ISO P20

ARDOLOY SK2.
M-482; Sintered carbide tool material
Titanium carbide grade for finish turning and boring steel, resists flank and crater wear.
ISO PO1

ARDORIT 6
M-1338; 0.12 max C, 0 8 Si, 0 8 Al, 6 5 Cr, bal Fe.
Bars: 70,000 TS, 30,000 YS; 28 El; 65 RA; 160 Brin.
For oil refinery equipment; creep and heat resistant.

ARDORIT 13A1
M-1338, 0.12 max C, 1 2 Si, 1 0 Al, 13 Cr, bal Fe
Annealed: 75,000 TS; 40,000 YS, 30 El, 70 RA, 160 Brin.
For oil refinery equipment, Type 410 Al, stainless, creep resistant.

ARDORIT 18A1
M-1338; 0 12 max C, 1 Si, 1 Al, 18 Cr, bal Fe
Annealed· 80,000 TS, 50,000 YS, 22 El; 48 RA; 150 Brin.
For oil refinery equipment, Type 430 Al, heat and creep resistant.

ARDORIT 20/10.
M-1338, 0 15 C, 19 5 Cr, 9 5 Ni, bal Fe.
Annealed· 80,000 TS; 35,000 YS, 55 El; 75 RA; 150 Brin.
Cold drawn 180,000 TS; 150,000 YS; 10 El; 250 Brin
For chemical plant equipment, tanks, mixers, agitators, Type 302, stainless, austenitic.

ARDORIT 24/20.
M-1338; 0 15 C, 2 Si, 24 Cr, 19 Ni, bal Fe
Annealed: 100,000 TS; 45,000 YS, 50 El; 65 RA, 185 Brin
For furnace parts, pumps, valves, turbine parts; Type 310; stainless, austenitic.

ARDORIT 25N
M-1338; 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe
Aged. 115,000 TS; 80,000 YS, 15 El.
Cast: 70,000 TS; 65,000 YS; 2 El, 190 Brin.
For furnace parts, heat treat boxes, baffles; heat and corrosion resistant

AREMITE.
M-195, Synthetic cast iron.
30,000-50,000 TS; 165 Brin.
For pipes, fittings, hardware.

ARGAL.
M-1362; 2-4 Mg, 0.4 max Mn, 0.3 max Cr, bal Al.
Soft: 28,000 TS; 13,000 YS; 30 El; 47 Brin.
Hard· 40,000 TS; 35,000 YS; 10 El; 73 Brin.
For aircraft tanks and fittings, marine parts, fuel lines, resists sea water corrosion.

ARGALIUM
M-1367, 1.5-3 0 Mg, 0 6-1.3 Mn, 1.3 max Si, 0 3 Cr, 0 2 Ti, bal Al
Soft· 26,000 TS, 10,000 YS; 20 El, 45 Brin.
Hard: 41,000 TS, 36,000 YS; 5 El; 77 Brin
For roofing, hydraulic tubing, architectural trim; good forming and welding properties

ARGELITE
Eng.; 90 Al, 6 Cu, 2 Si, 2 Bi
For light alloy parts, non-hardenable

ARGENT
M-547, 2 Ag, bal Sn
6775 TS; 3 7 El.
Al-solder, Sc-14.

ARGENTAL
England, 60-75 Al, 15-16 Ag, 7-20 Zn, 3-5 Cu
For jewelry, corrosion resistant

ARGENTAL
10 Sn, 5 Co, bal Cu
For jewelry; corrosion resistant.

ARGENTALIUM
Eng ; < 5 Ag, 0 1-1 Mg, bal Al
For light alloy parts, non-hardenable

ARGENTAN
Eng , 48 35 Cu, 34 05 Zn, 17.60 Ni
For table cutlery, ornaments, high resistance to corrosion.

ARGENTAN
U S , 50-90 Cu, 3-40 Ni, 0-10 Al, 0-40 Zn
For cutlery, corrosion resistant

ARGENTAN.
M-547, 2 Al, 0 5 Ag, bal Cu
Rolled 23,660 TS, 2 3 El.
For contacts.

ARGENTAN, BERLIN
Ger · 55 5 Cu, 29 1 Zn, 15.5 Ni
For electrical resistances, corrosion resistant

ARGENTAN, CHINESE
China, 40.4 Cu, 25.4 Zn, 31 6 Ni, 2 6 Fe.
For ornaments, jewelry, hardware; corrosion resistant

ARGENTAN, ENGLISH
Eng., 63 36 Cu, 17 Zn, 19 13 Ni, 0.38 Fe
For domestic ware, corrosion resistant

ARGENTAN, FRENCH
French· 50 32 Cu, 30 94 Zn, 18 4 Ni
For electricol resistances; corrosion resistant.

ARGENTAN (NEUSILBER)
Germ ; 26 Ni, 56 Cu, 18 Zn
For chemical equipment construction; substitute for Ag, a nickel silver.

ARGENTAN, RUSSIAN.
Russia, 63.88 Cu, 17.58 Zn, 17.58 Ni, 0.33 Fe, 0.32 Pb.
For ornaments, architectural purposes; corrosion resistant.

ARGENTAN, RUSSIAN (CAST).
Russia; 57.52 Cu, 18.94 Zn, 20.35 Ni, 3.15 Fe.
For ornaments, hardware; corrosion resistant.

ARGENTAN, SHEET.
Russia; 40-65 Cu, 17-32 Zn, 15-30 Ni.
For ornaments, jewelry, hardware; corrosion resistant.

ARGENTAN, SOLDER.
Russia; 35 Cu, 57 Zn, 8 Ni.
For solder; corrosion resistant

ARGENTAN, VIENNA.
Austria; 55.6 Cu, 21.8 Zn, 22.2 Ni, 0.38 Fe.
For ornaments, jewelry, hardware; corrosion resistant.

ARGENT FRANCAIS.
France; Cu-Zn-Ni.
For jewelry, ornaments, Moussets Silver

ARGENTIN
Eng; 85 Sn, 14.5 Sb, 0.5 Cu
For bearings, antifriction.

ARGENTINE METAL.
U. S., 85.5 Sn, 14.5 Sb
For statuettes and small ornaments; expands on cooling.

ARGESTE 13 Al
M-1333, 0.08 max C, 12-14 Cr, 1.0 max Mn, 1.0 max Si, 0.1-0.3 Al, bal Fe
Ann 50-65 Kg/mm^2 TS; 30 Kg/mm^2 YS, 20 El
Magnetic Type Stainless
W Nr 4002.

ARGESTE 13 H
M-1333, 0.08-0.12 C, 12-14 Cr, 1.0 max Mn, 1.0 max Si, bal Fe.
Martensitic type stainless, hardenable.
For structural parts in water and steam
W. Nr 4006, AISI Type 410 stainless.

ARGESTE 13 PX
M-1333, 0.10 max C, 13.5-15.5 Cr, bal Fe
Welding wire
W Nr 4009

ARGESTE 13 W
M-1333, 0.08 max C, 13-15 Cr, 1.0 max Si, 1.0 max Mn, bal Fe
Ann 50-65 Kg/mm^2 TS, 30 Kg/mm^2 YS, 20 El
Magnetic type stainless
For structural parts, building fittings
W Nr 4001

ARGESTE 17
M-1335, 0.10 max C, 15.5-17.5 Cr, bal Fe
Ann 45-60 Kg/mm^2 TS, 30 Kg/mm^2 YS, 20 El
Ferritic, non-hardenable stainless
For structural parts, armatures, building fittings
W. Nr. 4016, AISI Type 430

ARGESTE 17 L.
M-1333, 0.10 max C, 15.5-17.5 Cr, 0.9-1.3 Mo, bal Fe
Ann 45-65 Kg/mm^2 TS, 30 Kg/mm^2 YS, 30 El
Magnetic, stainless.
For parts for motor cars requiring higher resistance to corrosion
W. Nr. 4113.

ARGESTE 17 LT
M-1333, 0.10 max C, 16-18 Cr, 1.5-2.0 Mo, Ti = 7 × %C, bal Fe
Ann 50-65 Kg/mm^2 TS, 30 Kg/mm^2 YS, 20 El
Magnetic, non-hardenable stainless, weldable
For parts and welded assemblies of higher chemical stability
W Nr 4523

ARGESTE 17 Nb.
M-1333, 0.10 max C, 16.0-18.5 Cr, Nb = 12 × %C bal Fe.
Ann· 45-60 Kg/mm^2 TS; 30 Kg/mm^2 YS; 20 El.
Magnetic, non-hardenable stainless, weldable.
For welded assemblies of stainless.
W. Nr 4511.

ARGESTE 17 PX
M-1333; 0.10 max C, 16.5-18.5 Cr, bal Fe.
Welding wire.
W Nr. 4015.

ARGESTE 17 T.
M-1333, 0.10 max C, 16-18 Cr, Ti = 7 × %C, bal Fe.
Ann· 45-60 Kg/mm^2 TS, 30 Kg/mm^2 YS, 20 El
Magnetic, non-hardenable stainless, weldable
For welded assemblies of stainless
W Nr. 4510.

ARGESTE 17 U.
M-1333, 0.10-0.17 C, 15.5-17.5 Cr, 0.2-0.3 Mo, 0.15-0.25 S, bal Fe.
Magnetic, free machining, non-hardenable stainless
For stainless parts made on automatic screw machines, bolts, studs, nuts
W Nr. 4104

ARGESTE 17 UZ
M-1333, 0.10 C, 15.5-17.5 Cr, 0.25 Mo, 0.15-0.25 S, bal Fe (plus special additions)
Magnetic, non-hardenable stainless, free machining.
For special machined parts requirements

ARGESTE 17 X
M-1333, 0.10 max C, 16.0-18.0 Cr, Nb = 12 × %C min, bal Fe
Welding wire
W Nr 4518

ARGESTE 17 XT
M-1333, 0.10 max C, 16.5-18.5 Cr, 0.4-0.7 Ti, bal Fe
Welding wire
W Nr 4502

ARGESTE 58 M
M-1333, 0.10 max C, 17.0-19.0 Cr, 4.5-6.5 Ni, 7.5-9.5 Mn, bal Fe
Austenitic, corrosion resistant
For household articles, washing machines, rinsing tubs
W Nr 4371, Similar to AISI Type 202

ARGESTE 80 AB
M 1333, 0.05-0.20 C, 10.5-12.5 Cr, 9.0-11.0 Ni, 5.5-6.5 Mn, bal Fe
Austenitic, corrosion resistant
W. Nr. 3962

ARGESTE 80 AM.
M-1333 0.12 max C, 16.5-18.5 Cr, 11.0-13.0 Ni, bal Fe
Austenitic, ductile, corrosion resistant, less tendency to work harden
For cold formed or stamped stainless parts
W Nr 3956, AISI Type 305 stainless.

ARGESTE 80 FH
M-1333, 0.15 max C, 16-18 Cr, 7-9 Ni, bal Fe.
Austenitic, corrosion resistant, hardens readily by cold work
For cold worked wire and strip for springs for operation to 350°C
W Nr 4310, AISI Type 301 stainless

ARGESTE 80 K
M-1333, 0.12 max C, 17-19 Cr, 8-10 Mo, bal Fe.
Ann 50-70 Kg/mm^2 TS, 22 Kg/mm^2 YS, 50 El.
Austenitic, hardenable only by cold work, corrosion resistant
For dairy equipment, food handling, dental instruments
W Nr. 4300, AISI Type 302 stainless

ARGESTE 80 LC.
M-1333; 0.03 max C, 17-20 Cr, 10-12.5 Ni, bal Fe.
Austenitic, weldable, corrosion resistant.
For welded assemblies for food, dairy and chemical industries.
W. Nr. 4306; AISI Type 304L.

ARGESTE 80 Mn.
M-1333; 0.20 max C, 17.0-20.0 Cr, 7.5-9.5 Ni, 5.5-7.5 Mn, bal Fe.
Welding wire.
W. Nr. 4370.

ARGESTE 80 Nb.
M-1333; 0.10 max C, 17-19 Cr, 9-11.5 Ni, Nb = 8 × %C, bal Fe.
Austenitic, weldable, corrosion resistant.
For welded assemblies for food, chemicals, and for operation at elevated temperature.
W. Nr. 4550; AISI Type 347 stainless.

ARGESTE 80 P.
M-1333, 0.07 max, 17-20 Cr, 9-11.5 Ni, bal Fe
Austenitic, hardenable by cold work only, corrosion resistant, weldable.
For food processing equipment, dairy equipment.
W. Nr. 4301; AISI Type 304 stainless

ARGESTE 80 PX.
M-1333, 0.08 max C, 18-20 Cr, 8.5-10.5 Ni, bal Fe.
Welding wire.
W. Nr. 4302.

ARGESTE 80 PXLC.
M-1333; 0.025 max C, 18-20 Cr, 9-11 Ni
Welding wire.
W. Nr. 4316, AISI Type 304L stainless.

ARGESTE 80 SG
M-1333; 0.09 max C, 16.0-18.0 Cr, 6.5-7.75 Ni, plus special additions, bal Fe.
Austenitic, corrosion resistant.
W. Nr. 4568.

ARGESTE 80 T
M-1333, 0.10 max C, 17-19 Cr, 9-11.5 Ni, Ti = 5 × %C, bal Fe.
Austenitic, weldable, corrosion resistant
For welded assemblies for food, chemicals, and for operation at elevated temperatures
W. Nr. 4541, AISI Type 321 stainless

ARGESTE 80 U
M-1333, 0.15 max C, 17-19 Cr, 8-10 Ni, 0.1-0.2 S, bal Fe.
Ann: 50-70 Kg/mm^2 TS, 22 Kg/mm^2 YS, 50 El.
Austenitic, free machining, corrosion resistant
For stainless bolts, nuts, studs, shafts made on automatic screw machines.
W. Nr. 4305, AISI Type 303 stainless.

ARGESTE 80 UZ
M-1333, 0.15 max C, 17.0-19.0 Cr, 8.0-10.0 Ni, 0.1-0.2 S (plus special additions) bal Fe.
Austenitic, free machining, corrosion resistant.
For stainless screw machine parts, as fasteners.

ARGESTE 80 X
M-1333, 0.07 max C, 18-20 Cr, 8-10 Ni, Nb = 12 × %C min, bal Fe.
Welding wire.
W. Nr. 4551.

ARGESTE 82 LC.
M-1333, 0.03 max C, 16.5-18.5 Cr, 2.0-2.5 Mo, 11.0-14.0 Ni, bal Fe
Austenitic, very good resistance to corrosion.
For parts and apparatus of chemical and textile industry.
W. Nr. 4404, AISI Type 316L stainless.

ARGESTE 82 Nb.
M-1333; 0.10 max C, 16.5-18.5 Cr, 2.0-2.5 Mo, 10.5-13.5 Ni, Nb = 8 × %C, min, bal Fe.
Austenitic, weldable, very good resistance to corrosion.
For welded assemblies in chemical industry.
W. Nr. 4580.

ARGESTE 82 P.
M-1333; 0.07 max C, 16.5-18.5 Cr, 2.0-2.5 Mo, 10.5-13.5 Ni, bal Fe
Austenitic, very good resistance to corrosion
For parts and apparatus for textile industry.
W. Nr. 4401; AISI Type 316 stainless.

ARGESTE 82 PX.
M-1333; 0.06 max C, 18-20 Cr, 2.0-2.5 Mo, 9.0-11.0 Ni, bal Fe
Welding Wire
W. Nr 4402

ARGESTE 82 PXLC.
M-1333, 0.025 max C, 17-19 Cr, 2.0-2.5 Mo, 9.5-11.5 Ni, bal Fe.
Welding wire
W. Nr 4428

ARGESTE 82 SG
M-1333; 0.09 max C, 14.0-16.0 Cr, 2.0-2.5 Mo, 6.5-7.75 Ni, plus special additions, bal Fe
Austenitic, corrosion resistant
W. Nr. 4532

ARGESTE 82 T.
M-1333, 0.10 max C, 16.5-18.5 Cr, 2.0-2.5 Mo, 10.5-13.5 Ni, Ti = 5 × %C min, bal Fe.
Austenitic, weldable, very good resistance to corrosion
For welded assemblies for chemical, textile, and cellulose industries.
W. Nr 4571

ARGESTE 82 X
M-1333, 0.07 max C, 18-20 Cr, 2.0-2.5 Mo, 9.5-11.5 Ni, Nb = 12 × %C min, bal Fe
Welding wire
W. Nr 4575.

ARGESTE 83 LC
M-1333, 0.03 max C, 16.5-18.5 Cr, 2.5-3.0 Mo, 12.5-15.0 Ni, bal Fe
Austenitic, weldable, very good resistance to corrosion
For welded assemblies requiring good corrosion resistance
W. Nr 4435

ARGESTE 83 Nb
M-1333, 0.10 max C, 16.5-18.5 Cr, 2.5-3.0 Mo, 12.0-14.5 Ni, Nb = 8 × %C min, bal Fe.
Austenitic, weldable, very good resistance to corrosion
For parts and assemblies for textile, fuel and rubber industries.
W. Nr 4583

ARGESTE 83 P.
M-1333, 0.07 max C, 16.5-18.5 Cr, 2.5-3.0 Mo, 12.0-14.5 Ni, bal Fe
Austenitic, weldable, very good resistance to corrosion
For welded assemblies requiring corrosion resistance
W. Nr. 4436

ARGESTE 83 PX
M-1333, 0.06 max C, 18-20 Cr, 2.5-3.0 Mo, 10.0-12.0 Ni, bal Fe.
Welding wire.
W. Nr. 4403.

ARGESTE 83 PXLC.
M-1333; 0.025 max C, 17-19 Cr, 2.5-3.0 Mo, 10-13 Ni, bal Fe.
Welding wire.
W. Nr. 4430.

ARGESTE 83 T.
M-1333; 0.10 max C, 16.5-18.5 Cr, 2.5-3.0 Mo, 12-14 Ni, Ti = 5 × %C min, bal Fe.
Austenitic, weldable, very good resistance to corrosion.
For parts and assemblies in chemical, textile and cellulose industries.
W. Nr. 4573.

ARGESTE 83 X.
M-1333, 0.07 max C, 18-20 Cr, 2.5-3.0 Mo, 10-13 Ni, Nb = 12 × %C min, bal Fe.
Welding wire.
W. Nr 4576.

ARGESTE 120.
M-1333, 0.10 max C, 11.5-13.5 Cr, 12.0-14.0 Ni, bal Fe
Austenitic, good corrosion resistance
For cutleries, jewelry, stamped articles
W Nr 4307

ARGESTE 135 P
M-1333; 0.07 max C, 16.0-18.0 Cr, 4.0-5.0 Mo, 12.5-14.5 Ni, bal Fe
Austenitic, good corrosion resistance
For parts and apparatus with high pitting stability.
W Nr 4449

ARGESTE 135 PX
M 1333, 0.06 max C, 17-19 Cr, 4.0-5.0 Mo, 12.5-15 Ni, bal Fe.
Welding wire
W Nr 4447

ARGESTE 180 K
M-1333, 0.03 max C, 15.5-16.5 Cr, 17.5-18.8 Ni, bal Fe
Austenitic, good ductility, corrosion resistant
For cold headed stainless parts
W Nr 4321

ARGESTE 180 M
M-1333, 0.15 max C, 11.0-13.0 Cr, 0.3-0.8 Mo, 1.5-2.5 Ni, 17-19 Mn, bal Fe
Austenitic, corrosion resistant
For high-temperature parts against organic acids
W Nr 4451

ARGESTE 182 Nb
M-1333; 0.07 max C, 16.5-18.5 Cr, 2.0-2.5 Mo, 19.0-21.0 Ni, Cu, Nb, bal Fe
Austenitic, ductile, corrosion resistant
For parts in chemical industry in contact with sulphuric acid
W Nr 4505

ARGESTE 182 RT
M-1333, 0.07 max C, 16.5-18.5 Cr, 2.0-2.5 Mo, 19.0-21.0 Ni, Cu, Ti, bal Fe
Austenitic, ductile, corrosion resistant
For parts in chemical industry in contact with sulphuric acid
W Nr 4506

ARGESTE 182 RX
M-1333; 0.06 max C, 17.5-20.0 Cr, 2.0-2.5 Mo, 20.0-22.0 Ni, 1.8-2.2 Cu, Nb = 12 × %C min, bal Fe
Welding wire
W. Nr. 4507

ARGESTE K 15.
M-1333, 0.12-0.17 C, 12.0-14.0 Cr, bal Fe.
Magnetic, hardenable, corrosion resistant
For structural parts and turbine blades.
W. Nr. 4024.

ARGESTE K 15L.
M-1333; 0.12-0.17 C, 12.0-14.0 Cr, 1.0-1.3 Mo, bal Fe.
Magnetic, hardenable, corrosion resistant.
For steam turbine blades and similarly stressed parts.
W. Nr. 4119.

ARGESTE K 20
M-1333, 0.17-0.22 C, 12.0-14.0 Cr, 1.0 max Mn, 1.0 max Si, bal Fe.
Magnetic, hardenable, corrosion resistant.
For structural parts requiring higher strength
W Nr 4021; Nearest AISI 420

ARGESTE K 20L.
M-1333, 0.17-0.22 C, 12.0-14.0 Cr, 1.0-1.3 Mo, bal Fe
Magnetic, hardenable, corrosion resistant
For high quality structural parts as turbine blades.
W Nr 4120

ARGESTE K 20N.
M-1333, 0.17-0.25 C, 16.0-18.0 Cr, 1.0-2.5 Ni, bal Fe.
Magnetic, hardenable, corrosion resistant
Heat treated parts have good strength to 500°C.
W Nr 4057, AISI Type 431.

ARGESTE K 35L.
M-1333, 0.33-0.43 C, 15.5-17.5 Cr, 1.0-1.3 Mo, bal Fe
Magnetic, hardenable, corrosion resistant.
For arbors, spindles, bolts operating at elevated temperatures.
W Nr 4122

ARGESTE K 40.
M-1333, 0.40-0.50 C, 12.0-14.0 Cr, bal Fe
Magnetic, hardenable, corrosion resistant.
For high temperature parts, arbors, spindles, bolts, shafts
W Nr 4034

ARGESTE K 50
M-1333, 0.50-0.60 C, 13.0-15.0 Cr, 0.5-0.6 Mo, bal Fe
Hardenable, magnetic, corrosion resistant.
For cutlery, table knives, instrument parts, requiring hard, stainless surfaces.
W. Nr 4110.

ARGESTE K 90L
M-1333, 0.85-0.95 C, 17.0-19.0 Cr, 1.0-1.3 Mo, bal Fe
Magnetic, hardenable, corrosion resistant
For cutlery, kitchen knives, hardened shafts operating at elevated temperature
W Nr 4112, AISI Type 440B stainless

ARGESTE K 100
M-1333, 1.0-1.1 C, 16.0-17.0 Cr, 0.4-0.6 Mo, bal Fe.
Magnetic, hardenable to file hardness, corrosion resistant
For stainless ball bearings, races, hardened shafts, safety razor blades.
W Nr. 4125, AISI Type 440C stainless

ARGILITE
French, 90 Al, 6 Cu, 2 Si, 2 Bi
For automotive engine parts.

ARGOFIL
M-282, 0.25 Mn, 0.25 Si, bal Cu.
For filler rod for argon-arc and inert gas shielded metal arc welding of copper.
M.P. 1083°C.

ARGO HIGH SPEED.
Eng.; 0.82 C, 0.17 Mn, 1.74 Cr, 4.87 W, 0.10 V, bal Fe.
For tools, cutters, dies, reamers, gages, punches; high speed steel.

ARGOID METAL.
Eng.; 52.6 Cu, 25.8 Zn, 21.6 Ni.
For ornamental parts; Nickel Silver.

ARGOZOIL.
U.S.; 54 Cu, 28-20 Zn, 14 Ni, 2 Sn, 2-10 Pb.
For ornamental parts; corrosion resistant.

ARGUS.
M-548; Pb, Sb, bal Sn.
For bearings; antifriction Babbitt.

ARGUZOID.
Germ.; 48-56 Cu, 13-21 Ni, 23-31 Zn, 0-4 Sn, 0-4 Pb.
For cutlery, ornaments, utensils; German Silver.

ARGYROID (ARGIROIDE).
Eng.; Cu, Ni, Zn.
For resistances, ornaments; Nickel Silver.

ARGYROLITH.
Eng.; 50-70 Cu, 10-20 Ni, 5-30 Zn.
For resistances, ornaments; Nickel Silver.

ARGYROPHAN.
Eng.; Cu, Ni, Zn.
For resistances, ornaments; Nickel Silver.

ARISTALOY.
M18; Sn, Cu, Zn, bal Ag.
For dental amalgams and dies; corrosion resistant

ARISTOLOY
M-18; 67-70 Ag, 25-29 Sn, 5-3 Cu, 0-1 Zn.
For dental amalgams and dies; U S P. 1963085.

ARISTOLOY 4-6 Cr-Mo.
M-682; 4-6 Cr, 0.15 max C, 0.4-0.6 Mo, bal Fe
For oil tubes, stills, oil refineries; heat and creep resistant.

ARISTOLOY 7-9 Cr-Mo.
M-682; 7-9 Cr, 0.15 max C, Mo, bal Fe.
For oil tubes, stills, oil refineries; creep and heat resistant

ARISTOLOY 302.
M-682; 17.0-19.0 Cr, 8-10 Ni, 0.08-0.20 C, 2 max Mn, 1 max Si, bal Fe.
For stainless parts; Type 302; resists scaling to 1450°F.

ARISTOLOY 303.
M-682; 17.0-19.0 Cr, 8-10 Ni, 0.15 max C, S or Se or Zr, bal Fe
For stainless parts; Type 303; free machining.

ARISTOLOY 304.
M-682; 18-20 Cr, 8-11 Ni, 0.08 max C, 2 max Mn, 1 max Si, bal Fe.
For stainless parts; Type 304; heat and corrosion resistant.

ARISTOLOY 305.
M-682; 17-19 Cr, 10-13 Ni, 0.12 max C, 2 max Mn, 2 max Si, bal Fe.
For stainless parts, Type 305; corrosion resistant.

ARISTOLOY 306.
M-682; 18-20 Cr, 9-11 Ni, 0.08 max C, 2 max Mn, bal Fe.
For stainless parts for welding; Type 306; heat and corrosion resistant.

ARISTOLOY 307.
M-682; 20-22 Cr, 10-12 Ni, 0.08-0.20 C, 1.5 max Mn, bal Fe.
For stainless parts; Type 307; corrosion resistant

ARISTOLOY 308.
M-682; 19-21 Cr, 10-12 Ni, 0.08 max C, 1.5 Mn, bal Fe.
For stainless parts; Type 308; heat and corrosion resistant.

ARISTOLOY 309.
M-682, 22-24 Cr, 12-15 Ni, 0.20 max C, 2.0 max Mn, bal Fe.
For stainless parts; resists scaling to 1800°F.

ARISTOLOY 310.
M-682; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
For heat and corrosion resisting parts; resists scaling to 2000°F.

ARISTOLOY 316.
M-682; 16-18 Cr, 10-14 Ni, 0.10 max C, 2.0 max Mn, 2-3 Mo, bal Fe.
For stainless parts; heat and corrosion resistant.

ARISTOLOY 317.
M-682; 18-20 Cr, 11-14 Ni, 0.10 max C, 2.0 max Mn, 3-4 Mo, bal Fe.
For stainless parts; heat and corrosion resistant.

ARISTOLOY 321.
M-682; 0.08 max C, 2 max Mn, 1 max Si, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe.
For heat and corrosion resisting parts; heat and corrosion resisting.

ARISTOLOY 347.
M-682, 17-19 Cr, 9-12 Ni, Cb, 0.10 max C, 2 max Mn, 1 max Si, bal Fe
For stainless parts; heat and corrosion resistant

ARISTOLOY 410.
M-682; 11.0-13.5 Cr, 0.15 max C. 1 max Mn, 1 max Si, bal Fe.
For corrosion resistant parts; resists scaling to 1250°F

ARISTOLOY 414.
M-682, 11.0-13.5 Cr, 1.2-2.5 Ni, 0.15 max C, bal Fe.
For corrosion resistant parts, resists scaling to 1250°F.

ARISTOLOY 416
M-682; 12-14 Cr, 0.15 max C, 0.60 max Mo, 0.07 S, 0.07 Se, bal Fe
For corrosion resistant parts; free machining.

ARISTOLOY 420
M-682, 0.15 max C, 0.7 max Mn, 0.5 Si, 12-14 Cr, bal Fe
For corrosion resisting parts, air or oil hardening.

ARISTOLOY 430.
M-682; 14-18 Cr, 0.12 max C, 1 max Mn, 1 max Si, bal Fe
For corrosion resistant parts; stainless

ARISTOLOY 446.
M-682, 0.35 max C, 23-27 Cr, bal Fe.
For heat and corrosion resisting parts, resists scaling to 2000°F

ARISTOLOY 4027 Leaded
M-682; 0.25-0.30 C, 0.7-0.9 Mn, 0.2-0.3 Mo, 0.15-0.35 Pb, bal Fe.
Annealed. 80,000 TS, 65,000 YP; 25 El; 220 Brin.
Hardened 250,000 TS; 210,000 YS; 8 El; 477 Brin
For gears, shafts for truck and automobile transmissions.
Free-cutting, water or oil hardening.

ARISTOLOY 4140.
M-682; 0.40 C, 0.80-1.1 Cr, 0.15-0.25 Mo, bal Fe.
Rolled· 130,000 TS; 95,000 YS; 15 El; 40 RA; 270 Brin.
Annealed: 90,000 TS; 65,000 YS; 27 El; 55 RA; 185 Brin.
For gears, shafts, axles, fittings, bolts; oil hardened

ARK.
M-261; 0.7 C, 3.7 Cr, 0.6 Mo, 14 W, 1 V, bal Fe.
For tools, cutters, punches; high speed steel.

ARK HIGH SPEED.
M-261; 0.84 C, 1.53 Mn, W, Cr, bal Fe.
For tools, high speed cutters, high speed steel.

ARKIT.
French; 38 Co, 30 Cr, 16 W, 10 Ni, 4 Mo, 2.5 C.
For high speed cutting tips of lathe tools; high heat resistance.

ARKO.
U.S.; 80 Cu, 20 Zn.
For tubes, fittings, hardware, drawn and spun.

ARK SUPERIOR.
M-261; 0.76 C, 4.25 Cr, 0.6 Mo, 1.4 V, 18 W, bal Fe
For drills, broaches, reamers, hobs, gear cutters; high speed steel

ARK SUPERIOR EXTRA.
M-261, 0.78 C, 4.25 Cr, 0.6 Mo, 1.4 V, 22 W, bal Fe.
For form cutters, tools for chilled roll turning; high speed steel

ARK SUPERLATIVE
M-261; 0.8 C, 4.8 Cr, 0.6 Mo, 1.6 V, 18.5 W, 5.7 Co, bal Fe.
For tools, cutters, milling cutters, high speed steel.

ARK SUPREME
M-261; 0.8 C, 22 W, 5 Cr, 17 Co, 1.7 V, 0.6 Mo, bal Fe
For tools, cutters, planing and boring tools; high speed steel

ARK TRIUMPH
M-261, M-486, 1.2 C, 4.35 Cr, 4.5 V, 14 W, bal Fe
For form tools, broaches, reamers, high speed steel

ARKTURUS
M-1306, 0.55 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For cold work tools, headers, upsetters, oil hardened, tough

ARM 4
M-Russia; 0.08-0.14 C, 0.3-1.0 Mn, 0.6 max Si, 14-16 Cr, 14-16 Ni, 1.8-2.2 Mo, 0.8-1.2 W, 2.5-3.0 Co, 0.3 Ti, bal Fe
Annealed 90,000 TS; 40,000 YS; 40 El, B 82 Rock
For high temperature applications, welded structures, agitators
Heat and corrosion resistant.

ARM 6.
M-Russia, C, 16 Cr, 14 Ni, 2.5 Mo, 6 W, 1 Cb, 0.4 V, bal Fe
Annealed 85,000 TS; 35,000 YS, 50 El, B 80 Rock
For high temperature applications, chemical plant equipment, fasteners, mixers
Heat and corrosion resistant

ARM 12
M-Russia, 0.20 C, 11.5 Cr, 0.5 max Ni, 0.5 Mo, 0.25 V, 2.5 W, 2.2 Co, 0.01 B, bal Fe.
For high temperature applications, furnace parts.
Heat resistant to 600°C, corrosion resistant

ARMACAST.
M-112; 0.25-0.30 C, 2.65-3.15 Cr, 0.45-0.55 Mo, bal Fe.
Cast: 110,000 TS, 90,000 YS; 20 El; 45 RA; 200-225 Brin.
For road construction and railway equipment castings, tough.

ARMALOY.
M-132; C, alloy, bal Fe.
For cutting tools, bits, blades, ratchets, wrenches; cast alloy.

ARMASTEEL.
M-690; 2.7 C, 1.2 Si, 0.15 S, bal Fe.
Cast: 55,000-108,000 TS; 42,000-95,000 YS; 8-1.5 El; 143-285 Brin.
For gears, rocker arms, universal joints, camshafts; pearlitic, malleable iron.

ARMASTEEL GM 84 M.
M-690; 2.55 C, 1.4 Si, 0.45 Mn, 0.12 S, 0.05 P, bal Fe Pearlitic malleable cast iron
100,000 TS, 80,000 YS, 2 El; 241-269 Brin.
For parts requiring good strength; e.g. connecting rods
SAE Grade 70002; ASTM Grade 80002

ARMASTEEL GM 85 M.
M-690, 2.55 C, 1.4 Si, 0.45 Mn, 0.12 S, 0.05 P, bal Fe Pearlitic malleable cast iron.
80,000 TS, 60,000 YS, 3 El, 197-241 Brin
This grade preferred for additional local rehardening by flame or induction; as for planet carriers.
SAE & ASTM Grade 60003.

ARMASTEEL GM 85 M Modified
M-690, 2.55 C, 1.4 Si, 0.45 Mn, 0.12 S, 0.05 P, bal Fe. Pearlitic malleable cast iron
90,000 TS, 60,000 YS, 3 El; 217-269 Brin
For automotive crankshafts.
SAE & AST Grade 60003

ARMASTEEL GM 86 M
M-609, 2.55 C, 1.4 Si, 0.45 Mn, 0.12 S, 0.05 P, bal Fe Pearlitic malleable cast iron
70,000 TS, 48,000 YS; 4 El, 163-207 Brin.
For lightly stressed automotive type parts; e.g certain compressor crankshafts.
SAE Grade 48005; ASTM Grade 48004

ARMASTEEL GM 88 M
M-690; 2.55 C, 1.4 Si, 0.45 Mn, 0.12 S, 0.05 P, bal Fe Pearlitic malleable cast iron
105,000 TS, 85,000 YS, 2 El; 269-302 Brin
Compressive strength 250,000 psi ultimate
For parts requiring good strength and wear resistance, gears ASTM Grade 80002.

ARMATURE ELECTRIC
M-806; 0.04 C, 0.5 Si, bal Fe
Annealed: 45,000 TS, 25,000 YS; 25 El.
For rotating equipment and field poles, high permeability.

ARMCO 4-79 Ni.
M-10, 4 Mo, 79 Ni, bal Fe
For electrical equipment, high permeability

ARMCO 9% NICKEL A353
M-10, 0.13 max C, 0.90 max Mn, 0.15-0.30 Si, 8.5-9.5 Ni, bal Fe
2" max thickness. 100,000-120,000 TS; 75,000 YS; 20 El
Heat treated nickel alloy steel, weldable; for storage and process vessels for liquified gases to −320°F. Double normalized and tempered

ARMCO 9% NICKEL A553 GRADE A
M-10; 0.13 max C, 0.90 max Mn, 0.15-0.30 Si, 8.5-9.5 Ni, bal Fe
2" max thickness. 100,000-120,000 TS; 100,000 YS, 20 El
Quenched and tempered: nickel alloy steel, weldable; for storage and process vessels, for liquified gases to −320°F.

ARMCO 15-5 PH.
M-10; 0.07 C, 14.0-15.5 Cr, 3.5-5.5 Ni, 2.5-4.5 Cu, bal Fe
Martensitic stainless, precipitation hardenable.
Cond H 900: 204,000 TS; 182,000 YS; 14 El
For springs, strong stampings; better transverse ductility and toughness than 17-7 PH.

ARMCO 17-4 PH.
M-10; 0.05 C, 17 Cr, 4 Ni, 4 Cu, bal Fe.
Age-hardened: 210,000 TS; 200,000 YS; 6-15 El; 450 Brin.
For gears, cams, chains, valves, pump parts; stainless, age-hardenable.

ARMCO 17-7 PH.
M-10, 0.09 C, 16.0-18.0 Cr, 6.5-7.75 Ni, 0.75-1.25 Al, bal Fe.
Semi-austenitic; precipitation hardened.
Annealed: 130,000 TS; 40,000 YS; 35 El.
Hardened: 200,000-265,000 TS; 185,000-260,000 YS; 2-9 El, (wire can be stronger).
For springs, instrument stampings as gears, levers, cams, fasteners; stainless.

ARMCO 17-10P.
M-10; 0 15 max C, 16 0-18 0 Cr, 9 5-12.0 Ni, 0.2-0 4 P, bal Fe.
Austenitic stainless; precipitation hardenable
Sol Tr: 89,000 TS; 38,000 YS; 70 El; 143 Brin.
Double aged. 144,000 TS; 99,000 YS, 20 El; 31 Rock C; 70,000 psi endurance limit.

ARMCO 18-2 Mn
M-10; 0.10 max C, 18.0 Cr, 1.6-2.0 Ni, 0 034 N, bal Fe
Austenitic stainless steel, non-hardenable by heat treatment.
Annealed· 120,000 TS, 65,000 YS, 55 El; 96 Rock B.
High yield strength in annealed condition.

ARMCO 18-9 LW.
M-10, 0.10 max C, 2.0 max Mn, 1.0 max Si, 17-19 Cr, 8-10 Ni, 3-4 Cu, bal Fe.
Annealed: 78,000 TS.
Cold drawn 152,000 TS.
For cold formed parts, fasteners, ferrules; good formability, stainless, austenitic.

ARMCO 18 SR.
M-10; 0.05 C, 0.5 Mn, 1.0 Si, 18 0 Cr, 0.5 Ni, 2.0 Al, 0 4 Ti, bal Fe.
Ferritic stainless sheet and strip, weldable.
Room temp· 80,000-90,000 TS; 60,000-70,000 YS, 25-30 El; 90 Rock B
1000°F. 48,700 TS, 33,900 YS; 30 El
For industrial ovens, heaters, furnace tubes, annealing boxes, baffle plates, pyrometer tubes; resists scaling at high temperature

ARMCO 20-10 Mn TYPE 307
M-10, 0 08-0.20 C, 19-22 Cr, 9-12 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 70 RA; 150 Brin.
For chemical plant equipment; Type 307; stainless.

ARMCO 21-6-9.
M-10, 0 08 C, 19.0-21.5 Cr, 5.5-7.5 Ni, 8.0-10 0 Mn, bal Fe.
Austenitic stainless steel; non-hardenable by heat treatment.
Annealed. 100,000 TS; 51,000 YS; 75 El.
High strength austenitic type with good resistance to oxidation and toughness at sub-zero temperatures.

ARMCO 22-4-9.
M-10; 0.45-0.60 C, 7-10 Mn, 20-23 Cr, 3-5 Ni, 0.4 N, 0.12 max C, bal Fe.
Heat treated: 162,000 TS; 102,000 YS; 9.0 El; 9.0 RA; 344 Brin.
At 900°F: 114,000 TS; 58,000 YS; 20.0 El; 21.0 RA; 236 Brin.
At 1600°F: 38,000 TS; 25,000 YS; 27.0 El; 39.0 RA; 177 Brin.
For high temperature steam valves and gas turbines; age hardenable, corrosion, wear and heat resistant.

ARMCO 22-13-5.
M-10; 0.06 max C, 20.5-23.5 Cr, 11.5-13.5 Ni, 4.0-6.0 Mn; 1.5-3.0 Mo, 0.2-0.4 N, 0.1-0.3 Cb, 0.1-0.3 V, bal Fe.
Austenitic stainless steel; non-hardenable by heat treatment.
Annealed: 120,000 TS; 65,000 YS; 45 El; 98 Rock B.
For parts requiring higher yield strength than AISI 304.

ARMCO 48 Ni.
M-10; Nickel-Iron alloy.
High permeability, low coercive force, low hysteresis loss.
For instrument transformers, generators, and motors, soft magnetic alloy.

ARMCO 48 Ni-R.
M-10; Nickel-Iron alloy.
High permeability, low coercive force, low hysteresis loss.
For instrument transformers, generators and motors; soft magnetic alloy.

ARMCO TYPE 301.
M-10, 0 10-0 15 C, 16-18 Cr, 6-8 Ni, bal Fe.
Annealed. 90,000 TS, 45,000 YS, 55 El; 65 RA; 143 Brin.
For chemical plant equipment, Type 301; stainless, austenitic

ARMCO TYPE 302 B
M-10; 0 08-0 15 C, 17-19 Cr, 8-10 Ni, 2-3 Si, bal Fe
For heat resistant parts; Type 302 B, heat and corrosion resistant

ARMCO TYPE 303.
M 10; 0.15 max C, 17-19 Cr, 8-10 Ni, 0 07 max S, P, Se, 0 6 max Zr, Mo, bal Fe
Cold drawn· 100,000 TS, 60,000 YS, 40 El, 53 RA; 212 Brin.
Annealed. 90,000 TS, 35,000 YS, 50 El, 55 RA; 160 Brin.
For screw machine products, hardware, bolts, nuts, screws, Type 303, stainless, free-cutting

ARMCO TYPE 303 Se
M-10; 0.15 max C, 17-19 Cr, 8-10 Ni, 0 15 min Se, bal Fe.
Annealed· 80,000 TS; 35,000 YS, 50 El, 70 RA; 150 Brin
For stainless parts, screw machine products; Type 303 Se, stainless, free-cutting

ARMCO 304
M-10, 0 08 max C, 18 0-20 0 Cr, 8 0-10 5 Ni, bal Fe
Austenitic stainless steel, non-hardenable by heat treatment.
Annealed· 85,000 TS, 35,000 YS; 60 El; 150 Brin
Good grade of 18-8 type stainless steel; for food, beverage, meat handling equipment AISI 304.

ARMCO 304 L.
M-10, 0.03 max C, 18 0-20 0 Cr, 8 0-10.0 Ni, bal Fe.
Austenitic stainless steel, non-hardenable by heat treatment
Annealed: 80,000 TS, 30,000 YS; 60 El; 140 Brin.
For welded assemblies without subsequent heat treatment; for food, beverage, meat processing equipment AISI 304L.

ARMCO 305.
M-10; 0.12 max C, 17 0-19.0 Cr, 10 5-13.5 Ni, bal Fe.
Austenitic stainless steel; non-hardenable by heat treatment.
Annealed· 85,000 TS; 35,000 YS; 60 El; 140 Brin.
Low work hardening rate; for spinning, deep drawing and cold heading work. AISI 305.

ARMCO TYPE 308
M-10; 0.08 max C, 19-21 Cr, 10-12 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 50 El; 65 RA; 165 Brin.
For chemical and plastic plant equipment; stainless, austenitic

ARMCO TYPE 309.
M-10, 0.20 max C, 22-24 Cr, 12-15 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El, 55 RA; 150 Brin
For furnace parts, heat treating boxes, Type 309, heat and corrosion resistant.

ARMCO TYPE 310
M-10, 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe
Annealed 95,000 TS, 40,000 YS, 45 El; 65 RA; 185 Brin
Cold drawn. 125,000 TS, 90,000 YS, 20 El; 60 RA, 220 Brin
For furnace equipment, chemical plant equipment; Type 310, stainless, austenitic

ARMCO TYPE 316
M-10, 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Annealed: 80,000 TS, 30,000 YS, 60 El, 70 RA; 150 Brin
Cold drawn. 90,000 TS, 60,000 YS; 45 El; 60 RA, 180 Brin
For chemical and textile plant equipment, Type 316, stainless, austenitic

ARMCO 316 L
M-10, 0.03 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Annealed 80,000 TS, 30,000 YS, 60 El, 70 RA, 140 Brin
Cold drawn 90,000 TS, 60,00 YS, 45 El, 60 RA, 190 Brin
For chemical and textile plant equipment, welded structures, Type 316L, stainless, austenitic

ARMCO TYPE 321
M-10, 0.08 max C, 2 max Mn, 0.75 max Si, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe
Annealed 90,000 TS, 35,000 YS, 55 El, 60 RA, 160 Brin.
For high temperature service and welded corrosion resistant, stabilized, austenitic, stainless

ARMCO TYPE 348
M-10, 0.10 max C, 1.5 max Mn, 17-19 Cr, 9-12 Ni, Cb = 10 × C, bal Fe.
Annealed 85,000 TS, 40,000 YS, 45 El, 65 RA, 140 Brin
Cold drawn 110,000 TS, 65,000 YS, 40 El, 60 RA, 220 Brin
For welded structures, chemical plant equipment, stainless, austenitic

ARMCO 400
M-10, 0.05 max C, 1.0 max Mn, 1.0 max Si, 12.0-13.0 Cr, 0.5 max Ni, 0.5 max Al, bal Fe
Ferritic stainless, non hardenable, weldable
Room temp 61,500 TS, 29,500 YS; 35 El
1200°F 15,000 TS, 10,000 YS; 63 El
For office furniture, dryer drums, air conditioning panels, sink strainers, resists scaling up to 1300°F.

ARMCO TYPE 405
M-10, 0.08 max C, 11.5-13.5 Cr, 0.2 Al, bal Fe
Annealed 75,000 TS, 45,000 YS, 30 El, 65 RA, 160 Brin
Cold drawn: 85,000 TS, 70,000 YS, 20 El, 60 RA, 185 Brin.
For pumps, valves, tanks, Type 405, corrosion resistant.

ARMCO 409.
M-10; 0.05 max C, 10.0-12.0 Cr, 0.50 Ti, bal Fe.
Ferritic, non hardenable stainless.
Sheet: 68,000 TS; 40,000 YS.
Low cost stainless sheet; formable.

ARMCO TYPE 410.
M-10; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Annealed 75,000 TS; 41,000 YS; 35 El; 70 RA; 155 Brin.
Cold drawn: 110,000 TS; 85,000 YS; 23 El, 65 RA; 230 Brin
For pumps, valves, pressure vessels, motor shafts; Type 410, corrosion resistant.

ARMCO 410 Cb
M-10; 0.15 max C, 11.5-13.5 Cr, 0.25 max Cb, bal Fe.
Martensitic stainless steel, magnetic, hardenable
Hardened, tempered 500°F 195,000 TS, 161,000 YS; 16 El, 43 Rock C; 65 Ft lbs Charpy impact
Tempered 1100°F 137,000 TS; 121,000 YS, 19 El; 277 Brin, 73,000 psi endurance limit

ARMCO TYPE 410 Se
M-10, 0.15 max C, 12-14 Cr, 0.15 min Se, bal Fe
For corrosion resistant parts, Type 416 Se; corrosion resistant

ARMCO TYPE 414.
M-10, 0.15 max C, 11.5-13.5 Cr, 1.25-2.5 Ni, bal Fe
Annealed 120,000 TS, 95,000 YS, 20 El, 60 RA; 250 Brin
Cold drawn. 130,000 TS, 115,000 YS, 15 El, 58 RA, 270 Brin
For valves, propeller shafts, exhaust port inserts, Type 414, corrosion resistant.

ARMCO TYPE 416
M-10, 0.15 max C, 12-14 Cr, 0.07 max P, S, Se, Mo, 0.6 max Zr, bal Fe
Cold drawn, 100,000 TS, 85,000 YS, 13 El, 40 RA, 205 Brin.
Annealed 75,000 TS, 40,000 YS, 30 El, 60 RA; 105 Brin
For screw machine products, screws, shafts, gears, Type 416, corrosion resistant, free-cutting

ARMCO TYPE 420
M-10, 0.15 min C, 12-14 Cr, bal Fe
Annealed 95,000 TS, 50,000 YS, 25 El, 55 RA; 195 Brin
Cold drawn 105,000 TS, 85,000 YS, 17 El; 50 RA, 215 Brin
For cutlery, ball bearings, surgical instruments, Type 420, corrosion resistant

ARMCO TYPE 420 F
M-10, 0.15-0.45 C, 12-14 Cr, 0.18-0.35 Se, bal Fe
Annealed. 95,000 TS; 50,000 YS, 20 El, 50 RA, 195 Brin
For cutlery, ball bearings, dental and surgical instruments, Type 420 F, free-cutting, corrosion resistant

ARMCO TYPE 430
M-10, 0.12 max C, 14-18 Cr, bal Fe
Annealed 75,000 TS, 50,000 YS, 30 El, 65 RA, 155 Brin
Cold drawn 85,000 TS, 70,000 YS, 20 El, 60 RA; 185 Brin
For trim, hardware, fixtures, industrial equipment, Type 430; corrosion and heat resistant

ARMCO TYPE 431
M-10, 0.2 max C, 15-17 Cr, 1.5-2.5 Ni, bal Fe
Annealed 125,000 TS, 95,000 YS, 20 El, 55 RA; 250 Brin
Cold drawn 130,000 TS, 110,000 YS, 15 El, 35 RA; 270 Brin
For aircraft and marine parts, bolts; Type 431, corrosion resistant.

ARMCO TYPE 440 A.
M-10; 0.60-0.75 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Annealed: 105,000 TS; 60,000 YS, 20 El, 45 RA; 215 Brin.
For cutlery, ball bearings, pump shafts, valves; Type 440 A, corrosion resistant, hardenable.

ARMCO TYPE 440 B.
M-10, 0.75-0.95 C, 16-18 Cr, 0.75 max Mo, bal Fe
Annealed: 107,000 TS, 62,000 YS; 18 El; 35 RA, 220 Brin.
For cutlery, ball bearings, pump shafts, valves; Type 440 B; corrosion resistant, hardenable.

ARMCO TYPE 440 C.
M-10, 0.95-1.2 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Annealed: 110,000 TS; 65,000 YS; 14 El, 25 RA, 230 Brin
For cutlery, ball bearings, pump shafts, valves; Type 440 C; corrosion resistant, hardenable

ARMCO TYPE 440 F.
M-10; 0.95-1.2 C, 16-18 Cr, 0.75 max Mo, 0.2 S, bal Fe
Annealed 110,000 TS; 65,000 YS, 12 El, 20 RA, 230 Brin.
For cutlery, bearings, pump shafts, valves, Type 440 F, corrosion resistant, hardenable.

ARMCO TYPE 440F Se
M-10, 0.95-1.2 C, 16-18 Cr, 0.60 max Mo or Zr, bal Fe
For bearings, races, Type 440 FSe, corrosion resistant

ARMCO TYPE 446
M-10; 0.35 max C, 1.0 Si, 23-27 Cr, bal Fe.
Annealed. 80,000 TS, 50,000 YS, 23 El, 55 RA, 175 Brin
For furnace parts, heat treating boxes, Type 446; heat resistant.

ARMCO A-286
M-10, 0.05 C, 1.45 Mn, 0.5 Si, 14.75 Cr, 25.25 Ni, 1.3 Mo, 2.15 Ti, 0.15 Al, 0.3 V, 0.005 B, bal Fe
Austenitic, precipitation hardenable, stainless
Annealed 90,000 TS, 35,000 YS, 45 El; 83 Rock B
Sol tr & aged: 150,000 TS, 100,000 YS, 25 El; 34 Rock C
Very good high temperature properties as creep strength, fatigue, scaling, impact up to 1300°F, for high temperature fasteners, etc.
AMS 5731, 5732 etc.

ARMCO ALUMINIZED STEEL
M-10, sheet steel coated with Al
Rolled 45,000 TS, 30,000 YS, 15 El, 120 Brin
For structural uses, mufflers, corrosion resistant

ARMCO ABRASION RESISTING STEEL.
M-10; 0.43 max C, 1.4-2.0 Mn, 0.15-0.35 Si, bal Fe
As rolled 225-285 Brinell; good abrasion resistance for chutes, hoppers, spouts, truck bodies, ore cars, weldable with special precautions.

ARMCO BETA 3
M-10; 11.5 Mo, 6 Zr, 4.5 Sn, bal Ti.
Wrought: 100,000-110,000 TS; 90,000 YS, 15 El
Beta alloy: good cold formability, age hardenable to 135,000 TS AMS 4977

ARMCO DI-MAX M-15.
M-10,
Hot rolled silicon sheet steel, non-oriented, low core loss
For high efficiency distribution transformers and large power transformers.

ARMCO DI-MAX M-19.
M-10;
Hot rolled or cold finished silicon sheet steel; non-oriented; low core loss.
For 2, 4 or many pole large rotating machine laminations.

ARMCO DI-MAX M-22.
M-10;
Hot rolled or cold finished silicon sheet steel; non-oriented; low core loss.
For transformers, radio chokes, large rotating machines.

ARMCO DI-MAX M-27.
M-10,
Hot rolled or cold finished silicon sheet steel; non-oriented, low core loss
For transformers, radio chokes, domestic appliance motors

ARMCO DI-MAX M-36
M-10,
Hot rolled or cold finished silicon sheet steel, non-oriented, low core loss
For transformers, magnetos, motor laminations

ARMCO DI-MAX M-45
M-10,
Cold finished silicon sheet steel; low core loss, non-oriented
For generators, motor laminations

ARMCO ELECTROMAGNET IRON
M-10, 0.03 max C, bal Fe
Rolled 44,000 TS, 23,000 YS, 37 El, 70 RA; 83 Brin
Cold drawn 73,000 TS, 69,000 YS, 12 El, 63 RA, 142 Brin
For cores of DC electrical and magnetic equipment, high permeability.

ARMCO ENAMELING IRON
M-10, 0.1 max C, bal Fe
For enameling purposes, sheets

ARMCO HIGH STRENGTH A
M-10, 0.12 max C, 0.6 max Mn, 0.25-0.7 Si, 0.50-1.0 Cr, 0.8 max Ni, 0.1 max Mo, 0.3-0.5 Cu, 0.07 max Ti, bal Fe
½" max thickness 70,000 TS, 50,000 YS; 21 El
(thicker metal has higher C, Mn, and lower strength)
For bridges, buildings, railroad cars, agricultural equipment, vent stacks.
ASTM Standards A242, A588

ARMCO HIGH STRENGTH B
M-10, 0.22 max C, 0.85-1.25 Mn, 0.30 max Si, 0.2 min Cu, 0.02 min V, bal Fe.
¾" max thickness 70,000 TS, 50,000 El
(thicker metal has lower strength).
For bridges, buildings, railroad cars, dam components, tractors, trailers
ASTM Standard A441

ARMCO HIGH STRENGTH C-42
M-10, 0.21 max C, 1.35 max Mn, 0.3 max Si, 0.005-0.05 Cb or 0.01-0.10 V, bal Fe
60,000 TS, 42,000 YS, 24 El
For truck trailers, auto parts, utility poles.
ASTM Standard A572.

ARMCO HIGH STRENGTH C-45
M-10; 0.22 max C, 1.35 max Mn, 0.30 max Si, 0.005-0.05 Cb or 0.01-0.1 V, bal Fe.
60,000 TS, 45,000 YS; 19 El (8 in gage).
For miscellaneous structural work on bridges, buildings, railroad cars
ASTM Standard A572.

ARMCO HIGH STRENGTH C-50.
M-10; 0.23 max C, 1.35 max Mn, 0.30 max Si, 0.005-0.05 Cb, and/or 0.01-0.1 V, bal Fe.
65,000 TS, 50,000 YS; 18 El (8 in. gage).
For miscellaneous structural work on bridges, buildings, truck and trailer bodies.
ASTM Standard A572.

ARMCO HIGH STRENGTH C-55.
M-10; 0.25 max C, 1.35 max Mn, 0.30 max Si, 0.005-0.05 Cb and/or 0.01-0.1 V, bal Fe.
70,000 TS; 55,000 YS; 17 El (8 in. gage).
For miscellaneous structural work on bridges, buildings, railroad cars, trucks and trailers.
ASTM Standard A572.

ARMCO HIGH STRENGTH C-60
M-10; 0.26 max C, 1.35 max Mn, 0.30 max Si, 0.005-0.05 Cb and/or 0.01-0.10 V, bal Fe
75,000-TS; 60,000 YS, 15 El (8 in. gage).
For miscellaneous structural work on bridges, buildings, railroad cars, tanks, trucks
ASTM Standard A 572.

ARMCO HIGH STRENGTH C-65.
M-10; 0.26 max C, 1.35 max Mn, 0.30 max Si, 0.005-0.05 Cb, and/or 0.01-0.10 V, bal Fe.
80,000 TS, 65,000 YS, 15 El (8 in gage).
For miscellaneous structural work on bridges, transmission towers, utility poles, buildings
ASTM Standard A 572

ARMCO HIGH STRENGTH C-70.
M 10, 0.26 max C, 1.35 max Mn, 0.30 max Si, 0.005-0.05 Cb, and/or 0.01-0.10 V, bal Fe
85,000 TS, 70,000 YS.
For miscellaneous structural work on bridges, transmission towers, buildings, railroad cars, truck and trailer bodies, tanks

ARMCO HIGH STRENGTH D.
M 10; 0.28 max C, 1.1-1.6 Mn, 0.3 max Si, 0.20 min Cu, bal Fe
¾" max thickness 70,000 TS, 50,000 YS, 18 El
For bolted or riveted bridges, buildings, mining applications
ASTM Standard A440

ARMCO HY-80.
M-10, 0.18 max C, 0.10-0.40 Mn, 0.15-0.35 Si, 2.0-3.25 Ni, 1.0-1.8 Cr, 0.2-0.6 Mo, bal Fe
⅝" max thickness· 80,000-100,000 YS, 19 El
For submarine hulls, deck and hatch sections, diving bells, helicopter decks, other navy and marine applications, weldable.
MIL-S-16216 G (ships), (plate).

ARMCO HY-100.
M-10; 0.20 C, 0.10-0.40 Mn, 0.15-0.35 Si, 2.25-3.50 Ni, 1.0-1.8 Cr, 0.2-0.6 Mo, bal Fe.
⅝" max thickness 100,000-120,000 YS, 18 El.
For submarine hulls, marine diving bells, deck sections, weldable
MIL-S-16216 G (Ships), (plate)

ARMCO INGOT IRON.
M-10; 0.012 C, 0.017 Mn, 0.005 P, 0.025 Si, bal Fe
Treated: 38,000-45,000 TS; 20,000-25,000 YS, 40 El, 50 RA, 85 Brin.
Annealed· 38,000 TS, 19,000 YS, 40 El, 50 RA; 85 Brin.
For pipes, roofing, tanks, culverts, stoves, metal furniture, ductile.

ARMCO LO-TEMP, GRADE A.
M-10, 0.20 max C, 0.70-1.35 Mn, 0.15-0.50 Si, 0.25 max Cr, 0.25 max Ni, 0.08 max Mo, 0.35 max Cu, bal Fe.
1¼" max thickness: 70,000-90,000 TS; 50,000 YS; 18 El (8 in. gage).
Weldable, fine-grain, good toughness to −75°F.
For off shore platforms, ships, process and pressure tanks, storage tanks.
ASTM Standard A537.

ARMCO LTM.
M-10; 0.14 max C, 0.9-1.35 Mn, 0.15-0.30 Si, bal Fe
¾" max thickness· 62,000-82,000 TS; 42,000 YS; 20 El (8 in. gage).
For pressure vessels; fine grain; weldable.
Good toughness to −75°F. for pipes, tanks, refrigerated containers.

ARMCO ORIENTED M-3.
M-10,
Iron-silicon electrical steel sheet with oriented properties; low core loss; thickness 9 mils.

ARMCO ORIENTED M-4.
M-10,
Iron-silicon electrical steel sheet with oriented properties; low core loss, thickness 11 mils

ARMCO ORIENTED M-5.
M-10;
Iron silicon electrical steel sheet with oriented properties; low core loss; thickness 11, 12 mils.

ARMCO ORIENTED M-6
M-10,
Iron silicon electrical steel sheet with oriented properties, low core loss; thickness 12, 14 mils.

ARMCO ORIENTED M-7
M-10,
Iron silicon electrical steel sheet with oriented properties, low core loss; thickness 14 mils.

ARMCO ORIENTED M-8.
M-10,
Iron silicon electrical steel sheet with oriented properties; low core loss.

ARMCO ORIENTED T.
M 10,
Thin iron silicon sheets, electrical steel, with directional magnetic properties, good permeability; for transformers, yoke cores.

ARMCO ORIENTED TG.
M-10,
Thin iron-silicon sheets, electrical steel, with directional magnetic properties, designed for 400 Hz and higher frequency service

ARMCO ORIENTED T-S.
M-10;
Thin iron-silicon sheets, electrical steel, with directional magnetic properties, designed for 400 cycle service at inductions above 16 kilogausses

ARMCO PH 13-8 Mo.
M-10, 0.05 max C, 12.25-13.25 Cr, 7.5-8.5 Ni, 2.0-2.5 Mo, 0.9-1.35 Al, bal Fe
Martensitic stainless; precipitation hardenable.
Cond H 950, 225,000 TS, 205,000 YS; 12 El.
For springs, stampings, fasteners; better transverse properties than 17-7 PH

ARMCO PH 14-8 Mo
M-10; 0.05 C, 13.5-15.5 Cr, 7.5-9.5 Ni, 2.0-3.0 Mo, 0.75-1.25 Al, bal Fe
Semi-austenitic, precipitation hardened.
Cond SRH 900; 230,000 TS; 215,000 YS; 6 El.
For springs, stampings, watch and instrument parts, fasteners; stainless

ARMCO PH 15-7 Mo.
M-10; 0.09 max C, 14.0-16.0 Cr, 6.5-7.75 Ni, 2.0-3.0 Mo, 0.75-1.50 Al, bal Fe.
Semi-austenitic; precipitation hardened.
Annealed: 130,000 TS; 55,000 YS; 35 El.
Hardened: 220,000-265,000 TS; 210,000-260,000 YS; 7-2 El; 45-50 Rock C.
For springs, watch and instrument parts as gears, cams, levers, fasteners; stainless.

ARMCO QTC.
M-10; 0.20 max C, 1.15-1.50 Mn, 0.20-0.50 Si, 0.20 max Cr, 0.15 max Ni, 0.08 max Mo, 0.20 min Cu, 0.0015 min B, bal Fe.
¾" max thickness: 100,000-120,000 TS; 80,000 YS, 18 El
Quenched and tempered, fine-grain, weldable, for off-shore platforms, ships, railroad cars.

ARMCO SSS 100A A 514, A517, Grade D
M-10; 0.20 max C, 0.40-0.70 Mn, 0.20-0.35 Si, 0.85-1.2 Cr, 0.15-0.25 Ni, 0.2-0.4 Cu, 0.04-0.1 Ti or V, 0.0015-0.005 B, bal Fe
1¼" max thickness 115,000-135,000 TS; 100,000 YS, 18-16 El
Quenched and tempered steel for bridges, buildings crane booms, ships, earth moving equipment.
ASTM Standard A514, A517.

ARMCO SSS 100, A514, A517, GRADE E
M-10; 0.20 max C, 0.40-0.70 Mn, 0.20-0.35 Si, 1.4-2.0 Cr, 0.4-0.6 Mo, 0.2-0.4 Cu, 0.04-0.1 Ti or V, 0.0015-0.005 B, bal Fe
2½" max thickness: 115,000-135,000 TS; 100,000 YS, 18-16 El
Quenched and tempered steel for bridges, buildings, crane booms, ships, earth moving equipment
ASTM Standard A514, A517.

ARMCO SSS 100B, A514, A517, Grade L.
M-10; 0.20 max C, 0.40-0.70 Mn, 0.20-0.35 Si, 1.15-1.65 Cr, 0.25-0.40 Mo, 0.20-0.40 Cu, 0.04-0.10 Ti or V, 0.0015-0.005 B, bal Fe
2" max thickness: 115,000-135,000 TS, 100,000 YS, 18-16 El
Quenched and tempered steel for buildings, bridges, ordnance, ships, earth moving equipment, crane booms
ASTM Standard A514, A517

ARMCO SUPER-LO-TEMP, GRADE B
M-10, 0.20 max C, 0.70-1.35 Mn, 0.15-0.50 Si, 0.25 max Cr, 0.25 max Ni, 0.08 max Mo, 0.35 max Cu, bal Fe
1¼" max thickness. 80,000-100,000 TS, 60,000 YS, 22 El.
Quenched and tempered, fine-grain, excellent low temperature properties For refrigerated storage tanks
ASTM Standard A537.

ARMCO Ti-5Al-2½ Sn
M-10, 4-6 Al, 2-3 Sn, bal Ti.
Wrought. 115,000 TS, 110,000 YS, 10 El
Forgeable, weldable, good creep resistance to 900°F; alpha alloy. For aircraft parts and low temperature equipment.
AMS 4926, 4966

ARMCO Ti-6Al-2Sn-4Zr-6Mo.
M-10, 6 Al, 2 Sn, 4 Zr, 2 Mo, bal Ti.
Heat treated: 130,000 TS; 120,000 YS; 10 El.
Alpha-beta alloy; good high temperature creep strength; for jet engine components.
AMS 4975.

ARMCO Ti-6Al-2Sn-4Zr-6Mo.
M-10; 6 Al, 2 Sn, 4 Zr, 6 Mo, bal Ti.
Heat treated: 170,000-180,000 TS; 160,000-170,000 YS; 10-8 El.
High strength titanium alloy.

ARMCO TI-6Al-4V.
M-10, 5.5-6.5 Al, 3.5-4.5 V, bal Ti
Wrought: 130,000 TS, 120,000 YS; 10 El
Alpha-beta alloy, weldable, heat treatable, good properties to 800°F; for compressor blades and wheels, spacers, cryogenic applications, rocket cases, marine equipment.
AMS 4928; MIL-T-9047, Type III Comp A.

ARMCO TI-6Al-6V-2Sn
M-10, 6 Al, 6 V, 2 Sn, bal Ti
Wrought: 140,000-150,000 TS; 130,000-140,000 YS; 10 El
Alpha-beta alloy; for rocket engine cases, ordnance and aircraft components.
AMS 4978; MIL-T-9047

ARMCO Ti-8Al-1Mo-1V
M-10, 7.5-8.5 Al, 0.75-1.25 Mo, 0.75-1.25 V, bal Ti
Wrought 130,000 TS, 120,000 YS, 10 El
Alpha-beta alloy, good creep properties at elevated temperature, for jet engine and aircraft parts
AMS 4972

ARMCO Ti 40
M-10, Essentially pure titanium.
Wrought 50,000 TS, 40,000 YS, 20 El
For aircraft ducting, corrosion resisting parts in chemical industry
AMS 4902 (sheet)

ARMCO Ti 55
M-10, Commercially pure titanium.
Wrought 65,000 TS, 55,000 YS, 18 El
For anodizing racks, welding wire, aircraft industry, chemical industry
AMS 4900 (sheet)

ARMCO Ti 70.
M 10, Commercially pure titanium
Wrought. 80,000 TS; 70,000 YS, 15 El.
For racks in chemical industry, anodizing racks, aircraft industry.
AMS 4921 (bar).

ARMCO TRAN-COR A-6
M-10
Hot rolled silicon sheet steel, non-oriented, low core loss transformer grade, for large magnetic amplifiers, saturable reactors.

ARMCO TRAN-COR M-14
M-10
Hot rolled silicon sheet steel, non-oriented, low core loss transformer grade, for distribution transformers and large power transformers

ARMCO TRAN-COR 72
M-10, 3.0-3.4 Si, bal Fe
For electrical purposes, large generators, transformers; for magnetic cores

ARMCO TRAN-COR T
M-10
Thin iron-silicon sheets, electrical steel, non-oriented; good permeability, for transformers, chokes, converters, generators

ARMCO VTN
M-10; 0.22 max C, 1.15-1.50 Mn, 0.15-0.30 Si, 0.04-0.11 V, 0.01-0.02 N, bal Fe.
80,000-100,000 TS; 60,000 YS; 23 El
For pressure vessels, truck bodies, heavy machinery, construction, farm equipment. Weldable, good shock resistance to −75°F.

ARMCO ZGPG ZINCGRIP-PAINTGRIP.
M-10; Galvanized sheet steel phosphated.
For structures, sheet metal work, mill bonderized.

ARMCO ZINC GRIP.
M-10, 0.03 max C, bal Fe
For roofing, culverts; galvanized sheets.

ARMCO ZINCGRIP PAINTGRIP.
M-10, galvanized steel.
For structures; discontinued.

ARMELEC
M-691; 0.5 Si, bal Fe.
For armatures, motors, good permeability.

ARMIDE
M-132; Carbide alloy TaC.
250,000 TS.
For tipped cutters and tools, hard, tough and wear resisting.

ARMIDE (78)
M-132; Sintered carbide tool material
For cutting tools, finishing and light roughing cuts on steel

ARMIDE (78B)
M-132, Sintered carbide tool material
For cutting tools, general purpose machining of steel

ARMIDE (350)
M-132, Sintered carbide tool material
For cutting tools, light roughing and general finishing cuts on steel

ARMIDE (370)
M 132, Sintered carbide tool material
Cutting tools for heavy roughing cuts on steel

ARMIDE (883)
M-132, Sintered carbide tool material
For cutting tools, general purpose cutting of cast iron and non-ferrous metals.

ARMIDE GRAY
M-132, carbide
For tipped tools, for machining cast iron and brass

ARMIDE RED.
M-132, carbide
For tipped tools, for machining steel.

ARMIN 90
M-1307, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe
For engravers' tools, blanking and forming dies, high speed steel

ARMORLOY see McKAY ARMORLOY

ARMORLOY C
M-849, 0.09-0.15 C, 25 min Cr, 20 min Ni, bal Fe
Welded 87,000 TS, 60,000 YS, 45 El
For welding electrodes for armor, shielded arc, work hardenable

ARMSTEEL 88M
M-690, 3 C, Si, Mn, bal Fe
Cast. 105,000 TS, 85,000 YS, 2 El; 302 Brin
For transmissions gears and shafts, universal joints, pearlitic malleable iron.

ARMSTRONG.
U.S., 12 Cr, 5 Si, 0.5 C, bal Fe
For heat resisting steel parts; heat resisting stainless steel

ARMSTRONG-1.
U.S.; 3-50 Cr, 0.5-8 Si, C, bal Fe.
For heat and corrosion resisting parts; heat resisting.

ARMSTRONG-2.
U.S; 21.6 Cr, 3.4 Si, 2.35 C, 2.25 Mn, bal Fe.
For heat and corrosion resisting parts; heat resistant cast iron.

ARMSTRONG-3.
U.S., 12 Cr, 5 Si, 0.45 C, bal Fe
For heat and corrosion resisting parts; heat and corrosion resistant.

ARMSTRONG HIGH SPEED
M-132; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, cutters; high speed steel.

ARMSTRONG METAL.
Eng., 0.10 C, 4-6 Mn, 17 Cr, 8 Ni, 3 Cu, bal Fe
Annealed. 70,000 TS, 52 El, 71 RA, 126 Brin
For heat resisting parts; heat and corrosion resistant.

ARMSTRONG SELF HARDENING
M 132, C, alloy, bal Fe.
For tool shanks, oil hardening.

ARNE
M-111; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, 0.1 V, bal Fe
For dies, for cold work AISI O1.

ARNGRIM 2
M-111, 0.68 C, 0.25 Cr, 6 W, bal Fe
For permanent magnets.

ARNGRIM 3
M-111, 0.72 C, 0.65 Cr, 6 W, bal Fe
For permanent magnets

ARNOX-I
M-670, Barium ferrite + iron oxide
Hc = 1800, Hm = 10,000, Br 2200.
(BdHd) max 1,000,000; Bd = 1150
For magnets in door latches, holding assemblies, D C motors, focusing devices.
Permanent magnet, non conducting Non-oriented

ARNOX-III
M-670, Oxides
Hm = 8000; Br = 1500
Hc = 1100, Bd = 800
(BdHd) max = 400,000
For permanent magnets in toys and novelties, timing motors Non-oriented
Molded type magnet High coercive force and low residual induction and energy product

ARNOX-V
M-670, Barium ferrite.
Hm = 10,000, Br = 3950, Hc = 2200
(BdHd) max = 3,500,000; Bd = 2000
For permanent magnets in loudspeakers, motors, generators, magnetic separation applications
Ceramic magnet High coercive force
Magnetized in direction of orientation

ARNOX-Va
M-670, Barium ferrite.
Max energy product 3,500,000.
Remanence, Br, gauss 3850
Coercive force, Hc, oersteds 2000.
For permanent magnets (non-conducting)
Hard brittle ceramic, high coercive force, low flux density

ARO
M-1705, 0.50 C, 0.7 Mn, 0.7 Si, 0.2 V, 0.45 Mo, bal Fe.
Oil or water hardening shock resisting tool steel. AISI S2

AROSTIT C13
M-1325, 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed. 75,000 TS, 40,000 YS, 35 El; 70 RA; 180 Brin.
For turbine blades, chemical plant equipment; Type 410; corrosion resistant.

AROSTIT C13S.
M-1325; 0.12 max C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed. 70,000 TS; 40,000 YS; 30 El; 55 RA; 150 Brin.
Cold drawn: 130,000 TS; 120,000 YS; 2 El; 270 Brin.
For chemical plant equipment, bolts, oil refinery parts; Type 430F; corrosion and heat resistant.

AROSTIT C15.
M-1325; 0.25 C, 14.5 Cr, 1 max Ni, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El; 55 RA; 195 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For cutlery, valves, surgical instruments; Typt 420; corrosion resistant.

AROSTIT C18.
M-1325; 0.25 C, 17 Cr, 1 max Ni, bal Fe.
Annealed: 75,000 TS; 42,000 YS; 28 El; 53 RA; 160 Brin
For chemical plant equipment, bolts, shafts; Type 430; corrosion and heat resistant.

AROSTIT C20.
M-1325; 0.2 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For turbine blades, cutlery, surgical instruments, Type 420; corrosion resistant.

AROSTIT C20N.
M-1325; 0.20 C, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 50 RA, 205 Brin.
For turbine blades, cutlery, valves; corrosion resistant.

AROSTIT C22K.
M-1325; 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
Cold drawn. 130,000 TS, 110,000 YS, 15 El, 35 RA; 270 Brin.
For pump shafts, marine hardware, valve trim; Type 431; corrosion and heat resistant

AROSTIT C22L.
M-1325, 0.35 C, 16.5 Cr, 1.15 Mo, bal Fe.
Annealed: 130,000 TS; 100,000 YS; 18 El, 52 RA; 275 Brin.
For pump shafts, marine hardware, valve trim, corrosion resistant.

AROSTIT C30.
M-1325; 0.4 C, 29 Cr, 1.3 Si, bal Fe.
For furnace parts and equipment, heat treat boxes; heat resistant, ferritic.

AROSTIT C30H.
M-1325; 1.2 C, 1.3 Si, 29 Cr, bal Fe.
For wear plates, rolls, crushers; corrosion and heat resistant.

AROSTIT C30N.
M-1325; 1.3 C, 1.3 Si, 29 Cr, 2 Mo, bal Fe.
For wear plates, rolls, crushers; corrosion and heat resistant.

AROSTIT C40.
M-1325; 0.4 C, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 22 El; 52 RA; 200 Brin.
Cold drawn: 110,000 TS, 90,000 YS; 15 El; 45 RA; 225 Brin.
For turbine blades, gages, valve trim, cutlery; Type 420; corrosion resistant.

AROSTIT C90N.
M-1325; 0.9 C, 18 Cr, 1.15 Mo, 1 V, bal Fe.
Annealed: 107,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin.
For cutlery, valve parts, bearings, instruments; Type 440B; corrosion resistant, hardenable.

AROSTIT CK4.
M-1325; 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
For furnace equipment, heat treat boxes; heat resistant.

AROSTIT CK8.
M-1325; 0.15 C, 1.5 Si, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 50 El, 65 RA; 160 Brin.
For chemical plant equipment, tanks, mixers; Type 302; stainless, austenitic.

AROSTIT CK8 EXTRA.
M-1325; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe
Annealed: 85,000 TS; 35,000 YS; 55 El, 65 RA; 150 Brin.
For welded structures, chemical plant equipment; Type 321, stainless, austenitic.

AROSTIT CK8SI.
M-1325, 0.1 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 85,000 TS, 35,000 YS, 60 El; 70 RA; 140 Brin.
For welded structures, chemical plant equipment; Type 302, stainless, austenitic.

AROSTIT CK9N
M-1325, 0.15 C, 2 Si, 2 Mo, 9.5 Ni, 18 Cr, bal Fe.
Annealed 80,000 TS, 30,000 YS; 60 El, 80 RA; 135 Brin
Cold drawn: 150,000 TS, 135,000 YS, 6 El, 300 Brin.
For acid resistant equipment, mixers, filters, agitators; Type 316; stainless, austenitic

AROSTIT CK9N EXTRA
M-1325, 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Ti = 4 × C, bal Fe
Annealed: 85,000 TS; 35,000 YS, 50 El; 75 RA; 160 Brin.
Cold drawn. 150,000 TS, 135,000 YS, 6 El, 30 Brin
For welded structures, chemical plant equipment; Type 316 Ti, stainless, austenitic

AROSTIT CK12.
M-1325; 0.17 max C, 17 Cr, 4.7 Mo, 13 Ni, bal Fe
Annealed: 90,000 TS; 40,000 YS; 45 El, 65 RA, 170 Brin
For acid resistant equipment, mixers, agitators, Type 317, stainless, austenitic.

ARPOCALLOY
M-1012; C, Ni, Mo, bal Fe.
For tool shanks, cast iron.

ARRESTITE
M-97; 0.9 C, 1.5 Mn, 0.2 Cr, bal Fe.
For general tools; non-deforming.

ARROW.
M-73; 0.3 C, 1.0 Cr, 0.6 Mo, 0.2 V, bal Fe.
For tools, dies; water hardening.

ARROW NO. 16.
M-341; 0.95 C, 1.2 Mn, 0.5 Cr, 0.5 W, 0.1 V, bal Fe.
For tools and dies; non-deforming oil hardening.

ARROW HIGH SPEED.
M-355; 0.7 C, 18 W, 4 Cr, 2 V, bal Fe.
For tools, dies, broaches, drills; high speed steel

ARROW OIL HARDENING.
M-336; 0.6 C, 1.5 W, 0.9 Mn, 3 Cr, IV, bal Fe.
88,800 TS; 55,100 YS; 30 El; 189 Brin.
For tools, dies, perforated dies, taps, intricate shapes; non-shrinking.

ARROW OIL HARDENING.
M-387; 0.7 C, 2 W, bal Fe
For tools, dies; oil hardened.

ARROW OIL HARDENING SWEDISH STEEL.
M-336; 0.95 C, 1.25 Mn, 0.5 Cr, 0.5 W, 0.1 V, bal Fe.
For thread gages, taps, master tools, dies; non-shrinking.

ARROW SPECIAL.
M-355; 1.1 C, bal Fe.
For tools, dies.

ARS.
M-373; 2.35 C, 12.0 Cr, 4.0 V, 1.0 Mo, bal Fe
Air or oil hardening cold work tool steel, chromium type, AISI D7

ARSENICAL ADMIRALTY 30.
M-141, 71 Cu, 1.0 Sn, 0.03 As, bal Zn.
Annealed 53,000 TS, 65 El
Drawn: 85,000 TS, 10 El
For condenser and heat exchanger, embrittlement free

ARSENICAL ADMIRALTY-443.
M-8; 71.0 Cu, 27.96 Zn, 1.0 Sn, 0.04 As
Soft: 48,000 TS, 18,000 YS, 65 El, B 25 Rock
For condenser tubes, heat exchangers.
Resists dezincification, corrosion resistant

ARSENICAL ALUMINUM BRASS 54.
M-141, 76 Cu, 2 Al, 0.03 As, bal Zn
Annealed 60,000 TS, 27,000 YS, 55 El
For condensers and heat exchangers, free of embrittlement

ARSENICAL ALUMINUM BRONZE 53
M-141, 5.5 Al, 0.25 As, bal Cu
Annealed 60,000 TS, 22,000 YS, 60 El
For condenser tubes, resists sea-water corrosion

ARSENICAL COPPER
M-33, 99.7 Cu, 0.2 As, 0.02 P
Annealed: 34,000 TS, 10,000 YS; 45 El
Drawn 55,000 TS, 50,000 YS, 8 El
For condenser, heat exchanger, boiler tubes, corrosion resisting.

ARSENIC BRONZE
U.S.; 80 Cu, 10 Sn, 9.2 Pb, 0.8 As
30,000 TS, 60 Brin
For bearings; heavy duty

ART DIE.
M-35; 0.95 C, 0.30 Cr, 0.02 V, 0.25 Mn, bal Fe
Annealed 170 Brin
For jewelers' dies; deep hardening.

ARZADE
M-14; 3 C, 1.5 Si, bal Fe
For castings; malleable cast iron.

ARZITE
M-14, 3 C, Si, Mn, bal Fe.
For gears, fittings, housings, malleable iron

ARZITE METAL.
M-14; 3.2 C, 1.5 Si, 1.5 Ni, 0.8 Cr, bal Fe.
For castings; corrosion resistant malleable iron.

ARZON METAL.
M-14, 0.90 Si, 0.85 Mn, 2.30 C, 0.09 S, 0.16 P, bal Fe.
Cast: 90,000 TS; 65,000 YS; 6 El, 200 Brin.
Treated: 100,000 TS, 80,000 YS; 5 El.
For malleable iron castings, fittings, plumbing; close grain, white fracture.

AS5.
M-1176; 1-3 Cu, 5 Si, 0.5 Mg, bal Al.
Heat treated. 50,000-57,000 TS; 40,000-46,000 YS; 5-2 El; 110-140 Brin.
For light alloy parts, age-hardenable.

A.S. NO 5.
M-694, 1.0 C, 0.7 Mn, 5 Cr, 0.25 V, 1.1 Mo, bal Fe.
For tools, dies, air hardening.

A.S NO 7
M-694; 0.45 C, 0.9 Si, 1.15 Cr, 0.2 V, 2.5 W, bal Fe.
For master hobs, shear blades, punches; Type S1, hot work steel

AS10.
M-1176; 2.0-2.5 Cu, 9.5-10.5 Si, 1.4 Mg, 0.8-1.2 Ni, bal Al
Cast: 36,000-50,000 TS; 34,000-42,000 YS; 0.5-0.3 El, 95-125 Brin
For light alloy parts; corrosion resistant.

A.S. NO 15
M-694, 0.5 C, 0.7 Mn, 0.8-1.1 Cr, 0.15 V, bal Fe.
For dies, pressure resisting steel

A.S NO 27
M-694, 0.95-1.1 C, 0.3 Mn, 1.5 Cr, 0.2 V, bal Fe
For tools, dies, pressure resistant steel.

A.S NO. 42.
M-694, 0.3 C, 0.2 Mn, 3.5 Cr, 9.75 W, 0.5 V, bal Fe
For hot dies, hot work steel

A.S NO 46 GREEN LABEL
M-694, 0.9 C, 1.1 Mn, 0.5 Cr, 0.5 W, 0.2 V, bal Fe
For gages, spindles, punches, forming and trimming dies, Type O1, non-deforming, oil hardened.

A.S NO 66
M-694 0.8 C, 4 Cr, 2 V, 4-5 Mo, 6 W, bal Fe.
For lathe and planer tools, drills, form cutters, hot punches, high speed steel

A.S NO 85
M-694, 0.55 C, 0.4 Mn, 0.3 Si, 1.0 Cr, 3.0 Ni, 0.3 Mo, bal Fe
Oil hardening steel for shafts, lathe centers, tool holders

A.S NO 121
M-694, 0.95 C, 2.0 Mn, 2.2 Cr, 1.1 Mo, bal Fe.
Air hardening, medium alloy tool steel, for cold working tools; AISI A4.

A.S NO 670
M-694, 0.38 C 1.0 Si, 5.25 Cr, 1.05 V, 1.25 Mo, bal Fe
Air hardening hot work tool and die steel, chromium type, AISI H 13

A.S ACK-LOW
M-694, 0.70 C, 2.1 Mn, 1.0 Cr, 1.3 Mo, bal Fe
Air hardening cold work tool steel
AISI A6

ASARCOLO 117
M-815, 23 Pb, 5 Cd, 45 Bi, 8 Sn, 19 In.
Cast 5400 TS, 12 Brin
For hermetic seals, heat transfer medium, fusible cores; M.P 117

ASARCOLO 158.
M-815, 27 Pb, 10 Cd, 50 Bi, 13 Sn
6000 TS, 9 Brin
For foundry cores, pipe bending, for anchoring; M.P 158°F; fusible alloy.

ASARCOLO 158-162.
M-815; 50 Bi, 25 Pb, 12.5 Cd, 12.5 Sn.
For fire protection devices; fusible alloy; M.P. 158-162°F.

ASARCOLO 158-190.
M-815; 42.5 Bi, 37.7 Pb, 11.3 Sn, 8.5 Cd.
5500 TS; 9 Brin.
For foundry patterns, coating core boxes, spotting fixtures; M.P. 158-190°F; fusible alloy.

ASARCOLO 205.
M-815; 52 Bi, 32 Pb, 16 Sn.
For fire protection devices; fusible alloy; M.P. 205°F.

ASARCOLO 205-215.
M-815, 50 Bi, 31 Pb, 19 Sn.
For fire protection devices; fusible alloy; M.P. 205-215°F.

ASARCOLO 217-440.
M-815, 28.5 Pb, 14.5 Sn, 9 Sb, 48 Bi.
13,000 TS, 19 El.
For anchoring punches in stamping dies, making chuck jaws; M.P. 217-440°F, fusible alloy.

ASARCOLO 243-260.
M-815, indium alloy.
For soldering and sealing; M.P. 243-260°F, fusible alloy.

ASARCOLO 255
M-815, 45 Pb, 55 Bi.
6400 TS; 10 Brin.
For foundry molds, dies, proof casting cavities, M.P. 255°F, fusible alloy.

ASARCOLO 255-300.
M-815; 50 Bi, 50 Pb
For fire protection devices; fusible alloy, M.P. 255-300°F.

ASARCOLO 281
M-815, 58 Bi, 42 Sn
8000 TS; 22 Brin.
For molds and patterns; M.P. 281°F; fusible alloy

ASARCOLO 281-338
M-815, 40 Bi, 60 Sn.
8000 TS; 22 Brin
For soldering and sealing, M.P. 281-338°F; fusible alloy

ASARCOLO 362
M-815, 38 Pb, 62 Sn.
For fire protection devices; fusible alloy; M.P. 362°F

ASARCOLOY NO 7.
M-314, 0.75-3.0 Ni, bal Cd
Cast: 164,000 TS; 117,000 YS, 19 El, 43 RA; 33 Brin
For bearings, for severe service

ASARCON 3
M-815, M-314, 4.15 Al, 0.5 Mg, bal Zn.
Die Cast: 40,000 TS, 63,000 CS; 8 El, 80 Brin
For die castings, hardware, door knobs, instrument cases, coin chutes, ornaments.
High fluidity and castability.

ASARCON 7.
M-815, M-314; 3.5-4.3 Al, 0.25 max Cu, 0.010-0.020 Mg, 0.005-0.020 Ni, 0.003 max Cd, bal Zn
Die Cast 41,000 TS; 14 El, 76 Brin
For die castings, hardware, instrument cases, ornaments, coin chutes.
High fluidity and castability

ASARCON 55.
M-314, M-815; 5 Sn, 5 Pb, 5 Zn, 85 Cu.
Cast: 43,000 TS; 21,400 YS; 28 El; 72 Brin.
For water pump impellers, bushings, fittings; SAE 40; leaded red brass.

ASARCON 59.
M-314, M-815; 5 Sn, 9 Pb, 1 Zn, bal Cu.
Cast: 38,000 TS; 21,000 YS; 20 El; 66 Brin.
For bearings, bushings, sleeves, SAE 66; leaded bronze.

ASARCON 61.
M-314, M-815; 6 Sn, 1.5 Pb, 4.5 Zn, 88 Cu
Cast: 45,000 TS; 23,000 YS; 35 El; 76 Brin.
For gears, bearings, bushings; SAE 622, continuous cast.

ASARCON 77.
M-314, M-815, 7 Sn, 7 Pb, 3 Zn, 83 Cu.
Cast 40,000 TS; 27,000 YS; 16 El, 72 Brin
For bearings, spring bushings, thrust washers, SAE 660; leaded bronze

ASARCON 80.
M-314, M-815; 8 Sn, 4 Zn, 88 Cu
Cast. 49,000 TS, 23,000 YS, 18 El; 77 Brin.
For gears, bearings, sleeves; SAE 620, hard bronze

ASARCON 100
M-314, M-815, 10 Sn, 2 Zn, 88 Cu
Cast 51,000 TS, 28,000 YS, 18 El, 92 Brin
For gears, bearings, liners, sleeves, SAE 62, hard bronze

ASARCON 102
M-314, M-815, 10 Sn, 2 Pb, 88 Cu
Cast 49,000 TS, 25,000 YS, 18 El, 86 Brin
For bushings, bearings, sleeves, SAE 63, leaded gun metal

ASARCON 102N
M-314, 84 Cu, 10 Sn, 2.5 Pb, 3.5 Ni, bal Zn
Cast 53,000 TS, 31,000 YS, 15 El, 92 Brin
For hardware, marine parts, liners, free-cutting, leaded bronze

ASARCON 110
M-314, M-815 11 Sn, 89 Cu
Cast: 51,000 TS, 29,000 YS, 18 El, 100 Brin
For gears, worms, shafts, Al-bronze, continuous cast

ASARCON 210
M-314, M-815, 2.5 Sn, 10 Pb, 7.5 Zn, 80 Cu
Cast: 34,000 TS, 18,000 YS, 22 El, 62 Brin
For bearings, bushings, liners; leaded bronze

ASARCON 230
M-815, M-314, 1.5-2.5 Sn, 27.0-35.0 Pb, 0.25-0.75 Ni, bal Cu
Cast 16,300 TS, 9000 YS, 10 El, 30 Brin
For self-lubricating bearings, bushings and seals, jet engine fuel pumps
Leaded bronze Free-machining

ASARCON 310 N
M-314, M-815, 77 Cu, 3 Sn, 10 Pb, 8 Zn, 2 Ni
Cast 48,000 TS; 28,000 YS, 8 El, 80 Brin
For bearings Continuous cast.

ASARCON 520.
M-314, M-815, 5 Sn, 20 Pb, 75 Cu
Cast: 28,700 TS, 22,800 YS, 8 El, 57 Brin
For bearings, bushings, liners, leaded bronze.

ASARCON 773
M-314, M-815, 7 Sn, 7 Pb, 3 Zn, 83 Cu
Cast 40,000 TS; 27,000 YS, 16 El, 72 Brin
For bearings, bushings, liners, SAE 660, leaded bronze.

ASARCON 1010.
M-314, M-815; 10 Sn, 10 Pb, 80 Cu.
Cast: 41,000 TS, 26,000 YS, 10 El; 80 Brin.
For bearings, bushings, liners; SAE 64 leaded bronze.

ASARCON 1010B.
M-815; 10 Sn, 10 Pb, bal Cu.
Cast: 45,000 TS; 29,000 YS; 5 El; 93 Brin.
For gears, bearings, bushings, shafts; continuous cast

ASARCO ZDC NO 7.
M-815, M-314; 3.5-4.3 Al, 0.25 max Cu,
0.005-0.020 Mg, 0.005-0.020 Ni, 0.003 max Cd,
bal Zn.
Die Cast. 41,000 TS; 10 El, 82 Brin.
For hardware, housings, instrument cases.
Die castings.

A.S BEARCAT.
M-694, 0.50 C, 0.70 Mn, 3.25 Cr, 1.4 Mo, bal Fe
Air or oil hardening tool steel; good resistance
to impact, AISI S7.

A.S BLUE LABEL
M-694, 1.0-1.1 C, 0.25 Mn, 0.25 Si, bal Fe
For taps, drills, reamers, hobs, broaches;
Type W1, water hardened

A.S BRAKE & DIE STEEL
M-694; 0.50 C, 1 Cr, 0.9 Mn, 0.2 Mo, bal Fe.
For press brakes for forming and bending,
resists shock and wear

ASC #1.
M-569, 0.25-0.30 C, 0.70 Mn, 0.40 Si, bal Fe
Ann 70,000 TS, 40,000 YS, 24 El, 150 Brin
Uses castings for construction, railroad

ASC #2
M-569; 0.40-0.50 C, 0.70 Mn, 0.40 Si, bal Fe
Ann 80,000 TS, 40,000 YS, 18 El, 170 Brin
Uses castings for dies
Flame hardenable, wear resistant

ASC #3
M-569, 0.60-0.80 C, 0.70 Mn, 0.40 Si, bal Fe
Norm & Temper 110,000 TS, 60,000 YS, 10 El,
190 Brin
Uses castings for dies
Flame hardenable, wear resistant

ASC #5
M-569, 0.20 C, 0.70 Mn, 0.50 Si, 1.5 Cr,
1.1 Mo, bal Fe
Norm & Temper 70,000 TS, 40,000 YS, 20 El,
160 Brin
Uses Turbine casings and supports
High temp steel castings

ASC #6
M-569, 0.18 C, 0.60 Mn, 2.5 Cr, 1.1 Mo, bal Fe
Norm & temper. 70,000 TS, 40,000 YS, 20 El,
160 Brin.
Uses Turbine casings and supports
High temp steel castings

ASC #7
M-569, 0.25 C, 0.60 Mn, 0.50 Si, 0.60 Mo, bal Fe.
Norm & Temper. 70,000 TS, 45,000 YS, 22 El,
160 Brin
Uses Turbine casings and supports.
High temp steel castings

ASC #8
M-569, 0.30 C, 1.30 Mn, 0.50 Si, 0.40 Mo, bal Fe
Norm & Temper 90,000 TS, 60,000 YS, 180 Brin
Quenched. 200,000 TS, 150,000 YS, 400 Brin
High strength castings—dies
Weldable, water hardenable.

ASC #11
M-569; 0.40 C, 1.15 Mn, 0.40 Si, 1.15 Cr,
0.40 Mo, bal Fe
Physicals depend on heat treatment.
High strength castings.
Similar to wrought AISI 4140.

ASC #15.
M-569; 0.40 C, 1.15 Mn, 0.40 Si, 1.15 Cr,
1.75 Ni, 0.40 Mo, bal Fe.
Physicals depend on heat treatment
High strength castings—dies.
Similar to wrought AISI 4340

ASC-B10
M-1248, 0.4 Be, 2.6 Co, bal Cu
Annealed· 50,000 TS; 25,000 YS; 30 El; 50 RA;
70 Brin
Aged 125,000 TS; 105,000 YS, 8 El, 10 RA;
240 Brin
For current carrying springs, switch parts;
heat treatable, corrosion and wear resistant.

ASC-B25
M-1248, 1.9 Be, 0.3 Co, bal Cu
Annealed. 75,000 TS, 30,000 YS, 50 El, 70 RA;
80 Brin
Aged 205,000 TS, 170,000 YS, 1 El, 3 RA,
380 Brin
For electrical contacts, springs, diaphragms;
age hardenable, corrosion resistant

ASC B165
M-1248, 1.7 Be, 0.2-0.35 Co, bal Cu
Annealed 60,000 TS, 28,000 YS, 60 El,
79 Brin
Aged 200,000 TS, 185,000 YS, 1 El, 410 Brin.
For electrical contacts, springs, slips, diaphragms,
heat treatable, corrosion and wear resistant

ASCO
M-351, 1.7-1.2 C, bal Fe
For general tools, water hardening

ASCOLOY NO 66
M-1, 0.12 C, 0.43 Si, 0.40 Mn, 18.5 Cr, bal Fe.
Hot rolled 65,000-85,000 TS, 45,000-55,000 YS;
35-25 El, 60 RA, 150-160 Brin
For furnace parts, changed to "Allegheny No 66";
corrosion and heat resistant

A.S CROMAT V
M-694, 0.35 C, 1.05 Si, 5.15 Cr, 0.3 V, 1.25 W,
1.55 Mo, bal Fe
Hot work tool steel for forging and
hot forming dies, chromium type, AISI H 12

ASCULOY
M-158, Si, Cu, bal Al
For die castings

A.S DURAMOLD B
M-694, 0.07 C, 0.3 Mn, 0.15 Si, 1.0 Cr,
0.25 Mo, B, bal Fe
For cold hubbing and case hardening for
plastic molds AISI P 2

ASH-21
M-1249, 3.0-3.6 C, 4.0-4.75 Ni, 1.4-3.5 Cr, 0.4-0.7 Si,
bal Fe
Sand cast 45,000 TS; 600 Brin
Permanent mold 55,000 TS, 675 Brin
For cams, dies, rollers, bearing races,
white cast iron, corrosion resistant, hard

ASHBERRY METAL-A
Eng., 80 Sn, 1 Zn, 14 Sb, 2 Cu, 2 Ni, Al
For tableware and utensils, same as "Brittania"

ASHBERRY METAL-B
Eng., 78-80 Sn, 0-2.8 Zn, 14-19 Sb, 0-3 Cu.
For utensils, bearings, Babbitt.

ASHBERRY METAL-C.
Eng., 80 Sn, 14 Sb, 2 Cu, 1 Zn, 3 Ni.
For utensils, bearings, Babbitt.

ASHBERRY METAL-D.
Eng.; 79 Sn, 15 Sb, 3 Cu, 2 Zn, 1 Ni.
For utensils, bearings; Babbitt.

A.S. HOBBING IRON.
M-694; 0.05 C, 0.1 Mn, bal Fe.
For tools, hobbing molds; case-hardened.

A.S. HOLLOW DIE.
M-694; 1.0 C, 0.4 Mn, 1.5 Cr, 0.2 bal Fe.
For dies; tough.

A.S. HOT DIE.
M-694; 0.45 C, 0.9 Si, 1.15 Cr, 0.25 V, 2.5 W, bal Fe.
For hot header dies, forming tools, piercers; hot work steel, oil hardened.

A.S LUSTRE-DIE
M-694, 0.50 C, 1.0 Mn, 0.3 Si, 1.1 Cr, 0.25 Mo, bal Fe.
Oil hardening steel for arbors, shafts, lathe centers.

ASM-122.
M-1646, 0.25 max C, 13 Cr, 0.5 Mo, bal Fe.
Annealed: 95,000 TS, 50,000 YS; 25 El; B 92 Rock.
For cutlery, surgical instruments, gauges, needle valves, bearings
Corrosion resistant, hardenable, heat treatable.

ASM-123.
M-1646; 0.30 max C, 13 Cr, 0.25 Mo, 1.25 Ni, bal Fe.
Annealed: 98,000 TS, 52,000 YS, 22 El, B 95 Rock
For bearings, cutlery, gauges, needle valves, surgical instruments
Corrosion resistant, hardenable

A.S NICKEL-CHROME HOBBING STEEL
M-694; 0.10 C, 0.5 Mn, 0.6 Cr, 1.25 Ni, bal Fe
For tools, hobbing molds, case-hardened

ASR 1.
French, 0.36 C, 18 Cr, 9 Ni, 10 W, 2 Ti, 12 Co, bal Fe
For gas turbine components, heat and creep resistant

ASR 2
French, C, 18 Cr, 8 Ni, 10 W + Co, bal Fe
For gas turbines; heat, creep and oxidation resistant

A.S SPECIAL HOBBING IRON
M-694; 0.05 C, 0.10 Mn, 0.10 Si, bal Fe
For cold hubbing, can be case hardened for molds. AISI P1.

ASTAR 811-C.
M-118; 8 W, 1 Re, 1 Hf, 0.025 C, bal Ta
For space power systems utilizing liquid alkali metals as coolants.
High creep resistance, good ductility and weldability.

ASTRA
M-1405, 0.55 C, 2 W, 0.5 Si, 1.0 Cr, bal Fe
For cold punches, shears, piercers; oil hardened, tough

ASTRALLOY.
M-24, M-97; 0.25 C, 3.5 Ni, 1.4 Cr, 0.28 Mo, bal Fe
Normalized Plate 241,000 TS, 157,000 YS; 11.7 El, 39 RA, C 47 Rock
Quenched: 250,000 TS, 191,000 YS; 30 El; 39 RA.
For shafts, abrasion-resistant parts, coal mine chutes and hoppers.
High impact strength, tough, wear resistant, good weldability.

ASTRALLOY Gr. 1.
M-24, M-176; 0.23-0.27 C, 0.7-1.0 Mn, 0.02 max P & S, 3.25-3.75 Ni, 1.25-1.75 Cr, 0.2-0.3 Mo, bal Fe.
Normalized: 241,000 TS; 157,000 YS, 39 RA; 477 Brin.
Quenched: 250,000 TS; 190,000 YS; 39 RA.
For paper and mining industry equipment, coal mine chutes and hoppers.
High toughness and ductility. Good weldability. Abrasion resistant.

ASTRALLOY Gr. 2.
M-24, M-176; 0.29-0.33 C, 0.7-1.0 Mn, 0.02 S & P, 3.25-3.75 Ni, 1.25-1.75 Cr, 0.2-0.3 Mo, bal Fe.
Normalized: 250,000 TS, 160,000 YS; 35 RA; 500 Brin.
For paper and mining industry equipment, coal mine chutes and hoppers.
High toughness and ductility. Good weldability, abrasion resistant

A.S TRI-ACK
M-694; 1.5 C, 0.3 Mn, 12 Cr, 0.2 V, 0.8 Mo, bal Fe
For dies, air hardening, nondeforming

A.S. TRI-Mo
M-694, 1.5 C, 12 Cr, 0.20 V, 0.8 Mo, bal Fe.
For threading dies, cutting tools, punches, dies; non-deforming

ASTROLOY
M-1490; 0.05 C, 15 Cr, 17 Co, 5 Mo, 3.5 Ti, 4 Al, 0.06 Zr, bal Ni.
At R.T.: 190,000 TS, 130,000 YS, 15 El
For turbine wheels and blades, jet engine components, nozzles, compressor discs
High heat and corrosion resistance
High creep and stress-rupture strength

A.S.V
M-57, 0.7 C, bal Fe
For tools, cutters, water hardened

A.S. WHITE LABEL
M-694, 1.1 C, 0.2 V, bal Fe
For blanking and forming dies, plug gauges, water hardened

A.T. 2 DIE
M-140, 2.2 C, 12 Cr, 0.25 V, 0.90 Mo, bal Fe
For blanking and forming dies, gauges, oil hardened, non-deforming

AT-3
M-Russia, 3.2 Al, 0.84 Cr, 0.40 Fe, 0.34 Si, 0.01 B, bal Ti
At 70°F 126,000 TS, 122,000 YS, 16 El, 52 RA
At 750°F 84,000 TS, 80,000 YS, 16 El, 67 RA
At 1110°F 62,000 TS, 60,000 YS, 21 El, 86 RA
For aircraft structures, high temperature fasteners
Pseudoalpha alloy. Corrosion resistant

AT-4
M-Russia, 4.4 Al, 0.79 Cr, 0.60 Fe, 0.40 Si, 0.01 B, bal Ti
At 70°F 147,000 TS; 146,000 YS, 12 El, 41 RA
At 750°F 100,000 TS, 92,000 YS; 15 El, 55 RA
At 1110°F 58,000 TS, 55,000 YS, 28 El, 84 RA.
For high temperature fasteners, aircraft structures.
Pseudoalpha alloy. Corrosion resistant.

AT-6
M-Russia, 5.8 Al, 0.64 Cr, 0.38 Fe, 0.32 Si, 0.01 B, bal Ti
At 70°F: 162,000 TS, 157,000 YS, 13 El, 36 RA
At 750°F. 102,000 TS, 91,000 YS, 12 El, 58 RA.
At 1110°F 90,000 TS; 84,000 YS; 20 El; 78 RA.
For high temperature fasteners, aircraft structures
Corrosion resistant.

AT-8.
M-Russia; 6.5 Al, 0.73 Cr, 0.39 Fe, 0.4 Si, 0.01 B, bal Ti
At 70°F: 162,000 TS, 156,000 YS; 15 El; 38 RA
At 750°F 119,000 TS, 109,000 YS, 10 El, 47 RA.
At 1110°F: 82,000 TS; 74,000 YS, 16 El; 67 RA.
For airplane structures, high temperature fasteners
Corrosion resistant.

ATG-M.
M-104; 35 Ni, 20 Cr, bal Fe.
For gas engine and turbine discs; heat resistant.

ATGS.
French; 0.10 C, 75 Ni, 20 Cr, 2 Ti, 2 Al.
For gas turbine components; heat and oxidation resistant.

ATHA NO. 2600.
M-38; 0.4 C, 22 Ni, 8 Cr, 1.75 Si, 1 Cu, bal Fe.
For furnace parts, heat treating boxes, acid tanks; heat resistant.

ATHA CHROME ROLL.
M-38; 0.9 C, 1.35 Cr, bal Fe.
For rolls for tire rims, drawing dies; oil hardening

ATHA PNEU.
M-38, 0.50 C, 2.75 W, 1.25 Cr, 0.25 V, bal Fe.
For pneumatic chisels, rivet busters, hot work steel.

ATHA RIM ROLL.
M-38; 1.0 C, 0.5 Cr, bal Fe.
For forming rolls; water hardening.

ATHOS
Eng., 22 Ni, 8 Cr, 1.75 Si, 1.0 Cu, 0.7 Mn, ≯0.5 C, bal Fe
For stainless parts; heat and corrosion resistant

ATLAN.
M-353; 0.90 C, 0.50 Cr, 1.15 Mn, 0.5 W, bal Fe.
For tools, cutters, drawing dies; non-deforming

ATLAN H.C.C. DIE
M-353, 1.5 C, 12 Cr, 1 V, 0.8 Mo, bal Fe
For tools, blanking dies; non-deforming.

ATLAN NON-SHRINK DIE
M-353, 0.9 C, 1.5 Mn, bal Fe.
For tools, dies; non-deforming.

ATLANTALOY NO. 10.
M-695; 58 Cu, 1 Sn, 0.9 Pb, bal Zn
Cast: 51,000 TS, 27,000 YS, 12 El, 100 Brin.
For brush boxes, gears, levers, yellow brass, free-cutting.

ATLANTALOY NO 12.
M-695, 56.7 Cu, 40 Zn, 1.2 Al, 0.75 Fe, 0.9 Mn
Cast 81,000 TS, 22 El; 111 Brin.
For castings, instrument parts, plaster mold

ATLANTALOY NO 20.
M-695, 82.5 Cu, 11.2 Al, 5 Fe, 1.2 Mn
Cast: 74,500 TS, 41,500 YS; 7 El, 160 Brin
For castings, instrument parts, plaster mold, corrosion resistant

ATLANTALOY NO. 21.
M-695, 89 Cu, 10 Al, 1 Fe.
Cast: 79,300 TS; 34,900 YS, 22 El; 156 Brin
For castings, plaster mold

ATLANTALOY NO. 22.
M-695, 91 Cu, 7 Al, 2 Si.
Cast 61,400 TS, 44.5 El; 95 Brin
For castings; plaster mold.

ATLANTALOY NO. 23.
M-695, 79 Cu, 11 Al, 5 Fe, 5 Ni
Cast. 77,600 TS; 55,500 TS, 5.5 El, 190 Brin.
For castings; plaster mold

ATLANTALOY NO. 24.
M-695; 86.75 Cu, 8.5 Al, 3.5 Fe, 1.25 Mn,
Cast. 66,200 TS; 28 El.
For castings; plaster mold.

ATLANTALOY NO. 25.
M-695; 78 Cu, 10.5 Al, 4 Fe, 1.25 Mn, 4 Ni,
Heat treated: 100,000 TS; 60,000 YS; 4 El.
For gears, fiixtures, hardware, machine parts; Al-bronze, heat treatable.

ATLANTALOY NO. 31.
M-695; 65 Cu, 5 Al, 2.5 Fe, 5 Mn, bal Zn.
Cast: 110,000 TS; 72,000 YS; 10 El; 205 Brin.
For gears, valve bodies, marine hardware; manganese bronze.

ATLANTALOY NO. 40.
M-695; 0.8 Cu, 8 Zn, bal Al.
Cast: 26,300 TS, 19,500 YS, 6 El.
For gears, housings, gear cases; natural aging alloy.

ATLANTALOY NO. 42.
M-695; 91 Cu, 3.25 Al, 1.25 Fe, 4.5 Si.
Cast: 65,800 TS; 42,800 YS; 10 El; 121 Brin.
For castings; plaster mold.

ATLANTALOY NO 60.
M-695; 1.3 Cu, 93.2 Al, 0.5 Mg, 5.0 Si.
Cast: 16,000 TS; 15,000 YS; 1.0 El.
For castings; plaster mold.

ATLANTIC.
M-353, 0.5 C, 18 W, 4 Cr, 1 V, 0.15 Mo, bal Fe.
For tools, cutters, high speed steel.

ATLANTIC NO 33.
M-353, 0.33 C, 0.75 Cr, 0.75 Mo, 0.75 Cu, bal Fe.
Heat treated: 135,000 TS, 116,000 YS; 18 El; 54 RA; 277 Brin.
For chisels, dies, blacksmith tools, hot work tools; water hardened, non-tempering.

ATLANTIC 33C.
M-353, 0.33 C, 0.76 Cr, 0.5 Co, 0.75 Mo, 0.75 Cu, bal Fe.
For rivet sets, pneumatic tools, blacksmith tools; nontempering, water hardening

ATLANTIC 44.
M-353, 0.44 C, 0.75 Cr, 0.4 Mn, 0.75 Mo, 0.6 Si, 0.7 Cu, bal Fe
For dies, shear blades, pneumatic tools; tough, shock resistant.

ATLANTIC C.
M-353, 0.65 C, 4 Cr, 4 Co, 18 W, 1 Mo, bal Fe.
For shaping tools, millers, cutters; high speed steel.

ATLANTIC N.T.
M-353, 0.40 C, 0.4 Mn, 0.65 Si, 1.0 Cr, 0.5 Ni, 0.75 Mo, 0.5 Cu, bal Fe.
Shock resisting tool steel.

ATLANTIC STANDARD.
M-353, 0.8-1.2 C, 0.25 Si, 0.25 Mn, bal Fe.
Water Hardened 166-000-216,000 TS, 110,000-150,000 YS; 11-15 El, 32-37 RA; 330-600 Brin.
For taps, drills, reamers, punches, stamps, knurls, mandrels
Type W1 water hardening

ATLANTIC "V."
M-353; 0.8 C, 4.25 Cr, 2 V, 18.5 W, 0.65 Mo, bal Fe.
For cutting tools, high speed steel.

ATLAS 4-79
M-435; 0.06 max C, 78-80 Ni, 0.85 Co, 0.3-0.8 Mn, bal Fe
For communication and telephone equipment; high permeability.

ATLAS 12-12
M-435, 0.12 max C, 12-14 Cr, 12-14 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 50 El; 60 RA; 135 Brin
For cutlery, valves, low rate of work hardening.

ATLAS 20.
M-435, 0.08 max C, 2 Mn, 19-21 Cr, 2-3 Mo, 27-30 Ni, 3-4 Cu, bal Fe.
For chemical and paper industries; high resistance to H_2SO_4.

ATLAS 40.
M-435; 0.24 C, 1.2 Cr, 0.26 Mo, 3.5 Ni, 1.2 Al, bal Fe.
For plastic molds, die casting dies; precipitation hardening.

ATLAS 45% Ni ALLOY.
M-435; 0.06 max C, 0.4-1.0 Mn, 43.5-46.5 Ni, 0.6 max Co, bal Fe.
½ Hard: 140,000 TS; 128,000 YS, 1.5 El; 331 Brin.
For telephone equipment; high permeability and high induction.

ATLAS NO. 50.
M-76; 0.35-0.40 C, 9.5-11.0 W, 3.5 Cr, 0.40 V, bal Fe
At 750°F: 238,500 TS; 3.5 El; 17 RA.
At 1400°F: 32,000 TS; 35.5 El; 89.8 RA.
For hot nut tools, hot header punches and swedging dies, forming dies; hot die steel, oil hardened; see Atlas Hot Die

ATLAS NO 50A.
M-1; 0.3 C, 3.5 Cr, 9 W, 0.4 V, bal Fe
For hot work tools, punches, hot work tool steel.

ATLAS NO. 50B
M-1, 0.4 C, 3 Cr, 11 W, 0.5 V, bal Fe.
For hot work tools, punches; hot work tool steel

ATLAS NO 57.
M-696; 82 Cu, 11 Sn, 3.5 Zn, 0.5 Pb, 3.0 Ni-Sn hardener
For gears, bearings; wear resistant.

ATLAS 78½ Ni ALLOY.
M-435, 0.06 max C, 77.5-79.5 Ni, 0.6 max Co, bal Fe
Annealed 86,000 TS, 35,000 YS, 41 El; 130 Brin
For communication circuits, high permeability.

ATLAS NO 83A
M-696, 85 Cu, 2 Sn, 5 Zn, 8 Pb.
For gears, worms, nuts, bearings

ATLAS 89F-123
M-13, 88.7 Cu, 10 Al, 1.0 Fe, 0.30 special elements
80,000-95,000 TS; 42,000-55,000 YS, 12-15 El, 13-17 RA, 160-180 Brin
For gears, bearings; heat treatable

ATLAS 90
M-13, 90 Cu, 10 Al
Cast 70,000 TS, 28,000 YS; 25 El, 25 RA, 120 Brin
For gears, corrosion resistant

ATLAS 93.
M-1; 0.55 C, 0.55 Mn, 0.2 Si, 0.7 Cr, 0.4 Mo, bal Fe
Shock resisting tool steel

ATLAS 301
M-435, 0.15 max C, 16-18 Cr, 6-8 Ni, bal Fe.
Annealed 110,000 TS, 40,000 YS, 60 El, 70 RA, 165 Brin.
For doctor blades and springs, auto and furniture trim, high strength and wear resistance, stainless

ATLAS 302
M-435; 0.08-0.20 C, 17-19 Cr, bal Fe.
Annealed 80,000 TS; 35,000 YS; 50 El, 70 RA, 150 Brin.
For chemical plant equipment, Type 302, stainless, austenitic

ATLAS 303.
M-435; 0.15 max C, 17-19 Cr, 8-10 Ni, 0.07 min Se, 0.09-0.17 P, bal Fe.
Annealed: 90,000 TS; 45,000 YS, 40 El, 60 RA; 170 Brin.
For screw machine products, shafts, fasteners; Type 303; stainless, free-cutting

ATLAS 304.
M-435, 0.08 max C, 2 max Mn, 18-20 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 160 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El, 330 Brin.
For architectural molding and trim, kitchen equipment, chemical plant equipment; Type 304; stainless, austenitic

ATLAS 305.
M-435, 0.12 max C, 16-19 Cr, 8-11 Ni, bal Fe.
Annealed 85,000 TS, 38,000 YS; 50 El; 60 RA; 140 Brin.
For spinning, cold heading and drawing operations; low rate of work hardening, stainless

ATLAS 308
M-435, 0.08 max C, 19-21 Cr, 10-12 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS, 50 El; 60 RA; 150 Brin
For welding rods, heat and corrosion resistant

ATLAS 310
M-435, 0.25 max C, 2 max Mn, 24-26 Cr, 19-22 Ni, bal Fe
Annealed 100,000 TS, 45,000 YS; 50 El; 65 RA, 185 Brin
For furnace parts and equipment, heat treat boxes, baffles, Type 310, heat resistant, austenitic

ATLAS 316
M-435, 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo bal Fe.
Annealed 80,000 TS, 30,000 YS, 60 El, 80 RA, 150 Brin
Cold drawn: 150,000 TS, 135,000 YS, 6 El, 300 Brin
For chemical plant equipment, tanks, evaporators, valve trim, Type 316, stainless, austenitic

ATLAS 317
M-435, 0.10 max C, 18-20 Cr, 11-14 Ni, 3-4 Mo, bal Fe
Annealed 90,000 TS, 40,000 YS, 45 El, 160 Brin
For chemical plant equipment, tanks, high corrosion resistance

ATLAS D319.
M-435, 0.07 max C, 2 Mn, 17.5-19.5 Cr, 2.25-3.0 Mo, 13-15 Ni, bal Fe
For pulp and paper industry, high corrosion resistance.

ATLAS 321
M-435, 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe
Annealed: 85,000 TS, 33,000 YS, 58 El, 75 RA, 180 Brin
Cold drawn. 95,000 TS, 60,000 YS, 40 El, 60 RA; 190 Brin
For welded structures, chemical plant equipment, tanks, Type 321, stainless, stabilized

ATLAS 330.
M-435, 0.25 max C, 14-16 Cr, 33-36 Ni, bal Fe
Annealed: 80,000 TS, 40,000 YS; 30 El, 30 RA; 185 Brin
At 1800°F: 147,000 TS, 43 El; 40 RA.
For furnace parts and equipment, cracking units, fixtures, Type 330, heat resistant, austenitic.

ATLAS 331.
M-435; 0.08 max C, 19-21 Cr, 30-34 Ni, bal Fe
Annealed: 95,000 TS, 45,000 YS; 45 El, 60 RA; 160 Brin
For carburizing boxes, heater tubing, nitriding fixtures, good resistance to thermal shock.

ATLAS 347.
M-435; 0.08 max C, 17-19 Cr, 9-12 Ni, Cb = 10 × C, bal Fe
Annealed: 90,000 TS; 35,000 YS; 50 El, 65 RA, 160 Brin.
Cold drawn: 100,000 TS; 65,000 YS; 40 El; 60 RA; 212 Brin.
For welded structures, chemical plant equipment; Type 347; stainless, stabilized.

ATLAS 403.
M-435; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Annealed: 75,000 TS, 40,000 YS, 34 El, 72 RA, 155 Brin
Heat treated: 215,000 TS; 140,000 YS; 14 El; 54 RA; 415 Brin.
For dental and surgical instruments, valves, cutlery; Type 403; corrosion resistant, hardenable.

ATLAS 405
M-435, 0.08 max C, 11.5-13.5 Cr, 0.10-0.30 Al, bal Fe
Sub-annealed. 65,000 TS, 40,000 YS; 20 El, 50 RA; 165 Brin
For mufflers, oil refinery equipment, annealing boxes; creep resistant

ATLAS 410.
M-435, 0.15 max C, 11.5-13.5 Cr, bal Fe
Annealed 75,000 TS, 40,000 YS; 35 El, 70 RA, 155 Brin
Cold drawn. 100,000 TS; 85,000 YS, 60 El, 205 Brin
For flat springs, tableware, valve parts, turbine blades, Type 410, corrosion resistant, hardenable

ATLAS 416
M-435, 0.15 max C, 12-14 Cr, 0.18-0.35 S, bal Fe
Annealed 75,000 TS, 40,000 YS, 30 El, 60 RA, 155 Brin
Heat treated. 110,000 TS, 85,000 YS, 18 El, 55 RA; 230 Brin
For screw machine products, shafts, valve trim, Type 416, corrosion resistant, free-cutting

ATLAS 420
M 435, 0.15 min C, 12-14 Cr, bal Fe
Annealed 95,000 TS, 50,000 YS, 25 El, 55 RA, 196 Brin
Cold drawn 105,000 TS, 85,000 YS; 17 El, 50 RA, 215 Brin
For cutlery, surgical instruments, valve trim, Type 420, corrosion resistant, hardenable.

ATLAS 420F
M-435; 0.15 min C, 12-14 Cr, 0.18-0.35 S, bal Fe
Annealed 95,000 TS, 50,000 YS, 20 El, 50 RA, 196 Brin
Cold drawn 105,000 TS, 85,000 YS, 15 El; 45 RA, 215 Brin
For cutlery, surgical instruments, screw machine products, Type 420 F, corrosion resistant, free-cutting

ATLAS 430
M-435, 0.12 max C, 14-18 Cr, bal Fe
Annealed 70,000 TS, 40,000 YS; 30 El, 55 RA; 160 Brin
Cold drawn: 130,000 TS, 120,000 YS; 2 El, 190 Brin.
For oil refinery and chemical plant equipment, hardware, bolts; Type 430, corrosion resistant

ATLAS 431
M-435; 0.2 max C, 15-17 Cr, 1.2-2.5 Ni, bal Fe
Annealed 95,000 TS, 50,000 YS, 20 El; 50 RA; 195 Brin.
For oil refinery and chemical plant equipment; Type 431; corrosion resistant.

ATLAS 440A.
M-435; 0.6-0.75 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Annealed: 95,000 TS; 55,000 YS; 20 El; 240 Brin.
Heat treated: 275,000 TS; 240,000 YS; 2 El; 555 Brin.
For bearings, cutlery, surgical instruments, pivots; Type 440A; corrosion resistant, hardenable.

ATLAS 440B.
M-435; 0.75-0.95 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Annealed: 107,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin
Cold drawn. 120,000 TS; 95,000 YS, 9 El; 20 RA; 250 Brin.
For bearings, valves, surgical instruments; cutlery; Type 440B; corrosion resistant, hardenable.

ATLAS 440C.
M-435, 0.95-1.2 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Annealed: 100,000 TS; 60,000 YS, 18 El; 200 Brin.
Heat treated: 280,000 TS, 250,000 YS; 2 El, 575 Brin
For bearings, cutlery, valves, pivots, surgical instruments; Type 440C; corrosion resistant, hardenable

ATLAS 442
M-435, 0.20 max C, 23-27 Cr, bal Fe.
Sub-annealed: 80,000 TS, 50,000 YS, 20 El; 50 RA; 165 Brin
For oil burner furnace and boiler parts, high corrosion and oxidation resistance

ATLAS 446
M-435, 0.35 max C, 23-27 Cr, bal Fe
Annealed 75,000 TS; 45,000 YS; 35 El; 65 RA; 160 Brin
Cold drawn 175,000 TS, 155,000 YS; 2 El, 25 RA; 250 Brin.
For oil burner parts, heat treat boxes, furnace equipment, Type 446, corrosion resistant

ATLAS 501.
M-435, 0.10 min C, 1 max Mn, 5 Cr, bal Fe
Annealed 70,000 TS, 30,000 YS; 28 El, 65 RA; 160 Brin
Heat treated 175,000 TS; 135,000 YS, 15 El, 50 RA, 370 Brin.
For oil refinery equipment, valve trim, furnace parts, good to 1200°F, creep resistant

ATLAS 502
M-435; 0.10 max C, 1 max Mn, 4-6 Cr, 0.5 Mo, bal Fe
Annealed 75,000 TS, 35,000 YS, 26 El, 62 RA; 170 Brin
Heat treated 175,000 TS, 135,000 YS, 15 El, 50 RA; 370 Brin.
For oil refinery equipment, valve trim, furnace parts; good to 1200°F, creep resistant

ATLAS A
M-1, 0.30 C, 3.5 Cr, 9 W, 0.45 V, bal Fe
For hot work tools, piercers, punches, dies; hot work steel AISI H 21

ATLAS ACX.
M-435, 0.83 C, 18.5 W, 4 Cr, 1.7 V, 1 Mo, 10.5 Co, bal Fe
For hogging cutters, tools; high speed steel.

ATLAS AHT-28.
M-435, M-1636, 0.30 C, 0.50 Mn, 1.4 Cr, 4 Ni, 2 Mo, bal Fe.
Heat treated 241,000 TS; 204,000 YS, 12.5 El, 477 Brin.
For gears, rolls, camshafts, transmission components, carbide bit holders, oil or air hardenable.

ATLAS ALPHA.
M-435, 0.8 C, bal Fe.
For punches, dies, blacksmith tools; water hardened.

ATLAS ALPHA-8.
M-435; 0.8 C, 0.3 Mn, bal Fe.
For hammer dies, picks, set screws, wedges; water hardening, shock resistant.

ATLAS B.
M-1; 0.40 C, 3 Cr, 11 W, 0.5 V, bal Fe.
For hot work tools, dies, punches; hot work steel.

ATLAS BRAKE DIE.
M-435; 0.50 C, 1.1 Mn, 0.65 Cr, 0.15 Mo, bal Fe.
Heat treated: 130,000 TS; 118,000 YS, 20 El; 262 Brin.
For brake press dies, gears, drive shafts; high toughness and wear resistance.

ATLAS-CM.
M-435, M-1636; 0.40 C, 1.2 Mn, 0.15 Mo, 0.6 Cr, bal Fe.
Normalized: 100,000 TS; 65,000 YS; 24 El; 53 RA; 217 Brin.
For machinery parts, bolts, axles, jigs, fasteners, gears, shafts.
Shock resistant, tough, water hardening.

ATLAS CW26.
M-435; 2.4 C, 0.40 Mn, 8.15 Cr, 1.1 Mo, 5 V, bal Fe.
For drawing and stamping dies; high abrasion and wear resistance.

ATLAS DIE CASTING STEEL.
M-435; 0.4 C, 0.7 Mn, 0.6 Cr, 0.15 Mo, 1.25 Ni, bal Fe.
For die casting dies; oil hardened.

ATLAS EXTRA.
M-435; 1.05 C, 1.25 Mn, bal Fe.
For tools, shear blades, cutters; oil hardening.

ATLAS FNS.
M-435; 1.5 C, 12 Cr, 0.8 Mo, bal Fe.
For tools, lamination dies, hot work steel.

ATLAS HOBBING IRON.
M-435; 0.05 C, 0.2 Mn, 0.15 Si, bal Fe
For plastic mold dies; hubbed cavity

ATLAS HOT DIE.
M-253, M-1; 0.5 C, 4 Cr, 18 W, 1 V, bal Fe
For hot dies, punches, shears; hot work steel

ATLAS HW-7.
M-435, 0.45 C, 1 Si, 5 Cr, 3.75 W, 1 Mo, 0.5 V, 0.5 Co, bal Fe
At 1000°F: 217,000 TS; 8.5 El; 40 RA; 477 Brin.
For hot punches, shears, forging dies, cold punches; high hot strength and shock resistance.

ATLAS-KK.
M-435, 1.1 C, 1.7 Cr, 0.4 Mo, 1.4 V, bal Fe.
For bearings, machinery parts; oil hardening.

ATLAS M-4.
M-435; 1.25 C, 6 W, 4.25 Cr, 4.75 Mo, bal Fe
For reamers, tool bits, form rolls, drills; high abrasion and wear resistance.

ATLAS M-34.
M-435; 0.90 C, 1.45 W, 3.75 Cr, 8.7 Mo, 8.25 Co, 2.05 V, bal Fe.
For tool bits, reamers, form tools; high red hardness.

ATLAS NN
M-435; 2.2 C, 12 Cr, bal Fe.
For tools, dies, blanking dies; non-deforming.

ATLAS NON-MAG.
M-435; 0.40 C, 11.5-12.5 Mn, 7.0-8.5 Ni, bal Fe.
For transformer parts, retainer rings; low magnetic permeability.

ATLAS "Q."
M-435; 1.2 C, 0.5 Cr, bal Fe.
For tools, taps, reamers; water hardening.

ATLAS ROLL.
M-1636; 1.05 C, 0.3 Mn, 0.015 S, 0.02 P, 1.45 Cr, bal Fe.
Annealed: 95,000 TS; 54,000 YS; 26 El; 55 RA; 192 Brin.
Hardened: 189,000 TS; 131,000 YS; 14 El, 35 RA; 331 Brin.
For rolls, feed and pinch rolls, bearings, flaring tools.
Water hardening; wear and fatigue resistant.

ATLAS SPECIAL ALLOY 8.
M-435; 0.8 C, 0.2 Mn, 0.2 V, bal Fe.
For impact tools, rivet sets; water hardened, shock resistant.

ATLAS SPECIAL ALLOY 10.
M-435; 1.05 C, bal Fe
For tools, striking dies, water hardening.

ATLAS-SPS.
M-1636, M-435; 0.40 C, 0.75 Mn, 0.60 Cr, 1.25 Ni, 0.15 Mo, bal Fe.
Annealed· 105,000 TS, 70,000 YS; 25 El, 212 Brin.
Hardened 145,000 TS; 132,000 YS; 20 El; 293 Brin
For heavy duty shafts, gears, axles, spindles, tool holders, feed screws
Oil hardening, shock resistant.

ATLAS STAINLESS NO 20.
M-435, 0.07 C, 29 Ni, 20 Cr, 2-3 Mo, 4 Cu, bal Fe.
Cast· 65,000-75,000 TS; 28,000-38,000 YS, 50-35 El, 50-40 RA, 120-150 Brin
For chemical plant equipment, resists mixed acids, austenitic.

ATLAS SUPERIOR.
M-1474, Sn, bal Cu
For springs, bearings, corrosion resistant.

ATLAS TRIPLE EXTRA.
M-435, 1.3 C, 3.5 W, bal Fe
For fast finishing tools, drills, water hardening.

ATLAS SUPERIOR.
M-1636; 0.40 C, 1.1 Mn, 0.08 S, 0.02 P, 0.15 Mo, bal Fe.
Rolled· 108,000 TS, 84,000 YS; 18 El, 46 RA, 229 Brin.
For arbors, bolts, camshafts, collets, compressor shafts, guide bars, mandrels
Free-machining, water hardening.

ATLAS WEFINED-8.
M-435; 0.8 C, 0.3 Mn, bal Fe
For flaring tools, vise jaws, sledges, drills; water hardening.

ATLAS WEFINED-10.
M-435, 1.0 C, 0.25 Mn, bal Fe.
For stamping and blanking dies, arbors, lathe centers, drills; water hardening

ATLAS X-10
M-435; 1.05 C, 0.25 Mn, bal Fe.
For shear blades, die and cutting tools; water hardening.

ATLAS X-12
M-435; 1.2 C, 0.25 Mn, bal Fe
For drills, taps, reamers, files, cold forming dies, water hardening.

ATLAS XLO.
M-435, 0.55 C, 0.7 Mn, 0.8 V, 2 Cr, 0.55 Mo, bal Fe.
For drop forging die blocks, oil hardening

ATLAS XX-95.
M-435; 0.95 C, bal Fe.
For cold beading dies; water hardened.

ATLAS XXX.
M-435; 1.35 C, 3.75 W, bal Fe.
For tools, forming rolls; maximum wear resistance.

ATLOY D.D.
M-353; C, alloy, bal Fe.
Heat treated: 310,000 TS
For bushings, gears, clutches, gages, spindles; tough, non-deforming

ATLOY FM.
M-353, C, B, Pb, alloy, bal Fe.
For gears, arbors, worms, collets, motor shafts; free-cutting, fatigue and wear resistant

ATLOY H.T.
M-353, C, Cr, Mn, bal Fe.
Heat treated: 260-000-112,000 TS, 230,000-95,000 YS; 9.5-21.5 El; 26-62.5 RA; 514-241 Brin.
For arbors, axles, bolts, cams, gears, jaws; fatigue and wear resistant.

ATLOY Z.
M-353; C, B, alloy, bal Fe
Heat treated. 280,000 TS.
For gears, axles, connecting rods, propeller shafts; high strength

ATMODIE.
M-35; 1.5 C, 12 Cr, 0.8 Mo, 0.85 V, bal Fe.
For blanking and forming dies, punches, shear blades, tough and wear resistant; air hardening; AISI Type D2

ATMODIE SMOOTHCUT.
M-35; 1.5 C, 12 Cr, 0.9 Mo, 1.0 V, S, bal Fe.
For drawing and blanking dies, punches, mandrels, gages; air or oil hardening, free machining, wear and corrosion resistant
AISI D2.

ATMOS
M-1422, C, alloy, bal Fe
For dies, punches, air hardened

AT-NICKEL.
M-121; 99.0 min Ni.
For chemical plant equipment.
Welding grade Good resistance to alkaline salts and organic acids

ATR ALLOY.
M-83, M-1637, 0.5 Cu, 0.5 Mo, 1.5 Sn, 0.12 Fe, 0.10 Cr, 0.05 Ni, bal Zr
For nuclear reactors
Resists CO_2 corrosion.

ATRIX 1.
M-501; 0.19 C, 0.5 Si, 1.15 Mn, bal Fe.
For gears, shafts, machine tool parts, case hardening steel

ATRIX 3R.
M-501; 0.12 C, 1.15 Si, 2.5 Cr, 0.45 Mo, bal Fe.
For gears, cams, camshafts, pinions; case hardening steel, tough.

ATRIX 4R.
M-501; 0.15 C, 0.30 Mo, 0.60 Mn, 0.25 Si, bal Fe.
Annealed: 70,000 TS; 40,000 YS, 25 El; 60 RA; 145 Brin.
For gears, shafts, camshafts, bolts; case hardening steel, tough.

ATRIX 5R.
M-501; 0.13 C, 0.85 Cr, 0.45 Mo, bal Fe
For gears, cams, camshafts; case hardening steel, tough.

ATRIX 10A.
M-501; 0.24 C, 1.15 Cr, 0.25 Mo, bal Fe.
For gears, bolts, cams, camshafts; case hardening or water hardening steel.

ATRIX 10E.
M-501; 0.16 C, 1.05 Cr, 0.25 Mo, bal Fe.
For gears, bolts, camshafts, cams; case hardening steel, tough.

ATRIX 10S.
M-501; 0.34 C, 1.55 Cr, 1.55 Ni, 0.2 Mo, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

ATRIX 10SS.
M-501, 0.28 C, 0.55 Mn, Ni, Cr, 0.2 Mo, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

ATRIX 12
M-501; 0.24 C, 1.15 Cr, 0.25 Mo, 0.55 Mn, bal Fe.
For gears, bolts, crankshafts, fasteners; oil or water hardened, tough.

ATRIX 15A
M-501; 0.24 C, 1.25 Cr, 0.4 Mo, 0.55 Mn, bal Fe.
For gears, bolts, fasteners, pinions; oil or water hardened, tough.

ATRIX 15E
M-501, 0.16 C, 1.05 Cr, 0.45 Mo, 0.65 Mn, bal Fe.
For gears, cams, camshafts, machine tool parts; case hardening steel.

ATRIX 15S.
M-501, 0.28 C, 1.15 Cr, 1.15 Ni, 0.45 Mo, bal Fe.
For gears, bolts, fasteners, oil refinery equipment; oil hardened, shock resistant

ATRIX 15SS.
M-501, 0.28 C, 1.25 Cr, 0.35 Mo, 0.45 Mn, 1.15 Ni, bal Fe
For gears, bolts, fasteners, shafts; oil hardened, shock resistant

ATRIX 20
M-501, 0.24 C, 1.35 Cr, 0.55 Mo, 0.2 V, bal Fe
For gears, bolts, machine tool parts, shafts, oil hardened, shock resistant.

ATRIX N9
M-501, 0.2 C, 3.25 Cr, 0.5 Mo, 0.5 V, bal Fe
For oil refinery equipment, evaporators, heat exchangers, heat and creep resistant

ATRIX N10.
M-501, 0.21 C, 3 Cr, 0.4 Mo, 0.8 V, 0.4 W, bal Fe.
For oil refinery equipment, heat exchangers, heat and creep resistant

ATS
M-459, 0.05 C, 1.27 Mn, 16.5 Cr, 12.3 Ni, 1,1 Cb, bal Fe.
For turbine blades and nozzles.
Austenitic, corrosion and heat resistant

ATS2.
M-459, 0.08 C, 1.3 Mn, 17 Cr, 2.2 Mo, 13.5 Ni, 0.9 Cb or Ta, bal Fe.
For valves, jet engine components; high temperature resistant

ATS6.
M-459, 0.08 C, 1.3 Mn, 17 Cr, 1.4 Mo, 13 Ni, 0.7 V, 0.9 Cb, N_2, bal Fe.
For jet engine and missile components; high heat resistant.

ATS-103.
M-459; 0.38-0.47 C, 1.0-2.0 Mn, 19-21 Cr, 19-21 Ni, 19-21 Co, 3.5-4.5 Mo, 3.5-4.5 W, 3.5-4.5 Cb, bal Fe.
Rolled: 152,000 TS; 80,000 YS; 19 El; 25 RA; 260 Brin.
Aged. 140,000 TS; 42,000 YS; 20 El; 19 RA; 300 Brin.
For supercharger and jet engine components, turbine blades and wheels.
Corrosion and heat resistant.

ATS-113.
M-459; 0.4 C, 1.2 Mn, 20 Cr, 20 Ni, 43 Co, 4 W, 3 Fe, 4 Cb.
Heat Treated· 140,000 TS; 67,000 YS; 31 El; 31 RA; 269-352 Brin
For turbine blades and rotors; high temperature hardware, jet engine parts
High heat and corrosion resistant to 1500°F.

ATS-360.
M-459; 13-16 Cr, 18-22 Co, 4-5 Mo, 0.2 max C, 4.6 Al, 1.2 Ti, bal Ni.
At 20°C: 144,000 TS; 116,000 YS; 7 El, 7 RA
At 500°C· 132,000 TS, 105,000 YS, 8 El, 12 RA
For gas turbine and jet engine components, fasteners.
Similar to Nimonic 105 High creep and oxidation resistance

ATS-390
M-459, 14-16 Cr, 13-17 Co, 3.6 Mo, 5 Al, 4 Ti, 0.12-0.20 C, 0.02 B, 0.2 Zr, bal Ni
Heat treated 180,000 TS, 125,000 YS; 27 El, 28 RA; 370-440 Vickers
At 800°C: 147,000 TS, 109,000 YS, 19 El, 19 RA.
For gas turbine and jet engine components, missiles, space equipment.
Similar to Nimonic 115, high creep and oxidation resistance

ATSCO.
M-353; C, alloy, bal Fe
For tools, water hardening.

ATSCO AR.
M-353, 0.9 C, 0.7 Mn, 0.3 Mo, 1.1 Cr, bal Fe.
For shovel teeth, bucket lips; water hardened, abrasion resistant

ATSCO EXTRA.
M-353, 0.8-1.1 C, 0.25 Si, 0.25 Mn, bal Fe
Water hardened 166,000-216,000 TS, 110,000-150,000 YS, 11-15 El; 32-37 RA, 330-600 Brin.
For taps, drills, reamers, punches, stamps, knurls, mandrels
Type W1 water hardening

ATSCO SPECIAL
M-353; 0.5-1.0 C, 0.5-1.0 Mn, 0.3 Mo, bal Fe.
For rock drills, concrete wreckers, demolition tools; water hardening

ATSIL
M-353; 0.5 C, 0.6 Mn, 0.5 W, 0.3 Mo, 1.3 Si, bal Fe.
For shear blades, rivet sets, cutting tools; shock resisting

A.T. STEEL.
M-32; 0.35 C, 0.5 Mn, 0.3 Si, 1.5 Cr, 3.5 Ni, bal Fe.
Air hardening tool steel.

ATV-3.
M-104; 35 Ni, 11 Cr, 3 W, bal Fe.
For turbine and gas turbine parts; heat resistant.

ATV-R.
M-104; 30 Ni, 15 Cr, Mo, Al, bal Fe.
For turbine and gas engine parts; heat resistant.

ATV-S.
M-104; 35 Ni, 11 Cr, 0.15 C, 1 Al, 1 Ti, bal Fe.
For turbine and gas engine parts; heat resistant.

ATV-S7.
M-104; 30 Ni, 15 Cr, 20 Co, 0.12 C, 0.2 Ti, bal Fe.
For gas turbine discs; heat resistant

A-U4G1.
M-Russia; 4.36 Cu, 1.5 Mg, 0.6 Mn, 0.5 Si, bal Al.
Ht. Tr. 75,000 TS, 58,000 YS; 135 Brin.
For aircraft structures, fittings, hardware, rivets, fastenings.
Similar to Aluminum 2024, age-hardenable, high strength

A-U4SG
M-Russia, 4.35 Cu, 0.85 Si, 0.8 Mn, 0.5 Mg, bal Al
Ht Tr.: 70,000 TS, 60,000 YS, 12 El, 135 Brin.
For hydraulic fittings, structures, hardware, engine components
Similar to Aluminum 2014, age-hardenable, high strength.

AUBERT & DUVAL-56R
M-115, 0.08 C, 12 Cr, 1 Mo, 0.25 V, 1.0 W, bal Fe.
Annealed· 75,000 TS, 35,000 YS, 30 El, 70 RA, B 82 Rock.
Cold Drawn 95,000 TS; 80,000 YS; 15 El, 60 RA; B 92 Rock
For springs, table flatware, knives, oil refinery and chemical plant equipment.
Corrosion resistant.

AUBERT & DUVAL-56TS
M-1115, 0.20 C, 11 Cr, Mo, V, bal Fe.
Annealed 95,000 TS, 40,000 YS, 25 El, B 92 Rock.
Hardened 240,000 TS, 205,000 YS, 8 El, C 50 Rock
For valves, bearings, cutlery, surgical instruments, gears Corrosion resistant, hardenable

AUBERT & DUVAL 819B
M 1115; 0.3-0.4 C, 3.65-4.0 Ni, 1.5-2.0 Cr, 0.15-0.35 Mo, bal Fe
For gears, shafts, machinery parts, oil hardened, shock resistant.

AUBERT & DUVAL 897D
M-1115, 0.25-0.35 C, 3.0 3.5 Ni, 0.5-1.0 Cr, 0.8 Mn, bal Fe
For crankshafts, axles, connecting rods, AISI 3335, oil hardened, shock resistant

AUBERT & DUVAL AD3
M-1115, 0.12 max C, 3.0-3.5 Ni, 0.5-1.0 Cr, 0.5 Mn, bal Fe
For shafts, cams, camshafts, machinery parts, AISI 3310, case hardened, shock resistant

AUBERT & DUVAL APX
M-1115; 0.10-0.20 C, 1.5-3.0 Ni, 16-19 Cr, bal Fe
Annealed 107,000 TS, 62,000 YS, 18 El, 35 RA; 220 Brin
For cutlery, valves, surgical instruments, ball bearings, Type 431; corrosion resistant

AUBERT & DUVAL APZ
M-1115, 0.6-0.8 C, 1-2 Ni, 18-21 Cr, bal Fe.
Heat treated 143,000 TS
For exhaust valves, corrosion and heat resistant.

AUBERT & DUVAL CNS
M-1115, 0.3-0.4 C, 0.9-1.4 Ni, 0.5-1.0 Cr, 0.8 Mn, 0.5 Si, bal Fe.
For crankshafts, axles, bolts, gears, AISI 3135; oil hardened, shock resistant.

AUBERT & DUVAL CNS3
M-1115, 0.5-0.6 C, 0.8-1.3 Ni, 0.5-1.0 Cr, bal Fe.
For die blocks, hot work steel, oil hardened.

AUBERT & DUVAL F65.
M-1115, 0.34-0.40 C, 1.0-1.5 Cr, 0.10-0.30 Mo, 0.8 Mn, bal Fe.
For axles, gears, machinery parts; AISI 4137, oil hardened.

AUBERT & DUVAL F66.
M-1115; 0.28-0.34 C, 1.0-1.5 Cr, 0.10-0.30 Mo, 0.8 Mn, bal Fe.
For gears, shafts, machinery parts; AISI 4130, oil hardened.

AUBERT & DUVAL F66S.
M-1115, 0.21-0.28 C, 1.1-1.5 Cr, 0.10-0.30 Mo, 0.8 Mn, bal Fe
For gears, shafts, machinery parts; AISI 4125, tough

AUBERT & DUVAL FAD.
M-1115, 0.17 max C, 3.0-3.5 Ni, 0.80-1.3 Cr, bal Fe
For gears, cams, crankshafts, AISI 9315; case hardened, shock resistant

AUBERT & DUVAL FDMA
M-1115, 0.25-0.35 C, 3.2-3.7 Ni, 1.0-1.5 Cr, 0.3-0.6 Mo, bal Fe
For crankshafts, gears, connecting rod, oil hardened, shock resistant

AUBERT & DUVAL GK3
M-1115, 0.25-0.35 C, 2.75-3.3 Cr, 0.20-0.50 Mo, 0.4 max Al, bal Fe
For gears shafts, axles, machinery parts; nitriding steel

AUBERT & DUVAL GK5
M-1115, 0.15-0.25 C, 2.7-3.3 Cr, 0.2-0.5 Mo, 0.8 Mn, bal Fe
For gears, shafts, machinery parts, nitriding steel

AUBERT & DUVAL LK3
M-1115, 0.40-0.50 C, 1.5-2.0 Cr, 0.5-1.1 Al, 0.10-0.40 Mo, bal Fe
For gears, axles, machinery parts; nitriding steel

AUBERT & DUVAL LK5
M-1115, 0.25-0.35 C, 1.5-2.0 Cr, 0.10-0.40 Mo, 0.5-1.1 Al, bal Fe
For gears, shafts, machine tool parts, nitriding steel

AUBERT & DUVAL MEP
M-1115, 0.4-0.5 C, 1.0-2.0 Cr, 2.0-3.0 W, bal Fe
For impact tools, rivet sets, chisels, dies, cold work steel, oil hardened

AUBERT & DUVAL MES
M-1115, 0.3-0.4 C, 2.5-3.0 Cr, 2.5-3.0 W, bal Fe.
For rivet sets, extrusion rams and dies, hot work steel, oil or air hardened

AUBERT & DUVAL MMR0
M-1115, 0.20 max C, 1.1-1.6 Ni, 0.5-1.0 Cr, 0.8 Mn, bal Fe
For shafts, cams, gears, axles, machine tool parts, AISI 3120, case hardened shock resist.

AUBERT & DUVAL MMR1
M-1115, 0.17 max C, 1.1-1.6 Ni, 0.5-1.0 Cr, bal Fe.
For gears, cams, camshafts, AISI 3115 case hardened

AUBERT & DUVAL MMR3
M-1115, 0.13 max C, 1.1-1.6 Ni, 0.5-1.0 Cr, bal Fe
For gears, cams, camshafts; AISI 3115, case hardened

AUBERT & DUVAL MOC2
M-1115, 0.4-0.5 C, 1.0-1.5 Cr, 0.10-0.30 Mo, bal Fe
For gears, axles, shafts, bolts, spindles, AISI 4145, oil hardened

AUBERT & DUVAL MUV.
M-1115, 0.9-1.1 C, 0.1-0.4 V, bal Fe.
For punches, dies, threading taps, drawing dies; water hardened, Type W2

AUBERT & DUVAL NC36.
M-1115; 0.35-0.45 C, 0.5-1.0 Cr, 3.0-3.5 Ni, 0.8 Mn, bal Fe.
For gears, shafts, machinery parts; AISI 3340; oil hardened, shock resistant.

AUBERT & DUVAL NCAV.
M-1115; 0.14 max C, 3.0-3.5 Ni, 0.5-1.0 Cr, 0.5 Mn, bal Fe.
For cams, gears, camshafts, machinery parts; AISI 3310, case hardened, shock resistant.

AUBERT & DUVAL NCAV2.
M-1115, 0.17 max C, 3.0-3.5 Ni, 0.5-1.0 Cr, bal Fe.
For shafts, gears, camshafts, machinery parts; AISI 3316; case hardened, shock resistant.

AUBERT & DUVAL NCAV4.
M-1115, 0.20 max C, 3.0-3.5 Ni, 0.5-1.0 Cr, 0.5 Mn, bal Fe.
For camshafts, cams, gears, machinery parts, AISI 3316, case hardened, shock resistant.

AUBERT & DUVAL NCAV5
M-1115; 0.22 max C, 3.0-3.5 Ni, 0.5-1.0 Cr, bal Fe.
For camshafts, cams, gears, machinery parts; AISI 3320, case hardened, shock resistant.

AUBERT & DUVAL R2C
M-1115; 0.90-1.1 C, 1.8-2.2 Cr, bal Fe
For stamping tools, dies, jigs, templates, oil hardened

AUBERT & DUVAL R12S
M-1115, 0.6-0.7 C, 0.4-0.8 W, 0.15-0.40 V, bal Fe.
For punches, dies, chisels, impact tools, water hardened, tough

AUBERT & DUVAL RAD
M-1115, 0.9-1.2 C, 1.4-1.9 Cr, 0.5 Si, 0.8 Mn, bal Fe.
For roller bearings, thrust bearings, AISI 52100, water hardened, wear resistant

AUBERT & DUVAL SM1
M-1115, 0.6 C, 2.25-3.30 Ni, 0.6-1.0 Cr, 0.40 Mo, bal Fe
For die blocks, hot work steel, air hardened

AUBERT & DUVAL SMV
M-1115, 0.3-0.4 C, 4.5-5.5 Cr, 1-2 Mo, W, V, bal Fe.
For forging dies, punches, mandrels, hot shear blades, air hardened, hot work steel

AUBERT & DUVAL SYCOB
M-1115, 2.0-2.5 C, 11-13 Cr, V, Co, bal Fe
For cutting, pressing and stamping tools, drawing dies, oil or air hardened, non-deforming

AUBERT & DUVAL V300
M-1115; 0.4-0.5 C, 1.3-1.8 Si, 0.5-1.0 Cr, 0.1-0.3 Mo, bal Fe
For suspension springs, torsion bars, AISI 9245; tough

AUBERT & DUVAL VCD
M-1115, 0.3-0.4 C, 1.0-1.5 Cr, 0.2-0.4 V, bal Fe
For punches, rivet sets, dies, impact tools, water hardened, shock resistant

AUBERT & DUVAL X13
M-1115, 0.25-0.35 C, 12-14 Cr, 0.8 Mn, bal Fe
For valves, cutlery, turbine blades, surgical instruments, Type 420, corrosion resistant.

AUBERT & DUVAL X13M.
M-1115, 0.15 max C, 12-14 Cr, 0.8 Mn, bal Fe
For valves, cutlery, surgical instruments; Type 410; corrosion resistant

AUBERT & DUVAL X18
M-1115, 0.12 max C, 8-11 Ni, 17-20 Cr, bal Fe.
Annealed 80,000 TS, 35,000 YS, 55 El, 75 RA, 150 Brin
For chemical plant equipment, tanks, mixers; Type 302; stainless, austenitic.

AUBERT & DUVAL X18BC.
M-1115; 0.05 max C, 10-13 Ni, 17-22 Cr, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 304; austenitic, stainless.

AUBERT & DUVAL X18MBC.
M-1115; 0.05 max C, 10-13 Ni, 16-19 Cr, 2-3 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El, 65 RA; 160 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

AUBERT & DUVAL X18P.
M-1115, 0.12 max C, 9-12 Ni, 17-20 Cr, Ti = 5 × C, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, mixers, tanks; Type 321; stainless, austenitic

AUBERT & DUVAL X20T.
M-1115; 0.2-0.3 C, 7-11 Ni, 19-23 Cr, 1 75-3 75 W, bal Fe.
Heat treated· 114,000 TS; 65,000 YS; 40 El.
For valves for diesel engines; austenitic, corrosion and heat resistant.

AUBERT & DUVAL X25
M-1115, 0 15 max C, 18-20 Ni, 24-26 Cr, bal Fe.
Annealed: 100,000 TS, 45,000 YS; 50 El, 65 RA; 185 Brin.
For furnace parts, valve parts, jet engine parts; Type 310, stainless, austenitic

AUBURN CAST.
M-697; 0 7-1 0 C, bal Fe.
For tools, drills, taps; water hardened.

AUBURN EXTRA
M-697; 0 8-1 2 C, bal Fe.
For tools, drills, taps; water hardened

AUBURN HOT DIE
M-697, 0 5 C, 4 W, bal Fe.
For tools, hot shears; hot work steel

AUBURN PERFECTION.
M-697, C, alloy, bal Fe.
For tools, punches; water hardened.

AUBURN SPECIAL.
M-697, 0 7-1.4 C, bal Fe
For tools, drills, taps; water hardened.

AUBURN STANDARD
M-697, 0 7-0 9 C, bal Fe.
For tools, drills, taps, water hardened.

AUBURN TOOL MAKER.
M-697, 0 9 C, 1.2 Mn, bal Fe
For tools, dies, punches, non-deforming

AUDIO 52
4.5-4 75 Si, bal Fe.
For laminations for electrical equipment, high permeability.

AUDIO 58.
3 5-3.75 Si, bal Fe.
For laminations for electrical equipment, high permeability.

AUDIO 65.
3.25-3 75 Si, bal Fe
For laminations for electrical equipment, high permeability.

AUDIO 72.
3 25-3.75 Si, bal Fe.
For laminations for electrical equipment, high permeability.

AUDIO 82.
2.25-2.75 Si, bal Fe.
For laminations for electrical equipment; high permeability.

AUDIO 101.
2 25-2.75 Si, bal Fe.
For laminations for electrical equipment; high permeability.

AUDIO 117.
1-1.5 Si, bal Fe.
For laminations for electrical equipment; high permeability

AUDIO 130.
0.5-0.75 Si, bal Fe.
For laminations for electrical equipment, high permeability

AUDIO 145.
0.25-0 5 Si, bal Fe.
For laminations for electrical equipment; high permeability.

AUDIO 165
Under 0 25 Si, bal Fe
For laminations for electrical equipment, high permeability.

AUDIOLOY
M-38, 48 Ni, 52 Fe
For magnets, high permeability.

AUER METAL-A
Germ , 35 Fe, 65 Ce.
For gas and cigarette lighters, pyrophoric.

AUER METAL-B
Germ , 53 Fe, 30 Mn, 10 Sb, 7 Misch metal
For gas and cigarette lighters, pyrophoric, sparking alloy

AUER METAL-C
Germ,, 35 Fe, 35 Ce, 29 Misch metal
For gas and cigarette lighters, pyrophoric

AUER METAL-D
Germ , 35 Fe, 35 Ce, 24 La, 3 Yb, 2 Er.
For gas and cigarette lighters, pyrophoric

AUFRILOY.
M-681; Pb, Sn, bal Cu
For bearings, bushings, heavy duty

AUGER
M-289, C, bal Fe
For machine tool parts, water hardened

AUGER SECTION A
M-289, 0 75 C, bal Fe
For tools, mining drills, water hardened.

AUGER SECTION B.
M-289, 0 75 C, bal Fe
For tools, mining drills; water hardened.

AURIGA MARK I
M-476, 0 25 C, 0.7 Mn, bal Fe.
Annealed 67,200-78,500 TS, 34,000 YS, 20 El.
For structural castings, water hardening

AURIGA MARK III.
M-476, 0 4 C, 0 7 Mn, bal Fe.
Annealed 83,000-101,000 TS; 42,000 YS; 15 El.
For gears and wear resistant castings; water hardening.

AURIGA MARK VIII.
M-476; 0.20 C, Mo, bal Fe.
Normalized: 67,200 TS; 40,300 YS, 20 El.
For high temperature castings to 1020°F, heat resistant.

AURIGA MARK VIII A.
M-476; 0.15 C, Cr, Mo, bal Fe.
Normalized: 78,000 TS; 44,800 YS; 15 El.
For castings; high creep strength to 1020°F.

AURIGA MARK IX.
M-476; 0.3 C, Cr, Mo, bal Fe.
Hardened: 102,000-141,000 TS; 78,000-101,000 YS; 15-12 El.
For high strength castings; oil hardened.

AURIGA MARK X.
M-476, C, 11-14 Mn, bal Fe.
For wear resistant castings; Mn steel.

AURIGA MARK XV.
M-476, 0.3 C, 3 Cr, Mo, bal Fe
Hardened 102,000-141,600 TS, 78,000-101,000 YS, 15-12 El
For high strength castings; oil hardened.

AURIGA MARK XVI.
M-476; 0.3 C, Cr, Ni, Mo, bal Fe.
Hardened 102,000-141,600 TS, 78,000-100,000 YS, 15-12 El
For high strength castings; oil hardened.

AURIGA MARK XVII
M-476, 0.15 C, 18 Cr, 8 Ni, 1.5 W, bal Fe.
Annealed
For heat resistant castings, corrosion and heat resistant.

AURIGA MARK XXI.
M-476, 0.2 C, 5 Cr, Mo, bal Fe
Hardened 90,000 TS; 60,000 YS; 18 El
For castings for high temperature service, heat resistant.

AURIGA MARK XXII
M-476, 0.2 C, 9 Cr, 1.2 Mo, bal Fe.
Hardened. 90,000 TS, 60,000 YS, 18 El
For castings for high temperature service, heat resistant

AURIGA MARK XXIII
M-476, 0.2 C, 13 Cr, bal Fe
Hardened. 78,500 TS, 49,600 YS, 20 El.
For castings; corrosion resistant.

AURIGA MARK XXIV B
M-476, 0.15 C, 18 Cr, 8 Ni, Cb, bal Fe
Annealed 68,500 TS, 30,300 YS, 20 El
For castings, stainless, austenitic

AUR-O-MET 11B.
M-603, 10.5 Al, 1.0 Fe, bal Cu
Sand Cast: 75,000-85,000 TS; 32,000-42,000 YS, 20-35 El, 71-81 Rb.
Heat treatable aluminum bronze, corrosion resistant
For gears, worm wheels, valve seats, valve guides, shafts
ASTM B148-52-9B, SAE 68 B

AUR-O-MET 56.
M-603; 10.5 Al, 4.75 Ni, 4.25 Fe, bal Cu.
Sand Cast: 90,000-100,000 TS, 50,000-60,000 YS, 5-10 El, 89-93 Rb
For gears, machine and structural parts, impellers; corrosion and wear resistant
ASTM B148-52-9D

AUR-O-MET 115.
M-603, 5 Sn, 5 Pb, 5 Zn, bal Cu.
Cast: 32,000-38,000 TS; 15,000-17,000 YS; 20-40 El, B 24 Rock.
For water pump impellers, fittings for gasoline and oil lines, bushings, miscellaneous castings.
Red brass, free-cutting, good castability. SAE 40.

AUR-O-MET 123.
M-603; 3 Sn, 7 Pb, 9 Zn, bal Cu.
Sand cast: 29,000-39,000 TS; 13,000-17,000 YS; 18-30 El, 22 Rb (approx.).
Semi-red brass for general purpose plumbing and machine parts; ductile and corrosion resistant, free machining
ASTM B145-52 (5A).

AUR-O-MET 141.
M-603, 59 Cu, 39.5 Zn, 1.5 Si.
Cast 70,000-78,000 TS, 40,000-35,000 YS, 15-20 El, B 78-82 Rock.
For fittings, hardware, permanent mold and shell mold castings Yellow Brass, corrosion resistant.

AUR-O-MET 145.
M-603; 14 Zn, 5 Si, bal Cu
Die cast 70,000-92,000 TS, 40,000-60,000 YS, 20-15 El; 20 RA, 128-160 Brin.
For gears, water pumps, impellers, marine parts; corrosion and wear resistant

AUR-O-MET 150.
M-603, 60 Cu, 39.5 Zn, 0.5 Al
Cast: 40,000-45,000 TS; 11,000-14,000 YS, 23-28 El; B 40-50 Rock
For fittings, hardware, permanent and shell mold castings.
Yellow brass, corrosion resistant

AUR-O MET 305.
M-603, 10 Sn, 10 Pb, bal Cu, 0.25 max P.
Cast 27,000-39,000 TS, 15,000-22,000 YS; 26-34 El; B 27 Rock.
For wrist pins, piston pins, bushings, bearings
Good antifriction qualities
High leaded tin bronze
ASTM B144-52 (3A)

AUR-O-MET 315.
M-603, 7 Sn, 7 Pb, 2 Zn, bal Cu
Cast: 30,000-38,000 TS, 17,000-21,000 YS, 12-20 El, B 20 Rock
For bearings, spring bushings, thrust washers
High leaded tin bronze, SAE 660

AUR-O-MET 403.
M-603, 1.0 Sn, 3.0 Pb, 29 Zn, bal Cu.
Cast 30,000-38,000 TS, 11,000-15,000 YS, 20-35 El, B 10 Rock
For commercial bronze castings, radiator parts, fittings, battery terminals Good machinability
Yellow brass leaded, SAE 41

AUR-O MET 420.
M-603; 0.75 Sn, 0.75 Pb, 37.0 Zn, 1.25 Fe, 0.75 Al, 0.5 Mn, bal Cu
Cast 60,000-78,000 TS, 20,000-40,000 YS, 15-30 El, B 40-51 Rock
For propellers, marine hardware, shafts, gears, fittings. Good corrosion resistance
Manganese Bronze, high strength.
ASTM-B147-52 (7A)

AUR-O-MET 421.
M-603, 39.25 Zn, 1.25 Fe, 1.25 Al, 0.25 Mn, bal Cu.
Cast. 65,000-80,000 TS, 25,000-40,000 YS; 20-40 El; B 54-68 Rock
For gear shift forks, spiders, fittings, brackets, landing gears
Good corrosion resistance, high strength.
Manganese bronze, SAE 43

AUR-O-MET 424.
M-603, 26.0 Zn, 3.0 Fe, 5.5 Al, 3.5 Mn, bal Cu.
Cast 110,000-120,000 TS, 70,000-85,000 YS, 15-18 El, B 89-97 Rock.
For propellers, impellers, gears, fittings, marine hardware.
Good corrosion and wear resistance.
Manganese bronze, high strength. SAE 430-B.

AUSCO 80.
M-1152; 1.3-1.4 C, 0.7 Si, 0.9 Mn, 0.10 max Cr, 0.10 max Cu, 0.5 Ni, 0.15 Mo, bal Fe.
Heat treated: 110,000 TS; 80,000 YS; 7 El; 270 Brin.
For crankshafts; castings.

AUSTALON.
M-937; 0.08 C, 18 Cr, 8 Ni, 2 Mo, bal Fe
For orthodontic and denture applications; stainless, austenitic.

AUSTINOX.
M-884; 0.06 C, 18 Cr, 10 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, vessels, filters; Type 304; stainless, austenitic.

AUSTINOX B
M-884; 0.06 C, 18 Cr, 12 Ni, 2-3 Mo, bal Fe
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

AUSTINOX S.
M-884; 0.08 C, 18 Cr, 10 Ni, Ti = 5 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, mixers, tanks, Type 321; stainless, austenitic.

AUSTINOX SB.
M-884; 0.08 C, 18 Cr, 12 Ni, 2-3 Mo, Ti = 5 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El, 65 RA; 160 Brin
For welded acid resistant chemical plant equipment, Type 316 Ti; stainless, austenitic

AUSTRIAN ALLOY (SPANDAU).
Austria; 4-6 Cu, 2-3.5 Al, bal Zn
For die castings; Spandau Alloy.

AUSTRIAN (GERSDORF).
Austria; 60-50 Cu, 20-25 Zn, 20-25 Ni
For costume jewelry, German silver.

AUSTRIAN JOURNAL BOX.
Austria, 92.5 Cu, 7.5 Zn.
For bearing purposes; gilding metal

AUTO.
M-1322; 0.41 C, 1.1 Cr, 0.7 Mn, 0.25 Si, bal Fe
For gears, bolts, shafts, axles, bolts; oil or water hardened, shock resistant

AUTO NO. 1.
M-38; 0.5 C, 1.8 Ni, 1 Cr, bal Fe
For punches, shock tools; tough.

AUTOCHROM CV4
M-1322; 0.5 C, 0.85 Mn, 1 Cr, 0.09 V, bal Fe.
For gears, bolts, springs, crankshafts; oil hardened, shock resistant.

AUTOCRAT.
M-565; alloy, bal Cu.
For bearings.

AUTOCRAT BUSHING BRONZE.
M-565; P, Sn, bal Cu.
34,000 TS, 10 El; 68 Brin.
For bushings, bearings; bearing bronze.

AUTO DIE.
M-260, M-38, C, alloy, bal Fe.
For tools; oil hardening.

AUTO EXTRA N.C.
M-27; 0.30 C, 0.75 Cr, 3.5 Ni, bal Fe.
Heat treated: 150,000 TS; 106,000 YS; 14 El; 50 RA; 310 Brin.
For crankshafts, axles, valves, connecting rods, gears; oil hardened.

AUTO EXTRA NC W/H.
M-501, M-912; 0.22-0.30 C, 0.8 Cr, 3.5 Ni, bal Fe.
Heat treated: 135,000-142,000 TS; 92,500-113,800 YS.
For gears, bolts, studs, shafts, fasteners; oil hardened, shock resistant.

AUTO EXTRA PA.
M-27, 0.25 C, 1.3 Cr, 0.1 Mo, 4.5 Ni, bal Fe
Heat treated: 142,300 TS; 113,800 YS
For gears, bolts, crankshafts, fasteners, oil hardened, shock resistant.

AUTO FIRST QUALITY N.C.
M-27; 0.30 C, 0.50 Cr, 1.5 Ni, bal Fe.
For crankshafts, axles, connecting rods; gears; water hardened.

AUTO LITE Al-5
M-851; 4.5-6.0 Si, 2 max Fe, bal Al.
Cast: 30,000 TS; 5 El.
For die castings; high fluidity

AUTO LITE Al-6
M-851; 11-13 Si, 2 max Fe, bal Al
Cast: 37,000 TS, 1.8 El
For die castings, high fluidity.

AUTO-LITE Al-9
M-851, 7.5-9.5 Si, 3-4 Cu, 2 max Fe, bal Al
Cast: 43,000 TS, 2 El
For die castings; high fluidity.

AUTO-LITE Z-3
M-851, 3.5-4.2 Al, 0.03-0.08 Mg, bal Zn
Cast 43,000 TS, 10 El, 82 Brin
For die castings

AUTOMATIC AW-79
M-9, 0.3 C, 2 Mn, 4 Cr, 1 Mo, bal Fe
Welded 450 Brin
For tractor rolls and idlers, steel car wheels, hard facing electrode.

AUTO NC W/H.
M-501, M-912, 0.28-0.35 C, 0.7 Cr, 2.5 Ni, bal Fe
For gears, bolts, shafts, axles, crankshafts, oil hardened, shock resistant.

AUTOPAN
M-297; 0.6-1.0 Mg, 0.6-1.2 Si, 0.3 max Cr, 0.5-2.5 Pb, Sn, Cd, Bi, bal Al
Annealed 21,000 TS, 8000 YS, 20 El.
For screw machine products, fasteners, free-cutting

AUTO PRIMA NC W/H
M-27, 0.28-0.35 C, 0.5 Cr, 1.5 Ni, bal Fe.
Heat treated. 120,000-128,000 TS; 71,200-85,000 YS
For gears, bolts, shafts, axles, crankshafts, oil hardened, shock resistant.

AUTO SPEZIAL 2
M-1337, 0.45 C, W, Cr, V, bal Fe
For rams, punches, shears, crimpers, upsetters, hot work steel, oil hardened.

AUTO SUMUS.
M-1337, 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, drills, reams, taps, high speed steel.

AUTOTHERMIC
Eng., steel coated with Al.
For fire walls; heat resistant.

AUTOVALVE STEEL.
M-32; Ni, C, bal Fe.
For valves, spark plugs; low coefficient of res.; corrosion resistant.

AVESTA 248 SV.
M-16; 0.05 max C, 16 Cr, 5 Ni, 1 Mo, bal Fe.
Heat treated: 128,000 TS; 100,000 YS; 20 El;
280 Brin.
Weldable, hardenable stainless steel. As rolled for pressure vessels and as cast for propellers, turbines, valves etc. Corrosion resistant, austenitic-martensitic-ferritic.

AVESTA 249 MV.
M-16; 0.05 C, 17 Cr, bal Fe.
Annealed: 74,000 TS; 52,000 YS; 30 El, 150 Brin
Pressed and welded articles subject to slight corrosion attack. Oil refinery equipment, oil burners.
Corrosion resistant, type 430, ferritic.

AVESTA 252 M
M-16; 0.07 C, 23 Cr, 14.5 Ni, bal Fe
Annealed: 100,000 TS; 50,000 YS; 40 El, 170 Brin.
For furnace parts, heat treating boxes, oil burners; Type 309S, corrosion and heat resistant; austenitic.

AVESTA 252 S.
M-16, 0.03 max C, 21.5 Cr, 15 Ni, 2.7 Mo, 0.2 N, bal Fe
Annealed: 106,000 TS, 50,000 YS, 50 El, 190 Brin
Pipes, fittings, valves etc mainly for salt water application. Corrosion resistant, austenitic.

AVESTA 254
M-16, 0.10 C, 19.5 Cr, 20.5 Ni, bal Fe
Annealed 85,000 TS, 36,000 YS; 54 El, 160 Brin
For furnace parts. Low sensibility to sigma phase formation Corrosion and heat resistant, austenitic

AVESTA 254 EM.
M-16, 0.08 max C, 25 Cr, 21 Ni, bal Fe
Annealed: 93,000 TS; 43,000 YS; 50 El, 170 Brin
For annealing boxes, tanks, recuperators, Type 310 S, corrosion and heat resistant, austenitic.

AVESTA 254 SLX
M-16, 0.02 max C, 20 Cr, 25 Ni, 4.5 Mo, 1.5 Cu, bal Fe
Annealed 85,000 TS, 36,000 YS, 50 El,
155 Brin.
For pumps, chemical plant equipment, resists H_2SO_4, corrosion resistant, austenitic

AVESTA 393.
M-16; 0.12 C, 13.5 Cr, bal Fe.
Annealed. 78,000 TS, 50,000 YS, 30 El, 190 Brin
Heat treated 185,000 TS, 157,000 YS, 17 El,
390 Brin
For press and caul plates in hardboard, chipboard and plastic laminating ind
Type 410, hardenable, corrosion resistant

AVESTA 393 M
M-16; 0.07 max C, 14 Cr, bal Fe.
Annealed: 74,000 TS, 47,000 YS, 26 El, 150 Brin
For table flatware, wood pulp conveyor screws, steam and water turbine parts Recuperators Non-hardenable, corrosion resistant

AVESTA 453 E
M-16; 0.09 C, 26 Cr, 4.5 Ni, bal Fe
Annealed: 100,000 TS; 70,000 YS, 25 El, 210 Brin.
For furnace plates, lead and salt bath crucibles.
Ferritic-austenitic, heat resistant.

AVESTA 453 S.
M-16; 0.08 C, 26 Cr, 5 Ni, 1.5 Mo, bal Fe.
Annealed: 100,000 TS, 70,000 YS; 23 El; 220 Brin.
For valves, pumps, shafts and equipment in the cellulose, dyeing, chemical and dairy industries Corrosion resistant, ferritic-austenitic (Type 329).

AVESTA 453 SG.
M-16, 0.04 max C, 22 Cr, 6.0 Ni, 1.7 Mo, bal Fe.
Annealed: 90,000 TS; 56,000 YS; 20 El;
220 Brin.
Cast material, for ships propellers. Corrosion resistant, ferritic-austenitic.

AVESTA 664 M.
M-16, 0.07 max C, 17 Cr, 5.5 Ni, 6.5 Mn, bal Fe.
Annealed: 100,000 TS, 50,000 YS; 70 El;
190 Brin.
For sinks, food processing equipment, in the architecture
For Type 202, corrosion resistant, austenitic

AVESTA 664 MV.
M-16, 0.05 max C, 18 Cr, 5 Ni, 8 Mn, bal Fe.
Annealed: 106,000 TS, 54,000 YS; 60 El, 190 Brin.
For nitric acid and brewery equipment Type 204, corrosion resistant, austenitic.

AVESTA 739 G
M-16; 0.12 C, 13 Cr, 1 Ni, bal Fe.
Annealed. 100,000 TS, 64,000 YS; 20 El; 210 Brin.
For castings, water turbine parts, vanes, bottom plates, corrosion resistant

AVESTA 739 S
M-16, 0.14 C, 13.5 Cr, 1 Mo, bal Fe.
Annealed. 93,000 TS, 64,000 YS, 18 El, 190 Brin.
Hardened 192,000 TS, 128,000 YS, 10 El,
385 Brin
For paper mill knives, ship propellers, corrosion resistant, hardenable

AVESTA 739 SG
M-16, 0.12 C, 13 Cr, 1 Ni, 1 Mo, bal Fe
Annealed 92,000 TS; 58,000 YS, 16 El; 50 RA;
190 Brin
For castings, ship propellers, corrosion resistant

AVESTA 831
M-16; 0.2 C, 1.0 Si, 25 Cr, 0.8 Ni, bal Fe.
Annealed. 83,000 TS, 57,000 YS; 30 El, 175 Brin
For furnace equipment, Type 446, heat resistant, non-hardenable

AVESTA 832 H
M-16, 0.11 C, 17 Cr, 8 Ni, bal Fe
Annealed: 107,000 TS, 50,000 YS, 65 El, 200 Brin
For press and caul plates in hardboard, chipboard and plastic laminating ind and chain type bottle conveyors Type 302, corrosion resistant, austenitic

AVESTA 832 M
M-16, 0.05 max C, 18 Cr, 9 Ni, bal Fe
Annealed 85,000 TS, 40,000 YS, 70 El; 155 Brin
Cold strip rolled For household articles and in the architectural industry For equipment in the food-processing industry. Type 304, corrosion resistant, austenitic

AVESTA 832 MV.
M-16; 0.05 max C, 18 Cr, 9 Ni, bal Fe.
Annealed: 83,000 TS; 37,000 YS; 62 El; 150 Brin.
Hot rolled For welded structures, acid vessels and other equipment in food processing and chemical ind Type 304, corrosion resistant, austenitic.

AVESTA 832 MVN.
M-16; 0.05 max C, 18.5 Cr, 8.5 Ni, 0.20 N, bal Fe.
Annealed 90,000 TS; 48,000 YS; 50 El;
160 Brin.
High proof stress stainless steel. Cryogenic applications Corrosion resistant, austenitic.

AVESTA 832 MVNb.
M-16; 0.08 max C, 17.5 Cr, 9.5 Ni, Cb, bal Fe.
Annealed: 86,000 TS; 40,000 YS; 56 El; 160 Brin.
For nitric acid ind., aircraft internal combustion and jet engine parts. Furnace equipment, Type 347, corrosion resistant, austenitic.

AVESTA 832 MVR.
M-16; 0.03 max C, 18.5 Cr, 10 Ni, bal Fe.
Annealed: 77,000 TS; 36,000 YS; 60 El; 150 Brin.
For nitric acid equipment, nuclear ind. Type 304 L, corrosion resistant, austenitic.

AVESTA 832 MVRN.
M-16; 0.03 max C, 18.5 Cr, 10.5 Ni, 0.20 N, bal Fe.
Annealed: 88,000 TS; 40,000 YS; 50 El; 150 Brin.
High proof stress stainless steel. Equipment in the chemical ind. Corrosion resistant, austenitic.

AVESTA 832 MVT.
M-16; 0.08 max C, 17.5 Cr, 10 Ni, Ti, bal Fe
Annealed: 86,000 TS; 40,000 YS; 55 El; 160 Brin.
For nitric acid ind.; aircraft internal combustion and jet engine parts. Furnace equipment. Type 321, corrosion resistant, austenitic.

AVESTA 832 SF.
M-16; 0.05 max C, 17 Cr, 11 Ni, 2.3 Mo, bal Fe.
Annealed: 85,000 TS; 42,000 YS; 58 El; 150 Brin.
Equipment in the chemical, cellulose and food processing ind. Type 316, corrosion resistant, austenitic.

AVESTA 832 SFR.
M-16, 0.03 max C, 17 Cr, 11.5 Ni, 2.3 Mo, bal Fe.
Annealed: 83,000 TS; 42,000 YS; 58 El; 150 Brin
Equipment in the chemical and food processing ind. Type 316 L, corrosion resistant, austenitic

AVESTA 832 SFT.
M-16, 0.08 max C, 17 Cr, 12 Ni, 2.3 Mo, Ti, bal Fe.
Annealed: 85,000 TS; 42,000 YS; 55 El, 160 Brin.
Equipment in the chemical ind., Type 316 T, corrosion resistant, austenitic.

AVESTA 832 Si
M-16; 0.02 max C, 4 Si, 17.5 Cr, 14.5 Ni, bal Fe.
Annealed 96,000 TS; 42,000 YS, 55 El; 160 Brin.
Vessels, pipes, valves etc. Especially good resistance against highly concentrated nitric acid. Austenitic.

AVESTA 832 SK.
M-16, 0.05 max C, 17 Cr, 11.5 Ni, 2.7 Mo, bal Fe.
Annealed: 85,000 TS; 42,000 YS; 58 El, 150 Brin.
Main type for the chemical and cellulose ind. Type 316, corrosion resistant, austenitic.

AVESTA 832 SKER (832 SKR-5)
M-16; 0.03 max C, 17.5 Cr, 13.5 Ni, 2.7 Mo, bal Fe
Annealed. 85,000 TS; 40,000 YS; 58 El; 150 Brin.
Low ferrite grade mainly for the urea and acetic acid ind. (Type 316) corrosion resistant, austenitic.

AVESTA 832 SKNb.
M-16; 0.06 max C, 17 Cr, 13 Ni, 2.7 Mo, Cb, bal Fe.
Annealed: 85,000 TS; 42,000 YS; 55 El; 160 Brin.
For equipment in the chemical ind. Type 316 Cb, corrosion resistant, austenitic.

AVESTA 832 SKR.
M-16; 0.03 max C, 17.5 Cr, 13 Ni, 2.7 Mo, bal Fe.
Annealed, 85,000 TS; 42,000 YS; 57 El; 150 Brin.
For equipment in the chemical ind. Type 316 L, corrosion resistant, austenitic.

AVESTA 832 SKRN.
M-16; 0.03 max C, 17.5 Cr, 13 Ni, 2.7 Mo, 0.2 N, bal Fe.
Annealed: 90,000 TS; 50,000 YS; 50 El; 160 Brin.
High proof stress stainless steel. Equipment in the chemical and cellulose ind. For chemical tankers. Corrosion resistant, austenitic.

AVESTA 832 SKT.
M-16; 0.08 max C, 17 Cr, 13 Ni, 2.7 Mo, bal Fe.
Annealed: 85,000 TS; 42,000 YS; 55 El; 160 Brin.
For equipment in the chemical ind. Type 316 Ti, corrosion resistant, austenitic.

AVESTA 832 SL.
M-16; 0.05 max C, 16.5 Cr, 15 Ni, 4.3 Mo, bal Fe
Annealed: 88,000 TS; 46,000 YS; 51 El; 150 Brin.
For equipment in the chemical ind. Highly resistant to acids, austenitic.

AVESTA 832 SN.
M-16; 0.5 max C, 18.5 Cr, 14.5 Ni, 3.3 Mo, bal Fe.
Annealed. 85,000 TS, 43,000 YS; 50 El; 150 Brin.
For sulfite digesters and equipment in the chemical ind. Type 317, corrosion resistant, austenitic.

AVESTA 832 SNR
M-16, 0.03 max C, 18.5 Cr, 14.5 Ni, 3.3 Mo, bal Fe.
Annealed: 85,000 TS, 43,000 YS; 50 El, 150 Brin
For sulfite digesters and equipment in the chemical ind Type 317 L, corrosion resistant

AVESTA 832 SV.
M-16; 0.05 max C, 17.5 Cr, 9.5 Ni, 1.5 Mo, bal Fe.
Annealed 84,000 TS, 40,000 YS; 61 El, 150 Brin.
For equipment in the cellulose and food processing industry. Window frames Corrosion resistant, austenitic.

AVESTA 832T/NB.
M-16, 0.10 C, 18 Cr, 9.5 Ni, Cb, bal Fe.
Annealed 90,000 TS, 45,000 YS, 56 El, 65 RA; 150 Brin
For welded chemical plant equipment, tanks, mixers, Type 347, corrosion resistant

AVIAL.
M-698, 0.5 Si, 2.5 Cu, 0.6 Mg. 1.0 Ni, 0.7 Cr, bal Al.
Heat treated 57,000 TS; 26 El
For light alloy parts; hardenable.

AVIALITE-915.
M-8; 89.25 Cu, 9.25 Al, 0.4 Sn, 0.5 Ni, 0.6 Fe
Soft 80,000 TS, 40,000 YS, 22 El
Hard: 95,000 TS, 55,000 YS, 16 El.
For valve seats, spark-plug bushings in aircraft engines, same as "Millard Metal."

AVIOL.
Russia, 0.7 Si, 0.6 Mg, bal Al.
Annealed: 17,000 TS, 7000 YS; 27 El, 40 Brin
For aircraft parts

AVIONAL.
M-493, M-541, M-1548, 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
Annealed: 27,000 TS, 11,000 YS; 22 El, 47 Brin.
Heat Treated. 72,000 TS; 57,000 YS; 130 Brin.
For aircraft structures and fittings, age-hardenable.

AVIONAL.
M-624; 3-4 Cu, 0.6 Mg, 0.6 Mn, 0.3 max Si, 0.3 max Fe, bal Al.
For aircraft parts; age hardenable.

AVIONAL-14
M-624, M-249, M-541; 4.4 Cu, 0.8 Si, 0.4 Mg, 0.8 Mn, bal Al.
Annealed: 27,000-30,000 TS; 11,400-17,800 YS; 12-18 El; 45-55 Brin.
TA-Temper. 67,500-75,400 TS; 58,300-64,000 YS; 6-9 El; 125-140 Brin.

For aircraft structures, general engineering components.
Age hardenable; high strength.

AVIONAL-20.
M-249; Cu, Mg, bal Al.
For clad sheets for orthopedics; age-hardened, malleable as heat treated.

AVIONAL-21.
M-624, M-541; 2.5 Cu, 0.3 Si, 0.3 Mg, bal Al.
Annealed: 14,200-21,400 TS, 5700-10,000 YS; 25-40 El; 35-45 Brin.
TN-Temper: 38,400-50,000 TS; 21,500-28,400 YS; 16-23 El; 80-90 Brin.
For aircraft components, marine and transportation equipment

AVIONAL-22.
M-249, M-541; 3.5-5.0 Cu, 1 max Si, 0.2-1.5 Mn, 0.2-1.5 Mg, bal Al.
Annealed: 22,750 TS; 8500 YS; 30 El, 45 Brin.
Heat Treated: 62,500 TS; 42,500 YS, 20 El; 120 Brin.
For aircraft and bus construction, machine tool parts; age hardened, high fatigue strength.

AVIONAL-23
M-249, 3.5-5.0 Cu, 0.2-1.5 Mg, 0.2-1.5 Mn, 0-1 Si, bal Al
Annealed 27,000 TS; 11,500 YS; 20 El, 50 Brin
Heat treated 71,000 TS; 48,250 YS, 20 El, 125 Brin.
For aircraft construction, machine tool parts; age-hardened, high fatigue strength

AVIONAL-24
M-249, M-541, 3.5-5.0 Cu, 0.1 Si, 0.2-1.5 Mn, 0.2-1.5 Mg, bal Al
Annealed. 28,500 TS, 12,750 YS, 22 El, 55 Brin.
Heat Treated: 74,000 TS; 51,000 YS; 15 El, 150 Brin
For aircraft and bus construction, machine tool parts, age-hardened, high fatigue strength

AVIONAL-25
M-249, Cu, Mg, bal Al
Annealed 22,750 TS; 8500 YS, 30 El, 50 Brin.
Heat treated. 74,000 TS, 68,250 YS, 10 El, 150 Brin.
For aircraft and bus body construction, age-hardened, corrosion resistant

AVIONAL 411.
M-249, 1.0 Si, 4.8 Cu, 0.5 Mg, 0.8 Mn, bal Al
Heat treated 64,000-74,000 TS, 54,000-63,000 YS, 8-12 El, 115-130 Brin
For light alloy parts, hardenable

AVIONAL D
M-249, M-624, 3.5-5.0 Cu, 0.2-1.5 Mg, 0.2-1.5 Mn, 0-1 Si, bal Al
Soft: 25,000 TS, 11,000 YS, 22 El, 50 Brin.
Heat treated. 58,000-87,000 TS; 38,000 YS; 21-2 El, 105 Brin.
For aviation and automobile parts; corrosion resisting; heat treatable.

AVIONAL D Ti
M-249, 0.2 Si, 3-8 Cu, 0.5 Mn, 0.5 Mg, 0.2 Fe, 0.16 Ti, bal Al
For aircraft parts, age-hardenable

AVIONAL M.
M-249; 0.7 Si, 4.2 Cu, 0.65 Mg, 0.7 Mn, bal Al.
Heat treated: 57,000-65,000 TS; 40,000-44,000 YS; 16-20 El; 105-120 Brin.
For aircraft parts; age hardened.

AVIONALPLAT.
M-249; Al alloy.
For light alloy parts; Avional coated with Al.

AVIONAL S.
M-249; 3.5-5 Cu, 0.2-1.5 Mg, 0.2-1.5 Mn, 0.2 Fe, 0.1-1.0 Si, bal Al.
Extruded: 71,000 TS; 54,000 YS; 15 El; 125 Brin.
For aircraft parts, auto construction; heat treatable.

AVIONAL SK.
M-249; 3.5-5.0 Cu, 0.5-0.8 Mn, 0.5-0.8 Mg, bal Al.
Sheets. 65,000-72,000 TS; 48,000-56,000 YS; 18-14 El.
For light alloy parts; age-hardenable.

AVIONAL Z
M-249, 0.4 Si, 0.3 Fe, 0.75 Mn, 0.80 Mg, 4.5 Cu, bal Al.
Wrought: 62,700-71,500 TS; 37,000-46,000 YS; 15-12 El.
For aviation and automobile parts; similar to "Duralumin."

AVONMOUTH
M-699, Al alloy.
For light alloy parts.

AVROCAN M7-12
M-435; 0.40 C, 1.0 Si, 5.0 Cr, 1.4 Mo, 0.5 V, bal Fe
Heat Treated. 225,000-305,000 TS; 195,000-255,000 YS, 8-15 El; 30-50 RA; C 45-56 Rock.
For extrusion dies, forging dies and inserts, hot punches, header and gripper dies.
Tough, hot work tool steel, Type H11.

AVS METAL.
M-700, 0.2-0.4 C, bal Fe.
For structural parts, water hardened

"A W 70-90" TYPE A
M-537, 0.25 max C, 0.7 Mn, 0.1 P, 0.5 Cu, bal Fe.
90,000 TS, 70,000 YS, 20 El
For sheets, plates, easy to weld

A.W 70-90 TYPE B.
M 537, 0.25 max C, 0.7 Mn, 0.1 P, 0.5 Cu, bal Fe.
Rolled, 65,000 TS; 50,000 YS, 20 El.
For structural work, transportation industry, truck and tank truck bodies, weldable, atmospheric corrosion resistant

AWARNITE (NATURAL).
Eng., 75 Ni, 25 Fe
For heat and corrosion resistant parts, heat and corrosion resistant.

AWCO-07.
M-982, 7 Mg, 0.25 Mn, bal Al.
For welding rod

AWCO-21.
M-982, 2.25 Mg, 0.4 Mn, bal Al.
Annealed: 26,000 TS, 11,200 YS; 48 Brin.
Hard: 45,000 TS, 40,000 YS, 85 Brin.
For wire, corrosion resistant

AWCO-24
M-982, 0.5 Mg, 0.5 Si, bal Al.
S.T.-temper 27,000 TS, 13,500 YS, 50 Brin.
S.T.A.-temper. 33,600 TS, 27,000 YS, 70 Brin.
Drawn 47,000 TS, 40,000 YS; 90 Brin.
For wire; heat treatable.

AWCO-25.
M-982; 0.7 Mg, 1 Si, bal Al.
S.T.-temper: 33,600 TS, 20,000 YS, 60 Brin.
S.T.A.-temper: 45,000 TS; 40,000 YS; 95 Brin.
For wire, heat treatable.

AWCO-27
M-982; 3.5 Mg, 0.5 Mn, bal Al.
Annealed 35,000 TS; 16,200 YS; 55 Brin.
Hard: 51,000 TS; 43,500 YS; 100 Brin.
For wire; corrosion resistant.

AWCO-28.
M-982; 5 Mg, 0.35 Mn, bal Al.
Annealed: 40,000 TS; 18,000 YS; 65 Brin.
Hard: 60,000 TS; 49,000 YS; 115 Brin.
For weaving wire, rivets; corrosion resistant.

AWCO-31.
M-982; 5 Cu, bal Al.
For welding rod.

AWCO-35.
M-982; 3 Cu, 0.6 Mg, 0.6 Sb, 0.15 Sn, bal Al.
Drawn: 53,000 TS; 49,200 YS; 110 Brin.
For machined parts; free-cutting, heat treatable.

AWCO-40.
M-982; 10-13 Si, bal Al.
For welding rod.

AWCO-45
M-982; 4.5-6.0 Si, bal Al.
For welding rod.

AWCO-60.
M-982; 1.25 Mn, bal Al.
Annealed: 15,700 TS; 7800 YS; 30 Brin.
Hard: 33,600 TS; 25,800 YS, 60 Brin
For wire; corrosion resistant.

AWCO-301.
M-982, 4.1 Cu, 0.6 Mg, 0.45 Si, 0.5 Mn, bal Al
S.T.A.-temper: 61,500 TS; 36,000 YS; 105 Brin.
For wire, rivets, heat treatable

AWCO-303.
M-982; 4.5 Cu, 0.5 Mg, 0.75 Si, 0.75 Mn, bal Al
S.T.-temper: 62,500 TS, 38,000 YS; 115 Brin.
S.T.A.-temper. 69,000 TS; 58,000 YS, 135 Brin.
For wire, bolts, heat treatable

AWCO-304
M-982; 2 Cu, 0.4 Mg, bal Al.
S.T.A.-temper: 43,500 TS, 22,200 YS, 80 Brin
For wire, rivets

AWCO-EP.
M-982, 99.5 min Al.
23,000-28,000 TS
For conductors, cables, high conductivity.

AWCO-SP
M-982, 99.99 min Al
Annealed: 8500 TS
Hard: 16,000 TS
For wire, high conductivity

AWCO-SP12
M-982, 1.25 Mg, bal Al.
Rolled: 29,200 TS.
For costume jewelry.

AWCO-SP16
M-982; 0.25 Cu, 0.7 Mg, 0.3 Si, bal Al
Rolled: 45,000 TS
For costume jewelry, pens, bracelets;
good for anodizing.

A.W. DYNALLOY.
M-537, 0.12 C, 0.75 Mn, 0.7 Ni, 0.07 Mo, bal Fe.
65,000-80,000 TS; 50,000 YS; 25 El
For railroad equipment, trucks, buses, smoke
chambers, stacks, good weldability.

AW DYNALLOY 50.
M-537; 0.13 C, 0.9 Mn, 0.35 Cu, 0.45 Ni, 0.08 Mo,
bal Fe.
Plate 50,000 min YS; 70,000 min TS; 22 min El.
For railroad gondola and hopper cars,
automobile and truck bodies and frames,
lift trucks, conveyors, bridges, buildings.
Good forming and welding properties
ASTM A242 High strength, low alloy steel.

AW-TEN.
M-537; 0.18 C, 0.75 Mn, 0.04 Si, 0.02 Cb, 0.25 Cu,
bal Fe.
Hot Rolled: 70,000 min TS; 50,000 min YS;
18 min El.
For mine cars, bridges, railroad cars, booms,
agriculture equipment.
Good formability and weldability.
High strength, low alloy structural steel.

AW V-STEEL.
M-537, 0.22 max C, 1.25 max Mn, 0.02 min V,
bal Fe.
V-45 Plate: 65,000 min TS, 45,000 min YS
V-50 Plate 70,000 min TS, 50,000 min YS
V-55 Plate: 70,000 min TS, 55,000 min YS.
V-60 Plate 75,000 min TS; 60,000 min YS.
V-65 Plate: 80,000 min TS, 65,000 min YS.
For railroad and mine cars, truck and bus bodies.
High strength, low alloy steel. Tough
Readily workable and weldable

AWX-45
M-537, 0.14 C, 0.50 Mn, 0.04 Si, 0.02 Cb, bal Fe
Rolled 63,000 TS, 45,000 min YS, 25 El,
B 78 Rock
For trucks, plow frames, pressure vessels
Good weldability and formability.

AWX-50
M-537, 0.14 C, 0.50 Mn, 0.04 Si, 0.02 Cb, bal Fe
Plate 50,000 min YS; 67,000 TS, 22 El;
B 81 Rock
For trucks, plow frames, pressure vessels.
Good formability and weldability.
High strength, low alloy steel

AWX-55
M-537, 0.14 C, 0.50 Mn, 0.04 Si, 0.02 Cb, bal Fe.
Plate 55,000 min YS, 71,000 TS, 20 El, B 83 Rock
For trucks, plow frames, pressure vessels
Good formability and weldability
High strength, low alloy steel

AXALOY
M-702, 0.4 C, bal Fe
For truck axles; water hardened

AXITE
M-703, Co-Cr-W
For valve seats, hard facing electrodes;
wear resistant

AXLE STEEL
M-618, 0.35-0.45 C, 1.2 Mn, 1 Ni, 0.3 max Si,
bal Fe.
Heat treated 89,000-112,000 TS, 22 min El,
46 min RA, 174-223 Brin
For axles, gears, shafts, oil or water hardened

AXLOY 20
M-703, 3.6 C, 2.5 Si, 0.6 Mn, bal Fe
Cast 20,000 TS; 163 Brin.
For glass molds, soft cast iron.

AXLOY 30
M-703, 3.4 C, 1.8 Si, 0.7 Mn, 0.25-1.0 Ni, 0.4 Cr,
0.4 Mo, bal Fe.
Normalized 30,000-35,000 TS, 180 Brin
For machinery castings, gears; cast iron,
wear resistant.

AXLOY 30 CN
M-703, 3.2 C, 2.5 Si, 1.5 Ni, bal Fe.
For hydraulic cylinders, valves, cast iron.

AXLOY 30 CNM.
M-703, 3.3 C, 0.25-1.00 Ni, 0.25-1.00 Cr
0.25-1.00 Mo, bal Fe
Cast: 35,000 TS; 207 Brin.
For liners, cams, cylinder blocks, gears; cast iron.

AXLOY 30 CRN.
M-703; 3.2 C, 1 5 Ni, 0.8 Cr, 2 5 Si, bal Fe.
Cast: 30,0000 TS.
For oil field valves, pump liners; cast iron, corrosion resistant.

AXLOY 35.
M-703; 3.2 C, 1.9 Si, 0.85 Mn, bal Fe.
Normalized 35,000-45,000 TS, 220 Brin.
For machinery castings, gears; cast iron, wear resistant

AXLOY 35 CN.
M-703; 3 C, 2 Si, 2 Ni, 1 Cr, bal Fe.
Cast· 35,000 TS.
For brake drums, gears, pump liners; abrasion and wear resistant

AXLOY 50
M-703, 3.0 C, 2 2 Si, 1 Mn, bal Fe.
Normalized: 50,000-60,000 TS, 240 Brin
For gears, machinery castings, cast iron

AXLOY 50 CN.
M-703, 3 2 C, 2 2 Si, 2 Ni, 1 Cr, bal Fe
Cast 50,000 TS
For hydraulic cylinders, valves, steam chests, cast iron

AXLOY 50 CNM.
M 703, 3 2 C, 2 Si, 2 Ni, 1 Cr, bal Fe
Cast. 50,000 TS.
For cylinder heads, pressure gates; cast iron.

AXLOY CNM.
M-703, 3 C, 2 Si, 1 Ni, bal Fe.
Cast 35,000 TS
For dies, pistons, liners, cams, wear resistant

AZ
M-699, Al alloy
For light alloy parts.

A-Z5G
French, 5 Zn, 0 5 Mg, 0.2 Ti, 0 3 Cr, bal Al
Aged 31,300-35,600 TS, 18,500 22,800 YS, 5-9 El, 70 Brin
For aircraft components, high strength castings, age-hardenable, shock resistant

AZ8GU
French, 7 0-8 5 Zn, 1 7-3.0 Mg, 1-2 Cu, 0 2 Cr, 0 4 Mn, bal Al
Hardened 95,000 TS, 85,000 YS, 8 El.
For light alloy parts, age-hardenable

AZ 31
M-325, 1 0 Zn, 0 3 Mn, 3 0 Al, bal Mg
Plate, sheet, strip, extrusions
28,000-34,000 TS, 14,000-20,000 Proof stress; 8-12 El; up to 20,000 fatigue strength
Good general purpose alloy with medium strength and good corrosion resistance, weldable

AZ31A.
M-43, 2.5-3 5 Al, 0 6-1.4 Zn, 0 20 min Mn, bal Mg
Heat treated· 32,000-40,000 TS, 16,000-29,000 YS, 12-4 El
For aircraft structural parts; age hardenable.

AZ31B.
M-43; 3 0 Al, 1 0 Zn, bal Mg.
O-temper. 32,000-37,000 TS, 18,000-22,000 YS; 21-12 El; 56 Brin.
F-temper: 32,000-36,000 TS; 16,000-24,000 YS; 6-18 El; 46 Brin.
H24-temper. 37,000-42,000 TS, 24,000-32,000 YS; 6-19 El; 73 Brin.
Sheet, extrusions; formable, weldable; for use to 300°F.
ASTM B107-69; QQ-M-31b.

AZ61A.
M-43, 6.5 Al, 1.0 Zn, bal Mg.
F-temper· 36,000-45,000 TS; 16,000-33,000 YS, 7-16 El; 50-60 Brin.
General purpose alloy for use up to 300°F
Used as welding rod and wire, extruded bars and plate and tube, and forgings.
ASTM B107-69, B91-68, A5 19-69.

AZ63A (Mg Ingot)
M-43; 5.5-6 5 Al, 0 18 min Mn, 2.7-3.3 Zn, 0 04 max Cu, 0.01 max Ni, 0.20 max Si, 0 30 max other, bal Mg.
Ingots for remelting. ASTM B93-66.

AZ63A.
Various foundries; 6 0 Al, 3.0 Zn, 0 15 min Mn, bal Mg.
F-temper· 24,000-29,000 TS; 10,000-14,000 YS; 4-6 El.
T6-temper: 34,000-40,000 TS, 16,000-19,000 YS; 3-5 El.
Sand and permanent mold castings, are hardenable, good corrosion resistance; pressure tight.
For airplane wheel and brake castings, gear housings
ASTM B93-66, AMS 4420, 4422, QQ-M-55b; SAE 50

AZ80A
M-43; 8 5 Al, 0.5 Zn, bal Mg.
T5-temper 48,000-55,000 TS, 33,000-40,000 YS, 4-7 El, 82 Brin
Extruded rods and forgings; good strength.
ASTM B107-69, B91-68, AMS 4360

AZ81A
Various foundries, 7.6 Al, 0 7 Zn, 0 13 min Mn, bal Mg
T4-temper 34,000-40,000 TS, 10,000-12,000 YS; 7 15 El
Sand and permanent mold castings, age hardenable, good corrosion resistance
For aircraft equipment where good elongation and toughness are required.
ASTM B80-69; QQ-M-56, QQ-M-55; SAE 505

AZ91A (Mg Ingot)
M-43, 8 5-9 5 Al, 0 0003-0 001 Be, 0 15 max Mn, 0 45-0 9 Zn, 0 08 max Cu, 0 08 max Ni, 0 20 max Si, 0 30 other, bal Mg
Ingots for remelting
ASTM B93-66.

AZ91A
Various foundries, 9.0 Al, 0 7 Zn, 0 13 min Mn, bal Mg
F-temper: 34,000 TS, 23,000 YS; 3 El
Magnesium die cast alloy with good pressure tightness and corrosion resistance
For housings and small precision parts
ASTM B94-57, QQ-M-38, AMS 4490, SAE 501

AZ91B
Similar to AZ91A

AZ91B (Mg Ingot).
M-43, 8 5-9 5 Al, 0 0003-0 001 Be, 0.15 min Mn, 0 50-0 90 Zn, 0 25 max Cu, 0 01 max Ni, 0 20 max Si, 0 30 max other, bal Mg
Ingots for remelting for die casting and permanent mold casting use only
ASTM B93-66.

AZ91C (Mg Ingot).
M-43, 8 3-9.2 Al, 0.15 min Mn, 0.45-0.90 Zn, 0.04 max Cu, 0 01 max Ni, 0.20 max Si, 0.30 max other, bal Mg
Ingot for remelting.
ASTM B93-66.

AZ91C.
Various foundries; 8.7 Al, 0.7 Zn, 0.13 min Mn, bal Mg.
F-temper: 18,000-24,000 TS; 10,000-14,000 YS; 0.2 El.
T6-temper: 34,000-40,000 TS; 16,000-19,000 YS; 3-5 El.
Sand and permanent mold castings,-good pressure tightness; age hardenable.
For light weight housings for motors and various accessories.
ASTM B80-69; QQ-M-56; QQ-M-55; SAE 504

AZ92A (Mg Ingot).
M-43; 8 5-9.5 Al, 0.13 min Mn, 1.7-2.3 Zn, 0.04 max Cu, 0.01 max Ni, 0.20 max Si, 0.30 max other, bal Mg.
Ingot for remelting. ASTM B93-66.

AZ92A.
Various foundries; 9.0 Al, 2 0 Zn, 0 10 min Mn, bal Mg
F-temper: 20,000-24,000 TS, 10,000-14,000 YS, 1-2 El.
T4-temper: 34,000-40,000 TS; 10,000-14,000 YS; 6-9 El.
Sand and permanent mold castings with good balance of strength, ductility and pressure tightness, for motor housings for portable power tools
ASTM B80-69,B199-68; SAE 500,503.
AMS 4434,4484; QQ-M-56; QQ-M-55

AZ100A (Mg Ingot).
M-43; 9 4-10.6 Al, 0.13 min Mn, 0.20 max Zn, 0 04 max Cu, 0 01 max Ni, 0 20 max Si, 0 30 max other, bal Mg
Ingots for remelting ASTM B93-66

AZA.
M-1638; 0 45-0 85 Cu, 0 5 Fe, 0 15 Si, 7 1-7 8 Zn, 0 2-0 5 Mg, 0 1-0 2 Ti, 0 3 Mn, 0 2 Cr, 0 003 Be, 0 05 Ni, bal Al
Aged. 38,000 TS, 26,000 YS, 5 El, 77 Brin.
For hardware, aircraft and oil field equipment, dairy and agriculture equipment.
Pressure tight castings

A.Z. ALLOY.
M-591, 33 Zn, 1 Pb, bal Cu
For plates for photoengraving, free-cutting.

AZM.
M-325, 1.0 Zn, 0 3 Mn, 6.0 Al, bal Mg.
Extrusions and forgings.
30,000-36,000 TS; 20,000-22,000 Proof stress, 7-10 El, 55-70 VDH.
Medium strength alloy, machines readily, difficult to cold form and to weld; may need protection against corrosion.

AZOWIT 25 S.
M-1326; 0 30-0 37 C, 0 60 0.90 Mn, 0 80-1.10 Al, 1.0-1.3 Cr, bal Fe
Oil hardenable; to be casehardened by nitriding, good core hardness and strength.
DIN 34 Cr Al S5.

AZOWIT 30 M
M-1326; 0.20-0.34 C, 2.3-2 7 Cr, 0.15-0.25 Mo, 0.10-0.20 V, bal Fe.
Oil hardenable; to be case hardened by nitriding to surface hardness of 47-56 Rock C.
DIN 31 Cr Mo V 9.

AZOWIT 30 ML.
M-13[illegible]; 0.30 C, 0.25 Si, 0.50 Mn, 2 5 Cr, 0.20 Mo, 0.15 V, bal Fe.
Alloy steel, case hardenable by nitriding.
DIN 31 Cr Mo V 9; Werkstoff Nr. 1.8514.

AZOWIT 32 M.
M-1326; 0.28-0.35 C, 2.8-3.3 Cr, 0.3-0.5 Mo, bal Fe.
Oil hardenable; to be case hardened by nitriding to 48-57 Rc surface hardness.
DIN 32 Cr Mo 12.

AZOWIT 35
M-1326; 0.30-0.37 C, 0 60-0.90 Mn, 0 80-1.10 Al, 1 20-1.50 Cr, bal Fe.
Oil hardenable; to be case hardened by nitriding; good core hardness and strength.
DIN 34 Cr Al 6.

AZOWIT 35 M.
M-1326, 0.30-0.37 C, 0.60-0.90 Mn, 0.80-1 10 Al, 1 0-1.3 Cr, 0 15-0.25 Mo, bal Fe.
Oil hardenable; to be case hardened by nitriding, good core hardness and strength
DIN 34 Cr Al Mo 5

AZOWIT 35 ML
M-1326, 0 32 C, 0 25 Si, 0 60 Mn, 1.10 Cr, 0 20 Mo, 1 1 Al, bal Fe
Alloy steel, case hardenable by nitriding
DIN 34 Cr Al Mo 5, Werkstoff Nr 1 8544

AZOWIT 38 M
M-1326, 0 30 0 37 C, 0 80-1.10 Al, 1.50-1.80 Cr, 0 15-0 25 Mo, 0 90-1 10 Ni, bal Fe
Oil hardenable, to be case hardened by nitriding; good core hardness and strength
DIN 34 Cr Al Ni 7.

AZZALON.
M-96, 0 75-0 85 C, 0 05 Si, bal Fe
For welding rod

B NO 4
M-114, 0 7 C, 18 W, 4 Cr, 1 V, bal Fe
For drills, reamers, cutters, hobs, taps, broaches, high speed steel, oil hardened.

B NO 9
M-114, 0 7 C, 9 5 Mo, 1 5 W, 4 Cr, 1 V, bal Fe
For drills, reamers, hobs, broaches, taps, cutters, high speed steel, oil hardened

B9-HIGH SPEED
M-114; 8 84 C, 4 2 Cr, 18 5 W, 2 V, bal Fe
For tools, taps, reamers, high speed steel

B-10 HIGH SPEED STEEL
M-114; 0 8 C, 4 5 Cr, 18 5 W, 2 V, 9 Co, bal Fe.
For lathe and form tools, reamers, broaches, high speed steel for heavy cuts

B-47 HOT WORK
M-1, 0 40 C, 0 35 Mn, 4 2 Cr, 4 2 W, 4 2 Co, 2 2 V, 0 4 Mo, bal Fe
At 800°F 178,000 TS, 9 El; 36 RA
At 1200°F 110,000 TS, 16 5 El; 37 RA.
For hot work tools and dies, press dies, hot punches; hot work steel, AISI type H 19.

B-50
M-1683, 0 50 C, 0 85 Mn, 1.1 Cr, 0.15 V, 0 25 Mo, bal Fe.
Oil hardening tool steel for shafts, arbors, lathe centers

"B.50" QUALITY.
M-179; 60 Cu, 1 Pb, bal Zn.
Extruded· 55,000 TS; 30 El; 30 RA; 110 Brin.
Drawn: 64,000 TS; 26 El; 25 RA; 115 Brin.
For screw machine products, hardware; yellow brass.

B-76.
(See Heppenstall B76).

B-1900.
M-1491; 0.10 C, 8 Cr, 10 Co, 6 Mo, 1 Ti, 6 Al, 0.015 B, 0.10 Zr, 4 Ta, bal Ni.
At R.T.: 141,000 TS; 120,000 YS; 8 El.
At 1400°F: 138,000 TS; 117,000 YS; 4 El.
For high temperature applications, jet engines, turbines.
Heat and corrosion resistant.
Casting alloy. Good thermal fatigue and creep resistance.

B.A. 20.
M-28; 1.3 Mg, 1.0 Mn, bal Al.
Annealed: 23,000-15,500 TS; 11,000 YS; 18-15 El; 35 Brin.
For light alloy parts; architectural uses; wrought.

BA.21.
M-28, 1.5-2 5 Mg, 0.5 max Mn, bal Al.
O-temper: 24,500 TS; 11,000 YS, 18 El, 45 Brin.
½ H-temper: 33,500 TS; 27,000 YS; 5 El, 70 Brin.
Extruded: 24,500 TS; 14,500 18 El; 48 Brin
For marine applications; good corrosion resistance.

B.A.-23.
M-28; 1.0-1.5 Mg, 0.5-0.75 Si, bal Al
Sand cast: 14,000 TS, 7,500 YS; 3 El, 50 Brin
Hardened· 36,000 TS, 26,000 YS; 12 El; 85 Brin
For electrical fittings, architectural purposes; sand or dies cast, age-hardenable.

B A 24.
M-28; 0.5 Mg, 0 5 Si, bal Al
Annealed 26,000 TS, 16,000 YS, 18 El, 52 Brin
Aged· 36,000 TS, 29,000 YS, 8 El, 75 Brin.
For light alloy parts, aircraft components, age-hardenable, extruded

B.A. 24-MS.
M 28, 0.5 Mg, 0 5 Si, bal Al
Heat treated: 33,000 TS, 29,000 YS, 12 El, 90 Brin.
For light alloy parts, age-hardenable.

B.A.25.
M-28, 1 Mg, 1 Si, 0 5 Mn, bal Al
Heat treated 47,000 TS, 41,000 YS, 10 El, 110 Brin
For structural parts, age-hardenable

BA 27
M-28, 3-4 Mg, 1 0 max Mn, bal Al
O-temper 31,500 TS, 13,500 YS, 18 El, 55 Brin
½ H-temper. 40,500 TS, 33,500 YS, 5 El, 95 Brin
Extruded· 31,500 TS, 13,500 YS, 18 El, 55 Brin
For marine applications, good corrosion resistance

BA.28.
M-28, 4 5-5.5 Mg, 1 0 max Mn, bal Al
O-temper: 38,000 TS, 18,000 YS, 18 El, 65 Brin
½ H-temper· 45,000 TS; 38,000 YS, 5 El, 105 Brin
Sand cast 20,000 TS; 11,000 YS; 3 El, 54 Brin.
Extruded· 36,000 TS, 18,000 YS, 18 El; 60 Brin.
For architectural trim, moderately stressed parts, good corrosion resistance.

B A. 29.
M-28; 10-11 Mg, bal Al.
Heat treated. 36,000-40,000 TS, 24,000-29,000 YS, 7-12 El, 95-105 Brin.
For light alloy castings; sand and permanent mold, age-hardenable

BA-31.
M-28; 5-6 Cu, bal Al
Cast· 25,000 TS, 4 El, 65 Brin.
For light alloy parts, shock resistant.

BA.32.
M-28; 4-5 Cu, bal Al.
Cast: 31,500 TS, 18,000 YS; 7 El; 80 Brin.
Hardened: 47,000 TS; 47,000 YS; 1 El; 135 Brin.
For aircraft and transport castings; age-hardenable.

BA.33.
M-28; 3.5-4.5 Cu, 1.8-2.3 Ni, 1.2-1.7 Mg, bal Al.
Cast: 22,500 TS; 21,500 YS; 1 El; 90 Brin.
Heat treated: 31,500 TS; 30,000 YS; 1 El; 105 Brin.
For engine parts, pistons, cylinder heads; age-hardenable.

B.A.-34.
M-28; 9-11 Cu, 1 0-1.3 Fe, 0.2-0.3 Mg, bal Al.
Cast· 24,000 TS; 22,000 YS; 1.0 El; 105 Brin.
Hardened: 46,000 TS, 36,000 YS; 0.5 El; 140 Brin.
For pistons; age hardenable.

BA35.
M-28; 3 Cu, 0.5 Mg, 0.6 Sb, 0.2 Sn, bal Al.
Extruded· 36,000 TS; 15,500 YS; 10 El; 80 Brin.
For machinery parts, fasteners; free-cutting.

B.A.-37.
M-28; 7.5-8 5 Cu, 1.5-2 5 Si, bal Al.
Cast: 20,0000-26,000 TS; 1.5-3.0 El; 75 Brin.
For light alloy parts; sand and die casting.

BA 40
M-28; 10-13 Si, bal Al.
Sand cast 23,500 TS; 9000 YS, 5 El; 55 Brin
Chill cast· 27,000 TS, 10,000 YS, 7 El; 60 Brin.
For marine and general engineering castings; good corrosion resistance.

B.A./40D ALLOY.
M-28; 10-13 Si, bal Al.
Sand cast 23,500-24,000 TS; 11,000-13,500 YS, 8-5 El; 50-55 Brin
Chill cast 29,000-31,300 TS; 12,000-14,500 YS 15-8 El, 55-60 Brin
For light alloy parts, wrought forms, corrosion resistant castings, resists sea water corrosion modified alloy.

B A./40 J
M-28; 8 Si, bal Al
Sand cast 20,000-22,000 TS, 9,500-10,000 YS; 11-6 El, 47 Brin
For medium strength castings, corrosion resistant.

B A. 40M
M-28, 10-13 Si, bal Al
Cast 24,000-33,000 TS; 4-5 El, 70-75 Brin.
For light alloy parts, die castings

BA 41.
M-28, 10-13 Si, 0 6 max Mg, 0 6 max Mn, bal Al.
Aged 24,500 TS, 15,500 YS, 1 5 El; 75 Brin.
Hardened 34,500 TS; 34,500 YS; 1 0 El, 105 Brin.
For marine and general engineering castings; age-hardenable.

BA42
M-28, 12-14 Si, 1-3 Ni, 0.8-1 3 Mg, 0 7-1.2 Cu, bal Al.
Sand cast 24,000 TS; 0.5 El, 130 Brin.
Permanent mold· 36,000 TS; 0 5 El, 140 Brin.
For pistons, cylinder heads; low expansion, corrosion resistant.

BA 45.
M-28. 4.5-5.5 Si, bal Al
Sand cast: 18,000 TS; 9000 YS, 4 El, 40 Brin.
Chill cast 22,500 TS; 10,000 YS, 6 El; 50 Brin.
For hollowware, castings; good corrosion resistance.

BA46
M-28; 0.5 Mg, 5.0 Si, 0.35 Mn, bal Al.
P-temper. 21,300 TS, 1 El.
WP-temper: 33,600 TS; 2 El.
For general engineering castings; corrosion resistant, age-hardenable.

BA.60.
M-28; 1.0-1.5 Mn, bal Al.
O-temper: 13,500 TS; 8500 YS; 30 El; 30 Brin.
H-temper: 26,000 TS; 25,000 YS; 3 El; 51 Brin.
Extruded: 13,500 TS; 8000 YS; 20 El; 30 Brin.
For sheets and coiled strip, roofing; high corrosion resistance.

B.A./60A ALLOY.
M-28, 1.25 Mn, bal Al.
Hard: 29,000 TS; 25,000 YS; 5-3 El; 28 Brin.
Soft: 14,000 TS; 5000 YS; 40 El; 55 Brin
For light alloy parts, tubes, sections; corrosion resistant.

BA.301.
M-28; 3.5-5.0 Cu, 0.4-1.2 Mg, 0.4-1.2 Mn, 0.7 max Si, bal Al.
Solution treated: 54,000 TS; 31,500 YS, 15 El; 105 Brin.
For aircraft, road and rail transport, structures, high strength, heat treatable.

BA. 303.
M-28, 3.5-4.8 Cu, 0.6 max Mg, 1.2 max Mn, 1.5 max Si, bal Al.
Solution treated: 54,500 TS; 31,500 YS; 15 El; 115 Brin.
Aged: 62,500 TS; 51,500 YS; 8 El, 135 Brin
For aircraft, road and rail transport, structures, heat treatable, high strength.

BA 306.
M-28; 1.7 Cu, 0.7 Mg, 1 Si, 0.6 Mn, bal Al
W-temper: 44,800 TS, 27,000 YS, 15 El.
WP-temper 58,000 TS; 49,000 YS, 8 El
For light alloy parts; age-hardened

BA.352
M-28, 3.5-5.0 Cu, 0.4-1.2 Mg, 0.4-1.2 Mn, 0.7 max Si, bal Al.
Solution treated 54,000 TS, 31,500 YS; 15 El
For aircraft, road and rail transport structures; heat treatable, high strength.

BA.353.
M-28; 3.5-4.8 Cu, 0.6 max Mg, 1.5 max Si, 1.2 max Mn, bal Al.
Solution treated: 54,000 TS, 31,500 YS; 15 El
Aged 58,000 TS; 45,000 YS, 8 El.
For aircraft, road and rail transport, structures, heat treatable, high strength.

BA. 701.
M-28, 1.3 Cu, 2.9 Mg, 0.4 Mn, 5.7 Zn, 0.1 Cr, bal Al.
WP-tempered 81,000 TS, 69,400 YS, 9 El
For light alloy parts, age-hardened

BA 703
M-28; 1 Cu, 2.6 Mg, 0.25 Mn, 5.7 Zn, 0.1 Cr, bal Al
WP-temper 78,000 TS, 67,000 YS, 7 El.
For light alloy parts, age-hardened

BA. 704.
M-28; 1 Cu, 3 Mg, 0.25 Mn, 6 Zn, 0.1 Cr, bal Al
WP-temper: 85,000 TS, 74,000 YS, 5 El.
For light alloy parts, age-hardened.

BA.751.
M-28; 4.5-6.5 Zn, 2.0-3.5 Mg, 1.5 max Cu, 0.3-1.0 Mn, bal Al.
Age hardened 67,000-71,500 TS; 58,000-60,500 YS, 8 El.
For aircraft structures; age-hardenable.

B.A C. BRIGHTRAY.
M-121; 80 Ni, 20 Cr.
For fusion coating of poppet valves; resists heat and corrosion.

BACHITE.
M-704; 0.2 C, 18 Cr, 8 Ni, bal Fe.
For stainless parts, chemical equipment; austenitic.

BACK CASE METAL.
Eng; 62 Cu, 20 Zn, 18 Ni
For heat and corrosion resistant parts.

BADALL.
M-1535, 0.25 C, 0.028 S, 0.65 Si, 0.15 Mo, 0.85 Mn, 0.60 max Cr, 0.0025 max B, bal Fe.
Plate: 245,000 TS; 210,000 YS, 11 El; 44 RA, 500 Brin.
Plate: 190,000 TS; 175,000 YS, 16 El; 55 RA; 360-400 Brin
For severe service applications, pressure vessels, wear plates.
Heat treated, wear resistant plates.

BADGER.
M-73; 0.95 C, 0.3 Si, 1.2 Mn, 0.5 W, 0.5 Cr, bal Fe.
Heat Treat: 250,000 TS, 225,000 YS, 8 El; 16 RA; 50 Rock C
For blanking dies, punches, reamers, threading dies, non-deforming, oil hardening tool steel, AISI 01

BADGER
M-435, 1.2 C, 1.5 W, 0.4 Cr, 0.2 V, bal Fe
For tools, cutters, broaches, hot work tools, non-deforming.

BADGER DRILL ROD
M-1702, 0.94 C, 1.2 Mn, 0.3 Si, 0.5 Cr, 0.5 W, bal Fe
Oil hardening tool steel, AISI 01

BADGER FLAT GROUND
M-1702, 0.94 C, 1.2 Mn, 0.3 Si, 0.5 Cr, 0.5 W, bal Fe
Oil hardening tool steel, flat ground condition, AISI 01

BADGER STEEL
M-253, 0.9 1.2 C bal Fe
For taps, reamers, threading dies

BAHNALUMINIUM
M 621, 6 Cu, bal Al
Extruded 29,000 TS, 13,000 YS, 20 El, 50 Brin
Cold drawn: 36,000 TS; 17,000 YS, 10 El; 70 Brin
For light alloy parts, electric pantographs

BAILY'S METAL
Eng, 82.1 Cu, 12.8 Sn, 5.1 Zn
For bearings, corrosion resistant castings, corrosion resistant

BAKER NO 175L
M-18, 60 Ag, 20 Cu, 20 Zn
Annealed. 78,600 TS, 18 El
For coined parts, bearings, Silver solder, M P. 680°C.

BAKER ALLOY NO. 934
M-18, Pt alloy
For electrical resistances; resistance wire.

BAKER ALLOY NO. 1534
M-18, 8.5 Pt, 72.5 Au, 4 Ag, 14 Cu, 1 Zn.
Wire 182,500 TS, 1.3 El.
For electrical resistances; resistance wire.

BAKER 1729
M-18, 40.5 Pd, 10 Fe, bal Au.
Wire: 200,000-220,000 TS
For resistors; high electrical resistance.

BAKER ALLOY 1757.
M-18; 79 Pt, 15 Rh, 6 Ru.
Wire. 278,000 TS, 1.8 El.
For electrical contact equipment.
Corrosion resistant.

BAKER ALLOY NO 1765.
M-18; 92 Pt, 8 W.
300,000 TS, 2 El.
For electrical resistances; resistance wire.

BAKER 1780.
M-18; 40 Au, 10 Fe, bal Pd.
Wire: 175,000-210,000 TS.
For resistors; high electrical resistance.

BAKER CONTACT ALLOY NO. 846.
M-18, 50 Pt, 26 Pd, 20 Au, 4 Ag
Annealed: 107,000 TS; 85,000 YS; 25 El.
Hard 171,000 TS; 163,000 YS; 3 El.
For electrical contacts; heat resistant.

BALCO.
M-61; 30 Fe, bal Ni.
Rolled 70,000 TS.
For voltage resistors
Magnetic, high permeability

BALCO
M-897; 29-31 Fe, bal Ni.
Annealed: 80,000 TS, 55,000 YS; 25 El.
For thermometer bulbs, ballast tubes; heat resistant to 590°C.

BAL-CUT 1035
M-516, 0.15-0.25 Pb, 0.30-0.40 C, bal Fe.
For gears, shafts, free machining

BAL CUT X-1314
M-516, 0.10-0.20 C, 1.0-1.3 Mn, 0.15-0.25 Pb, bal Fe
For gears, shafts, free machining

BAL-CUT X-1335.
M-516, 0.15-0.25 Pb, 0.30-0.40 C, 1.35-1.65 Mn, bal Fe.
For gears, shafts, free machining.

BALDER
M-111, 0.05 C, 0.1 Si, 0.1 Mn, bal Fe
For electrical equipment, soft magnet iron

BALDWIN NO 1
M-1510, 0.75 C, 0.91 Cr, 0.40 Mo, 0.81 Mn, 1.78 Ni, bal Fe
For dies, punches, shear blades, knives, rolls; oil hardened, shock resistant

BALDWIN NO 711
M-1510, 0.35 C, 0.86 Cr, 0.81 Mn, 0.35 Mo, 0.48 Si, 0.34 Cu
Heat treated 267,000-275,000 TS, 209,000-221,000 YS; 13-15 El; 37-51 RA; 560-580 Brin
For chisels, punches, hard tools, furnace bars, dies, shears, non-tempering, water hardened.

BALDWIN AH
M 1510, 1.1 C, 0.75 Mn, 5.5 Cr, 0.3 V, 1.2 Mo, bal Fe
For dies, gages, forming rolls, master hobs, cutters, non-deforming, air hardened

BALDWINS P 25.
M-1417, 0.35 max C, 25 Cr, bal Fe
Annealed 85,000 TS, 50,000 YS, 30 El, 55 RA, 180 Brin
For furnace parts and equipment, heat treating boxes, Type 446, heat resistant

BALDWINS P 25-12.
M-1417, 0.20 max C, 24 Cr, 12 Ni, bal Fe.
Annealed 90,000 TS, 40,000 YS, 50 El, 65 RA, 170 Brin
For furnace parts, pumps, oil burners; Type 309; heat resistant.

BALDWINS P 25-22
M-1417; 0.25 max C, 25 Cr, 20 Ni, 1.5-3.0 Si, bal Fe
For furnace parts, Type 314; heat resistant.

BALDWINS P E.C
M-1417, 0.08 max C, 18 Cr, 9 Ni, Cb, bal Fe.
Annealed: 90,000 TS, 45,000 YS, 50 El; 65 RA; 160 Brin.
For welded chemical plant equipment, tanks; Type 347; stainless, austenitic.

BALDWINS P.E.H.
M-1417; 0.17-0.25 C, 18 Cr, 8 Ni, bal Fe.
Annealed 85,000 TS, 40,000 YS; 50 El; 70 RA; 170 Brin.
For chemical plant equipment, tanks, mixers, Type 302; stainless, austenitic.

BALDWINS P.E.L.
M-1417, 0.10 C, 18 Cr, 8 Ni, bal Fe.
Annealed 80,000 TS, 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters, Type 302; stainless, austenitic.

BALDWINS P E T.
M-1417, 0.08 max C, 18 Cr, 8 Ni, Ti, bal Fe.
Annealed. 85,000 TS; 35,000 YS, 55 El, 65 RA; 150 Brin.
For welded chemical plant equipment, tanks, mixers, Type 321; stainless, austenitic.

BALDWINS P.K.H
M-1417, 0.26-0.37 C, 13 Cr, bal Fe
Annealed: 100,000 TS, 55,000 YS, 22 El, 52 RA; 210 Brin
For valves, cutlery, surgical and dental instruments, Type 420; corrosion resistant

BALDWINS P.K I
M-1417, 0.07-0.12 C, 17 Cr, bal Fe.
Annealed 80,000 TS, 50,000 YS, 25 El, 50 RA; 160 Brin.
For oil refinery equipment, oil burners and heaters, bolts; Type 430, corrosion resistant

BALDWINS P K L
M 1417, 0.13-0.18 C, 13 Cr, bal Fe.
Annealed 75,000 TS, 40,000 YS, 35 El, 70 RA, 155 Brin
For turbine blades, valves, cutlery, surgical instruments, Type 410, corrosion resistant

BALDWINS P K M
M-1417, 0.19-0.25 C, 13 Cr, bal Fe
Annealed 95,000 TS, 50,000 YS, 25 El, 55 RA, 195 Brin
For valves, cutlery, surgical instruments, Type 420; corrosion resistant

BALDWINS P K N
M-1417, 0.25 max C, 17 Cr, 2 Ni, bal Fe
Annealed 125,000 TS, 95,000 YS, 20 El, 55 RA; 260 Brin
For pumps, marine hardware, valves, Type 431, corrosion and heat resistant

BALDWINS P M H
M 1417, 0.12 max C, 18 Cr, 10 Ni, 2.5 Mo, bal Fe
Annealed: 85,000 TS, 35,000 YS, 50 El, 65 RA, 160 Brin.
For acid resistant chemical plant equipment, mixers, Type 316, stainless, austenitic.

BALDWINS P.M.L.
M-1417, 0.07-0.12 C, 18 Cr, 9 Ni, 1.5 Mo, bal Fe
Annealed 85,000 TS, 35,000 YS, 50 El, 65 RA; 160 Brin.
For acid resistant chemical plant equipment, Type 316, stainless, austenitic

BALDWINS P T L.
M-1417, 0.08-0.16 C, 12 Cr, 10 Ni, bal Fe
For valves, pump parts, corrosion resistant

BALFORS ULTRA-CAPITAL +1.
Eng., C, alloy, bal Fe.
For cutters, tools, high speed steel

BALFOSTEEL
M-359, 0.7-1.2 C, bal Fe.
For punches, dies, reamers, saws; water hardening.

BALFOUR 4.T.S.S.
M-1112; 1.25 C, 1.2 Cr, 4.5 W, 0.25 V, bal Fe.
For reamers, rolls, punches, drawing dies; oil hardened, abrasion resistant.

BALFOUR 227.
M-1112; 0.28 C, 9 W, 3 Cr, 0.3 V, bal Fe.
For bolt headers, extrusion dies and liners; hot work steel, tough.

BALFOUR 293.
M-1112; 0.36 C, 3 Cr, 9 W, 0.3 V, bal Fe.
Annealed: 230 Brin.
For extrusion and hot piercing dies, rams, liners; hot work steel, oil hardened.

BALFOUR 351.
M-1112; 0.5 C, 1 Cr, 2 W, 0.3 V, bal Fe.
For punches, forging dies, shear blades; hot work steel, oil hardened.

BALFOUR A.B.75.
M-1112; 0.6 C, 2 Si, 0.85 Mn, 0.25 Cr, bal Fe.
For pneumatic chisels, shear blades, punches; oil hardened, tough.

BALFOUR A.G.S.
M-1112; 1.05 C, 1.3 Cr, 0.35 Mn, 0.25 Si, bal Fe.
Annealed: 210 Brin.
For forming rolls, cams, jigs, trimming dies; oil hardened, tough.

BALFOUR BLUE LABEL.
M-1112; 0.7-0.8 C, 0.3 Mn, bal Fe.
For drills, taps, punches, crimpers; Type W1; water hardened.

BALFOUR DARWINS AR1.
M-1725;
Corrosion resistant alloy useful in handling sulphuric acid.

BALFOUR DARWINS AR2.
M-1725;
Nickel-chromium-copper-molybdenum alloy for resistance to hot concentrated sulphuric acid.

BALFOUR DARWINS AR3.
M-1725;
Nickel-chromium-copper-iron alloy for resistance to sulphuric and phosphoric acids; used in pickling processes and in drainage disposal plants.

BALFOUR DARWINS AR4A.
M-1725;
Nickel-molybdenum-iron alloy for use with hydrochloric and sulphuric acids.

BALFOUR DARWINS AR5B.
M-1725;
Nickel-molybdenum-iron alloy; higher molybdenum than AR4A for greater corrosion resistance.

BALFOUR DARWINS AR6C.
M-1725;
Nickel-molybdenum-chromium-iron alloy for handling oxidizing acids as nitric acid and mixed acids and salts containing free chlorine.

BALFOUR DARWINS AR7.
M-1725;
A duplex, age-hardenable, corrosion-resistant stainless steel with good strength, weldability, resistance to corrosion and galling; used particularly in wood pulp processing.

BALFOUR DSW.
M-1112; 1.3 C, 4.5 W, bal Fe.
For dies, cutters; water or oil hardened.

BALFOUR E.X.D.I.
M-1112; 0.33 C, 1.5 Cr, 5.5 W, 3.75 Ni, bal Fe.
For extrusion dies, upsetting dies, mandrels; hot work steel, oil hardened.

BALFOUR NSS3.
M-1112; 0.95 C, 2.0 Mn, 0.3 Si, bal Fe.
For punches, reamers, taps, dies, cams, pawls; oil hardened, non-deforming.

BALFOUR OO.
M-1112; 0.6 C, 1 Cr, 2 W, 0.3 V, bal Fe.
For dies, punches, trimmers; oil hardened, non-deforming.

BALFOUR P.R.N.2.
M-1112; 1.05 C, 1.1 Mn, 1.5 Cr, bal Fe.
For blanking and forming dies, master hobs; oil hardened, abrasion resistant.

BALFOUR R.9030.
M-1112; 0.30 C, 0.75 Cr, 0.5 Mo, 2.75 Ni, bal Fe.
For plastic mold dies, piercing punches; hot work steel, oil hardened.

BALFOUR R9030.
M-1112; 0.95 C, 1.25 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies, punches, forming dies, crimpers, upsetters; oil hardened, non-deforming.

BALFOUR RSD.
M-1112; 0.95 C, 1.25 Mn, 0.5 W, 0.5 Cr, bal Fe.
For tools, dies, punches, headers, upsetters; non-deforming, oil hardened.

BALFOUR SC13.
M-1112; 2.15 C, 11.5 Cr, 0.75 Mo, bal Fe.
For blanking and forming dies, engravers rolls, hobs, nondeforming, air hardened

BALFOUR S.C.25.
M-1112; 1.5 C, 0.25 V, 0.75 Mo, 12 Cr, bal Fe
For blanking and forming dies, shear blades, air hardened, non-deforming

BALFOUR S.C.26.
M-1112; 1.8 C, 12 Cr, 0.3 Mn, 0.2 Si, bal Fe
For rolling dies, shear blades, rim rolls; air hardened, non-deforming.

BALFOUR SCP.
M-1112; 0.9 C, 0.15 V, bal Fe.
For chisels, drills, taps, punches, reamers, hobs; Type W2; water hardened.

BALFOUR S.D.20.
M-1112, 0.35 C, 0.60 Mn, 1.2 Cr, 1.75 Ni, bal Fe.
Annealed. 200 Brin.
For plastic mold dies, punches, extrusion dies; oil hardened, shock resistant.

BALFOUR S.I.W
M-1112, 0.65 C, 1.1 Si, 0.70 Mn, 0.2 Cr, 1.3 W, bal Fe.
Annealed: 220 Brin.
For pneumatic chisels, rivet snaps, shear blades; oil hardened, fatigue resistant.

BALFOURS SHOE DIE
M-350; 0.5 C, 0.6 Cr, 0.3 Mo, bal Fe.
For tools, leather cutters, oil hardened

BALFOUR TIO.H.
M-1112; 0.9 C, 1.2 Mn, 0.4 Cr, 0.5 W, bal Fe
For blanking and forming dies, cams, pauls; oil hardened, non-deforming

BALFOUR TSS.
M-1112; 1.3 C, 4.5 W, bal Fe.
For dies, cutters; water or oil hardened

BALLAST.
M-897; 99.8 Ni.
Soft: 60,000 TS; 18,000 YS; 50 El.
For cathodes and filaments for electronic tubes; heat resistant.

BALLAST NICKEL.
M-61; 99.6 Ni.
Annealed: 56,000 TS.
For ballast wire for voltage control electrical equipment; resistance 52 ohms/mil. ft.

BALL BEARING STAINLESS STEEL.
M-521; 0.4 C, 0.25 Si, 0.3 Mn, 11.5 Cr, bal Fe.
Annealed: 110,000 TS; 72,000 YS; 20 El; 240 Brin.
For ball bearings; corrosion resistant

"B" ALLOY.
U.S., 25 Zn, 3 Cu, bal Al.
For light alloy parts; non-hardenable.

BA.LM8.
M-28; 0.3-0.8 Mg, 3.5-6.0 Si, 0.5 max Mn, bal Al.
Sand Cast: 17,920 min TS; 11,200 PS, 2 min El.
WP-Sand Cast 33,600 min TS; 31,400 PS, 5 min El
WP-Chill Cast: 40,320 min TS; 31,400 PS; 2 min El.
For cylinder heads, propeller gear boxes, gear housings, crankcases
Pressure-tight leak-proof castings.

BALTIC C.D V.1.
M-1406; 2.25 C, 11.5 Cr, 0.5 Mo, 0.3 V, bal Fe.
For blanking and extrusion dies; oil hardened, non-deforming.

BALTIC C.D.V 2.
M-1406, 1.6 C, 12 Cr, 0.8 Mo, 0.5 V, bal Fe.
For blanking and extruding dies, gages, shear blades; air hardened, non-deforming

BALTIC C.L. 15
M-1406, 0.38-0.42 C, 3.0-3.5 Ni, 0.60 max Mn, bal Fe.
For chisels, snaps, tools, punches, tough and shock resistant

BALTIC C L 40T.
M-1406, 0.55 C, 2 Si, 0.90 Mn, 0.30 Cr, 0.20 V, bal Fe.
For punches, shear blades, concrete breakers, tough, shock resistant

BALTIC C.L 45.
M-1406, 0.50 C, 1.2 Cr, 0.7 Mn, 0.2 V, bal Fe.
For chisels, pneumatic tools, pistons, tough, shock resistant.

BALTIC C L.60
M-1406, 0.60 C, 0.60 Cr, 0.70 Mn, bal Fe
For vice grips, general tools; water hardened.

BALTIC C L 222.
M-1406, 0.35 C, 0.80 Cr, 0.70 Mo, 0.50 W, bal Fe
For punches, snaps, shear blades, pneumatic tools; non-tempering, water hardened.

BALTIC C.L 224.
M-1406, 0.55 C, 1.5 Ni, 0.75 Cr, 0.3 Mo, bal Fe
For drop forging dies, tough and wear resistant.

BALTIC C L 225
M-1406; 0.50 C, 0.50 Mn, 1.25 Ni, 0.50 Cr, 0.25 Mo, bal Fe
For drop forging dies; tough and wear resistant.

BALTIC C.L 400.
M-1406, 0.9 C, 3.75 Cr, 0.5 Mo, 0.5 V, bal Fe
For forging and extrusion dies, hot shears and punches, hot die steel, air or oil hardened.

BALTIC C L.444.
M-1406; 0.35 C, 5 Cr, 0.9 Si, 1.5 Mo, 1.25 W, 0.3 V, bal Fe.
For forging and extrusion dies, hot shears and punches; shock resistant, hot die steel.

BALTIC C.L.444W.
M-1406; 0.35 C, 0.90 Si, 5 Cr, 5 W, 0.30 V, bal Fe
For hot heading and gripping dies; oil hardened, hot die steel.

BALTIC C.L.666.
M-1406; 0.60-0.70 C, 0.40 Mn, 6 W, 0.6 Cr, bal Fe.
For coal cutters, picks; air or oil hardened.

BALTIC L.C.H D.
M-1406; 0.30 C, 9-10 W, 2.75 Cr, 0.4 V, bal Fe.
For dies, inserts and liners, oil hardened, hot die steel.

BALTIC P C S K.
M-1406; 0.45 C, 2 W, 1.5 Cr, 0.25 V, bal Fe.
For chisels, snaps, pneumatic tools, tough and shock resistant.

BALTOC.
M-260, M-38, 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe
For hogging tools for heavy cuts; high speed steel.

BAND FILE
M-38; 1.25 C, 0.5 Cr, bal Fe.
For files; water or oil hardening

BARAL.
M-511, up to 50 Ba, bal Al.
For getters in electrical discharge devices and vacuum tubes; good stability in air.

BARE-BRITE A632
M-663; Bare wire for inert gas welding of T1 steel, HY-80 and similar grades.
MIL-E-19822A, Type B88.

BARE-BRITE AX-90.
M-663, Low alloy bare wire for welding high strength low alloy steel for 100,000 psi TS in weld area Used for ships, military vessels and equipment, earth moving equipment.
MIL-E-23765/2 Type 100 S-1

BARE BRITE AX-110
M-663, Low alloy bare wire for welding high strength low alloy steel for 120,000 psi TS in weld area
MIL-F-23765/2 Type 120S-1.

BARE-BRITE AX-140
M-663, 0.10 C, 1.8 Mn, 0.35 Si, 2.25 Ni, 1.0 Cr, 0.55 Mo, bal Fe
Low alloy bare wire for welding high strength low alloy steel for 140,000 psi TS in weld area.
MIL-E-24355 Type 140S.

BARIO
Eng; 21.4 Cr, 57.4 Ni, 1 Fe, 15.4 W, 0.3 C
For resistor elements, stainless and corrosion resisting

BARIO, HARD
30 Co, 30 Cr, 25 W, 10 Mn, 5 Ti.
For tools, high temperature applications, corrosion and heat resistant.

BARIO, SHEET
90 Ni, 4.3 Cr, 1.2 W, 0.3 Si, traces Co, Cu, Fe
For tools, high corrosion resistant parts; stainless and corrosion resistant.

BARIO, SOFT.
60 Co, 20 Cr, 20 W
For tools, heat and corrosion resistant parts, corrosion and heat resistant.

BARIUM 13 Cr.
M-705, 0.12 C, 12-15 Cr, bal Fe
Annealed: 65,000-75,000 TS; 40,000-45,000 YS; 30 El, 60 RA.
For stainless parts; corrosion resistant.

BARIUM 17 Cr.
M-705; 0.10 C, 16-23 Cr, bal Fe.
Annealed: 70,000-80,000 TS, 40,000-45,000 YS; 28 El; 55 RA.
For stainless trim; corrosion resistant.

BARIUM 18-8.
M-705; 0 05-0 20 C, 16-23 Cr, 7-11 Ni, bal Fe.
Annealed: 80,000-89,000 TS; 35,000-45,000 YS, 50-60 El; 55-65 RA.
For stainless utensils; heat and corrosion resistant.

BARIUM DIE STEEL.
M-705; 0.4-0.6 C, 1-2 Ni, 0 5-1 0 Cr, 0.2-0.3 Mo, bal Fe.
For forging dies; in 3 grades of varying hardness.

BARMAG.
M-511; 35 Ba, bal Mg
For getters in electrical discharge devices and vacuum tubes

BARNITE.
Eng ; 5 5 Cu, Mg, Cr, Si, Ti, bal Al
For light alloy parts, age-hardenable.

BAROS
M-104; 90 Ni, 10 Cr.
For pen points, balance weights, heat resisting

BARR ALLOY NO. 00C.
M H ALLOY NO 00C.
M-212; 84 Cu, 16 Sn.
Cast 25,000-35,000 TS, 20,000-28,000 YS, 1-2 El; 80-100 Brin
For bearings for turn tables and movable bridges, compression of 0 1%-18000.

BARR ALLOY NO. 1
M H ALLOY NO 1.
M-212; 88 Cu, 8-10 Sn, 2-4 Zn
Cast 40,000-50,000 TS, 18,000-22,000 YS; 20-40 El, 20-30 RA, 65-74 Brin
For steam and hydraulic castings, air valves, small gears, U S.N "G" Bronze, "Gun Metal", "SAE No 62."

BARR ALLOY NO 4
M H ALLOY NO 4
M-212, 80 Cu, 10 Sn, 10 Pb
Cast 30,000-50,000 TS, 19,000-21,000 YS, 20-10 El, 20-10 RA, 55-65 Brin.
For high speed bearings, for high pressures

BARR ALLOY NO 5
M H ALLOY NO. 5
M-212; 85 Cu, 5 Sn, 5 Pb, 5 Zn.
Cast. 30,000-38,000 TS, 15,000-19,000 YS, 15-20 El, 15-20 RA, 50-59 Brin
For bearings, pumps, steam valves, carburetors, "Ounce Metal."

BARR ALLOY NO 9
M H ALLOY NO. 9
M-212, 58 Cu, 40 Zn, 1 5 Fe, 0.5-1.5 Al, 0 0-0 25 Mn
Grade A· 70,000-80,000 TS; 30,000-34,000 YS; 25-40 El, 100 Brin.
Grade B· 80,000-90,000 TS, 40,000-45,000 YS; 15-25 El, 120 Brin
For propeller blades and hubs, valve stems, engine framing, compression of 0 1%-20000

BARR ALLOY NO 11
M H ALLOY NO 11
M-212; 89 Cu, 10 Al, 1 Fe.
Cast: 65,000-80,000 TS, 23,000-27,000 YS; 20-27 El, 20-27 RA; 93-100 Brin.
Heat treated. 75,000-95,000 TS; 55,000-65,000 YS, 3-15 El; 140-200 Brin.
For gears, feed nuts, bearings; resists wear, repeated shock and corrosion.

BARR ALLOY NO. 14
M H ALLOY NO. 14.
M-212; 90 Cu, 6.5 Sn, 1.5 Pb, 2.0 Zn.
Cast; 34,000-40,000 TS, 16,000-19,000 YS; 23-35 El; 23-53 RA; 50-60 Brin.
For plain bearings, backs of Babbit-lined shells; low coefficient of friction and expansion.

BARR ALLOY NO. 15
M H ALLOY NO. 15.
M-212, 88 5 Cu, 11 Sn, 0.25 Pb, 0.25 P.
Sand cast: 33,000-40,000 TS; 21,000-24,000 YS; 10-15 El; 8-15 RA, 70-80 Brin.
Chill cast. 50,000 TS, 30,000 YS; 6 El; 100 Brin.
For worm gears mating with hardened worms; "SAE-65"; compression of 0.1%-17000.

BARR ALLOY NO 20
M H ALLOY NO 20.
M-212, 65 Cu, 23 Zn, 2 Fe, 3 Mn, 7 Al
Cast: 90,000-100,000 TS, 50,000-60,000 YS, 20-5 El; 180-200 Brin
For general castings, compression of 0.1%-65000.

BARR ALLOY NO 25 B
M H ALLOY NO. 25 B.
M-212, 69 Cu, 5 Sn, 25 Pb, 1 Ni
20,000-24,000 TS, 14,000-16,000 YS, 16-12 El
For general castings, bearings, acid resisting

BARR ALLOY NO. 48
M H ALLOY NO. 48
M-212, 84 Cu, 10 Sn, 2 5 Pb, 3 5 Ni
Sand cast· 40,000 50,000 TS, 25,000-28,000 YS, 25-15 El, 20-10 RA, 80-93 Brin
For gears, compression of 0 1%-20000-24000

BARRONIA METAL
M-20, 83 Cu, 0 5 Pb, 4 Sn, bal Zn
Cast 42,400 TS, 20,400 YS, 38 El, 33 RA, 72 Brin
Drawn 84,000 TS, 74,000 YS, 18 El, 46 RA; 171 Brin
For condenser tubes, heat exchangers, evaporators, fittings, for superheated steam work

BARROW B H BRAND PIG IRON
M-619, approx 4 0 T C , 1 5-4 0 Si, 0 025 max S, 0 03 max P, 0.25-1 5 Mn, bal Fe.
For metallurgical applications, for making steel and cast iron

BARROW B H R BRAND (CUPOLA GRADE)
M 619, 3 25-3 45 T C , 0 5 1.1 Si, 0 12-0 18 S, 0 045 P, 0 25 Mn, bal Fe
For metallurgical applications, for malleable foundries, various grades

BARROW B H S BRAND BESSEMER HAEMATITE PIG IRON
M-619, approx 4 0 T C , 1 5-4 5 Si, 0 03 max S, 0 035 max P, 0 25 1 2 Mn, bal Fe.
For metallurgical applications, for making steel.

BARROW B H S BRAND FOUNDRY HAEMATITE PIG IRON
M-619, approx 3 85 T C , 2 0-3 5 Si, 0 035 max S, 0 03 max P, 0 6-1 0 Mn, bal Fe
For metallurgical applications, for general foundry work

BARROW BRAND FOUNDRY HAEMATITE PIG IRON
M-619, approx 4 0 T C , 1 5-3 0 Si, 0 02 max S, 0 03 P, 0 90-1 25 Mn, bal Fe
For metallurgical applications, for heat resisting castings, for making alloy steels.

BARROW B X. BRAND PIG IRON.
M-619, approx 4 0 T C , 1 5-4.0 Si, 0 02 max S, 0 025 max P, 0.25-1 5 Mn, bal Fe.
For metallurgical applications, for making steel and cast iron.

BARROW B X.X BRAND PIG IRON.
M-619; approx 4.0 T C , 1.5-3 0 Si, 0.02 max S, 0 02 max P, 0 25-1 5 Mn, bal Fe.
For metallurgical applications; for making steel and cast iron.

BARROW B.X.X. BRAND PIG IRON "SWEDISH."
M-619, approx 4.0 T.C., 1.0-2.5 Si, 0.012 max S, 0.02 max P, 0.25 max Mn, bal Fe.
For metallurgical applications; for making steel and cast iron.

BARROW S P. BRAND FOUNDRY PIG IRON.
M-619; 3.5-3.75 T.C., 1.5-4 Si, 0.2-0.03 S, 0.1-0.3 P, 1.0-1.5 Mn, bal Fe.
For foundry iron for cylinders, valves, pumps, steam chests; for making steel and cast iron.

BARTO
M-32; 0.50 C, 0.50 Mn, 0.25 Si, 1.0 Cr, 1.75 Ni, bal Fe
Heat treated: 310,000 TS; 240,000 YS; 5 El; C 56 Rock.
For expander punches, feeder rolls, clutch parts, vice jaws, chuck jaws.
Tough, shock resistant

BARWORTH B.C.M
M-1407, 1.0 C, 1.5 Mn, 0.5 Cr, 0.4 Si, bal Fe.
For press tools, gages, taps, dies; non-deforming, oil hardened.

BARWORTH B M S
M-1407, 0.30-0.35 C, 3 Ni, 1 Cr, 0.4 Mo, bal Fe
For plastic mold dies, oil hardened

BARWORTH B.S C.C
M-1407, 1.5 C, 1 Mn, 1 Cr, 0.5 W, bal Fe
For press tools, taps, dies; oil hardened, wear resistant.

BARWORTH B S W 5Co
M-1407, 0.8 C, 20 W, 4.5 Cr, 1.5 V, 1 Mo, 5 Co, bal Fe.
For cutters, drills, reamers, hobs, broaches, high speed steel.

BARWORTH B S W.6/6/2
M-1407, 0.80-0.87 C, 4 Cr, 6.5 W, 2 V, 5 Mo, bal Fe
For lathe and planer tools, reamers, drills, hobs, high speed steel

BARWORTH B S W 10Co
M-1407, 0.8 C, 22 W, 4.5 Cr, 1.5 V, 1 Mo, 10 Co, bal Fe
For cutting tools, reamers, hobs, broaches, high speed steel

BARWORTH B S W.14
M-1407, 0.65 C, 14 W, 3.75 Cr, 0.5 V, bal Fe
For drills, turning tools, hot punches, die cores, high speed steel

BARWORTH B S W 16
M-1407, 0.75 C, 16 W, 4.5 Cr, 1 V, 1.5 Mo, bal Fe
For lathe and planer tools, drills, punches, taps, high speed steel

BARWORTH B S W 18
M-1407, 0.75 C, 18 W, 4.5 Cr, 1 V, 0.5 Mo, bal Fe
For lathe and planer tools, hot punches, high speed steel

BARWORTH B S W. 18V2
M-1407, 0.75-0.80 C, 18 W, 4.5 Cr, 2 V, 0.5 Mo, bal Fe
For lathe and planer tools, drills, reamers, taps, high speed steel

BARWORTH B S.W. 22.
M-1407, 0.76 C, 22 W, 4 Cr, 1.25 V, bal Fe.
For drills, turning tools, cutters, hot punches, high speed steel.

BARWORTH C.D S H
M-1407; 2 C, 13 Cr, bal Fe
For forging and blanking dies, punches; oil or air hardened, abrasion resistant

BARWORTH C.R.V.
M-1407; 0.45-0.50 C, 2 Cr, 0.2 V, bal Fe.
For die casting dies; oil hardened, for short runs.

BARWORTH C.T.S.
M-1407; 0.50-0.55 C, 1 Cr, 2 W, 1 Si, 0.6 Mn, bal Fe.
For hot stamping and pressing dies, pneumatic tools; cold work steel.

BARWORTH H.D.3.
M-1407, 0.35 C, 3.5 Cr, 3 W, 0.3 V, bal Fe.
For hot and cold stamping dies, extrusion dies, hot work steel, oil hardened.

BARWORTH J.H D.
M-1407, 0.3 C, 3 Cr, 10 W, 0.2 V, bal Fe
For stamping, pressing and extrusion dies; hot work steel, oil hardened

BARWORTH J H.D.N.
M-1407, 0.3 C, 3 Cr, 10 W, 0.2 V, 2 Ni, bal Fe
For stamping, pressing and extrusion dies, hot work steel, oil hardened.

BARWORTH N T. TYPE A
M-1407; 0.4 C, 0.3 Mn, 0.6 Cr, bal Fe
For chisels, shock tools; water hardened, tough

BARWORTH N T. TYPE B
M-1407, 0.4 C, 0.7 Mn, 1.0 Cr, bal Fe.
For chisels, pneumatic tools, oil hardened, shock resistant

BARWORTH S C R.
M-1407, 1.0 C, 1.0 Mn, 0.8 Cr, bal Fe
For press tools, taps, dies; oil hardened, wear resistant.

BARWORTH T C.
M-1407, 0.40 C, 5 Cr, 2 W, 1 Mo, bal Fe.
For die casting dies, oil hardened, for long runs.

BASCH METAL
M-92, 91 Al, 7 Cu, 0.8 Mg, 0.2 Mn, 1.4 Ni
Chill cast: 23,000 TS, 2 El, 90 Brin
Heat treated chill castings, light weight

BATH METAL-1
Eng., 83 Cu, 17 Zn
For plumbing, pipe, red brass

BATH METAL-2
Eng 55 Cu, 45 Zn
For bath fixtures, yellow brass

BATTERIUM
M-21, 89 Cu, 9 Al, 1 Ni, and 1 other metal.
78,000-101,000 TS, 35-48 El, 158-168 Brin
For chemical apparatus, valves, plug cocks, plate terminals, non-corrodible, acid resistant

BATTERY COPPER.
U S., 94 Cu, 6 Zn
For batteries, gilding metal

BATTERY PLATES
U S., 94 Pb, 6 Sb
For storage battery plates, hard

BAUDRINS METAL
Eng., 72 Cu, 7.10 Zn, 17 Ni, 2.5 Fe, 1.8 Co, 0-0.5 Al
For ornamental and corrosion resistant parts, corrosion resistant

BAUDRINS METAL NO 1
72 Cu, 16.6 Ni, 2.5 Sn, 7.1 Zn, 1.8 Co
For ornamental and corrosion resistant parts, corrosion resistant

BAUDRINS METAL NO 2
0.5 Al, 75 Cu, 1.5 Fe, 16 Ni, 2.75 Sn, 2.25 Zn, 2 Co
For ornamental and corrosion resistant parts; corrosion resistant.

BAUSH A-5 CASTING METAL.
M-254; 3 Cu, 2 Ni, bal Al.
Cast: 24,000 TS; 0.5 El; 100 Brin.
Heat treated: 30,000 TS.
For heat treating castings; highly resistant to corrosion.

BAUSH DURALUMIN GRADE A.
M-254; 3 Cu, 0.3 Mg, Fe, Si, bal Al.
Annealed: 22,000-28,000 TS; 14-10 El; 54-60 Brin.
Heat treated: 50,000-55,000 TS; 25,000-30,000 YS, 18-15 El; 83-93 Brin.
For light alloy parts for airplanes, dirigibles and automobiles; age-hardening

BAUSH DURALUMIN GRADE B.
M-254; 4 0 Cu, 0 6 Mn, 0 5 Mg, Fe, Si, 0 10 Cr, bal Al.
Annealed: 25,000 TS; 14 El; 60 Brin.
Heat treated 55,000-62,000 TS; 30,000-36,000 YS; 25-18 El; 93-100 Brin.
For light alloy parts for automobiles, airplanes, dirigibles; age-hardening; sheet grade.

BAXTRON-DBA.
M-522; WC + Ceramic + metal
For cutting tool inserts; milling cutters, wear components.
Ceramic-carbide composite.

BAXTRON-DBW.
M-522; WC + Oxide + metal.
Sintered: 539,000 Tr R., 91.8 Ra.
For cutting tools, dies, wear components, punches
High strength and hardness at elevated temperatures.
Composite.

B.A./"Y" ALLOY
M-28, 4 Cu, 2 Ni, 1.5 Mg, bal Al, 0-0 7 Si, 0-0.75 Fe
Hot rolled: 39,400 TS; 26,900 YS, 20 El, 30 RA
Cold rolled. 54,000 TS, 34,000 YS, 23 El, 33 RA
Heat treated· 35,000-50,000 TS, 30,000-36,000 YS; 1.5-6 5 El, 90-110 Brin,
Chill cast· 27,000 TS; 22,000 YS, 3 3 1 0 El, 105-85 Brin
For pistons in gasoline engines, reciprocating parts in aero engines, air cooled cylinder heads, similar to Duralumin, high strength at elevated temperatures.

BAZAR.
M-135, 10 Ni, Zn, bal Cu
For domestic utensils, ornaments; nickel silver.

B B.
M-261, 0 6 C, 9.5 W, 2 5 Cr, 0 1 V, bal Fe.
For tools, dies; hot die steel.

B & B.
30 Co, 15 Cr, 5 Mo, 2 5 Ti, 3 Al, 0 5 B, bal Ni
For jet engine components, buckets, high heat resistance.

BBB WELDING ELECTRODE.
M-706, 0.2 C, bal Fe
For welding electrode.

B.B D.C. STANDARD ALLOY
Eng; 88 5 Cu, 0.25 Pb, 1 Ni, 10 Sn, 0.25 P
For gears, bearings; tough.

B.B. HOT DIE.
M-261, 0 4 C, 10 W, 3.5 Cr, 0 5 V, bal Fe.
For hot dies, punches; hot die steel.

B.C. NO. 8.
M 50; 0.8 C, 0 2 Mn, bal Fe
For tools; general.

B.C. NO. 10.
M-50; 1 0 C, 0.2 Mn, bal Fe.
For tools, general.

BC-NO. 10V.
M-1724; 1.0 C, 0.22 V, 0.2 Mn, bal Fe.
For coining and embossing dies, engraving tools; Type W2; water hardening.

B.C. NO. 12.
M-50; 1.2 C, 0.2 Mn, bal Fe.
For tools; general.

BD.30.
M-341, 0.51 C, 0 95 Cr, 0.87 Mn, 0.20 Mo, bal Fe (typical).
Prehardened to 248-293 Brin.
For dies for hand operated and mechanically press brakes for forming operations

B-D Cu.
M-8, 0 010 B, bal Cu
Hard· 48,000 TS; 40,000 YS; 6 El; B 50 Rock.
Soft: 33,000 TS; 10,000 YS; 45 El; F 45 Rock
For electrical and electronic equipment, magnetrons, vacuum switchgear.
High resistance to grain growth and resistance to thermal stress cracking.

B E NO. 4 ALLOY.
U S, 4 Cu, 0 25 Mg, ≯ 0 5 Fe, ≯ 0 1 Si, bal Al
For boxes, covers, face-plates, U.S N. Bureau of Engineering Alloy.

BEACON.
M-433, 0.8-1 0 C, bal Fe
For tools, dies, springs; water hardening

BEARCAT.
M-24, 0.5 C, 0 7 Mn, 0 3 Si, 3 25 Cr, 1.4 Mo, bal Fe
Heat treated 342,000-145,000 TS, 205,000-130,000 YS, 4-20 El, 7-60 RA; 590-310 Brin
For rivet sets, punches, chisels, hobs; shock resistant, air or oil hardened

BEARDSHAW H M 1
M-1406, 0 95 C, 1 6 Mn, 0 25 Mo, 0 25 V, bal Fe.
For punches, gages, shear blades, reamers, oil hardened, non-deforming

BEARING METAL NO 600
Eng, 59 7 Cu, 35 Zn, 0 2 Sn, 0 33 Pb, 2 6 Mn, 1 38 Al, 0 7 Si.
For bearings, bushings; tough

BEARINGOY
M-208, Pb, Cu, Sb, bal Sn
For machine bearings, long life under poor lubrication

BEARING (STANDARD)
M-24, 1 0 C, 0 35 Mn, 0 23 Si, 1 35 Cr, bal Fe
For tools, bearings; water hardening.

BEARITE
M-214, 80.1 Pb, 0 37 Cu, 0 13 Bi, 16 75 Sb, 2 65 hardener
At 70°F: 9750 TS, 1 5 El; 29 1 Brin
At 212°F · 24.5 Brin
For bearings not subject to vibration or pounding; high compressive value, low coef fric

BEARIUM B-4.
M-431; 70 Cu, 26 Pb, bal Sn.
Cast: 21,650 TS, 9750 YS, 16 El; 40 Brin.
For bearings, bushings, poor lubrication.

BEARIUM B-8
M-431, 70 Cu, 22 Pb, 8 Sn
Cast 24,500 TS; 11,500 YS, 12 El; 50 Brin.
For bearings, bushings, thrust washers; for heavy duty requirements.

BEARIUM B-10.
M-431; 20 Pb, 70 Cu, bal Sn.
Cast: 25,500 TS; 12,000 YS; 10 El; 55 Brin.
For bearings, bushings; non-scoring; severe applications.

BEARIUM B-11.
M-431; 17.5 Pb, 70 Cu, bal Sn.
Cast: 30,000 TS; 8 El, 195 Brin.
For bearings, bushings; severe applications.

BEAUCALLOY.
M-1183, 1.4 C, Ni, Cr, bal Fe.
Hardened: 175,000 TS; 150,000 YS; 400 Brin.
For conveyor chains; casting.

BEAVER.
M-370; 1.5-1.6 C, 0.30-0.45 Si, 0.2-0.3 Mn, 0.7-0.9 V, 11.5-12.5 Cr, 0.75-0.85 Mo, bal Fe
Corrosion resistant, high hardness, resistant to tempering, minimum distortion on heat-treating
For blanking trimming, drawing dies, thread rolling dies, gages, punches, shear blades.
Type D2 Air hardening cold work tool steel.

BEAVER
M-435, 0.68 C, 1 Si, 8.25 Cr, 1 V, 1.4 Mo, 1.5 Ni, bal Fe
For slitter knives, blanking dies, cold work tools; high wear resistance.

BEAVER BABBITT.
M-565, Sb, Pb, Sn.
For machinery bearings, Babbitt.

BEAVER D-2
M-52, 1.5 C, 12 Cr, 0.4 V, 1.0 Mo, bal Fe.
Air Hardened 288,000 TS, 215,000 YS; 1 El, C 58 Rock.
For blanking and drawing dies, punches, gages, broaches, hobs, shear blades
Precision ground flat stock, AISI Type D2, wear and abrasion resistant Air harden

BECKET ALLOY.
Eng., 25-30 Cr, 3 Si, 1.5-3.0 C, bal Fe
For stainless castings, corrosion resistant

BECKETT METAL
M-544; 60 Cu, 5 Sn, 35 Pb
21,000 TS, 13,500 YS, 15 El; 36 RA.
For bearings, heavy duty.

BEDCO ALLOY
M-1429; 0.55 C, 1 Mn, 2 Si, 0.4 Mo, 0.35 V, bal Fe.
Heat treated 350,000 TS, 295,000 YS, 6 El, 12 RA, 600 Brin
For chisels, punches, pneumatic and beading tools, shock resistant, oil hardened

BEDCO M-2
M-1429; 0.65 C, 4 Cr, 2 V, 6.5 W, 5 Mo, bal Fe.
Hardened: C58-60 Rock.
For hot extrusion dies, punches, shear blades, forging mandrels.
High speed steel for hot working, shock resisting.

BEDCO M-2 HIGH SPEED
M-1429, 0.82 C, 5 Mo, 6.5 W, 4 Cr, 2 V, bal Fe.
Oil Hardened: C63-65 Rock.
For lathe and planer cutters, drills, taps, chasers, drawing dies, punches, hobs
Type M2 high speed steel, high red-hardness.

BEDCO T1
M-1429; 0.75 C, 0.3 Mn, 1.3 Si, 4.0 Cr, 1.15 V, 18.0 W, bal Fe.
Standard grade of tungsten high speed steel for cutting tools; AISI T1.

BEDEL 1 COURONNES 0
M-455; C, bal Fe.
For wood tools without hardening; crucible steel.

BEDEL 1 COURONNES 1.
M-455; C, bal Fe.
For saws, lathe tools; crucible steel.

BEDEL 1 COURONNES 2.
M-455; C, bal Fe.
For cutlery, taps, chisels, mandrels, razors, metal saws; crucible steel.

BEDEL 1 COURONNES 3.
M-455; C, bal Fe.
For drills, borers, mining bars, chisels, engraving tools, stone tools, needle dies; crucible steel

BEDEL 1 COURONNES 4.
M-455; C, bal Fe.
For rams, shear blades, dies, hammers; crucible steel.

BEDEL 1 COURONNES 5.
M-455; C, bal Fe.
For surgical instruments, forge tools; crucible steel.

BEDEL 1 TREFLE 5.
M-455, C, Cr, 4.5 Ni, Mo, bal Fe.
Heat treated: 157,000 TS; 135,000 YS; 15 El.
For valves operating at high temperatures; heat resistant.

BEDEL 2 COURONNES 0.
M-455; C, bal Fe.
For wood tools used without hardening, crucible steel

BEDEL 2 COURONNES 1.
M-455, C, bal Fe
For saws for hard wood, lathe tools; crucible steel.

BEDEL 2 COURONNES 2.
M-455, C, bal Fe.
For general cutlery, chisels, mandrels, razors, metal saws; crucible steel.

BEDEL 2 COURONNES 3
M-455, C, bal Fe.
For drills, borers, mining bars, chisels, punches, stone tools; crucible steel.

BEDEL 2 COURONNES 4.
M-455; C, bal Fe
For shear blades, cutting and stamping dies, hammers, crucible steel.

BEDEL 2 COURONNES 5.
M-455, C, bal Fe.
For surgical instruments, forge tools, crucible steel

BEDEL 3 COURONNES 0.
M-455, C, bal Fe.
For wood tools used without hardening; crucible steel.

BEDEL 3 COURONNES 1.
M-455; 0.9-1.1 C, bal Fe
For saws for hard wood, lathe tools; crucible steel.

BEDEL 3 COURONNES 2.
M-455, 1.0-1.1 C, bal Fe.
For general cutlery, taps, chisels, mandrels, razors, metals saws; crucible steel

BEDEL 3 COURONNES 3.
M-455; 1.2-1.3 C, bal Fe.
For drills, borers, chisels, engraving tools, needle dies, stone tools; crucible steel.

BEDEL 3 COURONNES 4.
M-455; 0.9 C, bal Fe.
For hot and cold shear blades, hammers, cutting and stamping dies; crucible steel.

BEDEL 3 COURONNES 5.
M-455, C, bal Fe.
For forge tools, surgical instruments; crucible steel.

BEDEL 405.
M-455; 1.6 C, 4.5 Cr, 12 W, 0.4 Mo, 0.5 V, 5 Co, bal Fe.
For special tools, engravers tools; textile needles.
High carbon, high-speed steel, wear and abrasion resistant

BEDEL NO. 600 C.
M-455; low C, 1.5 Ni, Cr, Mo, V, bal Fe.
Heat treated· 150,000-177,000 TS; 143,000-157,000 YS, 12 El.
For crankshafts, general case hardened parts for severe service; case-hardening steel

BEDEL NO 644.
M-455; C, W, Cr, V, bal Fe.
For high speed cutters, high speed steel.

BEDEL BCN
M-455; 0 4 C, Cr, 2-3 Ni, bal Fe.
Heat treated. 242,000-135,000 TS, 213,000-121,000 YS; 10-15 El
For general engineering construction; oil hardening

BEDEL BCN 3 S 2
M-455, high C, Cr, 3 Ni, bal Fe
Heat treated: 270,000 TS; 242,000 YS; 6 El
For general engineering construction; oil hardening.

BEDEL BCN 4 S
M-455; C, Cr, 4 Ni, bal Fe
Air hardened. 270,000-260,000 TS; 235,000-220,000 YS, 6-8 El
For general engineering construction, air hardening

BEDEL BK 3 B.
M-455, low C, 3 5 Ni, Cr, bal Fe
Annealed: 78,000 TS, 58,000 YS, 30 El.
Heat treated 135,000 TS; 128,000 YS; 11 El
For crankshafts, general case hardened parts for severe service; case hardening steel

BEDEL BN 23.
M-455, C, 25 Ni, Cr, bal Fe
Annealed 100,000 TS; 45 El.
For chemical plant equipment, non-magnetic, corrosion and acid resistant

BEDEL BN 33
M-455, C, 33 Ni, Cr, bal Fe
Annealed· 115,000 TS; 30 El
For chemical plant equipment, high acid and corrosion resistant

BEDEL BNAV 0
M-455, C, Cr, 3 Ni, Mo, bal Fe.
Heat treated 228,000 TS, 199,000 YS, 9 El.
For general engineering construction, oil hardening

BEDEL BNAV 1.
M-455, C, Cr, 4 Ni, Mo, bal Fe
Heat treated· 315,000 TS, 260,000 YS; 6 El.
For general engineering construction, air hardening

BEDEL BNAV 2.
M-455, medium C, Cr, 4 Ni, Mo, bal Fe
Heat treated 242,000 TS, 228,000 YS, 9 El
For aircraft motor crankshafts; oil hardening

BEDEL BNAV 3
M-455, low C, 4 Ni, Cr, Mo, bal Fe.
Annealed: 107,000 TS.
Heat treated· 143,000 TS; 135,000 YS; 14 El
For crankshafts, general case hardened parts for severe service, case hardening steel.

BEDEL C.3
M-455, low C, 2.5 Ni, bal Fe
Annealed· 85,000 TS; 78,000 YS, 20 El
For aviation and marine case hardened parts, case-hardening steel.

BEDEL C.5.
M-455, low C, 5 Ni, bal Fe.
Annealed· 90,000 TS, 78,000 YS; 20 El.
For aviation and marine case hardening parts; case hardening steel.

BEDEL CHROME 4.
M-455; C, 2-3 Cr, bal Fe.
For cold stamping dies and punches; non-deforming

BEDEL CKN
M-455; low C, 3 Ni, Cr, bal Fe
Annealed 85,000 TS.
Heat treated· 164,000 TS, 143,000 YS; 9 El.
For crankshafts, general case hardened parts for severe service; case hardening steel.

BEDEL "DIAMONT BEDEL"
M-455, 4 W, 4 Cr, V, bal Fe
For cutting tools, oil hardened

BEDEL DOUBLE TREFLE
M-455, C, 14 W, Cr, bal Fe
For general usage, medium speed cutters; high speed steel

BEDEL DOUBLE TREFLE E
M-455, C, 15-16 W, bal Fe
For tools, dies, oil hardening

BEDEL INO 2
M-455, medium C, 13 Cr, bal Fe
Heat treated 170,000 TS, 157,000 YS; 5 El
For marine valves, corrosion resistant

BEDEL INO 3
M-455, C, 13 Cr, V, bal Fe
Heat treated 135,000 TS, 110,000 YS, 10 El
For automobile valves, corrosion resistant

BEDEL INO 6
M-455, C, 17 Cr, V, bal Fe
For cutlery, surgical instruments, high heat and corrosion resistant.

BEDEL INO 11
M-455, C, 6 Ni, 25 Cr, bal Fe
For rolled or forged parts, pump and furnace parts, valves, heat and corrosion resistant, non-hardenable

BEDEL INO 12
M 455, C, 20 Cr, 8 Ni, Mo, bal Fe
For valves operating up to 900°C, austenitic, heat resistant

BEDEL INO 13.
M-455; C, 8 Ni, 20 Cr, bal Fe
For carburizing boxes, recuperator tubes, salt bath pots, heat and corrosion resistant; non-hardenable

BEDEL INO 14
M-455, C, 6 Ni, 25 Cr, bal Fe
For carburizing boxes, recuperator tubes, salt bath pots, heat and corrosion resistant, non-hardenable.

BEDEL INO 15
M 455, C, 6 Ni, 25 Cr, bal Fe.
For carburizing boxes, recuperator tubes, salt bath pots, heat and corrosion resistant; non-hardenable

BEDEL INO 16
M-455, C, 6 Ni, 25 Cr, Si, bal Fe.
For carburizing boxes, recuperator tubes, salt bath pots, heat and corrosion resistant; non-hardenable

BEDEL INO 20.
M-455, C, 25 Cr, 20 Ni, bal Fe
For pump, furnace and valve parts, carburizing boxes, heat and corrosion resistant; non-hardenable

BEDEL INO 21.
M-455; C, high Ni, high Cr, bal Fe.
For pump, furnace and valve parts, carburizing boxes; heat and corrosion resistant; non-hardenable.

BEDEL INO 22.
M-455, C, 25 Cr, 20 Ni, bal Fe.
For pump, furnace and valve parts, carburizing boxes, heat and corrosion resistant; non-hardenable.

BEDEL INO 23
M-455; C, 20 Cr, 20 Ni, Si, bal Fe.
For pump, furnace and valve parts, carburizing boxes, heat and corrosion resistant; non-hardenable.

BEDEL INO 31.
M-455, C, 14 Cr, 15 Ni, W, Mo, bal Fe
For valves operating up to 900°C; austenitic, heat resistant.

BEDEL INO 32
M-455; C, 15 Cr, 20 Ni, Mo, bal Fe
For valves operating up to 900°C, austenitic, heat resistant

BEDEL INO 33.
M-455; C, 25 Ni, 10 Cr, W, bal Fe
For valves operating up to 900°C, austenitic, heat resistant

BEDEL INO 40
M-455, C, 35 Ni, 15 Cr, bal Fe
For turbine blading, marine parts; maximum heat and corrosion resistant.

BEDEL INO 41.
M-455, C, 40 Ni, 10 Cr, bal Fe
For marine parts; maximum heat and corrosion resistant

BEDEL INO 50
M-455, C, 15 Cr, 50 Ni, bal Fe
For carburizing boxes, furnace parts, maximum heat and corrosion resistant

BEDEL INO 51
M-455, C, 50 Ni, 15 Cr, bal Fe
For carburizing boxes, furnace parts, maximum heat and corrosion resistant.

BEDEL M.G.B.A
M-455, C, Co, bal Fe
For magnets, magnet steel

BEDEL M.G.B.C.
M-455, C, 35 Co, 8 W, bal Fe
For magnets, magnet steel

BEDEL M.G.B.S.
M-455; C, 5-6 W, Cr, bal Fe
For magnets, magnet steel.

BEDEL QUATRE TREFLES.
M-455, C, W, Cr, V, Co, bal Fe
For high speed cutters; high speed steel for extra hard pieces at high speed.

BEDEL QUATRE TREFLES C.
M-455; C, 10 Co, Mo, V, bal Fe
For tools, dies; oil hardening

BEDEL R.B 6
M-455, C, 2.5 Cr, 0.5 Ni, bal Fe.
For bearings, dies, punches; not shock resistant.

BEDEL R.B. 7.
M-455; high C, 1.5 Cr, bal Fe.
For bearings, dies, punches; not shock resistant.

BEDEL SOC.
M-455; C, 13 Cr, Mo, Co, bal Fe
Heat treated 145,000 TS; 130,000 YS; 6 El.
For valves operating at temperatures up to 800°C; very oxidation resistant.

BEDEL SOC 2.
M-455; C, 20 Cr, high Co, bal Fe.
Heat treated: 135,000 TS; 115,000 YS; 7.5 El.
For valves operating at temperatures up to 800°C; very oxidation resistant

BEDEL SPECIAL F.
M-455, C, 4 W, Cr, Mo, bal Fe
For wire drawing dies, cold drawn wire dies; non-deforming.

BEDEL SPECIAL FA.
M-455, C, 13 Cr, Ni, Mo, V, bal Fe
For dies and punches, non-deforming

BEDEL SPECIAL FB.
M-455; C, 13 Cr, Mo, V, bal Fe
For dies and punches, non-deforming

BEDEL SPECIAL FK.
M-455, C, 13 Cr, Mo, V, bal Fe
For dies and punches, non-deforming

BEDEL SPECIAL FL.
M-455, C, 13, bal Fe.
For wire drawing, dies for cold drawn hard steel; non-deforming

BEDEL SPECIAL 000.
M-455, C, 13 Cr, bal Fe
For dies punches, rolling mill rolls, non-deforming

BEDEL SPECIAL OZ
M-455, C, 10 W, Cr, V, bal Fe
For hot forging tools, stamping and punching, hot shear blades, hot work steel

BEDEL SPECIAL X.
M-455, C, Cr, V, bal Fe
For calipers, gages, dies, punches, non-deforming

BEDEL SPECIAL Y.2.
M-455, C, 3 Ni, 0.7 Cr, bal Fe.
For pneumatic or hydraulic rivet sets, tough.

BEDEL SPECIAL Y 5
M-455, C, 2 W, 1 V, bal Fe.
For pneumatic chisels, punches, shear blades, tough

BEDEL SPECIAL Z3
M-455, C, 10 W, Cr, Ni, V, bal Fe
For tools, dies, oil hardening

BEDEL SPECIAL Z4.
M-455; C, 10 W, Cr, V, Co, bal Fe
For tools, dies, oil hardening

BEDEL TRIPLE TREFLE
M-455, C, 18 W, Cr, bal Fe
For heavy roughing and milling cutters, high speed steel

BEDEL TRIPLE TREFLE E.
M-455, 0.75 C, 18 W, 5 Cr, 1 Mo, 1 V, bal Fe
For tools, cutters, drills, reamers, broaches, lathe and planer tools
High-speed steel, high red hardness

BEDEL TRIPLE TREFLE E S.
M-455, C, W, Cr, V, 6 Co, bal Fe.
For high speed cutters; super high speed steel.

BEDEL TRIPLE TREFLE ESD.
M-455, C, 5 Co, Mo, V, bal Fe.
For tools, dies; oil hardening

BEDEL TRIPLE TREFLE F.R.
M-455, C, high W, high Cr, bal Fe.
For taps, forming tools, bores, finishing tools; high speed steel.

BEDEL UN TREFLE 1.
M-455; C, 2-3 W, Cr, V, bal Fe.
For hot and cold forging punches, dies; hot work steel.

BEDEL UN TREFLE 2.
M-455; C, 4 Ni, Cr, Mo, bal Fe.
For hot stamping dies and punches, pipe mandrel, shear blades; shock resistant.

BEDEL UN TREFLE 3.
M-455; C, Cr, Ni, bal Fe.
For pneumatic chisels, hot slicing; shock resistant.

BEDEL UN TREFLE COURONNE.
M-455; C, 5-6 F, Cr, bal Fe.
For hot punches and dies for screw machines; hot work steel.

BELAIS WHITE GOLD-1.
M-237; 75-85 Au, 8-18 Ni, 4-14 Zn.
For jewelry, ornaments; corrosion resistant.

BELAIS WHITE GOLD-2.
M-237; 75-85 Au, 10-18 Ni, 2-9 Zn, 0.05-0 5 Pt or 0.5-2 0 Mn.
For jewelry, ornaments; corrosion resistant

BELECTRIC NO 1.
M-707; 3.25 C, 2 0 Si, bal Fe.
Cast: 35,000-42,000 TS; 200-220 Brin.
For gears, pinions, brake drums, brake shoes, pumps; cast iron.

BELECTRIC NO 2
M-707; 2.9 C, 2 0 Si, bal Fe.
Cast: 42,000-50,000 TS; 220-240 Brin.
For gears, pinions, brake drums, pumps, cast iron.

BELECTRIC NO. 3.
M-707, 3 C, 2 Si, alloys, bal Fe.
Cast· 50,000-65,000 TS, 230-300 Brin.
For gears, pinions, brake shoes, pumps; cast iron

B ELECTROMAL
M-707; 2 3-2.4 C, 1.2-1.3 Si, 1 Cu, 4 Ni, bal Fe.
Cast: 60,000-70,000 TS; 45,000 YS; 15 El, 143-170 Brin
For castings; malleable iron

BELGIAN ALUMINUM PISTON ALLOY
Belgium; 90.5 Al, 7 Cu, 2.5 Zn.
For pistons, non-hardenable

B-ELITE.
M-459, 0 10 C, 0.65 Mn, 0.12 Si, bal Fe.
For welding electrode; general purpose

B-ELITE HS.
M-459; 0 2 C, 1.5 Mn, 0.2 Si, 0.15 Al, 0.25 Ti, bal Fe.
For welding electrode, general purpose.

B-ELITE KVA.
M-27; 0 2 C, 1 Mn, 0.4 Zr, bal Fe.
Welded: 80,000 TS; 20-25 El.
For welding electrodes; cored, high ductility.

B-ELITE KVA.
M-459; 0 18 C, 1.1 Mn, 0.6 Si, 0.10 Al, 0 3 Zr, bal Fe.
For welding electrode; general purpose.

BELL BRAND.
M-368; 0.7-1.0 C, bal Fe.
For tools; water hardened.

BELL BRASS.
Eng.; 64 Cu, 35 Zn, 0.85 Sn.
For bells.

BELL BRONZE.
M-657; 80 Cu, 20 Sn.
For bells.

BELLER NO. 4.
M-1117; 0.75 C, bal Fe.
For tools, taps, springs, punches; water hardened.

BELL METAL-1.
Eng.; 83 Al, 10 Mn, 7 Cd
For bells, chimes, whistles, ornaments.

BELL METAL-2.
Eng; 85-60 Cu, 15-40 Sn.
For bells, chimes; hard bronze

BELL METAL, JAPANESE KARAKANE-1.
Japan; 72-61 Cu, 14-25 Sn, 0.14 Pb, 0-9.4 Zn, 0-3 Fe.
For bells; corrosion resistant

BELL METAL, JAPANESE KARAKANE-2.
Japan; 71 42 Cu, 14 2 Sn, 14.3 Pb.
For bells; free-cutting.

BELL METAL, JAPANESE KARAKANE-3.
Japan; 70 Cu, 19 Sn, 3 Zn, 8 Pb.
For bells; free-cutting.

BELL METAL, JAPANESE KARAKANE-4.
Japan, 65.95 Cu, 17 25 Sn, 3 45 Zn, 10.35 Pb
For bells, free-cutting

BELL METAL, JAPANESE KARAKANE-5.
Japan, 64 Cu, 24 Sn, 9 Zn, 3 Fe
For bells, corrosion resistant

BELL METAL, JAPANESE KARAKANE-6.
Japan; 61 Cu, 18 Sn, 6 Zn, 3 Fe, 12 Pb.
For bells; free-cutting

BELL METAL, MUSICAL
U S, 84 Cu, 16 Sn.
For bells, bronze

BELL SPECIAL
M-368, 1 2 C, 0.2 V, bal Fe
For tools, fixtures, jigs, water hardened

BELMALLOY
M-707, 2 15-2 35 C, 1.0 Si, 1 0 Mn, bal Fe
Cast 70,000-80,000 TS, 45,000-50,000 YS, 5-10 El, 179-207 Brin
For tractor parts, axle parts, pearlitic malleable cast iron.

BELMONT
M-1705, 0 90 C, 1 5 Mn, 0 25 Si, 0 3 Mo, bal Fe.
Oil hardening tool steel AISI 02

BELMONT NO. 40
M-1255
For aluminum solder, M P. 400°F.

BELMONT NO 60.
M-1255
For aluminum solder, M P. 650°F.

BELMONT HOLTITE.
M-1255, 50 Cu, 50 Zn, granular
For brazing all metals except aluminum

BELMONT MAB.
M-1255, For aluminum brazing, M P. 720°F.

BELMONT SUPERDIE
M-1255, Zinc base, plus Al, Cu, and Ti.
For cast stamping dies, blow molds.

BELT LACE
U.S.; 62 Cu, 38 Zn
For belt lacing, light alloy parts; high impact strength.

BEMIT.
GERMANY; 96.91 Al, 2 0 Cu, 0.45 Mn, 0 27 W.
For light alloy welded, drawn or stamped parts; also called "Benit;" German alloy.

BENDIX A2 FLAT GROUND STOCK.
M-1694; 1.0 C, 0.5 Mn, 5.0 Cr, 0.3 V, 1.25 Mo, bal Fe.
Air hardening tool steel. AISI A2.

BENDIX COMMERCIAL DRILL ROD.
M-1694, 1 0 C, 0.3 Mn, 0.2 Si, bal Fe.
Water hardening tool steel. AISI W1.

BENDIX D2.
M-1694; 1.5 C, 0 4 Mn, 0 3 Si, 12.0 Cr, 0.9 V, 0.8 Mo, bal Fe.
High carbon, high chromium tool steel AISI D2

BENDIX D2 FLAT GROUND STOCK
M-1694, 1.55 C, 0.25 Mn, 0 38 Si, 12 0 Cr, 0 8 V, 0 8 Mo, bal Fe
High carbon, high chromium tool steel. AISI D2.

BENDIX O1
M-1694, 0 90 C, 1 2 Mn, 0 35 Si, 0 5 Cr, 0.2 V, 0 5 W, bal Fe
Oil hardening tool steel. AISI O1.

BENDIX O1 DRILL ROD
M-1694, 0 90 C, 1 2 Mn, 0 5 Cr, 0.2 V, 0.5 W, bal Fe
Oil hardening tool steel AISI O1

BENDIX O1 FLAT GROUND STOCK.
M-1694, 0 90 C, 1 2 Mn, 0 35 Si, 0 5 Cr, 0 2 V, 0 5 W, bal Fe
Oil hardening tool steel AISI O1

BENECKE.
M-823, 0.7-1 0 C, alloy, bal Fe.
For tools, dies, oil hardening

BENEDICT METAL
M-98, 75 80 Cu, 20-25 Ni, 0 75 max Fe + Mn
Hard 88,300 TS, 83,000 YS, 6 El, 35 RA, 148 Brin
Annealed 50,000 TS, 30,000 YS, 46 El, 63 RA; 76 Brin
For condensers, feed water heaters, coinage, corrosion resistant

BENEDICT PLATE
Eng , 57 Cu, 28 Zn, 15 Ni
For white metal for flat work, corrosion resistant

BENSON
M-959, 10 Sn, 15 Sb, bal Pb
For bearings, bushings, Babbitt

BENUM
M-1405, 0 3 C, 0 5 Mn, 1 3 Cr, 0 3 Si, 0 3 Mo, 4 2 Ni, bal Fe
For molds, dies, air hardened, tough

BENZ AVIATEK
Eng , 80 Al, 6 Cu, 12 Zn, 1 5 Fe
For pistons, non-hardenable

BERA AUTO A
M-1261, 88 7 Sn, 7.8 Sb, 3 5 Cu
Cast 12,800 TS, 26 Brin
For engine bearings; M P 440-620°F, shock resistant

BERA AUTO SPECIAL.
M-1261, 90 3 Sn, 6.5 Sb, 3 Cu, 0 2 Ni
Cast 12,800 TS, 25 Brin
For engine bearings, M.P. 440-610°F; shock resistant

BERACO.
M-1260, M-1261, 10 Sn, 13 5 Sb, 0.5 Cu, 76 Pb.
Cast: 12,900 TS, 30 Brin
For transmission bearings; M.P. 470-705°F.

BERA COMMON A
M-1261, 55 Sn, 10 Sb, 2 5 Cu, 32 5 Pb.
Cast: 11,400 TS, 22 Brin
For refrigerator and generator bearings, M.P. 355-620°F; good castability.

BERA COMMON B.
M-1261; 24.5 Sn, 13 Sb, 0.5 Cu, 62 Pb
Cast: 12,800 TS; 26 Brin.
For refrigerator and generator bearings; M P. 355-535°F; good castability

BERA DIESEL
M-1261, 83.5 Sn, 8 Sb, 6 5 Cu, 2 Pb.
Cast: 17,100 TS; 31 Brin.
For diesel engine bearings; M P. 355-710°F; wear resistant.

BERALITE 35.
M-1011; 35 Be, bal Al.
Drawn: 62,800 TS, 58,400 YS, 1 5 El; 94 Brin.
Annealed 41,400 TS, 23,100 YS, 14 5 El; 68 Brin.
For instruments; corrosion resistant.

BERALOY 1
M-61, 1.8 2.4 Co, 0 3-0.5 Be, bal Cu.
Rolled 110,000 TS; 95,000 YS; 10 El; 200 Brin
For springs, 50% electrical conductivity.

BERALOY NO 25
M-61; 97 75 Cu, 2.0 Be, 0.25 Co.
Annealed: 66,000 TS
Heat treated 175,000 TS
For springs, electric contacts, diaphragm valves, bearings, age-hardenable

BERALOY A
M-897: 2 Be, 0 25 Co, bal Cu
Heat treated 180,000 TS, 95,000 YS, 1 El
For springs, corrosion resistant, hardenable

BERALOY A
M-61, 1 9-2 2 Be, 0.25-0 50 Co, bal Cu
Annealed 66,000 TS, 26,000 YS, 60 El.
Heat treated 200,000 TS, 179,000 YS, 2 El
For diaphragms, springs, age hardenable

BERALOY B
M-61, 1 9-2 2 Be, 0 25-0 50 Ni, bal Cu
Annealed 66,000 TS, 26,000 YS, 60 El
Heat treated 200,000 TS, 179,000 YS, 2 El.
For diaphragms, springs, age-hardenable

BERALOY C.
M-61, 0 4-0 5 Be, 2 5-2 7 Co, bal Cu
Annealed 30,000 TS
Heat treated 110,000 TS; 10 El
For springs, age-hardenable

BERALOY D
M 61, 1 6 1 8 Be, 0 25-0 50 Co, bal Cu
For springs, diaphragms, age hardened, corrosion resistant.

BERA MARINE
M-1261, 85 Sn, 10 Sb, 5 Cu
Cast 19,900 TS, 28 Brin
For engine bearings, M P 440-630°F, shock resistant

BERA STEAM A
M-1261, 80 Sn, 11 5 Sb, 5 5 Cu, 3 Pb.
Cast 17,800 TS, 34 Brin
For steam turbine and generator bearings; M P 355-675°F, wear resistant

BERA STEAM B
M-1261, 74 Sn, 9 Sb, 4 Cu, 13 Pb.
Cast: 14,200 TS, 28 Brin
For steam turbine bearings; M P. 355-625°F, wear resistant

BERDO ALLOY NO. 1
M-20; Cu, Sn, Pb, Ni
30,000 TS, 20,000 YS; 1.5 El, 2.6 RA; 99 Brin.
For bearings, heavy service, C.Y P.-38,000.

BERDO ALLOY NO. 2.
M-20; Cu, Sn, Pb, Ni.
75 Brin
For bearings; general service; C.Y.P -28,000

BERDO ALLOY NO. 3.
M-20, Cu, Sn, Pb, Ni
44 Brin.
For bearings; light service; C.P.Y.-14,000.

BERDO NO. 6.
M-20, Cu-Sn-Ni-Pb-P.
For mill bearings, rock drill parts, gears; wear resistant.

BERDO NO. 7.
M-20; Cu-Sn-Ni-Pb-P
For mill bearings, rock drill parts, gears, wear resistant

BERGAL.
M-708; 94.1 Al, 4.0 Cu, 0.8 Mg, 0.7 Mn, 0.4 Si
For light alloy parts, age-hardenable

BERGISCHE-CMVW11.
M-1290, 0.20 C, 12.5 Cr, 1.1 Mo, 0.6 Ni, 0.3 V, 0.5 W, bal Fe
Annealed: 95,000 TS; 40,000 YS, 25 El, 55 RA, B 92 Rock
Heat Treated 225,000 TS. 205,000 YS, 8 El, C 50 Rock.
For surgical instruments, hardware, oil refinery equipment, marine equipment.
Corrosion resistant, hardenable Cast alloy.

BERGISCHE-CMW11
M-1290, 0.20 C, 12.5 Cr, 1.1 Mo, 0.6 Ni, 0.3 V, bal Fe
Annealed 93,000 TS, 38,000 YS, 26 El, 52 RA, B 90 Rock
Heat Treated 240,000 TS, 205,000 YS, 9 El, 25 RA; C 50 Rock
For surgical instruments, gears, hardware, oil refinery equipment
Corrosion resistant, hardenable Cast alloy

BERGIT 1
M-1290, 0.10 C, Ni, Cr, Mo, Cu, bal Fe
Annealed 85,000 TS, 35,000 YS, 50 El, 65 RA, 160 Brin
For acid resistant chemical plant equipment, stainless, austenitic

BERGIT A
M-1290, 0.10 C, Ni, Mo, bal Fe
For machine tool parts, cams, case hardened

BERGIT B
M-1290, 28.5 Mo, bal Ni
Sol ann & age 78,000-92,000 TS, 57,000 min YS, 8 min El
Corrosion resistant nickel base casting.
Werkstoff Nr. 2.4482, DIN G-X8NiMo6530

BERGIT C
M-1290, 19.0 Mo, 17.0 Cr, bal Ni
So. ann & age 71,000-85,000 TS, 57,000 min YS, 5 min El
Corrosion resistant nickel base casting
Werkstoff Nr. 2.4472, DIN G-X8NiMoCr6018

BERGSOE F.
M-1260; 88.7 Sn, 7.8 Sb, 3.5 Cu
Cast: 17,000 TS; 25 Brin
For engine bearings; M.P 440-620°F, shock resistant.

BERGSOE G.
M-1260, M-1261, 88 Sn, 8 Sb, 4 Cu
Cast: 18,500 TS; 27 Brin.
For engine bearings, M.P. 440-625°F, shock resistant

BERGSOE M.
M-1260, M-1261; 6 Sn, 16 Sb, 79 Pb.
Cast. 29 Brin.
For transmission bearings; M.P 470-520°F.

BERGSOE P.
M-1260, M-1261, 16 Sb, 84 Pb.
Cast: 19 Brin
For transmission bearings, M.P 475-520°F.

BERGSOE WM.
M-1260, M-1261, 5 Sn, 12 Sb, 83 Pb
Cast 25 Brin.
For transmission bearings, M.P. 470-490°F

BERGSOL Mn Cu.
M-1260, M-1261, 8 Sn, 14 Sb, 0.5 Cu, 77.5 Pb
Cast. 29 Brin
For transmission bearings, M.P. 470-715°F

BERGSTAHL AM16-13N
M-1290, 0.05 max C, 18 Cr, 8 Ni, 0.7 Cb, bal Fe
Annealed 90,000 TS, 45,000 YS, 56 El, 65 RA, 160 Brin
For chemical plant equipment, stainless, austenitic, Type 347

BERGSTAHL AM17
M-1290, 0.40 C, Mn, bal Fe
For gears, bolts shafts, machine tool parts, water hardened

BERGSTAHL AM17 13E
M-1290, 0.10 max C, 17 Cr, 13 Ni, 2 Mo, bal Fe
Annealed 85,000 TS, 35,000 YS, 50 El, 65 RA, 160 Brin
Cold drawn 150,000 TS, 135,000 YS, 6 El, 300 Brin
For acid resistant chemical plant equipment, Type 316 stainless, austenitic

BERGSTAHL AM18 8
M-1290 0.18 max C, 18 Cr 8 Ni, bal Fe
Annealed 80,000 TS, 35,000 YS, 55 El, 75 RA, 150 Brin
Cold drawn 180,000 TS, 150,000 YS, 10 El, 250 Brin
For chemical plant equipment, tanks, mixers, filters, Type 302 stainless, austenitic

BERGSTAHL AM858
M-1290, 0.10 max C, Cr Ni Mn, bal Fe
Annealed 80,000 TS 35,000 YS, 55 El, 75 RA, 150 Brin
For chemical plant equipment, stainless

BERGSTAHL AMG10
M-1290, 0.3 C, Ni, Mn, Si, bal Fe
For machine tool parts, oil hardened

BERGSTAHL C1H
M-1290, 0.80 C, Cr, bal Fe
For bearings, liners, sleeves, bushings, water hardened

BERGSTAHL C2H
M-1290, 0.65 C, Cr, Ni, bal Fe
For springs, bolts, axes, hammers; oil hardened, tough

BERGSTAHL CM1
M-1290, 0.25 C, 1.2 Cr, 0.4 Mo, bal Fe
For gears, bolts, shafts, fasteners, oil hardened, tough

BERGSTAHL CM1B
M-1290, 0.35 C, 1.2 Cr, 0.25 Mo, bal Fe
For gears, bolts, shafts, machine tool parts, oil hardened, shock resistant

BERGSTAHL CM1H
M-1290, 0.45 C, 1.3 Cr, 0.4 Mo, bal Fe.
For gears, bolts, machine tool parts, oil hardened, shock resistant.

BERGSTAHL CM3.
M-1290; 0.15 C, Cr, Mo, bal Fe.
For gears, bolts, machine tool parts; case hardening steel.

BERGSTAHL CMVW2.
M-1290; 0.22 C, 0.75 Cr, 0.25 Mo, 0.3 V, bal Fe.
For gears, bolts, machine tool parts, case hardening steel.

BERGSTAHL CMW1
M-1290, 0.22 C, 1.2 Cr, 0.45 Mo, bal Fe
For gears, bolts, machine tool parts, case hardening steel.

BERGSTAHL CMW2.
M-1290, 0.22 C, 1.2 Cr, 0.45 Mo, bal Fe
For machine tool parts, gears, fasteners, case hardening steel

BERGSTAHL CMW3
M-1290, 0.10 C, Cr, Mo, bal Fe
For machine tool parts, gears, fasteners, case hardening steel

BERGSTAHL CMW4
M-1290, 0.22 C, Cr, Mo, V, bal Fe
For machine tool parts, gears, fasteners, case hardening steel

BERGSTAHL CN5
M-1290, 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe
Cast 90,000 TS, 65,000 YS, 2 El, 212 Brin
For cylinder liners, bushings, valve seats, Type CC-50, heat resistant

BERGSTAHL CN7
M-1290, 0.3 C, 1.3 Si, 22 Cr, 7 Ni, bal Fe.
For furnace parts, heat treat boxes, conveyors, heat and corrosion resistant

BERGSTAHL CN8
M-1290, 0.4 C, 22 Cr, 9.5 Ni, bal Fe
Cast: 85,000 TS, 45,000 YS, 35 El, 165 Brin
For heat treat boxes, burner tips, conveyors, chains, Type HF, corrosion and heat resistant

BERGSTAHL CN10
M-1290, 0.4 C, 22 Cr, 9.5 Ni, bal Fe
Cast 85,000 TS, 45,000 YS, 35 El, 165 Brin
For heat treat boxes, burner tips, conveyors, chains, Type HF, corrosion and heat resistant

BERGSTAHL CN15
M-1290, 0.4 C, 26 Cr, 14 Ni, bal Fe
Cast 75,000 TS, 47,000 YS, 17 El, 25 RA, 200 Brin
For heat treat boxes, furnace parts, conveyor belts, hearth plates, Type HH, corrosion and heat resistant

BERGSTAHL CN20
M-1290, 0.4 C, 25 Cr, 19 Ni, bal Fe
Cast 75,000 TS, 50,000 YS, 17 El, 170 Brin
For furnace parts, retorts, stack dampers, Type HK, corrosion and heat resistant

BERGSTAHL CN35
M-1290; 0.5 C, 25 Cr, 30 Ni, bal Fe
For retorts, heat treat boxes, dampers, corrosion and heat resistant

BERGSTAHL CN38.
M-1290; 0.25 C, 17 Cr, 38 Ni, bal Fe
Cast: 70,000 TS, 40,000 YS, 10 El, 12 RA, 170 Brin
For heat treat boxes, salt pots, furnace parts, Type HT, corrosion and heat resistant

BERGSTAHL CV1.
M-1290: 0.24 C, 1.0 Cr, 0.2 V, 0.6 Mn, bal Fe
For gears, bolts, machine tool parts, oil hardened, shock resistant.

BERGSTAHL CV1H
M-1290; 0.45 C, 1.0 Cr, 0.2 V, 0.6 Mn, bal Fe.
For gears, bolts, springs, crankshafts; oil hardened, shock resistant.

BERGSTAHL CV2
M-1290, 0.35 C, 1.2 Cr, 0.2 V, 0.6 Mn, bal Fe.
For gears, crankshafts, axles, bolts, oil hardened, shock resistant

BERGSTAHL E2
M-1290, 2.0 C, 11.5 Cr, bal Fe.
For blanking and forming dies, punches; oil hardened, nondeforming

BERGSTAHL E12.
M-1290, 1.25 C, 1 Cr, bal Fe
For bearings, cutters, bushings, liners, water hardened, wear resistant

BERGSTAHL E16
M-1290, 0.8 C, Cr, bal Fe
For bearings, liners, bushings; water hardened, wear resistant

BERGSTAHL F28
M-1290; 2.7 C, Cr, bal Fe
For liners, nozzles, abrasion resistant

BERGSTAHL MNA1
M-1290, 1.2 C, Mn, bal Fe
For dies, cutters, tools, oil hardened

BERGSTAHL MNA2
M-1290, 1.25 C, Mn, bal Fe
For dies, cutters, tools, oil hardened

BERGSTAHL MVW2
M-1290, 0.20 C, Mo, V, bal Fe
For gears, bolts, fasteners, shafts, case hardened

BERGSTAHL MVW4.
M-1290, 0.20 C, Mo, V, bal Fe.
For gears, bolts, fasteners, shafts, case hardened

BERGSTAHL MW2
M-1290, 0.22 C, 0.65 Mn, 0.4 Mo, 0.3 max Cr, bal Fe
For gears, bolts, machine tool parts; water hardened, tough

BERGSTAHL P6M
M-1290, 0.12 C, Cr, Mo, bal Fe
For gears, bolts, camshafts, cams, case hardened

BERGSTAHL P7M
M-1290, 0.12 C, Cr, Mo, bal Fe.
For gears, bolts, camshafts, cams, case hardened

BERGSTAHL SP120
M-1290, 1.2 C, 1.3 Si, 29 Cr, bal Fe.
For wear plates, crushers, rolls, abrasion and heat resistant

BERGSTAHL VCN170
M-1290, 0.40 C, Ni, Cr, bal Fe
For gears, bolts, crankshafts, oil hardened, tough

BERGSTAHL VMS
M-1290, 0.45 C, Mn, Si, bal Fe
Hot rolled 98,000 TS, 59,000 YS, 24 El, 54 RA; 212 Brin,
For gears, axles, bolts, shafts, water hardened.

BERGSTROM TYPE S
M-1128, C, Mn, Ni, bal Fe
300 Brin
For hard surfacing electrodes, work hardening rod.

BERKSHIRE.
M-32, 1.2 C, 1.34 W, bal Fe
For taps, cutters, engravers tools, fast finishing steel, water hardened

BERKSHIRE, HIGH MANGANESE.
M-32: 1.2 C, 1.0 Mn, 0.4 Si, 0.5 Cr, 0.2 V, 1.4 W, bal Fe.
Water or oil hardening high carbon tool steel, for shafts, arbors, drill bushings, lathe centers.

BERLIN NO. 1.
Germany; 56 Cu, 29 Zn, 16 Ni
For electrical resistances, ornaments; corrosion resistant

BERLIN NO. 2.
Germany, 48 Cu, 24 Zn, 24 Ni, 3.6 Fe
For ornamental parts; spinning, drawing, stamping

BERMAX
M-709, 5-7 Sn, 9-11 Sb, 0.5 max Cu, bal Pb
Cast: 11,000 TS; 4.5 El, 20 Brin,
For bearings; anti friction, non-magnetic

BERRYDUR
M-296, 15 Cr, 60 Ni, 16 Fe, 2 Mn, 7 Mo, 0.5 Be.
For heat and corrosion resisting parts, heat and corrosion resistant.

BERRYDUR CONTRACID.
Be, bal Cu
600 Brin
For springs.

BERRYDUR-Cu.
1 Be, bal Cu.
260 Brin.
For springs; non-magnetic.

BERRYDUR-Cu
2.5 Be, bal Cu
360 Brin
For springs, non-magnetic

BERRY METAL
M-1281, 10 Pb, 8 Ni, 2 Sb, bal Cu.
Cast: 20,000 TS, 13,000 YS, 6 El.
For bearings, wear resistant

BERSCH METAL.
Germ., 93 Al, 7 Ni
For bearings

BERTHIER'S ALLOY-1.
Eng., 68 Cu, 32 Ni
For evaporators, stills; corrosion resistant

BERTHIER'S ALLOY-2
Eng., 72 Cu, 25 Zn, 2 Pb, 1.2 Sn.
For screw machine products, free-cutting.

BERUDA ALLOY
Eng., Cu-Zn.
For strong corrosion resistant parts, high tensile brass, corrosion resistant.

BERYLCO 10
M-646, 0.4 Be, 2.6 Co, bal Cu.
Annealed: 50,000 TS; 25,000 YS; 30 El; 50 RA; 70 Brin
Heat treated: 125,000 TS; 105,000 YS, 8 El, 10 RA, 240 Brin
For springs, resistance welding electrodes; age-hardenable

BERYLCO 10 C.
M-646; 0.6 Be, 2.6 Co, bal Cu.
Cast. 60,000 TS; 30,000 YS; 20 El; 35 RA; 90 Brin.
Annealed: 40,000 TS; 20,000 YS; 30 El, 50 RA; 70 Brin.
Hardened: 90,000 TS; 75,000 YS; 10 El, 15 RA, 185 Brin.
For resistance welding parts, switches, contacts; age-hardenable, corrosion resistant.

BERYLCO 20C.
M-646, 2.0-2.25 Be, 0.35-0.60 Co, bal Cu.
Heat treated 110,000-160-000 TS; 95,000-140,000 YS; 8-2 El; 10-3 RA; 250-440 Brin.
For plastic molds, safety tools, cams, pump parts; wear and impact resistant, age-hardenable.

BERYLCO 20CR
M-646; 2.0-2.25 Be, 0.35-0.65 Co, bal Cu.
Cast: 70,000 TS; 40,000 YS, 15 El; 138 Brin.
Heat treated. 155,000 TS, 115,000 YS; 0 El; 380 Brin.
For plastic molds, safety tools, gears, bushings, bearings; age hardenable

BERYLCO 25.
M-646, 2 Be, 0.3 Co, bal Cu
Heat treated 200,000 TS; 170,000 YS, 2 El, 3 RA, 400 Brin.
For springs, diaphrams, age hardenable

BERYLCO 25S
M-646, 2 Be, 0.3 Co, bal Cu.
Annealed 165,000 TS, 135,000 YS, 5 El, 8 RA, 350 Brin
4 No Hard: 190,000 TS, 160,000 YS; 2 El, 3 RA, 400 Brin.
For springs, diaphragms, clips, bellows, corrosion and heat resistant

BERYLCO 40
M-646, 2 Be, 0.25 Co, bal Cu
Rolled 98,000 TS, 2 El
Heat treated 180,000 TS, 95,000 YS, 1 El
For springs; age-hardenable

BERYLCO 50
M-646, 0.3-0.55 Be, 1.4-1.7 Co, 1.0 Ag, bal Cu
Heat treated 110,000-95,000 TS, 90,000-65,000 YS, 5-10 El, 5-10 RA, 195-240 Brin
For springs, resistance welding electrodes and dies, age-hardenable

BERYLCO 70
M-646, 0.1 Be, 0.5 Cr, bal Cu
Heat treated 80,000 TS, 60,000 YS; 15 El; 25 RA; 150 Brin
For springs, current carrying parts, age-hardenable.

BERYLCO 165
M-646, 1.6-1.8 Be, 0.2-0.35 Co, bal Cu
Annealed 70,000 TS, 30,000 YS, 40 El, 45 RA, 95 Brin
Hardened 185,000 TS, 155,000 YS, 2 El, 3 RA, 355 Brin
For springs, terminal plugs, jewelry, clips, heat treatable, corrosion resistant

BERYLCO 185.
M-646, 1.5-2.0 Be, 0.5 max Ni or Co, 0.25 max Fe, bal Cu
Annealed. 68,000 TS; 49 El.
Heat treated 195,000 TS; 3 El
For springs, age-hardenable.

BERYLCO 200C
M-646, 2.05-2.25 Be, 0.35-0.65 Co, bal Ni.
For bearings, gears, cams, plungers, drawing dies, age-hardenable, corrosion and wear resistant

BERYLCO 250-C.
M-646, 2.6-2.8 Be, 0.35-0.65 Co, bal Cu
For bearings, gears, cams, valves, drawing dies; age-hardenable, corrosion and wear resistant

BERYLCO 275CR.
M-646, 2.6-2.8 Be, 0.35-0.65 Co, bal Cu.
Heat treated 125,000-175,000 TS, 110,000-145,000 YS; 5-2 El; 8-3 RA; 270-415 Brin.
For plastic mold dies, safety tools; age-hardenable, corrosion resistant.

BERYLCO-717.
M-646; 0.5 Be, 0.7 Fe, 30 Ni, bal Cu.
Bar: 110,000-140,000 TS; 10-15 El.
Age-hardened: 145,000 min TS; 125,000 min YS; 10 min El; C 29 Rock.
For marine hardware, piping, high velocity heat exchangers, hydrophone parts.
High sea water corrosion resistant. Age-hardenable.

BERYLCO-717 C.
M-646; 0.50 Be, 1.0 Fe, 0.95 Mn, 0.06 C, 29 Ni, bal Cu.
Cast: 76,000 TS; 44,700 YS; 14 El; 15.3 RA; B 82 Rock.
Heat Treated: 121,500 TS; 84,400 YS; 14.5 El; C 20 Rock.
For marine hardware, heat exchangers.
Age hardenable High sea water corrosion resistant

BERYLCO CR-1
M-646, 2 75 Be, 0 5 max C, bal Ni
Heat treated· 125,000-195,000 TS; 200,000-180,000 YS; 2-0 El; 300-520 Brin.
Cast: 115,000 TS, 60,000 YS, 5 El; 240 Brin
For aircraft fuel pumps, impellers, core drill bits; age hardened, corrosion resistant castings.

BERYLCO CR-2.
M-646, 2 75 Be, 0 75-1.1 C, bal Ni.
For aircraft fuel pumps, impellers, core drill bits; age hardened, corrosion and wear resistant.

BERYLCO HPA
98.0 Be, 1 8 BeO, 0 18 Fe, 0 15 Al, 0 08 Mg, 0 02 Mn, 0 02 Cu, 0 10 Si, 0 05 Zn, 0 06 Ni
Vacuum hot pressed 40,000 TS; 30,000 YS, 1 El; Rock B 80
Hot Extruded and Annealed· 70,000 TS, 45,000 YS, 10 El, Rock B 90
For nuclear space applications

BERYLCO NICKEL 440
M-646, 1 95 Be, 0.50 Ti, bal Ni
Annealed 105,000 TS, 45,000 YS, 40 El; B 70 Rock
Hard Drawn 170,000 TS, 165,000 YS, 2 El, C 35 Rock.
HT Temper 270,000 TS, 230,000 YS, 8 El, C 51 Rock.
For heat resistant springs, and switches, diaphragms, bellows, retainer clips, electrical shunts, contact springs
High strength and corrosion resistant Age-hardenable

BERYLDUR
M-646, 0.8-1 2 Be, 0 2 min Ni, 4 0 others, bal Cu
Annealed 55,000-65,000 TS, 18,000-30,000 YS; 40-60 El.
Aged 125,000 140,000 TS, 105,000 125,000 YS, 12-20 El, 230-300 Brin.
For springs, clips, connectors; age-hardenable, high strength, corrosion resistant

BERYLLIUM-ALUMINUM
M-646, 5 0 Be, 1 0 Mg, bal Al
For master alloy for remelting, pigs.

BERYLLIUM BRONZE 1.0% Be
M-198, M-296, 1.0 Be, bal Cu.
Untempered: 67,000 TS, 62,000 YS; 7.5 El.
For corrosion resistant parts; corrosion resistant

BERYLLIUM BRONZE 1 5% Be.
M-198, M-296, 1.5 Be, bal Cu.
Untempered· 68,000 TS, 45 El
Tempered. 94,000 TS; 8 El.
For corrosion resistant parts; corrosion resistant

BERYLLIUM BRONZE 2.0% Be.
M-198, M-296; 2.0 Be, bal Cu.
Untempered: 72,000 TS; 15,500 YS; 40 El.
Tempered: 121,000 TS; 100,000 YS; 1 El.
For corrosion resistant parts; corrosion resistant.

BERYLLIUM BRONZE 2.5% Be.
M-198, M-199, M-296; 97.5 Cu, 2.5 Be.
Soft: 62,000 TS; 20,000 YS; 52 El; 66 RA; 98 Brin.
Hard: 176,000 TS; 160,000 YS; 0.6 El; 396 Brin.
For springs and parts subjected to frictional wear; wear resistant.

BERYLLIUM-COBALT.
M-646; 50 Be, bal Co.
For master alloy for remelting.

BERYLLIUM-COPPER.
M-646; 4 0 Be, bal Cu.
Used to introduce Be in Cu alloys; master alloy.

BERYLLIUM COPPER NO. 175.
M-960; 2 15 Be, 0 35 Ni, bal Cu.
Heat treated: 160,000-185,000 TS; 140,000-160,000 YS; 5-2 El; 360-450 Brin
For springs, clips, diaphragms; age hardenable, high fatigue strength.

BERYLLIUM I-400
M-1037; 92 Be, 4.5 BeO, 0.2 max Al, 0.5 max C, 0 3 max Fe, 0.1 max Mg, 0.15 max Si.
Unnotched 129,000 TS; 86,400 YS; 10.6 El
Notched. 127,100 TS.
For super-critical gyro applications.
For aerospace structures, pressure vessels, jet engine turbine wheels and blades High stiffness-weight ratio.

BERYLLIUM-IRON.
M 646, 50 Be, bal Fe.
Used to introduce Be in Cu-Fe alloys; master alloy.

BERYLLIUM-MAGNESIUM-ALUMINUM.
M-646, 5 0 Be, 5 0 Mg, bal Al
For master alloy for remelting

BERYLLIUM MALLEABLE.
M-305, 99 8 Be, 0.2 Ti
For X-ray windows, camera shutters; very malleable

BERYLLIUM MANGANESE BRONZE 1.0% Be.
M-198, M-296, 1 0 Be, 10 Mn, bal Cu.
Untempered 74,000 TS, 38,000 YS, 22 El
Tempered 146,000 TS; 127,700 YS; 2 3 El
For corrosion resistant parts; corrosion resistant.

BERYLLIUM MANGANESE BRONZE 1.5% Be.
M-198, M-296, 1.5 Be, 3 Mn, bal Cu
Untempered 78,000 TS. 38,000 YS, 25 El.
Tempered 150,000 TS, 135,000 YS, 4 5 El
For corrosion resistant parts; corrosion resistant.

BERYLLIUM-NICKEL.
M-646, 50 Be, bal Ni.
Used to introduce Be in Cu-Ni alloys; master alloy.

BERYLLIUM S-200-C.
M-1037; 98 Be, 2 BeO, 0 16 max Al, 0.15 max C, 0 18 max Fe, 0 08 max Mg, 0 08 max Si.
Hot Pressed. 44,800 TS, 33,800 YS, 1.6 El.
For aerospace structures, pressure vessels, jet engine components. High stiffness-weight ratio.

BERYLLIUM-SILVER.
M-646, 50 Be, bal Ag.
For master alloy for remelting.

BESCOLOY
M-424, C, bal Fe
For piercer points.

BESPLATE
M-710; Ni
For Anodes.

BEST.
M-336, 1.0 C, 0.3 Mn, bal Fe.
78,000 TS; 41,600 YS; 28 El; 167 Brin.
For tools, taps, reamers, dies; "Soderfors Best"; non-deforming.

BEST.
M-364; 0.7-1.1 C, bal Fe
For general tools, taps, drills; water hardening.

BEST
M-459; 1.0 C, 0.1 V, 0.25 Mn, bal Fe.
For cutters, dies, tools, drills; Type W2; water hardened

BEST 2
M-1287; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 100,000 TS; 53,000 YS, 21 El, 42 RA; 200 Brin
For springs, drills, taps, reamers, broaches, Type W1, water hardened.

BEST 3K.
M-1287, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated 190,000 TS, 145,000 YS, 10 El, 30 RA; 400 Brin
For springs, drills, taps, punches, tools, Type W1; water hardened

BEST 4W
M-1287; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 174,000 TS; 128,000 YS, 12 El, 37 RA, 355 Brin
For springs, rails, hammers, crimpers, Type W1, water hardened

BEST BRONZE
Eng; 90 Cu, 10 Zn
For jewelry trade as base for fire enameling, primers, bullet shells, gilding brass

BEST (DISSTON).
M-357, 0.70-1.20 C, bal Fe
For tools, drills, taps, water hardened

BEST TYPE METAL
Eng; 50 Pb, 25 Sn, 25 Sb
For type metal

BETHADUR 301
M-24, 0.12 C, 17 Cr, 7 Ni, bal Fe
For stainless parts, cooking utensils, stainless, austenitic

BETHADUR NO 302
M-24, 0.12 C, 17-19 Cr, 9-10 Ni, bal Fe
Water quench 95,000 TS, 57,000 YS, 42 El, 75 RA, 152 Brin.
For ship fittings, food containers, ornamental trim, non-magnetic, austenitic, corrosion resistant

BETHADUR 304.
M-24; 0.08 C, 19 Cr, 10 Ni, bal Fe
For welded construction, chemical equipment, non-magnetic, austenitic, corrosion resistant.

BETHADUR 305
M-24; 0.10 C, 18 Cr, 12 Ni, bal Fe.
For welded construction followed by corrective treatment; non-magnetic, austenitic, corrosion resistant

BETHADUR 308.
M-24, 0.10 C, 20 Cr, 11 Ni, bal Fe
For welded construction, valves, non-magnetic, austenitic, corrosion resistant

BETHADUR 309.
M-24; 0.12 C, 23 Cr, 13.5 Ni, bal Fe
For furnace parts, petroleum stills, heat, stainless and corrosion resistant

BETHADUR 310.
M-24; 0.15 C, 1 Mn, 1 Si, 20.5 Ni, 25 Cr, bal Fe.
For furnace parts, heat exchangers; heat resistant.

BETHADUR 316.
M-24, 0.08 C, 17 Cr, 12 Ni, 2.5 Mo, bal Fe.
For chemical and textile equipment, corrosion and heat resistant

BETHADUR 317.
M-24; 0.08 C, 1 Mn, 0.75 Si, 12.5 Ni, 19 Cr, 3.5 Mo, bal Fe
For high temperature parts, corrosion and heat resistant

BETHADUR 321.
M-24, 0.08 C, 20 Cr, 11 Ni, Ti = 5 × C, bal Fe.
For stainless parts, welded parts; stainless, stabilized

BETHADUR 347
M-24, 0.08 C, 18 Cr, 10.5 Ni, Cb = 10 × C, bal Fe.
For stainless and heat resistant parts, stainless and heat resistant, stabilized

BETHADUR 348
M-24, 0.15 max C, 18-20 Cr, 8-12 Ni, Cb = 10 × C, bal Fe
For heat and corrosion resistant parts, stainless

BETHADUR 403
M-24, 0.10 C, 11.5-13.0 Cr, bal Fe.
For steam turbine blades, corrosion resistant

BETHADUR 405
M-24, 0.08 C, 0.4 Mn, 0.5 Si, 12.5 Cr, 0.2 Al, bal Fe
For turbine blades, annealing boxes; corrosion and heat resistant

BETHADUR 410
M-24, 0.10 C, 12 Cr, 0.3 Mo, bal Fe
Heat treated 100,000 TS, 70,000 YS, 20 El, 60 RA, 200-240 Brin
For turbine blades, valves, cutlery, bolts, corrosion resisting, hardenable

BETHADUR 414
M-24, 0.10 C, 0.4 Mn, 0.5 Si, 1.75 Ni, 12.25 Cr, bal Fe
For valve parts, scraper knives, spring parts, corrosion and heat resistant

BETHADUR 420
M-24, 0.3 C, 13 Cr, bal Fe
Heat treated 250,000 TS, 214,000 YS, 10 El, 22 RA, 514 Brin
For surgery and dental tools, table cutlery, corrosion resisting, hardenable

BETHADUR 425
M-24, 0.12 max C, 16-18 Cr, bal Fe
For corrosion resistant parts, corrosion resistant

BETHADUR NO 430
M-24, 0.10 C, 16 Cr, bal Fe.
Annealed 75,000 TS, 58,000 YS, 28 El, 62 RA; 170 Brin
For exterior trim, ornaments, cold rivets, tanks, retorts, nitric acid equipment; ductile, corrosion resistant

BETHADUR 431.
M-24, 0.15 C, 1.7 Ni, 16 Cr, bal Fe
For starter cylinders, valves, corrosion resisting

BETHADUR NO 440
M-24; 1.15 C, 17 Cr, bal Fe, 0.3 Mn
Annealed 118,000 TS, 78,000 YS, 16 El, 19 RA; 241 Brin
For ball bearings, cutlery, hard stainless parts; corrosion and abrasion resistant.

BETHADUR NO. 440-A.
M-24; 0.65 C, 15-18 Cr, bal Fe.
Oil treated: 258,000 TS, 195,000 YS; 3 El; 6 RA; 495 Brin.
For balls for ball bearings, ball races, cutlery, valves, instruments, hardened machine parts; corrosion, heat and abrasion resistant.

BETHADUR 440 B.
M-24; 0.85 C, 0.7 Mn, 0.4 Si, 17 Cr, bal Fe.
For cutlery, surgical instruments, hardenable, corrosion resistant.

BETHADUR 440 C.
M-24; 1.1 C, 0.4 Mn, 0.05 Si, 17 Cr, bal Fe
For needle valves, ball bearings, oil pumps, hardenable, corrosion resistant.

BETHADUR NO. 486
M-24; 0.25 C, 25 Cr, bal Fe
Water quench: 95,000 TS; 50,000 YS, 15 El, 20 RA; 187 Brin.
For protection tubes, conveyor chains, furnace parts, bolts, nuts, racks, corrosion and heat resistant to S-atm, discontinued.

BETHADUR 501
M-24, 0.16-0.20 C, 4-6 Cr, 0.5 Mo, bal Fe
Annealed 79,000 TS, 33,000 YS, 33 El, 75 RA; 143 Brin
For oil refinery equipment, corrosion resistant

BETHADUR 502
M-24, 0.08 C, 4-6 Cr, bal Fe
For oil refinery equipment, corrosion resistant

BETHALLOY.
M-24, 0.75 C, 0.75 Mn, 0.3 Si, 0.9 Cr, 0.37 Mo, 1.8 Ni, bal Fe
For tools, broaches, taps, slitting cutters, reamers, oil hardened, tough.

BETHALON NO 303
M-24, 0.08-0.20 C, 17-19 Cr, 8 Ni, 0.07 min S, P, Se, 0.6 max Zr, Mo, bal Fe
Soft. 95,000 TS, 57,000 YS, 35 El, 45 RA, 152 Brin
For stainless parts, automatic and screw machine parts, free machining, stainless

BETHALON 416
M-24 0.15 max C, 12-14 Cr, 0.6 max Mo, 0.07 min S, bal Fe
Annealed 75,000 TS, 40,000 YS; 30 El, 60 RA, 155 Brin
Heat treated: 200,000 TS, 150,000 YS, 12 El, 40 RA, 415 Brin
For screw machine products, valve trim, pump shafts, Type 416, stainless, hardenable

BETHALON 430F.
M-24, 0.12 max C, 16-18 Cr, Mo, S, Se, bal Fe
For automatic and screw machine parts, not to be welded; similar to Bethadur No 3 plus machinability.

BETHANIZED PRODUCTS.
M-24; Zn coated steel
For wire for severe duty and weather resistance, can be worked and deformed

BETHCO MACHINE SCREW
M-24, 0.3 C, bal Fe
For machine screws, special cold heading steel, special process.

BETHCO WOOD SCREW.
M-24; 0.25 C, bal Fe.
For wood screws; special cold heading steel, special process.

BETH-CU-LOY.
M-24, 0.3 Cu, 0.2 C, bal Fe.
For sheet metal construction, roofing, siding; resists atmospheric corrosion.

BETHLED.
M-24; C, Mn, S, Pb, bal Fe.
For screw machine products; free-cutting.

BETHLEHEM 33C.
M-24, 0.40 C, 1.3 Mn, 0.08 S, bal Fe.
Annealed: 90,000 TS; 62,000 YS; 26 El; 47 RA; 183 Brin.
Heat treated: 142,000-178,000 TS, 102,000-161,000 YS; 13-12 El, 39-36 RA, 285-375 Brin.
For screw machine products, bolts, nuts, hardware; free-cutting, water hardened.

BETHLEHEM 57
M-24, 0.35 C, 3.25 Cr, 0.3 V, 9 W, bal Fe.
For dies, trimmers, pliers, punches, shear blades, forming dies; hot work tool steel.

BETHLEHEM 57 SPECIAL.
M-24; 0.4 C, 3.5 Cr, 14 W, 0.3 V, bal Fe
For spike cutters, hot headers, punches, forming dies; hot work steel.

BETHLEHEM 66 HS
M-24, 0.83 C, 4 Cr, 5 Mo, 6.3 W, 1.9 V, bal Fe.
For tools, cutters, taps, reamers, broaches; high speed steel

BETHLEHEM 67 CHISEL.
M 24, 0.5 C, 2.5 W, 1.15 Cr, 0.75 Si, bal Fe.
Heat treated: 185,000-337,000 TS, 180,000-255,000 YS, 14-9 El, 47-27 RA, 420-670 Brin.
For chisels, rivet sets, pneumatic tools, upsetters, Type S1, shock resistant

BETHLEHEM 67 TAP
M 24, 1.2 C, 0.65 Cr, 0.25 Mn, 0.2 V, 1.4 W, bal Fe.
For dies, cutting tools, taps, drills; oil hardening

BETHLEHEM 71.
M-24, 0.60 C, 0.25 Ni, 0.9 Mn, 0.25 max Cr, 2 Si, bal Fe
For tools, hand and pneumatic chisels, shear blades, punches, resists shock.

BETHLEHEM 235
M-24, 0.35-0.50 C, 1.4-2.0 Mn, bal Fe
Rolled. 110,000 TS, 70,000 YS, 16 El; 220 Brin
Ht Tr. 155,000 TS, 130,000 YS, 10 El, 330 Brin.
For shovels, crushers, scraper blades, hoppers
Wear resistant Was Bethlehem Abrasion Resisting.

BETHLEHEM AH-5
1.0 C, 0.6 Mn, 5.25 Cr, 1.1 Mo, 0.25 V, bal Fe.
For cutters, tools, dies, punches, air hardening, tough wear resistant.

BETHLEHEM ALLOY HOLLOW DRILL STEEL
M-24, 0.28 C, 0.95 Mn, 0.65 Cr, 2.25 Ni, 0.3 Mo, bal Fe
For hollow drills and forged on bits, shock and wear resistant.

BETHLEHEM AUGER DRILL
M-24, 0.75 C, 0.2 Mn, 15 Si, bal Fe
For auger drills; water hardening

BETHLEHEM BEARING Cr-Mo
M-24, 1.0 C, 1.5 Cr, with or without V or Mo, bal Fe
For ball races, cups, cones, ball bearings, roller paths; water hardened, bearing steel.

BETHLEHEM BEST.
M-24, 0.7-1.1 C, 0.2 V, bal Fe.
For tools, punches, dies, broaches, reamers, shear blades, water hardened.

BETHLEHEM BFS.
M-24; 1.3 C, 4 W, bal Fe.
For tools, cutters, finishing tools, reamers, dies; smooth finishing steel.

BETHLEHEM BRAKE DIE.
M-24; 0.51 C, 0.95 Cr, 0.87 Mn, 0.2 Mo, bal Fe.
For dies, press brakes; pre-heat treated.

BETHLEHEM BROACHING STEEL.
M-24; 0.8 C, 0.20 Si, 0.25 Mn, bal Fe.
For stone working tools, drills; Type W1; water hardened.

BETHLEHEM BTR.
M-24; 0.7 C, 1.2 Mn, 0.5 Cr, 0.2 V, 0.5 W, bal Fe.
For tools, master tools and dies, taps, hobs, reamers, broaches; non-deforming; oil hardened.

BETHLEHEM CARBON.
M-24; 1.0 C, 0.25 Mn, 0.2 Si, bal Fe.
For cutting tools; water hardening.

BETHLEHEM COLD HEADER DIE.
M-24; 0.95 C, 0.40 Mn, 0.40 Si, bal Fe.
Heading dies, gripper dies, swaging and forming dies.

BETHLEHEM COMMERCIAL WATER HARDENING DRILL ROD.
M-24; 1.0 C, 0.30 Mn, 0.20 Si, bal Fe.
For automatic screw machine parts, dowel pins, mandrels, punches, small tools, dies.
AISI Type W1 water hardening tool steel.

BETHLEHEM Cr-Mo-V-HIGH V.
M-24; 0.38 C, 5.2 Cr, 1.2 Mo, 1 V, 1 Si, 0.4 Mn, bal Fe.
Heat treated: 220,000 TS; 185,000 YS; 12 El; 38 RA; 440 Brin.
For die casting dies, shear blades, header dies; hot work steel, shock resistant.

BETHLEHEM Cr-Mo-W
M-24; 0.33 C, 1.05 Si, 5 Cr, 1.6 Mo, 1.5 W, bal Fe.
For spike cutters, hot headers, trimmers, die casting dies; hot work steel.

BETHLEHEM CROMO-V.
M-24; 0.40 C, 0.37 Mn, 1.0 Si, 5.2 Cr, 1.2 Mo, 0.90 V, bal Fe.
For tools, die casting dies, hot shear blades; oil or air hardening, hot work steel.

BETHLEHEM HM.
M-24; 0.78 C, 8.5 Mo, 3.8 Cr, 1.1 V, 1.6 W, bal Fe.
For reamers, drills, lathe and planer tools, hobs, taps; Type M1; high speed steel.

BETHLEHEM H.T.W.
M-24; 0.9 C, 1.7 Cr, 0.2 V, bal Fe.
For bearings, bearing races; wear resistant.

BETHLEHEM M-10.
M-24; 0.7 C, 8 Mo, 4 Cr, 2 V, 1.5 W, bal Fe.
For lathe and planer tools, drills; high speed steel

BETHLEHEM 01 DRILL ROD.
M-24; 0.90 C, 1.2 Mn, 0.5 Cr, 0.2 V, 0.5 W, bal Fe.
For pin header, special punches, precision gages, dies, drills, plugs.
AISI Type 01 oil hardening tool steel.

BETHLEHEM PISTON.
M-24; 1.15 C, 0.6 Cr, 0.2 V, bal Fe.
For pistons, pneumatic chipping and riveting hammers; hard and tough.

BETHLEHEM PIVOT STEEL.
M-24; 1.2 C, 1.65 Cr, 0.4 Mo, bal Fe.
For pivot bearings; wear resisting.

BETHLEHEM SILICO-MANGANESE SPRING STEEL.
M-24; 0.7 C, 0.9 Mn, 0.2 Si, bal Fe.
Heat treated: 210,000-235,000 TS; 180,000-195,000 YS; 12-9 El; 30-35 RA; 415 Brin.
For springs; oil hardened.

BETHLEHEM SOLID DRILL.
M-24; 0.8 C, bal Fe.
For drills, bits, blacksmith tools; shock resistant.

BETHLEHEM SPECIAL HS.
M-24; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For turning, planing, drilling, tapping, and reaming tools; high speed steel.

BETHLEHEM STANDARD BEARINGS.
M-24; 1.0 C, 1.35 Cr, bal Fe.
For bearings, rollers, master gauges; bearing steel.

BETHLEHEM STONE DRESSING.
M-24; 1.15 C, 0.25 Mn, 0.20 Si, bal Fe.
For tools for stone dressing; water hardened.

BETHLEHEM SUPERIOR.
M-24, 0.7-1.3 C, 0.15-0.25 V, bal Fe.
For taps, reamers, cutters, punches, dies, broaches, chisels; tool steel, extra quality.

BETHLEHEM T1 HIGH SPEED (B.S.H.S.)
M-24; 0.73 C, 4.0 Cr, 1.1 V, 18.0 W, bal Fe
General purpose high speed cutting tool, all types of cutting operations.
AISI Type T1 high speed tool steel.

BETHLEHEM X
M-24; 0.7-1.1 C, bal Fe.
For general tools, quarrying tools, crow bars, soft rock drills, chisels; water hardening.

BETHLEHEM XLC
M-24; 0.8-1.2 C, bal Fe
For dies, cold cutters, chisels, punches, shear blades, regular quality carbon tool steel

BETHLEHEM XX.
M-24; 0.9-1.3 C, bal Fe.
For gripper and header dies, punches; Type W1; cold heading.

BETHLEHEM XXX SPECIAL.
M-24; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, finishing tools, cutters; high speed steel

BETHNAMEL.
M-24; 0.1 C, bal Fe.
Rolled: 26,000 TS; 43,000 YS, 38 El; 77 Brin.
For porcelain enameled articles; good drawability.

BF 4-6 CrMo.
M-139; 0.3 C, 4-6 Cr, Mo, bal Fe.
For castings; corrosion resistant.

BF 302 STAINLESS.
M-139; 0.08-0.20 C, 17-19 Cr, 8-10 Ni, bal Fe.
For castings; stainless.

BF 316 STAINLESS.
M-139; 0.2 C, 18 Cr, 8 Ni, 3 Mo, bal Fe.
For stainless parts; stainless, acid resistant.

BF 410 STAINLESS.
M-139, 0.15 max C, 2 max Mn, 1.5 max Si, 11.5-13.5 Cr, bal Fe.
For castings, corrosion resistant.

BF 954.
M-1154; 0.3 C, 13 Cr, bal Fe.
For knives, crusher jaws, guide plates, blasting nozzles; wear resistant.

BF-CrMo.
M-139; 0.3 C, 0.8 Cr, 0.2 Mo, bal Fe.
For castings; water hardening.

BFD.
M-373; 1.20 C, 0.35 Mn, 0.25 Si, 0.6 Cr, 0.2 V, 1.5 W, bal Fe.
AISI Type 07 oil hardening tool steel.

"B-F" HIGH SPEED see REPUBLIC T1.

B-F H.T. LOW CARBON.
M-139; 0.30 C, 0.6-0.8 Mn, bal Fe
Heat treated: 128,000-80,000 TS; 98,000-53,000 YS; 10-30 El; 18-65 RA; 250-165 Brin.
For general structural parts; cast metal; Iz-14-18

BF-MM
M-139; 0.25-0.35 C, 0.20-0.25 Mo, 1.0-1.25 Mn, 0.30 Si, bal Fe.
Heat treated: 90,000-210,000 TS; 65,000-183,000 YS; 25-7 El; 55-25 RA, 196-480 Brin
For power shovels, tractor tread steel, mine car wheels; resists shock and wear; IZ-3-56

B-F N.C.M.
M-139, 0.25-0.35 C, 0.15-0.25 Mo, 1.75-2.25 Ni, 0.75-1.0 Cr, bal Fe.
Heat treated 220,000-100,000 TS, 182,000-80,000 YS, 2-22 El; 14-55 RA; 460-220 Brin.
For dipper teeth, gears, rollers, wheels, resists abrasion and shock

BFS.
M-24, 1.3 C, 0.28 Mn, 3.50 W, bal Fe
Water or oil hardenable tool steel, high hardness and wear resistance as heat treated, for lathe centers, drill bushings.

"B-F" TOOL
M-97, 0.9-1.2 C, bal Fe
For tools, drills, taps, water hardening

B-F UNIQUE NO 20
M-97, C, Cr, V, bal Fe
For flying shears; tough

BHS
M-459; 0.25 C, 1.5 Mn, 0.2 Si, 0.15 Al, 0.25 Ti, bal Fe
For welding electrode

B.H.T.A. METAL
M-338, 2 Cu, 1.25-1.75 Ni, 1.75-2.0 Fe, 0.8 Mg, 0.5 max Si, bal Al
Heat treated 60,000 TS, 47,000 YS; 10 El.
For light alloy parts forgings; Duralumin type, age hardening

BICALOY
M-711; Cu alloy
For resistance welding electrodes, wear and deformation resistant

BICOP OXYGEN FREE COPPER.
Cu
For electrical motors, generators, high conductivity

BIDDERY, HEINIES
84.3 Zn, 11.4 Cu, 2.9 Pb, 1.4 Sn
For bearings, Babbitt

BIDERY (BIDDERY)
U.S., 90.2 Zn, 6.3 Cu, 2.6 Pb, 0.8 Sn
For buttons, ornaments, free-cutting

BIDERY BUTTONS "A."
48.5 Cu, 33.3 Zn, 6.06 Sn, 12.15 Pb.
For buttons, ornamental parts; free-cutting.

BIDERY BUTTONS "B."
48.5 Cu, 33.32 Zn, 6.06 Sn, 12.15 Pb.
For buttons; free-cutting

BIERMAN TUNGSTEN BRONZE
Germany; 95 Cu, 3.4 Sn, 1.6 W.
For strong corrosion resistant parts; corrosion resistant.

BIG J.
M-477; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed tools; high speed steel.

BIH.
M-459; 0.3 C, 1.1 Mn, 0.2 Si, 1 Cr, 0.2 Ti, bal Fe.
For welding electrode.

BILAME A.
M-771, nickel alloy bimetal.
For thermostats, fire detectors; bimetal.

BILAME AS.
M-771; nickel alloy bimetal.
For thermostats, fire detectors, bimetal.

BILAME BC.
M-771, nickel alloy bimetal.
For thermostats, fire detectors; bimetal

BILGEN BRONZE.
Germany; 97 Cu, 1.9 Sn, 0.5 Fe, 0.2 Pb
For electrical bronze; corrosion resistant.

BINAL
M-1469; Sinter cast boron carbide.
(Made to customers requirement)

BINDING BRASS
U.S., 63.25 Cu, 35 Zn, 1.75 Pb.
For automatic screw machine products, free-cutting.

BINNEY NO 71
M-25; C, alloy, bal Fe.
For heat treating furnaces and equipment; heat resistant

BINNEY NO 73
M-25, C, alloy, bal Fe
For heat treating furnaces and equipment, heat resistant

BINNEY HEAT RESISTING ALLOY.
M-25, C, Cr, Ni, bal Fe
Cast
For furnace parts resists heat to 1400°F

BIRDSBORO 20A6
M-136, 0.25 max C, 0.90 Mn, 0.50 Cr, 0.50 Ni, 0.50 Mo, bal Fe
Cast: 80,000-120,000 TS, 50,000-90,000 YP, 150-210 Brin, 14-20 El
For general and structural applications, gears, shafts, housings Good weldability
AISI 8620 modified

BIRDSBORO-20 CN
M-136, 0.25 max C, 0.70 Mn, bal Fe.
Cast 60,000-75,000 TS, 30,000-45,000 YP; 115-140 Brin; 22-30 El
For general and structural applications, gears, housings Excellent weldability.
AISI 1020

BIRDSBORO-22 CMN.
M-136, 0.25 max C, 1.0 Mn, bal Fe
Cast 70,000-80,000 TS, 40,000-55,000 YP; 22-30 El; 30-50 RA
For general and structural applications, gears, housings.
ASTM A216, WCC

BIRDSBORO-25A6
M-136, 0.30 max C, 0.90 Mn, 0.50 Cr, 0.50 Ni, 0.50 Mo, bal Fe
Cast. 105,000-145,000 TS; 85,000-120,000 YP, 14-17 El; 30-35 RA
For general and structural applications, gears, housings, shafting.
AISI 8625 modified.

BIRDSBORO-25 CN.
M-136; 0.30 max C, 0.70 Mn, bal Fe.
Cast: 65,000-80,000 TS; 35,000-55,000 YP, 125-160 Brin; 24-30 El.
For general and structural applications, gears, housings.
Excellent weldability AISI 1025.

BIRDSBORO NO 30
M-136; 0.30 C, 0.20 Mo, 1.0 Cu, bal Fe.
85,000 TS; 55,000 YS; 22 El; 40 RA; 180 Brin.
For engineering construction; corrosion and fatigue resisting.

BIRDSBORO-30A1.
M-136; 0.35 max C, 0.90 Mn, 0.20 Mo, 1.0 Cu, bal Fe.
Cast: 80,000-105,000 TS; 50,000-90,000 YS, 150-210 Brin; 15-30 El; 30-40 RA
For general and structural applications, gears, housings. Good weldability.

BIRDSBORO-30A2.
M-136; 0.35 max C, 0.80 Mn, 0.95 Cr, 0.20 Mo, bal Fe
Cast 90,000-120,000 TS; 65,000-100,000 YP, 14-20 El, 30-40 RA; 180-260 Brin.
For general and structural castings, shafts, gears, housings: AISI 4130, shock resistant.

BIRDSBORO-30A3
M-136, 0.35 max C, 0.75 Mn, 0.85 Cr, 2.0 Ni, 0.3 Mo, bal Fe
Heat Treated. 120,000-145,000 TS, 95,000-120,000 YP, 14-20 El, 30-40 RA; 200-250 Brin
For general and structural castings, gears, shafting, housing
AISI 4330 Shock resistant

BIRDSBORO-30A4
M-136, 0.35 max C, 1.5 Mn, 0.5 Cr, 0.5 Ni, 0.5 Mo, bal Fe.
Cast: 120,000-150,000 TS; 95,000-125,000 YP, 9-14 El, 22-30 RA; 240-310 Brin.
For general and structural castings, shafts, housings, gears.
Tough, shock resistant.

BIRDSBORO-30A6.
M-136, 0.35 max C, 0.90 Mn, 0.50 Cr, 0.50 Ni, 0.50 Mo, bal Fe.
Cast 120,000-145,000 TS, 95,000-120,000 YP, 14-20 El, 30-40 RA.
For general and structural applications, gears, shafts, housings
AISI 8630 modified.

BIRDSBORO-30 CN
M-136, 0.35 max C, 0.70 Mn, bal Fe
Cast: 65,000-80,000 TS, 35,000-55,000 YP, 125-160 Brin, 22-30 El, 30-50 RA
For general and structural applications, gears, housings
Excellent weldability. AISI 1030.

BIRDSBORO 40.
M-136; C, alloy, bal Fe
For rolls; least susceptible to fire cracking

BIRDSBORO-40A2.
M-136, 0.45 max C, 0.80 Mn, 0.95 Cr, 0.20 Mo, bal Fe.
Cast: 90,000-165,000 TS; 60,000-140,000 YP, 9-20 El, 22-40 RA; 240-310 Brin.
For general and structural castings, gears, shafts, housings. AISI 4140, tough.

BIRDSBORO-40A3.
M-136; 0.45 C, 0.75 Mn, 0.85 Cr, 2.0 Ni, 0.30 Mo, bal Fe.
Ht Tr.: 180,000-210,000 TS; 150,000-180,000 YP; 20-25 RA; 330-400 Brin.
For general and structural castings, shafts, gears, housings. AISI 4340. Shock resistant.

BIRDSBORO-40A5
M-136; 0.45 max C, 0.95 Mn, 0.5 Cr, 0.5 Ni, 0.5 Mo, bal Fe
Cast: 120,000-150,000 TS, 95,000-125,000 YP; 9-14 El, 22-30 RA; 290-350 Brin
For general and structural castings, shafts, gears, housings
High strength, shock resistant
AISI 8640 Modified.

BIRDSBORO-40 CN.
M-136, 0.50 max C, 0.80 Mn, bal Fe
Cast: 80,000-95,000 TS, 40,000-60,000 YP; 140-180 Brin, 30-40 RA, 18-28 El
For general and structural applications, gears, housings. Weldable with caution. AISI 1040

BIRDSBORO-45A2
M-136, 0.50 max C, 0.80 Mn, 0.95 Cr, 0.20 Mo, bal Fe
Cast 120,000-165,000 TS, 95,000-140,000 YP, 14-9 El 22-30 RA, 300 Brin
For general and structural castings, gears, shafts, housings AISI 4145, tough

BIRDSBORO-45A7
M-136, 0.50 max C, 0.80 Mn, 2.0 Cr, 0.5 Mo, bal Fe
Ht Tr 175,000-210,000 TS, 145,000-180,000 YP, 6-12 El, 12-30 RA, 290-350 Brin
For general and structural castings, gears, shafts, housings Tough, shock resistant

BIRDSBORO-45 CN
M-136, 0.50 C, 0.80 Mn, bal Fe
Cast 80,000-95,000 TS, 40,000-60,000 YP, 140-180 Brin, 18-28 El, 30-40 RA
For general and structural applications, gears housings Weldable with caution

BIRDSBORO 50
M-136 C, alloy, bal Fe
For rolls, water hardening

BIRDSBORO-50 CN
M-136, 0.55 max C, 0.80 Mn bal Fe
Cast 80,000-95,000 TS, 50,000-65,000 YP, 22-30 El, 25-40 RA
For general and structural applications, gears, housings AISI 1050

BIRDSBORO-CMo
M-136, 0.25 max C, 1.0 Mn, 0.25 Mo, bal Fe
Cast 65,000-80,000 TS, 35,000-50,000 YP, 24-30 El, 35-50 RA
For general and structural applications, gears, shafts, housings
AISI 4024 modified, tough

BIRDSBORO-CNi
M-136, 0.45 max C, 0.8 Mn, 3.5 Ni, bal Fe
Ht Tr. 120,000-145,000 TS, 95,000-120,000 YP, 14-20 El, 30-40 RA
For general and structural castings, shafts, gears, housings
AISI 2340, tough, shock resistant

BIRDSBORO-CrMo1.
M-136, 0.25 max C, 0.5 Cr, 0.5 Mo, bal Fe
Cast: 70,000-80,000 TS; 45,000-55,000 YS; 22-30 El; 35-50 RA.
For general and structural castings, shafts, gears, housings.
ASTM A356, Alloy 5.

BIRDSBORO-CrMo2.
M-136; 0.20 max C, 0.65 Mn, 1.25 Cr, 0.5 Mo, bal Fe.
Cast: 70,000-80,000 TS; 45,000-55,000 YP; 22-30 El; 35 RA.
For general and structural castings, shafts, gears, housings.
ASTM A356 Alloy A.

BIRDSBORO-CrMo2 + V.
M-136; 0.18 max C, 0.55 Mn, 1.25 Cr, 0.50 Mo, 0.20 V, bal Fe.
Cast 70,000-80,000 TS; 40,000-55,000 YP; 20-30 El; 35-50 RA
For general and structural castings, shafting, gears, housings. Shock resistant

BIRDSBORO-CrMo3.
M 136; 0.18 max C, 0.55 Mn, 2.3 Cr, 1.0 Mo, bal Fe
Cast. 70,000-105,000 TS; 40,000-85,000 YP, 17-30 El; 30-45 RA
For general and structural castings, gears, shafts, housings Tough, shock resistant.
ASTM A217, Alloy WC9.

BIRDSBORO CrMo4.
M-136, 0.20 max C, 0.55 Mn, 5.25 Cr, 0.55 Mo, bal Fe
Cast: 90,000-120,000 TS, 60,000-95,000 YP, 18-25 El; 35-45 RA
For general and structural castings, gears, shafts, housings
ASTM A217 Alloy C5

BIRDSBORO DA
M 136, 0.2-0.3 C, 0.6 Cr, 0.4 Mo, 1.5 Mn, 0.7 max Ni, bal Fe
Normalized 110,000 TS, 85,000 YS, 17 El, 35 RA, 225 Brin
For rolls, wear resistant

BIRDSBORO-LC2
M 136 0.25 max C, 0.65 Mn, 2.5 Ni, bal Fe
Cast 80,000 TS, 50,000 YP, 24 El, 35 RA
For general and structural applications, gears, shafts, housings Shock resistant

BIRDSBORO-LC3
M-136, 0.15 max C, 0.65 Mn 3.5 Ni, bal Fe
Cast 60,000-80,000 TS, 40,000-55,000 YP, 24-30 El, 35-50 RA
For general and structural castings, gears, housings, shafts
ASTM A352, LC3, AISI 4812 Modified
Tough, shock resistant

BIRDSBORO METAL
M-136, 3.0 C, 1.5 Si, 0.8 Mn, alloy, bal Fe
For rolls, alloy cast iron

BIRDSBORO-MM.
M-136, 0.32 max C, 1.5 Mn, 0.50 Mo, bal Fe
Cast 80,000-120,000 TS, 50,000-90,000 YS, 14-22 El, 150-210 Brin, 30-35 RA
For general and structural applications, gears, housings Good weldability. ASTM A148

BIRMABRIGHT
M-106, 3-6 Mg, 0.3-0.7 Mn, bal Al
Sand cast 20,000-22,400 TS, 20,000-22,400 YS, 3-6 El, 55-60 Brin, 5.8 Izod.
Good corrosion resistance, takes good finish, for decorative parts
Gen. Eng Bs 1490 LM 5-M

BIRMABRIGHT.
M-325, M-137, 3-6 Mg, 0.25-0.75 Mn, bal Al.
Sand cast. 20,000-22,000 TS, 11,000-15,000 YS, 5.5-3.0 El; 54-60 Brin.
Drawn: 34,000-43,000 TS; 20,000-27,000 YS; 25.0-15.0 El; 70-80 Brin.
For tubes, rivets, bolts, nuts, screws, architectural metal work, corrosion resistant to salt water.

BIRMABRIGHT B.B. 1.
M-325, 1 Mg, bal Al.
Soft temper: 17,000 TS; 8000 YS, 22 El.
½ H temper: 22,000 TS; 10,000 YS, 4 El.
For light weight construction; corrosion resistant, easily weldable.

BIRMABRIGHT BB 1-X.
M-325, 1 Mg, bal Al.
Soft 15,000 TS; 7000 YS, 30 El.
¼ H 18,000 TS; 15,000 YS, 7 El.
¾ H: 24,000 TS, 21,000 YS, 4 El.
For marine parts; resists sea water corrosion.

BIRMABRIGHT BB 2
M-325, 2 Mg, bal Al.
Soft: 23,000 TS, 9000 YS; 22 El
½ Hard 32,000 TS, 27,000 YS; 5 El.
Extruded: 23,100 TS, 12,000 YS; 30 El
For marine construction, hardware, resists sea water corrosion.

BIRMABRIGHT BB 3
M-325, 3 Mg, bal Al
Soft 31,000 TS, 15,000 YS, 24 El.
½ Hard: 39,000 TS, 32,000 YS; 6 El.
Extruded 30,000 TS; 14,000 YS, 26 El.
For marine construction, hardware, resists sea water corrosion

BIRMABRIGHT BB 5.
M 325, 5 Mg, bal Al
Soft. 36,000 TS; 18,000 YS; 18 El.
½ Hard 45,000 TS, 36,000 YS, 12 El.
Extruded 34,000 TS; 18,000 YS, 17 El
For marine construction, hardware, fixtures, resists sea water corrosion

BIRMABRIGHT BB 7
M-325, 7 Mg, bal Al
Soft 44,000 TS, 20,000 YS, 20 El
Extruded 43,000 TS, 21,000 YS, 20 El
For marine construction, fixtures, resists sea water corrosion

BIRMABRIGHT-BB17
M-325, 0.5 Mg, bal Al
Sheet, soft 13,000-18,000 TS, 25-30 El
Sheet, ½ hard 19,000-26,000 TS, 12-20 El
For highly reflective surface parts, trim, architectural Not heat treatable.

BIRMAL
M-137; 2.6 Mg, 0.25-0.75 Mn, bal Al.
Cast 22,000 TS 15,000 YS, 3.0 El, 58 Brin
For light alloy parts, heat treatable

BIRMAL L4
M-137, 2-4 Cu, 0.5-1.5 Mg, 8.5-10.5 Si, 0.5-1.5 Ni, 0.2 Ti, bal Al.
Permanent mold 32,500 TS, 0 El, 120 Brin
For pistons, age-hardenable

BIRMAL MB7
M-137, 0.7-1.3 Cu, 0.75-1.2 Mg, 0.35-0.85 Si, 1.6 Ni, 7.0 Sn, 0.2 Ti, bal Al
Cast
For bearings, age-hardenable

BIRMAL P83
M-137, 3-4 Cu, 7.5-9.5 Si, 1.3 max Fe, 1.0 max Zn, bal Al
Die cast: 40,400 TS, 15,700 YS, 3 El; 85 Brin.
For general purpose die castings; SAE 306.

BIRMALITE.
M-137; 9-11 Cu, 0.1-0.5 Mg, 1.0 Fe, bal Al.
Cast: 19,000 TS; 17,000 YS; 0.5 El; 80 Brin.
Heat treated: 40,000 TS; 0.5 El; 150 Brin.
For pistons; heat treatable.

BIRMAMETAL BMB 761.
M-321; 1 Cu, 1 Mg, 1 Si, bal Al
W(T4): 38,100 TS; 22,400 YS; 15 El
WP(T6): 56,000 TS, 44,800 YS; 6 El
For structures, marine trim; age hardenable.

BIRMASIL.
M-137; 11-14 Si, bal Fe.
For light alloy castings, die cast alloy.

BIRMASIL SPECIAL.
M-137, M-325, 10-13 Si, 2.5-3.5 Ni, 0.2 Ti, 0.6 Mg, bal Al.
Chill cast. 42,000-36,000 TS; 22,000-16,000 YS; 3-6 El; 70-80 Brin
Sand cast 28,000-29,000 TS, 14,000-16,000 YS, 4-2 El; 52-60 Brin.
For automotive engine water cooled cylinder blocks, cylinder heads, fire brick molds, motor car fittings; British Patent 342, 152; good corrosion resistance.

BIRMETAL-230.
M-321, 2.5 Cu, 0.3 Mg, bal Al
Ht. Tr.: 43,000 TS, 24,000 YS, 27 El, 70 Brin.
For rivets.
Heat treatable, corrosion resistance.

BIRMETAL-477.
M-321, 4.4 Cu, 0.7 Mg, 0.3 Si, 0.6 Mn, bal Al
Ht Tr. 70,000 TS, 60,000 YS; 13 El, 135 Brin.
For rivets, fittings, hardware
High strength, age-hardenable, good fatigue strength

BIRMETAL-AM503
M-321, 1.5 Mn, bal Mg.
Plate. 29,000-40,000 TS, 11,000-22,000 YS, 5-14 El
Extrusion: 44,000 TS; 29,000 YS, 4 El, 55 Vickers.
For fuel tanks, oil tanks, welded structures, bearing housings, valve and pump bodies, trailer bodies Good weldability, shock resistant

BIRMETAL-AZ31.
M-321, 1.0 Zn, 0.3 Mn, 3.0 Al, bal Mg
Extrusion: 38,000 TS, 29,000 YS, 15 El, 49 Brin
H24 Sheet 42,000 TS, 32,000 YS, 15 El.
For general purpose component parts, truck cabs, shipping containers
Good corrosion resistance, good bendability

BIRMETAL-AZM.
M-321, 0.3 Mn, 6.0 Al, bal Mg
Extrusion. 38,000-49,000 TS, 24,000-31,000 YS, 10-18 El
For control levers, hardware, bearing caps and housings, fittings.
Medium strength, excellent machinability Needs protection from corrosion

BIRMETAL B.B. 016
M-325; 1 Mg, 0.6 Si, 0.25 Cu, bal Al
W-temper: 30,000 TS; 16,000 YS, 15 El
WP-temper: 40,000 TS, 30,000 YS, 13 El
For light weight construction; age-hardenable.

BIRMETAL BB. 016.
M 325; 0.016 Si, bal Mg.
Annealed: 24,000-30,000 TS, 12,000-20,000 YS; 20-12 El.
Aged: 32,000-44,000 TS; 20,000-36,000 YS; 20-10 El
For marine construction; resists sea water corrosion.

BIRMETAL B.B. 019.
M-325, 1.25 Mg, 0.9 Si, 0.15 Cu, 0.2 Ti, bal Al.
W-temper: 32,000 TS; 20,000 YS; 12 El.
WP-temper: 36,000 TS, 32,000 YS; 10 El.
For light weight construction; age-hardenable.

BIRMETAL BB .019
M-325; 0.019 Si, bal Mg.
Annealed. 24,000-36,000 TS; 18,000-24,000 YS; 20-12 El
Aged. 32,000-40,000 TS; 24,000-32,000 YS, 20-10 El.
For marine construction, resists sea water corrosion.

BIRMETAL B.B. 055.
M-325, 0.5 Mg, 0.5 Si, bal Al.
W-temper: 24,000 TS; 12,000 YS; 20 El
WP-temper 36,000 TS; 28,000 YS; 9 El.
For light weight construction, age-hardenable

BIRMETAL BB 055.
M-325, 0.055 Si, bal Mg
Annealed: 10,000-26,000 TS, 10,000-20,000 YS, 30-10 El.
Aged 24,000-36,000 TS, 20,000-30,000 YS, 20-10 El
For marine construction; resists sea water corrosion.

BIRMETAL BBZ 36
M 321, 0.3 Cu, 3.5 Mg, 0.3 Mn, 6.5 Zn, 0.3 Cr, bal Al
W P temper. 70,000-84,000 TS, 64,000-78,000 YS, 15-8 El
For light weight construction, heat treatable

BIRMETAL BMB 473
M 321, 4 Cu, 0.7 Mg, 0.7 Mn, 0.3 Si, bal Al
Quenched 40,000-50,000 TS, 11,000-30,000 YS, 15-8 El
For light weight construction, heat treatable

BIRMETAL BMB 551
M-321, 4.5 Cu, 0.5 Mg, 0.7 Mn, 1.0 Si, 0.75 Fe, bal Al
W P temper 52,000-64,000 TS, 40,000-56,000 YS, 10-8 El
For light weight construction, heat treatable

BIRMETAL BMB 1306
M-321, 0.75 Cu, 2.75 Mg, 0.5 Mn, 5.5 Zn, bal Al
W P temper. 64,000-70,000 TS, 56,000-60,000 YS, 10 El
For light weight construction, corrosion resistant, heat treatable

BIRMETAL BMB 2308
M 321, 1.75 Cu, 2 Mg, 0.2 Mn, 6.5 Zn, 0.15 Cr, bal Al
W P temper 70,000-76,000 TS, 60,000-66,000 YS; 5 El
For aircraft structures, heat treatable

BIRMETAL-ZW1
M-321, 1.2 Zn, 0.4-0.8 Zr, bal Mg
Extrusion 36,000-48,000 TS, 24,000-33,000 YS, 10-20 El, 60-75 Vickers
For structural components welded by argon-arc process, airframe structures, cowlings, window and door frames
Medium strength, high corrosion resistant. Good weldability.

BIRMETAL-ZW3
M321; 3.0 Zn, 0.4-0.8 Zr, bal Mg
Extrusion: 40,000-51,500 TS, 29,000-40,000 YS, 10-25 El; 65-75 Vickers.
Sheet 36,000-45,000 TS, 24,000-33,000 YS, 8-18 El
For structural and stressed components, airframes, cowlings, window and door frames.
High strength, excellent corrosion resistant.
Free from stress corrosion cracking

BIRMETAL-ZW6.
M-321; 5.5 Zn, 0.4-0.8 Zr, bal Mg.
Extruded: 49,000 TS; 38,000 YS, 10 El.
Heat Treated: 51,000 TS; 42,000 YS; 8 El.
For floor beams, aircraft structural members.
High strength, good corrosion resistant.
Shock resistant.

BIRMID D7.
M-137; 2-4 Cu, 4-6 Si, 0.3-0.7 Mn, 0.25 Ni, 0.3 Zn, 0.2 Ti, bal Al.
Sand cast: 20,200 TS; 2 El; 70 Brin.
Permanent mold: 22,400 TS, 2 El; 75 Brin.
For heavy duty castings; age-hardenable, good castability.

BIRMID D8.
M-137; 2-4 Cu, 4-6 Si, 0.3-0.7 Mn, 0.35 Ni, 0.3 Zn, 0.2 Ti, bal Al.
Sand cast: 20,200 TS, 89,600 YS, 2 El, 60 Brin
Heat treated: 47,000 TS; 40,000 YS; 1 El, 110 Brin.
For gears, cases, hardware, instrument housings; age-hardenable, good castability.

BIRMID 21.
M-137; 2-4 Cu, 0.3-0.7 Mn, 0.2 max Zn, 0.2 max Ti, bal Al
Sand cast: 21,300 TS, 9000 YS; 1.7 El; 60 Brin
Permanent mold· 27,000 TS, 10,000 YS, 2.0 El; 70 Brin.
For moderately stressed parts; not heat treatable

BIRMID 112.
M-137; 0.7-2.5 Cu, 9-11.5 Si, 0.2 max Ti, bal Al.
Cast 36,000 TS, 13,500 YS, 1.5 El; 70 Brin.
For instrument housings, die castings.

BIRMID 298/304.
M-137, 4-5 Cu, 0.05-0.30 Ti, 0.25 max Si, bal Al
Sand cast· 40,400 TS; 4 El
Permanent mold: 44,800 TS, 9 El
Heat treated. 42,600 TS; 27,000 YS; 5 El; 100 Brin
For high strength, shock resistant castings; age-hardenable

BIRMID 300.
M-137, 9.5-11 Mg, 0.2 Ti, 0.25 Si, 0.1 Mn, bal Al
Sand cast· 42,600 TS, 22,400 YS, 10 El, 76 Brin.
Permanent mold· 49,300 TS, 24,600 YS, 18 El; 80 Brin.
For high strength castings, age-hardenable

BIRMID 428.
M-137; 6-8 Cu, 2-4 Si, 2-4 Zn, 0.6 max Mn, 1 max Fe, bal Al
Cast· 24,600 TS, 14,600 YS, 1 El, 80 Brin.
For housings, gear cases, light stressed parts

BIRMIDAL
M-106, 0.3-0.8 Mg, 3.5-6 Si, bal Al
Four grades of castings of same compositions, 18,000-43,000 TS range
General purpose castings, properties vary with varying heat treatments
Gen. Eng BS 1490: LM 8 M, 8-P, 8-W, 8-WP.

BIRMIDAL.
M-137; 0.5 Mg, 3.5-6.0 Si, 0.2 max Ti, bal Al.
Cast: 25,000 TS; 15,000 YS; 2-10 El, 60 Brin.
Heat treated· 44,000 TS; 32,000 YS; 1-5 El; 95 Brin.
For gear cases, instrument housings, age-hardenable.

BIRMIDIUM "Y."
M-137; 3.5-4.5 Cu, 1.8-2.3 Ni 1.2-1.7 Mg, bal Al.
Sand cast: 25,000 TS, 20,000 YS; 0.5 El; 85 Brin.
Aged: 32,000 TS; 29,000 YS; 1.0 El; 100 Brin.
For pistons, cylinder heads, crankcases, oil pans; age-hardenable, heat resistant

BIRMIDIUM "Y" ALLOY.
M-325, M-137; 3.5-4.5 Cu, 1.8-2.3 Ni, 1.2-1.7 Mg, bal Al.
Heat treated: 35,000-42,000 TS; 2-3 El.
For automobile pistons, piston heads, crank cases; corrosion resistant.

BIRMINGHAM.
Eng.; 62-50 Cu, 32-20 Zn, 12-30 Ni.
For German silver; corrosion resistant.

BIRMINGHAM 21.
M-137; 2-4 Cu, 4-6 Si, 2 max Zn, 0.2 max Ti, 0.15 max Mg, bal Al.
Sand cast· 21,300 TS; 9000 YS; 1.7 El; 60 Brin.
Permanent mold· 27,000 TS; 11,000 YS; 2 El; 70 Brin.
For cast parts subject to moderate stress; sand and permanent mold castings.

BIRMINGHAM 298/304.
M-137, 4-5 Cu, 0.10 max Mg, 0.25 max Si, 0.05-0.30 Ti, bal Al
T4-temper· 34,800 TS; 14,000 YS; 12 El, 65 Brin.
T6-temper· 42,000 TS, 27,000 YS, 5 El; 100 Brin
For shock resistant castings; sand and permanent mold cast, age-hardenable.

BIRMINGHAM 300.
M-137, 0.1 max Cu, 9.5-11.0 Mg, 0.2 max Ti, 0.25 max Si, bal Al.
Sand cast: 43,000 TS; 22,400 YS; 10 El; 76 Brin.
Permanent mold. 49,000 TS; 25,000 YS, 18 El, 80 Brin
For highly stressed castings, solution heat treated only.

BIRMINGHAM 428
M-137, 6-8 Cu, 2-4 Si, 2-4 Zn, 0.2 max Ti, bal Al.
Permanent mold 25,000 TS, 12,500 YS, 1 El, 80 Brin.
For castings for light stress, permanent mold casting.

BIRMINGHAM L.4
M-137, 2-4 Cu, 8.5-5-10.5 Si, 1.2 max Fe, 0.5-1.5 Mg, 0.2 max Ti, bal Al.
Permanent mold. 32,000 TS, 0 El, 90-120 Brin.
For pistons, permanent mold castings.

BIRMINGHAM P.83
M-137, 3-4 Cu, 7.5-9.5 Si, 1.3 max Fe, 0.1 max Mg, 1 max Zn, 0.3 max Sn, bal Al.
Die cast· 40,400 TS, 16,000 YS, 3 El, 85 Brin.
For instruments, casings, die castings.

BIRSO.
M-577, C, bal Fe.
For gears, housings, castings.

BISBO ARMA.
M-1286; 2.5 T.C., 0.7 C.C., 1.4 Si, 0.4 Mn, 0.025 Bi, bal Fe.
Ht Tr· 70,000-100,000 TS; 48,000-80,000 YS; 2-4 El, 163-269 Brin.
For crankshafts, rocker arms, universal joint yokes, gears Pearlitic malleable iron.

BISCO
M-334, 0.9 C, 1.2 Mn, 0.5 Cr, bal Fe.
For ring dies, spacers, washers, tubing; non-deforming, oil hardening.

BISCO ANNITE NO 1
M-334; 2.25 C, 13 Cr, 0.2 V, Mo, bal Fe
For punches, dies, gauges; nondeforming.

BISCO ANNITE NO. 2.
M-334; 1.5 C, 11.5 Cr, 0.25 V, 0.8 Mo, bal Fe.
For punches, dies, gauges, nondeforming.

BISCO DIE.
M-334; W. C.
For dies, wire drawing dies and cutlery tools; sintered.

BISCO TOOL STEEL TUBING.
M-334; 1 C, 1.2 Mn, 0.5 Cr, bal Fe.
For tubing bushings, blanking dies, non-shrink, oil hardened.

BISHIRALLOY.
Lead infiltrated powdered iron; for gears, bushings, electrical conductors, sliding parts, valve guides, piston rings
Self lubricating.

BISMO 18-4-1
M-24; 0.7-0.9 C, 4 Cr, 1.5 W, 8.5 Mo, 1.5 V, bal Fe.
For tools, cutters, reamers; high speed steel.

BISMO M-3.
M-24, M-334; 1.0 C, 4 Cr, 6.2 W, 6.2 Mo, 2.4 V, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel, oil hardened

BISMUTH BRASS-1.
U.S., 52 Cu, 30 Ni, 12 Zn, 5 Pb, 1 Bi
For ornaments, hardware, corrosion resistant

BISMUTH BRASS-2
U.S., 47 Cu, 31 Ni, 21 Zn, 1 Bi, 1 Sn
For ornaments, hardware, corrosion resistant

BISMUTH BRONZE
U.S.; 45-53 Cu, 33-10 Ni, 20-22 Zn, 16-15 Sn, 1 Bi, 0-0.1 Al.
For ornaments, hardware; corrosion resistant

BISON
M-1705, 0.5 C, 0.75 Si, 1.15 Cr, 0.2 V, 2.5 W, bal Fe
Oil hardening shock resisting tool steel
AISI S1

B & K AZ-31A
M-1395; 2.5-3.5 Al, 0.6-1.4 Zn, 0.20 min Mn, bal Mg
32,000-40,000 TS, 16,000-29,000 YS, 12-2 El
For light alloy parts; readily formed

BKE
Russia; 3-4 Cd, bal Cu.
For electrical contacts, high conductivity

BKS
M-459, 0.85 C, 0.10-0.40 Si, 0.5-0.7 Mn, bal Fe
Heat treated 190,000 TS; 145,000 YS, 10 El; 30 RA, 400 Brin
For springs, tools, cutters, punches, Type W1, water hardened.

BKS-3.
M-459; 0.85 C, 1.0 Cr, bal Fe
For bearings, cutters, liners; water hardened, wear resistant

BKS EXTRA
M-459, 0.80 C, 1.1 Cr, 0.1 V, bal Fe
For bearings, liners, sleeves, cutters; water hardened, wear resistant

B K SPECIAL.
M-1260, 90.3 Sn, 6.5 Sb, 3 Cu, 0.2 Ni
Cast. 12,800 TS, 25 Brin
For engine bearings; M.P. 440-610°F; shock resistant.

BKS SPECIAL.
M-459, 0.85 C 0.1-0.4 Si, 0.5-0.7 Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS, 10 El; 30 RA; 400 Brin
For tools, dies, springs, cutters; Type W1, water hardened.

BLA-CALOY.
M-1254; 3.3 C, 0.7 Mn, 2 Si, 0.05 Mg, bal Fe.
For gears, shafts, cams, housings; ductile cast iro

BLACKALLOY see BLACKALLOY TX90.

BLACKALLOY-525
M-1095, 44 Co, 24 Cr, 20 W, bal Fe.
Cast C 63-65 Rock.
For cutting and boring tools
Hard, abrasion and heat resistant.

BLACKALLOY-TX90
M-1095; 42 Co, 24 Cr, 22 W, bal Fe
Cast: C 66-67 Rock.
For tools, cutters, form tools, reamers, drills
Centrifugally cast High heat and abrasion resista

BLACK BEAUTY.
M-691, 0.2 C, bal Fe
For construction steel, black oxide sheet

BLACK DEVIL.
M-712; 0.09 C, 0.3 Mn, bal Fe
For welding rod; E 6020

BLACK DEVIL NO 75
M-712, 0.09 C, 0.37 Mn, 0.2 Si, 0.56 Mo, bal
Welded. 70,000-74,000 TS, 57,000-62,000 YS, 34-27 El, 65-50 RA
For welding electrodes, E-7020

BLACK DEVIL E B
M-712, 0.07 C, 0.39 Mn, 0.21 Si, bal Fe
Welded 66,000 TS, 56,000 YS, 26 El, 45 RA
For welding electrodes, arc, E-6030

BLACK DIAMOND
M-38, 1.0 C, bal Fe
For tools, cutters, drillers, dies, hammers, water hardening

BLACK LABEL
M-341, 1.1 C, 0.5 Cr, 0.2 V, bal Fe
For tools and dies, water hardening

BLACK LABEL CAST (EXTRA)
M-261, C, bal Fe
For tools and dies, water hardening

BLACKOR.
M-26, 87 W, 9 C
For oilwell core bits, cutters, tools, W_2C hard facing compound

BLACKSKIN ADMIRALTY
M-319, 70 Cu, 29 Zn, 1 Sn
Cast 45,000-60,000 TS
For condenser tubes, corrosion resistant

BLACK STREAK ALNICO NO 4.
M-373, 12 Al, 28 Ni, 5 Co, bal Fe
For cast permanent magnets, high coercive for

BLANCO BA
M-1288, 0.10 C, 18 Cr, 8.5 Ni, bal Fe
Annealed: 80,000 TS; 35,000 YS; 55 El, 75 RA, 150 Brin
Cold drawn. 180,000 TS, 150,000 YS; 10 El, 250 Brin
For chemical plant equipment, tanks, fermente
Type 302; stainless, austenitic.

BLANCO BA88.
M-1288; 0.12 C, 18 Cr, 8 Ni, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS, 35,000 Ys; 40 El; 60 RA; 150 Brin
For screw machine products, fasteners; Type 3
stainless, free-cutting

BLANCO B SPEZIAL.
M-1288; 0.1 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
Cold drawn. 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks, mixers, vessels; Type 302; stainless, austenitic.

BLANCO B SUPER.
M-1288, 0.1 max C, 18 Cr, 2 Mo, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin
Cold drawn. 150,000 TS; 135,000 YS; 6 El; 300 Brin.
For acid resistant chemical plant equipment, tanks; Type 316, stainles, austenitic

BLANCO CM2.
M-1288, 0.35 C, 16.5 Cr, 1.15 Mo, bal Fe
Annealed: 90,000 TS; 55,000 YS, 20 El; 45 RA; 180 Brin
For oil refinery equipment, furnace parts; corrosion and heat resistant.

BLANCO CN12.
M-1288, 0.1 max C, 12.5 Cr, 12 Ni, bal Fe.
For valves, pumps; corrosion and heat resistant

BLANCO CNM.
M-1288, 0.07 max C, 17 Cr, 13 Ni, 4.7 Mo, bal Fe.
Annealed 90,000 TS; 40,000 YS; 45 El, 60 RA; 180 Brin
For acid resistant chemical plant equipment, Type 317, stainless, austenitic

BLANCO CT
M 1288; 0.12 max C, 18 Cr, 19.5 Ni, Ti = 4 × C, bal Fe
Annealed 85,000 TS, 35,000 YS, 55 El, 65 RA, 150 Brin
For welded structures, chemical plant equipment; Type 321; stainless, austenitic.

BLANCO CT2N.
M-1288, 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe
Annealed 90,000 TS, 45000 YS, 56 El; 65 RA; 160 brin
Cold drawn 100,000 TS, 65,000 YS, 40 El, 60 RA, 202 Brin
For welded structures, chemical plant equipment, Type 347, stainless, austenitic.

BLANCO CU
M-1288, 0.07 max C, 17.5 Cr, 2 Mo, 17.5 Ni, 2 Cu, Ti = 7 × C, bal Fe
For valves, pumps, chemical plant equipment, corrosion and heat resistant

BLANCO F.
M-1314; 0.08 C, 17 Cr, bal Fe.
Annealed: 80,000 TS, 50,000 YS, 25 El, 50 RA; 150 Brin.
Cold drawn: 130,000 TS; 120,000 YS, 2 El, 200 Brin
For gears, shafts, furnace parts, heat treating boxes; corrosion and heat resistant, Type 430.

BLANCO G
M-1288, 0.20 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El, 55 RA; 196 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El, 50 RA; 215 Brin.
For turbine blades, cutlery, valves, instruments; Type 420; stainless, hardenable.

BLANCO H.
M-1314; 0.4 C, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 50 RA; 200 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; stainless, hardenable.

BLANCO K(H).
M-1288, 0.4 C, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS, 20 El; 50 RA; 200 Brin.
For valves, cutlery, surgical and dental instruments, Type 420, stainless, hardenable.

BLANCO L1.
M-1288, 0.12 max C, 13 Cr, bal Fe
Annealed 75,5000 TS, 40,000 YS; 35 El; 70 RA; 155 Brin
Cold drawn 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For turbine blades, surgical instruments, Type 410; stainless.

BLANCO L2
M-1288; 0.12 max C, 13 Cr, bal Fe
Annealed: 75,000 TS; 40,000 YS, 35 El, 70 RA; 155 Brin.
Cold drawn 100,000 TS, 85,000 YS, 17 El, 60 RA, 205 Brin.
For turbine blades, cutlery, surgical and dental instruments, Type 410, stainless.

BLANCO L3
M-1288, 0.12 max C, 13 Cr, 0.4 Si, bal Fe.
Annealed 75,000 TS; 40,000 YS, 35 El, 70 RA; 155 Brin
Cold drawn 100,000 TS, 85,000 YS; 17 El; 60 RA; 205 Brin
For cutlery, turbine blades, instruments; Type 410, stainless

BLANCO M
M-1314, 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS, 50,000 YS, 25 El, 55 RA, 196 Brin.
Cold drawn 105,000 TS, 85,000 YS, 17 El; 50 RA; 215 Brin.
For cutlery, valves, turbine blades, knives; Type 420, stainless, hardenable.

BLANCO M1.
M-1288, 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed 95,000 TS, 50,000 YS, 25 El; 55 RA; 196 Brin.
Cold drawn 105,000 TS, 85,000 YS, 17 El, 50 RA, 215 Brin.
For cutlery, valves, turbine blades, knives; Type 420, stainless, hardenable.

BLANCO M2
M-1288, 0.22 C 0.4 Si, 17 Cr, 1.5 Ni, bal Fe.
Annealed. 125,000 TS, 95,000 YS, 20 El, 55 RA; 260 Brin
Cold drawn 130,000 TS, 110,000 YS, 15 El, 35 RA, 270 Brin.
For pumps, marine hardware, valve trim, shafts, Type 431, stainless.

BLANCO M3
M-1288, 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed 95,000 TS, 50,000 YS; 25 El, 55 RA; 195 Brin.
Cold drawn. 105,000 TS, 85,000 YS, 17 El; 50 RA; 215 Brin.
For valves, pumps, turbine blades, cutlery, knives; Type 420, stainless, hardenable.

BLANCO M3E.
M-1288; 0.9 C, 0.4 Si, 18 Cr, 1.15 Mo, 1 V, bal Fe.
For valves, bearings, instrument pivots, rollers; corrosion and wear resistant, hardenable.

BLANCO M4.
M-1288, 0.12 C, 16.5 Cr, 0.25 Mo, 0.20 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 160 Brin.
For gears, shafts, screw machine products; Type 430F; stainless, free-cutting.

BLANCO RCM.
M-1288; 0.20 C, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For valves, cutlery, valve trim, turbine blades; Type 420 Mo; stainless, hardenable.

BLANCO SPEZIAL.
M-1288; 0.07 C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El; 330 Brin.
For welded structures, chemical plant equipment, tanks: Type 304; stainless, austenitic.

BLANCO SPEZIAL.
M-1314; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks; Type 302; stainless, austenitic.

BLANCO SUPER.
M-1288; 0.07 max C, 18 Cr, 2 Mo, 10.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El; 300 Brin.
For acid resistant chemical plant equipment, tanks; Type 316, stainless, austenitic.

BLANCO SUPER EXTRA.
M-1288; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe
Annealed: 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn 150,000 TS; 135,000 YS; 6 El; 300 Brin.
For welded structures, chemical plant equipment, tanks: Type 316 Ti; stainless, austenitic.

BLANCO SUPER EZN.
M-1288, 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For welded structures, chemical plant equipment, tanks; Type 316 Cb; stainless, austenitic.

BLANCO T70.
M-1288; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For heat treating boxes, furnace parts, rabble arms; Type 430 Ti; stainless, ferritic.

BLANCO W.
M-1288; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El, 70 RA; 155 Brin
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For valve trim, turbine blades, cutlery; Type 410; stainless.

BLANKO-BLECH.
M-1288; 80 Cu, 20 Ni.
For turbine blades, condenser tubes; corrosion resistant.

BLATT (LEAF) GOLD.
Eng.; 77 Cu, 23 Zn.
For gold leaf substitute, signs; corrosion resistant.

BLATT (LEAF) SILVER.
Eng.; 91 Sn, 8.3 Zn, 0.4 Pb, 0.2 Fe.
For bearings, tin foil for wrappers; Babbitt.

BLAUPUNKT.
M-1331; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel.

BLAW-KNOX C-1.
M-1222, M-112; 0.08-0.20 C, 0.5-1.1 Mn, 0.2-0.4 Si, bal Fe.
Cast: 55,000 TS; 27,000 YP; 25 El; 45 RA; 135-155 Brin.
For general machinery castings, housings, shafts, case-hardened parts.

BLAW-KNOX C-1-0.
M-1222, M-112, 0.3 max C, 0.7 max Mn, 0.35-0.45 Si, bal Fe.
Cast: 60,000 TS; 30,000 YS; 30 El, 45 RA; 135-155 Brinell.
For general machinery castings, gears, housings, casings. Water hardening

BLAW-KNOX C-1-1.
M-1222, M-112, 0.20-0.25 C, 0.6-0.8 Mn, 0.35-0.45 Si, bal Fe.
Cast: 60,000 TS; 30,000 YP; 30 El; 45 RA; 135-155 Brin.
For general machinery castings, gears, housings, casings. Water hardening.

BLAW-KNOX C-1-2.
M-1222, M-112, 0.20-0.30 C, 0.6-0.8 Mn, 0.30-0.45 Si, bal Fe
Cast: 65,000 TS, 33,000 YP, 26 El, 40 RA; 140-155 Brin.
For general purpose castings, gears, shafts, housings Water hardening

BLAW-KNOX C-1-3.
M-112, M-1222, 0.30-0.35 C, 0.65-0.85 Mn, 0.30-0.45 Si, bal Fe.
Cast: 70,000 TS, 35,000 YS; 24 El, 36 RA; 145-160 Brin
For general machinery castings, gears, shafts, casings. Water hardening.

BLAW-KOX C-1-4.
M-112, M-1222, 0.35-0.40 C, 0.7-0.9 Mn, 0.30-0.45 Si, bal Fe
Cast: 75,000 TS, 40,000 YP; 22 El; 33 RA; 150-165 Brin.
For general machinery castings, housings, gears, shafts. Water hardening.

BLAW KNOX C-1-5.
M-112, M-1222, 0.40-0.45 C, 0.7-0.9 Mn, 0.30-0.45 Si, bal Fe.
Cast: 80,000 TS, 42,000 YP; 20 El; 30 RA; 155-170 Brin.
For general machinery castings, housings, shafts, gears. Water hardening.

BLAW-KNOX C-1-6.
M-112, M-1222; 0.50-0.55 C, 0.7-0.9 Mn, 0.3-0.45 Si, bal Fe.
Cast: 85,000 TS; 45,000 YP; 18 El; 25 RA; 160-175 Brin.
For gears, shafts, housings, general purpose castings. Water hardening.

BLAW-KNOX C-2.
M-112, M-1222; 0.27-0.32 C, 0.9-1.3 Mn, 0.3-0.45 Si, 0.3-0.4 Ni, 0.10-0.18 Mo, bal Fe.
Cast: 85,000 TS, 62,000 YP; 22 El; 50 RA; 170-300 Brin.
For gears, countershafts, axles, housings, castings. Oil hardening, shock resistant.

BLAW-KNOX C-2-A.
M-112, M-1222; 0.32-0.38 C, 1.05-1.25 Mn, 0.3-0.45 Si, 0.3-0.4 Ni, 0.10-0.18 Mo, bal Fe.
Cast: 90,000 TS; 65,000 YP; 20 El; 45 RA; 185-310 Brin.
For gears, housings, shafts. Oil hardening.

BLAW-KNOX C-3-A.
M-112, M-1222; 0.35-0.40 C, 1.15-1.35 Mn, 0.3-0.45 Si, 0.20 Mo, bal Fe.
Cast: 95,000 TS; 65,000 YP; 20 El; 45 RA; 190-320 Brin.
For gears, axles, shafts, housings.
Oil or water hardening.

BLAW-KNOX C-4.
M-112, M-1222; 0.3-0.4 C, 1.0-1.2 Mn, 0.3-0.45 Si, 0.2 Mo, 0.1 V, bal Fe.
Cast: 80,000 TS; 50,000 YP, 22 El, 40 RA; 150-170 Brin
For gears, housings, axles, shafts.
Water or oil hardening.

BLAW-KNOX C-5.
M-112, M-1222, 0.25-0.35 C, 0.8-1.0 Mn, 0.3-0.45 Si, 0.7-0.8 Ni, 0.35-0.40 Mo, bal Fe.
Cast: 90,000 TS, 65,000 YP; 24 El, 50 RA; 180-330 Brin
For gears, shafts, axles, bolts
Water or oil hardening.

BLAW-KNOX C-6.
M-112, M-1222, 0.4-0.5 C, 0.5 Mn, 0.4 Si, 2.75-3.25 Cr, 0.3-0.4 Mo, bal Fe.
Cast: 110,000 TS, 90,000 YP, 16 El; 40 RA; 225-400 Brin
For gears, shafts, axles Oil hardening, tough

BLAW-KNOX C-6-M
M-112, M-1222, 0.25-0.30 C, 0.5-0.6 Mn, 0.3-0.45 Si, 2.75-3.25 Cr, 0.2-0.3 Mo, bal Fe
Cast 100,000 TS, 75,000 YP, 19 El, 50 RA, 225-350 Brin
For gears, shafts, housings
Oil hardening, shock resistant.

BLAW-KNOX C-7
M-112, M-1222, 0.3-0.4 C, 0.8-1.0 Mn, 0.3-0.45 Si, 0.8 Cr, 1.5 Ni, 0.4 Mo, bal Fe
Cast 125,000 TS, 100,000 YP, 15 El, 35 RA; 220-365 Brin.
For gears, shafts, housings Shock resistant, tough.

BLAW-KNOX C-8
M-112, M-1222, 0.25-0.35 C, 0.7-0.9 Mn, 0.30-0.45 Si, 0.50 Cr, 0.50 Ni, 0.4 Mo, bal Fe.
Cast 115,000 TS, 90,000 YP, 22 El, 50 RA; 200-325 Brin
For gears, shafts, housings
Shock resistant Water hardening

BLEIZINNBRONZE 7
M-1420, Zn, Sn, bal Cu
Cast 25,000 TS, 8 El, 100 Brin
For hardware, bronze

BLEIZINNBRONZE 8.
M-1420, Zn, Sn, bal Cu.
Cast: 22,000 TS; 8 El, 60 Brin.
For hardware; bronze.

BLEIZINNBRONZE 10
M-1420, Zn, Sn, bal Cu
Cast. 26,000 TS; 15 El, 70 Brin.
For hardware; bronze.

BLENDALLOY 22-1000 HIGH PURITY NICKEL.
M-1626, 0.005 max C, 0.005 max Fe, 99.98 Ni.
For plater bars, tube cathodes, fluorescent lamp components, and resistance thermometers.

BLENDALLOY 22-9604.
M-1626, 0.005 max C, 0.005 max Fe, 96 Ni, 4 W. (High purity product).
For specialized electronic and magnetic applications.

BLENDALLOY 22-9800.
M-1626, 0.005 max C, 0.005 max Fe, 98 Ni, 0.50 Ti, 0.25 Mg. (High purity product).
For springs requiring high electrical conductivity and parts requiring good thermal conductivity.

BLENDALLOY 25-4200 ("42-ALLOY").
M-1626, 0.005 max C, 42 Ni, 58 Fe (High purity product).
For electronic, magnetic and electrical applications. Glass sealing.

BLENDALLOY 25-4206.
M-1626; 0.005 max C, 43 Ni, 48 Fe, 2.5 Ti, 5 Cr, 0.5 Al. (High purity product).
For springs, mechanical filters, tuning forks.

BLENDALLOY 25-4601 FM
M-1626, 0.005 max C, 46 Ni, 53 Fe, 0.5 Mn, 0.10 Se, (High purity product).
For glass sealing applications

BLENDALLOY 25-4803
M-1626, 0.005 max C, 48 Ni, 49 Fe, 3 Mo. (High purity product).
High magnetic permeability with minimum energy loss For communication and electronic equipment.

BLENDALLOY 25-5000 (Orthonol).
M-1626, 0.005 max C, 50 Ni, 50 Fe. (High purtity product).
Soft magnetic alloy with very high squareness and high core gain For saturable reactors, magnetic amplifiers, switching devices, and power inverter-converter applications.

BLENDALLOY 25-5200 ("52" Alloy)
M-1626, 0.005 max C, 52 Ni, bal Fe (High purity product).
Precise thermal expansion, uniformly fine-grained microstructure, excellent electrical and thermal conductivity
For glass sealing in dry reed switches and mercury wetted relays

BLENDALLOY 25-7904 (Permalloy)
M-1626; 0.005 max C, 80 Ni, 15 Fe, 5 Mo (High purity product).
Soft magnetic alloy with high initial permeability. For use in transformers, reed relays, amplifiers, vacuum tubes, microphones, loud speakers, cables.

BLENDALLOY 25-8000.
M-1626, 0.005 max C, 80 Ni, bal Fe. (High purity product).
For electronic and magnetic applications

BLENDALLOY 25-8004 (Permalloy)
M-1626, 0.005 max C, 80 Ni, 15 Fe, 5 Mo (High purity product)
Soft magnetic alloy with high squareness and high core gain, low coercive force.
For preamplifiers and modifiers, converters

BLENDALLOY 25-8300
M-1626, 0.005 max C, 83 Ni, bal Fe. (High purity product).
For electronic and magnetic applications.

BLENDALLOY 32-9010
M-1626; 0.005 max C, 0.005 max Fe, 90 Co, 10 Ni.
For electronic, magnetic, magnetostrictive, and plating applications.

BLITZ FEE.
M-1312; 0.86 C, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel.

BLOCK BRASS.
U.S.; 66.5 Cu, 32 Zn, 1.5 Pb.
For free machining brass parts.

BLOCK'S ALLOY.
U.S.; 54 Co, 45 Ni, 0.9 Si.
For tools; corrosion and heat resistant.

BLOMBIT.
M-621; 2-7 Ag, 93-98 Cu.
Forged: 72,000-78,000 TS; 8-5 El; 120-140 Brin.
For electrodes and tips for spot welding, 83-90% conductivity.

BLUE ANCHOR DRILL ROD.
M-342; 1.20-1.35 C, bal Fe.
Cold drawn: 85,000 TS; 60,000 YS; 25 El; 50 Brin.
For tools, taps, drills, reamers, water hardening.

BLUE CHIP.
M-57; 0.70 C, 0.25 Mn, 4 Cr, 18 W, 1 V, bal Fe.
Annealed: 105,100 TS, 75,000 YS; 14 El; 17 RA, 230 Brin.
For tools, cutters, reamers, drills, punches, dies shears, taps, high speed steel.

BLUEDAC.
M-712, 0.08 C, 0.57 Mn, 0.21 Si, bal Fe.
Cast: 63,000 TS, 55,000 YS; 29 El; 55 RA.
Welded: 73,000 TS; 64,000 YS, 23 El; 35 RA
For welding electrodes; arc welding all positions; E-6011

BLUE DEVIL YOLOY.
M-712; 0.2 C, 0.5 Cu, bal Fe.
80,000 TS, 75,000 YS; 25 El; 53 RA
For welding rod; flux coated.

BLUE DIAMOND
M-542; C, alloy, bal Fe.
For road machinery cutting edges, wear resistant

BLUE DOT SPECIAL.
M-750, C, alloy, bal Fe.
For maintenance and repair operations; oil hardening.

BLUE EDGE
M-275, 0.5 C, 1 Cr, 1 W, bal Fe.
For pneumatic chisels, shear blades, cold rivet sets; shock resisting AISI S3

BLUE GOLD
U.S.; 75 Au, 25 Fe.
For ornaments, jewelry; corrosion resistant.

BLUE LABEL
M-341; 1.0-1.1 C, 0.15-0.25 V, Mn, Si, bal Fe.
For cold swaging dies, forming rolls, knives, punches, collets, pipe cutters, drill bushings
AISI W2 water hardening tool steel.

BLUE LABEL.
M-343, 0.8-1.1 C, bal Fe
For general tools; "Heller Special Tool."

BLUE LABEL.
M-350; C, bal Fe.
For tools, drills, taps; water hardened.

BLUE LABEL.
M-694; 1.0 C, 0.3 Mn, 0.25 Si, bal Fe.
Type W1 water hardening tool steel.

BLUE LABEL EXTRA.
M-373; 0.6-1.4 C, 0.25 Si, 0.25 Mn, bal Fe.
For drills, taps, cutters, punches; Type W1; water hardened.

BLUE LABEL SF-2.
M-341; same as Blue Label but surface finished on two sides.

BLUE RIBAND VICTORY NO. 7.
M-713; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For cutters, tools; hig speed steel.

BLUE SEAL.
M-510, 0.9-1.0 C, bal Fe.
For tools, gauges, springs; water hardened

BLUE STREAK 18-4-1.
M-822, 0.72 C, 4 Cr, 18 W, 1 V, bal Fe.
For cutting tools; high speed steel.

BLUE STREAK COBALT.
M-822, 1.25 C, 4.0 Cr, 3.0 V, 9.0 W, 3.0 Mo, 9.0 Co, bal Fe
High speed steel, extra wear and red hardness properties, tungsten-cobalt type.

BLUE STREAK MOLY
M-822; 0.8 C, 4 Cr, 5.75 W, 4.5 Mo, 1.6 V, bal Fe
For cutting tools, high speed steel

BLUE TIP NAVAL BRASS
M-266, 60 Cu, 0.75 Sn, bal Zn
Hard: 68,000 TS, 45,000 YS, 35 El
Annealed: 63,000 TS, 40,000 YS, 40 El.
For bolts, nuts, marine hardware, valve stems, corrosion resistant.

BM
M-459, 1.1 C, 13 Mn, 0.25 Si, bal Fe
For welding electrode

B-METAL (BAHN-METALL).
M-315, M-316, M-402, 0.03-0.05 Li, 0.68-0.76 Ca, 0.62-0.72 Na, 0.02-0.04 K, 0.2 Al, bal Pb
For locomotive bearings and journal bearings in railroad cars, retains high hardness at high temperature.

B MONEL.
M-61, M-68, 67 Ni, 30 Cu
For stainless parts, corrosion resistant

"B M S"
M-344, 0.7 C, 5 Cr, 1.5 W, bal Fe
For tools, chisels, hard punches, shear blades, air hardening

BMS
M-459, 1.1 C, 1.1 Cr, 1.1 W, bal Fe
For metal saws, water hardened

BMSC
M-459, 1.15 C, 0.65 Cr, 0.1 V, bal Fe
For bearings, sleeves, liners, oil or water hardened

BMS EXTRA
M-459, C, W, bal Fe.
For metal saws, water hardened.

BMSW.
M-459; 1.15 C, W, Cr, bal Fe.
For cutters, bearings, water hardened

"BNC" STEEL.
English, C, Cr, Ni, bal Fe.
Hardened: 194,000 TS, 15 El, 50 RA; 400 Brin
For gears, pinions; case hardening.

BND
M-345, M-1177, 0.7 C, Cr, bal Fe.
For tools, gripper dies; tough

B.N.F. COPPER-NICKEL-IRON ALLOY.
M-396, 5-10 Ni, 1-2 Fe, 0.3-0.8 Mn, bal Cu
For marine parts and hardware, resists sea water corrosion.

B.N.F. LEAD ALLOY NO. 1.
M-396, 0.25 Cd, 0.5 Sb, bal Pb.
For lead sheathing of electric cables

B.N.F. LEAD ALLOY NO. 2.
M-296; 0.25 Cd, 1.5 Sn, bal Pb.
For water pipes, lead sheathing of electric cables; corrosion resistant.

B.N.F. LEAD ALLOY NO. 3
M-396; 0.15 Cd, 0.4 Sn, bal Pb.
For sheathing of ship cables.

BOBIERRE'S METAL.
France; 66-58 Cu, 34-42 Zn.
For bolts, nuts, sheathing, yellow brass.

BOCHLET FCHD
M-1435, 0.14 max C, 17-19 Mn, 10-13 Cr, 0.5-2.0 Si, 0.6 Ti, bal Fe
For turbine blades, jet engine components; austenitic, heat resistant

BOCHUM 85C7
M-1331; 0.85 C, 1.75 Cr, 0.35 Mn, bal Fe.
For bearings, liners, forming dies; water hardened, wear resistant

BOCHUM BC13V.
M-1331, 1.15 C, 0.65 Cr, 0.1 bal Fe
For blanking and forming dies, water hardened, wear resistant.

BOCHUM BCMH.
M-1331, 1.0 C, 1.0 Mn, 0.37 Si, bal Fe
Annealed: 100,000 TS, 53,000 YS, 21 El, 42 RA, 200 Brin
For drills, taps, reamers, cutters, Type W1; water hardened

BOCHUM BCMW.
M-1331, 0.9 C, 0.37 Si, 1.0 Mn, bal Fe
Heat treated 190,000 TS, 145,000 YS, 10 El; 30 RA, 400 Brin
For drills, taps, reamers, broaches, hobs, Type W1, water hardened

BOCHUM BCR
M-1331; 0.85 C, Cr, bal Fe
For bearings, liners, sleeves, water hardened, wear resistant

BOCHUM BCVH
M-1331, 0.90 C, Cr, V, bal Fe.
For bearings, liners, sleeves; water hardened, wear resistant

BOCHUM BCVW
M-1331, 0.80 C, Cr, V, bal Fe
For bearings, liners, sleeves, water hardened, wear resistant

BOCHUM BFK6.
M-1331, 0.60 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Heat treated 160,000 TS, 113,000 YS, 12 El; 40 RA, 325 Brin.
For gears, rails, punches, hammers, water hardened.

BOCHUM BFK7
M-1331; 0.75 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated 185,000 TS; 140,000 YS; 15 El, 40 RA; 400 Brin.
For springs, tools, punches, crimpers, water hardened

BOCHUM BFK8.
M-1331; 0.90 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated: 190,000 TS, 145,000 YS, 10 El, 30 RA; 400 Brin.
For springs, tools, cutters, drills; Type W1; water hardened.

BOCHUM BGK9.
M-1331; 0.85 C, 0.1-0.4 Si, 0.5-0.7 Mn, bal Fe.
For springs, tools, drills, taps, reamers; water hardened; Type W1.

BOCHUM BSW10
M-1331; 1.2 C, W, Cr, bal Fe.
For cutters, bearings, water hardened, wear resistant.

BOCHUM BSW18.
M-1331; 1.2 C, W, Cr, bal Fe.
For cutters, bearings, water hardened, wear resistant.

BOCHUM C58G.
M-1331, 0.25 C, 14.5 Cr, 0.1 max Ni, bal Fe.
For cutlery, valves, surgical and dental instruments, stainless, hardenable

BOCHUM C68G
M-1331, 0.25 C, 17 Cr, 1.8 max Ni, bal Fe.
Annealed 125,000 TS; 95,000 YS, 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, cutlery; corrosion and heat resistant.

BOCHUM CSG.
M-1331; 0.60 C, Cr, V, bal Fe.
For springs, gears, crankshafts; oil hardened, shock resistant.

BOCHUM D7.
M-1331; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS, 128,000 YS; 12 El; 37 RA, 355 Brin.
For rails, axes, hammers, crimpers, water hardened; Type W1

BOCHUM D8.
M-1331, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 190,000 TS, 145,000 YS; 10 El, 30 RA; 400 Brin
For drills, taps, springs, reamers, Type W1; water hardened

BOCHUM D10.
M-1331, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 100,000 TS, 53,000 YS, 20 El; 42 RA; 200 Brin
For springs, cutters, hobs, drills, taps, Type W1, water hardened.

BOCHUM D11
M-1331, 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 110,000 TS, 56,000 YS, 18 El; 40 RA, 210 Brin.
For springs, cutters, taps, drills, hobs; Type W1; water hardened.

BOCHUM D13.
M-1331, 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe
For engravers' tools, blanking and forming dies; Type W1, water hardened.

BOCHUM EK10
M-1331, 0.10 C, 0.25 Si, 0.37 Mn, bal Fe.
Cold drawn: 72,000 TS; 60,000 YS; 22 El; 58 RA; 145 Brin.
For gears, shafts, fasteners; case hardening steel.

BOCHUM EK15.
M-1331; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS, 25 El; 60 RA; 145 Brin.
For gears, shafts, fasteners; case hardening steel.

BOCHUMER BC1.
M-1343; 1.0 C, 1.55 Cr, bal Fe.
For bearings, sleeves, liners, blanking dies; water hardened, wear resistant.

BOCHUMER BC2.
M-1343; 0.90 C, 0.8 Cr, 0.30 Mn, bal Fe.
For springs, tools, punches, dies, hammers; Type W1; water hardened.

BOCHUMER BCE SPEZIAL.
M-1343; 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For bearings, liners, sleeves; water hardened, abrasion resistant.

BOCHUMER BCL200.
M-1343; 2.1 C, 11.5 Cr, 0.3 Mn, bal Fe.
For blanking and forming dies, punches; oil or air hardened, nondeforming.

BOCHUMER BCOL155.
M-1343; 1.65 C, 11.5 Cr, 0.3 Mn, bal Fe
For blanking and forming dies, punches; air hardened, nondeforming

BOCHUMER BCOV40.
M-1343, 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, 0.7 Mn, bal Fe.
For gears, bolts, fasteners, machine tool parts, oil hardened, tough.

BOCHUMER BCS120.
M-1343, 1.25 C, 1.15 Si, 1.2 Cr, 0.7 Mn, bal Fe.
For bearings, sleeves, liners; water or oil hardened, wear resistant.

BOCHUMER BC SPEZIAL.
M-1343; 1.45 C, 0.6 Mn, 1.4 Cr, bal Fe.
For bearings, liners, sleeves; water hardened, abrasion resistant.

BOCHUMER BCSV/G.
M-1343, 0.61 C, 1.18 Cr, 0.1 V, 0.7 Mn, bal Fe
For springs, gears, crankshafts, oil hardened, shock resistant.

BOCHUMER BCSV/K
M-1343, 0.61 C, 1.18 Cr, 0.1 V, 0.75 Mn, bal Fe
For springs, gears, crankshafts; oil hardened, shock resistant.

BOCHUMER BCV115.
M-1343; 1.15 C, 0.65 Cr, 0.1 V, 0.3 Mn, bal Fe.
For cutters, dies, forming dies, water hardened, wear resistant.

BOCHUMER BCVOW.
M-1343; 0.45 C, 0.45 Mo, 1.35 Cr, 0.8 V, 0.45 W, bal Fe
For cold work tools, upsetters, headers; oil hardened, tough.

BOCHUMER BCWL200.
M-1343, 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For blanking and forming dies, punches, oil hardened, nondeforming.

BOCHUMER BFS5½.
M-1343; 0.46 C, 1.7 Si, 0.65 Mn, bal Fe.
For springs, punches, crimpers; oil hardened, tough.

BOCHUMER BFS5½+.
M-1343; 0.51 C, 1.7 Si, 0.65 Mn, bal Fe.
For springs, punches, crimpers; oil hardened, tough.

BOCHUMER BFS6.
M-1343, 0.6 C, Si, Mn, bal Fe.
Heat treated: 160,000 TS; 115,000 YS; 12 El, 40 RA; 325 Brin.
For springs, punches, crimpers; oil hardened, tough.

BOCHUMER BMS1.
M-1343; 0.53 C, 0.9 Si, 0.9 Mn, bal Fe
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 320 Brin.
For gears, springs, shafts; water or oil hardened.

BOCHUMER BMV85.
M-1343; 0.9 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, forming dies, crimpers, upsetters; oil hardened, shock resistant.

BOCHUMER BNCO/G.
M-1343; 0.35 C, 0.25 Mo, 1.35 Cr, 3.9 Ni, bal Fe.
For gears, bolts, crankshafts, studs; oil hardened, shock resistant

BOCHUMER BNCO/K.
M-1343, 0.19 C, 1.25 Cr, 0.2 Mo, 3.75 Ni, bal Fe.
For gears, bolts, cams, studs, camshafts; case hardening steel, shock resistant.

BOCHUMER BVA3.
M-1343; 0.2 C, 0.55 Mo, 1.0 Mn, 0.25 Si, bal Fe.
For gears, bolts, cams, studs, camshafts; case hardening steel, tough

BOCHUMER BVT40.
M-1343, 0.16 C, 1.05 Cr, 0.45 Mo, 0.65 Mn, bal Fe
For gears, pinions, machine tool parts; case hardening steel, tough

BOCHUMER BVT40N.
M-1343, 0.16 C, Cr, Mo, V, bal Fe
For gears, machine tool parts, case hardening steel, tough.

BOCHUMER BVT50
M-1343, 0.24 C, 1.25 Cr, 0.45 Mo, bal Fe.
For gears, pinions, bolts, fasteners, shafts, oil hardened, tough

BOCHUMER BVT50N
M-1343; 0.22 C, Cr, Mo, V, bal Fe
For bolts, cams, camshafts, fasteners, case hardening steel, tough

BOCHUMER BVT60
M-1343, 0.24 C, 1.35 Cr, 0.55 Mo, 0.2 V, bal Fe
For bolts, machine tool parts, shafts, studs, oil hardened, tough

BOCHUMER BVT60N
M-1343, 0.22 C, 1.15 Cr, 0.25 Mo, 0.2 V, bal Fe.
For bolts, machine tool parts, shafts, studs, oil hardened, tough

BOCHUMER BVT90
M-1343; 0.18 C, Cr, Mo, V, bal Fe
For gears, bolts, machine tool parts; case hardening steel, tough

BOCHUMER BVT125 EXTRA
M-1343, 1.3 C, 4.75 W, 0.20 max Cr, bal Fe
For cutters, form cutters, engravers tools, water hardened

BOCHUMER BVT130
M-1343, 0.20 C, 1.25 Cr, 0.22 Mo, 0.55 Mn, bal Fe
For gears, bolts, machine tool parts, case hardening steel, tough.

BOCHUMER BVT130V.
M-1343; 0.22 C, 12 Cr, 1 Mo, 0.4 Ni, 0.3 V, bal Fe.
Annealed. 95,000 TS, 40,000 YS, 25 El, 55 RA, B 92 Rock
Heat Treated 240,000 TS; 20,000 YS; 10 El, 25 RA, C 50 Rock.
For cutlery, surgical instruments, knives, shafts, gears, scissors.
Corrosion resistant, hardenable.

BOCHUMER BVT130VSo.
M-1343; 0.20 C, 12 Cr, 1 Mo, 0.3 V, 0.5 W, bal Fe.
Annealed: 95,000 TS; 40,000 YS, 25 El; 55 RA; B 92 Rock.
Heat Treated: 240,000 TS; 200,000 YS; 10 El; 25 RA; C 50 Rock.
For gears, shafts, cutlery, hardware, surgical instruments
Corrosion resistant, hardenable.

BOCHUMER BWC100.
M-1343; 1.0 C, 0.9 Mn, 1 Cr, 1.15 W, bal Fe.
For cutters, dies, shears, upsetters; oil hardened, tough.

BOCHUMER BWCO SUPRA.
M-1343; 0.65 C, 3.75 Cr, 0.85 Mo, 0.7 V, 8.5 W, bal Fe.
For lathe and planer tools, reamers, taps, drills; high speed steel.

BOCHUMER BWCV25 EXTRA.
M-1343; 0.30 C, Cr, V, W, bal Fe.
For upsetters, crimmers, header dies; oil hardened, tough.

BOCHUMER BWCV25 SPEZIAL.
M-1343; 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For upsetters, riveters, header dies; oil hardened, tough.

BOCHUMER BWCV25 SUPRA.
M-1343; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion press dies and rams, upsetters; hot work steel, oil hardened.

BOCHUMER BWCV30 SPEZIAL.
M-1343; 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For header dies, upsetters, crimpers; oil hardened, tough.

BOCHUMER BWCV40 SPEZIAL.
M-1343; 0.45 C, 1.05 Cr, 0.2 V, 1.85 W, bal Fe.
For header dies, upsetters, crimpers; oil hardened, tough.

BOCHUMER BWCV50 SPEZIAL.
M-1343, 0.55 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For header dies, upsetters, crimpers, oil hardened, tough.

BOCHUMER BWV115.
M-1343, 1.2 C, 0.2 Cr, 0.1 V, 1.0 W, bal Fe.
For cutters, bearings, crimpers; water hardened, wear resistant

BOCHUMER CBV.
M-1343, 0.15 C, 0.65 Cr, 0.50 Mn, 0.25 Si, bal Fe.
For gears, bolts, machine tool parts, case hardened.

BOCHUMER CBV1
M-1343, 0.33 C, 1.0 Cr, 0.65 Mn, bal Fe.
For gears, bolts, fasteners, oil hardened, tough.

BOCHUMER CBV2.
M-1343; 0.37 C, 0.65 Mn, 1.0 Cr, bal Fe.
For gears, bolts, fasteners, oil hardened, tough.

BOCHUMER CBV/H.
M-1343; 0.36 C, 0.65 Mn, 1.55 Cr, bal Fe.
For gears, bolts, fasteners, oil hardened, tough.

BOCHUMER CBVO/D.
M-1343; 0.30 C, 0.55 Mn, 1.5 Cr, 0.18 Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

BOCHUMER CBVO/G.
M-1343; 0.40 C, Cr, Mn, Mo, V, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

BOCHUMER CBVO/H.
M-1343; 0.50 C, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

BOCHUMER CBVO/M.
M-1343; 0.25 C, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

BOCHUMER CBVO/MD.
M-1343; 0.21 C, 0.65 Mn, 0.85 Cr, 0.25 Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

BOCHUMER CBVO/TM.
M-1343; 0.24 C, 0.55 Mn, 1.15 Cr, 0.25 Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

BOCHUMER CBVO/V.
M-1343; 0.30 C, 0.55 Mn, 2.5 Cr, 0.2 Mo, 0.15 V, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

BOCHUMER CBVO/W.
M-1343; 0.16 C, 0.65 Mn, 1.05 Cr, 0.20 Mo, bal Fe.
For gears, cams, camshafts; case hardened.

BOCHUMER CBVO/Z.
M-1343; 0.42 C, 0.65 Mn, 1.05 Cr, 0.20 Mo, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, tough.

BOCHUMER CBV/V.
M-1343; 0.22 C, Cr, V, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

BOCHUMER CBVZ.
M-1343; 0.41 C, 1.0 Cr, 0.65 Mn, 0.25 Si, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

BOCHUMER CMBV/H
M-1343; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, cams, camshafts, fasteners; case hardened, tough.

BOCHUMER CMBV/W.
M-1343; 0.16 C, 1.15 Mn, 0.95 Cr, bal Fe.
For gears, cams, camshafts, fasteners; case hardened, tough

BOCHUMER CNBV1W.
M-1343, 0.15 C, 1.55 Cr, 1.55 Ni, bal Fe.
For gears, bolts, machine tool parts; case hardened, tough.

BOCHUMER CNBV2W.
M-1343; 0.18 C, 2 Cr, 2 Ni, 0.5 Mn, bal Fe
For gears, bolts, machine tool parts, case hardened, tough.

BOCHUMER CNBVO/M.
M-1343; 0.25 C, 0.50 Mn, 1.0 Cr, 0.18 Mo, 1.5 Ni, bal Fe
For gears, bolts, fasteners; oil hardened, shock resistant.

BOCHUMER CRVO.
M-1343, 0.33 C, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

BOCHUMER CRW.
M-1343; 0.85 C, 1.75 Cr, 0.35 Mn, bal Fe.
For bearings, bushings, liners, sleeves; water or oil hardened, wear resistant.

BOCHUMER CV23.
M-1343; 0.22 C, 0.65 Mn, 1.1 Cr, 0.2 V, bal Fe.
For gears, pinions, bolts, shafts, oil hardened, tough.

BOCHUMER CV40/H.
M-1343; 0.42 C, Cr, V, bal Fe.
For gears, bolts, springs, crankshafts; oil hardened, tough.

BOCHUMER CV48.
M-1343, 0.50 C, 1.0 Cr, 0.09 V, bal Fe.
For gears, bolts, springs, studs; oil hardened, shock resistant.

BOCHUMER CV58.
M-1343; 0.50 C, 0.85 Mn, 1.0 Cr, 0.1 V, bal Fe.
For gears, bolts, springs, crankshafts; oil hardened, shock resistant.

BOCHUMER EMC.
M-1331; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe
For camshafts, cams, gears; case hardened.

BOCHUMER ES5.
M-1343, 0.85 C, 0.25 Si, 0.25 Mn, bal Fe.
Heat treated. 188,000 TS; 143,000 YS; 12 El; 35 RA; 390 Brin.
For springs, drills, taps, reamers; Type W1; water hardened.

BOCHUMER ES6.
M-1343; 0.70 C, 0.25 Si, 0.25 Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, rails, punches, hammers; Type W1; water hardened

BOCHUMER EVL.
M-1343; C, Cr, Ni, bal Fe
For machine tool parts; oil hardened, shock resistant.

BOCHUMER FCK.
M-1343, C, Cr, bal Fe.
For machine tool parts, oil hardened.

BOCHUMER F EXTRA.
M-1343, C, alloy, bal Fe.
For machine tool parts, oil hardened.

BOCHUMER FRS
M-1343; 0.67 C, 1.3 Si, 0.5 Cr, 0.5 Mn, bal Fe
For punches, crimpers, upsetters; oil or water hardened.

BOCHUMER GKS
M-1343; 0.15 C, Si, 1.1 Mn, bal Fe.
For machine tool parts, case hardened.

BOCHUMER HMFB EXTRA.
M-1343; 0.55 C, Ni, Cr, Mo, V, bal Fe
For forging dies, punches, upsetters, shears; oil hardened, shock resistant

BOCHUMER HMFB SPEZIAL.
M-1343, 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For forging and header dies, punches, oil hardened, shock resistant

BOCHUMER HMS 35.
M-1343; 0.10 C, 0.25 Si, 0.37 Mn, bal Fe
Annealed 64,000 TS; 48,000 YS, 28 El, 65 RA, 135 Brin.
For plastic mold dies, rivets, screws, fan blades; case hardened

BOCHUMER HMS 40
M-1343, 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed 70,000 TS; 55,000 YS, 25 El, 60 RA, 145 Brin.
For screws, bolts, fan blades, bushings, gears, case hardened.

BOCHUMER HMS 45.
M-1343, 0.22 C, 0.25 Si, 0.45 Mn, bal Fe
Annealed 73,000 TS, 61,000 YS, 22 El, 58 RA; 150 Brin.
For gears, bolts, fan blades, camshafts, water hardened

BOCHUMER HMS 55
M-1343; 0.35 C, 0.25 Si, 0.55 Mn, bal Fe
Hot rolled· 85,000 TS; 54,000 YS; 30 El; 53 RA; 185 Brin.
For gears, shafts, axles, bolts, screws; water hardened.

BOCHUMER HMS 65.
M-1343; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For axles, gears, bolts, tie rods, bushings; water hardened

BOCHUMER HMS 80.
M-1343; 0.60 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El, 40-54 RA; 321-229 Brin.
For wheels, die blocks, girders, shafts, water hardened

BOCHUMER HMS 85.
M-1343, 0.60 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated: 115,000-160,000 TS; 77,000-113,000 YS, 23-12 El; 54-40 RA; 229-331 Brin.
For wheels, die blocks, rails, girders; water hardened.

BOCHUMER HSS.
M-1343, C, alloy, bal Fe.
For machine tool parts, gears, oil hardened, tough.

BOCHUMER HSS EXTRA.
M-1343, C, alloy, bal Fe.
For machine tool parts, gears; oil hardened, tough.

BOCHUMER HSS SPEZIAL
M-1343, C, alloy, bal Fe
For machine tool parts, gears, oil hardened, tough.

BOCHUMER KMC 17E
M-1343, 0.20 C, 1.15 Cr, 1.25 Mn, bal Fe
For camshafts, cams, gears, case hardened.

BOCHUMER KSS/CV
M-1343, C, Cr, V, bal Fe
For saws, saw blades, oil hardened

BOCHUMER LFS
M-1343, C, Mn, Si, bal Fe
For springs, oil hardened.

BOCHUMER LKI S
M-1343; C, Si, Mn, bal Fe.
For machine tool parts

BOCHUMER LKRS
M-1343, C, Cr, bal Fe
For machine tool parts

BOCHUMER M14
M-1343, 0.17 C, 0.30 Si, 1.05 Mn, bal Fe
For gears, cams, camshafts, case hardened

BOCHUMER M17
M-1343, 0.19 C, 0.50 Si, 1.15 Mn, bal Fe
For gears, cams, camshafts, case hardened.

BOCHUMER MBV
M-1343, 0.4 C, 0.37 Si, 0.95 Mn, bal Fe
Hot rolled 90,000 TS, 58,000 YS, 17 El, 50 RA; 200 Brin
For gears, shafts, machine tool parts; water hardened.

BOCHUMER MBV/M.
M-1343; 0.30 C, 0.25 Si, 1.35 Mn, bal Fe
For gears, machine tool parts, shafts, water hardened

BOCHUMER MCV 24
M-1343; 0.27 C, Mn, Cr, V, bal Fe.
For gears, bolts, machine tool parts, oil hardened, shock resistant

BOCHUMER MINIMUM R.
M-1343, C, alloy, bal Fe.
For machine tool parts; oil hardened.

BOCHUMER MNFS.
M-1343; 0.46 C, Mn, Si, bal Fe.
Hot rolled: 98,000 TS; 60,000 YS; 24 El; 45 RA; 215 Brin.
For gears, shafts, machine tool parts; water hardened.

BOCHUMER MS.
M-1343; 0.55 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For header dies, upsetters, dies, crimpers; oil hardened, tough.

BOCHUMER MSBV.
M-1343; 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
For gears, shafts, fasteners; oil or water hardened.

BOCHUMER MSS.
M-1343; C, alloy, bal Fe.
For machine tool parts; oil hardened.

BOCHUMER MSS/CV.
M-1343; C, Cr, V, bal Fe
For saws, oil hardened.

BOCHUMER MSS EXTRA
M-1343, C, 2 W, bal Fe.
For saws, oil hardened.

BOCHUMER MSS SPEZIAL.
M-1343; C, 1 W, bal Fe.
For saws, oil hardened.

BOCHUMER MV38
M-1343; 0.42 C, 0.25 Si, 1.75 Mn, 0.1 V, bal Fe.
For gears, bolts, crankshafts, dies; oil hardened, tough

BOCHUMER NFS
M-1343; C, alloy, bal Fe.
For files, oil hardened.

BOCHUMER NZF S/H.
M-1343, 0.65 C, 1.7 Si, 0.70 Mn, bal Fe
For springs, upsetters, punches, oil hardened, tough

BOCHUMER NZF S/M
M-1343, 0.51 C, 1.7 Si, 0.65 Mn, bal Fe
For springs, upsetters, punches, oil hardened, tough

BOCHUMER NZF S/O
M-1343, 0.55 C, 1.7 Si, 0.70 Mn, bal Fe
For springs, punches, upsetters; oil hardened, tough

BOCHUMER NZF S/W
M-1343, 0.46 C, 1.7 Si, 0.65 Mn, bal Fe.
For springs, punches, rivet sets, oil hardened, tough.

BOCHUMER P400
M-1343, C, alloy, bal Fe
For machine tool parts, oil hardened.

BOCHUMER P600
M-1343, C, alloy, bal Fe
For machine tool parts; oil hardened

BOCHUMER PFS.
M-1343; C, alloy, bal Fe
For machine tool parts, oil hardened

BOCHUMER PFS/1
M-1343; C, alloy, bal Fe.
For machine tool parts, oil hardened.

BOCHUMER PKL/V-KPV
M-1343, 1.0 C, 0.25 Mn, 0.10 V, bal Fe
For header dies, forming rolls, Type W2, water hardened

BOCHUMER PNC45
M-1343; 0.45 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, crankshafts, forging dies, oil hardened, shock resistant.

BOCHUMER RKS.
M-1343; C, alloy, bay Fe.
For machine tool parts; oil hardened, tough.

BOCHUMER RKS SPEZIAL.
M-1343; C, alloy, bal Fe.
For machine tool parts; oil hardened, tough.

BOCHUMER SAFS.
M-1343; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
Heat treated: 340,000 TS; 280,000 YS; 5 El; 20 RA; 600 Brin.
For springs; oil hardened, shock resistant.

BOCHUMER SC 60.
M-1343; 0.67 C, 1.3 Si, 0.5 Cr, 0.5 Mn, bal Fe.
Heat treated: 320,000 TS, 250,000 YS; 8 El; 25 RA; 550 Brin.
For springs; oil hardened, shock resistant.

BOCHUMER SFS60.
M-1343; 0.6 C, bal Fe.
Heat treated 160,000 TS; 113,000 YS; 12 El; 40 RA; 320 Brin.
For wheels, die blocks, rails, springs; water hardened.

BOCHUMER SFS65
M-1343, 0.69 C, bal Fe.
Heat treated. 175,000 TS; 128,000 YS; 12 El; 37 RA; 350 Brin.
For springs, clutch discs, girders, rails; water hardened

BOCHUMER SFS70.
M-1343; 0.72, bal Fe.
Heat treated 175,000 TS; 128,000 YS; 12 El, 37 RA, 350 Brin.
For springs, clutch discs, girders, rails; Type W1; water hardened

BOCHUMER SMFS/O
M-1343; 0.60 C, Si, Mn, bal Fe.
Heat treated: 160,000 TS, 113,000 YS, 12 El; 40 RA, 320 Brin.
For wheels, die blocks, rails, springs; water hardened.

BOCHUMER SPEZIAL REZISTANCE STAHL.
M-1343, 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For extrusion rams, dies; hot work steel, oil hardened

BOCHUMER SPEZIAL W.
M-1343, 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe
For extrusion rams, dies, hot work steel, oil hardened.

BOCHUMER SSCV
M-1343, C, V, bal Fe
For machine tool parts, water hardened

BOCHUMER SSS.
M-1343, C, bal Fe
For machine tool parts, water hardened

BOCHUMER SSS1.
M-1343, 0.70 C, 1.7 Si, 0.70 Mn, bal Fe
For springs, punches, upsetters, chisels, oil hardened, shock resistant.

BOCHUMER SSS1 EXTRA
M-1343, C, W, V, bal Fe.
For heading dies, cutters, liners, oil or water hardened

BOCHUMER SSSK.
M-1343, 0.50 C, 1.0 Cr, 0.09 V, 0.85 Mn, bal Fe
For springs, gears, fasteners, crankshafts; oil hardened, shock resistant.

BOCHUMER TSE.
M-1343; C, Cr, Mn, bal Fe.
For machine tool parts; water hardened.

BOCHUMER TSV.
M-1343; C, bal Fe.
For machine tool parts; water hardened.

BOCHUMER UFS.
M-1343; C, bal Fe.
For machine tool parts; water hardened.

BOCHUMER UGS.
M-1343; C, bal Fe.
For machine tool parts; water hardened.

BOCHUMER UMS45.
M-1343; 0.22 C, 0.45 Mn, 0.25 Si, bal Fe.
Annealed: 73,000 TS; 41,000 YS; 22 El; 58 RA; 140 Brin.
For screws, bolts, gears, shafts, rivets; case hardened.

BOCHUMER WFS SPEZIAL.
M-1343; 0.50 C, Cr, Mo, V, bal Fe.
For header and forming dies, punches; oil hardened, tough.

BOCHUMER WFS SUPRA.
M-1343; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For extrusion dies, rams, liners, punches; oil hardened, tough.

BOCHUMER WK45.
M-1343; 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For axles, gears, bolts, fasteners, crankshafts; water hardened.

BOCHUMER WK60.
M-1343; 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 320 Brin.
For wheels, die blocks, springs, girders, rails; water hardened.

BOCHUMER ZFS.
M-1343; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, punches, upsetters; oil hardened, shock resistant.

BOCHUMER ZMCV.
M-1343; 1.4 C, 0.30 Mn, 0.30 Cr, 0.1 V, bal Fe.
For engravers tools, cutters, bearings; water hardened, wear resistant.

BOCHUM EU.
M-1331; 0.15 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For machine tool parts, gears, fasteners, case hardened.

BOCHUM K55 SPEZIAL.
M-1331; 0.55 C, 0.1-0.4 Si, 0.5-0.7 Mn, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 15 El; 20 RA; 180 Brin.
For axles, gears, bolts, shafts; water hardened.

BOCHUM K65.
M-1331; 0.60 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El; 40-54; 320-230 Brin.
For wheels, die blocks, girders, clutch discs; water hardened.

BOCHUM KPN.
M-1331; 0.50 C, 1.05 Cr, 3.25 Ni, 0.5 Mn, bal Fe.
For gears, bolts, crankshafts, axles, oil hardened, shock resistant.

BOCHUM M80.
M-1331; 0.16 C, 0.95 Cr, 1.15 Mn, 0.25 Si, bal Fe.
For gears, bolts, camshafts, cams; case hardened, tough.

BOCHUM M90.
M-1331; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, bolts, camshafts, cams; case hardened, tough.

BOCHUM M100.
M-1331; 0.22 C, 1.25 Cr, 1.30 Mn, bal Fe.
For gears, bolts, camshafts, cams; water or oil hardened.

BOCHUM MMB3.
M-1331; C, alloy, bal Fe.
For machine tool parts; oil hardened.

BOCHUM MN18G.
M-1331; 1.3 C, Mn, Cr, bal Fe.
For cutters, wear plates; oil or water hardened.

BOCHUM MNH(G).
M-1331, 1.2 C, 12.5 Mn, 0.4 Si, bal Fe.
For tracks, frogs, dipper teeth shovels; wear and abrasion resistant.

BOCHUM MNHW.
M-1331; 1.2 C, 0.4 Si, 12.5 Mn, bal Fe.
For wear plates, dipper teeth, shovels; wear and abrasion resistant.

BOCHUM PKS10H.
M-1307; 1 1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 200,000 TS, 130,000 YS; 8 El; 25 RA; 400 Brin.
For springs, taps, drills, reamers, cutters, hobs; Type W1, water hardened.

BOCHUM PKS EXTRA
M-1307; 1 0 C, 0.1 V, 0 25 Mn, bal Fe.
Heat treated: 200,000 TS; 130,000 YS; 8 El; 25 RA; 400 Brin.
For reamers, drills, drawing and stamping dies; oil or water hardened, wear resistant.

BOCHUM PKS EXTRA SPEZIAL.
M-1331; 1.0 C, Cr, V, bal Fe.
Heat treated: 200,000 TS, 130,000 YS; 8 El; 25 RA; 400 Brin.
For reamers, drills, drawing dies; oil or water hardened.

BOCHUM QKS10W.
M-1307, 1 0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 200,000 TS, 130,000 YS; 8 El, 25 RA; 400 Brin
For springs, taps, drills, reamers, cutters, hobs; Type W1; water hardened.

BOCHUM RR8.17.
M-1331, 0 08 C, 17 Cr, 0 4 Si, bal Fe.
Annealed 80,000 TS; 50,000 YS, 25 El; 50 RA, 150 Brin.
For oil refinery equipment, sinks, soot blowers; Type 430; stainless.

BOCHUM RR8 17E
M-1331; 0 1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For welded oil refinery equipment; Type 430 Ti; stainless

BOCHUM RR10.13
M-1331; 0.12 max C, 0 4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El, 70 RA; 155 Brin.
For turbine blades, cutlery, valves, surgical instruments; Type 410; stainless.

BOCHUM RR10.13Mo.
M-1331; 0 12 max C, 13 Cr, 0.2 Mo, bal Fe.
Annealed: 75,000 TS, 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, cutlery, valves, surgical instruments; Type 410; stainless.

BOCHUM RR10.13T.
M-1331; 0.12 max C, 13 Cr, 0.4 Si, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, cutlery, valves, knives; Type 410; stainless.

BOCHUM RR10.17MoS.
M-1331; 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 20 El; 45 RA; 150 Brin.
For screw machine products; Type 430F; stainless, free-cutting.

BOCHUM RR10.17S.
M-1331, 0.10 C, 20 Ni, 25 Cr, Mo, Si, Cu, bal Fe.
For chemical plant equipment, tanks; stainless, austenitic.

BOCHUM RR15.13
M-1331; 0.15 max C, 0.4 Si, 13 Cr, bal Fe
Annealed: 75,000 TS, 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, cutlery, valves, surgical instruments; Type 410; stainless.

BOCHUM RR20.13.
M-1331; 0.20 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, cutlery, valves, Type 420; stainless.

BOCHUM RR20.13Mo.
M-1331; 0.20 C, 13 Cr, 1.15 Mo, bal Fe.
Annealed 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, valves, cutlery; Type 420 Mo; stainless.

BOCHUM RR20.13Ni.
M-1331; 0.20 C, 13 Cr, Ni, bal Fe.
For valves, cutlery, surgical and dental instruments; corrosion resistant.

BOCHUM RR22.17Ni.
M-1331, 0.22 C, 17 Cr, 1.5 Ni, 0.4 Si, bal Fe
Annealed 125,000 TS; 95,000 YS; 20 El, 55 RA, 260 Brin
For pumps, marine hardware, valves; Type 431, heat and corrosion resistant.

BOCHUM RR35.17Mo
M-1331; 0.35 C, 16.5 Cr, 1.15 Mo, bal Fe
For chemical plant equipment; corrosion resistant.

BOCHUM RR40.13.
M-1331, 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 100,000 TS, 55,000 YS; 20 El; 50 RA; 200 Brin.
For valves, cutlery, pump parts, Type 420; stainless.

BOCHUM RR45.13Mo.
M-1331; C, alloy, bal Fe.
For machine tool parts; oil hardened, tough.

BOCHUM RR90.17MoV.
M-1331; 0.90 C, 18 Cr, 1.15 Mo, 1.0 V, bal Fe.
For bearings, cutlery, valves; oil hardened, wear and corrosion resistant.

BOCHUM U35.
M-1331; 0.35 C, 0.40 Si, 0.60 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 185 Brin.
For gears, bolts, axles, shafts, fasteners; water hardened.

BOCHUM U45.
M-1331; 0.45 C, 0.40 Si, 0.60 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For axles, gears, bolts, crankshafts; water hardened.

BOCHUM U60.
M-1331; 0.60 C, 0.40 Si, 0.60 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 320 Brin.
For wheels, die blocks, girders, springs, rails; water hardened.

BOCHUM U75.
M-1331; 0.75 C, 0.40 Si, 0.60 Mn, bal Fe.
Heat treated: 180,000 TS; 135,000 YS, 12 El; 36 RA; 375 Brin.
For springs, tools, hammers, rails, girders; Type W1; water hardened.

BOCHUM U90.
M-1331; 0.90 C, 0.40 Si, 0.60 Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, taps, reamers, drills; Type W1; water hardened.

BOCHUM VK22.
M-1331; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed: 78,000 TS; 40,000 YS; 22 El; 58 RA; 140 Brin.
For screws, bolts, gears; water hardened.

BOCHUM VK35.
M-1331; 0.35 C, 0.25 Si, 0.45 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS, 30 El; 53 RA; 185 Brin.
For gears, shafts, axles, bolts, water hardened.

BOCHUM VK45
M-1331; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 98,000 TS; 58,000 YS; 24 El; 45 RA; 212 Brin
For gears, bolts, axles, shafts, crankpins, water hardened.

BOCHUM VK53.
M-1331, 0.53 C, 0.25 Si, 0.65 Mn, bal Fe.
Annealed: 96,000 TS; 52,000 YS; 16 El; 23 RA; 170 Brin.
For gears, axles, bolts, shafts; water hardened.

BOCHUM VK60.
M-1331, 0.61 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated. 160,000 TS; 115,000 YS; 12 El; 40 RA; 325 Brin.
For wheels, die blocks, rails, girders; water hardened.

BOCHUM W3G.
M-1331, 0.90 C, Cr, bal Fe.
For bearings, liners, cutters; oil or water hardened, wear resistant.

BODVAR 1.
M-111; 1.0 C, 3.6 Cr, 0.5 W, 2 Co, bal Fe
For permanent magnets

BODVAR 2.
M-111; 0.95 C, 5.5 Cr, 0.5 W, 3.25 Co, bal Fe.
For permanent magnets

BODYRITE SOLDER.
M-815; Pb, bal Sn.
For solder; for auto bodies.

BOFORS 2R27.
M-1184; 0.10 max C, 13.5 Cr, 0.3 max Ni, bal Fe.
Annealed: 71,100 TS, 42,700 YS; 160 Brin.
For corrosion resistant parts; ferritic, corrosion resistant.

BOFORS 2R29.
M-1184, 0.09 C, 17 Cr, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 60 Brin.
For household articles, meat hooks, furnace grates, furnace parts.
Type 430 stainless, non-hardenable.

BOFORS 2R37.
M-1184; 0.3 C, 13 Cr, bal Fe.
Annealed: 75,000 TS; 48,000 YS; 26 El; 150 Brin.
Hardened: 250,000 TS; 215,000 YS; 8 El; C 52 Rock.
For chemical and oil refinery equipment, surgical instruments, marine hardware
Corrosion resistant steel, Type 420, stainless, hardenable.

BOFORS 2 R 47.
M-1184; 0.20 C, 13 Cr, 0.3 max Ni, bal Fe.
Hardened: 106,700 TS; 92,500 YS, 240 Brin.
For corrosion resistant parts; hardenable martensitic.

BOFORS 2R57.
M-1184; 0.30 C, 13 Cr, 0.4 Ni, bal Fe.
Annealed: 78,000 TS; 50,000 YS, 25 El; 155 Brin.
Hardened: 145,000 TS; 117,000 YS; 25 El; 280 Brin.
For chemical and oil refinery equipment, surgical instruments, gears, shafts.
Corrosion and heat resistant. Martensitic.

BOFORS 2R 77.
M-1184; 0.35 C, 13.5 Cr, 0.3 max Ni, bal Fe.
Hardened: 135,000 TS, 107,000 YS; 300 Brin.
For corrosion resistant parts; hardenable, martensitic.

BOFORS 2R107.
M-1184; 0.55 C, 14 Cr, bal Fe.
Annealed: 110,000 TS; 72,000 YS; 20 El; 240 Brin.
Hardened: 156,000 TS; 128,000 YS; 10 El; 325 Brin.
For edge tools, instruments, springs, intake valves, cutlery, surgical instruments.
AISI Type 420, hardenable, corrosion resistant.

BOFORS 2RA27.
M-1184; 0.06 C, 11.5-14.5 Cr, 0.1-0.3 Al, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 30 El; 60 RA; 160 Brin.
Cold Drawn: 85,000 TS; 70,000 YS; 20 El; 60 RA; 185 Brin.
For heat treating equipment, oil refinery equipment.
Type 405 corrosion resistant steel.

BOFORS 2RL2.
M-1184; 0.10 C, 13 Cr, 0.2 S, bal Fe.
Annealed: 72,000 TS; 35,000 YS; 30 El; 155 Brin.
Hardened: 100,000 TS; 78,000 YS; 25 El, 210 Brin.
For screw, bolts, fasteners, shafts, screw machine products.
Type 416 stainless, free-cutting.

BOFORS 2RM2.
M-1184; 0.08 C, 13 Cr, 6 Ni, bal Fe
Heat Treated Casting: 106,000-142,000 TS; 74,000 min YS; 10 min El; 230-290 Brin.
For water turbine castings, turbine blades and wheels, ship propellers, feed screws for the cellulose industry. Hardenable, stainless cast alloy.

BOFORS 2RO26.
M-1184; 0.10 C, 12 Cr, 0.5 Ni, 0.5 Mo, bal Fe.
Annealed: 78,000 TS; 50,000 YS; 27 El; 165 Brin.
Hardened: 107,000 TS; 85,000 YS; 22 El; 220 Brin.
For tableware, knives, turbine parts, machinery components.
Resistant to stress corrosion cracking. Martensitic, hardenable.

BOFORS 2RO27.
M-1184; 0.10 C, 13.5 Cr, 1.2 Mo, bal Fe.
Annealed: 78,000 TS; 50,000 YS; 25 El; 155 Brin.
Hardened: 135,000 TS; 107,000 YS; 25 El; 280 Brin.
For chemical and oil refinery equipment.
Martensitic, corrosion and heat resistant.

BOFORS 2RO46.
M-1184; 0.20 C, 12 Cr, 1.2 Mo, bal Fe
Hardened: 142,000 TS; 121,000 YS; 17 El; 300 Brin.
For steam turbine blading, compressor parts, gas turbine components, propeller shafts.
Corrosion and creep resistant, hardenable.

BOFORS 2 RO-189.
M-1184; 0.85 C, 17 Cr, 0.3 max Ni, 0.6 Mo, bal Fe.
Hardened: 590 Brin.
For corrosion resistant edge tools; martensitic, corrosion resistant, hardenable.

BOFORS A286.
M-1184; 0.06 C, 15 Cr, 25 Ni, 1.3 Mo, 0.3 V, 2.0 Ti, bal Fe
Rolled: 150,000 TS; 105,000 YS; 22 El; 290 Brin.
For gas turbine components, jet engine parts, afterburners.
High heat and creep resistant, austenitic.

BOFORS ARO-75.
M-1184; 0.3 C, 1.0 Cr, 0.25 Mo, 1.1 Al, bal Fe.
Heat treated 121,000 TS; 99,200 YS, 245-290 Brin.
For fuel pump pistons, valve parts; nitriding steel.

BOFORS B4.
M-1184; 0.25 C, bal Fe.
For machine parts; construction steel.

BOFORS B4V.
M-1184; 0.15 C, 0.65 Mn, bal Fe
Heat treated: 71,000-142,000 TS, 36.000-42,000 YS; 150-300 Brin.
For gears, shafts, case hardening

BOFORS B7
M-1184; 0.35 C, bal Fe.
For machinery parts, construction steel

BOFORS B10.
M-1184, 0.45 C, bal Fe
For machine parts, gears, construction steel.

BOFORS B12.
M-1184, 0.6 C, bal Fe
For machinery parts, construction steel

BOFORS B14.
M-1184, 0.70 C, 0.2 Si, 0.6 Mn, bal Fe.
Stress Relieved: 107,000-121,000 TS; 57,000 YS; 13 El; 220-250 Brin.
Heat Treated 175,000 TS; 130,000 YS, 12 El; 350 Brin
For machinery components, gears, shafts, control rods, axes, hammers, springs.
AISI 1070 steel
Wear resistant, water hardening

BOFORS B15T.
M-1184; 0.75 C, 0.2 Si, 0.6 Mn, bal Fe
Stress Relieved: 110,000 TS, 60,000 YS, 12 El, 240 Brin.
Heat Treated. 180,000 TS, 135,000 YS; 10 El; 370 Brin
For rock drills, chisels, reamers, shafts, axes, hammers, springs, hand tools, pliers
Water hardening, AISI 1075 steel. Wear resistant.

BOFORS B15 V.
M-1184; 0.75 C, bal Fe.
For tools, fixtures; water hardening.

BOFORS B20V.
M-1184: 1.0 C, 0.20 Si, 0.30 Mn, bal Fe.
For tools, drills, reamers; water hardened; Type W1

BOFORS B24V.
M-1184; 1.2 C, 0.2 Si, 0.3 Mn, bal Fe,
For reamers, drills, taps, hobs, cutters; water hardened; Type W1.

BOFORS B28V.
M-1184; 1.4 C, bal Fe.
For knives, trimming tools; water hardening.

BOFORS CR83.
M-1184; 0.4 C, 0.8 Cr, 1.25 Ni, bal Fe.
114,500 TS; 85,100 YS; 240 Brin.
For machine parts, shafts, crankshafts; water or oil hardened.

BOFORS CRO861.
M-1184; 0.35 C, 0.7 Mn, 1.4 Cr, 1.4 Ni, 0.2 Mo, bal Fe.
Hardened: 156,000-178,000 TS; 128,000 YS; 12 El; 45 RA; 330-370 Brin.
For shafts, gears, connecting rods, bolts, crankshafts.
AISI 4337, oil hardening, tough, shock resistant.

BOFORS DR34.
M-1184; 0.15 C, 0.7 Mn, 0.8 Cr, 1.5 Ni, bal Fe.
Hardened: 100,000-206,000 TS; 57,000-100,000 YS; 10-14 El; 210-430 Brin.
For gears, bolts, camshafts, shafting worms, chains.
Case hardening, tough.

BOFORS DR44
M-1184; 0.20 C, 0.7 Mn, 0.8 Cr, 1.5 Ni, bal Fe.
Hardened: 114,000-228,000 TS; 71,000-114,000 YS; 10-12 El, 240-480 Brin.
For gears, bolts, camshafts, worms.
Case hardening, tough

BOFORS DRO-1133.
M-64; 0.55 C, 0.6 Cr, 1.6 Ni, 0.3 Mo, bal Fe.
For drop forging dies; oil hardened.

BOFORS DRS16
M-1184; 0.80 C, 21 Cr, 1.5 Ni, 2 Si, bal Fe.
Hardened: 137,000 TS; 111,000 YS, 15 El; 290 Brin.
For outlet valves for internal combustion engines
Martensitic, heat and corrosion resistant.
Resists leaded fuels.

BOFORS FR-86
M-1184, 0.35 C, 1.2 Cr, 2.6 Ni, bal Fe
Rolled 128,000 TS; 107,000 YS; 270-300 Brin.
For crankshafts, shafts, oil hardened.

BOFORS HR-19.
M 1184, 0.55 C, 1.5 Cr, 3 Ni, bal Fe
For cold and hot work dies, bakelite dies; oil hardening

BOFORS HR33.
M-1184; 0.15 C, 0.75 Cr, 3.0 Ni, bal Fe
Heat treated: 99,500-185,000 TS, 71,100-113,800 YS; 210-390 Brin.
For gears, shafts, case hardened

BOFORS HR44
M-1184, 0.20 C, 3.0 Ni, 0.7 Cr, bal Fe
Heat treated 142,200-213,000 TS; 92,500-142,200 YS, 300-430 Brin
For gears, cams, shafts, case hardened

BOFORS HRD-1243
M-1184, 0.55 C, 1 Cr, 3 Ni, 0.3 Mo, bal Fe.
For cold and hot work dies, forging dies; oil hardening

BOFORS HRP 1152
M-1184; 0.50 C, 0.85 Mn, 1.05 Cr, 0.15 V, bal Fe
Annealed: 105,000 TS; 75,000 YP, 27 El; C 16 Rock.
Hardened 300,000 TS, 263,000 YP, 4 El; 570 Brin
For gears, springs, shafts, machinery parts, axles, clutches, small tools.
Oil hardened, shock resistant.

BOFORS IR 34.
M-1184; 0.13 C, 0.4 Mn, 0.7 Cr, 3.5 Ni, bal Fe.
Hardened: 120,000-192,000 TS, 78,000-114,000 YS, 10-12 El; 250-400 Brin.
For gears, worms, camshafts, bolts, fasteners.
AISI 3310 steel, case hardening, tough and shock resistant

BOFORS IR74.
M-1184; 0.30 C, 0.60 Mn, 0.75 Cr, 3.5 Ni, bal Fe.
For gears, pinions, shafts; oil hardening, tough.

BOFORS KR35.
M-1184; 0.12 C, 1.25 Cr, 4.5 Ni, bal Fe.
For camshafts, crankshafts, gears; case hardening, tough.

BOFORS KR75.
M-1184; 0.3 C, 1.3 Cr, 4.3 Ni, bal Fe.
Heat treated: 156,500 TS; 128,000 YS; 330-370 Brin.
For shafts, gears, wear parts; air hardening.

BOFORS N82.
M-1184; 0.4 C, 1.25 Mn, bal Fe.
99,500 TS; 71,000 YS; 240 Brin.
For machinery parts; water or oil hardened.

BOFORS N 91.
M-1184; 0.45 C, 0.8 Mn, bal Fe.
Normalized: 85,000-107,000 TS; 46,000 YS; 18 El; 180-230 Brin.
For induction and flame hardened machinery components, gears, pinions, shafting.
AISI 1045 steel. Water hardening.

BOFORS NON-SHRINKING STEEL RT-1733.
M-267; 0.85-0.95 C, 1.0-1.25 Mn, 0.5-0.6 Cr, 0.5-0.6 W, bal Fe.
For blanking dies, broaches, cutters, tools, drills, plugs, gages; non-shrinking tool steel.

BOFORS P02
M-1184; 85 C, 4.3 Cr, 6.4 W, 5 Mo, 2 V, bal Fe.
For cutters, twist drills, high speed steel.

BOFORS P03.
M-1184, 0.85 C, 7 W, 4 Cr, 3-5 Mo, 2 V, bal Fe.
Heat treated. C 64-67 Rock.
For lathe and planer tools, milling cutters, drills, broaches, reamers
High speed steel High red hardness, wear and abrasion resistant.

BOFORS P10.
M-1184, 0.75 C, 4 Cr, 18 W, 1.2 V, bal Fe.
For dies, shears, cutters, high speed steel.

BOFORS P15
M-1184, 0.8 C, 18 W, 4 Cr, 1.5 V, 2 Co, 1 Mo, bal Fe.
For cutting tools, high speed steel.

BOFORS P 121.
M-1184; 0.60-1.05 C, 0.10 V, bal Fe.
Annealed: 120,000 TS, 70,000 YS; 15 El, 220 Brin.
Hardened: 185,000 TS, 135,000 YS; 13 El; 400 Brin
For axes, cutting tools, drills, springs, punches.
Water hardening, wear resistant. Type W2

BOFORS P171
M-1184, 0.8 C, 0.1 V, bal Fe.
For pneumatic tools; water hardened.

BOFORS P181.
M-1184, 0.9 C, 0.1 V, bal Fe.
For tools, dies, punches, water hardening.

BOFORS P211.
M 1184, 1 C, 0.1 V, bal Fe
For cold working dies, pneumatic pistons, water hardening.

BOFORS Q5.
M-1184; 0.8 C, 4 Cr, 18 W, 1.7 V, 5.5 Co, 1 Mo, bal Fe
For cutters, taps, hobs, reamers; high speed steel.

BOFORS Q10.
M-1184; 0.8 C, 4 Cr, 18 W, 1.7 V, 10.5 Co, 1 Mo, bal Fe.
For cutters, millers, tool bits, hobs, high speed steel

BOFORS QRO45.
M-1184; 0.30 C, 2.8 Cr, 2.8 Mo, 0.5 V, 2.8 Co, bal Fe.
Hardened: C 45-55 Rock.
For die casting and forging dies, extrusion dies, mandrels, punches.
Oil or air hardening.
Hot work steel. Develops high red hardness and toughness to 1300°F.

BOFORS QX2.
M-1184; 1.0 C, 7 W, 4 Cr, 3-5 Mo, 2 V, 9.5 Co, bal Fe.
Hardened: C 64-67 Rock.
For lathe and planer tools, milling cutters, drills, broaches, reamers, shears.
High speed steel. High red-hardness.
Wear and abrasion resistant.

BOFORS R10-214
M-1184; 0.10 max C, 27 Cr, 5 Ni, 1.5 Mo, bal Fe.
Rolled: 85,330 TS, 64,000 YS; 210 Brin.
For sulphite-cellulose industries; high corrosion resistant.

BOFORS R10214.
M-1184; 0.20 C, 23-28 Cr, 2.5-5.0 Ni, 1-2 Mo, bal Fe.
Normalized: 103,000 TS; 78,000 YS; 18 El; 45 RA; 235 Brin.
Annealed: 95,000 TS, 41,000 YS; 29 El, 60 RA; 225 Brin.
For valves, pumps, furnace parts; Type 327; heat resistant.

BOFORS R309.
M-1184; 1.5 C, 2 Cr, bal Fe.
For files, trimmer tools; oil hardened.

BOFORS RCK3.
M-1184; 0 15 C, 25 Cr, 13 Ni, 0.2 N, bal Fe.
Annealed: 94,000 TS; 50,000 YS; 54 El; 170 Brin
For feeding plates in clinker coolers in cement industry.
Austenitic, stainless, high oxidation resistance.
Type 309S.

BOFORS RCK4.
M-1184; 0.20 C, 21 Cr, 12 Ni, 0.2 N, bal Fe.
Annealed: 117,000 TS; 67,000 YS, 41 El, 240 Brin
For outlet valve heads in internal combustion engines.
Austenitic, corrosion resistant, oxidation resistant.

BOFORS RCT.
M-1114; 0.40 C, 12 Ni, 14.5 Cr, 2 3 Si, bal Fe.
Hardened: 106,700 TS, 64,000 YS; 240 Brin
For engine valves; heat resistant.

BOFORS RCT3.
M-1184; 0.20 C, 21 Cr, 13 Ni, 1.2 Si, 3.0 W, bal Fe.
Annealed: 104,000 TS; 47,000 YS; 27 El; 220 Brin.
For stator blades, turbolators, rings in jet engines, gas and steam turbines, diesel engine valves.
Austenitic, high heat resistant.

BOFORS RD-653.
M-1184; 0.25 C, 1.1 Cr, 0.2 Mo, bal Fe.
Rolled: 128,000 TS; 99,500 YS; 270-310 Brin.
For shafts, cams, gears; oil hardened.

BOFORS RE39.
M-1184; 0.20 C, 17.5 Cr, 2.1 Ni, bal Fe.
Heat treated: 121,000-135,000 TS; 92,500-112,000 YS; 20-15 El; 60-45 RA; 260-288 Brin.
For pumps, spindles, propeller shafts; Type 431; corrosion resistant.

BOFORS REB-210.
M-1184; 0.15 C, 22.5 Cr, 24 Ni, bal Fe.
71,000 TS; 28,500 YS; 180 Brin.
For heat resistant parts; resists S and SO_2.

BOFORS RES210.
M-1184; 0.2 C, 22-24 Cr, 12-15 Ni, 2 max Mn, 1 max Si, bal Fe
Annealed: 85,000-95,000 TS; 40,000-50,000 YS; 45-55 El; 150-185 Brin.
For heat treating boxes, furnace parts, chemical plant equipment; Type 309; austenitic, heat resistant.

BOFORS RIM21.
M-1184; 0.08 C, 18 Cr, 11 Ni, 1.5 Mo, bal Fe.
Annealed: 85,000 TS; 36,000 YS; 60 El; 160 Brin
For acid resisting shafts, bolts, chemical plant equipment.
Austenitic, stainless, non-hardening.

BOFORS RIM-29.
M-1184; 0.08 max C, 18 Cr, 18 Ni, bal Fe.
Annealed· 82,500 TS; 28,500 YS; 60 El; 70 RA; 165 Brin
Cold drawn. 125,000 TS; 95,000 YS, 25 El; 55 RA; 277 Brin
For chemical and oil refinery equipment, tanks, vessels. Type 302; stainless, austenitic.

BOFORS RIM-92.
M-1184; 0.08 max C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe
Annealed· 90,000 TS, 45,000 YS, 60 El, 135 Brin.
Cold drawn 180,000 TS, 150,000 YS, 10 El, 330 Brin.
For chemical plant equipment, welded structures; Type 304; stainless, austenitic

BOFORS RIM 200
M-1184, 0 04 C, 18 Cr, 9 Ni, bal Fe
Annealed 85,000 TS, 35,000 YS, 55 El, Rock B 80
For architectural trim, kitchen equipment, chemical and textile plant equipment.
Type 304 stainless, austenitic

BOFORS RIM-210
M-1184, 0 07 max C, 19 Cr, 10 Ni, 1 5 Mo, bal Fe.
Annealed. 78,400 TS, 28,500 YS, 165 Brin.
For sulfite, cellulose industries, high corrosion resistance

BOFORS RIM 213
M-1184, 0 07 C, 18 Cr, 11 Ni, 2.3 Mo, 0 4 Ti, bal Fe
Annealed 85,000 TS; 38,000 YS, 50 El; 165 Brin.
For chemical plant equipment and structural parts operating at 900-1150°F
Stabilized, austenitic, stainless, weldable grade.

BOFORS RIM-215
M-1184; 0 08 max C, 18 Cr, 11 Ni, 2.7 Mo, bal Fe.
Annealed· 82,500 TS; 165 Brin.
For chemical industries; corrosion resistant, austenitic.

BOFORS RIM 290.
M-1184, 0 03 max C, 18 Cr, 10 Ni, bal Fe.
Annealed· 76,000 TS; 32,000 YS, 60 El, 140 Brin
For welded structures, chemical and textile plant equipment, food and drug equipment.
Type 304L stainless, austenitic steel.

BOFORS RIM-291.
M-1184, 0.08 max C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 60 El; 135 Brin.
Cold drawn: 180,000 TS, 150,000 YS; 10 El; 330 Brin.

For chemical plant equipment, welded structures; Type 304; stainless, austenitic.

BOFORS RIM-294.
M-1184; 0.08 max C, 18 Cr, 10 Ni, 0.8 Mn, 0.5 Ti, bal Fe.
Annealed: 82,500 TS; 28,500 YS; 165 Brin.
For chemical industries; heat and corrosion resistant.

BOFORS RIM295.
M-1184; 0.08 max C, 17-19 Cr, 9-12 Ni, Cb = 10 × C, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 55-50 El; 175 Brin.
For welded structures, chemical plant equipment; Type 347; corrosion and heat resistant

BOFORS RK 214.
M-1184; 0.10 max C, 28 Cr, 4.5 Ni, bal Fe
Annealed: 85,300 TS; 64,000 YS; 210 Brin.
For furnace parts, nitric acid parts; heat and corrosion resistant.

BOFORS RLH 2.
M-1184; 0 10 C, 18 Cr, 8 Ni, 0 25 S, bal Fe.
Annealed: 85,000 TS; 28,000 YS; 60 El, 160 Brin.
For screws, bolts, fasteners, shafts, screw machine products.
Type 303 stainless, free-cutting, austenitic, non-hardenable.

BOFORS RNK 29.
M 1184, 0 09 C, 18 Cr, 5 Ni, 8.5 Mn, 0 2 N, bal Fe.
Annealed 104,000 TS; 56,000 YS, 59 El; 200 Brin.
For shafts, valve parts, bolts, fittings, foodstuff and chemical equipment.
Type 202 stainless, austenitic.

BOFORS RO211.
M-1184, 0 12 C, 2.5 Cr, 1 1 Mo, bal Fe
Normalized· 88,000 TS, 70,000 YS, 26 El; 190 Brin.
For steam and gas turbine parts, operating up to 1100°F.
Martensitic, corrosion resistant.

BOFORS RO-346
M-1184; 0.15 C, 0.8 Cr, 0 6 Mo, bal Fe.
For camshafts, crankshafts, gears; case hardened, tough.

BOFORS RO-752
M-1184, 0.35 C, 1 05 Cr, 0.20 Mo, bal Fe.
For shafts, gears; tough.

BOFORS RO-952.
M-1184; 0.40 C, 1 10 Cr, 0 25 Mo, bal Fe
For shafts, gears; oil hardened, tough

BOFORS RO4154
M-1184; 0 25 C, 3 Cr, 0.5 Mo, bal Fe
Hardened· 124,000 TS; 102,000 YS; 20 El, 260 Brin.
For construction elements subjected to stresses at temperatures up to 1100°F.
Martensitic Good impact strength and resistance to temper brittleness.

BOFORS RO-7155.
M-1184; 0.30 C, 2.7 Cr, 0.5 Mo, bal Fe.
For shafts, gears; oil hardened.

BOFORS ROP10.
M-1184; 0.08 C, 3.0 Cr, 0.8 Mo, 0.2 V, bal Fe.
For hobbed molds for pressing and injection molding of plastics, hobbed dies for zinc die castings Case-hardening, shock resistant.

BOFORS ROP18.
M-1184; 0.2 C, 1.3 Cr, 0.5 Mo, 0.2 V, bal Fe.
For hobbed hot work dies, die casting and drop forging dies.
Hot work steel, oil or air hardening.

BOFORS ROP19.
M-1184; 0.40 C, 5.3 Cr, 1.4 Mo, 1.0 V, 1.0 Si, bal Fe.
Annealed: 98,000 TS; 74,000 YS; 28 El; 210 Brin.
Heat Treated: 290,000 TS; 228,000 YS; 3 El; C 55 Rock.
For die casting and hot pressing dies, extrusion dies, mandrels, punches.
Type H13 hot work steel Tough and red hard.

BOFORS ROP21
M-1184; 1 C, 5.3 Cr, 0.2 V, 1.1 Mo, bal Fe.
For cold work dies, shears, press tools; air hardened.

BOFORS ROP43.
M-1184; 0.23 C, 12 Cr, 1.2 Mo, 0.6 Ni, 0.3 V, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened: 240,000 TS; 205,000 YS; 9 El; C 48 Rock.
For cutlery, bearings, valves, surgical instruments, Corrosion resistant, hardenable.

BOFORS ROP46.
M-1184, 0 20 C, 12 Cr, 0.5 Mo, 0.35 V, bal Fe
Annealed· 90,000 TS, 38,000 YS, 26 El; B 90 Rock.
Hardened: 235,000 TS, 200,000 YS, 9 El, C 50 Rock.
For valves, cutlery, bearings, surgical instruments, valves; corrosion resistant, hardenable.

BOFORS ROP57.
M-1184, 1 5 C, 12 Cr, 0.2 V, 0.8 Mo, bal Fe.
For dies, stamping and shearing tools; oil or air hardened

BOFORS ROP-63
M-1184, 0 30 C, 0 3 Mn, 2.5 Cr, 0.2 V, 0.5 Ni, 0 3 Mo, bal Fe
Heat treated· 142,200 TS; 121,000 YS; 295-330 Brin.
For gears, shafts, nitrided parts; nitriding steel.

BOFORS ROP5462.
M-1184, 0 24 C, 1.3 Cr, 0.5 Mo, 0 2 V, bal Fe.
Hardened· 121,000 TS; 107,000 YS; 20 El, 260 Brin.
For steam turbine rings, bolts, screws, nuts at temperatures to 1025°F.
Martensitic, high temperature steel.

BOFORS ROP9653.
M-1184; 0 45 C, 1.5 Cr, 0 7 Mo, 0 3 V, bal Fe
For die casting and hot pressing dies, extrusion dies and mandrels, punches, forging dies
Hot work, oil hardening steel.

BOFORS ROPT.
M-1184; 0 20 C, 3.0 Cr, 0.6 Mo, 0 5 W 0.8 V, bal Fe
Hardened· 128,000 TS; 107,000 YS; 17 El; 275 Brin.
For turbine discs for jet engines, gas and steam turbines, shafts, rotors, bolts.
Martensitic, high creep resistance.

BOFORS RP1152 see BOFORS HRP 1152.

BOFORS RR27
M-1184, 0 08 max C, 11 5-13 Cr, 0 1-0.3 Al, bal Fe.
Annealed 71,000 TS; 42,600 YS, 22 El; 70 RA; 150 Brin
Heat treated· 175,000 TS; 145,000 YS; 21 El; 64 RA, 352 Brin.
For oil refinery and chemical plant equipment; Type 405; corrosion resistant.

BOFORS RR77.
M-1184; 0.15 min C, 12 14 Cr, bal Fe.
Annealed: 88,000 TS; 40,000 YS; 32 El; 68 RA; 170 Brin.
For cutlery, valve trim, turbine blades; Type 420; stainless, hardenable.

BOFORS RR212.
M-1184; 0.35 C, 23-27 Cr, bal Fe.
Annealed: 90,000 TS; 60,000 YS; 20 El; 45 RA; 180 Brin.
For furnace parts, heat treating boxes; Type 446; heat resistant.

BOFORS RR412.
M-1184; 0.35 C, 23-27 Cr, bal Fe.
Annealed: 90,000 TS; 60,000 YS; 20 El; 45 RA; 180 Brin.
For furnace parts, heat treating boxes; Type 446; heat resistant.

BOFORS RT27.
M-1184; 0.3 C, 1 Cr, 5.5 W, 3.5 Ni, bal Fe.
For extrusion dies, mandrels; oil hardened, hot work steel.

BOFORS RT45.
M-1184; 0.3 C, 3 Cr, 10 W, 2 Ni, 0.3 V, bal Fe.
For die casting dies, hot work dies; hot work steel, oil hardened.

BOFORS RT46.
M-1184; 0.30 C, 12 Cr, 12 W, 0.5 V, bal Fe.
For die casting and pressing dies, extrusion dies and mandrels, punches. Hot work steel Type H23. Develops red hardness and toughness up to 1300°F

BOFORS RT60.
M-1184; 2 C, 13 Cr, 1 W, bal Fe.
For stamping and shearing tools, dies; oil hardening.

BOFORS RT 225
M-1184; 1.3 C, 5 W, bal Fe
For impact extrusion dies, water hardened.

BOFORS RT-1733.
M-1184; 0.9 C, 0.6 Cr, 0.6 W, 1.2 Mn, bal Fe
For cutting, threading tools; oil hardening.

BOFORS RTO 712.
M-1184; 0.4 C, 1.2 Cr, 2.5 W, 0.3 Mo, 0.15 V, bal Fe.
For chisels, pneumatic tools; tough.

BOFORS RTO-912.
M-1184, 0.45 C, 1 Cr, 2.5 W, 0.25 Mo, 0.15 V, bal Fe.
For chisels, shear blades; hot work steel.

BOFORS S-145.
M-1184; 0.55 C, 1.75 Si, 0.75 Mn, bal Fe.
Hardened: 185,000 TS; 164,000 YS, 380-440 Brin
For springs; tough, oil hardened.

BOFORS SIR.
M-1184, 0.20 C, 25 Cr, bal Fe.
Annealed. 71,000 TS, 43,000 YS, 170 Brin.
For furnace parts, heat treating boxes, quenching baskets.
Corrosion and heat resistant to 2000°F

BOFORS SRO
M-1184, 0.45 C, 9 Cr, 0.3 Mo, 2.8 Si, bal Fe.
Hardened: 144,000 TS; 121,000 YS; 30 El; 320 Brin
For valves, oil refinery equipment.
Martensitic, heat and corrosion resistant.

BOFORS SRO2.
M-1184; 0.45 C. 13 Cr, 1.0 Ni, 2.8 Si, bal Fe.
Heat Treated 142,000 TS; 121,000 YS; 16 El; 300 Brin.
Uses: Intake valves, outlet valves.
Martensitic steel, corrosion and oxidation resistant.

BOHLER.
German; 0.015 C, 1 Mn, 1.2 Si, 17.5 Cr, 16 Ni, 1.75 Mo, 2 Cb, 0.12 V, bal Fe.
For gas engine parts; high heat resistance.

BOHLER 2M.
M-27; 0.5 C, 0.3 Si, 1.8 Mn, bal Fe.
Hardened: 170,000-200,000 TS; 150,000 YS; 9 El; 352-415 Brin.
For leaf springs; spring steel.

BOHLER 2NCMO.
M-27; 0.30 C, 0.7 Cr, 1.9 Ni, 0.25 Mo, bal Fe.
Heat treated: 121,000 TS; 92,500 YS.
For turbine and motor parts; oil hardened, shock resistant.

BOHLER NO. 2 Si.
M-27; 0.6 C, 2 Si, bal Fe.
Heat treated: 220,000 TS; 156,000 YS; 460 Brin.
For valves, springs; good resistance to scaling.

BOHLER 3NIMO.
M-27, 0.15 Cr, 3.5 Ni, 0.25 Mo, bal Fe.
For gears, cams, camshafts, case hardened.

BOHLER 3 NM.
M-27; 0.32 C, 3 Ni, bal Fe.
Hardened: 113,000 TS, 71,000 YS; 20 El; 50 RA; 240 Brin.
For bolts, shafts, gears, connecting rods; tough.

BOHLER NO 3 NW.
M-27, 0.14 C, 3.0 Ni, bal Fe.
Heat treated 100,000 TS; 64,000 YS; 22 El, 55 RA; 235 Brin
For gears, cams, camshafts, case hardening steel.

BOHLER 3WKZ.
M-27, C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe
For tools, dies, hot work dies, hot work steel.

BOHLER NO 4
M-27, 0.5 C, 2.25 W, 0.25 V, bal Fe
For hot work tools and dies, hot work steel

BOHLER NO 5 NM
M-27, 0.25 C, 5.0 Ni, bal Fe.
For auto parts, crankshafts.

BOHLER 5 NW
M-27, 0.12 C, 5 Ni, bal Fe.
Oil treated 105,000-143,000 TS, 75,000-118,000 YS, 20-18 El, 60-57 RA, 210-288 Brin.
For gears, shafts, turbine blades, carburizing steel.

BOHLER NO. 16
M-27, 0.9 C, 0.1-0.2 V, bal Fe
For tools, drills, chasers, water hardened.

BOHLER NO. 36 N
M-27, C, alloy, bal Fe
For component parts of barometers, optical instruments, low coefficient of expansion.

BOHLER NO 90.
M-27, 0.90 C, 0.20 max Si, 0.30 Mn, bal Fe.
For cold heading and forming dies for heavy duty; water hardening

BOHLER 701.
M-27; 0.45 C, 3 Si, 9 Cr, bal Fe.
Heat treated: 135,200 TS, 106,700 YS
For inlet and exhaust valves, corrosion and heat resistant

BOHLER NO. 711
M-27; 50 Fe, 50 other metals.
For hard facing work, well drill bits, cutting tools, does not require heat treatment for hardening.

BOHLER 751.
M-27, 0.70 C, bal Fe.
Annealed: 85,000-100,000 TS; 175-204 Brin.
Heat Treated: 174,000 TS; 128,000 YS; 12 El, 355 Brin.
For soft to hard rock drills, hammers, punches
Water hardening, wear resistant.

BOHLER 851.
M-27; 0.85 C, bal Fe.
Hardened: Rock C 65.
Annealed: 85,000-100,000 TS; 175-204 Brin.
For mines, quarries and road construction drills, hard rock drills, punches.
Water hardening, wear resistant.

BOHLER ACO.
M-27; 0.27 C, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment, fasteners; heat and creep resistant.

BOHLER AC1.
M-27; 0.34 C, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment, bolts; heat and creep resistant.

BOHLER AC3.
M-27; 0.30 C, Cr, V, bal Fe.
For gears, shafts, crankshafts, machine tool parts; oil or water hardened.

BOHLER ACE
M-27, 0.33 C, 1.1 Cr, 1.1 Al, 0.20 Mo, bal Fe.
Heat treated. 114,000 min TS; 85,400 YS.
For gears, shafts, construction parts; nitriding steel.

BOHLER ACN.
M-27, 0.35 C, 0.5 Mn, 1.8 Cr, 1 Ni, 1.1 Al, Mo, bal Fe
Hardened: 142,000-160,000 TS; 113,000 YS; 13 El, 40 RA, 293-340 Brin
For gears, shafts, pump parts, nitriding steel.

BOHLER ACV
M-27; 0.3 C, 0.6 Mn, 2.5 Cr, 0.2 Mo, 0.3 V, bal Fe
Hardened 145,000-150,000 TS, 128,000 YS, 13 El, 45 RA, 320-373 Brin
For gears, shafts, valves, cylinders; nitriding steel.

BOHLER AS 2.
M-27, 0.2 C, 18 Cr, 8 Ni, bal Fe
Annealed 85,000 TS; 35,000 YS, 60 El, 70 RA, 150 Brin
Rolled 125,000 TS, 95,000 YS, 25 El, 55 RA; 277 Brin.
For chemical plant equipment; Type 302, stainless, austenitic

BOHLER AS2G.
M-27, 0.15 C, 1.5 Si, 18 Cr, 8.5 Ni, bal Fe
Annealed: 80,000 TS, 35,000 YS; 55 El, 70 RA, 150 Brin
Cold drawn: 180,000 TS, 150,000 YS, 10 El, 250 Brin
For chemical plant equipment, tanks, filters, Type 302; stainless, austenitic

BOHLER AS-4.
M-27, 0.10 max C, 16-18 Cr, 10-14 Ni, 2 max Mo, Cb, bal Fe
Annealed. 85,000-95,000 TS, 35,000-45,000 YS; 60-50 El, 75-60 RA; 150-190 Brin.
For valve seats, cones and spindles, piston rods; Type 316 Cb; austenitic, stainless.

BOHLER AS-8
M-27; 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS, 60-50 El; 75-60 RA; 150-190 Brin.
For valve seats, kitchen utensils, chemical plant equipment; Type 316; stainless, austenitic.

BOHLER AUTO MS.
M-27; 0.5 C, Mn, Si, bal Fe.
For crankshafts, connecting rods, axles, cranks, levers; oil hardened.

BOHLER AUTO SPECIAL PA.
M-27; 0.35 C, 1.25 Cr, 4.45 Ni, bal Fe.
For crankshafts, gear shafts, axles, steering gear parts; oil hardened.

BOHLER AWP.
M-27, 0.45 C, 1.4 Si, 0.8 Mn, 13 Cr, 13 Ni, 1.3 W, 1.2 V, bal Fe.
For hot extrusion dies, die casting dies, hot working dies.
Hot work steel, tough.

BOHLER AZH
M-27; 0.85 C, 0.3 Mn, 0.25 Si, bal Fe.
For tools, drills, taps, water hardening.

BOHLER BATS.
M-27, C, bal Fe. For bats for threshing machines.

BOHLER B-ELITE.
M-27; 0.2 C, bal Fe For welding wire and electrodes, for electric arc welding

BOHLER B-ELITE 18
M-27; C, bal Fe For welding wire and electrodes; for electric arc welding.

BOHLER B-ELITE U
M-27, 0.1 C, bal Fe For welding wire and electrodes, electric arc welding.

BOHLER BH
M-27, C, bal Fe For welding wire and electrodes; for electric arc welding

BOHLER BHC
M-27, 0.7 C, 2 Mn, 1 Cr, 0.2 Ti, bal Fe.
Welded 220,000 TS
For hard facing rod; wear resistant

BOHLER BH-EXTRA
M-27, C, bal Fe
For welding wire and electrodes, for electric arc welding

BOHLER BHS
M-27, 0.22 C, 1.6 Mn, 0.3 Ti, bal Fe
Welded: 87,000 TS.
For welding wire; wear resistant.

BOHLER BHW
M-27, C, bal Fe
For welding wire and electrodes, for electric arc welding

BOHLER BLADE STEEL.
M-27, C, bal Fe
For blades

BOHLER BLITZ
M-27, 0.65 C, 0.65 Mn, bal Fe.
Heat treated: 99,600 TS, 64,000 YS
For rifle barrels; water hardened.

BOHLER BM.
M-27, C, bal Fe.
For welding wire and electrodes; for arc welding.

BOHLER BOREAS.
M-27, C, bal Fe.
For drawing plates of steel wire and hard bronze wire; for arc welding.

BOHLER BROWNIE.
M-27; C, bal Fe.
For mining drills; for work on medium hard rocks.

BOHLER BROWNIE EXTRA.
M-27; C, bal Fe.
For mining drills; for work on hardest rocks.

BOHLER BS2.
M-27; 0.55 C, 0.10-0.40 Si, 0.5-0.7 Mn, bal Fe.
Heat treated: 155,000 TS; 110,000 YS; 15 El; 45 RA; 320 Brin.
For gears, bolts, shafts, axes, fasteners; water hardened.

BOHLER B-SPECIAL.
M-27; C, bal Fe.
For welding wire; for gas welding.

BOHLER BTH.
M-27; 0.60 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
For rails, hammers, springs, bolts, gears, shafts; water hardened.

BOHLER BW.
M-27; C, bal Fe.
For welding electrodes; for electric arc welding.

BOHLER BW-VII.
M-27; C, bal Fe.
For welding wire; for gas welding.

BOHLER BW-IX.
M-27; C, bal Fe.
For welding wire; for gas welding.

BOHLER BW XII.
M-27; 0.1 C, 1 Mn, 0.5 Ni, bal Fe.
Welded: 67,000 TS; 22-26 El.
For welding wire, gas welding.

BOHLER C/2.
M-27; 0.85 C, 0.50 Cr, bal Fe.
For wood saws, band saws; water hardened.

BOHLER CC.
M-27; 0.8 C, 18 W, 1.6 V, 1 Mo, 4.2 Cr, 9 Co, bal Fe.
For super high speed cutters, reamers, taps; high speed steel.

BOHLER CC55N.
M-27; 1.35 C, 12.5 W, 4 Cr, 4 V, 5 Co, bal Fe.
For cutters, forming dies, tools; oil hardened, wear resistant.

BOHLER CC55 SPEZIAL.
M-27; 1.5 C, 12 W, 5 Cr, 5 V, 5 Co, bal Fe.
For high speed cutters, high speed steel.

BOHLER CC SPECIAL.
M-27; 0.65 C, 4.1 Cr, 18.5 W, 1.35 V, 18.5 Co, 0.8 Mo, bal Fe.
For super high speed cutters; high speed steel.

BOHLER CM EXTRA.
M-27; 0.58 C, 1.0 Cr, 0.95 Mn, 0.09 V, bal Fe.
For springs, gears, crankshafts, bolts; oil hardened, shock resistant.

BOHLER CMO.
M-27; 0.25 C, 1.1 Cr, Mo, bal Fe
Hardened: 128,000-150,000 TS; 100,000 YS; 16 El; 50 RA; 262-311 Brin.
For shafts, gears, bolts; water hardening.

BOHLER CNME.
M-27 0.56 C, Ni, Cr, Mo, V, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

BOHLER CNW.
M-27; 0.45 C, 1.35 Cr, 1.65 Ni, bal Fe.
For tools, dies, gears, shafts; oil hardening.

BOHLER COH.
M-27; C, Co, bal Fe.
For magnets; magnetic steel.

BOHLER COK.
M-27; 0.95 C, 0.30 Mn, 8.5 Cr, 15.5 Co, 1.0 Mo, bal Fe.
For magnets, regulators for furnace installations; magnet steel.

BOHLER COM.
M-27; C, Co, bal Fe.
For half ring and horseshoe magnets; magnet steel.

BOHLER CRUCIBLE QUALITY.
M-27; 0.7-1.2 C, bal Fe.
For tools, dies; crucible quality steel.

BOHLER CRV.
M-27; 0.5 C, 1 Cr, V, bal Fe.
Hardened: 185,000-225,000 TS; 170,000 YS; 400-477 Brin.
For springs; oil hardening.

BOHLER CS.
M-27, 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For high temperature springs; heat resistant.

BOHLER CSF.
M-27; 0.6 C, 0.8 Cr, 1.7 Si, bal Fe.
Heat treated: 199,200 TS; 170,800 YS.
For springs, oil hardened, tough.

BOHLER CSI.
M-27; 0.7 C, 1.3 Si, 0.5 Cr, bal Fe.
For tools, dies, punches; shock resistant.

BOHLER CV.
M-27, 1.2 C, 0.8 Cr, 0.1 V, bal Fe.
For drills, taps; water or oil hardened.

BOHLER DC 7.
M-27, 0.2 C, 0.3 Si, 1 Mn, 0.5 Cr, bal Fe
Hardened 78,000-85,000 TS; 42,000 YS; 28 El; 142-176 Brin
For bolts, valves, fittings, case hardening.

BOHLER DCM 10.
M-27, 0.15 C, 0.3 Si, 0.7 Mn, 1.1 Cr, 0.2 Mo, bal Fe.
Hardened: 85,000-105,000 TS, 57,000 YS; 24 El; 60 RA; 176-223 Brin
For bolts for high temperature; case hardening

BOHLER DCM 12
M-27, 0.25 C, 0.6 Mn, 1.2 Cr, 0.2 Mo, bal Fe.
Hardened: 92,000-113,000 TS; 71 000 YS; 22 El; 60 RA, 192-235 Brin.
For high temperature bolting; good creep resistance

BOHLER DCM 15.
M-27; 0.25 C, 0.5 Mn, 1.3 Cr, 0.4 Mo, bal Fe
Hardened 106,000-120,000 TS; 85,000 YS; 22 El; 60 RA, 223 253 Brin.
For bolting for high temperature, good creep resistance

BOHLER DCM42
M-27; 0.25 C, 1.1 Cr, 0.2 Mo, bal Fe.
Heat treated: 92,500 TS, 71,200 YS.
For steam boiler equipment; heat and creep resistant.

BOHLER DCM54.
M-27; 0.25 C, 1.3 Cr, 0.45 Mo, bal Fe.
Heat treated: 113,800 TS; 85,400 YS.
For power engines; used up to 970°F.

BOHLER DCM195.
M-27, 0.1 C, 5.5 Cr, 0.5 Mo, bal Fe.
Heat treated: 85,400 TS; 56,900 YS.
For power engines; used up to 1120°F.

BOHLER DCM910.
M-27; 0.1 C, 2.3 Cr, 1 Mo, bal Fe.
Heat treated: 71,200 TS, 38,400 YS.
For steam boiler parts; used up to 1022°F.

BOHLER DCMV7.
M-27; 0.10 C, 1.8 Cr, 0.3 Mo, 1.1 Si, 0.3 V, bal Fe.
Heat treated: 71,200 TS; 42,700 YS.
For oil plant pipes and vessels; used up to 1022°F.

BOHLER DCMV 20.
M-27; 0.18 C, 1 Cr, 0.4 Si, 0.6 Mn, 0.45 Mo, 0.2 V, bal Fe.
Hardened: 106,000-120,000 TS; 85,000 YS; 21 El; 50 RA; 223-248 Brin.
For high temperature bolting; good creep resistance.

BOHLER DCMV 30.
M-27; 0.18 C, 1.2 Cr, 0.5 Mo, 0.3 V, bal Fe.
Hardened: 113,000-128,000 TS; 85,000 YS; 19 El; 50 RA; 235-262 Brin.
For high temperature bolting; good creep resistance.

BOHLER DCMV55.
M-27; 0.24 C, 1.24 Cr, 0.5 Mo, 0.2 V, bal Fe.
Heat treated: 114,000 TS; 84,500 YS.
For heat engines; used up to 970°F.

BOHLER DCMV511.
M-27; 0.20 C, 1.3 Cr, 1.1 Mo, V, bal Fe.
Heat treated: 99,600 TS; 78,300 YS.
For high temperature screws; used up to 986°F.

BOHLER DCMVW12.
M-27; 0.22 C, 3 Cr, 0.5 Mo, 0.8 V, W, bal Fe.
Heat treated: 114,000 TS; 78,300 YS
For engine parts, used up to 986°F.

BOHLER DMO3.
M-27, 0.15 C, 0.30 Mo, 0.70 Mn, bal Fe
Annealed: 64,000 TS, 38,400 YS.
For steam boiler fittings; used up to 986°F.

BOHLER DMO6
M-27; 0.15 C, 0.55 Mo, 0.45 Mn, bal Fe
Annealed 64,000 TS, 41,300 YS.
For steam boiler fittings; used up to 970°F.

BOHLER DMV83.
M-27, 0.14 C, 0.80 Mo, 0.30 V, bal Fe.
Heat treated 99,600 TS, 85,400 YS.
For heat resistant parts; used up to 986°F.

BOHLER D SPECIAL
M 27; 1.2-1.3 C, 0.6-0.8 Mn, 1.05-0.25 Si, 1.1-1.3 Cr, bal Fe
For tools, dies, oil hardening.

BOHLER E2
M-27, 0.15 C, 0.25 Si, 0.37 Mn, bal Fe
Annealed: 70,000 TS, 40,000 YS, 25 El, 60 RA; 145 Brin
For gears, bolts, machine tool parts, case hardened

BOHLER EB30.
M 27, 0.13 C, 4 Cr, bal Fe.
For oil refinery equipment, creep and heat resistant.

BOHLER EB60
M-27, 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
Heat treated: 114,000 TS; 57,000 YS
For gears, bolts, machine tool parts; case hardened.

BOHLER EB80.
M-27, 0.16 C, 1.05 Mn, 0.95 Cr, bal Fe
Heat treated. 142,500 TS; 86,000 YS.
For gears, cams, camshafts; case hardened.

BOHLER EB95.
M-27; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe
Heat treated: 171,000 TS; 100,000 YS.
For gears, cams, camshafts; case hardened.

BOHLER EB100.
M-27, 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, cams, camshafts; case hardened

BOHLER EBK.
M-27; 0.16 C, bal Fe.
For machine tool parts; case hardened.

BOHLER EBKW.
M-27; 0.10 C, bal Fe.
Heat treated: 85,400 TS.
For machine tool parts; case hardened.

BOHLER EBM.
M-27; 0.20 C, 1.15 Cr, 1.25 Mn, bal Fe.
Heat treated: 150,000 TS.
For gears, cams, camshafts; case hardened.

BOHLER ECL 80.
M-27; 0.15 C, 1 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
Oil hardened: 128,000-156,000 TS; 100,000 YS; 14 El; 40 RA; 262-321 Brin.
For gears, shafts, pinions; high core strength, tough, case hardened.

BOHLER ECL 100.
M-27; 0.2 C, 1 Mn, 1.3 Cr, 0.25 Mo, bal Fe.
Oil hardened: 156,000-200,000 TS; 120,000 YS; 10 El; 30 RA; 335-410 Brin.
For gears, shafts, pinions; case hardening, tough core.

BOHLER ECN 100.
M-27; 0.15 C, 1 Cr, 0.8 Ni, bal Fe.
For gears, pinions, crankshafts; carburizing steel, tough.

BOHLER ECN150.
M-27; 0.15 C, 1.55 Cr, 1.55 Ni, 0.5 Mn, bal Fe
For gears, bolts, oil refinery equipment; case hardened, tough.

BOHLER ECN 200
M-27; 0.17 C, 2 Cr, 1.8 Ni, 0.1 Mo, bal Fe.
Heat treated 190,000 TS, 130,000 YS.
For gears, pinions, shafts; case-hardening, tough

BOHLER EL.
M-27, 0.05 C, 4 Cr, 0.5 Mo, bal Fe
Heat treated: 107,000 TS.
For plastic mold dies.

BOHLER EMC
M-27, 0.40 C, 1.0 Cr, bal Fe
Heat treated: 241,800 TS, 185,000 YS
For structural parts, gears, shafts, oil hardened.

BOHLER ENA.
M-27, 0.16 max C, 1.5 Ni, 0.2 Cr, bal Fe
For gears, cams, camshafts, case hardening, tough

BOHLER FPB EXTRA
M-27; 0.14 C, 1 Cr, 4.3 Ni, bal Fe
For plastic mold dies, case hardened.

BOHLER EPB EXTRA M.
M-27, 0.19 C, 4.00 Ni, 0.20 Mo, 1.25 Cr, bal Fe
Heat treated: 200,000 TS.
For gears, bolts, camshafts, cams; case hardened, shock resistant.

BOHLER EPB EXTRA W
M-27, 0.20 C, 1.2 Cr, 4.3 Ni, 0.35 W, bal Fe.
For tools, dies, case hardened

BOHLER EPB PRIMA.
M-27; 0.17 C, 1.5 Cr, 1.5 Ni, bal Fe.
For plastic mold dies; case hardened.

BOHLER FPB SPEZIAL.
M-27, 0.13 C, 0.80 Cr, 3.5 Ni, bal Fe
For plastic mold dies; case hardened

BOHLER ES.
M-27, 0.17 max C, Mn, Si, bal Fe
For gears, cams, camshafts; case hardening steel.

BOHLER ES 2.
M-27, 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed. 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, bolts, machine tool parts; case hardened

BOHLER ESC.
M-27; 0.15 max C, 0.75 Cr, bal Fe.
For gears, cams, camshafts; case hardening steel.

BOHLER ESK.
M-27; 0.15 C, 0.8 Cr, bal Fe.
For gears, shafts; case hardening.

BOHLER ES PRIMA.
M-27; 0.13 C, 2.5 Ni, 0.7 Cr, bal Fe.
For gears, bolts, camshafts, cams;
case hardened, shock resistant.

BOHLER ES SPECIAL.
M-27; 0.15 C, 0.8 Cr, 3.5 Ni, bal Fe.
Rolled: 100,000 TS; 78,000 YS; 22 El; 200 Brin.
Oil hardened: 200,000 TS; 175,000 YS; 14 El;
400 Brin.
For fasteners, gears, camshafts, splineshafts,
pawls, arbors.
Case hardening, tough, wear resistant.

BOHLER EWH.
M-27; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Cold Rolled: 78,000 TS; 66,000 YS, 20 El; 156 Brin.
Water Hardened: 104,000 TS; 80,000 YS;
6 El; 205 Brin.
For fasteners, gears, camshafts, cams, pawls.
Case-hardening, wear resistant.

BOHLER EXTRA FM.
M-27; 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For bearings, bushings, cutters; water
or oil hardened, wear resistant

BOHLER EXTRA H.
M-27; 1.1 C, 0.1 V, bal Fe.
For nail machine dies and cutters, cutting dies,
coining dies; water hardening

BOHLER EXTRA HARD.
M-27; 1.4 C, 0.5 Cr, 1.1 V, bal Fe
For cutting tools, razors, surgical instruments,
chisels, drawing mandrels; oil hardening.

BOHLER EXTRA K.
M-27; 0.8 C, 2.0 Cr, bal Fe.
For cold rolls, press discs, rams, cams;
wear resisting.

BOHLER EXTRA K 5.
M-27; 1 C, 5 Cr, 1 Mo, V, bal Fe.
For forming and blanking tools; air hardened, tough.

BOHLER EXTRA MG.
M-27; 1.05 C, 1.0 Mn, 0.6 Cr, bal Fe.
Water Hardened: 220,000 TS; 155,000 YP;
11 El; 600 Brin.
Oil Hardened: 188,000 TS; 120,000 YP; 10 El;
400 Brin.
For taps, threading dies, chasers, reamers, broaches,
gauges, knives, bearings, plastic mold dies.
Tough, oil harden or water harden.

BOHLER EXTRA MITTEL-HART.
M-27; 1.25 C, bal Fe.
For milling cutters, file cutters, stone picks,
knives, cams; water hardening.

BOHLER EXTRA RAPID 300.
M-27; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For forming and blanking dies, engravers' tools,
high speed steel.

BOHLER EXTRA S.
M-27, M-1618; 0.9 C, 0.1 V, bal Fe.
For cold header dies and punches; shock resistant.

BOHLER EXTRA SC.
M-27; 1.25 C. 1.15 Si, 1.2 Cr, 0.7 Mn, bal Fe.
For engravers' tools, bearings, bushings;
oil hardened, wear resistant.

BOHLER EXTRA SOFT.
M-27; 0.70 C, bal Fe.
For hammers, axes, tools, shafts, rails; Type W1;
water hardened.

BOHLER EXTRA TOUGH.
M-27; 1.12 C, 0.25 Si, 0.23 max Mn, bal Fe.
For taps, threading dies, reamers, mint dies;
water hardening. AISI W1.

BOHLER EXTRA WEICH.
M-27; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 174,000 TS; 128,000 YS; 12 El;
37 RA; 355 Brin.
For springs, rails, punches, hammers, axes;
water hardened; Type W1.

BOHLER EXTRA ZAH.
M-27; 0.85 C, 0.2 Mn, 0.25 Si, bal Fe.
For tools, drills, taps, punches;
Type W1; water hardened.

BOHLER EXTRA ZAHNHART.
M-27; 1.1 C, 0.2 Mn, 0.2 bal Fe.
For tools, drills, taps; water hardening.

BOHLER EXTRA ZH100.
M-27, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS, 53,000 YS; 21 El;
42 RA; 200 Brin.
For springs, tools, Type W1; water hardened

BOHLER F120.
M-27; 1.2 C, bal Fe
Hardened: Rock C 66
Annealed: 85,000-100,000 TS, 175-204 Brin.
For machinist files, drills, cutters, reamers
Water hardening, wear resistant.

BOHLER F130.
M-27; 1.3 C, bal Fe
Hardened: Rock C 66
Annealed: 85,000-100,000 TS, 175-204 Brin.
For hard files
Water hardening, wear resistant.

BOHLER F145.
M-27, 1.45 C, bal Fe
Hardened Rock C 66
Annealed: 85,000-100,000 TS, 175-204 Brin.
For precision and circular files, knurling
and rotary files.
Water hardening, wear resistant.

BOHLER FB8
M-27, 0.12 max C, 0.8 Si, 0.8 Al, 6.5 Cr, bal Fe.
For oil refinery equipment, creep and heat resistant.

BOHLER FB8G
M-27; 0.3 C, 2.2 Si, 6 Cr, bal Fe
For oil refinery equipment, creep and heat resistant

BOHLER FB10.
M-27; 0.12 max C, 1 Si, 1 Al, bal Fe.
For oil refinery equipment.

BOHLER FB30G.
M-27; 0.6 C, 1.5 Si, 29 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant

BOHLER FB30S.
M-27; 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe.
Cast: 90,000 TS; 65,000 YS; 2 El; 212 Brin.
For cylinder liners, bushings, valve seats and bodies;
corrosion and heat resistant.

BOHLER FC.
M-27; 1.4 C, 0.7 Cr, bal Fe.
Hardened: Rock C 67.
Annealed: 85,000-100,000 TS; 175-204 Brin.
For precision files, needle files,
knurling and rotary files.
Water hardening, wear resistant.

BOHLER FF.
M-27; 0.15 C, 2 Si, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 302; stainless, austenitic.

BOHLER FF.
M-27; 0.2 max C. 22-24 Cr, 12-15 Ni, 2 max Mn, 3.5 max Si, bal Fe.
Annealed: 85,000-95,000 TS, 40,000-50,000 YS; 45-55 El; 150-185 Brin.
For heat treat boxes, furnace parts, refinery equipment; Type 309, austenitic, heat resistant.

BOHLER FFB.
M-27, 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe
Annealed: 95,000 TS; 45,000 YS, 50 El; 65 RA; 180 Brin.
At 1200°F 57,000 TS, 22,000 YS, 32 El; 45 RA
For valves, pumps, engine components, furnace parts, Type 310, austenitic, heat resistant

BOHLER FFBG
M-27, 0.4 C, 2 Si, 26 Cr, 14 Ni, bal Fe.
Annealed 90,000 TS; 45,000 YS; 45 El; 170 Brin.
For furnace parts, valves, pumps; Type HI; corrosion and heat resistant.

BOHLER FFG
M-27; 0.4 C, 2 Si, 22 Cr, 9.5 Ni, bal Fe.
Cast: 85,000 TS, 45,000 YS; 35 El; 165 Brin.
For furnace parts, heat treating boxes, conveyors; Type HF; corrosion and heat resistant.

BOHLER FIRST QUALITY
M-27, 0.7-1.3 C, bal Fe.
For general purpose tools and dies, water hardening

BOHLER FM.
M-27, 0.15 C, 0.2 Si, 1.5 Cr, 0.4 Mn, bal Fe
For staybolt taps, screw dies, gages, milling cutters, reamers, drills, rulers, case hardened

BOHLER FM EXTRA
M-27, 1.5 C, 1.4 Cr, 0.1 V, bal Fe.
For tools, dies, bearings, wear resistant.

BOHLER FOX A 7.
M-27, 0.12 C, 7 Mn, 19 Cr, 0.5 Ni, bal Fe
Welded: 95,000 TS, 48 El.
For stainless welding electrodes, austenitic, corrosion resistant

BOHLER FOX DCMS.
M-27, 0.15 C, 0.6 Mn, 0.8 Cr, 0.4 Mo, bal Fe
Welded. 86,000 TS, 27 El.
For welding electrodes; for high temperature service.

BOHLER FOX DMO.
M-27; 0.1 C, 0.6 Mn, 0.4 Mo, bal Fe.
Welded: 80,000 TS, 33 El.
For welding wire; Mo coated.

BOHLER FOX DUR 600.
M-27, 0.4 C, 3 Si, 10 Cr, bal Fe.
Welded: 30,000 TS.
For welding electrodes, hard facing, coated, abrasion resistant.

BOHLER FOX FB 30 S.
M-27; 0.1 C, 1 Mn, 25 Cr, 3 Ni, 0.25 N_2, bal Fe.
For welding electrodes; coated, heat resistant.

BOHLER FOX GFW.
M-27; Cu-Ni.
For welding electrodes; Monel metal.

BOHLER FOX MSU.
M-27; 0.1 C, 0.6 Mn, bal Fe.
Welded: 76,000 TS; 32 El.
For welding wire; coated.

BOHLER FOX SAS 4.
M-27; 0.08 C, 18 Cr, 10 Ni, 2.2 Mo, 0.8 Nb, bal Fe.
Welded.
For welding electrodes, coated, stainless.

BOHLER FOX SAS 8.
M-27; 0.08 C, 17 Cr, 15 Ni, 2 Mo, 2 Cu, 0.8 Nb, bal Fe.
Welded.
For welding electrodes; coated, stainless.

BOHLER-FOX SFW.
M-27; Ni-Cu.
For welding electrodes for cast iron; Monel metal, coated.

BOHLER FOX SPE.
M-27, 0.1 C, 0.6 Mn, bal Fe.
Welded 68,000 TS, 34 El.
For welding wire; coated.

BOHLER FOX UMZ.
M-27, 0.1 C, 0.6 Mn, bal Fe.
Welded. 68,000 TS; 34 El.
For welding wire, coated.

BOHLER FOX WKZ 50.
M-27, 0.3 C, 2.3 Cr, 4.5 W, 8.6 V, bal Fe.
Welded 210,000 TS.
For welding electrodes hard facing, coated.

BOHLER FSB
M-27; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed 95,000 TS, 45,000 YS, 50 El; 65 RA; 180 Brin
At 1200°F 57,000 TS, 22,000 YS, 32 El; 45 RA.
For valves, pumps, furnace parts and equipment, Type 310, austenitic, heat resistant.

BOHLER G55.
M-27; 0.63 C, 0.20 Cu, bal Fe.
Heat treated 121,000 TS; 78,300 YS.
For rifle barrels, water hardened.

BOHLER GA
M-27; C, bal Fe.
For welding wire or electrodes, for gas or electric welding.

BOHLER GCMO.
M-27, 0.55 C, 1.1 Cr, 0.4 Ni, 0.45 Mo, 0.1 V, bal Fe.
For drop forging dies, hot work steel, oil hardened.

BOHLER GCN4.
M-27, 0.35 C, 1.3 Cr, 4 Ni, 0.25 Mo, bal Fe.
For drop forging dies; hot work steel, oil hardened

BOHLER GEODURIT SH.
M-27, carbides
For hard facing with carbides, tubes filled with carbides.

BOHLER GMC.
M-27; 0.40 C, Cr, Mn, Mo, bal Fe.
For bolts, gears, machine tool parts; oil hardened, tough.

BOHLER GMCA.
M-27; 0.4 C, 1.35 Mn, 1.85 Cr, 0.2 Mo, bal Fe.
For tools, dies, punches; non-deforming.

BOHLER GMME.
M-27; 0.56 C, Ni, Cr, Mo, V, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

BOHLER GMNE.
M-27; 0.55 C, 0.7 Cr, 0.5 Mo, 1.7 Ni, bal Fe.
For tools, dies, gears, shafts; shock resistant.

BOHLER GNM.
M-27; 0.5 C, 0.7 Cr, 0.5 Mo, 1.8 Ni, bal Fe.
For drop forging dies, swages; oil hardening.

BOHLER GNME.
M-27; 0.55 C, 0.6 Mn, 1 Cr, 2 Ni, 0.6 Mo, V, bal Fe.
For drop forging dies, hot work steel.

BOHLER GSF.
M-27; 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
Heat Treated: 175,000 TS; 150,000 YS; 350 Brinell.
For springs, tools, punches.
Water hardening, shock resistant.

BOHLER GSI.
M-27; 0.5 C, 0.7 Cr, 0.9 Mn, bal Fe.
For drop forging dies for soft materials; water hardening.

BOHLER HARD.
M-27; 0.45 C, 0.25 Si, 0.56 Mn, bal Fe.
For gears, bolts, machine tool parts; water hardened.

BOHLER HARD CORE.
M-27, C, bal Fe.
For core insertions

BOHLER HART.
M-27; 1.4 C, 0.3 Mn, 0.25 Si, bal Fe.
For tools, cutters, hobs; keen cutting edge.

BOHLER HH.
M-27; 0.61 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated: 160,000 TS, 113,000 YS, 12 El; 40 RA; 325 Brin.
For hammers, axes, punches; water hardened.

BOHLER HM.
M-27; 0.30 C, 0.25 Si, 1.35 Mn, bal Fe.
Heat treated: 113,800 TS; 64,000 YS
For gears, bolts, machine tool parts, water or oil hardened.

BOHLER HMA.
M-27; 0.40 C, 0.37 Si, 0.95 Mn, bal Fe.
For gears, bolts, machine tool parts, water hardened.

BOHLER HSB.
M-27; 0.80 C, 0.50 Cr, 0.40 Ni, bal Fe.
For saw blades; water or oil hardened.

BOHLER H VII/VI.
M-27; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed. 73,000 TS, 41,000 YS, 22 El, 58 RA; 140 Brin.
For gears, bolts, machine tool parts; water hardened.

BOHLER IMP.
M-27; 0.65 C, 3.75 Cr, 0.85 Mo. 0.07 V, 8.5 W, bal Fe.
For lathe and planer tools, reamers, drills, hobs; high speed steel.

BOHLER IN 1 A.
M-27; 0.25 C, 0.3 Si, 0.7 Mn, 3 Cr, 0.3 Mo, bal Fe.
Hardened: 92,000-108,000 TS; 64,000 YS; 18 El; 192-226 Brin.
For chemical processing equipment; creep resistant.

BOHLER IN 5.
M-27; 0.1 C, 0.3 Si, 0.4 Mn, 3 Cr, 0.3 Mo, bal Fe.
Hardened: 71,000-85,000 TS; 40,000 YS; 25 El; 142-176 Brin.
For chemical processing equipment; creep resistant.

BOHLER IN5A.
M-27; 0.10 C, 2.7 Cr, 0.2 V, bal Fe.
For high pressure vessels.

BOHLER IN 8.
M-27; 0.17 C, 0.3 Si, 0.4 Mn, 2.5 Cr, 0.5 Mo, 0.5 W, 0.05 V, bal Fe.
Hardened: 92,000-117,000 TS; 64,000 YS; 22 El; 55 RA; 192-239 Brin.
For chemical processing equipment; creep resistant.

BOHLER IN8N.
M-27; 0.18 C, 2.7 Cr, 0.25 Mo, 0.15 V, bal Fe.
Heat treated: 99,600 TS; 64,000 YS.
For oil plant equipment; used up to 950°F.

BOHLER IN 9.
M-27; 0.22 C, 0.3 Si, 0.4 Mn, 3.0 Cr, 0.6 V, 0.5 Mo, bal Fe.
Hardened: 78,000 TS; 64,000 YS; 19 El; 160 Brin
For chemical processing equipment; creep resistant.

BOHLER IN 10.
M-27, 0.22 C, 0.3 Si, 0.4 Mn, 0.3 Cr, 0.4 Mo, 0.4 W, 0.8 V, bal Fe.
Hardened: 120,000-152,000 TS, 106,000 YS; 18 El, 55 RA; 253-300 Brin.
For chemical processing equipment; creep resistant.

BOHLER INC5
M-27, 0.10 C, 5.3 Cr, 0.55 Mo, bal Fe
Heat treated. 85,400 TS, 57,000 YS.
For pipes and tanks for corrosive oils; corrosion resistant.

BOHLER INOIL
M-27; 0.1 C, 5 Cr, 0.5 Mo, bal Fe.
Hardened 71,000-92,000 TS, 65,000 YS, 22 El, 50 RA, 145-192 Brin
For chemical processing equipment; creep resistant

BOHLER INVAR STEEL.
M-27; C, alloy, bal Fe
For component parts of barometers and optical instruments; low coefficient of expansion.

BOHLERIT
M-27; WC + Co, TiC + WC + Co.
For cutting tools, dies; sintered carbides

BOHLER JAR STEEL
M-27; C, bal Fe
For machinery parts, water hardening.

BOHLER K
M-27; 2.25 C, 13 Cr, bal Fe.
For tools, dies; non-deforming.

BOHLER K-3.
M-27, C, Cr, bal Fe
For magnets, magnet steel.

BOHLER K-3 S.
M-27, C, alloy, bal Fe.
For plug and ring gages, rolls for rubbers, oil hardening

BOHLER K-100.
M-27; 1.05 C, 0.4 Cr, 0.2 Si, 0.3 Mn, bal Fe.
For ball bearings, races; water hardened.

BOHLER K-100/1.
M 27; 1.2 C, 0.8 Cr, bal Fe
For mint and medal dies, press dies, rolls; water hardening.

BOHLER K-100 S.
M-27; 1.1 C, 1.2 Cr, bal Fe.
For gears, cams, rams, slides, spindles; water or oil hardening.

BOHLER K100 W/S.
M-27; 0.90 C, 0.25 Si, 0.30 Mn, 0.80 Cr, bal Fe.
For bearings, bushings, cutters; water hardened, wear resistant.

BOHLER K150.
M-27; 1.05 C, 1.5 Cr, bal Fe.
For bearings, bushings, cutters; water hardened, wear resistant.

BOHLER KHMU.
M-27; 0.10 C, 0.40 Cu, bal Fe.
For body structures, acid containers; rust resistant.

BOHLER KHS.
M-27; 0.60 C, 1.4 Si, 1.0 Mn, bal Fe.
Heat treated: 199,000 TS; 156,500 YS.
For springs; oil hardened, tough.

BOHLER KHSW.
M-27; M-164; 0.50 C, 1.7 Si, 0.7 Mn, bal Fe.
Heat treated: 199,000 TS; 156,500 YS.
For springs; oil hardened, tough. AISI S4.

BOHLER KK.
M-27; 1.0 C, 0.2 Si, 1.1 Cr, 0.7 Mn, bal Fe.
For ball bearings, races; water hardened.

BOHLER KL.
M-27; 0.52 C, 0.9 Si, 2.5 W, 1.7 Cr, bal Fe.
Oil Hardened: 337,000 TS; 255,000 YP; C 67 Rock.
For cold punches, wood working tools, chipper knives, milling cutters, chain saw teeth, shear blades, coining tools.
Shock resistant Type S1 tool steel.

BOHLER KMC.
M-27, 0.33 C, 1.0 Cr, 0.65 Mn, 0.25 Si, bal Fe.
For gears, bolts, machine tool parts; water hardened.

BOHLER KMCW.
M-27, 0.41 C, 1.0 Cr, 0.65 Mn, bal Fe.
For oil refinery equipment; creep and heat resistant

BOHLER KNIFE STEEL.
M-27; 0.7 C, bal Fe.
For knives, tools; water hardening.

BOHLER KP.
M 27, 1.3 C, 4.75 W, bal Fe.
For high duty cold drawing and pressing dies, bending punches, drawing mandrels; oil hardening.

BOHLER KPV.
M-27; 1.45 C, 1.2 V, 1 W, bal Fe.
For tools, dies, bearings; water hardening.

BOHLER KR SPECIAL.
M-27, M-1182; 2.1 C, 0.8 Mo, V, 12 Cr, bal Fe.
For tools, dies, plug gages, drawing dies; non-deforming.

BOHLER KW5.
M-27; 0.15 max C, 11.5-13 Cr, bal Fe.
Heat treated: 120,000-135,000 TS; 110,000-117,000 YS; 16-15 El, 63-58 RA; 220-240 Brin.
For steam turbine blades, valves, cutlery; Type 410; corrosion resistant.

BOHLER KW20.
M-27; 0.20 C, 0.40 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For cutlery, valves, turbine blades; Types 420; stainless.

BOHLER KW30.
M-27; 0.30 C, 13 Cr, 0.30 Mn, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 200 Brin.
For valves, cutlery, turbine blades; Type 420; stainless.

BOHLER KW40.
M-27; 0.40 C, 13 Cr, 0.30 Mn, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 22 El; 52 RA; 210 Brin.
For valves, cutlery, turbine blades; Type 420; stainless.

BOHLER KW-60.
M-27; 0.4 C, 13 Cr, bal Fe.
For knives, scissors, surgical instruments, gages, calipers, valve seats, piston rods; rust and abrasion resisting.

BOHLER KW60-1.
M-27; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For cutlery, valves, turbine blades, gages, gears; Type 420; stainless, hardenable.

BOHLER KWA.
M-27, 0.12 max C, 14-18 Cr, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 30 El; 55 RA; 150 Brin.
Cold drawn: 130,000 TS; 120,000 YS; 2 El; 185 Brin.
For oil refinery equipment, bolts, kitchen sinks; Type 430; stainless, ferritic.

BOHLER LIGHTNING
M-27, 0.5 C, 1.6 Cr, Mo, V, bal Fe.
Heat treated. 156,000 TS; 142,000 YS; 350 Brin.
For rifle barrels; tough.

BOHLER M751
M-27; 0.75 C, bal Fe
Hardened: Rock C 64.
Annealed: 85,000-100,000 TS; 175-204 Brin.
For soft to hard rock drills, punches, cutters.
Water hardening, wear resistant.

BOHLER M851.
M-27, 0.85 C, bal Fe.
Hardened Rock C 65.
Annealed: 85,000-100,000 TS, 175-204 Brin.
For hard rock drills, cutters.
Water hardening, wear resistant

BOHLER MAGNET STEEL.
M-27; 6.3 W, 0.7 C, bal Fe.
For magnets, water hardening.

BOHLER MARTIN STEEL.
M-27; 0.05-1.1 C, bal Fe.
For general use, machinery parts; all grades of carbon steel.

BOHLER ME.
M-27, 0.70 C, 0.25 max Si, 0.34 Mn, 5.8 W, bal Fe.
For magnets; magnet steel.

BOHLER ME-6.
M-27, C, W, bal Fe.
For meter magnets; magnet steel.

BOHLER MIDDLE HARD 100.
M-27, 1.0 C, 1 W, bal Fe.
Annealed: 84,000 TS; 60,000 YS; 26 El; 185 Brin.
Heat Treated: 280,000 TS; 535 Brin.
For heading and flanging tools, bending and blanking dies, center bits, plugs, jaws, cold heading dies.
Water hardening cold work tool steel.

BOHLER MIDDLE HARD 115.
M-27; 1.2 C, 1 W, bal Fe.
Annealed: 84,000 TS; 60,000 YS, 26 El; 185 Brin.
Hardened: 210,000 TS; 185,000 RS; 2 El; 400 Brin.
For beading and flanging tools,
bending and blanking dies, center bits,
plugs, jaws, cold heading dies.
Water or oil hardening cold work steel.

BOHLER MITTEL-HART.
M-27; 1.15 C, 0.25 max Si, 0.23 Mn, bal Fe.
For turning tools, milling cutters, crown hammers,
knives, mint dies; water hardening.

BOHLER ML.
M-27; C, alloy, bal Fe.
For rifle barrels; oil hardening.

BOHLER MOLETTE.
M-27; C, bal Fe.
For female and embossed relief molettes,
case hardening steel.

BOHLER Mo RAPID EXTRA 3.
M-27; 0.95 C, W, Mo, bal Fe
For cutters, dies, gauges, punches; oil hardened

BOHLER MO RAPID EXTRA 9.
M-27; 0.8 C, 2 W, 9 Mo, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, drills; high speed steel

BOHLER MO RAPID EXTRA 500.
M-27; 0.8 C, 6 W, 5 Mo, 4 Cr, 2 V, 5 Co, bal Fe.
For lathe and planer tools, reamers,
broaches, drills; high speed steel.

BOHLER MO RAPID EXTRA 800
M-27; 1.05 C, 1.5 W, 9.5 Mo, 1.2 V, 8 Co,
3.7 Cr, bal Fe
Hardened C 63-70 Rock; 15-34 Izod.
For cutters to machine hard and wear resistant
materials, twist drills, router bits, milling cutters.
High speed steel type M42, tough

BOHLER MO RAPID EXTRA 1200
M-27; 1.3 C, 9.5 W, 3.5 Mo, 4 Cr, 3.5 V,
10.5 Co, bal Fe.
For lathe and planer tools, form cutters, reamers,
high speed steel.

BOHLER MO RAPID EXTRA V30
M-27; 1.2 C, 6 W, 5 Mo, 4 Cr, 3.5 V, bal Fe.
For lathe and planer tools, engravers'
cutters, reamers; high speed steel.

BOHLER MPA
M-27; 0.25 C, 1 Cr, 4.2 Ni, Mo, bal Fe
Heat treated· 170,000 TS, 135,000 YS; 15 El, 50 RA;
360 Brin
For shafts, gears, bolts; tough.

BOHLER MPD.
M-27, 0.3 C, 1.9 Cr, 2.6 Ni, 0.9 W, 2.6 Mo,
Cb, bal Fe.
For die casting tools, spreaders, oil hardened

BOHLER MPD EXTRA.
M-27; 0.3 C, 1.8 Cr, 1.3 Ni, 0.9 W, 3.2 Mo, 3.2 Co,
bal Fe.
For die casting tools, spreaders; oil hardened.

BOHLER MS45.
M-27, 0.45 C, 0.3 Si, 0.6 Mn, bal Fe
Hot rolled: 98,000 TS, 59,000 YS; 24 El;
45 RA; 212 Brin.
For gears, bolts, shafts, machine tool parts;
water hardened.

BOHLER MS60.
M-27; 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Heat treated: 160,000 TS; 113,000 YS;
12 El; 40 RA; 325 Brin.
For hammers, axes, springs, punches;
water hardened.

BOHLER MS70.
M-27; 0.75 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 185,000 TS; 140,000 YS; 14 El;
38 RA; 375 Brin.
For springs, tools, punches, hammers, axes;
water hardened; Type W1.

BOHLER MS85.
M-27; 0.85 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El;
30 RA; 400 Brin.
For springs, tools, cutters, drills, taps;
Type W1; water hardened

BOHLER MS90.
M-27, 0.90 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated· 195,000 TS, 150,000 YS, 10 El;
30 RA; 420 Brin.
For springs, drills, reamers, broaches;
Type W1; water hardened.

BOHLER MSI.
M-27; 0.6 C, 0.95 Si, 0.95 Mn, bal Fe.
For tools, dies, punches, springs, oil hardening.

BOHLER MS STEEL
M-27; 0.45-0.85 C, bal Fe
For general purpose tools; water hardening

BOHLER MST
M-27; M-1618, 0.9 C, 2 Mn, 0.2 V, bal Fe
For stay bolt traps, broaches, reamers, gages,
cutting dies, non deforming AISI 02.

BOHLER MYA.
M-27, 0.4 C, 1.5 Si, 1.35 Cr, 0.1 V, 0.3 Mn, bal Fe.
For tools, dies, punches, shock resistant

BOHLER MYAH.
M-27; 1.20 C, 1.00 Si, 0.75 Mn, 0.10 V, bal Fe.
For chisels, die holders, punches,
water hardened, tough

BOHLER MYD
M-27, 0.35 C, 1.5 Si, 1.35 Cr, 0.1 V, bal Fe
For tools, dies, punches, oil hardening.

BOHLER MY EXTRA
M-27; 0.45 C, 2 W, 1 Cr, bal Fe.
For pneumatic chisels, hot work tools;
hot work steel, oil hardened.

BOHLER MY EXTRA W.
M 27, 0.35 C, 0.90 Si, 0.30 Mn, 1.05 Cr, 0.18 V,
1.85 W, bal Fe
For forging and header dies, punches,
oil hardened, tough.

BOHLER NAB
M-27, 0.75 C, 0.90 Mn, bal Fe
For dies and parts of textile machines;
water hardened

BOHLER NBS
M-27, 0.5 C, 1 Cr, 3.5 Ni, 0.2 Mo, bal Fe.
For table ware dies, hollow stamping dies, swaging
dies, air hardening

BOHLER NBSN.
M-27, 0.5 C, 0.7 Cr, 0.3 Mo, 1.7 Ni, bal Fe.
For table ware dies, hollow stamping dies,
swaging dies; oil hardening

BOHLER NEEDLE DIE STEEL.
M-27; C, alloy, bal Fe.
For dies.

BOHLER NH
M-27; 0.35 C, 0.25 Si, 0.55 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 52 RA;
185 Brin
For gears, bolts, shafts, machine tool parts;
water hardened.

BOHLER NI.
M-27; 0.25 C, 1.55 Ni, bal Fe.
For shafts, axles, connecting rods, cranks, levers; oil hardening.

BOHLER NIP29.
M-27; 29 Ni, bal Fe.
For head conductor; controlled expansion.

BOHLER NIP36.
M-27; 36 Ni, bal Fe.
For heat conductor; controlled expansion.

BOHLER NIP50.
M-27; 49 Ni, bal Fe.
For electrical motors, laminations; high permeability.

BOHLER NMH
M-27; 0.40 C, 0.8 Cr, 1.4 Ni, 0.4 Mo, bal Fe.
Heat treated: 135,200 TS; 106,700 YS.
For large forgings, gears, shafts; oil hardened

BOHLER NW
M-27, 0.4 C, 1.25 Cr, 4.4 Ni, bal Fe.
For drop forging dies, hot press swages, clipping tools, heavy anvil blocks; air hardening

BOHLER NWM.
M-27, 0.45 C, 4 Ni, 1.3 Cr, 0.3 Mo, bal Fe.
For forging and header dies, punches; oil hardened, tough

BOHLER OFH70
M-27; 0.56 C, 0.30 Si, 0.55 Mn, bal Fe.
Heat treated 160,000 TS, 112,000 YS; 12 El; 40 RA, 320 Brin
For wheels, die blocks, rails, girders, axles, water hardened

BOHLER PA2
M-27; 0.35 C, 1.3 Cr, 4.5 Ni, bal Fe.
For gears, bolts, forging and heading dies; oil hardened, shock resistant

BOHLER PANTHER
M-27, C, bal Fe.
For general use, water hardening.

BOHLER PAZ.
M-27, 0.35 C, 1.3 Cr, 4.5 Ni, bal Fe.
For gears, bolts, crankshafts, dies, tools, oil hardened, shock resistant

BOHLER PNA.
M-27, 0.08 C, 1-1.25 Mn, bal Fe
Welded 55,000 TS, 45,000 YS; 33-40 El, 60-80 RA
For welding rod.

BOHLER PPA
M-27, 0.16 C, 1.0 Cr, 4.45 Ni, bal Fe.
Heat treated: 170,000 TS; 142,000 YS; 12 El; 45 RA, 400 Brin.
For gears, chain wheels, cams, camshafts, bolts; case hardening steel.

BOHLER PRIMA H.
M-27, 1.3 C, 0.20 Si, 0.20 Mn, bal Fe
For engravers' tools, forming and blanking dies, Type W1, water hardened.

BOHLER PRIMA HART.
M-27; 1.3 C, bal Fe
For tools, cutters, dies, drills, water hardened.

BOHLER PRIMA MITTELHART 100.
M-27; 1.0 C, bal Fe.
Annealed. 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For tools, drills, cutters, taps; water hardened

BOHLER PRIMA MITTELHART 115.
M-27; 1.15 C, bal Fe.
Annealed: 110,000 TS, 56,000 YS; 19 El; 40 RA; 210 Brin.
For tools, cutters, drills, taps, reamers; water hardened.

BOHLER PRIMA WEICH.
M-27; 0.70 C, 0.20 Si, 0.20 Mn, bal Fe.
Heat treated. 174,000-122,000 TS; 128,000-82,000 YS; 12-22 El; 37-52 RA; 355-240 Brin.
For springs, clutch discs, rails, die blocks; Type W1; water hardened.

BOHLER PRIMA ZAH.
M-27, 0.85 C, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA, 400 Brin
For tools, drills, cutters, hammers; water hardened.

BOHLER PT 15.
M-27; 0.13 C, 0.2 Cr, 1.5 Ni, bal Fe.
For gears, bolts, camshafts, cams, fasteners; case hardened.

BOHLER PV35.
M-27; 1.5 C, Cr, Si, bal Fe.
For cutters, bearings, bushings; water or oil hardened.

BOHLER RAPID STEEL.
M-27, 14 W, 3.9 Cr, 0.7 C, bal Fe.
For cutters, tools, high speed steel.

BOHLER REMANENCELESS STEEL
M-27; C, bal Fe.
For electrical equipment, high permeability.

BOHLER SAS2
M-27, 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe
Normalized: 93,000 TS; 36,000 YS, 45 El. 60 RA; 165 Brin
Annealed: 87,000 TS, 33,000 YS; 57 El; 73 RA; 155 Brin.
For muffles, cowls, welded structural parts, Type 321, stainless, austenitic.

BOHLER SAS4.
M-27, 0.10 max C, 16-18 Cr, 10-14 Ni, 2-2.7 Mo, Cb = 10 × C, bal Fe.
Annealed 85,000-95,000 TS, 35,000-45,000 YS, 60-50 El, 75-60 RA, 150-190 Brin.
For acid resistant chemical plant equipment, Type 316 Cb, stainless, austenitic

BOHLER SAS4MN
M-27, 0.07 C, 17.5 Cr, 11.5 Ni, 2.7 Mo, Cb, bal Fe.
Annealed: 85,000 TS, 35,000 YS, 50 El, 65 RA, 160 Brin.
For welded acid resistant chemical plant equipment, Type 318; stainless, austenitic.

BOHLER SAS8
M-27; 0.20 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Annealed 85,000-95,000 TS, 35,000-45,000 YS, 60-50 El, 75-60 RA, 150-190 Brin
For chemical plant equipment, mixers, agitators, Type 316, austenitic, stainless.

BOHLER SC EXTRA
M-27, 1.25 C, 1.15 Si, 1.2 Cr, bal Fe.
For tools, dies, oil hardening

BOHLER SCV.
M-27, 0.6 C, 1 Mn, 1.2 Cr, 0.1 V, bal Fe.
For tools, dies, springs; oil hardening.

BOHLER SHF
M-27, 1.1 C, 1.2 Cr, V, 0.4 N, bal Fe.
For cold work tools; water hardened

BOHLER SIC20.
M-27; 0.80 C, 20 Cr, 4 Ni, 2 Si, bal Fe.
Heat treated: 142,300 TS; 106,700 YS.
For exhaust valves; high heat resistance.

BOHLER SK3.
M-27; 1.05 C, 1.0 Cr, 0.30 Mn, bal Fe.
For bearings, cutters, liners, sleeves; water hardened, wear resistant.

BOHLER SKVL.
M-27; 0.08 C, 17.5 Cr, 1.2 Mo, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, chemical plant equipment; corrosion resistant.

BOHLER SMF.
M-27; 0.55 C, 1.7 Si, 0.8 Mn, bal Fe.
Appealed: 115,000 TS; 78,000 YS; 22 El; 223 Brin.
Oil Hardened: 295,000 TS; 275,000 YS; 2 El; 575 Brin.
For springs, lock washers, chisels, collets, hand tools.
Water hardening, tough, shock resistant.

BOHLER SPECIAL.
M-27; 2.4 C, 12 Cr, 4 V, Mo, bal Fe.
For blanking and shaping dies; high wear resistance, non-deforming.

BOHLER SPECIAL EXTRA MG.
M-27; 1.05 C, 1.0 Mn, 0.6 Cr, bal Fe.
Annealed: 100,000 TS; 54,000 YP; 20 El; 197 Brin.
Water Hardened: 200,000 TS; 140,000 YP; 11 El; 400 Brin.
For taps, threading dies, chasers, reamers, broaches, knives, beading and bending tools, gauges. Tough, oil hardening.

BOHLER SPECIAL K.
M-27; 2.0 C, 12 Cr, bal Fe.
Oil Hardened: C 62-66 Rock; 534,000 C.S.
For punching and piercing dies, holes, trimming dies, reamers, thread rolling dies, mandrels.
Type D3 air hardening tool steel, wear and abrasion resistance.

BOHLER SPECIAL K5.
M-27; 1.00 C, 5 Cr, 1 Mo, 0.15 V, bal Fe.
Air Hardened: 250,000 TS; 200,000 YS; 3 El; C 58 Rock.
Annealed: 103,000 TS; 50,000 YS; 26 El; C 18 Rock.
For blanking and punching tools. forming and embossing dies, thread rolling dies, shear blades, cutters.
Type A2 air hardening tool steel, deep hardening, wear resistant.

BOHLER SPECIAL K8.
M-27; 0.55 C, 8.5 Cr, 1.1 W, 1.2 Mo + V, bal Fe.
For high duty knives, shear blades, rotary cutters.
Hot work tool steel, oil or air harden.

BOHLER SPECIAL KMV.
M-27, M-1618; 1.5 C, 12 Cr, 0.4 V, 1 Mo, bal Fe.
Air Hardened: 287,000 TS; 214,000 YS; 1 El; C 56 Rock.
For blanking and drawing dies, punches, gages, broaches, hobs, shear blades.
Type D-2 tool steel, air harden.
Wear and abrasion resistant.

BOHLER SPECIAL KN.
M-27; 2 C, 12 Cr, bal Fe.
For cutting dies, cold shears, roll punches; anvil plates, beater rolls, pressure tools; cold and hot working steel; air hardening.

BOHLER SPECIAL KNL.
M-27; 1.7 C, 12 Cr, 0.6 Mo, 0.5 W + V, bal Fe.
Hardened: 288,000 TS; 214,000 YS; 1 El; C 58 Rock.
For shear blades, lamination dies, bending and rolling dies, cold punches.
Type D 2 air hardening tool steel, wear resistant and tough.

BOHLER SPECIAL KR.
M-27; 2.1 C, 12.5 Cr, 0.9 W + V, bal Fe.
Hardened: C 60-65 Rock.
For punching and piercing dies, hobs, trimming dies, reamers, thread rolling dies, mandrels.
Type D 6 air hardening, non-deforming tool steel.

BOHLER SPECIAL KRM.
M-27, M-1618; 2.1 C, 12 Cr, 0.8 Mo, 0.2 V, bal Fe.
Hardened: C 64-66 Rock.
For blanking and forming dies, crimpers.
Wear and abrasion resistant.
Oil hardening, non-deforming. Type D 4 tool steel.

BOHLER SPECIAL KV.
M-27; C, Cr, V, bal Fe.
For wire drawing plates; oil hardening.

BOHLER SPECIAL VERY HARD.
M-27; 1.45 C, 3.3 W, 0.25 V, bal Fe.
For turning, planing, slotting and molding cutters, boring tools, milling cutters, drills, engraving tools, reamers.
Cold work tool steel, water or oil harden. wear resistant.

BOHLER SPECIAL W-43.
M-27; C alloy, bal Fe.
For rifle barrels; oil hardening.

BOHLER SPEZIAL EXTRA HART.
M-27; 1.4 C, 0.30 Cr, 0.10 V, 0.30 Mn, bal Fe
For blanking and forming dies, engravers tools; oil or water hardened, wear resistant

BOHLER SPEZIAL KR
M 27; 2.1 C, 11.5 Cr, V, 0.90 W, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

BOHLER SPEZIAL ZAH.
M-27; 1.42 C, W, V, bal Fe.
For bearings, cutters, blanking dies; oil hardened, wear resistant.

BOHLER SPI.
M-27; 0.65 C, 1.7 Si, bal Fe.
For chisels, upsetters, punches; oil hardened, shock resistant.

BOHLER SPN.
M-27; 0.45 C, 1.8 Mn, bal Fe.
For chisels, upsetters, punches; oil hardened, tough.

BOHLER SPU.
M-27; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For springs, taps, reamers, drills; Type W1; water hardened.

BOHLER SPV.
M-27; 0.90 C, 0.10 V, 1.9 Mn, 0.25 Si, bal Fe.
For forming and blanking dies, punches; oil hardened, non-deforming.

BOHLER SSC.
M-27; 1.1 C, 0.7 Cr, 0.1 V, bal Fe.
For tools, dies, bearings; water hardening.

BOHLER SSW.
M-27; 1.2 C, 1 W, bal Fe.
For tools, dies; oil hardening.

BOHLER SSWV.
M-27; 1.2 C, 1 0 W, V, bal Fe
For twist drills, cutting tools; water hardened.

BOHLER SUPER RAPID.
M-27; 15 W, 3.7 Cr, 0.8 C, 0.2 V, 0.2 Mo, bal Fe.
For high speed cutters, tools; high speed steel.

BOHLER SUPER RAPID EXTRA.
M-27; 0.75 C, 18.5 W, 1 V, 4.3 Cr, bal Fe.
Annealed: 100,000 TS; 70,000 YS; 14 El; 255 Brin.
Hardened: C 63-65 Rock
For fine-edged cutting tools, taps, thread millers, twist drills, hobs, broaches.
AISI Type T1 tool steel, high speed steel.

BOHLER SUPER RAPID EXTRA 214
M-27, 0.75 C, 4.0 Cr, 18 W, 1 Mo, 1.55 V, 2.5 Co, bal Fe
For high speed cutters, taps, drills, reamers, high speed steel.

BOHLER SUPER RAPID EXTRA 500.
M-27; 0.80 C, 18 W, 1.0 Mo, 1.6 V, 5 Co, 4.3 Cr, bal Fe.
Oil Hardened: C 64-65 Rock.
Air Hardened: C 60-62 Rock
For cutters, drills, broaches, lathe and planer tools, hobs.
AISI Type T4 tool steel. High speed steel.

BOHLER SUPER RAPID EXTRA HV
M-27; 0.9 C, 14.5 W, 2 V, 1 Mo, 4.5 Co, bal Fe.
For milling cutters; abrasive resistant, high speed steel

BOHLER SUPER RAPID EXTRA MO.
M-27, 0.80 C, 6.5 W, 5.0 Mo, 2.0 V, 4.3 Cr, bal Fe
Oil Hardened: C 63-65 Rock
For lathe and planer tools, drills, hobs, broaches, cut off tools, thread rolling dies.
High speed steel Type M2, tough and wear resistant

BOHLER SVM.
M-27, M 1618, 0.6 C, 2.0 Si, 0.85 Mn, 0.25 Cr, 0.25 Mo, 0.2 V, bal Fe
Oil Hardened 340,000 TS; 283,000 YP, 5 El, 601 Brin
Annealed 107,000 TS, 64,000 YP, 27 El; 212 Brin.
For shear blades, pneumatic tools, punches, chisels.
Type S-5 tool steel. Shock resistant

BOHLER SW.
M-27; 1.0 C, 0.2 Si, 0.9 W, 0.3 Mn, bal Fe.
For tools, dies; oil or water hardening.

BOHLER THM
M-27; 0.8 C, 2.6 W, 0.5 Mo, V, bal Fe
For header dies, punches, upsetters, cold work steel

BOHLER TOUGH.
M-27; 0.85 C, 0.25 max Si, 0.30 Mn, bal Fe.
For cold chisels, hammers, shear blades, punches, press dies, knives; water hardening

BOHLER TW.
M-27; 1.15 C, 0.9 W, bal Fe.
For twist drills, taps, files, water hardening.

BOHLER TWR.
M-27; 1.5 C, 1.2 W, V, bal Fe.
For paper mill knives; water hardened, wear resistant.

BOHLER TWV.
M-27; 1.2 C, 1.2 W, 1.0 V, bal Fe.
For circular knives, drawing rings, cartridge shell dies, piercing punches; water hardening.

BOHLER TWVW.
M-27; 0.90 C, 1.1 W, V, bal Fe.
For industrial knives; water hardened.

BOHLER TWW.
M-27; 1.25 C, 0.85 Cr, 1.6 W, bal Fe.
For milling cutters, saw blades; oil hardening.

BOHLER UF100.
M-27, 1.0 C, 0.20 Si, 0.40 Mn, bal Fe.
Water hardened: 220,000 TS; 155,000 YP; 10 El; 600 Brin.
For springs, cutters, drills.
Water hardening, wear resistant.

BOHLER UM 1.
M-27; 0.33 C, 17.5 Mn, 3 Cr, bal Fe.
Water quenched: 135,000 TS; 60,000 YS; 46 El; 48 RA.
For nonmagnetic parts; nonmagnetic, austenitic.

BOHLER UM2.
M-27; 0.65 C, 9 Mn, 3 Cr, 7.3 Ni, bal Fe.
Water quenched: 126,000 TS; 80,000 YS; 54 El, 44 RA.
For non-magnetic structural parts; non-magnetic, austenitic.

BOHLER UM2M.
M-27; 0.20 C, 8 Mn, 8 Cr, 6 Ni, bal Fe.
Annealed. 85,400 TS; 34,200 YS
For electrical equipment, non-magnetic.

BOHLER UM8
M-27; 0.50 C, 18 Mn, 5 Cr, bal Fe.
Annealed: 116,700 TS, 71,200 YS
For electrical equipment; non-magnetic.

BOHLER UMB.
M-27; 0.20 C, 6 Mn, 11 Cr, 10 Ni, bal Fe
Cold drawn: 213,400 TS; 170,700 YS.
For electrical equipment; non-magnetic wires.

BOHLER US.
M-27; C, alloy, bal Fe.
For die casting dies, oil hardening.

BOHLER US 25.
M-27, 0.3 C, 2.35 Cr, 0.25 V, bal Fe
For tools, dies, mandrels, oil hardening.

BOHLER USK
M-27, 0.45 C, 1.6 Cr, 0.6 Mo, V, bal Fe.
For cold working and stamping dies, oil hardened.

BOHLER US SPECIAL.
M-27; 0.4 C, 1.55 Cr, 0.3 V, 0.6 Mo, bal Fe.
For tools, dies, containers for rod and tube extrusion, hot work steel

BOHLER US SPEZIAL.
M-27, 0.45 C, 1.6 Cr, Mo, V, bal Fe.
For extrusion press liners, rams and dies; oil hardened

BOHLER US ULTRA
M-27; 0.35 C, 1 Si, 5 Cr, 1.5 Mo, 0.4 V, bal Fe.
For permanent mold and die casting dies; hot work steel.

BOHLER US ULTRA 2.
M-27; 0.4 C, 1 Si, 5 Cr, 1.2 Mo, 1 V, bal Fe.
For extrusion press liners, rams and dies; oil hardened.

BOHLER US ULTRA 4
M-27, 0.36 C, 1 Si, 5 Cr, 1.3 W, 1.4 Mo, 0.4 V, bal Fe
For die casting dies, punches.
Hot work, oil hardening steel.

BOHLER V6 N.
M-27; 0.9 C, V, 0.7 Ni, bal Fe.
For cold heading, coining and embossing dies; water hardening.

BOHLER V444D.
M-27; 0.45 C, Ni, Cr, W, bal Fe.
For heading and forging dies; oil hardened, tough.

BOHLER VB 135.
M-27; 0.35 C, 1 Cr, 0.70 Mn, bal Fe.
Hardened: 106,000-128,000 TS; 85,000 YS; 18 El; 60 RA; 223-272 Brin.
For bolts, gears, shafts, connecting rods; oil hardening.

BOHLER VB150.
M-27; 0.50 C, 1.05 Cr, 0.1 V, 0.95 Mn, bal Fe.
For springs, gears, bolts, crankshafts; oil hardened, shock resistant.

BOHLER VB200.
M-27; 0.45 C, 1.7 Cr, V, bal Fe.
Heat treated: 170,700 TS; 135,000 YS.
For construction equipment; oil hardened.

BOHLER VBS 135.
M-27; 0.40 C, 1.2 Mn, 1.2 Si, bal Fe.
Hardened: 128,000-145,000 TS; 97,000 YS; 14 El; 45 RA; 270-295 Brin.
For bolts, gears, shafts, connecting rods; tough, wear resistant.

BOHLER VBV140.
M-27, 0.50 C, 1.75 Mn, 0.1 V, bal Fe.
Hot rolled. 97,000 TS; 59,000 YS; 40 El, 200 Brin
Heat treated: 142,300 TS; 106,700 YS.
For valve lifters, crankshafts; oil hardened, tough.

BOHLER VC2.
M-27; 0.85 C, 0.5 Cr, V, bal Fe.
For wood saw blades and bands; water or oil hardened.

BOHLER VCL125.
M-27; 0.25 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough

BOHLER VCL135.
M-27; 0.33 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, tough.

BOHLER VCL 140.
M-27; 0.4 C, 1.1 Cr, Mo, bal Fe.
Hardened: 142,000-160,000 TS; 13 El; 40 RA; 293-340 Brin.
For bolts, gears, shafts; oil hardening.

BOHLER VCL150.
M-27; 0.50 C, 1.1 Cr, Mo, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

BOHLER VCL230.
M-27; 0.30 C, 2.5 Cr, 0.2 Mo, 0.15 V, 0.55 Mn, bal Fe.
For die casting dies, crankshafts; oil hardened, tough.

BOHLER VCL240.
M-27; 0.50 C, 1.0 Cr, 0.2 Mo, 0.60 Mn, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

BOHLER VCN 100.
M-27; 0.35 C, 1.1 Cr, 1.1 Ni, bal Fe.
Hardened: 135,000-156,000 TS; 113,000 YS; 16 El; 45 RA; 285-300 Brin.
For bolts, gears, shafts; tough.

BOHLER VCN150.
M-27; 0.34 C, 1.5 Ni, 1.5 Cr, 0.2 Mo, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

BOHLER VCN 200.
M-27; 0.3 C, 2 Ni, Mo, 2 Cr, bal Fe.
Hardened: 156,000-184,000 TS; 135,000 YS; 14 El; 45 RA; 221-388 Brin.
For bolts, gears, connecting rods, shafts; tough, heavy forgings.

BOHLER VCN400W.
M-27; 0.25 C, 1 Cr, 4 Ni, Mo, bal Fe.
For crankshafts, gears; heavy forgings, oil hardened.

BOHLER VSI.
M-27; 0.60 C, 1.7 Si, bal Fe.
Heat treated: 113,800 TS; 85,400 YS.
For valves.

BOHLER VSK
M-27; 0.45 C, 1.5 Si, 15 Cr, 13 Ni, 3 W, bal Fe.
Annealed: 106,700 TS, 71,200 YS.
For exhaust valves; corrosion and heat resistant.

BOHLER VSW.
M-27; 0.45 C, 2.5 Si, 19 Cr, 10 Ni, 1.2 W, bal Fe.
Annealed: 114,000 TS; 71,200 YS.
For exhaust valves; austenitic.

BOHLER W50.
M-27, 1.05 C, 0.5 Cr, bal Fe
For balls, rollers, bearings, bearing steel.

BOHLER W100.
M-27, 1.0 C, 0.9 Cr, bal Fe
For balls, rollers, races, bearings, bearing steel.

BOHLER W 150
M-27, 1 C, 1.5 Cr, bal Fe.
For balls, races, rollers, bearings; water hardening bearing steel.

BOHLER WACE.
M-27, 0.33 C, 1.1 Cr, 1.1 Al, Mo, bal Fe
For gears, cams, camshafts, nitriding steel

BOHLER WACV.
M-27, 0.30 C, 2.5 Cr, 0.2 Mo, 0.15 V, 0.55 Mn, bal Fe
For die casting and plastic mold dies, oil hardened, tough.

BOHLER WB
M-27, 0.5 C, 0.9 Mn, bal Fe.
For drop forging dies; water hardening

BOHLER WD3
M-27, 0.45 C, 1 Si, 1 Mn, V, bal Fe
For piercing dies and tools; oil hardened, tough

BOHLER WD6.
M-27, 0.28 C, 0.70 Cr, 1.7 Ni, V, bal Fe
For piercing dies and tools, oil hardened, tough

BOHLER WD15
M-27, 0.3 C, 0.8 Cr, 4.0 Ni, 1.5 Mo, bal Fe
For mandrels, piercers; hot work steel

BOHLER WD17
M-27, 0.25 C, 0.8 Cr, 4.5 Ni, 4.5 W, 0.4 Mo, bal Fe
For mandrels, piercers, hot work steel

BOHLER WEICH.
M-27; 0.65 C, 0.3 Mn, 0.25 Si, bal Fe
For tools, punches, springs, water hardening.

BOHLER WFO
M-27; 0.6 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot Rolled: 115,000 TS, 70,000 YS, 16 El; 240 Brin.
Oil Hardened: 160,000 TS; 113,000 YS, 13 El, 320 Brin.
For springs, hand tools, hammers, wrenches.
Oil or water hardening.

BOHLER WH.
M-27; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed: 73,000 TS; 41,000 YS; 22 El; 58 RA; 140 Brin.
For rivets, nails, gears, bolts, fasteners; case hardened, water hardened.

BOHLER WKD.
M-27; M-1618; 0.5 C, 4 Cr, 18 W, 1 V, bal Fe.
High speed steel, for piercing and punching tools; AISI H26.

BOHLER WKV.
M-27; 0.45 C, 1.6 Cr, 0.5 Mo, 0.5 W, 1 V, bal Fe.
For hot piercing and punching tools, gripper dies, upsetters.
Hot work steel, shock resistant.

BOHLER WKW2.
M-27; 0.2 C, 14 Cr, bal Fe.
For stainless parts, dies; corrosion resistant.

BOHLER WKW2M.
M-27; C, 13 Cr, 1.2 Mo, bal Fe.
For plastic mold dies; corrosion resistant.

BOHLER WKW4.
M-27; 0.40 C, 14 Cr, 0.30 Mn, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 23 El; 52 RA; 200 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; stainless.

BOHLER WKW6.
M-27; 0.4 C, 13.5 Cr, bal Fe
For tools, dies, cutlery, tableware, hardenable corrosion resistant

BOHLER WKW8.
M-27; C, 16 Cr, 1 Mo, bal Fe.
For plastic mold dies; corrosion resistant.

BOHLER WKZ
M-27, M-1618, 0.3 C, 9 W, 0.4 V, 2.7 Cr, bal Fe.
For dies, ram heads, extrusion press tools, die casting dies, permanent molds.
Oil hardening, hot work steel.

BOHLER WKZ50.
M-27, 0.3 C, 4.35 W, 2.35 Cr, 0.65 V, bal Fe.
For hot shear blades, heading and riveting dies.
Hot work steel, shock resisting

BOHLER WKZ100.
M-27, 0.55 C, 4 Cr, 10 W, 1 V, 0.8 Mo, bal Fe
For hot working mandrels, punches, hot work tool steel.

BOHLER WKZ EXTRA
M 27, 0.35 C, 3.5 Cr, 11 W, 0.5 V, bal Fe
For hot forming dies, hot work tool steel

BOHLER WM
M-27, 0.3 C, 3.85 W, 1.05 Cr, 0.2 V, bal Fe.
For tools, dies, hot working mandrels, hot work steel

BOHLER WM2
M-27, 0.35 C, 0.9 Si, 1.85 W, 0.05 Cr, 0.2 V, bal Fe
For tools, dies, hot work tools, hot work steel

BOHLER WMD
M-27, 0.33 C, 2.8 Cr, 3 Mo, 0.5 V, bal Fe
For hot dies, heading dies, rams, upsetters
Hot work, oil hardening, shock resistant.

BOHLER WON
M-27, 0.8 C, 0.3 Mn, 0.3 V, bal Fe
For stamping tools, mint and medal dies, cold beater tools, special dies, water hardening.

BOHLER WPD
M-27, 0.25 C, 1.8 Cr, 0.9 W, 2.8 Mo, 2.5 Ni, bal Fe.
For hot press tools, press jaws, hot rolling mandrels, hollow punches, hot work steel

BOHLER WPN.
M-27; C, 2.3 Cr, 1.7 Ni, 10 W, V, bal Fe.
For hot work tools and dies; oil hardened, hot work steel

BOHLER WPZ.
M-27; 0.3 C, 2.25 Cr, 9 W, 0.3 V, 2.2 Co, bal Fe.
For injection and compression molding and extrusion dies, spline bushings; hot work steel.

BOHLER WV.
M-27; 1.2 C, 0.2 Cr, 1 W, 0.1 V, bal Fe.
For drills, taps; water or oil hardened.

BOHLER Z-II.
M-27; C, bal Fe.
For wire drawing cast steel plates.

BOHLER ZCS.
M-27; 0.5 C, 0.9 Si, 1.15 Cr, bal Fe.
For crankshafts, gears, connecting rods; oil hardening.

BOHLER ZE.
M-27, C, bal Fe.
For wire drawing cast steel plates.

BOHLER ZK.
M-27, 1.4-1.5 C, 0.25-1.15 Si, 1.3-1.5 Cr, 0.08-0.15 V, bal Fe.
For tools, dies, pneumatic chisels, rivet sets; tough, shock resistant.

BOHLER ZM.
M-27; C, Mn, bal Fe.
For leaf springs.

BOHLER ZNM
M-27, 0.5 C, 0.7 Cr, 1.7 Ni, Mo, bal Fe.
Heat treated. 243,000 TS; 213,000 YS.
For gears, air or oil hardening.

BOHLER ZNM4
M-27, 0.4 C, 1.3 Cr, 4 Ni, Mo, bal Fe
Heat treated: 228,000 TS, 213,000 YS.
For gears, bolts, crankshafts; oil hardened, shock resistant.

BOHLER ZRH.
M-27, 0.53 C, 1.6 Si, bal Fe
Heat treated· 113,800 TS, 78,300 YS.
For gears, bolts, shafts; oil hardened, tough.

BOHLER ZRW.
M-27, 0.5 C, 1.6 Si, bal Fe
Heat treated 106,700 TS; 71,200 YS.
For gears, bolts, crankshafts, oil hardened, shock resistant.

BOHLER ZSV.
M-27, 0.42 C, 1.2 Si, 1 Mn, 1.2 Cr, V, bal Fe.
For adjustable spanners, oil hardened, tough

BOHNALITE 62S.
M-138, 0.8-1.2 Mg, 0.4-0.8 Si, 0.15-0.40 Cu, 0.15 max Ti, bal Al.
Annealed 17,500 TS, 6500 YS, 30 El, 28 Brin.
T4-temper 35,000 TS, 21,000 YS, 25 El, 65 Brin.
T6-temper: 45,000 TS, 40,000 YS, 17 El, 95 Brin
For doors, window frames, trim, age hardenable.

BOHNALITE A.
M-138, 5-7 Sn, 0.75-1.25 Cu, 1.5-2.2 Si, 0.75-1.25 Ni, bal Al.
Cast
For bearings, similar to Alcoa X750

BOHNALITE B.
M-138, 4.5 Cu, 1.2 max Si, 1.0 max Fe, 0.03 max Mg, bal Al
Heat treated 28,000-45,000 TS, 14,000-27,000 YS, 10-1 El; 55-115 Brin.
For airplane parts, windshield frames, engine crankcases; S.A.E. No 38.

BOHNALITE C.
M-138; 4-5 Cu, 2.0-3.0 Si, 1.2 max Fe, bal Al.
Mold cast· 40,000-55,000 TS, 20,000-45,000 YS; 11-1 El, 70-120 Brin.
For permanent mold castings; good ductility.

BOHNALITE F.
M-138; 6-8 Cu, 4.0 max Si, 1.5 max Fe, 2.5 Zn, bal Al.
19,000-24,000 TS; 12,000 YS; 2-1 El; 50-70 Brin.
For crankcases, oil pans, transmission cases; permanent mold.

BOHNALITE J.
M-138; 9.2-10.0 Cu, 1.5 max Fe, 0.15-0.35 Mg, bal Al.
Heat treated: 26,000-40,000 TS; 18,000-28,000 YS; 1.0 El; 80-115 Brin.
For pistons, camshaft bearings, valve tappet guides; permanent mold.

BOHNALITE K.
M-138; 6-8 Cu, 5-6 Si, 0.20-0.60 Mg, bal Al.
Aged: 27,000 TS; 19,000 YS; 90 El.
For automotive pistons; permanent mold.

BOHNALITE L.
M-138; 0.5-1.5 Cu, 11-13 Si, 1.3 Fe, 0.7-1.5 Mg, 2.0-3.0 Ni, bal Al.
Mold Cast: 28,000-40,000 TS; 22,000-33,000 YS; 1-0 El; 90-120 Brin.
For pistons; permanent mold.

BOHNALITE L-2.
M-138; 9-12 Si, 1-3 Cu, 0.5-2.5 Ni, 0.5-1.5 Mg, 0.2 max Ti, bal Al.
T551-temper: 31,000 min TS; 90-120 Brin.
For pistons; age hardenable.

BOHNALITE L-3.
M-138; 8-10 Si, 3.0-4.5 Cu, 0.2 max Ti, 1.0 max Fe, 0.8 max Mn, bal Al.
F-temper: 34,000 TS; 19,000 YS; 90 Brin.
T5-temper. 34,000 TS; 25,000 YS, 100 Brin.
T6-temper: 42,000 TS; 30,000 YS; 105 Brin.
For hydraulic pistons, covers; age hardenable.

BOHNALITE L-4.
M-138, 8.5-10.5 Si, 2-4 Cu, 0.5-1.5 Mg, 0.5-1.5 Ni, bal Al
Aged 31,000 TS, 85 Brin.
For automotive pistons; permanent mold.

BOHNALITE L-6.
M-138; 11-13 Si, 0.5-2.75 Cu, 0.7-1.3 Mg, 1.3 max Fe, 0.15 max Ti, bal Al.
Cast: 31,000 min TS; 90-120 Brin
For pistons, age hardenable

BOHNALITE M-4.
M-138, 3.25-4.50 Mg, bal Al.
Cast: 22,000 TS, 12,000 YS, 6 El, 46 Brin.
For dairy equipment, cooking utensils; corrosion resistant.

BOHNALITE M-10.
M-138; 9.5-10.6 Mg, bal Al.
Solution treated: 42,000 TS; 20,000 YS, 12 El; 50 Brin.
For castings; best corrosion resistance.

BOHNALITE W.
M-138; 0.1 max Cu, 4.5-6.0 Si, 0.8 max Fe, 0.3 max Zn, bal Al.
17,000-22,000 TS, 7000 YS, 6-3 El, 35-65 Brin.
For automobile body parts, architectural castings; permanent mold.

BOHNALITE W-3.
M-138; 1.0-1.5 Cu, 4.5-5.5 Si, 0.8 max Fe, 0.4-0.6 Mg, bal Al.
Heat Treated: 27,000-40,000 TS; 20,000-27,000 YS, 5-1 El; 60-100 Brin.
For crankcases; pressure tight.

BOHNALITE W-4.
M-138; 0.2 max Cu, 6.5-7.5 Si, 0.6 max Fe, 0.3 Mg, bal Al.
Heat treated: 26,000-40,000 TS; 14,000-20,000 YS; 5-3 El; 50-70 Brin.
For marine parts; corrosion resistant.

BOHNALITE W-5.
M-138; 4-5 Cu, 5-6 Si, 0.1 max Mg, 1.0 max Zn, bal Al.
Cast: 22,000 TS; 1 El; 60 Brin.
For pressure tight castings; sand casting.

BOHNALITE W-6.
M-138; 2.5-4.5 Cu, 5-8 Si, 1.2 Fe, 1.2 Mg, bal Al.
Cast: 22,000 TS; 1 El; 65 Brin.
Aged: 24,000 TS; 1 El; 65 Brin.
T6-temper: 32,000 TS; 1 El; 85 Brin.
For sand castings; heat treatable.

BOHNALITE X-10.
M-138; 9-11 Al, 0.1 Mn, bal Mg.
Cast: 22,000 TS; 12,000 YS; 1-3 El; 53 Brin.
Heat treated: 36,000 TS, 17,000 YS; 1-4 El; 65 Brin.
For castings; permanent mold, sand or die cast.

BOHNALITE Y.
M-138; 3.5-4.5 Cu, 0.6 max Si, 0.8 max Fe, 1.2-1.8 Mg, 1.7-2.3 Ni, bal Al.
Heat treated: 35,000-40,000 TS; 24,000 YS, 1.0-0.5 El; 85-115 Brin.
For pistons, cylinder heads of aircraft engines; good high temperature properties.

BOHN ALLOY NO. 9.
M-138, 10 Sb, 6 Sn, 0.25 As, 0.5 Cu, 0.005 Zn, bal Pb
For bearings, bushings; lead Babbitt.

BOHN ALLOY 70.
M-138; 0.75-1.75 Sn, 2.0-3.5 Pb, 70-73 Cu, bal Zn.
Cast: 35,000 TS, 12,000 YS, 25 El, 45 Brin
For marine hardware; leaded yellow brass.

BOHN ALLOY 80.
M-138; 78-82 Cu, 9.25-10.75 Sn, 8.5-10.7 Pb, 0.7 max Ni, 0.7 max Zn
Cast 25,000 TS, 16,000 YS, 8 El, 60 Brin
For bearings, high leaded bronze, SAE 64.

BOHN ALLOY 88C
M-138; 85-89 Cu, 7.7-9.0 Sn, 0.4-0.9 Pb, 3-5 Zn, 0.75 max Ni.
Cast: 36,000 TS; 18,000 YS, 70 Brin
For bearings, leaded tin bronze; SAE 621.

BOHN ALLOY PMB20.
M-138; 79 Cu, 9.5 Pb, 10 Sn
For bearings, piston pin bushings, axle bearings; leaded bronze

BOHN ALLOY XXA
M-138; 60-68 Cu, 3-7 Al, 2-5 Mn, 2-4 Fe, 1.5 max Sn, 0.2 max Pb, bal Zn.
Cast: 95,000 TS, 45,000 YS; 20 El, 148 Brin.
For ship propellers, marine hardware, manganese bronze, corrosion resistant.

BOHN ALLOY XXX
M-138, M-645, 63-67 Cu, 13 hardener, bal Zn.
Cast: 110,000 TS; 75,000 YS, 12 El, 20 Brin.
For ingots, Mn bronze.

BOHNOLLOY NO. 3
M-138; 2.25-3.75 Cu, 7.0-8.5 Sb, bal Sn.
14,900 TS, 6100 YS, 25-30 El; 24.5 Brin
For bearings, bushings; anti-friction; S.A.E. No. 12.

BOHNOLLOY-12
M-138; 87.0-91.5 Cu, 3.5-4.5 Sn, 3.5-4.5 Pb, 1.5-4.0 Zn, 0.10 max Fe.
For general purpose bearings, transmission bushings, thrust washers, piston pin bushings.
Moderate to high loads, bearing bronze.

BOHNOLLOY 15.
M-138; 0.6 As, 0.5 Cu, 15 Sb, 10 Sn, 0.005 Zn, bal Pb.
For main and rod bearings and bushings; SAE 14, Babbitt, moderate loads.

BOHNOLLOY NO. 18.
M-138; 0.9-1.2 Sn, 14.5-15.5 Sb, 0.6 max Cu, 0.8-1.1 As, bal Pb.
For bearings, bushings; Babbitt; SAE 15.
Used with lead-tin overlay on hard or soft shafts for moderate loads.

BOHNOLLOY NO. 45.
M-138; 52-57 Cu, 38-42 Pb, 4.5-5.5 Ag.
For bearings; heavy duty.

BOHNOLLOY 58.
M-138; 45-47 Cu, 9-11 Ni, bal Zn.
Soft: 65,000 TS; 40,000 YS; 5 El; 95 Rock B.
For hardware; wrought alloy, white brass; architectural applications; weldable.

BOHNOLLOY NO. 70 A.
M-138; 67-74 Cu, 26-31 Pb, 0.75-1.50 Ag.
For bearings; heavy duty.

BOHNOLLOY NO. 70 C.
M-138; 67-74 Cu, 1 max Ag, bal Pb.
For bearings; heavy duty.

BOHNOLLOY MB7.
M-138; 1 Cu, 7 Sn, 1.6 Ni, 0.5 Si, 1 Mg, bal Al.
For bearings, bushings; SAE 770, heat treated, used on hard shafts.

BOHNOLLOY MB8.
M-138, 1 Cu, 6.25 Sn, 0.5 Ni, 0.1 Fe, 1.5 Si, bal Al.
For heavy duty rod and main bearings; SAE 770, used with soft shafts.

BOHNOLLOY PMB20.
M-138, 79 Cu, 0.5 max Sb, 9.5 Pb, 10 Sn, 0.05 max P
For piston pin bushings; SAE 797, mating with hard shaft.

BOHNOLLOY PMB20A.
M-138, 79 Cu, 0.5 max Sb, 10.0 Sn, 9.5 Pb, 0.75 max Zn.
For piston pin bushings, SAE 797, mating with hard shaft.

BOHNOLLOY PMB21.
M-138, 73.5 Cu, 23 Pb, 3.5 Sn, 0.5 max Zn.
For rocker arm and transmission bushings, SAE 794 or 799, intermediate loads.

BOHNOLLOY PMB22.
M-138; 83 min Cu, 8 Pb, 4 Sn, 0.5 max Zn.
For transmission and chassis bushings; SAE 798; medium to high loads.

BOHNOLLOY P.M.B. 24.
M-138, 75-77 Cu, 1 max Sn, 0.25 max Fe, 23 min Pb.
For bearings on steel backing, heavy duty SAE 49.

BOHNOLLOY P.M.B. 30.
M-138; 68-70 Cu, 0.5 max Sn, 0.25 max Fe, 30 min Pb.
For bearings on steel backing; heavy duty; SAE 48.
May be used on soft shaft without an overplate.

BOHNOLLOY PMB42.
M-138; 56 Cu, 42 Pb, 2.5 Sn, 0.1 max Mg, 0.1 max Ni.
For bearings; intermediate, used on soft shaft.

BOHNOLLOY R-54A.
M-138; 57-60 Cu, 0.5-1.5 Sn, 0.8-2.0 Fe, 0.2-0.5 Mn, 0.1-0.25 Al, 0.2 max Pb, bal Zn.
Hard: 78,000 TS; 55,000 YS; 15 El; 80 Rock B.
Soft: 68,000 TS; 35,000 YS; 25 El; 65 Rock B.
For extruded shapes, hardware, pump rods, clutch discs, valve stems; corrosion resistant, high strength.

BOHNOLLOY R54B.
M-138; 57-60 Cu, 0.5-0.7 Pb, 1 Sn, 1 Fe, 0.35 Mn, bal Zn.
½ H-temper: 78,000 TS; 55,000 YS; 15 El; 150 Brin.
Soft: 68,000 TS; 35,000 YS; 25 El; 116 Brin.
For pump rods, valve stems and bodies, shafts; manganese bronze.

BOHNOLLOY R54C.
M-138; 57-60 Cu, 1.0-1.2 Pb, 1 Sn, 1 Fe, 0.35 Mn, bal Zn.
½ H-temper: 78,000 TS; 55,000 YS; 15 El; 150 Brin.
Soft: 68,000 TS; 35,000 YS; 25 El; 116 Brin.
For pump rods, valve stems and bodies, shafts; manganese bronze, free-cutting.

BOHNOLLOY R-55.
M-138; 56-58 Cu, 2-3 Pb, bal Zn.
Soft: 60,000 TS; 20,000 YS; 30 El; 90 Brin.
For wrought architectural parts, casements, lock bodies, extrusions.

BOHNOLLOY R-56.
M-138; 56-59 Cu, 0.7-1.2 Al, 0.8-1.3 Fe, bal Zn.
Hard: 80,000 TS; 50,000 YS; 12 El; 85 Rock B.
Soft: 70,000 TS; 25,000 YS; 20 El; 70 Rock B.
For wrought architectural shapes, marine hardware; wrought alloy Mn bronze.

BOHNOLLOY R-56C.
M-138; 56.5-58.5 Cu, 0.1-0.25 Mn, 0.2 Al, 0.2 Fe, bal Zn.
Wrought: 60,000-65,000 TS; 20,000-25,000 YS; 30-40 El; 70-80 Brin.
For architectural shapes, door frames; wrought alloy, architectural bronze.

BOHNOLLOY R-57.
M-138; 56-59 Cu, 2.4 Al, 1.0-2.5 Fe, 2.5-4.0 Mn, bal Zn.
Wrought: 95,000-110,000 TS; 40,000-45,000 YS; 15-20 El; 150-180 Brin.
For propellers, gears, shafts; wrought alloy, Mn bronze.

BOHNOLLOY R-58E.
M-138; 58.5-62.0 Cu, 1.5-2.5 Pb, bal Zn.
Forged: 58,000 TS; 23,000 YS; 40 El; 75 Brin.
For forgings; forging brass.

BOHNOLLOY R-59.
M-138, 53-55 Cu, 2.0-2.75 Pb, bal Zn.
Forged: 55,000 TS, 20,000 YS; 25 El.
For brass forgings, screws, studs; used for color matching.

BOHNOLLOY R-60.
M-138; 59-60 Cu, 0.30 max Pb, bal Zn.
Wrought: 75,000 TS; 55,000 YS; 20 El.
Extruded: 50,000 TS; 20,000 YS; 35 El.
For condenser tubes; Muntz metal.

BOHNOLLOY R-60L.
M-138; 59-62 Cu, 0.5-1.0 Sn, 0.4-1.0 Pb, bal Zn.
½ H-temper: 58,000 TS, 25,000 YS; 25 El; 90 Brin.
Hard: 65,000 TS; 40,000 YS; 16 El; 100 Brin.
For hardware, screw machine products, fasteners; leaded naval brass.

BOHNOLLOY R60M.
M-138; 60 Cu, 2 Pb, 0.75 Sn, bal Zn.
½H-temper: 65,000 TS; 48,000 YS; 15 El; 150 Brin.
Soft: 54,000 TS; 24,000 YS; 30 El; 83 Brin.
For bearings, hardware; light loads, free-cutting.

BOHNOLLOY R-60N.
M-138; 60 Cu, 0.75 Sn, 0.2 max Pb, bal Zn.
Wrought: 60,000 TS; 27,000 YS; 30 El; 120 Brin.
Extruded: 60,000 TS; 25,000 YS; 30 El; 98 Brin.
For forgings and tubing, water pump parts; shafts; naval brass.

BOHNOLLOY R-61.
M-138; 60-63 Cu, 2.5-3.7 Pb, bal Zn.
Hard: 60,000 TS; 48,000 YS; 18 El; 75 Rock B.
Soft: 45,000 TS; 18,000 YS; 45 El; 70 Rock B.
For rods, pins, nuts, plugs, screws, valve caps and discs; free cutting, automatic screw machine parts.

BOHNOLLOY R62.
M-138; 61 Cu, 2.85 Pb, bal Zn.
Soft: 52,000 TS; 25,000 YS; 25 El; 100 Brin.
For moderate thread rolling; slight cold working.

BOHNOLLOY R 63.
M-138; 61 Cu, 1-4-1.8 Pb, bal Zn.
Extruded: 55,000 TS; 40,000 YS; 30 El; 90 Brin.
For cold headed parts, hardware, thread rolling; free-cutting.

BOHNOLLOY R-64.
M-138; 63-64.5 Cu, 0.75 Pb, bal Zn.
Extruded: 55,000 TS; 40,000 YS; 30 El; 90 Brin.
For cold headed parts, roll threading, free cutting.

BOHNOLLOY R64R.
M-138, 63 Cu, 1.75 Pb, bal Zn.
For swaged, riveted and rolled parts; free-cutting

BOHNOLLOY R65.
M-138, 62.5 Cu, 1.25 Pb, bal Zn
For spun and swaged parts; free-cutting and good workability.

BOHNOLLOY R66.
M-138; 61 Cu, 3.5 Pb, bal Zn
For screw machine products, fasteners; free-cutting

BOHNOLLOY R67
M-138; 60 Cu, 0.75 Pb, 0.8 Si, 2.5 Mn, bal Zn.
½ H-temper: 78,000 TS; 40,000 YS; 10 El; 150 Brin.
For bearings, bushings, free-cutting.

BOHNOLLOY R68
M-138; 60 Cu, 0.75 Pb, 0.80 Si, 2.5 Mn, bal Zn
½ H-temper: 74,000 TS, 40,000 YS, 12 El, 150 Brin.
For bearings, bushings; free-cutting.

BOHNOLLOY R69.
M-138; 60 Cu, 0.8 Si, 2.5 Mn, bal Zn.
Hard: 78,000 TS; 60,000 YS; 9 El, 165 Brin
Soft: 60,000 TS; 30,000 YS, 30 El, 80 Brin.
For bearings, bushings; good ductility.

BOHNOLLOY R-71
M-138, 58-61 Cu, 2-4 Mn, 1-2 Al, 0.6-1.0 Si, bal Zn.
½ hard: 78,000 TS; 67,000 YS, 15 El, 80 Rock B.
Soft. 40,000 TS; 34,000 YS; 20 El; 65 Rock B.
For synchromesh rings, gears, bearings, bushings, forgeable bearing alloy.

BOHNOLLOY R93.
M-138; 91 Cu, 12 Si, 7 Al.
Soft: 85,000 TS, 35,000 YS; 25 El; 160 Brin.
For pole line hardware, nuts, bolts, corrosion resistant.

BOKEBIT.
M-345; 0.80 C, 4.24 Cr, 18.8 W, 8 Mo, 2 V, 9 Co, bal Fe.
For tools, cutters; high speed steel.

BOKER POWER CHISEL.
M-345; 0.53 C, 2 W, 1.3 Cr, 0.25 V, 0.3 Mn, bal Fe.
For tools, chisels, crimpers, upsetters; oil hardened, shock resistant.

BOKER SPECIAL NO. 847.
M-345; 0.8 C, 4 Cr, 8.5 Mo, 1.5 W, 1.1 V, bal Fe.
For cutters, reamers, hobs, taps, drills, broaches; Type M1; high speed steel.

BOKER SUPER COBALT.
M-345; 0.8 C, 4.2 Cr, 19 W, 0.8 Mo, 2 V, 12 Co, bal Fe.
For tools, cutters; high speed steel.

BOLONEY.
M-714; Sn, Pb, bal Cu.
For bearings; heavy duty.

BOLSTER SILVER.
Eng.; 65.5 Cu, 16 Zn, 18 Ni, 0.5 P.
For ornaments, hardware, spun and drawn.

BOLTON 1% TIN BRONZE.
M-575; 1 Sn, P, bal Cu.
For telephone and telegraph wire; high electrical conductivity.

BOLTON 1.5% TIN PHOSPHOR BRONZE.
M-575; 1.5 Sn, 0.15 P, bal Cu
Annealed. 39,200 TS; 11,000 YS, 62 El; 70 Brin.
Hard: 61,500 TS, 53,500 YS; 22 El, 140 Brin
For flexible tubing; corrosion resistant.

BOLTON 2.5% TIN PHOSPHOR BRONZE.
M-575; 2.5 Sn, 0.035 P, bal Cu.
Annealed: 44,000 TS; 13,500 YS; 57 El, 80 Brin.
Hard: 68,000 TS; 59,600 YS, 21 El; 157 Brin.
For rotor bars for motors, high electrical conductivity.

BOLTON NO. 10 PHOSPHOR BRONZE
M-575; 5 Sn, 0.15 P, bal Cu
Annealed: 49,500 TS, 20,200 YS, 64 El, 85 Brin.
Hard: 88,000 TS, 69,500 YS, 20 El; 210 Brin
For spring contacts, worm gears, bolts, fuse clips, corrosion resistant, high strength

BOLTON NO 11 PHOSPHOR BRONZE
M-575, 6 Sn, 0.15 P, bal Cu
Annealed. 52,000 TS, 17,500 YS, 68 El, 82 Brin
Hard. 117,000 TS, 102,000 YS, 3.5 El, 241 Brin
For springs, electrical contacts, strong and corrosion resistant

BOLTON NO. 12 PHOSPHOR BRONZE.
M-575, 3.5 Sn, 0.06 P, bal Cu.
Annealed: 44,500 TS, 14,500 YS, 62 El, 79 Brin
Hard: 79,500 TS, 69,500 YS, 18 El, 180 Brin
For rotor bars for motors, corrosion resistant

BOLTON NO 14 PHOSPHOR BRONZE
M-575; 10 Sn, 0.035 P, bal Cu
Annealed. 62,500 TS, 25,000 YS, 67 El, 105 Brin
Hard 106,300 TS, 78,000 YS, 21 El; 235 Brin.
For springs, bellows; wear and corrosion resistant

BOLTON NO 15 PHOSPHOR BRONZE
M-575, 8 Sn, 0.15 P, bal Cu
Annealed: 54,300 TS, 22,000 YS, 77 El; 93 Brin
Hard 97,500 TS, 76,000 YS, 20 El, 232 Brin.
For diaphragms, bellows, high strength, corrosion resistant.

BOLTON NO 16 PHOSPHOR BRONZE.
M-575; 7 Sn, 0.25 P, bal Cu
Wire: 123,000 TS
For wire cloth for paper making equipment, corrosion resistant, high strength.

BOLTONS "SPECIAL" BEARING METAL.
M 575.
For bearings, bushing.

BONDED CARBIDE JR.
M-140; 0.77 C, 0.2 Mn, 4.25 Cr, 1.9 V, 18.5 W, 0.75 Mo, 7.8 Co, bal Fe.
For tools, dies, lathe and planer tools; high speed steel.

BONDED CARBIDE SR.
M-140; 0.7 C, 0.2 Mn, 4.5 Cr, 1.5 V, 18 W, 0.7 Mo, 10 Co, bal Fe.
For tools, dies, cutters, drills, taps, reamers; high speed steel.

BONDUR.
M-116; 3.5-5.5 Cu, 0.3-0.5 Si, 0.25-1.0 Mn, 0.2-0.7 Mg, bal Al.
Annealed: 31,000 TS; 15 El.
Heat treated: 65,000 TS; 43,000 YS; 16 El; 125 Brin.
For light alloy parts, aircraft parts; age-hardening, Duralumin type alloy.

BONDUR.
M-1548; 3.5-5.5 Cu, 0.4 Si, 0.3-1.0 Mn, 0.2-0.7 Mg, bal Al.
Heat Treated: 74,000-80,000 TS, 57,000-63,000 YS; 8-12 El; 130-150 Brin.
For structural components, transportation equipment, fittings, fasteners Age hardenable, high strength.

BONDURPLATE
M-116; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al, clad with 0-1.5 Mn, 0-1.0 Mg, 0-1.2 Si, bal Al.
Aged: 55,000-60,000 TS; 35,000-45,000 YS; 20-15 El.
For aircraft construction, wings, fuselage; age-hardenable clad alloy.

BONDWICH.
M-926; shim material with silver brazing alloy clad on both sides.
For sandwich brazing of carbide tipped cutting tools, shim absorbs stresses during brazing and cutting

BONNEY-FLOYD 4-6 Cr-Mo
M-139, 0.21-0.35 C, 4-6 Cr, Mo, Cu, bal Fe.
For heat and corrosion resistant parts, heat and corrosion resistant

BONNEY-FLOYD NIRRESIST.
M-139, 1.1 min C, 16-23 Ni, 5-7 Cu, Cr, bal Fe
For heat and corrosion resistant parts, heat and corrosion resistant

BOOTH 20S
M-338, 56-62 Cu, 0.75 Fe, 1.25 Mn, 0.5 Pb, 0.5 Sn, bal Zn.
70,000 TS, 30,000 YS, 28 El, 120 Brin.
For extrusions, corrosion resistant.

BOOTH 20SA
M-338; 57-58 Cu, 0.75 Fe, 1.0-1.2 Mn, bal Zn.
70,000 TS, 30,000 YS, 25 El, 120 Brin
For extrusions, corrosion resistant

BOOTH 76A
M-338, 1.8-2.5 Al, 76-78 Cu, bal Zn
60,000 TS, 20,000 YS, 30 El, 70 Brin
For condenser tubes, corrosion resistant.

BOOTH A1
M-338, 55-60 Cu, 2.0-3.5 Pb, bal Zn.
Annealed: 60,000 TS, 30,000 YS, 30 El; 100 Brin.
Cold drawn: 75,000 TS, 60,000 YS; 20 El; 170 Brin
For screws, nuts, bolts; free cutting

BOOTH AD.
M-338; 70-72 Cu, 1.0 Sn, bal Zn.
54,000 TS; 18,000 YS; 45 El; 65 Brin.
For tubes; corrosion resistant.

BOOTH ADA.
M-338; 70-72 Cu, 0.01-0.05 As, 1.0 Sn, bal Zn.
56,000 TS, 18,000 YS; 40 El; 75 Brin.
For condenser tubes; embrittlement free.

BOOTH ALM.
M-338; 1.2 Mn, bal Al.
Rolled: 25,800 TS; 3 El.
For cooking utensils; good corrosion resistance.

BOOTH B1.
M-338; 56.5-60.0 Cu, 1.0-2.5 Pb, bal Zn.
Annealed: 60,000 TS; 25,000 YS; 40 El; 35 RA; 100 Brin.
Cold drawn: 70,000 TS; 50,000 YS; 25 El; 170 Brin.
For screws, bolts, nuts; free cutting.

BOOTH B2C.
M-338; 58-61 Cu, 0.75 Pb, bal Zn.
60,000 TS; 24,000 YS; 35 El; 100 Brin.
For extrusions; free-cutting.

BOOTH B76
M-338, 61-63 Cu, 1.5-2.0 Pb, bal Zn.
Annealed: 55,000 TS, 20,000 YS, 40 El; 80 Brin.
Cold drawn: 66,000 TS, 35,000 YS; 25 El; 150 Brin.
For hardware, free cutting.

BOOTH CAP COPPER.
M-338, 96.0-97.5 Cu, bal Zn.
Soft: 35,000 TS, 50 El, 35 Brin
Hard: 50,000 TS; 10 El, 80 Brin.
For small pressings, red brass

BOOTH J5K.
M-338; 56-62 Cu, 0.75 Fe, 0.75 Mn, 0.5 Pb, 1.2-2.0 Sn, bal Zn
75,000 TS, 30,000 YS, 25 El, 120 Brin.
For extrusions; free-cutting.

BOOTH MG1
M-338, 1.0 Mg, 0.2 Mn, bal Al
Rolled: 31,400 TS, 3 El
For light alloy parts, good forming and corrosion resistance.

BOOTH MG2
M-338, 0.15 Mn, 2.5 Mg, 0.5 max Fe, 0.4 max Si, bal Al
Soft 26,000 TS 15,000 YS, 18 El.
Hard 36,000 TS, 26,000 YS, 8 El.
For welded vessels, architectural trim, weldable, corrosion resistant

BOOTH M G. 3.
M-338, 0.15 Cu, 3-4 Mg, 0.6 Si, 0.7 Fe, 1 Mn, 0.5 Cr, 0.2 Ti, bal Al
O-temper: 31,400 TS, 13,500 YS, 18 El
¼ H-temper: 38,100 TS, 26,500 YS, 8 El.
For structural members, corrosion resistant.

BOOTH MG5
M-338, 0.6 max Fe, 4.5-5.5 Mg, 0.15 Mn, bal Al.
Annealed: 38,000 TS, 18,000 YS, 18 El, 40 RA.
¼ H-temper: 43,000 TS, 30,000 YS, 8 El; 60 RA.
For rivets, marine parts, not hardenable, corrosion resistant

BOOTH MG7
M-338, 7 Mg, 0.6 Fe, 0.15 Cu, 0.6 Si, 0.2 Ti, bal Al.
Annealed: 50,000 TS, 24,000 YS, 26 El, 70 RA.
Hard: 70,000 TS, 62,000 YS, 4 El; 115 RA.
For rivets, light alloy parts; weldable and ductile.

BOOTH MV3
M-338, 59-61 Cu, 2-3 Pb, bal Zn.
Annealed: 60,000 TS; 20,000 YS, 30 El; 100 Brin.
Cold drawn 70,000 TS; 50,000 YS; 2 El, 160 Brin.
For screws, bolts, nuts; free cutting.

BOOTH T2.
M-338; 2-3 Al, 54-56 Cu, 0.5 Fe, 1.0 Mn, 1.5-2.0 Pb, bal Zn.
80,000 TS; 40,000 YS; 15 El; 150 Brin.
For extrusions; corrosion resistant.

BOOTH YDA.
M-338; 57-59 Cu, 0.5 Fe, 1.0-1.5 Mn, 0.5 Ni, 1.0 Sn, bal Zn.
70,000 TS; 30,000 YS; 25 El; 120 Brin.
For extrusions; corrosion resistant.

BOOTH YDB.
M-338; 50-61 Cu, 0.75-1.00 Pb, bal Zn.
Annealed: 55,000 TS; 20,000 YS; 40 El; 80 Brin.
Cold drawn: 70,000 TS; 40,000 YS; 25 El; 150 Brin.
For hardware; free cutting.

BORA.
M-459; 2 C, 12 Cr, 0.7 W, bal Fe.
For high duty blanking and forming dies; oil hardened, non-deforming.

BORA 5.
M-459; M-1496; 1.0 C, 5.0 Cr, 1.0 Mo, 0.4 Mn, 0.4 V, bal Fe.
Annealed: 103,000 TS; 51,000 YS; 26 El; 18 Rock C.
Hardened: 178,000-255,000 TS; 145,000-200,000 YS; 3-12 El; 7-32 RA; 41-53 Rock C.
For blanking and trimming dies, shear blades, broaches, rolling dies, gauges.
Type A2 air hardening, nondeforming cold work tool steel, tough.

BORA 12.
M-459; 2.0 C, 12 Cr, bal Fe.
For shear blades, blanking and forming dies; oil hardened, nondeforming.

BORA 318.
M-459; 2.1 C, 13 Cr, 0.4 Mo, 0.7 W, 1 Co, bal Fe.
For cutting tools, blanking and forming dies; oil hardened, nondeforming.

BORA SPECIAL M.
M-459; 1.6 C, 12 Cr, 0.7 Mo, 0.4 V, 0.5 W, bal Fe.
Hardened: 62-66 Rock C.
For punches, blanking and forming dies, cold forming and thread rolling dies.
Air hardening, non-deforming.

BORAL.
M-44, M-1395; B,C, Al.
For aircraft engine shielding, neutron curtains; absorbs thermal neutrons.

BORA SPECIAL.
M-459; 1.6 C, 0.4 Mn, 12 Cr, 0.2 V, bal Fe.
For blanking dies; nondeforming.

BORCHER ALLOY.
Eng.; 24 Ni, 32.5 Cr, 0.5 Ag, 1.8 Mo, bal Fe.
For chemical apparatus, crucibles, pyrometer tubes; heat and corrosion resistant.

BORCHER ALLOY 1.
U.S.; 30 Cr, 35 Co, 35 Ni.
For chemical apparatus; heat and corrosion resistant.

BORCHER ALLOY 2.
U.S.; 36 Cr, 60 Fe, 4 Mo.
For heat treating and annealing pots; heat and corrosion resistant.

BORCHER ALLOY 3.
U.S.; 65 Cr, 35 Fe.
For pyrometer tubes, crucibles; heat and corrosion resistant.

BORCHER ALLOY 4.
U.S.: 34 Co, 34 Ni, 30 Cr, 2 Ag.
For chemical apparatus; heat and corrosion resistant.

BORCHER ALLOY 5.
U.S.; 35 Co, 35 Ni, 30 Cr, 0.5-5.0 Mo.
For heat resisting parts, annealing pots; heat and corrosion resistant.

BORCHER'S "A."
65-68 Ni, 30 Cr, 0.5-5.0 Au, 0.25-1.5 Ag.
For resistances, heat and corrosion resistant parts; heat and corrosion resistant.

BORCHER'S "B."
52-68 Ni, 30 Cr, 0.15-1.5 Ag, bal Au.
For heat and corrosion resistant parts; heat and corrosion resistant.

BORCOLOY GR. 5.
M-1004; B, 12 Co, bal Fe.
For tools, cutters, discontinued.

BORCOLOY GR. 7.
M-1004; B, Co, bal Fe.
For tools, cutters; discontinued.

BORE 2.
M-111; 1.1 C, 0.3 Cr, 1 W, 0.1 V, bal Fe.
For twist drills, finishing cutters; water hardened.

BORE 2 LEDLOY.
M-111; 1 1 C, 0.3 Cr, 1 W, 0.1 V, 0.2 Pb, bal Fe.
For twist drills, punches; water hardened.

BORITE.
M-333; 1-1.2 C, bal Fe.
For tools, drills; water hardening.

BORITE HOLLOW
M-333; 0 70 C, 0 20 Si, 0.20 Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 360 Brin.
For drills, tools, springs, hammers; Type W1, water hardened.

BORITE SOLID DRILL.
M-333; 0.75 C, 0.20 Si, 0.20 Mn, bal Fe.
For moil points; blacksmith tools; shock resistant

BORIUM.
M-202; WC+ W_2C.
For welding rod for hard facing, hard inserts; hard and abrasion resisting.

BOROBEST 2D.
M-1343; 0.20 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El, 55 RA; 195 Brin. For cutlery, turbine blades, surgical instruments, Type 420; stainless, hardenable.

BOROBEST 4K.
M-1343, 0.40 C, 13 Cr, bal Fe
Annealed: 95,000 TS; 50,000 YS, 20 El; 50 RA; 200 Brin.
For cutlery, valves, surgical instruments; Type 420; stainless, hardenable.

BOROD.
M-202; 62 WC+ 38 steel.
For welding rod for hard facing, hard and abrasion resisting.

BOROLITE.
M-1284; Boron carbide.
For cutting tools; sintered carbide.

BORON DEOXIDIZED COPPER 109.
M-8; 0.01 B, bal Cu.
Hard. 48,000 TS; 40,000 YS; 6 El; B 50 Rock.
Soft: 33,000 TS; 10,000 YS; 45 El; F 45 Rock.
For electrical and electronic parts, magnetrons, synchrotons, vacuum switchgear.
Resists oxide penetration and thermal stress cracking. Resists grain growth.

BORON DEOXIDIZED COPPER 1170.
M-8; 0.01 B, bal Cu.
Hard: 48,000 TS; 40,000 YS; 6 El; B 50 Rock.
Soft: 33,000 TS; 10,000 YS; 45 El; F 45 Rock.
For electrical and electronic parts, magnetrons, synchrotons, vacuum switchgear.
Resists oxide penetration and thermal stress cracking. Resists grain growth.

BORON STAINLESS STEEL.
M-901; 0.08 max C, 17-19 Cr, 8-12 Ni, 1.2 B, bal Fe.
Annealed: 90,000 TS; 50,000 YS; 10-25 El; 185 Brin.
For thermal neutron shields and control rods; austenitic, stainless, absorbs thermal neutrons.

BORON STEEL.
U S.; 0.06-0 4 B, 0.45-0.16 C, Al, Si, Mn, bal Fe.
For structural and machine parts; water hardening.

BORON-T.
M-50, M-1414; 0.40 C, 1.6 Mn, 0 8 max Ni + Cr + Mo, 0.003 B, bal Fe.
Oil harden: 116,000-160,000 TS; 95,000-152,000 YS; 18-27 El, 48-57 RA; 24-70 Iz.
For fasteners, crankshafts, axles, shafts, gears, pinions
Oil hardening, impact resistant

BOROSIL.
M-398; 3-4 B, 38-42 Si, bal Fe.
For boron additions to steel.

BOROTAL Z7.
German; 3-4 Cu, 2 max Fe, 3 max Pb, 3 max Zn, 0.1 graphite, bal Al
For bearings.

BOROTEC 10009.
M-717;
Nickel base alloy powder for overlays on steel, stainless and nickel base alloys.

BOROTO B K.
Germany, graphitic white metal.
31 Brin.
For bearings; for high stresses.

BOROTO B L
Germany; graphitic white metal.
35 Brin.
For bearings; high friction and heavy torque.

BOROTO B N.
Germany; graphitic white metal
18 Brin
For bearings; for high speeds.

BOROTO B R.
Germany, graphitic white metal.
27 Brin.
For bearings, high friction and speed.

BOSCH Al 1
M-304; 2 5-5.0 Cu, 0 2-1.8 Mg, 0 3-1.5 Mn, bal Al.
For aircraft structures, age hardenable

BOSCH (Al-5).
M-304; 6 Cu, 3 Si, bal Al
Sand cast: 21,200 TS; 1-2 El.
Chill cast: 24,400 TS, 1-2 El, 80 Brin.
Die cast 28,000 TS, 1-2 El.
For Al castings, very good machinability

BOSCH (Al-7).
M-304; 89 Al, bal Zn + modifying agent
Annealed: 36,000 TS; 20 El.
Soft drawn 42,500 TS, 12 El, 30 RA; 85 Brin.
For parts for machinery and apparatus, pressed, forged and drawn parts; ages at room temperature.

BOSCH (Al-9)
M-304; 4 Cu, 2 Si, 1.5 Ni, bal Al
Die cast: 28,000 TS; 2 El; 80 Brin.
For ordinary die cast parts, good fluidity.

BOSCH Al 12.
M-304; 99.5 Al.
Annealed: 13,000 TS; 5000 YS; 45 El; 23 Brin.
Hard: 24,000 TS; 22,000 YS; 15 El; 44 Brin.
For structures, machine tool parts; corrosion resistant.

BOSCH (Al-20).
M-304; 88 El, 11 Zn, 0.5 Mg.
Annealed: 46,000 TS; 36,000 YS; 18 El; 25 RA.
Pressed: 50,000 TS; 18 El; 20 RA; 100 Brin.
For high quality parts for fine mechanism; good hot working properties.

BOSCH Al 24.
M-304; 0.6-1.4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, 0.3 max Cr, bal Al.
Annealed: 21,000 TS; 8000 YS; 24 El; 36 Brin.
Hard: 32,000 TS; 29,000 YS, 6 El.
For structural members.

BOSCH Al 25.
M-304; 4.0-5 5 Mg, 0.8 max Mn, 0 3 max Cr, bal Al.
Annealed: 42,000 TS; 22,000 YS; 35 El; 65 Brin.
For light alloy parts, marine structures; resists gasoline corrosion.

BOSCH Al 27.
M-304; 2.5-5.0 Cu, 0 2-1.8 Mg, 0.3-1.5 Mn, Pb, Sn, Cd, Bi, bal Al.
For screw machine products; free-cutting.

BOSCH Al 29.
M-304; 6-10 Mg, 0.2-0.7 Mn, 1.5 max Fe, bal Al.
For gasoline meters, aircraft parts; corrosion resistant

BOSCH (Al-34).
M-304; 89 Al, 11 Cu.
Chill cast 21,000 TS; 1-2 El; 80 Brin.
Sand cast: 20,000 TS; 1-2 El; 75 Brin.
For automobile pistons, sand and permanent mold parts; good machinability.

BOSCH (Al-36).
M-304; 89 Al, 6 5 Cu, 3.5 Ni.
Annealed: 19,000 TS, 1-2 El.
Die cast: 27,000 TS, 2 El; 80 Brin.
For die castings, good fluidity and machinability.

BOSCH Al 39
M-304, 1.0-1 5 Mn, 0.3 max Cr, bal Al
Annealed: 16,000 TS; 6000 YS; 40 El; 28 Brin.
Hard 29,000 TS, 27,000 YS, 10 El; 55 Brin.
For light alloy tanks, formed parts; good formability and corrosion resistance.

BOSCH Al 42
M-304; 5.0 6 5 Si, 2-3 Cu, 0.2-0.6 Mn, 1.5 max Fe. bal Al.
For light alloy parts, high corrosion resistance.

BOSCH AM-14.
M-304; 90 Cu, 10 Al.
Pressed. 85,000 TS; 25 El; 150 Brin
For parts exposed to H_2SO_4 and HNO_3; acid resistant.

BOSCH AM-158.
M-304; 1.5 Mn, bal Al.
Pressed: 17,800 TS, 20 El, 50 RA; 35 Brin.
Drawn 21,300 TS, 6 El; 30 RA; 50 Brin.
For rods, tubes, pressings; corrosion resistant.

BOSCH (An-4).
M-304; 4 Zn, 3 Cu, balance Al plus modifying agent.
Die cast 50,100 TS; 2 El; 110 Brin.
For die castings; high tensile and bending strength.

BOSCH (Br-6).
M-304; 66 Cu, 6 Sn, bal Zn.
Pressed: 50,000 TS; 0 5 El, 140 Brin.
For bearings subject to heavy loads and wear; hard, dense bronze

BOSCH (Br-14).
M-304; 86 Cu, 10 Sn, 2 Zn, 2 Pb.
Sand cast. 36,000 TS; 6 El; 80 Brin.
For bearings, phosphor bronze castings; corrosion and high wear resistant, tough, hard.

BOSCH (Br-32).
M-304; 76 Cu, Al, Ni, Fe, Mn.
Pressed: 120,000 TS; 72,000 YS; 0.5 El; 20 RA; 250 Brin. For gears, forged parts; special bronze; wear resistant.

BOSCH (Cu-28).
M-304; 99.9 Cu.
Annealed: 40,300 TS; 40 El.
Pressed: 33,000 TS; 40 El; 60 RA; 50 Brin.
For bars, shapes, tubes, pressed parts; electrolytic copper; corrosion resistant.

BOSCH (Me-1).
M-304; 58 Cu, 1.8 Pb, bal Zn.
Annealed: 67,000 TS; 27 El; 30 RA; 115 Brin.
Pressed: 62,500 TS; 18 El; 20 RA; 105 Brin.
For hot pressed parts for machines, apparatus and equipment; easily workable.

BOSCH (Me-2).
M-304; 58 Cu, 2.2 Pb, bal Zn.
Annealed: 67,000 TS; 30 El; 35 RA; 110 Brin.
Soft drawn: 72,000 TS; 20 El; 40 RA; 130 Brin.
For automatic parts, spring boxes, ornamental and hot pressed parts; easily workable.

BOSCH (Me-3).
M-304; 59 Cu, 2.5 Pb, bal Zn.
Pressed: 65,000 TS; 30 El; 38 RA.
Soft drawn: 72,000 TS; 20 El; 25 RA; 120 Brin.
For screws and turned parts for fine work, clock manufacture; somewhat cold workable.

BOSCH (Me-4).
M-304; 59 Cu, 1 Pb, bal Zn.
Pressed: 65,000 TS; 30 El; 45 RA.
Soft drawn: 72,000 TS; 20 El; 25 RA; 100 Brin.
For wire, hot pressed and forged parts; can be cold drawn.

BOSCH (Me-5) RIVET BRASS.
M-304; 62 Cu, 0.5 Pb, bal Zn.
Pressed: 58,000 TS, 40 El; 60 RA.
Soft drawn: 65,000 TS; 30 El.
For clock manufacture and fine mechanical work, rivets, tubes; cold workable.

BOSCH (Me-6) (BOSCH SPECIAL)
M-304, 57 Cu, some Ni and Mn, bal Zn.
Pressed: 72,000 TS; 30 El; 40 RA
Soft drawn: 78,500 TS; 20 El.
For piston rods, screws, valve spindles, condenser shells; corrosion resistant to sea water.

BOSCH ME-15.
M-304; 78 Cu, 4 Pb, 3 Sn, bal Zn
Sand cast: 32,000 TS; 15 El; 70 Brin.
For housings, fittings; free cutting.

BOSCH (Me-16).
M-304; 61.5 Cu, 2 Pb, bal Zn.
Pressed: 50,000 TS; 35 El; 40 RA; 80 Brin.
Soft drawn: 58,000 TS; 30 El; 40 RA; 90 Brin
For rods, bars, and shapes handled by automatic machinery; cold workable.

BOSCH (Me-17).
M-304; 63 Cu, bal Zn.
Pressed: 46,000 TS, >40 El; 55 RA; 75 Brin.
Soft drawn: 55,000 TS; >35 El; 50 RA; 85 Brin.
For cold formed rods and shapes, rivets; excellent cold forming.

BOSCH (Me-25) (BOSCH METAL).
M-304; 57 Cu, Mn, Al, Ni, bal Zn.
Pressed: 86,000 TS; 15 El; 20 RA; 135 Brin.
Soft drawn: 94,000 TS; 12 El; 15 RA; 155 Brin.
For bushings, bars, shapes; resists sea water corrosion and wear.

BOSCH NS-1.
M-304; Cu, Ni, Fe, Mn.
Pressed: 85,000 TS; 30 El; 30 RA; 150 Brin.
Hard: 100,000 TS; 15 El; 20 RA; 180 Brin.
For plates of nickel color; corrosion resistant.

BOSCH Pb-7.
M-304; 74 Pb, 10 Sn, 15 Sb, 1 Cu.
Cast: 8000 TS; 30 Brin.
For bearing shells; anti-friction

BO-STAN.
M-1469; 98.7 Type 304 stainless, 1.2 B, bal Fe.
Annealed: 104,500 TS; 7.5 El; 5.5 RA; 220 Brin.
Cold worked: 420 Brin.
For pressurized water reactors and controls; sintered, corrosion and heat resistant.

BOUND BROOK
M-632; Sn, P, graphite, bal Cu.
For bearings, bushings; sintered

BOURBOUNFS
Eng., 51 Sn, 49 Al, 0.3 Fe, 0.3 Cu

BOW AND ARROW.
M-233; 0.9 C, bal Fe.
For tools, dies, water hardened.

BOWCO.
M-336, C, W, Mn, Cr, V, Mo, Co, bal Fe.
For reamers, punches, dies, stamping and cutting tools, high speed steel

BOWCO 7720.
M-336, C, Cr, Mn, Mo, bal Fe.
For blanking dies, oil hardening

BOWCO COBALT
M-336, C, W, Co, Mn, Cr, V, Mo, bal Fe.
For tools for trimming and heavy cutting on hard and abrasive material, high speed steel

BOWCO FAST FINISHING
M-336, 1.3 C, 1.8 Cr, 4 W, 0.2 V, bal Fe.
For dies, cutting tools, oil hardening

BOWCO NON-SHRINK
M-336, 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, 0.35 Si, bal Fe
For tools, dies, oil hardening, non-deforming

BOWCO OIL HARDENING
M-336, 0.9 C, 1.3 Mn, 0.5 Cr, 0.5 W, 0.1 V, bal Fe.
For thread gages, taps, dies, non-shrinking

BOWCO ONE STAR
M-336; 0.7 C, 14 W, 4 Cr, 2 V, bal Fe
For tools, cutters for intermittent cutting, high speed steel

BOWCO WATER HARDENING TUBING
M-336, 1.0-1.1 C, bal Fe
For forming and blanking dies, water-hardened.

BOWER 315
M-709, M-97, 0.10-0.15 C, 0.5 Mn, 0.3 Si, 2.8 Ni, 1.5 Cr, 5.0 Mo, bal Fe
For bearings for service up to 600°F, case hardened.

BOWSTEEL FC.
M-1434; 1.0 C, 0.25 V, bal Fe
For tools, cutters, taps, reamers, Type W2; water hardened.

BOWSTEEL FCCR.
M-1434, 1.5 C, 12 Cr, 1 Mo, 3 Co, bal Fe.
For blanking and forming tools and dies, Type D5, air hardened, non-deforming

BOWSTEEL FND.
M-1434, 0.90 C, 1 Mn, 0.5 Cr, 0.5 W, bal Fe.
For dies, punches, broaches, taps, hobs; Type O1; oil hardened, non-deforming.

BOW WIRE.
Eng.; 93 Cu, 2 Zn, 5 Sn.
For corrosion resistant wire, corrosion resistant.

BOYD.
M-1705; 0.75 C, 0.75 Mn, 0.9 Cr, 1.75 Ni, 0.35 Mo, bal Fe.
Tool steel, miscellaneous applications as dies, wood working tools, shears. AISI L6.

BOYD-WAGNER NO. 4 SWEDISH.
M-336; 1.05 C, 0.5 Cr, 0.1 V, bal Fe.
For wood and machine screw cold header dies, water hardening.

BOYD-WAGNER NO 9 SWEDISH.
M-336, 0.9 C, 0.5 Cr, bal Fe.
For large cold header dies, water hardening.

BOYD-WAGNER NO 41 SWEDISH
M-336; 0.7 C, 0.6 Mn, bal Fe.
For chipping chisels; water hardening.

BOYD-WAGNER B-W POINT 5.
M-336, 0.02 C, 0.18 Mn, trace Si, 0.012 S, 0.004 P, bal Fe.
For plastic molds, white metal, die casting dies; water hardening.

BOYD-WAGNER CHROME MAGNET.
M-336, C, Cr, bal Fe.
For magnets, magnet steel.

BOYD-WAGNER EZ9W.
M 336, 0.35 C, 5 W, bal Fe
For punches, shear tools, gripper dies, hot work steel, oil hardened

BOYD WAGNER TUNGSTEN MAGNET.
M-336, C, W, bal Fe
For magnets, magnet steel.

B QUALITY
M-618, high C, W, Cr, bal Fe.
For die blank, cold drawing, dies, oil hardening.

BR 2 FM DIL STEEL
M-73, 2.5 C, 0.3 Si, 0.75 Mn, 5.25 Cr, 1.1 Mo, 4.5 V, bal Fe
Hardened C 55-66 Rock.
For dies, brick and tile mold liners and sleeves requiring extreme abrasion resistance, air hardenable, good temperature resistance.
BR-3 see Latrobe BR3
BR-4 FM see Latrobe BR-4FM.

BRAEBURN A T 2
M-140, 2.2 C, 12 Cr, 0.25 V, 0.9 Mo, bal Fe
Hardened: C 63-65 Rock
For blanking and forming dies, gauges, trimmer and drawing dies, lathe centers, brick mold liners.
Cold work Type D4, oil or air hardening.
High abrasion resistance.

BRAEBURN-BDM.
M-140, 0.30-0.35 C, 0.8 Mn, 0.5 Si, 1.7 Cr, 0.4 Mo, bal Fe
Hardened: C 36-42 Rock.
For extrusion and die casting dies, machined plastic molds, holder blocks, compression molding dies.
Oil hardening, tough.

BRAEBURN COBALT.
M-140; 0.65-0.73 C, 3.75-4.25 Cr, 0.85-1.0 V, 17.5-18.5 W, 4-4.5 Co, 0.75-1.0 Mo, bal Fe.
For tools and cutters for lathe and planer work; high speed steel.

BRAEBURN EXTRA.
M-140; 0.7-1.0 C, 0.25 Si, 0.25 Mn, bal Fe.
For drills, reamers, cutters; water hardened.
Type W1.

BRAEBURN H.C.A.
M-140; 0.30 C, 12 Cr, 1.2 W, 0.9 V, bal Fe.
For master hobs, brass extrusion dies, die casting dies; hot work steel, oil hardened.

BRAEBURN M-7.
M-140, 1.0 C, 3.75 Cr, 2.05 V, 1.75 W, 8.75 Mo, bal Fe.
For broaches, reamers, end mills, counterbores; high speed steel.

BRAEBURN M-10.
M-140; 0.88 C, 4 Cr, 8 Mo, 2 V, bal Fe.
For milling cutters, end mills, form tools, taps, high speed steel

BRAEBURN S.O.D.
M-140; 0.95 C, 1.65 Mn, 0.15 V, bal Fe.
For dies, tools, punches, non-deforming.

BRAEBURN SPECIAL
M-140, 0.7-1.4 C, 0.25 Mn, 0.25 Si, bal Fe.
For shears, reamers, drills, punches, hobs, broaches, water hardened; Type W1.

BRAEBURN STANDARD.
M-140, 0.60-1.4 C, 0.25 Si, 0.30 Mn, bal Fe.
For drills, taps, shear knives, reamers, broaches, Type W1; water hardened.

BRAEBURN T-15.
M-140; 1.5 C, 13 W, 4.5 Cr, 4.75 V, 5.0 Co, bal Fe.
Hardened C 65-67 Rock.
For lathe tools, form cutters, drills, broaches, boring tools, punches, milling cutters.
Type T-15 high-speed steel High red-hardness.
Abrasion resistant.

BRAECUT
M-140, 1.15 C, 4.25 Cr, 2.25 V, 5.25 W, 12 Co, 6.25 Mo, bal Fe.
For cutting tools for high temperature alloys, high speed steel

BRAEFOUR
M-140, 1.25 C, 4.5 Cr, 4 V, 5.5 W, 4.5 Mo, bal Fe.
Hardened: C 64-66 Rock.
For cutting, finishing and form tools, broaches, end mills, hobs, gauges, lathe and planer tools, reamers.
Type M-4 high speed steel, excellent abrasion resistance and high red-hardness

BRAEMAX
M-140, 1.1 C, 1.5 W, 9.5 Mo, 3.75 Cr, 1.15 V, 8 Co, bal Fe.
Hardened: C 66-70 Rock.
For broaches, form cutters, hobs, end mills, milling cutters, gear shaper cutters, taps.
High-speed steel. High red-hardness and abrasion resistance.

BRAEMOW M-2.
M-140; 0.8 C, 0.2 Mn, 4.2 Cr, 2 V, 6.5 W, 5.0 Mo, bal Fe.
For tools, cutters; high speed steel.

BRAEMOW SPECIAL.
M-140, 0.65 C, 5 Mo, 6.5 W, 4.2 Cr, 1.9 V, bal Fe.
Heat treated. 550-640 Brin
For planing and shaping tools, high speed steel.

BRAETUF.
M-140; 1.15 C, 4.0 Cr, 2.0 V, 5.0 W, 6.75 Mo, 7.25 Co, bal Fe.
Hardened: C 69 Rock.
For cutting tools for machining tough superalloys, cold extrusion punches, broaches, reamers, milling cutters, drills.
Modified Type M44; high-speed steel.

BRAEVAC 718.
M-140; 0.06 C, 0.05 Mn, 18-19 Cr, 53 Ni, 3 Mo, 5.2 Cb + Ta, 1.0 Ti, 0.5 Al, 0.004 B, bal Fe.
Ht. Tr.: 200,000 TS; 177,000 YS; 22 El.
At 1200°F: 167,000 TS; 148,000 YS; 20 El.
For aircraft and aerospace structures, high temperature fasteners.
High strength at elevated temperatures, precipitation hardening.

BRAEVAN.
M-140; 1.02 C, 5.7 Mo, 6.25 W, 4 Cr, 2.5 V, bal Fe.
Heat treated: 630-660 Brin.
For broaches, reamers, form tools, drills, high speed steel.

BRAEVAN 2.
M-140; 1.15 C, 5.5 Mo, 5.6 W, 4 Cr, 3.3 V, bal Fe
For broaches, reamers, end mills, form tools; high speed steel

BRAEVAN-M-3
M-334; 1 C, 6.2 W, 5.6 Mo, 2.5 V, 4.0 Cr, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

BRAGE 1.
M-111; 1.05 C, 0.5 Cr, 0.1 V, bal Fe
For threading tools, water hardening

BRAGE 2
M-111; 1.1 C, 0.25 Cr, 1 W, 0.1 V, bal Fe.
For threading tools, twist drills; water hardening

BRAND 110.
M-1409, 0.55-0.65 C, bal Fe
For drop forging die blocks, water hardened.

BRAND 113
M-1409, 0.5 C, 1 Ni, bal Fe.
For drop forging die blocks, water hardened

BRAND 123.
M-1409, C, Ni, Cr, bal Fe
For cold chisels and sates; oil hardened, shock resistant.

BRAND 124
M-1409, 0.5 C, 3 Ni, 0.75 Cr, bal Fe.
For drop forging dies, oil hardened, shock resistant.

BRAND 125.
M-1409; 0.5 C, 1.5 Ni, 1 Cr, 0.25 Mo, bal Fe.
For drop forging dies, oil hardened, shock resistant

BRAND 131.
M-1409, C, Ni, Cr, bal Fe.
For cold chisels and sates; oil hardened, shock resistant.

BRAND 133
M-1409, 0.15 C, bal Fe.
Annealed: 70,000 TS, 40,000 YS; 25 El; 60 RA, 143 Brin.
For gears, pinions, shafts, case hardened.

BRAND 134.
M-1409; 0.15 C, 3 Ni, bal Fe.
For gears, pinions, camshafts, cams; case hardened, tough.

BRAND 135.
M-1409; 0.15 C, 2 Ni, Mo, bal Fe.
For gears, pinions, camshafts, cams, shafts; case hardened, tough.

BRAND 138.
M-1409; 0.15 C, 5 Ni, bal Fe.
For gears, pinions, camshafts, cams; case hardened, tough.

BRAND 140.
M-1409; 0.15 C, Ni, Cr, bal Fe.
For gears, pinions, camshafts, fasteners; case hardened, tough.

BRAND F.T.20-30.
M-1409, 0.12 C, 25 Cr, 20 Ni, bal Fe.
For furnace parts, glass molds; heat and scale resistant to 1250°F.

BRAND F.T.1000
M-1409, 0.2-0.3 C, 18-20 Cr, 0.4 Ni, 1.2 Mo, bal Fe.
For furnace parts, glass molds; heat and scale resistant to 1150°C

BRASS, DRAWING.
M-8; 67-70 Cu, 30-33 Zn
Sand cast: 40,000 TS, 23,000 YS; 35 El; 35 RA; 45 Brin
Hard rolled: 67,200 TS, 67,000 YS; 15 El, 50 RA, 145 Brin.
For seamless tubes, deep drawing

BRASS E-133
M-1191, 58.5-60.5 Cu, 1.5-2.0 Pb, bal Zn.
Forged: 55,000-60,000 TS; 20,000-25,000 YS; 40-30 El, 80-100 Brin.
For hardware, machinery parts, leaded brass, free-cutting

BRASS, ESCUTCHEON
U.S., 64.5 Cu, 35.07 Zn, 0.43 Pb
For escutcheon pins, yellow brass

BRASS, HIGH
M-8, 65 Cu, 35 Zn
Cold rolled: 47,000-75,000 TS, 20,000-60,000 YS, 5-60 El, 5-75 RA, 45-180 Brin
Used for drawing, forming and spinning parts, high strength

BRASS, KRUPP NICKEL
M-72, 48.5 Cu, 24.3 Zn, 24.3 Ni, 2.9 Fe
For ornamental and corrosion resistant parts, corrosion resistant

BRASS, LANCASHIRE
Eng., 73 Cu, 25 Zn, 2 Pb
For parts to be brazed or soldered, free-cutting

BRASS, LEADED HIGH
M-8, 65 Cu, 0.5-1.5 Pb, bal Zn
For cupped, formed or drawn parts, does not foul cutting tools

BRASS, LEADED LOW
U.S., 78 Cu, 20 Zn, 1.7 Pb, traces Fe
Hard: 80,000 TS, 5 El
Soft: 40,000 TS; 35 El
For rivets, pins, wire, free-cutting

BRASS, LEADED SCREEN WIRE
U.S., 69 Cu, 30 Zn, 1.0 Pb, traces Fe
For screens, hardware; high ductility.

BRASS LK80-3L
Russian, 79.28 Cu, 0.28 Pb, 17.35 Zn, 0.24 Fe, 2.8 Si
Cast: 63,000 TS, 24,000 YS, 36 El, 44 RA.
For hardware, plumbing, red brass

BRASS LMTS58-2
Russian; 57.2 Cu, 40.15 Zn, 0.08 Fe, 1.54 Mn, 0.01 P.
Rolled: 72,000 TS, 48,000 YS, 26 El; 60 RA.
For marine parts, strong and corrosion resistant.

BRASS LS59-1.
Russian, 55.32 Cu, 1.42 Pb, 40.25 Zn
Rolled: 75,000 TS, 55,000 YS, 18 El; 31 RA

BRASS, MANGANESE
U.S.; 85-54 Cu, 2-40 Zn, 1-25 Mn, 0-2.4 Fe, 0-2.5 Ni, Al, Pb.
For propellers, marine parts, bolts, fittings; corrosion resistant.

BRASS, MANGANESE NICKEL
U.S., 66-53 Cu, 5-40 Zn, 2-18 Ni, 1.5-20 Mn, Al, Fe, Sn, Pb.

For condenser tubes, pump parts, corrosion resisting fittings; corrosion resistant.

BRASSOID.
M-538; brass coated Zn.
For fabricated parts, easily formed, stamped, drawn.

BRASS, PIN WIRE.
U.S.; 61 Cu, 39 Zn.
Wire: 51,000 TS; 20 El.
For brass pins, condenser tubes, water pipes; corrosion resistant.

BRASS STEEL.
M-538; brass coated steel.
For fabricated parts; easily formed, stamped, drawn.

BRASS TIN.
M-538; brass coated tin.
For fabricated parts; easily formed, stamped, drawn.

BRAZE 051.
M-63; 5 Ag, 58 Cu, 37 Zn.
Melting range 1545-1615°F.
For brazing Nichrome resistance elements, and for steels.

BRAZE 056.
M-63; 5 Ag, 78.4 Cd, 16.6 Zn.
For solder, M.P. 480-600°F.

BRAZE 071.
M-63; 7 Ag, 85 Cu, 8 Sn.
For brazing alloy; M P. 1225-1805°F.

BRAZE 090 (TL)
M-63, 9 Ag, 53 Cu, 38 Zn.
Melt point 1410°F; Flow point 1565°F.
For brazing copper base alloys such as band instruments.

BRAZE 200.
M-63; 20 Ag, 45 Cu, 30 Zn, 5 Cd.
Melt point 1140°F, Flow point 1500°F.
For brazing ferrous and non-ferrous alloys, good color match for yellow brass.

BRAZE 202
M-63, 20 Ag, 45 Cu, 35 Zn.
For brazing steel; M.P. 1315-1500°F.

BRAZE 250 (NE).
M-63, 25 Ag, 52.5 Cu, 22.5 Zn.
Melt point 1250°F; Flow point 1575°F.
For brazing ferrous and non-ferrous metals that are not damaged by 1600°F temperature.

BRAZE 251.
M-63, 25 Ag, 57.5 Cu, 17.5 Zn.
For brazing alloy; M.P. 1255-1625°F

BRAZE 400 (DT).
M-63; 40 Ag, 36 Cu, 24 Zn.
M.P. 1235°F; Flow P. 1415°F.
For brazing copper base alloys, morel, mild steel; can braze wide joints.

BRAZE 403 (SS)
40 Ag, 30 Cu, 28 Zn, 2 Ni.
Melt Point 1220°F; Flow Point 1435°F.
For brazing tungsten carbide tool tips, and for stainless food handling equipment.
AWS BAg-4.

BRAZE 404 (SS-5)
M-63; 40 Ag, 30 Cu, 25 Zn, 5 Ni.
Melt Point 1220°F; Flow Point 1580°F.
For brazing tungsten carbide tips, and for stainless steel.

BRAZE 450 (DE).
M-63; 45 Ag, 30 Cu, 25 Zn.
Melt Point 1225°F; Flow Point 1370°F.
For brazing ships piping, band instruments, aircraft engine oil coolers, brass lamps. AWS BAg-5.

BRAZE 501 (ETX).
M-63; 50 Ag, 34 Cu, 16 Zn.
Melt Point 1250°F; Flow Point 1425°F.
For brazing steam turbine blading and heavily galvanized or tinned steel.
AWS BAg-6.

BRAZE 505.
M-63; 50 Ag, 20 Cu, 28 Zn, 2 Ni.
Melting range: 1220-1305°F.
For brazing 300 series stainless food handling equipment.

BRAZE 541.
M-63; 54 Ag, 40 Cu, 5 Zn, 1 Ni.
Melt Point 1340°F; Flow Point 1575°F.
For atmosphere furnace brazing steel and stainless; for applications up to 700°F.
AMS 4772 B; AWS BAg-13.

BRAZE 559.
M-63; 56 Ag, 42 Cu, 2 Ni.
Melting range: 1420-1640°F.
For furnace brazing of steels and high temp. alloys where zinc fumes are undesirable.
AMS-4765; AWS BAg-13a.

BRAZE 560.
M-63, 56 Ag, 22 Cu, 17 Zn, 5 Sn.
Melt Point 1145°F; Flow Point 1205°F.
For brazing food handling equipment requiring a low melting cadmium free alloy.
AWS BAg-7.

BRAZE 580.
M-63; 57.5 Ag, 32.5 Cu, 3 Mn, 7 Sn.
For brazing alloy; M.P. 1120-1345°F.

BRAZE 600 (RT).
M-63; 60 Ag, 25 Cu, 15 Zn.
Melt Point 1245°F, Flow Point 1325°F.
For brazing Monel and other nickel base alloys and for silverware.

BRAZE 603.
M-63; 60 Ag, 30 Cu, 10 Sn.
Melt Point 1115°F; Flow T. 1325°F.
For brazing marine heat exchangers, ferrous and non-ferrous alloys, vacuum tube seals.
AMS 4773A; AWS BAg-18.

BRAZE 630.
M-63; 63 Ag, 28.5 Cu, 6 Sn, 2.5 Ni.
Melt Point 1275; Flow Point 1475.
For brazing 400 series stainless, alloy steels, food handling equipment. Good for combined furnace brazing and hardening for low alloy steels.
AMS 4774A.

BRAZE 650 (Easy).
M-63; 65 Ag, 20 Cu, 15 Zn.
Melt Point 1240°F; Flow Point 1325°F.
For brazing silverware, iron and nickel alloys.
ASME BAg-9.

BRAZE 655.
M-63; 65 Ag, 28 Cu, 5 Mn, 2 Ni.
For jet engine components, brazing alloy; M.P. 1385-1560°F.

BRAZE 700 (Medium).
M-63; 70 Ag, 20 Cu, 10 Zn.
Melt Point 1275°F; Flow Point 1360°F.
For brazing silverware when subsequent joints are made with Braze 650.
ASME BAg-10.

BRAZE 720 (BT).
M-63; 72 Ag, 28 Cu.
Melt Point and Flow Point 1435°F. (Eutectic alloy)
For brazing electric components requiring highest electrical and thermal conductivity; low volatile materials and impurities; for furnace brazing.
AWS BAg-8.

BRAZE 750 (Hard).
M-63; 75 Ag, 22 Cu, 3 Zn.
Melt Point 1365°F; Flow Point 1450°F.
For brazing silverware, for step brazing or subsequent enameling; iron and nickel base alloys.
ASME BAg-11

BRAZE 752.
M-63; 75 Ag, 25 Zn.
For brazing alloy; M.P. 1300-1330°F.

BRAZE 800 (IT).
M-63; 80 Ag, 16 Cu, 4 Zn.
Melt Point 1340°F; Flow Point 1490°F.
For brazing silver, iron and nickel base alloys

BRAZE 852.
M-63; 85 Ag, 15 mn
Melt Point 1760°F; Flow Point 1780°F.
For brazing stainless steels, Stellite and Inconel.

BRAZE ATT see **BRAZE 200 (ATT).**

BRAZE BT see **BRAZE 720 (BT).**

BRAZE DE see **BRAZE 450 DE**

BRAZE DT see **BRAZE 400 DT.**

BRAZE EASY see **BRAZE 650 (EASY).**

BRAZE ETX see **BRAZE 501 ETX.**

BRAZE HARD see **BRAZE 750 (HARD)**

BRAZE IT see **BRAZE 800 (IT).**

BRAZE MEDIUM see **BRAZE 700 (MEDIUM)**

BRAZE NE see **BRAZE 250 NE.**

BRAZE RT see **BRAZE 600 (RT).**

BRAZE SS see **BRAZE 403 (SS).**

BRAZE TL see **BRAZE 090 (TL)**

BRAZINAL.
M-1231; Si, bal Al.
Cast: 45,000 TS, 80 Brin
For brazing alloy for Al.

BRAZING BRASS
M-8; 80-75 Cu, 20-25 Zn.
For brazing

BRAZING BRASS 282.
M-279, 59 Cu, 38.8 Zn, 0.2 P
Brazing sheets, annealed.
Low melting temperature

BRAZING METAL
M-8, 84-86 Cu, 14-16 Zn
Cast. 95,000-50,000 TS, 7 El, 180 Brin
For brazed joints on steel parts, tough and ductile

BRAZING METAL "F."
Eng.; 85 Cu, 15 Zn.
For brazing metal, water pipe, architectural purposes, low m p.

BREARLEY B.
M-472; 0.15 max C, 14-16 Cr, bal Fe.
Heat treated 68,000-80,000 TS; 20 El; 130-153 Brin
For pressings, cooking utensils, Type 430; corrosion resistant.

BREARLEY B B.H.
M-472; 0.35-0.40 C, 11.0-12.5 Cr, bal Fe
Heat treated: 212,000-280,000 TS, 450-580 Brin
For ball bearings and engine valves; Type 420, stainless steels.

BREARLEY C.
M-472; 0.15 max C, 16-18 Cr, bal Fe.
Annealed: 60,000-80,000 TS, 50,000 YS; 30 El; 50 RA; 130-155 Brin.
For boiler and furnace fittings, kitchen sinks; Type 430; corrosion resistant.

BREARLEY SI.
M-472; 0.12 max C, 12-15 Cr, bal Fe.
For heat and corrosion resistant parts; stainless, heat and corrosion resistant.

BREARLY.
U.S; 12-14 Cr, 0.5 max Si, 0.3 C, bal Fe.
For cutlery, surgical instruments; stainless and corrosion resisting.

BREARLY A.
M-472; 0.12 max C, 12-14 Cr, bal Fe
Heat treated: 80,000-100,000 TS; 25 El, 152-207 Brin.
For turbine blades and shrouds, tanks, cooking utensils, Type 405; corrosion resistant.

BREARLY "K."
M-472, 0.25 C, 16-18 Cr, bal Fe.
67,000-90,000 TS
For chemical plant, particularly for HNO_3, corrosi
resistant

BREARLY PATENT.
U.S, 9-16 Cr, 0.7 max C, bal Fe.
For cutlery, surgical instruments; stainless and corrosion resisting

BREDA CM10.
M-1449, 0.09-0.12 C, 13 Cr, 0.5 max Si, bal Fe.
Annealed: 75,000 TS, 40,000 YS, 35 El; 70 RA; 155 Brin
For valves, cutlery, surgical and dental instrument
Type 403, corrosion resistant

BREDA CM13
M-1449, 0.26-0.37 C, 13 Cr, bal Fe
Annealed 95,000 TS; 50,000 YS, 25 El, 55 RA; 195 Brin
For valves, cutlery, surgical and dental instrument
Type 420, corrosion resistant

BREDA CMC
M-1449, 0.38-0.45 C, 13 Cr, bal Fe
Annealed 100,000 TS; 55,000 YS, 23 El, 52 RA; 210 Brin.
For valves, cutlery, surgical and dental instrument
Type 420, corrosion resistant.

BREDA LYS
M-1449, 0.07-0.12 C, 17 Cr, bal Fe
Annealed 80,000 TS; 50,000 YS, 25 El; 50 RA, 150 Brin.
For oil refining equipment, oil burners and heaters
Type 430, corrosion resistant.

BREDA NK1
M-1449, 0.25 max C, 17 Cr, 2 Ni, bal Fe
Annealed 125,000 TS, 95,000 YS; 20 El, 55 RA,
260 Brin
For pumps, marine hardware, valves; Type 431; corrosion and heat resistant.

BREDA-NK2
M-1449, 0.20 max C, 24 Cr, 12 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS, 50 El; 65 RA; 170 Brin.
For furnace parts, pumps, oil burners, heat treat boxes, Type 309; stainless, austenitic.

BREDA-NK3.
M-1449, 0.25 max C, 25 Cr, 20 Ni, 1.5 max Si, bal Fe.
Annealed: 100,000 TS, 45,000 YS, 50 El; 65 RA; 185 Brin.
For furnace parts, pumps, valves, turbine and jet parts; Type 310, stainless, austenitic.

BREDA RAS.
M-1449, 0.40 C, 10 Cr, 1 Mo, 2.5 Si, bal Fe.
For oil refinery equipment; heat resistant.

BREDA RF302.
M-1449; 0.35 C, 25 Cr, bal Fe.
Annealed: 85,000 TS; 50,000 YS; 30 El; 55 RA; 180 Brin.
For furnace parts and equipment; Type 446; heat resistant.

BRESCIANA AK.
M-1451, 0.09-0.12 C, 13 Cr, 0.5 max Si, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, valves, cutlery, knives; Type 403 and 410; corrosion resistant.

BRESCIANA ATK.
M-1451; 0.07-0.12 C, 17 Cr, bal Fe
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, oil burners and heaters; Type 430; corrosion resistant.

BRESCIANA AU.
M-1451; 0.17-0.25 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA, 150 Brin.
For chemical plant equipment, tanks, mixers; Type 302; stainless, austenitic.

BRESCIANA AUS.
M-1451, 0.11-0.16 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS, 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 301 and 302, stainless, austenitic.

BRESCIANA AUT.
M-1451, 0.09-0.15 C. 18 Cr, 9 Ni, Ti, bal Fe.
Annealed: 85,000 TS, 35,000 YS, 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, tanks; Type 321, stainless, austenitic

BRESCIANA CNV.
M-1451; 0.20 max C, 24 Cr, 12 Ni, bal Fe.
Annealed: 90,000 TS, 40,000 YS, 50 El, 65 RA; 170 Brin
For furnace parts, heat treating boxes, pumps, oil burners, Type 309, corrosion and heat resistant.

BRESCIANA INC.
M-1451; 0.26-0.37 C, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS, 22 El, 52 RA; 200 Brin.
For valves, cutlery, surgical instruments, Type 420; corrosion resistant.

BRESCIANA KK.
M-1451, 0.35 max C, 25 Cr, bal Fe
Annealed. 85,000 TS, 50,000 YS; 30 El, 55 RA; 180 Brin
For furnace parts and equipment, Type 446, heat resistant.

BRESCIANA MIC.
M-1451; 0.38-0.45 C, 13 Cr, bal Fe.
Annealed: 110,000 TS; 60,000 YS; 20 El; 50 RA; 220 Brin.
For valves, cutlery, surgical instruments; Type 420; corrosion resistant.

BRESCIANA VV.
M-1451; 0.25 max C, 25 Cr, 20 Ni, 1.5 max Si, bal Fe.
Annealed. 100,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin.
For furnace parts, valves, pumps, turbine components; Type 310; corrosion and heat resistant.

BRICROME.
M-715; 1.75 T.C., 1.5 Si, 0.8 Mn, 30 Cr, bal Fe.
Cast: 72,000 TS; 310 Brin.
For piston rings, cylinder liners; wear resistant.

BRIDGE BRONZE A.
English; 80 Cu, 20 Sn, 0.1 P.
3 El; 1.8 RA; 80 Brin.
For tubes; P-Bronze.

BRIDGE BRONZE B.
English; 85 Cu, 15 Sn, 0.1 P.
50 Brin.
For springs, electrical parts, P-Bronze.

BRIDGE BRONZE C.
English; 80 Cu, 10 Sn, 0.7-1.0 P, 10 Pb.
15 El; 74 Brin.
For bearings; heavy duty P-Bronze.

BRIDGE BRONZE D.
English; 88 Cu, 10 Sn, 0.3 P, 2 Zn.
For bearings, gears, worm wheels; P-Bronze.

BRIDGEPORT NO. 1.
M-141, 66 Cu, 34 Zn.
Hard: 74,000 TS; 60,000 YS; 8 El.
Soft: 47,000 TS; 15,000 YS; 62 El.
For hardware, general drawing and forming; yellow brass.

BRIDGEPORT 2.
M-141; 1.8 Pb, 63.25 Cu, bal Zn.
Hard. 55,000 TS; 42,000 YS; 30 El; B 75 Rock.
Soft: 45,000 TS; 15,000 YS; 55 El, F 65 Rock.
For screw machine parts requiring some cold working such as roll threading, knurling, etc., binding posts, toggle switch parts.
High leaded brass, free-cutting.

BRIDGEPORT NO. 3.
M-141; 65.5 Cu, 33.9 Zn, 0.60 Pb.
Hard: 74,000 TS; 60,000 YS; 8 El.
Soft: 49,000 TS; 17,000 YS; 57 El.
For hardware, bolts, studs, low leaded brass.

BRIDGEPORT NO 5.
M-141; 80 Cu, 20 Zn.
Hard: 74,000 TS; 59,000 YS; 7 El.
Soft. 44,000 TS, 14,000 YS, 50 El.
For tubing, hardware, diaphragms, low brass.

BRIDGEPORT NO 6
M-141; 35.35 Zn, 3.4 Pb, bal Cu.
Hard: 58,000 TS; 45,000 YS; 25 El; 144 Brin.
Soft 49,000 TS; 20,000 YS, 40 El; 61 Brin.
For screw machine products; free-cutting brass.

BRIDGEPORT 14
M-141, 40.25 Zn, bal Cu
Hard: 72,000 TS; 50,000 YS, 25 El; B 78 Rock.
Soft 54,000 TS; 21,000 YS, 50 El, F 80 Rock.
For architectural trim, fasteners, condenser plates, heat exchangers.
Good hot working qualities, high corrosion resistance.

BRIDGEPORT NO. 16.
M-141, 65 Cu, bal Zn.
For wood and machine screws; yellow brass.

BRIDGEPORT NO. 18
M-141, 67 Cu, 0.5 Pb, bal Zn.
Hard: 75,000 TS, 60,000 YS; 7 El.
For garden sprayers, free-cutting.

BRIDGEPORT NO. 19.
M-141, 0.3 Mn, 0.7 Sn, 1 Fe, 58.5 Cu, bal Zn.
Hard: 83,000 TS, 55,000 YS, 25 El; 165 Brin.
Soft. 72,000 TS; 30,000 YS; 45 El; 100 Brin.
For bolts, valve parts, tie rods; manganese bronze.

BRIDGEPORT NO. 24.
M-141; 60 Cu, 0.12 Pb, 0.65 Sn, bal Zn.
Hard: 75,000 TS; 53,000 YS; 20 El; 156 Brin.
Soft: 57,000 TS; 25,000 YS; 47 El; 100 Brin.
For nuts, bolts, marine hardware; Naval Brass.

BRIDGEPORT NO. 25.
M-141; 90 Cu, 10 Zn.
Soft: 38,000 TS; 12,000 YS; 45 El.
For threaded fasteners; resists season cracking.

BRIDGEPORT NO. 26.
M-141; 95 Cu, 5 Zn.
Hard: 56,000 TS; 50,000 YS; 5 El; 114 Brin.
Soft: 35,000 TS; 11,000 YS; 45 El; 50 Brin.
For jewelry; gilding metal.

BRIDGEPORT NO. 28.
M-141; 60 Cu, 0.6 Pb, 0.65 Sn, bal Zn.
Hard: 75,000 TS; 53,000 YS; 20 El; 156 Brin.
Soft: 57,000 TS; 25,000 YS; 47 El; 100 Brin.
For marine hardware; Leaded Naval Brass.

BRIDGEPORT NO. 29.
M-141; 60 Cu, 0.65 Sn, 1.75 Pb, bal Zn.
Hard: 75,000 TS; 53,000 YS; 15 El; 162 Brin.
For hardware; Leaded Naval Brass.

BRIDGEPORT NO. 30.
M-141; 71 Cu, 0.03 As, 1.05 Sn, bal Zn.
Soft: 53,000 TS; 22,000 YS; 65 El; 68 Brin.
For condenser tubes; Arsenical Admiralty Metal.

BRIDGEPORT NO. 32.
M-141; 98.53 Cu, 0.07 P, 1.4 Sn.
Hard; 65,000 TS; 50,000 YS; 8 El; 137 Brin.
Soft: 40,000 TS; 14,000 YS; 48 El; 56 Brin.
For flexible hose; P-bronze, corrosion resistant.

BRIDGEPORT NO. 34.
M-141; 89.85 Cu, 0.15 P, 10.0 Sn.
For springs; P-bronze, corrosion resistant.

BRIDGEPORT 35.
M-141; 8 Sn, 0.1 P, bal Cu.
Hard: 93,000 TS; 72,000 YS; 10 El; B 93 Rock.
Soft: 60,000 TS; 24,000 YS; 63 El; F 82 Rock.
For springs, fuse clips, contacts, meterparts, diaphragms, bellows, snap switches, cutter pins, terminals.
Phosphor bronze—13% elect. cond.

BRIDGEPORT 36.
M-141; 5.5 Sn, 0.15 P, bal Cu.
Annealed: 47,000 TS; 19,000 YS; 64 El; B 26 Rock.
Hard: 81,000 TS; 75,000 YS; 10 El; B 87 Rock.
Spring: 100,000 TS; 80,000 YS; 4 El; B 95 Rock.
For springs, fuse clips, contacts, relay parts, snap switches, terminals, diaphragms, bellows, cotter pins.
Phosphor bronze—18% elect. cond

BRIDGEPORT NO. 37.
M-141; 69.5 Cu, 30.5 Zn.
Hard: 76,000 TS; 63,000 YS; 8 El.
Soft: 47,000 TS; 15,000 YS, 62 El.
For cartridge cases, deep drawn parts; cartridge brass.

BRIDGEPORT 41.
M-141, 0.75 Pb, 60 Cu, bal Zn.
Annealed: 54,000 TS; 21,000 YS; 50 El; F 80 Rock.
¼ Hard: 72,000 TS; 50,000 YS; 25 El; B 78 Rock.
For screw machine products, bolts, fasteners, hardware, valve stems.
Low leaded brass, free cutting, corrosion resistant.

BRIDGEPORT 42.
M-141; 38.65 Zn, 1.10 Pb, bal Cu.
Hard: 80,000 TS; 60,000 YS; 6 El; B 85 Rock.
Soft: 54,000 TS; 20,000 YS; 40 El; F 80 Rock.
For screw machine products, bolts, fasteners, hardware. Corrosion resistant.
Free-cutting Muntz Metal.

BRIDGEPORT 45.
M-141; 61.0 Cu, 38.35 Zn, 0.65 Sn.
Hard: 75,000 TS; 50,000 YS; 20 El; B 80 Rock.
Soft: 54,000 TS; 25,000 YS; 50 El; B 55 Rock.
For bolts, fasteners, propellers, valve stems, rivets, marine hardware.
Good resistance to salt water corrosion.
Cold heading Naval Brass. Corrosion resistant.

BRIDGEPORT NO. 53.
M-141; 5 Al, 0.25 As, bal Cu.
Soft: 60,000 TS; 22,000 YS; 60 El.
For propellers, hardware; aluminum bronze.

BRIDGEPORT NO. 54.
M-141; 20.87 Zn, 2.1 Al, 0.03 As, bal Cu.
Soft: 60,000 TS; 27,000 YS; 55 El.
For hardware; corrosion resistant; Al-Bronze.

BRIDGEPORT NO. 62.
M-141; 62.25 Cu, 35.75 Zn, 2 Pb.
Hard: 74,000 TS, 60,000 YS; 7 El; 150 Brin.
Soft: 49,000 TS, 17,000 YS; 52 El.
For hardware, bolts, nuts; free-cutting.

BRIDGEPORT NO 63.
M-141; 65.5 Cu, 33.4 Zn, 1.1 Pb.
Hard: 74,000 TS; 60,000 YS; 7 El.
Soft· 49,000 TS; 17,000 YS, 54 El.
For hardware, bolts, nuts; free-cutting.

BRIDGEPORT NO. 64.
M-141; 67 Cu, 31.25 Zn, 1.75 Pb.
Hard: 75,000 TS, 60,000 YS, 7 El; 150 Brin.
Soft: 52,000 TS; 20,000 YS; 50 El, 70 Brin.
For screw machine products; leaded brass.

BRIDGEPORT NO. 69.
M-141, 70 Cu, 30 Zn.
Hard· 65,000 TS, 25 El.
Soft. 50,000 TS; 60 El.
For hollow rivets, fasteners, good formability, ductile.

BRIDGEPORT 77
M-141; 30 Zn, 0.05 Hg, bal Cu
Hard 78,000 TS; 64,000 YS; 8 El; 110 Brin.
Soft: 47,000 TS; 15,000 YS, 65 El; 58 Brin
For heat exchangers, condensers; resists bio-fouling and dezincification.

BRIDGEPORT NO 85
M-141; 85 Cu, 15 Zn
Hard: 70,000 TS; 57,000 YS, 5 El.
Soft 40,000 TS; 12,000 YS; 47 El.
For flexible hose, deep drawn parts; red brass.

BRIDGEPORT NO 87
M-141, 88 Cu, 12 Zn
For costume jewelry, resembles 14K gold.

BRIDGEPORT NO. 89
M-141; 89 Cu, 2 Pb, 8.5 Zn
Hard: 52,000 TS, 45,000 YS; 18 El; B 58 Brin.
Soft 37,000 TS, 12,000 YS, 45 El; F 55 Brin.
For hardware; free-cutting

BRIDGEPORT 90.
M-141; 88.5 Cu, 2 Pb, 1 Ni, 0.07 P, bal Zn.
Hard· 70,000 TS, 60,000 YS; 12 El; 144 Brin.
For screw machine products, hardware; free-cutting, corrosion resistant.

BRIDGEPORT 92.
M-141; 89.0 Cu, 9.1 Zn, 1.9 Sn
Hard: 90,000 TS; 72,000 YS; 3 El; B 90 Rock.
For springs, spring contacts, slide contacts.
Substitute for phosphor bronze. Corrosion resistant.

BRIDGEPORT 100.
M-141; Ag, bal Cu (20 oz. Troy/ton Avoir.)
Soft: 32,000 TS; 10,000 YS; 45 El; F 40 Rock.
For radio, television, radar and computer parts, bus conductors.
Silver bearing copper.

BRIDGEPORT 101.
M-141; Ag, bal Cu (10 oz. Troy/ton Avoir.)
Soft: 32,000 TS; 10,000 YS; 45 El; F 40 Rock.
For radio, television, radar and computer parts, wave guides, bus conductors.
Does not soften as readily as pure copper during soldering. Silver bearing copper.

BRIDGEPORT NO. 102.
M-141; 99.90 min Cu.
Hard: 50,000 TS; 45,000 YS; 4 El; 100 Brin.
Soft· 34,000 TS; 11,000 YS; 45 El; 45 Brin.
For electrical uses and hollowware; tough pitch copper.

BRIDGEPORT 103.
M-141, 99 92 min Cu.
Hard· 53,000 TS; 51,000 YS; 3 El; B 56 Rock.
Soft. 32,000 TS, 8000 YS; 43 El, F 33 Rock.
For electronic and radar parts, bus conductors, wave guides, transistor and rectifier bases, heat sinks
OFHC copper—102% elect cond

BRIDGEPORT NO. 104
M-141. Cu
For electronic parts, vacuum tube parts; oxygen free copper

BRIDGEPORT NO. 105.
M-141; 99 9 min Cu 0 02 P.
Hard 55,000 TS, 50,000 YS; 8 El, 107 Brin.
Soft 32,000 TS; 10,000 YS; 45 El, 40 Brin
For deep drawing and water tubes, deoxidized copper.

BRIDGEPORT 106.
M-141, 99.98 min Cu
Hard 55 000 TS, 50,000 YS, 8 El, B 60 Rock
Soft 32,000 TS, 10,000 YS, 45 El, F 40 Rock.
For tubular bus bars
Deoxidized copper

BRIDGEPORT 108
M-141, 0 02 P, 0 3 As, 99 4 + min Cu
Hard 40,000 TS, 32,000 YS; 25 El, F 77 Rock.
For condensers, heat exchangers
Inhibited.
Arsenical deoxidized copper

BRIDGEPORT 110
M-141; 0 02 P, 99 91 + Cu
Hard 50,000 TS, 45,000 YS, 14 El; B 40 Rock
Soft 32,000 TS, 10,000 YS, 45 El; F 40 Rock.
For heat sinks.
85% elect cond, corrosion resistant.

BRIDGEPORT 112
M-141, 99 50 Cu, 0 50 Te.
½ H-temper: 44,000 TS; 42,000 YS, 20 El, 78 Brin.
For screw machine products; high conductivity, free-cutting

BRIDGEPORT 120
M-141, 99 7 Cu, 0.3 S
½ H-temper· 44,000 TS; 42,000 YS, 20 El; 78 Brin.
For screw machine products, fasteners; high conductivity, free-cutting

BRIDGEPORT NO. 133.
M-141; 59 Cu, 1.75 Pb, bal Zn.
Hard: 72,000 TS; 50,000 YS; 15 El; 144 Brin.
Soft: 52,000 TS; 20,000 YS, 45 El; 72 Brin.
For hardware, machine tool parts; BPT forging rod.

BRIDGEPORT 134.
M-141; 2.25 Pb, 38 Zn, bal Cu.
Rolled: 75,000 TS; 52,000 YS; 22 El; B 80 Rock.
For hot forged and machined parts, hardware, fasteners, bolts.
27% elect. cond. Forging brass.
Corrosion resistant, free-cutting.

BRIDGEPORT 141.
M-141; 62.25 Cu, 37.75 Zn.
Annealed: 54,000 TS; 21,000 YS; 45 El; F 80 Rock.
Half Hard: 70,000 TS; 50,000 YS; 10 El; B 75 Rock.
For architectural trim, fasteners, hardware, heat exchangers, brazing rod, condenser tubes.
Muntz Metal. Good corrosion resistance.

BRIDGEPORT 142.
M-141; 62 0 Cu, 37.9 Zn, 0.1 As.
Hard· 56,000 TS; 23,000 YS; 50 El; F 82 Rock.
For condensers, heat exchangers.
Free from dezincification.
Arsenical Muntz Metal Inhibited.

BRIDGEPORT NO. 192.
M-141; 58 Cu, 0.9 Sn, 0.6 Fe, bal Zn.
For welding rod, brazing; non-fuming.

BRIDGEPORT 285.
M-141, 81 Cu, 4 25 Si, 0.15 Pb, bal Zn.
Annealed: 95,000 TS, 50,000 YS; 30 El; 185 Brin.
For valve stems, pump parts, corrosion and wear resistant.

BRIDGEPORT NO 511
M-141; 88.85 Cu, 10 Ni, 1.15 Fe
Hard: 50,000 TS; 45,000 YS, 18 El
Soft 45,000 TS, 15,000 YS, 40 El
For condensers and heat exchangers; cupro-nickel, corrosion resistant

BRIDGEPORT NO 520
M-141, 78 85 Cu, 20 Ni, 0 4 Fe, 0 75 Mn.
Soft 49,000 TS, 14,000 YS; 40 El
For condensers and heat exchangers, cupro-nickel, corrosion resistant.

BRIDGEPORT 521.
M-141; 20 Ni, bal Cu
Hard: 103,000 TS, 101,000 YS; 2 El.
Spring 85,000 TS, 81,300 YS, 2 5 El.
For wave guides, radar equipment, relay springs.
Resists stress corrosion cracking

BRIDGEPORT NO. 531
M-141; 67 75 Cu, 31 Ni, 0.5 Fe, 0.75 Mn.
Soft· 60,000 TS, 25,000 YS; 45 El, 75 Brin
For condensers and heat exchangers; cupro-nickel, corrosion resistant

BRIDGEPORT NO 548
M-141, 48 Cu, 9 5 Ni, bal Zn
For nickel silver welding rod, corrosion resistant.

BRIDGEPORT NO 555.
M-141, 55 Cu, 18 Ni, bal Zn.
Drawn. 100,000 TS; 3 El.
Spring: 115,000 TS; 90,000 YS; 2 5 El, B99 Brin.
For telephone switch parts, springs; corrosion resistant.

BRIDGEPORT 558
M-141; 12 Ni, 56.5 Cu, bal Zn
Annealed: 55,000 TS; 22,000 YS, 50 El; B 40 Rock.
Hard. 100,000 TS; 90,000 YS; 5 El, B 93 Rock.
For spring parts and contacts for telephone boards, radios, controls, springs, resistance wire, diaphragms Good workability and weldability.
Corrosion resistant nickel silver.

BRIDGEPORT NO. 565
M-141; 65 Cu, 18 Ni, bal Zn.
Hard: 85,000 TS; 75,000 YS; 3 El; 172 Brin.
Soft: 60,000 TS, 30,000 YS; 35 El; 64 Brin.
For hollowware, zippers, tableware, optical goods; nickel silver, corrosion resistant.

BRIDGEPORT NO. 566.
M-141; 65 Cu, 12 Ni, 0.15 Mn, bal Zn.
For jewelry, hardware; nickel silver, corrosion resistant.

BRIDGEPORT NO. 567.
M-141; 65.25 Cu, 9.75 Ni, 0.15 Mn, bal Zn.
Hard: 86,000 TS; 75,000 YS; 4 El, 180 Brin.
Soft: 60,000 TS; 28,000 YS; 36 El; 100 Brin.
For hardware, hollowware, jewelry, nickel silver, corrosion resistant.

BRIDGEPORT NO. 606.
M-141; 96.05 Cu, 3 Si, 0.95 Mn
Hard: 94,000 TS; 58,000 YS; 8 El
Soft: 60,000 TS, 25,000 YS; 60 El.
For pole line hardware, stampings; silicon bronze, corrosion resistant.

BRIDGEPORT NO. 609
M-141; 98 Cu, 2 Si.
Annealed: 45,000 TS; 15,000 YS; 50 El.
Drawn: 80,000 TS, 50,000 YS; 12 El.
For transmission lines, marine hardware, bolts, welding rod; corrosion resistance.

BRIDGEPORT 632.
M-141; 0.10 Fe, 2.95 Si, bal Cu.
Hard: 94,000 TS; 58,000 YS; 8 El, B 93 Rock.
Soft: 60,000 TS; 25,000 YS, 60 El; F 85 Rock.
For bolts, fasteners, springs, marine fittings, hardware. High fatigue strength.
High silicon bronze, corrosion resistant.

BRIDGEPORT 635.
M-141, 97.5 Cu, 1.9 Ni, 0.6 Si.
Annealed: 40,000 TS, 12,000 YS; 50 El; 56 Brin
Aged: 103,000 TS, 97,000 YS; 17 El; 216 Brin.
For cold headed bolts, fasteners, switch gear, springs, contacts; age-hardenable, corrosion resistant

BRIDGEPORT 707.
M-141; 7 Al, 2.0 Si, bal Cu.
Soft: 90,000 TS, 50,000 YS; 30 El; B 85 Rock.
For pump rods, gears, valve stems, pole-line hardware, oil burner nozzles.
High strength and corrosion resistance.
Duronze III.

BRIDGEPORT 708.
M-141, 91.5 Cu, 1.75 Si, 6.75 Al.
Annealed: 85,000 TS; 40,000 YS; 30 El; 165 Brin.
For valve stems, bolts, fasteners, corrosion and wear resistant, hot forgeable.

BRIDGEPORT NO. 715.
M-141; 96.75 Cu, 2.9 Al, 0.35 Si.
Hard: 75,000 TS, 15 El
Soft: 40,000 TS; 55 El.
For bolts, nuts, screws; Al-bronze.

BRIDGEPORT NO. 820.
M-141; 95.35 Cu, 0.15 P, 4.5 Sn.
Hard: 81,000 TS; 75,000 YS; 10 El; 172 Brin.
Soft: 50,000 TS; 21,000 YS; 52 El; 71 Brin
For springs, clutch discs, diaphragms; P-bronze.

BRIDGEPORT 828.
M-141; 92 Cu, 1.9 Sn, 6.1 Zn.
Hard: 72,000 TS; 8 El.
½ H-temper: 58,000 TS; 20 El.
Spring: 90,000 TS; 2 El; 172 Brin.
For electrical switches, springs, contacts; substitute for P-bronze, 37% electrical conductivity.

BRIDGEPORT NO. 835.
M-141; 98.85 Cu, 0.75 Sn, 0.25 Si, 0.15 Mn.
For copper welding rods.

BRIDGEPORT NO. 840.
M-141; 98.6 Cu, 1.4 Sn.
Hard: 65,000 TS; 10 El.
Soft: 40,000 TS, 40 El.
For pole line hardware, marine parts; corrosion resistant.

BRIDGEPORT NO. 980
M-141; 99 Cu, 1 Cd.
Hard: 55,000 TS, 45,000 YS; 6 El; B65 Brin.
Soft: 35,000 TS, 15,000 YS, 60 El, F35 Brin.
For electrical applications; high electrical conductivity

BRIDGEPORT NO. 985
M-141; 99.1 Cu, 0.9 Cd.
Hard: 55,000 TS, 48,000 YS; 6 El; 116 Brin.
Soft: 37,000 TS, 12,000 YS; 50 El; 45 Brin.
For trolley wire, marine hardware; cadmium copper.

BRIDGEPORT 992.
M-141, 0.13 Zr, bal Cu
Annealed: 30,000 TS, 10,000 YS; 45 El; 40 Brin.
Aged: 60,000 TS, 55,000 YS; 15 El; 116 Brin.
For resistance welding electrodes, grid wires; heat treatable, high conductivity

BRIDGEPORT NO 1232
M-141; 3 Si, bal Cu
Welded: 55,000 TS, 55 El.
For welding rod, bronze

BRIDGEPORT NO 1426
M-141, 95.5 Cu, 3.5 Al, 1.0 Si.
For tubing, corrosion resistant

BRIDGEPORT 1552
M-141; 1.9 Sn, 6.1 Zn, bal Cu
For fuse clips, springs, diaphragms, good electrical conductivity

BRIDGEPORT BRONZE
M-141, 60 Cu, 0.75 Sn, bal Zn.
Drawn: 75,000 TS, 15 El
For condenser tubes, water pipes, nuts, bolts, corrosion resistant.

BRIDGEPORT F-37
M-141, 30 Zn, bal Cu
For bearing retainer cages, cartridge brass.

BRIDGEPORT F-3034
M-141, 0.10 S, 0.25 P, bal Cu
For hardware, P-bronze, corrosion resistant

BRIDGEPORT FORGING ROD
M-141, 59.5 Cu, 1.75 Pb, 0.2 Sn, bal Zn
Annealed: 52,000 TS, 20,000 YS, 45 El
For forgings, hardware, free cutting

BRIDGEPORT JEWELRY BRONZE NO 92.
M-141, 89 Cu, 1.9 Sn, bal Zn
Hard: 90,000 TS, 72,000 YS, 3 El; B90 Rockwell.
For costume jewelry, electrical contacts; resembles red gold.

BRIDGEPORT MANGANESE BRONZE 19.
M-141; 58.5 Cu, 1.0 Fe, 0.75 Sn, 0.3 Mn, bal Zn
Annealed: 60,000 TS, 15 El.
Drawn: 85,000 TS, 35 El
For welding rod, forgings, brazing; corrosion resistant.

BRIDGEPORT PHOSPHOR 36 BRONZE GRADE A.
M-141; 5.0 Sn, 0.15 P, bal Cu.
Annealed: 50,000 TS; 52 El.
Drawn: 81,000 TS; 10 El.
For springs, diaphragms, clutch discs; corrosion and fatigue resistant.

BRIDGEPORT PHOSPHOR BRONZE GRADE C.
M-141; 8 Sn, 0.10 P, bal Cu.
Annealed: 60,000 TS; 65 El.
Drawn: 112,000 TS; 3 El.
For springs, diaphragms; corrosion and fatigue resistant.

BRIDGEPORT PLUMRITE.
M-141; 61 Cu, 38.6 Zn, 0.4 Pb.
For brass pipe for fresh water service and chemical plants; high strength.

BRIDGEPORT SULPH-COPPER.
M-141; 0.3 S, 99.7 Cu.
½ H temper: 42,000 TS; 39,000 YS; 20-35 El; 77 Brin.
H-temper: 48,000 TS; 46,000 YS; 18-20 El; 81 Brin.
For nozzles, welding tips, motor parts; free-cutting, high electrical and thermal conductivity.

BRIGHT ALLOY.
M-580.
For anodes; electroplating.

BRIGHT CAP GILDING.
Eng, 90 Cu, 9 9 Zn, 0.4-0.1 Pb.
For gilding, jewelry; corrosion resistant.

BRIGHT EXTRUDED BRONZE
M 33; 58.5 Cu, 38 7 Zn, 2 5 Pb.
As extruded: 56,000 TS, 20,000 YS; 28 El, 33,000 shear; 56 Rock B.
For architectural, ornamental hardware, hinges.

BRIGHTRAY A.
M-121, 80 Ni, 20 Cr.
118,000 TS
For electrical resistances; can be used up to 1150°C.

BRIGHTRAY-C.
M-121, 80 Ni, 19 Cr, 0 5 max Fe, 1 5 Si.
Cold Drawn 106,000 TS, 47 El, 63 RA; 196 Brin.
For electrical resistances, heating elements.
Heat resistant to 1150°C.

BRIGHTRAY-F
M-121, 37 Ni, 18 Cr, 2 Si, bal Fe
For electrical resistances, heating elements, electric furnace elements
Heat resistant to 1000°C

BRIGHTRAY H.
M 121, 19 Cr, 3 8 max Al, 0 5 max Fe, bal Ni
Annealed. 95,000 TS, 30 El; 55 RA; 185 Brin.
Cold Drawn: 165,000 TS, 1 El, 1 RA, 260 Brin.
For electrical resistors, heating elements.
Heat resistant to 1250°F.

BRIGHTRAY S
M 121, 80 Ni, 20 Cr.
Annealed 107,000 TS, 50,000 YS, 47 El, 63 RA, 187 Brin.
For heavy industrial electrical and resistance heating elements; rod and strip.

BRIGHTWAY B
M-121; 15-17 Cr, 58-60 Ni, 20 Fe.
Annealed: 99,000 TS, 41,000 YS; 44 El; 66 RA, 190 Brin.
For heating elements, electrical resistances; heat resistant to 950°C

BRIGHTWAY H.
M-121, 80 Ni, 20 Cr.
Annealed: 95,000 TS; 30 El, 55 RA, 185 Brin.
For electrical resistances, heating elements, operating range 1100-1250°C.

BRILLALUMAG 3.
M-770; 3 Mg, bal Al.
Annealed: 39,000 TS; 14,000 YS; 30 El; 35 Brin.
Hardened: 53,000 TS; 50,000 YS; 4 El; 65 Brin.
For decorative, light alloy parts; takes high polish.

BRILLALUMAG 5.
M-770; 5 Mg, bal Al.
Annealed: 47,000 TS; 31,000 YS; 28 El; 48 Brin.
Hardened: 69,000 TS; 50,000 YS; 3 El; 90 Brin.
For decorative, light alloy parts; takes high polish.

BRILLIANT.
M-333; 0.70 C, 4 Cr, 1 V, 18 W, bal Fe.
For twist drills, reamers, taps, milling cutters; high speed steel.

BRILLIANT AXL.
M-52; 0.7 C, 4.5 Cr, 18.5 W, 0.6 max Co, 1 2 V, bal Fe.
For twist drills, lathe and planer tools, cutters; high speed steel.

BRILLIANT MM.
M-333; 0.7 C, 5 Mo, 6 W, 4 Cr, 4 V, bal Fe.
For cutters, dies; Type M4; high speed steel.

BRILLIANT WKE.
M-52; 0.8 C, 4.5 Cr, 1.2 Mo, 18.5 W, 5.5 Co, 1 6 V, bal Fe.
For milling cutters, hobs, drills, taps; high speed steel.

BRILLIANT WKE EXTRA.
M-52, 0 8 C, 4 5 Cr, 1 Mo, 18 5 W, 10 Co, 1.6 V, bal Fe.
For milling cutters, planer and shaper tools; high speed steel

BRILLIANT WW
M-333, 0 7 C, 18 W, 4 Cr, 1 V, bal Fe.
For drills, taps, cutters, reamers; Type T1, high speed steel.

BRILLUM.
M-469, 1.5 Cu, 2 Ni, bal Al.
For pistons, light alloy

BRILYBDENUM
M-715, 3 2 C, 2 Si, 0 4 Ni. 0.2 Cr, bal Fe
For piston rings, heat resistant.

BRIMCO.
M-509; 87-88 Cu, 2.36-3 25 Sn, 0 016-0.06 P, 0.21-0.23 Mn, bal Zn
For contacts, corrosion resistant.

BRIMCO BRONZE.
M-1579, 2 5 Sn, 10 Zn, bal Cu
Hard 77,000 TS; 70,000 YS; 8 El; Rock B 83.
Spring. 94,000 TS, 81,000 YS, 4 El; Rock B 90.
For fuse clips, fasteners, lock washers, springs, electrical components
Good formability and strength.

BRIMCOLLOY-100.
M-1579; 86 Cu, 0 5 Sn, 13 5 Zn
½ Hard: 54,000 TS; 48,500 YS; 18 El; B 70 Rock.
Hard: 67,500 TS; 63,000 YS; 5 El, B 78 Rock.
Spring 80,500 TS; 76,000, 3 El, B 87 Rock.
For electrical contacts, jewelry chain relay components
Corrosion resistant. Readily fabricated.

BRIMCOLLOY-200.
M-1579, 86.0 Cu, 1.0 Sn, 13.0 Zn.
Hard: 77,500 TS, 65,200 YS; 5 El; B 82 Rock.
Spring: 84,000 TS; 76,000 YS; 2 El; B 88 Rock.
For electrical contacts, springs, fuse clips, heat exchangers, condensers.
Corrosion resistant, readily fabricated.

BRIMCOLLOY-300.
M-1579; 86.0 Cu, 2.0 Sn, 12.0 Zn.
Hard: 75,000 TS; 67,000 YS; 8 El; B 82 Rock.
Spring: 88,000 TS; 75,000 YS; 3 El; B 89 Rock.
For electrical contacts, springs, fuse clips, retention devices, heat exchangers.
Corrosion resistant, readily fabricated.

BRIMCOLLOY-400.
M-1579; 87 Cu, 2 Sn, 2 Pb, bal Zn.
Half Hard: 58,000 TS; 49,000 YS; 14 El; B 70 Rock.
Hard: 76,000 TS; 70,000 YS; 10 El; B 80 Rock.
For meter and gauge components, bearings, thrust washers, valve parts.
Corrosion resistant, self-lubricating, free-cutting

BRIMOL.
M-715; 2.8 C, 2 Si, 14 Ni, 3 Cr, 7 Cu, bal Fe.
For cylinder liners, rings; austenitic.

BRINALLOY.
M-264; 70 Ni, 16 Cr, 10 Si.
Cast: 120,000 TS; 600 Brin.
For valve seats and discs; resists wear, galling and corrosion.

BRISTAHL.
M-716; 0.2 C, 18 Cr, 8 Ni, bal Fe
For stainless steel parts, stainless.

BRISTOL.
Eng.; 60.8-75.7 Cu, 24.3-39.2 Zn.
For hardware, clocks.

BRISTOL.
European; 0.30 C, 0.90 Cr, 0.65 Ni, 1.0 Mo, 0.6 Al, bal Fe.
Heat treated: 150,000-200,000 TS; 135,000-175,000 YS, 18-16 El; 55-50 RA; 300-400 Brin.
For nitrided parts, gears, cams; nitriding steel.

BRISTOL ALLOY BUTTONS.
Eng; 57-61 Cu, 36-37 Zn, 2.7-5.3 Sn.
For buttons, fixtures; corrosion resistant.

BRISTOL BRASS.
Eng.; 76-61 Cu, 24-39 Zn.
For condenser tubes, pipes, ornamental purposes, same as "Princes Metal."

BRITEST.
M-715, 3.1 T.C., 2.0 Si, 0.8 Mn, 1 Cr, bal Fe
Cast: 58,000 TS, 280 Brin.
For piston rings, cylinder liners, wear resistant

BRITISH ALUMINUM PISTON ALLOY.
M-968; 88 Al, 12 Cu.
For pistons, castings, non-hardenable.

BRITISH ALUMINUM PISTON ALLOY.
M-968, 85 Al, 14 Cu, 1 Mn.
For pistons, castings; non-hardenable

BRITISH ALUMINUM PISTON ALLOY.
M-968; 94.5 Al, 5.5 Ni.
For pistons, castings, non-hardenable.

BRITISH I Steel
0.45 C, 0.62 Mn, 2.8 Cr, 0.43 Ni, 0.9 Mo, 0.20 V, bal Fe.
At 70°F: 167,000 TS, 3.7 El; 7.0 RA.
At 1000°F: 88,000 TS; 9.2 El; 17.5 RA.
At 1200°F: 48,000 TS, 25 El, 55.4 RA.
For ordnance mortar tubes.
Good fatigue resistance.

BRITISH NAVY ANTIFRICTION METAL.
M-561; 5 Cu, 85 Sn, 10 Sb.
For admiralty lining, plastic bearings; Babbitt.

BRITOR.
W, C
For welding; welding to steel.

BRITTANIA, ENGLISH.
Eng.; 90-85 Sn, 0-3 Zn, 1.3 Cu, 5-10 Sb.
For bearings, table ware; corrosion resistant.

BRITTANIA, GERMAN.
Germ.; 70-94 Sn, 0-5 Zn, 1.8-5 Cu, 3.7-5 Sb, 0-9 Pb.
For bearings; Babbitt.

BRITTANIA METAL-1.
M-332; 94-80 Sn, 1.5-5 Zn, 0.9 Cu, 4-16.2 Sb, 1-8.5 Pb, 2-8 Bi.
10,000 TS; 19-11 El; 25-10 RA.
For bearings, table ware; heavy duty.

BRITTANIA METAL-2.
M-332; 91 Sn, 1.5 Cu, 7-5 Sb.
80,000 TS; 50 El; 8 Brin.
For bearings, pewter, table ware; corrosion resistant.

BRITTANIA METAL-3.
M-332; 91-85 Sn, 0-3 Zn, 0.2-1 Cu, 9-11 Sb.
For bearings, table ware.

BRIX.
Eng; 75-60 Ni, 15-20 Cr, 5 Cu, 4 Si, 3 Ti, 2 Al, 1-4 W, 1 B.
For heating elements, heat and corrosion resisting parts; heat and corrosion resistant.

BRM.
M-289; 0.75-0.85 C, 4.2 Cr, 2.1 V, 19 W, 0.6 Mo, bal Fe.
For tools and cutters; oil hardening, high speed steel

BRM
M-783, 0.8 C, 4.15 Cr, 2.1 V, 19 W, 0.6 V, bal Fe
For cutting tools; oil hardening

BROACHING.
M-24, 0.80 C, 0.40 Mn, 0.30 Si, bal Fe
For cutting hard stone, granite, quartz
AISI Type W1 water hardening tool steel.

BROCKHOUSE
M-961; 0.2 C, 18 Cr, 8 Ni, bal Fe.
For case hardening boxes, steam boiler parts; heat resisting

BROLUNICK
Eng, 82 Cu, 7 Al, 5.5 Ni, 4 Fe, 2 Mn.
For corrosion resisting parts, Al-Bronze, tough

BROLUNICK BRONZE.
French, 7 Al, 5.5 Ni, 4 Fe, 2 Mn, bal Cu
For gears, housings, propellers, marine hardware; tough, corrosion resistant

BROMET.
Australia; WC.
For dies, sintered

BRONCO
M-926, copper clad with P-bronze.
For springs, high current carrying capacity.

BRONWITE.
M-815; 20 Mn, 20 Zn, 1 Al, bal Cu.
Die Cast 75,000 TS; 40,000 YS, 20 El.
Sand Cast 60,000-70,000 TS; 30,000-35,000 YS; 25-40 El.
For general die castings, hardware, fixtures.
For die casting copper alloys
Die castable bronze, corrosion resistant

BRONZALUN.
M-250, a bronze with abrasive grains cast in the metal 85 Cu, 15 alumina or carborundum.
For floor plates, stair treads, car steps and door saddles; wear resistant and "anti-slip."

BRONZARK.
M-118; Sn, bal Cu.
For welding electrodes; for cast iron or copper.

BRONZE AU-CADMIUM.
M-897; 1 Cd, bal Cu.
For heating elements; useful operating temperature to 350°C.

BRONZE DEVIL.
M-712; 8.5 Sn, 0.25 P, bal Cu.
For P-bronze welding rods; arc welding.

BRONZE OTSSN3-7-5-1.
Russian; 85.08 Cu, 3.58 Pb, 7.35 Zn, 0.01 P, 3.4 Sn, 0.3 Ni.
Cast: 27,000 TS; 13,000 YS; 17 El; 26 RA.
For hardware, plumbing; free-cutting.

BRONZE, PHOSPHOR GRADE "A."
M-8; 96 Cu, 3.75 Sn, 0.25 P.
Cold rolled: 90,000 TS; 45,000 YS; 10 El.
Wire: 150,000 TS; 0.5 El.
For springs, electrical switches, diaphragms; high strength.

BRONZE, PHOSPHOR GRADE "C."
M-8; 92 Cu, 8 Sn.
Plates: 50,000 TS, 20,000 YS; 73 El; 60 Brin.
Wire: 150,000 TS.
For springs, switches, fittings; tough.

BRONZE, PHOSPHOR GRADE "D."
M-8, 89.5 Cu, 10.5 Sn.
Cold rolled: 92,000 TS; 83,000 YS; 29 El; 218 Brin.
For worm wheels, pumps; tough.

BRONZE, STEAM FITTING.
U.S.; 88 Cu, 8 Sn, 2 Zn, 2 Pb.
For steam fittings, pressure tight.

BRONZE, STEAM VALVE.
U.S., 88 Cu, 10 Sn, 2 Zn.
For steam valves.

BRONZE, STEEL (STAHL).
U.S.; 52-59 Cu, 36-43 Zn, 1 Fe, 2.5-3.0 Mn, 1 Al.
For propellers, marine parts, hardware; same as "Uchatius Bronze."

BRONZE WABBLER.
M-136, Sn, bal Cu.
For rolls; tough and hard.

BRONZE, WEATHERSTRIP.
U.S., 89 Cu, 9.5 Zn, 1.5 Sn.
For weather strips.

BRONZE, WHITE.
U.S., 54 Cu, 42 Zn, 4 Ni, 0.3 Fe + Al.
For ornamental and architectural parts; corrosion resistant.

BRONZE, WIRE.
U.S.; 98.75 Cu, 1.2 Sn, 0.05 Pb.
For electrical purposes, roofing, gutters.

BRONZOCHROM NO. 185.
M-717; Zn, Ni, bal Cu.
180-235 Brin.
For superfacing on steel and cast iron; M.P. 1000-1200°F.

BRONZOCHROM NO. 186.
M-717; Zn, bal Cu
240-290 Brin.
For brazing rod on iron and copper; M.P. 1000-1200°F.

BRONZOCHROM NO. 187.
M-717; Zn, bal Cu.
300 Brin.
For brazing rod on copper; M.P. 1000-1200°F.

BRONZOCHROM 10185.
M-717; Nickel-base alloy powder for overlays on ferrous and nickel base alloys.

BRONZOTEC 10146.
M-717; Copper-base alloy powder for braze welding.

BRONZ-ROD NO. 61.
M-1096; 97 Cu, 2.85 Si, 0.15 Fe.
Welded: 55,000 TS; 22,000 YS; 8 El; Rockwell F85.
For brazing rod for steels and cast iron; high tensile brazing.

BRONZSTOX.
M-214; Sn, Pb, bal Cu.
For bearings, bushings; heavy loads.

BROTERNAL.
M-282, 92 Cu, 1 Mn, 7 Al.
Drawn: 112,000 TS; 85,000 YS; 6 El; 200 Brin.
For periscope tubes, paper mill and dye works equipment; Al bronze, corrosion resistant.

BROWN BAILEY BB4K-TI.
M-472; 0.10 max C, 16-18 Cr, 10-14 Ni, 1.7-2.7 Mo, Cb = 10 × C, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 60-50 El; 75-60 RA; 150-190 Brin.
For acid resistant chemical plant equipment; Type 316 Cb; stainless, austenitic.

BROWN BAILEYS QS.
M-472; 0.4 C, 6-8 Cr, 1 Si.
For valves for internal combustion engines; heat and corrosion resistant.

BROWN BAILEYS QSS.
M-472; 0.4 C, 6-8 Cr, 3 Si, bal Fe.
For valves for internal combustion engines; heat and corrosion resistant.

BROWN BAYLEY BBH.
M-472; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS; 40,000 YS; 32 El; 68 RA; 170 Brin.
Heat treated: 256,000 TS; 190,000 YS; 6 El; 10 RA; 540 Brin.
For cutlery, valve trim, springs, turbine blades; Type 420, stainless, hardenable.

BROWN-BAYLEYS BB 2 K.
M-472; 0.2 C, 18-22 Cr, 7-12 Ni, other alloys, bal Fe.
89,600 TS.
For chemical plant equipment resisting sulfurous, acetic and sulfuric acids; resists severe chemical corrosion.

BROWNIE EXTRA.
M-1182; 0.80 C, bal Fe.
For drills, taps, reamers, cutters; Type W1; water hardened.

BROWN LABEL.
M-341; 0.5 C, 0.2 Mn, 1.15 Cr, 2.5 W, 0.2 V, 0.75 Si, bal Fe.
For coining and swaging dies, chisels; oil hardening, tough; AISI S1 shock resistant tool steel.

BROWN LABEL.
M-343; 0.85-1.0 C, 3-4 Cr, bal Fe.
For tools, hot work tools and dies, hot shear blades, bull dies; "Hellers Hot Die Steel."

BROWN & SHARPE WATER HARDENING.
M-1172; 1.08-1.18 C, 0.2-0.3 Mn, 0.4-0.5 Cr, bal Fe.
Annealed: 97,000 TS; 56,000 YS; 27 El; 45 RA; 170-200 Brin.
For tools, dies, fixtures, gages, templates; ground flat stock.

BROWN & SHARPE OIL HARDENING.

M-1172; 1.08-1.18 C, 0.7-0.9 Mn, 1.1-1.3 Cr, 0.20-0.35 Mo, bal Fe.

Annealed: 99,000 TS; 58,000 YS; 24 El; 40 RA; 170-200 Brin.

For tools, dies, fixtures, gages, templates; ground flat stock.

BRUSH-10.

M-1037; 0.40-0.70 Be, 2.35-2.70 Co, bal Cu.

Cast: 45,000-50,000 TS; 5000-10,000 PL; 20-30 El; 72-81 Brin.

Cast and Aged: 100,000 TS; 50,000 PL; 3-15 El; 191-241 Brin.

Wrought and Aged: 110,000-125,000 TS; 100,000-120,000 YS; 70,000-95,000 PL; 5-8 El; 79-82 Rock 30 T.

For springs, switches, instrument parts, clutch rings, resistance welding electrodes.

Tough, strong, corrosion resistant, heat treatable. (CA 175).

BRUSH 10-C.

M-1252, M-1037; 0.45-0.65 Be, 2.4-2.6 Co, bal Cu.

Heat treated. 90,000-120,000 TS. 70,000-90,000 YS; 5-12 El; 5-18 RA; 195-262 Brin

For slip rings, contact arms, switch parts, age-hardenable, good conductivity

BRUSH-10X.

M-1037; 0.4-0.7 Be, 2.35-2.7 Co, bal Cu.

Ht-Temper: 110,000-130,000 TS; 100,000-120,000 YS; 8-20 El; B 95-102 Rock.

For wind tunnel components, springs, switch gears, resistance welding electrodes.

High strength up to 800°F. Corrosion resistant. Heat treatable (CA 175).

BRUSH 17.

M-1037; 31 Ni, 0.70 Fe, 1.0 max Mn, 0.3-0.7 Be, 0.15 max Si, bal Cu.

Cast· 76,000 TS; 45,000 YS, 14 El; B 82 Rock.

Age Hardened· 120,000 TS, 85,000 YS; 14 El, C 20 Rock.

For marine hardware, sonar cases, heat exchangers, desalinization equipment.

Corrosion resistant Age-hardenable.

BRUSH 18.

M-1037, 30 Ni, 0.62 Fe, 1.5 max Mn, 0.4-0.6 Be, 0.7-0.9 Si, bal Cu.

Cast· 100,000 TS; 70,000 YS; 12 El, B 94 Rock.

Age Hardened: 120,000 TS; 80,000 YS; 13 El; C 30 Rock.

For marine hardware, desalinization equipment, heat exchangers, valve bodies, sonar cases

Corrosion resistant. Age-hardenable.

BRUSH 20-C

M-1252, M-1037, 1.90-2.15 Be, 0.35-0.65 Co, bal Cu.

Heat treated. 150,000-175,000 TS; 125,000-160,000 YS; 1-4 El; 1-5 RA, 352-426 Brin.

For bearings, gears, valve and pump parts; age-hardenable, wear and corrosion resistant.

BRUSH 25.

M-1037; 1.8-2.0 Be, 0.2-0.3 Co, bal Cu.

For corrosion and wear resistant parts; corrosion and wear resistant.

BRUSH 35-C.

M-1252, M-1037; 0.25-0.50 Be, 1.4-1.6 Ni, bal Cu.

Heat treated: 70,000-90,000 TS; 50,000-70,000 YS; 5-17 El, 5-25 RA; 180-210 Brin.

For resistance welding dies and jaws; age-hardenable, high conductivity.

BRUSH 50.

M-1037; 0.25-0.50 Be, 1.4-1.7 Co, 0.9-1.1 Ag, bal Cu.

Annealed: 35,000-55,000 TS; 25,000 YS; 20-35 El; B 35 Rock.

HT-Temper: 120,000 TS; 110,000 YS; 8-20 El; B 95-102 Rock.

For resistance welding applications, electrodes.

Heat treatable, corrosion resistant.

BRUSH 50 C.

M-1037; 0.40-0.65 Be, 1.4-1.7 Co, 1.0-1.15 Ag, bal Cu.

Cast: 45,000-60,000 TS; 15,000-35,000 YS; B 50-65 Rock.

Heat Treated 100,000 TS, 75,000 YS; 3-15 El; B 92-100 Rock.

For resistance welding electrodes; dies and holders.

RWMA Class III, heat treatable, corrosion resistant.

BRUSH 55 C.

M-1037; 0.45-0.65 Be, 2.4-2.6 Co, bal Cu.

Cast· 90,000-120,000 TS, 70,000-90,000 YS; 5-12 El; 5-18 RA; B 90-103 Rock.

For resistance welding electrodes, circuit breaker and switch parts, slip rings, contact arms, welder bearings

Good conductivity. Resists elevated temperatures to 700°F. RWMA Class 3.

BRUSH 125

M-1037; 1.8-2.00 Be, 0.12-0.18 Co + Ni, bal Cu.

Magnetic mass susceptibility $-0.5\text{x}10^{-1}$.

Magnetic permeability 0.999997.

Heat Treated. 200,000 TS; 175,000 YS, 2-5 El; C 42 Rock

For strain members in nonmagnetic cables, wire forms, springs

High strength, nonmagnetic, heat treatable, corrosion resistant.

BRUSH 165

M-1037, 1.6-1.8 Be, 0.2-0.3 Co, bal Cu

For corrosion and wear resistant parts; corrosion and wear resistant

BRUSH 165 C.

M-1037, 1.6-1.85 Be, 0.2-0.65 Co, bal Cu

Cast, 73,000 TS, 38,000 YS; 23 El; B 78 Rock.

Heat Treated 150,000 TS, 140,000 YS, 2-4 El, C 37 Rock

For plastic tooling and pressure containers

RWMA Class IV, corrosion resistant, heat treatable, tough

BRUSH 190

M-1037, 1.80-2.05 Be, 0.2-0.3 Co, 0.20 min Co + Ni, bal Cu

Condition AM 105,000 TS, 95,000 YS, 20 El, Rock 40 (30N).

Condition XHMS 190,000 TS; 180,000 YS; 3 El; Rock 61 (30N)

For springs, shafts, fasteners

(CA 172) Corrosion resistant, heat treatable.

BRUSH 200 C.

M-1037 2 Be, 4 max additives, bal Ni.

Annealed 130,000 TS, 57,000 YS; 30 El, B 97 Rock.

Aged· 240,000 TS; 190,000 YS, 5 El; C 54 Rock.

For safety tools, plastic molds and cores, fuel pump impellers, mechanical seals.

Good structural stability at elevated temperatures.

BRUSH 220-C.

M-1037; 2.0-2.3 Be, 0.4 max C, bal Ni.

For corrosion and wear resistant parts; corrosion and wear resistant.

BRUSH 220-CC.

M-1037; 2.0-2.3 Be, 0.8 max Cr, 0.4 max C, bal Ni.

For corrosion and wear resistant parts; corrosion and wear resistant.

BRUSH 221-C.
M-1037; 2.0-2.3 Be, 0.5-1.0 C, bal Ni.
For corrosion and wear resistant parts; corrosion and wear resistant.

BRUSH 221-CC.
M-1037; 2.0-2.3 Be, 0.8 max Cr, 0.5-1.0 C, bal Ni.
For corrosion and wear resistant parts; corrosion and wear resistant.

BRUSH 245 C.
M-1037; 2.3-2.55 Be, 0.35-0.65 Co, bal Cu.
Cast: 83,000 TS; 45,000 YS; 23 El; B 84 Rock.
Heat Treated: 175,000 TS; 165,000 YS; 1-2 El; C 40-45 Rock.
For plastic tooling, pressure containers.
Heat treatable, corrosion resistant, impact resistant.

BRUSH 250 C.
M-1037; 2.50-2.75 Be, 0.35-0.65 Co, bal Cu.
Cast: 140,000-165,000 TS; 110,000-130,000 YS; 0-2 El; 0-2 RA; C 42-48 Rock.
For plastic molds, deep drawing dies, zinc die casting dies.
High wear resistance.

BRUSH 260-C.
M-1252, M-1037; 2.55-2.80 Be, 0.4 max C, bal Ni.
Cast: 115,000-125,000 TS; 60,000-70,000 YS; 7-12 El; 5-10 RA; 250-283 Brin.
Heat treated 200,000-220,000 TS; 190,000-210,000 YS; 0-2 El; 0-1 RA; 500-560 Brin.
For aircraft parts, molds for plastics, age-hardenable, heat resistant to 800°F

BRUSH 260-CC.
M 1037; 2.55-2.8 Be, 0.8 max Cr, 0.4 max C, bal Ni.
For springs, bellows; age hardenable

BRUSH 261-C
M-1252, M-1037; 2.55-2.80 Be, 0.5-1.0 C, bal Ni.
For aircraft parts, molds for plastics; age hardenable, heat resistant to 800°F.

BRUSH 261-CC.
M-1037, 2.55-2.8 Be, 0.8 max Cr, 0.5-1.0 C, bal Ni.
For springs, bellows; age hardenable.

BRUSH 275-C
M-1252, M-1037, 2.50-2.75 Be, 0.35-0.65 Co, bal Cu.
Heat treated. 140,000-165,000 TS; 110,000-130,000 YS, 0-2 El; 0-2 RA, 393-460 Brin.
For plastic molds, deep drawing dies, age--hardenable, wear resistant

BRUSH BERYLLIUM NO 6
M-1037, 2.4-2.6 Be, 1.2-1.3 Ni, bal Cu.
Heat treated· 76,000-193,000 TS, 68,000-85,000 YS; 34-0 El; 33-2 RA; 135-387 Brin.
For springs, diaphragms, instrument parts; age-hardenable; now Brush 240-C.

BRUSH-M25.
M-1037; 1.8-2.05 Be, 0.20-0.30 Co, 0.2 Pb, bal Cu.
HT Temper: 175,000-215,000 TS; 150,000-200,000 YS; 2-5 El; C 39-45 Rock
Annealed· 65,000-85,000 TS; 25,000 YS; 50 El; B 65 Rock.
For gears, shafts, screw machine products, fasteners.
Free-cutting (CA 172), heat treatable, corrosion resistant.

BRUSH M220C.
M-1037; 2.0-2.3 Be, 0.5-0.75 C, bal Ni.
Heat Treated: 170,000-190,000 TS; 160,000-180,000 YS; 1-2 El; C 48-52 Rock.
For molds, plungers, forming tools and plungers in the glass industry.
Age-hardenable. High strength, corrosion and oxidation resistant.

BRUSH M260C.
M-1037; 2.55-2.80 Be, 0.4 max C, bal Ni.
Cast: 115,000-125,000 TS; 60,000-70,000 YS; 7-12 El; 5-10 RA; C 24-30 Rock.
Aged: 210,000-230,000 TS; 200,000-210,000 YS; 1-2 El; 0-1 RA; C 50-54 Rock.
For turbine wheels, glass molds, valve bodies, fuel injection tips.
Age-hardenable, corrosion resistant.
High temperature resistant.

BRUSH QMV.
M-1037; Be, bal Cu.
For corrosion and wear resistant parts; age-hardenable.

BRUSH WIRE.
U.S.; 64.25 Cu, 35 Zn, 0.75 Sn.
For wire.

BRUSH ZrII-5% Be.
M-1037; 5 Be, bal Zr.
For brazing Zircalloy alloys.
High temperature brazing alloy.

BRYAN.
M-1705; 1.10 C, 0.30 Mn, 0.50 Si, 0.25 Cr, bal Fe.
Water hardening carbon tool steel, good hardness and wear, AISI W4.

BRYIRON.
M-718; 2.96 T.C., 0.73 Mn, 1.2 Si, 1.5 Ni, bal Fe.
51,000 TS; 221 Brin.
For liners, pistons; Tr. S. 4160; Def. 0.207".

BRYMILL BRM-1.
M-478, 0.10-0.18 C, 0.5-1.1 Mn, bal Fe.
Annealed 60,000 TS; 36,000 YS; 38 El; B 70 Rock.
For gears, fasteners, bolts, machine tool parts.
Case hardening

BRYMILL BRM-5.
M-478, 0.25-0.35 C, bal Fe.
Drawn: 89,600 TS, 15 El, 40 RA.
For bolts, studs, jack spindles, water hardened.

BRYMILL BRM-6.
M-478; 0.35-0.45 C, bal Fe.
Drawn 103,000 TS, 10 El; 35 RA.
For axles, shafts, racks, clutch plates, chain links; water hardened.

BRYMILL CH-2
M-478; 0.12-0.18 C, 0.90-1.5 Mn, 0.08-0.15 S, bal Fe.
Heat treated. 98,500 TS; 20 El; 50 RA.
For screw machine products, gears, bolts, fasteners; case hardened, free-cutting.

BRYMILL CH-8.
M-478, 0.08-0.55 C, 2.75-3.5 Ni, bal Fe.
Heat treated. 107,500 TS; 30 El; 50 RA.
For gears, bolts, crankshafts, camshafts; case hardened or thru hardened, tough.

BRYMILL DH-11
M-478, 0.4 C, 1 Ni, bal Fe
For shafts, axles, gears, machinery parts; case hardening.

BRYMILL DH12.
M-478; 0.30-0.40 C, 1.3-1.7 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened.

BRYMILL DH13
M-478; 0.25-0.35 C, 0.35-0.75 Mn, 2.75-3.5 Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

BS 1.
M-459; C, bal Fe.
For rock drills; water hardening.

BS 4.
M-459; C, bal Fe.
For rock drills; water hardening.

B.S.C. 3 NS.
M-1724; 0.25-0.37 C, 2.75-3.75 Ni, 0.30 Cr, bal Fe.
Normalized: 76,000-112,000 TS; 44,800 YS; 24 El; 45 RA; 152-229 Brin.
Oil treated: 100,800-132,200 TS; 71,000 YS; 22 El; 50 RA; 201-277 Brin.
For crankshafts, axles, connecting rods, forgings; Iz-35.

B.S.C. 3 1/2 NS.
M-1724; 0.35-0.45 C, 3.25-3.75 Ni, 0.30 Cr, bal Fe.
Oil treated: 123,000-145,600 TS; 18 El; 50 RA; 241-293 Brin.
For crankshafts, axles, connecting rods, forgings; Iz-35.

B.S.C. 5 CC.
M-1724; 1.0 C, 5.0 Cr, 0.45 V, 1.1 Mo, 0.6 Mn, bal Fe.
For brick mold liners, thread rolling dies, cold work steel, air hardenable.

B.S.C. "A."
M-1724; 0.45-0.50 C, 0.50 max Ni, 0.7-0.9 Mn, bal Fe.
Normalized: 89,600-112,000 TS; 44,800 YS; 20 El; 35 RA; 163-212 Brin.
Oil treated: 100,800-134,000 TS; 62,700 YS; 18 El; 40 RA; 197-285 Brin.
For gun and other mechanism parts, keys, shafts, gears, cylinders; suitable for surface hardening.

B.S.C. "A-31."
M-1724: 0.50-0.60 C, 0.60-0.80 Mn, bal Fe.
Normalized: 100,800 TS; 18 El; 40 RA; 197-241 Brin.
Oil treated: 123,200 TS; 65,000-85,000 YS; 15 El; 35 RA; 235-285 Brin.
For cylinders, gears, cams, mechanism parts; suitable for surface hardening, oil hardening, shock resistant.

B.S.C. A.W.
M-1724; 0.7 C, 3.75 Cr, 14 W, 0.65 V, bal Fe.
For drills, cutters, reamers, blanking and piercing dies; high speed steel.

B.S.C. "B.C.T.B."
M-1724; 0.55-0.65 C, 0.5-0.8 Cr, 0.5-0.8 Mn, bal Fe.
Normalized: 144,000 TS; 67,200 YS, 15 El; 277 Brin.
Oil treated: 126,000-160,000 TS; 90,000-112,000 YS, 18-23 El; 341 Brin.
For mandrels, gear wheels, dies; axles, pinions, cylinder liners.

B.S.C. C 12.
M-1724; 1.8 C, 12 Cr, 0.5 V, 1 Mo, bal Fe.
For dies, wortle plates, drawing dies; non-deforming.

B.S.C. C.D.
M-1724; 2 C, 12 Cr, bal Fe.
For dies, cold press cutting dies; non-deforming.

B.S.C. "C.H.-2N."
M-1724; 0.10-0.15 C, 2.0-2.5 Ni, bal Fe.
Normalized: 56,000 TS; 30,200 YS; 30 El; 55 RA; 103 Brin.
For general case-hardened objects; Iz-50.

B.S.C. "C.H.-3N."
M-1724; 0.10-0.15 C, 2.75-3.50 Ni, 0.30 max Cr, bal Fe.
Normalized: 67,200 TS; 36,000 YS; 28 El; 55 RA; 137 Brin.
Hardened: 104,400 TS; 67,200 YS; 18 El; 45 RA.
For general case-hardened objects; gears, cams, cam shafts, fasteners; Iz-40.

B.S.C. "C.H.-5 N."
M-1724; 0.09-0.16 C, 4.6-5.50 Ni, 0.20 max Cr, bal Fe.
Normalized: 71,700 TS; 50,000 YS; 28 El; 55 RA.
Hardened: 190,000 TS; 112,000 YS; 13 El; 40 RA.
For gear wheels; tough core.

B.S.C. CVM2.
M-1724; 0.36 C, 1.4 W, 5.0 Cr, 0.3 V, 1.35 Mo, 0.9 Si, bal Fe.
For blanking and forging dies, punches, shears; hot work steel; air or oil hardened.

B.S.C. CVM3.
M-1724; 0.4 C, 5.0 Cr, 1.1 V, 1.35 Mo, 0.9 Si, bal Fe.
For blanking and forging dies, punches, shears, hot work steel, oil hardened.

B.S.C. "C.H.M.S."
M-1724, 0.10-0.18 C, 0.6-0.9 Mn, bal Fe.
Normalized: 58,300 TS; 36,500 YS; 28 El; 50 RA; 111 Brin.
Hardened: 69,400 TS; 50,000 YS; 20 El; 50 RA.
For wheels, cam shafts, pins, levers, spindles; Iz-50.

B.S.C. "C.H.N.C."
M-1724, 0.09-0.16 C, 3.0-3.75 Ni, 0.8-1.1 Cr, bal Fe.
Hardened: 100,800-207,000 TS; 78,500-123,200 YS; 20-12 El; 55-35 RA; 192-277 Brin
For heavily loaded gears, shafts; Iz-18-45.

B.S.C. "C.H.N.M."
M-1724; 0.15-0.20 C, 1.75-2.1 Ni, 0.20-0.35 Mo, bal Fe.
Normalized: 74,000-85,200 TS; 52,000 YS; 25 El; 50 RA; 143-166 Brin.
Hardened: 112,000-123,200 TS; 89,600 YS; 17 El; 40 RA; 228-255 Brin.
For ball and roller races; Iz-50.

B.S.C. "C.O.M.O."
M-1724; 0.07-0.15 C, 0.20-0.35 Cu, 0.20 Mo, bal Fe.
Normalized. 58,000-78,400 TS; 33,000 YS; 25 El; 50 RA; 111-152 Brin.
For boiler and superheater tubes, boiler drums; high creep limit.

B.S.C. C.V.M.
M-1724, 0.35 C, 5 Cr, 0.3 V, 1.25 Mo, 0.9 Si, bal Fe.
For hot forging and die casting dies, oil hardening.

B.S.C. H.S.M.
M-1724; 0.3 C, 3 Cr, 10 W, 0.3 V, bal Fe.
For hot forging dies, hot work steel.

B.S.C. "H.T.C."
M-1724, 0.37-0.43 C, 0.6-0.9 Mn, 0.5 max Ni, bal Fe.
Normalized: 78,400-100,800 TS; 40,200 YS; 23 El, 40 RA, 140-197 Brin.
Oil treated: 89,600-112,000 TS; 53,000 YS, 22 El; 45 RA; 170-241 Brin.
For crankshafts, shafts, spindles, aero engine cylinders, axles, connecting rods; suitable for surface hardening.

B.S.C. "H.T.C.N."
M-1724; 0.35-0.45 C, 0.6-1.2 Mn, 0.5-1.0 Ni, bal Fe.
Oil treated: 94,000-112,000 TS; 22 El; 45 RA; 174-223 Brin.
For crankshafts, spindles, aero engine cylinders, connecting rods; Iz-35.

B.S.C. MED. "C."
M-1724; 0.25-0.35 C, 0.40-0.80 Mn, 0.5 max Ni, bal Fe.
Normalized: 58,200-78,400 TS; 36,000 YS; 25 El; 50 RA; 109-163 Brin.

Oil treated: 78,400 TS; 47,000 YS; 24 El; 48 RA; 152 Brin.

For locomotive and automobile axles, armature shafts, lathe and other spindles, marine shafting, water hardening.

B.S.C. M.I.C.

M-1724; 0.9 C, 1.6 Mn, 0.35 Cr, bal Fe.

For tools, dies, taps, gauges; non-deforming.

B.S.C. M.I.C.4.

M-1724; 0.95 C, 0.5 W, 0.5 Cr, 0.2 V, 1.25 Mn, bal Fe.

For paper and metal slitters, wood knives, shears, cold work steel, oil hardened.

B.S.C. M.I.C.8.

M-1724; 1.4 C, 0.25 Mo, 1.0 Si, 0.3-1.0 Mn, bal Fe.

For gages, jigs, drawing and forming dies; graphitic steel, oil hardened.

B.S.C "N.C."

M-1724, 0.18-0.25 C, 3.0-3.75 Ni, 0.4-0.8 Cr, bal Fe

Oil treated: 112,000-134,000 TS, 89,600 YS; 19 El; 55 RA, 217-285 Brin.

For bolts, studs, shafts, axles, crankshafts, for highly stressed parts; Iz-40

B.S.C. "NILEX"

M-1724, C, 36 Ni, bal Fe.

Rolled: 89,00-112,000 TS; 40 El, 55 RA.

For use where minimum coefficient of expansion is required.

B.S.C "S.H.N.C."

M-1724, 0.25-0.32 C, 3.75-4.5 Ni, 1.0-1.5 Cr, bal Fe.

Air hardened 224,000-280,000 TS, 168,000 YS; 12 El; 25 RA, 444-555 Brin.

Hardened and tempered. 134,400-156,800 TS, 98,500 YS; 18 El, 50 RA, 240-311 Brin

For highly stressed shafts, gears, tubes, turnbuckles; air hardening steel; Iz 15-35.

B.S.C "Si-Cr"

M-1724; 0.4-0.5 C, 3.5-4.25 Si, 0.4-0.6 Mn, 7.5-8.5 Cr, bal Fe

Oil treated 123,200-156,800 TS, 100,800 YS, 18 El; 45 RA, 255-320 Brin.

For exhaust valves for high duty, non-scaling steel, notch-brittle when cold

B.S.C. "Si-Mn"

M-1724, 0.50-0.60 C, 1.5-2.0 Si, 0.6-1.0 Mn, bal Fe.

179,000-224,000 TS; 145,600 YS, 7 El, 364-460 Brin.

For spring plates, laminated automobile springs, oil hardening.

B.S.C SUPER C 12.

M-1724, 1.6 C, 12 Cr, 0.5 V, bal Fe.

For dies, press dies, non-deforming

B.S.C. SUPER "C.H.N.C"

M-1724, 0.14-0.18 C, 4-4.5 Ni, 1-1.3 Cr, 0.30 max Mo, bal Fe.

Hardened: 190,000 TS, 145,600 YS, 12 El; 35 RA

For exceedingly high strength core; Iz-25.

B.S.C. SUPER "S.H.N.C."

M-1724; 0.25-0.32 C, 3.75-4.5 Ni, 1.0-1.5 Cr, 0.15-0.25 Mo, bal Fe

Air hardened. 224,000-280,000 TS; 179,000 YS; 12 El; 25 RA; 450-555 Brin

Hardened and tempered: 134,400-168,000 TS, 100,800 YS; 18 El, 50 RA, 250-311 Brin.

For forgings, tubes, shafts; air hardening steel; Iz-15-35.

B.S.C. SUPERTOUGH "A."

M-1724; 0.10-0.15 C, 1.4-1.8 Mn, bal Fe.

Normalized: 76,000-98,600 TS; 50,000 YS; 25 El; 55 RA; 143-207 Brin.

Oil hardened: 76,000-98,600 TS; 56,000 YS; 30 El; 60 RA; 174-217 Brin.

Case hardened: 89,600-100,800 TS; 44,800 YS; 28 El; 50 RA; 143-174 Brin.

For gear wheels, cam shafts, pins, levers, spindles, railway work; tough core; Iz-50-80.

B.S.C. SUPERTOUGH "B."

M-1724; 0.25-0.30 C, 1.4-1.8 Mn, bal Fe.

Oil hardened: 98,500-123,200 TS; 71,700 YS; 20 El; 50 RA; 196-255 Brin.

For crankshafts, connecting rods, railway axles, armature spindles, tough core; Iz-50.

B.S.C SUPERTOUGH "C."

M-1724; 0.25-0.30 C, 1.4-1.8 Mn, 0.20-0.30 Mo, bal Fe.

Oil hardened: 112,000-134,000 TS; 89,600 YS; 20 El; 50 RA; 223-286 Brin.

For crankshafts, connecting rods, railway axles, armature spindles; Iz-50; tough.

B.S.C. SUPERTOUGH "C-20."

M-1724; 0.15-0.20 C, 1.5-1.8 Mn, 0.5-0.7 Ni, 0.25-0.30 Mo, bal Fe.

Oil hardened. 89,600-112,000 TS; 67,200 YS; 20 El; 50 RA; 183-235 Brin.

For general use, axles, railway parts; Iz-70; good workability.

B.S.C. SUPER "V.N.C.A."

M-1724; 0.25-0.35 C, 3.0-3.75 Ni, 0.5-0.8 Cr, 0.15-0.25 Mo, bal Fe.

Oil treated. 132,000-156,000 TS, 112,000 YS, 18 El; 45 RA, 269-341 Brin.

For aero and automotive engine crankshafts, propellers, shafts, gear shafts, pressure vessels; great toughness, Iz-40.

B.S.C. "V.A. 65."

M-1724; 0.22-0.28 C, 2.75-3.50 Ni, 1.0-1.4 Cr, 0.15-0.25 Mo, bal Fe.

Oil treated: 145,600-157,000 TS, 125,400 YS; 17 El; 40 RA, 293-321 Brin

For highly stressed aero engine connecting rods; also known as "Non-Brit;" Iz-35.

B.S.C. V.A.P.

M-1724; 0.78 C, 4 Cr, 18 W, 1.3 V, bal Fe.

For twist drills, broaches, cutters; high speed steel

B.S.C. "V.C.M."

M-1724, 0.30-0.35 C, 0.5-0.7 Ni, 0.7-1.5 Cr, 1.0-1.5 Mo, bal Fe.

Oil treated: 123,000-145,600 TS; 112,000 YS; 18 El; 50 RA; 248-293 Brin

For studs, bolts, used in high temperature and high pressure steam generating plants, high creep limit, Iz-40

B.S.C. "V.H.R.D."

M-1724; 0.7-1.0 C, 0.15-0.20 Si, 0.3-0.5 Mn, bal Fe.

For mandrels, drills, dies, wear resisting parts; suitable for surface hardening

B.S.C "V.N.C.A."

M-1724, 0.25-0.35 C, 3.0-3.75 Ni, 0.5-0.8 Cr, bal Fe.

Oil treated. 123,000-145-600 TS, 100,800 YS; 18 El; 50 RA, 240-341 Brin.

For aero and automotive engine crankshafts, propellers, shafts, gear shafts, pressure vessels; great toughness; Iz-40.

B.S.C. "V.N.C.G."

M-1724, 0.28-0.32 C, 3.0-3.75 Ni, 0.55-0.70 Cr, bal Fe.

Oil treated: 224,000-280,000 TS, 179,200 YS; 10 El; 25 RA; 429-555 Brin.

For shock resisting gears; Iz-10.

BSEM 558.

M-106; same as RR.250.

BS 4.
M-459; C, bal Fe.
For rock drills; water hardening.

B.S.C. 3 NS.
M-1724; 0.25-0.37 C, 2.75-3.75 Ni, 0.30 Cr, bal Fe.
Normalized: 76,000-112,000 TS; 44,800 YS; 24 El; 45 RA; 152-229 Brin.
Oil treated: 100,800-132,200 TS; 71,000 YS; 22 El; 50 RA; 201-277 Brin.
For crankshafts, axles, connecting rods, forgings; Iz-35.

B.S.C. 3 1/2 NS.
M-1724; 0.35-0.45 C, 3.25-3.75 Ni, 0.30 Cr, bal Fe.
Oil treated: 123,000-145,600 TS; 18 El; 50 RA; 241-293 Brin.
For crankshafts, axles, connecting rods, forgings; Iz-35.

B.S.C. 5 CC.
M-1724; 1.0 C, 5.0 Cr, 0.45 V, 1.1 Mo, 0.6 Mn, bal Fe.
For brick mold liners, thread rolling dies, cold work steel, air hardenable.

B.S.C. "A."
M-1724; 0.45-0.50 C, 0.50 max Ni, 0.7-0.9 Mn, bal Fe.
Normalized: 89,600-112,000 TS; 44,800 YS, 20 El; 35 RA; 163-212 Brin.
Oil treated: 100,800-134,000 TS; 62,700 YS; 18 El; 40 RA; 197-285 Brin.
For gun and other mechanism parts, keys, shafts, gears, cylinders; suitable for surface hardening.

B.S.C. "A-31."
M-1724: 0.50-0.60 C, 0.60-0.80 Mn, bal Fe.
Normalized: 100,800 TS; 18 El; 40 RA; 197-241 Brin.
Oil treated: 123,200 TS; 65,000-85,000 YS; 15 El; 35 RA; 235-285 Brin.
For cylinders, gears, cams, mechanism parts; suitable for surface hardening, oil hardening, shock resistant.

B.S.C. A.W.
M-1724; 0 7 C, 3.75 Cr, 14 W, 0.65 V, bal Fe.
For drills, cutters, reamers, blanking and piercing dies; high speed steel.

B.S.C. "B.C.T.B."
M-1724; 0.55-0.65 C, 0.5-0.8 Cr, 0.5-0.8 Mn, bal Fe.
Normalized: 144,000 TS; 67,200 YS; 15 El, 277 Brin.
Oil treated: 126,000-160,000 TS; 90,000-112,000 YS; 18-23 El; 341 Brin.
For mandrels, gear wheels, dies; axles, pinions, cylinder liners.

B.S.C. C 12.
M-1724; 1.8 C, 12 Cr, 0.5 V, 1 Mo, bal Fe.
For dies, wortle plates, drawing dies; non-deforming.

B.S.C. C.D.
M-1724; 2 C, 12 Cr, bal Fe.
For dies, cold press cutting dies; non-deforming.

B.S.C. "C.H.-2N."
M-1724; 0.10-0.15 C, 2.0-2.5 Ni, bal Fe.
Normalized: 56,000 TS; 30,200 YS; 30 El; 55 RA; 103 Brin.
For general case-hardened objects; Iz-50.

B.S.C. "C.H.-3N."
M-1724; 0.10-0.15 C, 2.75-3.50 Ni, 0.30 max Cr, bal Fe.
Normalized: 67,200 TS; 36,000 YS; 28 El; 55 RA; 137 Brin.
Hardened: 104,400 TS; 67,200 YS; 18 El; 45 RA.
For general case-hardened objects; gears, cams, cam shafts, fasteners; Iz-40.

B.S.C. "C.H.-5 N."
M-1724; 0.09-0.16 C, 4.6-5.50 Ni, 0.20 max Cr, bal Fe.
Normalized: 71,700 TS; 50,000 YS; 28 El; 55 RA.
Hardened: 190,000 TS; 112,000 YS; 13 El; 40 RA.
For gear wheels; tough core.

B.S.C. CVM2.
M-1724; 0.36 C, 1.4 W, 5.0 Cr, 0.3 V, 1.35 Mo, 0 9 Si, bal Fe.
For blanking and forging dies, punches, shears; hot work steel; air or oil hardened.

B.S.C. CVM3.
M-1724, 0.4 C, 5.0 Cr, 1.1 V, 1.35 Mo, 0.9 Si, bal Fe.
For blanking and forging dies, punches, shears, hot work steel, oil hardened.

B.S.C. "C.H.M.S."
M-1724; 0.10-0.18 C, 0.6-0.9 Mn, bal Fe.
Normalized: 58,300 TS, 36,500 YS; 28 El; 50 RA; 111 Brin.
Hardened: 69,400 TS; 50,000 YS; 20 El; 50 RA.
For wheels, cam shafts, pins, levers, spindles; Iz-50.

B.S C. "C.H.N.C."
M-1724; 0.09-0.16 C, 3.0-3.75 Ni, 0 8-1.1 Cr, bal Fe.
Hardened: 100,800-207,000 TS; 78,500-123,200 YS; 20-12 El; 55-35 RA, 192-277 Brin
For heavily loaded gears, shafts; Iz-18-45

B S C. "C.H.N.M."
M-1724; 0.15-0.20 C, 1.75-2 1 Ni, 0.20-0 35 Mo, bal Fe.
Normalized: 74,000-85,200 TS, 52,000 YS; 25 El; 50 RA; 143-166 Brin.
Hardened: 112,000-123,200 TS; 89,600 YS, 17 El; 40 RA; 228-255 Brin.
For ball and roller races; Iz-50.

B S.C. "C.O.M.O."
M-1724; 0.07-0.15 C, 0 20-0.35 Cu, 0 20 Mo, bal Fe.
Normalized: 58,000-78,400 TS, 33,000 YS; 25 El; 50 RA, 111-152 Brin.
For boiler and superheater tubes, boiler drums; high creep limit.

B.S.C. C.V.M.
M-1724, 0.35 C, 5 Cr, 0 3 V, 1.25 Mo, 0 9 Si, bal Fe.
For hot forging and die casting dies, oil hardening.

B.S C. H.S M.
M-1724; 0.3 C, 3 Cr, 10 W, 0 3 V, bal Fe.
For hot forging dies, hot work steel.

B S.C. "H T.C."
M-1724, 0.37-0.43 C, 0 6-0 9 Mn, 0.5 max Ni, bal Fe.
Normalized: 78,400-100,800 TS; 40,200 YS, 23 El; 40 RA, 140-197 Brin.
Oil treated· 89,600-112,000 TS; 53,000 YS; 22 El; 45 RA; 170-241 Brin.
For crankshafts, shafts, spindles, aero engine cylinders, axles, connecting rods; suitable for surface hardening.

B.S.C. "H.T.C.N."
M-1724; 0.35-0.45 C, 0.6-1.2 Mn, 0.5-1.0 Ni, bal Fe.
Oil treated: 94,000-112,000 TS; 22 El; 45 RA; 174-223 Brin.
For crankshafts, spindles, aero engine cylinders, connecting rods; Iz-35.

B.S.C. MED. "C."
M-1724; 0.25-0.35 C, 0.40-0.80 Mn, 0.5 max Ni, bal Fe.
Normalized: 58,200-78,400 TS; 36,000 YS; 25 El; 50 RA; 109-163 Brin.

Oil treated: 78,400 TS; 47,000 YS; 24 El; 48 RA; 152 Brin.
For locomotive and automobile axles, armature shafts, lathe and other spindles, marine shafting, water hardening.

B.S.C. M.I.C.
M-1724; 0.9 C, 1.6 Mn, 0.35 Cr, bal Fe.
For tools, dies, taps, gauges; non-deforming.

B.S.C. M.I.C.4.
M-1724; 0.95 C, 0.5 W, 0.5 Cr, 0.2 V, 1.25 Mn, bal Fe.
For paper and metal slitters, wood knives, shears, cold work steel, oil hardened.

B.S.C. M.I.C.8.
M-1724, 1.4 C, 0.25 Mo, 1.0 Si, 0.3-1.0 Mn, bal Fe.
For gages, jigs, drawing and forming dies; graphitic steel, oil hardened.

B.S.C. "N.C."
M-1724, 0.18-0.25 C, 3.0-3.75 Ni, 0.4-0.8 Cr, bal Fe.
Oil treated: 112,000-134,000 TS; 89,600 YS; 19 El; 55 RA; 217-285 Brin.
For bolts, studs, shafts, axles, crankshafts; for highly stressed parts; Iz-40.

B.S.C. "NILEX"
M-1724, C, 36 Ni, bal Fe.
Rolled: 89,00-112,000 TS; 40 El, 55 RA
For use where minimum coefficient of expansion is required.

B.S.C. "S.H.N.C."
M-1724, 0.25-0.32 C, 3.75-4.5 Ni, 1.0-1.5 Cr, bal Fe.
Air hardened: 224,000-280,000 TS, 168,000 YS, 12 El, 25 RA; 444-555 Brin.
Hardened and tempered: 134,400-156,800 TS; 98,500 YS, 18 El, 50 RA, 240-311 Brin
For highly stressed shafts, gears, tubes, turnbuckles, air hardening steel; Iz-15-35

B.S.C. "Si Cr."
M-1724, 0.4-0.5 C, 3.5-4.25 Si, 0.4-0.6 Mn, 7.5-8.5 Cr, bal Fe
Oil treated. 123,200-156,800 TS, 100,800 YS; 18 El; 45 RA; 255-320 Brin
For exhaust valves for high duty, non scaling steel, notch-brittle when cold.

B.S.C. "Si-Mn"
M-1724, 0.50-0.60 C, 1.5-2.0 Si, 0.6-1.0 Mn, bal Fe.
179,000-224,000 TS, 145,600 YS; 7 El; 364-460 Brin.
For spring plates, laminated automobile springs, oil hardening

B.S.C. SUPER C 12
M-1724; 1.6 C, 12 Cr, 0.5 V, bal Fe.
For dies, press dies, non-deforming.

B.S.C. SUPER "C.H.N.C."
M-1724, 0.14-0.18 C, 4-4.5 Ni, 1-1.3 Cr, 0.30 max Mo, bal Fe.
Hardened: 190,000 TS, 145,600 YS, 12 El; 35 RA.
For exceedingly high strength core, Iz-25.

B.S.C. SUPER "S.H.N.C."
M-1724; 0.25-0.32 C, 3.75-4.5 Ni, 1.0-1.5 Cr, 0.15-0.25 Mo, bal Fe.
Air hardened: 224,000-280,000 TS; 179,000 YS; 12 El; 25 RA; 450-555 Brin.
Hardened and tempered: 134,400-168,000 TS, 100,800 YS, 18 El, 50 RA; 250-311 Brin.
For forgings, tubes, shafts; air hardening steel; Iz-15-35.

B.S.C. SUPERTOUGH "A."
M-1724; 0.10-0.15 C, 1.4-1.8 Mn, bal Fe.
Normalized: 76,000-98,600 TS; 50,000 YS; 25 El; 55 RA; 143-207 Brin.
Oil hardened: 76,000-98,600 TS; 56,000 YS; 30 El; 60 RA; 174-217 Brin.
Case hardened: 89,600-100,800 TS; 44,800 YS; 28 El; 50 RA; 143-174 Brin.
For gear wheels, cam shafts, pins, levers, spindles, railway work; tough core; Iz-50-80.

B.S.C. SUPERTOUGH "B."
M-1724; 0.25-0.30 C, 1.4-1.8 Mn, bal Fe.
Oil hardened: 98,500-123,200 TS; 71,700 YS; 20 El; 50 RA; 196-255 Brin.
For crankshafts, connecting rods, railway axles, armature spindles, tough core; Iz-50.

B.S.C. SUPERTOUGH "C."
M-1724; 0.25-0.30 C, 1.4-1.8 Mn, 0.20-0.30 Mo, bal Fe.
Oil hardened: 112,000-134,000 TS; 89,600 YS; 20 El; 50 RA; 223-286 Brin.
For crankshafts, connecting rods, railway axles, armature spindles; Iz-50; tough.

B.S.C. SUPERTOUGH "C-20"
M-1724; 0.15-0.20 C, 1.5-1.8 Mn, 0.5-0.7 Ni, 0.25-0.30 Mo, bal Fe
Oil hardened: 89,600-112,000 TS; 67,200 YS; 20 El; 50 RA; 183-235 Brin.
For general use, axles, railway parts; Iz-70; good workability.

B.S.C. SUPER "V.N.C.A."
M-1724; 0.25-0.35 C, 3.0-3.75 Ni, 0.5-0.8 Cr, 0.15-0.25 Mo, bal Fe.
Oil treated: 132,000-156,000 TS, 112,000 YS; 18 El; 45 RA; 269-341 Brin.
For aero and automotive engine crankshafts, propellers, shafts, gear shafts, pressure vessels; great toughness, Iz-40.

B.S.C. "V.A. 65"
M-1724; 0.22-0.28 C, 2.75-3.50 Ni, 1.0-1.4 Cr, 0.15-0.25 Mo, bal Fe.
Oil treated: 145,600-157,000 TS, 125,400 YS; 17 El; 40 RA, 293-321 Brin.
For highly stressed aero engine connecting rods; also known as "Non-Brit," Iz-35

B.S.C. V.A.P.
M-1724, 0.78 C, 4 Cr, 18 W, 1.3 V, bal Fe.
For twist drills, broaches, cutters; high speed steel.

B.S.C. "V.C.M."
M-1724; 0.30-0.35 C, 0.5-0.7 Ni, 0.7-1.5 Cr, 1.0-1.5 Mo, bal Fe.
Oil treated. 123,000-145,600 TS, 112,000 YS, 18 El; 50 RA, 248-293 Brin.
For studs, bolts, used in high temperature and high pressure steam generating plants, high creep limit; Iz-40

B.S.C. "V.H.R.D."
M-1724, 0.7-1.0 C, 0.15-0.20 Si, 0.3-0.5 Mn, bal Fe.
For mandrels, drills, dies, wear resisting parts; suitable for surface hardening

B.S.C. "V.N.C.A."
M-1724, 0.25-0.35 C, 3.0-3.75 Ni, 0.5-0.8 Cr, bal Fe.
Oil treated: 123,000-145-600 TS, 100,800 YS; 18 El; 50 RA, 240-341 Brin
For aero and automotive engine crankshafts, propellers, shafts, gear shafts, pressure vessels; great toughness; Iz-40.

B.S.C. "V.N.C.G."
M-1724; 0.28-0.32 C, 3.0-3.75 Ni, 0.55-0.70 Cr, bal Fe.
Oil treated: 224,000-280,000 TS, 179,200 YS; 10 El; 25 RA; 429-555 Brin.
For shock resisting gears; Iz-10.

BSEM 558.
M-106; same as RR.250.

BSEM 558.
M-106; same as RR.350.

BSF.
M-459; 0.33 C, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, machine tool parts; water hardened, tough.

BSF; DMOC.
M-459; C, Cr, Mo, bal Fe.
18-15 El.
For machinery parts; oil hardened.

B.S.I. (B.S.S.)
M-504; all specifications.
British Standards Specifications.

BSI 30 VMS.
M-1290; 0.30 C, 1.25 Mn, bal Fe.
Heat treated: 85,000-128,000 TS; 57,000-71,000 YS, 16-12 El.
Low alloy steel casting.
Werkstoff Nr. 1.5066.

BSI AM 12.
M-1290; 1.2 C, 13 0 Mn, bal Fe.
Sol. ann. & age 85,000 min TS; 42,500 min YS; 25 min El.
Non-magnetic steel casting.
Werkstoff Nr. 1.3802; DIN G-X120 Mn 12.

BSI AM 16.13 S.
M-1290; 0 05 C, 16.5 Cr, 12.5 Ni, bal Fe.
Sol ann & age: 64,000 min TS, 28,000 min YS; 20 min El.
Non-magnetic steel casting.
DIN G-X5CrNi1613.

BSI AM 16.13 SS.
M-1290; 0.07 C, 16.5 Cr, 12.5 Ni, Nb, bal Fe.
Sol ann. & age: 64,000 min TS; 28,000 min YS, 20 min El.
Non-magnetic steel casting.
DIN G-X10CrNiNb1613; Werkstoff Nr. 1 3959

BSI AM 16 16 ES.
M-1290, 0.05 C, 16 5 Cr, 16 0 Ni, 2.25 Mo, bal Fe.
Sol ann & age: 64,000 min TS; 28,000 min YS, 20 min El.
Non-magnetic steel casting.
DIN G-X5CrNiMo1616

BSI AM 16 16 ESS.
M-1290, 0 07, 16.5 Cr, 16.0 Ni, 2 25 Mo, Nb, bal Fe.
Sol. ann & age: 64,000 min TS; 28,000 min YS; 20 min El
Non-magnetic steel casting.
DIN G-X7CrNiMoNb1616

BSI AM 18.10.
M-1290, 0.12 C, 17 5 Cr, 10.5 Ni, bal Fe
Sol. ann & age· 64,000 min TS, 28,000 min YS, 20 min El.
Non-magnetic steel casting.
DIN G-X12CrNi1811; Werkstoff Nr. 1 3955.

BSI AM 858
M-1290, 0 27 C, 8 5 Mn, 7 5 Cr, 5.5 Ni, bal Fe.
Sol. ann & age· 71,000 min TS, 31,000 min YS; 30 min El.
Non-magnetic steel casting.
DIN G-X25 MnCrNi886; Werkstoff Nr. 1 3966.

BSI AM G 10.
M-1290; 3.1 C, 10.5 Ni, 5.75 Mn, 2 0 Si, bal Fe.
Non-magnetic stainless steel casting.
DIN G-X300 NiMnSi106.

BSI C 18.8 S.
M-1290; 0 07 C, 18 Cr, 9 Ni, bal Fe.
Sol. Annealed: 64,000-85,000 TS; 28,000 min YS; 25 min El.
Stainless cast steel; good low temperature properties to −196°C.
DIN G-X6CrNi189; ASTM A296 Gr CF8.

BSI CM 1.
M-1290; 0.25 C, 1.0 Cr, 0.25 Mo, bal Fe.
Heat treated; 85,000-170,000 TS; 64,000-120,000 YS; 16-5 El
Low alloy steel casting Also useful to −100°C.
Werkstoff Nr. 1.7218.

BSI CM 1B.
M-1290, 0.35 C, 1.3 Cr, 0 45 Mo, bal Fe.
Heat treated: 78,000-150,000 TS; 42,500-100,000 YS; 20-9 El.
Low alloy steel casting.

BSI CM 1 H
M-1290, 0 42 C, 1.0 Cr, 0.20 Mo, bal Fe.
Heat treated: 106,000-184,000 TS; 78,000-142,000 YS; 12-4 El.
Low alloy steel casting
Werkstoff Nr. 1 7225.

BSI CM 1 K.
M-1290; 0 34 C, 1.0 Cr, 0.25 Mo, bal Fe.
Heat treated 78,000-150,000 TS, 42,500-106,000 YS; 20-9 El.
Low alloy steel casting
Werkstoff Nr 1 7220

BSI GS-C 25
M-1290, 0 22 C, bal Fe
Annealed: 64,000 TS, 35,000 min YS, 22 min El
Carbon steel casting, useful to −40°C
Werkstoff Nr 1 0416

BSI GS-38
M-1290, 0 15 C, bal Fe
Annealed· 54,000 min TS, 28,000 min YS, 25 min El.
Low carbon, unalloyed steel casting
Werkstoff Nr 1 0416.

BSI GS 38D
M-1290, 0 15 C, bal Fe
Annealed 54,000 min TS; 28,000 min YS, 25 min El
Carbon dynamo steel casting

BSI GS 45
M-1290; 0 22 C, bal Fe
Annealed 64,000 min TS, 35,000 min YS, 22 min El
Low carbon steel casting
Werkstoff Nr 1 0443

BSI GS-45D
M-1290, 0.20 C, bal Fe
Annealed 64,000 min TS, 35,000 min YS; 22 min El
Carbon dynamo steel casting

BSI GS-52
M 1290, 0 30, bal Fe.
Annealed· 74,000 min TS, 40,000 min YS; 18 min El
Carbon steel casting
Werkstoff Nr. 1 0551

BSI GS-60
M-1290; 0.37 C, bal Fe.
Annealed. 75,000 min TS, 42,000 min YS, 15 min El.
Carbon steel casting

BSI GS-70.
M-1290, 0 45 C, bal Fe.
Annealed· 88,000 min TS; 50,000 min YS, 12 min El
Carbon steel casting.
Werkstoff Nr. 1 0553.

BSI Ni 2.
M-1290; 0.10 C, 1.55 Ni, bal Fe.
Heat treated· 64,000-85,000 TS; 38,000 min YS; 20 min El.
Low alloy steel casting, useful to −50°C.
Werkstoff Nr. 1.5621.

BSI Ni 3.
M-1290; 0.10 C, 3.55 Ni, bal Fe.
Heat treated. 71,000-92,000 TS; 51,000 min YS; 20 min El.
Low alloy steel casting, good low temperature properties to −100°C.
Werkstoff Nr. 1.5638; ASTM A352 Gr.LC3.

BSI SHF.
M-1290; 0.38 C, 2.1 Ni, 1.1 Cr, 0.45 Mo, bal Fe.
Heat treated: 255,000 min TS; 212,000 min YS; 5 min El
Low alloy steel casting.

BSI V1.
M-1290, 0.29 C, 1.35 Cr, 0.4 Mo, 0.1 V, bal Fe.
Heat treated. 128,000 min TS, 100,000 min YS; 10 min El.
Low alloy steel casting (formerly PZA)
Werkstoff Nr 1.7725

BSI V2
M-1290, 0.35 C, 2.45 Cr, 0.4 Mo, 0.1 V, bal Fe
Heat treated· 100,000-120,000 TS, 78,000-92,000 YS, 12-11 El
Low alloy steel casting (formerly PZB)
Werkstoff Nr. 1.7755.

BSO SPEZIAL
M-459, 0.41 C, 1.0 Cr, 0.65 Mn, 0.25 Si, bal Fe.
For gears, bolts, machine tool parts, water hardened.

B.S. SEEWASSER.
M-116, 5-10 Mg, bal Al.
Soft 47,000 TS, 22,000 YS, 25 El
Hard 78,000 TS, 65,000 YS, 3 El
For light alloy parts, ship and seaplane parts, corrosion resistant to sea water

B.S. SEEWASSER
M-196, 7.5 Mg, 0.3 Mn, bal Al
Heat treated 30,000 TS, 20,600 YS, 4 El; 10 RA; 80 Brin
Rolled 64,000 TS; 45,000 YS, 8 El, 50 RA; 120 Brin
For furniture, interior light fixtures, wire, castings; resists sea water corrosion.

BS-SEEWASSER 05
M-116, 4.0-5.5 Mg, 0.8 max Mn, 0.3 max Cr, bal Al.
Soft 42,000 TS, 22,000 YS, 35 El; 65 Brin.
Hard· 60,000 TS, 50,000 YS; 10 El; 105 Brin.
For aircraft and marine parts, good corrosion resistance

BS-SEEWASSER 07
M-116; 5.5-7.5 Mg, 0.8 max Mn, 0.3 max Cr, bal Al.
For aircraft and marine parts, good corrosion resistance.

BS-SEEWASSER 63/03.
M-116; 2-4 Mg, 0.4 max Mn, bal Al.
Soft. 28,000 TS, 13,000 YS, 30 El; 47 Brin.
Hard 40,000 TS, 35,000 YS; 10 El, 73 Brin.
For aircraft tanks, and fittings, fuel lines, marine parts, resists sea water corrosion.

BSW.
M-459; 0.25 C, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, fasteners, shafts; oil hardened, tough.

BSW, DMOCN.
M-459; C, Cr, Mo, bal Fe.
23-18 El.
For machinery parts.

BTF ALLOY.
M-1429; 0.55 C, 1 Mn, 0.35 Mo, 0.30 Cr, 2 Si, bal Fe.
For punches, rivet sets, pneumatic tools; oil hardened, shock resistant.

BTG.
M-104; 60 Ni, 12 Cr, 2 W, bal Fe.
For ammonia synthesis tubes; heat and NH$_3$ resistant.

B.T.G. STEEL.
Eng; 60 Ni, 25 Fe, 12 Cr, 2 Mn, 0.5 C, 3 W.
Sand cast· 50,000-70,000 TS; 40,000-70,000 YS; 2-10 El, 130-180 Brin.
Rolled· 90,000-109,000 TS; 50,000-70,000 YS; 25-45 El; 50-70 RA; 180-200 Brin.
For heating elements; heat and corrosion resistant.

BTH ALLOY NO. 12.
M-306, Ni-Cr-Fe
For seals to lead glass; metal to glass seal

BTR see BETHLEHEM BTR.

BUCKEYE BRONZE.
U.S., 41.6 Sn, 0.6 Cu, 15.6 Pb, 37.8 Zn, 4.3 Al.
For bearings, Babbitt

BUCKEYE M1
M-1705, 0.78 C, 3.9 Cr, 1.05 V, 1.6 W, 8.5 Mo, bal Fe
High speed tool steel, molybdenum type.
AISI M1.

BUCKEYE M2
M-1705, 0.80 C, 4.0 Cr, 1.75 V, 6.0 W, 5.0 Mo, bal Fe
High speed tool steel, Mo-W type.
AISI M2

BUCKEYE M3 CLASS 1.
M-1705, 1.0 C, 4.0 Cr, 2.5 V, 6.25 W, 6.25 Mo, bal Fe
High speed tool steel, Mo-W type.
AISI M3 (Class 1)

BUCKEYE M3 CLASS 2
M-1705, 1.15 C, 4.0 Cr, 3.0 V, 6.0 W, 5.5 Mo, bal Fe.
High speed tool steel, Mo-W type
AISI M3 (Class 2)

BUCKEYE M4.
M-1705; 1.3 C, 4.0 Cr, 4.0 V, 5.5 W, 4.5 Mo, bal Fe.
High speed steel for cutting tools, high hardness and good wear; AISI M4.

BUCKEYE M7
M-1705, 1.0 C, 3.75 Cr, 2.0 V, 1.75 W, 8.75 Mo, bal Fe
High speed tool steel, molybdenum type
AISI M7

BUCKEYE M10
M-1705; 0.86 C, 4.0 Cr, 2.0 V, 8.5 Mo, bal Fe.
High speed tool steel, molybdenum type.
AISI M10.

BUCKEYE M42.
M-1705, 1.10 C, 3.75 Cr, 1.15 V, 1.70 W, 9.5 Mo, 8.0 Co, bal Fe.
High speed tool steel, Mo-Co type.
AISI M42

BUCKEYE M43.
M-1705; 1.2 C, 3.75 Cr, 1.6 V, 2.7 W, 8.0 Mo, 8.0 Co, bal Fe.
High speed tool steel, Mo-Co type.
AISI M43.

BUCKEYE T1.
M-1705; 0.75 C, 4.0 Cr, 1 V, 18.0 W, bal Fe.
High speed tool steel, tungsten type.
AISI T1.

BUCKEYE T2.
M-1705; 0.83 C, 4.25 Cr, 2.1 V, 18.5 W, 0.85 Mo, bal Fe.
High speed tool steel, tungsten type.
AISI T2.

BUCKEYE T4.
M-1705; 0.75 C, 4.5 Cr, 1.0 V, 19.0 W, 5.0 Co, bal Fe.
High speed tool steel, tungsten-cobalt type.
AISI T4.

BUCKEYE T5.
M-1705; 0.80 C, 4.0 Cr, 2.0 V, 18.0 W, 8.0 Co, bal Fe.
High speed tool steel, tungsten-cobalt type.
AISI T5

BUCKEYE T15.
M-1705; 1.5 C, 4.75 Cr, 5.0 V, 12.5 W, 5.0 Co, bal Fe
High speed tool steel W-Co-V type.
AISI T15.

BUCKLE BRASS-1.
Eng; 90 Cu, 9 Zn, 1 Pb.
For bullets, shells, tubes, cartridges; free-cutting.

BUCKLE BRASS-2.
Eng.; 65 Cu, 34 Zn, 1 Pb.
For bullets; free-cutting.

BUDERUS RCC.
M-501; 2.25 C, 13 Cr, bal Fe.
For tools, dies; non-deforming.

BUDERUS RCW2.
M-501; 0.28 C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe.
For hot dies, hot work steel.

BUDERUS RSZ.
M-501; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe
For tools, dies, cutters, high speed steel.

BUDERUS RSZ ESPECIAL
M-501; C, 19 W, 4 Cr, 2.2 V, bal Fe.
For tools, dies, cutters; high speed steel

BUDERUS RT6.
M-501; 0.7-0.8 C, bal Fe
For tools, punches, springs; water hardened.

BUDERUS RT9.
M-501; 0.9-1.0 C, bal Fe
For tools, drills, springs; water hardened.

BUDERUS RT11.
M-501; 1.05-1.15 C, bal Fe.
For tools, taps, drills, water hardened.

BUDERUS RT12.
M-501; 0.8 C, bal Fe.
For tools, punches; water hardened.

BUDERUS RTC20.
M-501; 0.6 C, 1.0 Cr, 0.2 V, 0.5 Mn, bal Fe.
For tools, crimpers, pliers; oil hardened.

BUDERUS RVS.
M-501; 0.95 C, 1.2 Mn, 0.5 W, 0.5 Cr, bal Fe.
For tools, dies; non-deforming.

BUDERUS T76.
M-501; 1.3 C, 4.5 W, bal Fe.
For tools, dies, cutters; fast finishing steel.

BUDERUS TRW2.
M-501; 0.5 C, 2.25 W, 1.5 Cr, 0.25 V, bal Fe.
For tools, dies, hot work dies; hot work steel.

BUFF-ALOY.
M-962; high C, bal Fe.
For wire cloth; abrasion resisting.

BUFLOKAST.
M-143; 3.2 C, 2.4 Si, 0.7 Mn, bal Fe.
For drums, dryers, kettles, chemical engineering equipment; cast iron for chromium plating.

BUILDTEC 10225.
M-717; Nickel base alloy powder for spraying on cast iron.

BUILDTEC 10681.
M-717; Nickel base alloy powder for spraying on steel, stainless, nickel alloys.

BULL ALLOY.
Eng; 18.3 Sb, 0.6 Fe, 80.9 Pb.
For bearings; antifriction

BULLDOG
M-1433; 0.50 C, 1.2 Cr, 0.25 V, 2.5 W, bal Fe
For chisels, upsetters, crimpers, punches; Type S1; shock resistant.

BULLET BRASS.
U.S.; 90 Cu, 9-10 Zn, 0-1 Pb
For bullets, shells, cartridges.

BULL'S METAL
M-719; 0.5-1.5 Al, 0.5-1.0 Mn, 0.5-1.0 Sn, 0.8-1.2 Fe, 57-60 Cu, bal Zn
Cast: 65,000 TS; 30,000 YS, 25 El, 30 RA; 420 Brin
For marine hardware, propellers; corrosion resistant.

BULL'S WHITE METAL B
M-719, 80 Sn, 10 Sb, 6 Pb, 4 Cu
For bearings, linings for marine, white metal, wear resistant.

BUNDYWELD STEEL TUBING
M-401, 0.2 C, bal Fe.
For tubing, gasoline and oil lines, refrigerator coils, hydrogen welded, copper coated, rolled steel tubing.

BU-NITE
Eng, Ni-Al, bal Cu
For pistons; retain strength up to 370°C.

BUNTING NO 27
M-720, 78.5-81.5 Cu, 9-11 Sn, 9-11 Pb
Cast. 35,000 TS; 17,000 YS, 20 El, 60 Brin.
For bearings for machinery and automobiles; C.S. 21,000

BUNTING NO 72
M-720, 83 Cu, 7 Sn, 7 Pb, 3 Zn, 0.07 P, 0.2 Fe, 0.2 Sb
Cast. 34,000 TS, 16,000 YS; 20 El; 58 Brin.
For bearings, C.S. 20,000

BUNTING NO. 78.
M-720; 66-70 Cu, 3.5-4.5 Sn, 26-30 Pb.
Cast: 18,000 TS, 8000 YS, 5 El; 36 Brin.
For bearings; plastic.

BUNTING NO 96
M-720, 10 Sn, 2.5 Pb, 1 Zn, 0.1 P, 0.2 Fe, 0.2 Sb, bal Cu.
Cast: 40,000 TS; 18,000 YS; 20 El; 65 Brin.
For bearings; C.S. 22,000.

BUNTING NO. 98.
M-720, 88 Cu, 10 Sn, 2 Zn, 0.06 Fe, 0.20 Sb, 0.1 P.
Cast: 40,000 TS; 18,000 YS; 20 El; 67 Brin.
For bearings for aircraft; C.S. 23,000.

BUNTING 100.
M-720; 87.5-90.5 Cu, 1.0 max Fe, 1.75 max C, 9.5-10.5 Sn.
Sintered: density 5.8-6.2.

For bearings.
SAE 840; ASTM B438 Gr.1 Type I.

BUNTING 101.
M-720; 87.5-90.5 Cu, 1.0 max Fe, 1.75 max C, 9.5-10.5 Sn.
Sintered: density 6.4-6.8.
For bearings.
SAE 841; ASTM B 438 Gr.1 Type II.

BUNTING 102.
M-720; 87.5-90.5 Cu, 1.0 max Fe, 1.75 max C, 9.5-10.5 Sn.
Sintered: density 6.4-6.8.
13,500-16,000 TS; 11,000-15,000 YS (Comp).
For mechanical components.
SAE 841; ASTM B255 Type 1.

BUNTING 104.
M-720; 82.6-88.5 Cu, 1.0 max Fe, 2.0-4.0 Pb, 1.75 max C, 9.5-10.5 Sn.
Sintered: density 6.5-6.9.
For bearings.
SAE 843; ASTM B438 Gr2 Type I.

BUNTING 105.
M-720; 87.5-90.5 Cu, 1.0 max Fe. 1.75 max C, 9.5-10.5 Sn.
Sintered: density 6.81-7.2.
16,000-20,000 TS; 15,000-20,000 YS (comp).
For mechanical components
SAE 842; ASTM B255 Type II.

BUNTING NO. 124.
M-720; 85 Cu, 5 Sn, 9 Pb, 1 Zn, 0.2 Fe, 0.2 Sb, 0.1 P.
Cast: 28,000 TS, 14,000 YS; 15 El; 50 Brin.
For bearings; C S 17,000; low friction.

BUNTING NO 125.
M-720; 4 5 Sn, 20 5 Pb, 1 Zn, 0.2 Fe, 0.2 Sb, 0.05 P, bal Cu
Cast 22,000 TS, 11,000 YS; 12 El; 40 Brin.
For bearings for electric motors; C S. 14,000.

BUNTING NO 135.
M-720; 8 Sn, 15 Pb, 1 Zn, 0 2 Fe, 0.2 Sb, 0.05 P, bal Cu.
Cast 30,000 TS; 14,000 YS, 15 El; 52 Brin.
For bearings, C.S 18,000

BUNTING NO 143.
M-720; 85 Cu, 14 Sn, 1 Pb, 0.25 Zn, 0.20 Fe, 0.20 Sb, 0.1 P
Cast: 40,000 TS, 15,000 YS; 10 El; 85 Brin.
For bearings, C S. 24,000.

BUNTING NO. 147.
M-720, 88 Cu, 8 Sn, 1 Pb, 3 Zn, 0.2 Fe, 0.2 Sb, 0.1 P.
Cast. 35,000 TS, 17,000 YS; 15 El; 65 Brin.
For bearings C.S 17,000

BUNTING NO. 156.
M-720; 89 Cu, 11 Sn, 0.2 P.
Cast: 40,000 TS; 18,000 YS; 20 El; 67 Brin.
For gears; C S. 23,000.

BUNTING NO. 158
M-720, 70 Cu, 5 Sn, 25 Pb, 0.2 Fe, 0.2 Sb, 0.25 Ni, 0 03 P.
Cast: 20,000 TS; 10,000 YS; 8 El; 38 Brin.
For bearings; C.S. 13,000.

BUNTING NO. 162.
M-720; 70 Cu, 9 Sn, 21 Pb, 0.2 Fe, 0.2 Sb, 0.25 Ni, 0.03 P.
Cast: 30,000 TS; 15,000 YS; 15 El; 55 Brin.
For bearings; C.S. 20,000.

BUNTING NO. 164.
M-720; 86.5 Cu, 11 Sn, 1.2 Pb, 0.3 Fe, 0.2 Sb, 1.0 Ni, 0.25 P.
Cast: 40,000 TS; 18,000 YS; 12 El; 75 Brin.
For bearings; C.S. 23,000.

BUNTING NO. 170.
M-720; 0.25 Cu, 10 Sn, 0.08 Fe, 15 Sb, 0.20 Ni, 0.08 P, bal Pb.
Cast.
For bearings; Babbitt.

BUNTING NO. 183.
M-720; 63-67 Cu, 3.5-4.5 Sn, 3-5 Pb, 19-21 Ni, bal Zn.
Cast: 30,000 TS; 17,000 YS; 8 El; 95 Brin.
For bearings to resist food acids; corrosion resistant.

BUNTING NO. 188.
M-720; 8-10 Sn, 1.0-1.5 Pb, 0.1 P, 5 Ni, bal Cu.
For high strength castings; age hardenable.

BUNTING 200.
M-720; 95.9 min Fe, 0.25-0.60 C, 3.0 max other.
Sintered: density 5.7-6.1; porosity 18.
For bearings.
SAE 851; ASTM B439 Gr2.

BUNTING 201.
M-720; 96.25 min Fe, 0.25 max C, 3.0 max other.
Sintered: density 5.7-6 1; porosity 18.
For bearings.
SAE 850; ASTM B439 Gr.1.

BUNTING 202
M-720; 7 0-11.0 Cu, 86.5 min Fe, 0.3 max C.
Sintered: density 5.8-6.2.
29,500-34,000 TS; 28,500-30,000 YS (comp).
For mechanical components.
SAE 862 is similar.

BUNTING 203.
M-720; 18.0-22 0 Cu, bal Fe.
Sintered: 5.8-6.2 density.
For bearings
SAE 863; ASTM B439 Gr.4.

BUNTING 204
M-720; 7.0-11.0 Cu, bal Fe.
Sintered: 5.8-6.2 density; porosity 18.
For bearings.
SAE 862; ASTM B439 Grade 3.

BUNTING 205
M-720; 97.75 min Fe, 0.025 max C.
Sintered: density 5.7-6.1.
16,000 TS; 12,000 YS (Comp).
For bearings and for mechanical components.
SAE 850, ASTM B310 Type I C1.A.

BUNTING 206.
M-720; 15.0-25 0 Cu, 69.75-85.0 Fe, 0.025 max C.
Sintered: density 7.1 min.
65,000 TS; 70,000 YS (Comp).
For mechanical components.
SAE 870; ASTM B303 C1.A.

BUNTING 207.
M-720; 97.0 min Fe, 0.61-1.0 C.
Sintered: density 6 11-6 5.
34,000 TS; 26,000 YS (Comp).
For mechanical components.
SAE 855; ASTM B310 Type II C1.C.

BUNTING 208
M-720, 15.0-25.0 Cu, 69-84 Fe, 0.61-1.0 C.
Sintered: density: 7.1 min.
85,000 TS, 120,000 YS (Comp).
For mechanical components
SAE 872, ASTM B303 Class C.

BURDEN BEST.
M-721; 0.05 C, 0 1 Si, 2.5 SiO_2.
For plates, pipe; wrought iron.

BURDEN WROT.
M-721; 0.06 C, 1.1 Si, 2.5 SiO_2.
For plates, pipe; wrought iron.

BURDOX 9.
M-1467; 56-60 Cu, 1 max Sn, 0.25-1.0 Mn, bal Zn.
For welding rod; M.P. 1400-1600°F.

BURDOX 91.
M-1467; 57-61 Cu, 0.25-1.0 Sn, 0.05 max Pb, 0.01 max Al, bal Zn.
For welding rod, M.P. 1630-1650°F.

BURDOX 92.
M-1467; 58-60 Cu, 0.6-0.9 Sn, 0.35-0.50 Fe, 0.15-0.30 Mn, 0.25-0.40 Ni, bal Zn.
For welding rod.

BURGESS ALUMINUM SOLDER.
Eng.; 76 Sn, 21 Zn, 3 Al.
For aluminum solder.

BURGESS-PARR NO 85 ALLOY.
M-29; Ni, Cr, Co, Mo.
For chemical apparatus; acid resistant.

BURLOY A.
M-570; 0.12 max C, 16-23 Cr, 7-11 Ni, bal Fe.
For stainless and corrosion resistant parts; stainless, heat and corrosion resistant.

BURLOY B
M-570; 0.21-0.35 C, 12-15 Cr, bal Fe
For corrosion resistant parts; corrosion resistant.

BURLOY C.
M-570; 0.12 max C, 24-30 Cr, 12-15 Ni, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

BURLOY C-1.
M-570; 0.36-0.50 C, Si, 16-23 Cr, 7-11 Ni, bal Fe
For heat and corrosion resistant parts; heat and corrosion resistant

BURNDY NO. 101.
M-722; Cu.
Cast: 20,000 TS, 9,000 YS, 50 El, 35 Brin.
For castings

BURNDY NO 111
M-722; 37 Zn, 1.5 Fe, 1.5 Al, 0.25 Mn, bal Cu
Cast: 70,000-80,000 TS, 30,000-34,000 YS, 25-40 El, 100-150 Brin.
For castings; high strength

BURNDY NO. 113
M-722; 92.9 Cu, 1.7 Sn, 2.2 Pb, 3.2 Zn.
Cast: 22,600 TS; 9,200 YS, 18 El.
For castings, free-cutting.

BURNDY NO 113LM
M-722; 1 Li, bal Cu
For electrical convectors, high conductivity.

BURNDY NO. 202.
M-722, 85 Cu, 5 Sn, 5 Pb, 5 Zn
Cast: 26,000-37,000 TS, 8,000-13,000 YS; 15-20 El, 45-59 Brin.
For castings, bearings, pressure tight.

BURNDY NO. 206.
M-722, 80 Cu, 10 Sn, 10 Pb, trace P
Cast. 22,000-23,000 TS; 9,000-12,700 YS; 6-9 El; 46-65 Brin.
For castings, bearings; pressure tight.

BURNDY NO. 302.
M-722, 89 Cu, 1 Fe, 10 Al.
Cast: 60,000-80,000 TS, 9,000-13,000 YS; 15-27 El; 93-100 Brin.
For castings; Al bronze.

BURNDY NO. 308.
M-722; 88 Cu, 10 Sn, 2 Zn.
Cast: 30,000-45,000 TS; 10,000-16,000 YS; 15-30 El; 57-74 Brin.
For castings; Gum Metal.

BURNDY NO. 309
M-722; 86 Cu, 9.5 Sn, 2.5 Pb, 2 Zn.
Cast: 30,000-40,000 TS; 17,000-19,000 YS; 15-25 El; 52-72 Brin.
For castings; modified Gun Metal.

BURNDY NO. 314.
M-722; 96 Cu, 1 Mn, 3 Si.
Cast: 50,000 TS; 30,000 YS; 24 El; 103 Brin.
For castings; "Everdur."

BURNDY NO. 316.
M-722; 88 Cu, 4 Fe, 8 Al.
Cast: 75,000 TS; 15-20 El, 100 Brin
For castings; Al bronze.

BURNDY NO. 329.
M-722, 91 Cu, 7 Al, 2 Si
Cast 70,000 TS; 25 El.
For castings, Duronze III.

BURR-A.
Eng.; 62 Cu, 38 Zn
For pipes, tubes, hardware

BURR-B.
Eng; 90 Cu, 10 Zn.
For window screen wire, radiators

BURYS C 16.B
M-1415; 0.5 C, 1 Si, 1.5 Cr, 2 W, 0.2 V, bal Fe.
For pneumatic tool pistons, chisels, riveters; tough and impact resistant

BURYS H 18 S.
M-1415; 1.0 C, 1.5 Cr, bal Fe
For ball and roller bearings, forming rolls; oil or water hardened

BUSH BRAND BEARING METAL
M-575; P, alloy, bal Cu
For bearings, fatigue and wear resistant.

BUSHINGS
Eng; 85-86.2 Cu, 10.2-11.0 Sn, 3.6-4.0 Zn.
For bushings, bearings; high strength

BUSTER.
M-35, 0.50-0.58 C, 2.2 W, 1.25 Cr, 0.25 Mn, 1 Si, 0.25 V, bal Fe
Ht Tr: 283,000 TS, 246,000 YS, 10 El, C 53 Rock
Annealed 190 Brin
For dies, chisels, shear blades, punches, forging dies
Type S1 hot work tool steel, shock resistant

BUSTER ALLOY 50.
M-35, 0.50 C, 1.5 Cr, 2.5 W, bal Fe.
For cold work tools and dies; oil hardened, tough

BUSTER 60
M-35, 0.55 C, 1.25 Cr, 2.75 W, 0.2 V bal Fe.
Heat Treated 231,000-315,000 TS; 209,000-275,000 YS; 9-11 El; 27-42 RA; C 48-56 Rock.
For header and swaging dies, chipping chisels, rivet busters, track tools
Type S1 shock resisting tool steel, good fatigue resistance.

BUSTER BRAND.
M-35; C, Cr, W, bal Fe.
For tools, chisels, shear blades; shock resisting

BUTTON.
U.S.; 80 Zn, 20 Cu
For die castings, ornaments; red brass.

BUTTON ALLOY-1.
Eng.; 60-50 Cu, 30-45 Zn, 0-10 Sn.
For buttons, ornaments; corrosion resistant.

BUTTON ALLOY-2.
Eng.; 43 Cu, 57 Zn.
For buttons, ornaments; low strength.

BUTTON BRASS.
Eng.; 90 Cu, 10 Zn, 0.5 Sn.
For buttons, ornaments.

BVT 90.
German; 0.3 C, 13 Cr, 2 Mo, 1 V, bal Fe.
For turbine rotors; high heat resistant.

BVT-130.
M-1343; 0.20 C, 12 Cr, 1.2 Mo, bal Fe.
Annealed: 82,000 TS; 38,000 YS; B 82 Rock.
For chemical plant and oil refinery equipment, gears, shafts, marine hardware.
Corrosion resistant, hardenable.

B. & W. 2.
M-17; 0.15 max C, 0.3-0.6 Mn, 1.75-2.25 Cr, 0.4-0.6 Mo, 0.5 max Si, bal Fe.
Annealed: 68,000 TS; 40,000 YS; 35 El; 140 Brin.
For oil refinery tubes; resists S-atm.

B. & W. 5.
M-17, 0.15 max C, 0.5 max Mn, 0.5 max Si, 4-6 Cr, 0.45-0.60 Mo, bal Fe.
Annealed: 70,000 TS; 30,000 YS; 35 El; 150 Brin.
For oil refining tubes, steam superheater; resists S-atm.

B & W 9 (CROLOY 9).
M-17; 0.15 max C, 0.5 max Mn, 0.5 max Si, 8-10 Cr, 1.25-1.75 Mo, bal Fe.
Annealed: 78,000 TS; 40,000 YS, 30 El; 165 Brin.
For oil refining still and exchanger tubes; for service up to 1250°F.

B & W 12-14 Cr.
M-447, 0.12 max C, 12-14 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

B & W 16-3-3.
M-17; 0.15 max C, 15.5-17 Cr, 12.5-14.5 Ni, 2-3.25 Mo, bal Fe.
Water quenched: 95,000 TS; 38,000 YS; 55 El; 160 Brin.
For acetic acid, sulfite liquor corrosion resistant parts; corrosion resistant.

B & W. 18
M-17; 0.10 max C, 0.5 max Mn, 0.5 max Si, 15-18 Cr, bal Fe.
Annealed: 75,000 TS; 48,000 YS; 28 El; 170 Brin.
For corrosion resistant parts to HNO_3 and mixed acids; acid and corrosion resistant.

B. & W. 18-8.
M-17; 0.07 max C, 0.6 max Mn, 0.75 max Si, 16.5-20 Cr, 7-10.5 Ni, bal Fe.
Water quenched. 90,000 TS; 30,000 YS; 65 El; 140 Brin.
For corrosion resisting parts; corrosion resistant.

B. & W 25-20.
M-17; 0.15 max C, 1.0 max Mn, 0.75 max Si, 24-26 Cr, 19-21 Ni, bal Fe.
Air cooled. 95,000 TS, 38,000 YS; 50 El; 150 Brin.
For heat resistant parts; resists oxidation to 2100°F.

B. & W. 27.
M-17; 0.25 max C, 0.75 max Mn, 0.50 max Si, 25-30 Cr, bal Fe
Water quenched: 85,000 TS; 50,000 YS; 22 El; 180 Brin.
For heat resistant parts; resists oxidation to 2100° and sulfur atmospheres.

B & W NO. 400.
M-447; 0.15 C, 4-6 Cr, bal Fe.
100,000 TS; 15-20 El.
For oil refinery equipment; corrosion resistant.

B & W NO. 401.
M-447; 0.25 C, 4-6 Cr, bal Fe.
100,000 TS; 15-20 El.
For oil refinery equipment; corrosion resistant.

B & W NO. 402.
M-447; 0.10 C, 4-6 Cr, bal Fe.
100,000 TS; 15-20 El.
For oil refinery equipment; corrosion resistant.

B & W NO. 420.
M-17, M-447; 0.25 C, 4-6 Cr, 0.75-1.25 W, bal Fe.
100,000 TS; 15-20 El.
For oil refinery equipment; corrosion resistant.

B & W. 441.
M-447, M-17; 0.3 C, 4-6 Cr, 0.60 Mo, bal Fe.
Annealed: 100,000 TS; 50,000 YS; 25 El; 50 RA; 200 Brin.
For oil still headers, castings, pumps, pipe; moderate corrosion resistance.

B & W NO. 445.
M-447; 0.30 C, 8-10 Cr, 1.5 Mo, bal Fe.
Cast: 90,000 TS; 180 Brin
For oil refinery and boiler parts; heat and corrosion resistant.

B & W NO 450.
M-17, M-447; 0.12 C, 0.25 Ni, 12-14 Cr, bal Fe.
Cast: 90,000-70,000 TS; 15-20 El, 180-150 Brin.
For oil refinery equipment, boilers; heat and corrosion resistant.

B & W NO 600.
M-17, M-447, 0.16 C, 18-21 Cr, 9-12 Ni, bal Fe.
Cast. 70,000-85,000 TS, 60-40 El, 130-160 Brin.
For corrosion resisting parts, chemical industries; austenitic alloy, high corrosion resistance

B & W NO 603
M-447, M-17, 0.07 max C, 16-23 Cr, 7-11 Ni, Ti, bal Fe.
Cast: 70,000-85,000 TS, 130-160 Brin.
For stainless parts; stainless.

B & W NO 604.
M-447; 0.08 C, 18 Cr, 8 Ni, bal Fe.
Cast 70,000-85,000 TS; 130-160 Brin.
For stainless parts; stainless, austenitic.

B & W NO 610.
M-17, M-447; 0.16 C, 17-19 Cr, 7.5-10.5 Ni, 2-3 Si, bal Fe
80,000-100,000 TS; 60-40 El.
For corrosion resisting parts, austenitic, high corrosion resistance.

B & W NO 640
M-447, 0.16 C, 17-19 Cr, 7.5-10.5 Ni, 2.5-3.5 Mo, bal Fe
80,000-100,000 TS, 60-40 El.
For corrosion resisting parts, resists mineral acids; austenitic; corrosion resistant.

B & W NO. 640S.
M-447; 0.08 C, 19 Cr, 9 Ni, 3 Mo, bal Fe.
Cast: 88,000 TS; 170 Brin.
For paper mill sulfite units, corrosion resistant.

B & W NO. 642
M-447; 0.12 C, 17-19 Cr, 7.5-10.5 Ni, 2.5-3.5 Mo, bal Fe.
Cast: 75,000-85,000 TS; 60-40 El; 140-165 Brin.
For corrosion resisting parts; paper mill sulfite; resists mineral acids; austenitic; corrosion resistant.

B & W NO. 650.
M-17, M-447; 0.16 C, 22-25 Cr, 10-13 Ni, bal Fe.
80,000-100,000 TS; 60-40 El.
For sulfite paper industry apparatus; heat and corrosion resistant.

B & W NO. 661.
M-17, M-447; 0.35 C, 22-25 Cr, 10-13 Ni, 2.0-2.5 Si, bal Fe.
Cast: 70,000 TS; 190 Brin.
For oil still tube supports, furnace parts; heat and corrosion resistant to 1800°F.

B & W NO. 690.
M-447; 0.16 max C, 24-30 Cr, 7-11 Ni, Mo, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

B & W NO. 692.
M-447; 0.10 max C, 24-30 Cr, 7-11 Ni, Mo, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

B & W NO. 700.
M-17, M-447; 0.4-0.6 C, 16-20 Cr, 62-68 Ni, bal Fe.
Cast: 60,000 TS; 180 Brin.
For heat resisting parts, oil burners; heat resistant.

B & W NO. 701.
M-17, M-447; 1.0-1.25 C, 16-20 Cr, 60-65 Ni, bal Fe.
For heat resisting parts; heat resistant.

B & W NO. 800.
M-17, M-447; 1.0-1.5 C, 24-26 Cr, 10-12 Ni, bal Fe.
Cast: 450 Brin.
For heat resisting parts, wire guides; heat resistant.

B & W NO. 850.
M-447; 1.6 C, 18 Cr, 6 Ni, bal Fe.
Cast: 380-420 Brin.
For rolling mill plugs, wire guides; wear and heat resistant.

B. & W. 900.
M-447, M-17; 0.25 C, 17-19 Cr, bal Fe.
Cast: 95,000 TS; 45,000 YS; 10 El; 15 RA; 200 Brin.
For castings and pump parts, flanges, nozzles; corrosion resistant; nitric acid, sea water and mine water resistant.

B & W NO 902.
M-17, M-447; 0.10 C, 17-19 Cr, bal Fe.
85,000 TS; 45,000 YS; 15 El; 20 RA; 150 Brin.
For corrosion and HNO_3 resisting parts; corrosion resistant.

B & W NO. 910.
M-17, M-447; 0.25 C, 17-19 Cr, 1 Si, bal Fe.
Cast: 80,000 TS; 180 Brin.
For corrosion and HNO_3 resisting parts; corrosion resistant.

B & W NO. 912.
M-17, M-447; 0.10 C, 17-19 Cr, bal Fe.
For corrosion and HNO_3 resisting parts; corrosion resistant.

B & W NO. 950.
M-17, M-447; 0.25 C, 26-30 Cr, bal Fe.
Cast: 60,000 TS; 190 Brin.
For corrosion and HNO_3 resisting parts, hot S gases; corrosion resistant.

B & W NO. 951.
M-447; 1.5 C, 29 Cr, 2 Ni, bal Fe.
Cast: 90,000 TS.
For heat and wear resistant parts; heat and wear resistant.

B. & W. ALLOY NO. 1000.
M-17, M-447; 2.35 Cu, 1.50 Mn, 2 Si, 18 Cr, 9 W, bal Fe.
Cast and treated: 600-680 Brin.
For abrasion resisting parts, ceramic and cold drawn dies; not shock resisting.

B. & W. ALLOY NO. 1100.
M-17, M-447; 0.25 C, 0.50 Mn, 1.85 Si, 25 Cr, 20 Ni, bal Fe.
Cast: 70,000-85,000 TS; 40,000 YS; 75-10 El; 160-180 Brin.
For furnace rolls, grates, retorts, skid rails, chains; Rockwell "B"—83-89.

B & W NO. 1101.
M-17, M-447; 0.3 C, 24-26 Cr, 19-23 Ni, bal Fe.
Cast: 70,500 TS; 160 Brin.
For heat resisting castings, furnace parts; heat resistant to 2000°F.

B & W NO. 1102.
M-17, M-447; 0.15 max C, 24-26 Cr, 19-23 Ni, bal Fe.
At 1500°F: 24,500 TS; 27 El; 36.4 RA.
At 2000°F: 8700 TS; 28.5 El; 45.8 RA.
For heat resisting castings; heat resistant to 2000°F.

B & W NO. 1200.
M-17, M-447, 0.4 C, 7-9 Cr, 18-21 Ni, bal Fe.
Cast: 60,000 TS; 150 Brin.
For corrosion resisting parts, furnace castings; stainless.

B & W NO. 1300.
M-17, M-447; 0.45 C, 14-16 Cr, 33-36 Ni, bal Fe.
Cast: 70,000 TS; 180 Brin
For heat and corrosion resisting parts; furnace parts; heat and corrosion resistant.

B & W NO. 1400.
M-17, M-447; 0.35-0.50 C, 1.25-1.75 Cr, 14-16 W, bal Fe.
For high speed tools and cutters; high speed steel.

B & W NO 1440
M-447; 0.5 C, 1.5 Cr, 7 Mo, bal Fe.
Cast
For tube mill piercer points; wear resistant.

B & W NO. 1500
M-17, M-447; 0.25 C, 25-30 Cr, 8-11 Ni, bal Fe.
Cast: 75,000 TS.
For furnace parts, heat and corrosion resisting parts; heat and corrosion resisting.

B & W NO. 1501.
M-447; 0.6 C, 25-20 Cr, 8-11 Ni, bal Fe
Cast: 75,000 TS.
For oil burner parts; heat and corrosion resistant.

B. & W. 5150.
M-447; 1.0 C, 0.4 Mn, 1.4 Cr, bal Fe
Cast: 11,500 TS; 350-500 Brin.
For grinding units, wear plates; abrasion resistant.

B & W NO. 5202.
M-447; 1C, 2 Mn, 1.5 Cr, 0.5 Mo, 0.8 Si, bal Fe.
Cast: 150,000 TS; 500-650 Brin.
For grinding and pulverizing equipment; wear resistant.

B & W IRON.
M-17; 0.05 max C, 0.25-0.40 Mn, 0.025 max S, 0.10 max Cu, bal Fe.
Hot finished: 45,000-50,000 TS; 30,000-41,000 YS; 49-70 El; Rock B 53-57.
Cold drawn: 68,000-86,000 TS; 60,000-80,000 YS; 25-42 El; Rock B 76-88.
For electric motor and generator housings.
Good magnetic characteristics.

B. & W. NIROSTA KA-2.
M-447; 0.13-0.16 C, 16-20 Cr, 7-11 Ni, bal Fe.
Hot finished: 85,000 TS; 28,000 YS; 50 El; 45 RA; 160 Brin.
Cold drawn: 75,000 TS; 25,000 YS; 55 El; 120 Brin.
For heat and corrosion resistant parts, tubes; stainless, heat and corrosion resistant.

B. & W. NIROSTA KA-2S.
M-447; 0.7 max C, 16-20 Cr, 7-11 Ni, bal Fe.
Hot finished: 85,000 TS; 28,000 YS; 50 El; 45 RA; 125 Brin.
Cold drawn: 75,000 TS; 25,000 YS; 55 El; 120 Brin.
For heat and corrosion resistant parts, tubes; stainless, heat and corrosion resistant.

"B-W" STANDARDIZED.
M-213; 0.15-0.25 C, 0.30-0.60 Mn, bal Fe.
Rolled: 55,000-65,000 TS, 35,000-40,000 YS; 30 El; 55 RA.
Heat treated: 65,000-75,000 TS; 40,000-45,000 YS; 20 El; 60 RA; 158 Brin.
For general use, boiler plates.

BW XII.
M-459; 0.10 C, 1.3 Mn, 0.10 Si, 0.4 Ni, bal Fe
For welding electrode; general purpose, gas.

BX-3 (see Jessop BX-3).

B-XX
M-424; 0.3-0.4 C, bal Fe
For gears, shafts, water hardening.

BYLOY GR W2.
M-292; 0.30 max C, 1.1-1.6 Mn, 0.10 min Mo, 0.10 min Cu, 0.0005 min B, bal Fe
Rolled. 105,000 TS; 80,000 TS; 21 El; 48 RA; 210 Brin
Heat treated 145,000 TS, 135,000 YS, 15 El, 55 RA, 340 Brin.
For shovels, ore chutes, dippers, graders, drag buckets; abrasion and wear resistant.

BYRWILL "B"
M-723; 91-93 Zn, 2-3 Pb, 6-7 Cu
28,000 TS; 67 Brin
For bearings; antifriction.

C-4 HOT DIE STEEL
M-432, 0.95 C, 4 Cr, bal Fe.
For hot work dies, gripper dies, bolt and rivet header dies; hot work steel.

C 40
Germany; 60 Al_2O_3, 40 mixed carbides.
For hard cutters to machine steel and cast iron.
Sintered Alloy.

C 46
Italian; 10 Cu, 1 Si, 0.25 Mg, 0.15 Ti, 1.5 Ni, bal Al.
For castings; heat resistant

"C63" QUALITY.
M-179; Cu, 10 Ni, bal Zn.
Rolled: 80,000 TS; 44,000 YS; 22 El; 12 RA; 145 Brin
Drawn: 90,000 TS; 48,000 YS; 20 El; 10 RA, 150 Brin.
For hot stampings, hardware, architectural trim; silver bronze.

C-74 ARMOR.
M-1222 and M-112; 0.25-0.30 C, 1.0-1.6 Mn, 0.3-0.4 Si, 0.5-1.0 Cr, 0.75-1.45 Ni, 0.4-0.6 Mo, bal Fe.
Cast· 120,000 TS, 95,000 YP; 18 El; 40 RA; 225-270 Brin.
For gears countershafts, axles, crankshafts.
Oil hardening, tough, shock resistant.

"C90" QUALITY.
M-179; 55-60 Cu, 0.2 max Pb, 2-3 Mn, bal Zn.
Extruded: 70,000 TS; 32,000 YS; 30 El; 30 RA; 120 Brin.
Drawn. 76,000 TS; 38,000 YS; 20 El; 25 RA; 130 Brin.
For high pressure air service tubes; Parson's manganese bronze.

"C92" QUALITY.
M-179; 55-60 Cu, 0.2 max Pb, 2-3 Mn, bal Zn.
Rolled: 76,000 TS; 38,000 YS; 25 El; 30 RA; 135 Brin.
For disc and slotted valves; Parson's manganese bronze.

C-207.
M-31; 7.5 W, 0.8 Zr, 0.2 Ti, 0.1 C, bal Cr.
For gas turbine engines.
High stress-rupture strength above 1800°F.
High resistance to thermal shock and fatigue, excellent oxidation resistance.

C-242.
M-239, 0.3 C, 10 Co, 20 Cr, 10 Mo, 1 max Fe, bal Ni.
For high temperature applications, jet engine and gas turbine components.
Heat and oxidation resistant.

C-501.
M-724, 2.1 Mg, 1.5 Mn, bal Al
For light alloy parts, similar to "Pearlman"

C-502
M-724; 11-14 Si, bal Al.
For light alloy parts; similar to "Silumin."

C-503
M-724, 4 Cu, 0.4 Ti, bal Al.
Heat treated 40,000-43,000 TS, 26,000-27,000 YS; 4-5 El; 80-90 Brin.
For light alloy parts; age-hardenable

C 908
M-4, 3004 aluminum bonded to 300 stainless steel
For cooking utensils. 0.010-in, layer of 300 stainless steel bonded to 3004 aluminum of H 111 temper.

CADMET.
M-1091, WC + Co.
For cutting tool, sintered carbides

CADMIUM AMALGAM.
Eng., Cd, bal Hg.
For modeling purposes, fusible plugs, softens when moderately heated, soft as wax.

CADMIUM COPPER
M-33; 99 Cu, 1 Cd.
Cold drawn 80,000 TS; 4 El.
For trolley wire, electrical conductors; high conductivity.

CADMIUM COPPER 985.
M-141, 99.1 Cu, 0.9 Cd.
Hard: 55,000 TS; 48,000 YS; 6 El; 116 Brin.
Soft: 37,000 TS; 12,000 YS; 50 El; 45 Brin.
For trolley wire, marine hardware; corrosion resistant.

CADMIUM SILVER.
Eng., Cd, bal Ag
For corrosion resistant parts.

CA DOUBLE DIAMOND.
M-38; 1.0 C, 1.5 Cr, 0.35 Mo, bal Fe.
For rock drills; hollow drill steel.

CALIDO (Elalco).
M-44; 60 Ni, 16 Cr, 24 Fe.
100,000 TS; 56,000 YS; 28 El; 59 RA.
For dipping baskets, electrical resistance materials; resists oxidation up to 1000°C.

CALIDO (Elalco).
M-47; 64 Ni, 8 Cr, 25 Fe, 3 Mn.
For electrical resistances; heat resistant.

CALITE 25-10
M-30; 0.25-0.45 C, 23-28 Cr, 10-14 Ni, 0.25-1.00 Si, 0.25-1.00 Mn, bal Fe.
Cast: 81,000 TS; 45,000 YS; 16 El; 180 Brin.
Annealed: 87,000 TS; 51,000 YS; 5 El; 180 Brin.
For furnace parts, beams, tube supports; heat resistant to 1950°F.

CALITE A.
M-30, 0.4 C, 15-18 Cr, 35-37 Ni, 1-1.7 Si, 1.5 Mn, bal Fe.
At 1600°F: 18,000 TS; 26 El.
Cast: 68,000 TS; 36,200 YS; 8 El; 7 RA; 156 Brin
For carburizing boxes, hearth plates, retorts; corrosion and heat resisting to 2000°F.

CALITE A-15
M-30; 0.15 max C, 15-18 Cr, 35-37 Ni, 1.00-1.75 Si, 1.00-1.75 Mn, bal Fe.
Cast: 71,000 TS, 34,000 YS; 19 El; 112 Brin
Annealed: 90,650 TS; 44,200 YS; 13 El.
For retorts, fan blades; heat resistant to 2000°F.

CALITE B-18.
M-30; 0.29-0.36 C, 18-20 Cr, 8-10 Ni, 1 Mo, bal Fe.
Cast: 80,000 TS; 35,000 YS, 9 El; 3 RA; 170 Brin.
Annealed: 105,000 TS, 48,100 YS; 17 El
For beams supporting loads at elevated temperatures, oil still tube supports; heat resisting up to 1650°F; resists sulfur; formerly Calite B.

CALITE B-18 L.C
M-30; 0.08 max C, 18-20 Cr, 8-10 Ni, 0 75-1 75 Si, 1.00-1 75 Mn, 0 9-1.1 Mo, 0.1 N_2, bal Fe.
Cast· 156 Brin.
For welded stainless equipment; heat resistant to 1650°F.

CALITE B-18 Mo.
M-30; 0.08 max C, 18-20 Cr, 12 5-14 00 Ni, 2.9-3.1 Mo, bal Fe.
Cast: 78,600 TS; 34,100 YS; 44 El; 143 Brin
Annealed: 77,200 TS, 33,300 YS; 37 El; 149 Brin.
For paper and pulp equipment; corrosion resistant.

CALITE "B-28"
M-30; 0 35 C, 25-28 Cr, 10-12 Ni, 1 Mo, 0.1 N.
Cast. 85,000 TS; 57,000 YS, 24 El; 10 RA; 187 Brin.
For furnace parts, beams, tube supports; to sustain loads at high temperatures

CALITE B-28 N.
M-30, 0 30-0 35 C, 24-26 Cr, 10-12 Ni, 0 75-1.75 Si, 0.75-1.75 Mn, 0.16 N_2, bal Fe.
Cast: 84,100 TS; 47,400 YS; 10 El; 217 Brin.
Annealed: 86,000 TS; 46,500 YS; 7 El.
For furnace parts, hangers, supports; heat resistant.

CALITE B-29.
M-30, 0.29-0.34 C, 28-30 Cr, 15-17 Ni, 1.00-1.75 Si, 0.7-1.7 Mn, 0.9-1.10 Mo, 0.1 N_2, bal Fe.
Cast: 64,600 TS; 45,000 YS; 8 El.
Annealed: [illegible],500 TS; 50,650 YS; 6 El.
For furnace parts; heat resistant to 2100°F.

CALITE "E."
M-30; 7.8 Ni, 17.28 Cr, 73.62 Fe, 0.45 Mn, 0.14 C, 0.18 Al, 0.14 Cu.
Rolled, annealed: 85,000 TS; 50 El; 60 RA; 165 Brin.
For stainless parts, bolts, nuts, forged and rolled parts; resists oxidation up to 1800°F.

CALITE "E-28."
M-30; 0.2 max C, 22-26 Cr, 12-14 Ni, bal Fe.
Rolled: 95,000 TS; 40 El; 50 RA; 156 Brin.
For malleable bolts, nuts, rivets, welding wire, furnace parts; heat resistant to 1950°F.

CALITE "N."
M-30; 0.55 C, 17-20 Cr, 65-68 Ni, 1-1.7 Si, 1-1.7 Mn, bal Fe.
At 100°F: 50,000 TS, 2 El; 1 RA; 190 Brin.
At 2100°F: 8,000 TS, 12 El; 13 RA.
For furnace parts, heat treatment equipment, carburizing boxes; resists heat up to 2100°F; poor S resistance.

CALLOY CADMIUM-BARIUM.
M-511, Cd, Ba
For alloys for bearings

CALLOY CADMIUM-CALCIUM.
M-511; Cd, Ca.
For alloys for bearings.

CALLOY CADMIUM-STRONTIUM.
M-511, Cd, Sr.
For alloys for bearings

CALLOY.
(CALAL).
M-511; 8-26 Ca, bal Al
For the deoxidation of steel

CALLOY LEAD-BARIUM.
M-511; Ba, bal Pb.
For alloys for bearings

CALLOY LEAD-CALCIUM.
M-511; Ca, bal Pb
For alloys for bearings.

CALLOY LEAD-STRONTIUM
M-511, Sr, bal Pb
For alloys for bearings

CALLOY STRONTIUM ALUMINUM.
M-511, up to 50 Sr, bal Al.
For getters in electrical discharge devices and vacuum tubes, good stability in air.

CALMALLOY see CALMALLOY NO. 1.

CALMALLOY NO 1.
M-31; 30 Cu, 68 Ni, 2 Fe
For electrical equipment
Magnetically soft, high permeability.

CALMALLOY NO. 2.
M-31; 88 Ni, 10 Cu, 2 Fe.
For electrical and magnetic equipment.
Magnetically soft alloy
High magnetic permeability

CALMAR 18-8 Cb.
M-277, 17-20 Cr, 7-10 Ni, 0.9-1.25 Cb, C, bal Fe.
Annealed· 80,000-85,000 TS, 40,000-45,00 YS; 40-45 El.
For castings; abrasion and corrosion resistant.

CALMAR 19-9.
M-277; 0.15 max C, 18-21 Cr, 8-10 Ni, bal Fe.
Heat treated: 85,000 TS; 40,000 YS; 64 El.
For stainless castings, stainless.

CALMAR 19-9M.
M-277, 0.15 max C, 18-21 Cr, 8-10 Ni, bal Fe.
Heat treated: 90,000 TS; 45,000 YS; 50 El.
For stainless castings; stainless.

CALMAR 19-9S.
M-277; 0.07 max C, 18-21 Cr, 8-10 Ni, bal Fe.
Heat treated: 75,000 TS; 37,000 YS; 55 El.
For stainless castings; stainless.

CALMAX.
M-111; 0.28 C, 12 Cr, 7 W, 9 Co, 0.4 V, bal Fe.
Hardened: C 54-55 Rock.
For cores in die casting dies, extrusion dies, forging dies, mandrels.
Hot work tool steel, high hot hardness, air or oil hardening.

CALMET.
M-726; Ni-Cr.
For thermocouples, resistance wire; heat resistant to 1920°F.

CALO FERRO (30).
M-275; 0.3 C, 9 W, 3.5 Cr, 0.2 V, bal Fe.
For tools, dies, hot piercing punches; hot working dies, mild high speed steel.

CALO-FERRO (45).
M-275; 0.45 C, 13 W, 3 Cr, 0.25 V, bal Fe.
For tool, dies, hot piercing punches; hot work tool steel.

CALO FERRO 50
M-275; 0.50 C, 3 Cr, 0.5 V, 15 W, bal Fe.
For hot extrusion dies and mandrels, upsetters; Type H24; oil hardened.

CALOMIC.
M-108; 65 Ni, 15 Cr, 20 Fe.
115,000 TS
For electrical resistance; formerly "Pyromic No. 3"

CALOR 5
M-1318; 0.30 C, W, Cr, V, bal Fe.
For upsetters, riveters, punches, hot work steel, oil hardened.

CALOR 10.
M-1318; 0.30 C, 2.6 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams and liners, punches, dies; hot work steel, oil hardened.

CALOR 10 Co.
M-1318; 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion rams and liners, dies, punches; hot work steel, oil hardened.

CALOR 304
M-1318, 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe.
For gears, punches, crimpers, crankshafts; oil hardened, tough.

CALORIZED 4-6 Cr-Mo
M-30, 0.15 C, 0.5 Mo, 4-6 Cr, bal Fe.
For parts to resist erosion and hydrogen sulfide; 35% Al-1/32" case.

CALOR LR.
M-1318; 0.30 C, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For cold water tools, upsetters, punches; oil hardened, tough.

CALOXO 25-12.
M-277; 24-27 Cr, 11-14 Ni, 0.25 max C, bal Fe.
Annealed: 75,000-85,000 TS; 40,000-45,000 YS; 30-35 El.
For stainless castings; stainless.

CALOXO 26.
M-277; 25-30 Cr, 0.25 min C, bal Fe.
For corrosion resisting parts; corrosion resistant.

CALOXO 26-4.
M-277; 25-30 Cr, 2.5-4.0 Ni, 0.25 min C, bal Fe.
For heat and corrosion resisting parts; corrosion and heat resistant.

CALOXO 28.
M-277; 0.25 max C, 26-30 Cr, bal Fe.
For corrosion and heat resisting castings; corrosion and heat resistant.

CALOXO 28-10.
M-277; 27-30 Cr, 8-12 Ni, 0.25 max C, bal Fe.
For heat and corrosion resisting parts; heat and corrosion resistant.

CALOXO 28-10 M.
M-277; 27-30 Cr, 8-12 Ni, 3-4.5 Mo, 0.25 min C, bal Fe.
For heat and corrosion resisting parts; heat and corrosion resistant.

CALOXO 35-15.
M-277; 0.35 max C, 15-18 Cr, 35-38 Ni, bal Fe.
For heat and corrosion resisting castings; heat and corrosion resistant.

CALSUN BRONZE 951.
M-8; 95.5 Cu, 2 Sn, 2.5 Al.
Soft: 52,000 TS; 40 RA.
Hard: 135,000 TS; 1 RA.
For electrical conductors; corrosion resistant

CALUMET.
M-38; 0.30 C, bal Fe.
Rolled: 65,000-75,000 TS; 40,000-50,000 YS.
For machine tool parts, gears, shafts; easy to machine, water hardened.

CALUMET.
M-1431; 1.0 C, 2 Mn, 0.9 Cr, 0.9 Mo, bal Fe.
For punches, blanking and forming dies; air hardened.

CALUMETAL B
M-1166, 0.26-0.33 C, 1.2 Mn, 0.25 Mo, bal Fe.
Heat treated: 130,000 TS; 93,000 YS, 16 El; 16 RA; 260 Brin.
Cast: 83,000 TS, 59,000 YS; 23 El; 37 RA, 194 Brin.
For guides for rolling mills, wear resistant, tough.

CALUMETAL C-5.
M-1166, 0.20 max C, 4.0-6.5 Cr, 0.45-0.65 Mo, bal Fe.
Annealed: 90,000 TS, 60,000 YS, 18 El; 35 RA; 230 Brin.
For castings for high temperature service to 1400°F, corrosion and heat resistant.

CALUMETAL L
M-1166; 0.38-0.43 C, 0.7 Mn, 0.4 Si, 1.5-2.0 Ni, 0.7 Cr, 0.3 Mo, bal Fe.
Normalized: 100,000-130,000 TS; 70,000-95,000 YS; 10-20 El, 25-40 RA; 210-250 Brin.
Heat treated: 120,000-250,000 TS; 100,000-225,000 YS, 3-18 El; 7-40 RA; 250-500 Brin.
For machine tool parts, gears, shafts, castings; shock resistant, oil hardened.

CALUMETAL MC.
M-1166; 0.20 max C, 0.7 Mn, 0.4 Si, 0.8-1.1 Cr, 0.15-0.25 Mo, bal Fe.
Heat treated: 100,000-200,000 TS, 90,000-180,000 YS; 6-18 El; 35-60 RA; 200-390 Brin.
For gears, pinions, shafts, castings; tough, carburizing steel.

CALUMETAL NE.
M-1166; 0.28-0.33 C, 0.7 Mn, 0.4 Si, 0.45-0.80 Ni, 0.4-0.7 Cr, 0.2-0.3 Mo, bal Fe.
Normalized: 90,000-115,000 TS; 65,000-90,000 YS; 22-28 El; 40-55 RA; 190-230 Brin.
Heat treated: 110,000-215,000 TS; 90,000-170,000 YS; 8-25 El; 30-55 RA; 200-450 Brin.
For gears, pinions, shafts, machinery parts, castings; tough, water hardened.

CALUMETAL WC1.
M-1166; 0.25 max C, 0.7 Mn, 0.6 max Si, 0.45-0.65 Mo, bal Fe.
Annealed: 65,000 TS; 35,000 YS; 24 El; 35 RA; 200 Brin.
For castings, gears, bolts, housings; for high temperature service.

CALUMETAL WC6.
M-1166; 0.20 max C, 0.7 Mn, 0.4 Si, 1.0-1.5 Cr, 0.4-0.6 Mo, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 20 El; 35 RA; 200 Brin. For pressure tight castings for high temperature uses; tough, oil hardened.

CALUMETAL WC9.
M-1166; 0.18 max C, 0.6 Mn, 0.4 Si, 2.0-2.75 Cr, 0.9-1.1 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 20 El; 35 RA; 200 Brin. For pressure tight castings; to operate up to 1000°F.

CALUMETAL X-1.
M-1166; 0.08 max C, 1.5 max Mn, 1.5 max Si, 8-11 Ni, 18-21 Cr, bal Fe
Annealed: 85,000 TS, 35,000 YS; 55 El, 60 RA; 120 Brin.
For food and chemical plant equipment, castings, stainless, austenitic.

CALUMETAL X-2.
M-1166; 0.08 max C, 1.5 max Mn, 1.5 max Si, 8-11 Ni, 18-21 Cr, 0.07-0.10 S, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 40 El; 50 RA; 120 Brin.
For screw machine products; stainless, austenitic, free-cutting.

CALUMETAL X4
M-1166, 0.08 max C, 8-11 Ni, 18-21 Cr, 2-3 Mo, bal Fe.
Annealed 85,000 TS, 40,000 YS; 50 El; 55 RA; 160 Brin
For castings to handle hot chlorides and acids, austenitic, stainless, Type 316.

CALUMETAL X-5.
M-1166; 0.30 max C, 1.5 max Mn, 11-13 Cr, 23-27 Ni, bal Fe.
Cast: 90,000 TS, 40,000 YS; 20 El; 30 RA; 170 Brin.
For furnace parts, heat treating boxes, austenitic, stainless.

CALUMETAL X-8.
M-1166, 0.15 max C, 11.5-13.5 Cr, bal Fe.
Heat treated· 97,000-150,000 TS; 70,000-100,000 YS; 10-20 El; 40-55 RA; 190-350 Brin.
For chemical plant equipment, stainless castings, corrosion resistant; ACI-CK20

CALUMETAL X-15.
M-1166; 0.35 max C, 33-37 Ni, 14-17 Cr, bal Fe.
Cast: 65,000 TS; 40,000 YS; 6 El; 10 RA; 170 Brin.
At 1600°F. 18,500 TS; 14,000 YS; 22 El; 53 RA; 55 Brin.
For conveyors, furnace parts, heat treating boxes; resists oxidation and carburization.

CALUMET BOX AND PIN.
M-38; C, alloy, bal Fe.
For mining boxes and pins; water hardening.

CALUMET BR.
M-1166; 0.3-0.4 C, 0.9-1.1 Mn, 0.25-0.45 Si, 0.2-0.3 Mo, bal Fe.
Normalized: 95,000-115,000 TS; 60,000-95,000 YS; 30-18 El; 50-30 RA; 150-200 Brin.
For tool bit bodies, plows, bucket teeth sprockets; castings.

CALUMET E.
M-1166; 0.36-0.43 C, 1.2 Mn, 0.25 Mo, bal Fe.
Cast: 83,000 TS; 59,000 YS; 23 El; 37 RA; 194 Brin.
Heat treated: 125,000 TS; 114,000 YS; 17 El; 40 RA; 286 Brin.
For guides for rolling mills, wear resistant, tough.

CALUMET G.
M-1166, 0.32-0.39 C, 0.7-1.3 Ni, 0.6 Mo, bal Fe.
Cast: 100,000 TS; 65,000 YS, 20 El, 35 RA; 200 Brin.
Heat treated: 200,000 TS; 173,000 YS; 6 El; 10 RA; 600 Brin.
For gears, connecting rods, cams, dies; tough, wear resistant.

CALUMET GH.
M-1166, 0.4-0.5 C, 0.5-0.8 Mn, 0.45-0.75 Cr, 1.0-1.5 Ni, bal Fe.
Heat treated 110,000-180,000 TS; 80,000-120,000 YS, 20-10 El; 35-20 RA, 200-350 Brin.
For gears, cams, rollers, structures, castings.

CALUMET GR
M-1166; 0.3-0.4 C, 0.5-0.8 Mn, 0.45-0.75 Cr, 1.0-1.5 Ni, bal Fe.
Heat treated· 80,000-110,000 TS; 50,000-90,000 YS; 30-20 El; 50-38 RA; 160-230 Brin.
For crankshafts, axles, cams, links; castings, abrasion resistant.

CALUMET H
M-1166, 0.25-0.35 C, 1.6 Mn, 0.45 Si, bal Fe.
Cast· 77,000 TS, 48,000 YS, 30 El; 56 RA; 168 Brin.
Heat treated 127,000 TS, 115,000 YS, 17 El; 47 RA; 286 Brin
For sprockets, gears, housings, abrasion resistant.

CALUMET M.
M-1166, 0.32-0.39 C, 0.7 Mn, 1 Cr, 0.2 Mo, bal Fe
Cast: 96,000 TS, 63,000 YS, 22 El, 42 RA, 178 Brin
Heat treated: 126,000 TS; 106,000 YS, 12 El; 29 RA; 330 Brin
For gears, shafts, sprockets, housings; abrasion resistant.

CAMBRILOY 1
M-727; 0.11 C, 1.3 Cr, 0.8 Si, 0.55 Mo, bal Fe.
For woven wire conveyor belts, wire cloth and slings.

CAMBRILOY 3.
M-727; 0.15 max C, 3.0 Cr, 1.2 Si, 0.55 Mo, bal Fe.
For woven wire conveyor belts, wire cloth and slings.

CAMBRILOY 5
M-727; 0.10 max C, 5.0 Cr, 1.0 max Si, bal Fe.
For woven wire conveyor belts, wire cloth and slings.

CAMBRILOY 35-19.
M-727; 0.15 max C, 20 Cr, 35 Ni, 2 Si, bal Fe.
For woven wire conveyor belts, wire cloth and slings.

CAMBRILOY 35-19 Cb.
M-727; 0.15 max C, 20 Cr, 35 Ni, 2 Si, 1.2 Cb, bal Fe.
For woven wire conveyor belts, wire cloth and slings; high temperature operation.

CAMBRILOY 80-20.
M-727; 0.15 max C, 1.2 Si, 1.0 Fe, 20 Cr, bal Ni.
For woven wire conveyor belts, wire cloth and slings; high temperature operation.

CAMBRILOY 80-20 Cb.
M-727; 0.15 max C, 1.2 Si, 1.2 Cb, 20 Cr, bal Ni.
For woven wire conveyor belts, wire cloth and slings.

CAMBRILOY A.
M-727; 80 Cr, 20 Ni.
For furnace parts, conveyor belts; heat resistant to 2050°F in S-free atmosphere.

CAMBRILOY AL.
M-727; Aluminum coated carbon steel for woven wire conveyor belts, wire cloth and slings.

CAMELIA METAL.
Eng.; 70 Cu, 15 Pb, 10 Zn, 4.2 Sn, 0.5 Fe.
For hardware; free-cutting.

CAMITE.
M-149; C, W, bal Fe.
For cutting tool tips; similar to "Carboloy."

CAMLOY.
M-490; 25-35 Ni, 10-20 Cr, bal Fe
90,000-112,000 TS; 40-35 El.
For marine parts, valves and tubing for superheated steam, turbine blading, fittings, tanks; stainless and heat resisting.

"CA" NICKEL.
M-121, 4 Co, bal Ni.
For magnetostrictive transducers; high electro-mechanical coupling coefficient.

CAN METALS.
Ger.; 95 Pb, 1.75 Ca, 1.35 Cu, 1 Sr, 1 Ba.
For bearings.

CANNON.
M-40; 0.70 C, 16 W, 3.5 Cr, 1.0 V, bal Fe.
For high speed tools, planing and lathe tools, twist drills, punches; high speed steel.

CANNONITE.
M-347; 2.7 C, 1.5 Si, bal Fe
50,000 TS; 0 El; 250 Brin
For diesel engine and refrigeration parts, crankshafts, pistons, cylinders, brake drums; high test cast iron; Tr. S. 8300.

CANNON-MUSKEGON NO. 6.
M-1491; 28 Cr, 4 W, 1 C, bal Co.
For hard facing bushings, pressure valves, tong bits, hot trimming dies.
Heat and abrasion resistant.

CANNON-MUSKEGON NO. 12.
M-1491; 29 Cr, 8 W, 1.5 C, 1.0 Si, 3 max Fe, bal Co.
For hardfacing bushings, saw teeth, pressure bars, entry guides.
Wear and abrasion resistant.

CANNON-MUSKEGON NO. 40.
M-1491; 15 Cr, 4.5 Fe, 3.25 B, 4.25 Si, 0.75 C, bal Ni.
For hardfacing gear teeth, plump plungers, valve plugs.
Wear, oxidation and abrasion resistant.

CANNON-MUSKEGON NO. 41.
M-1491; 13 Cr, 4 Fe, 3 B, 4 Si, 0.6 C, bal Ni.
For hardfacing and welding, oil expeller screws, scraper blades.
Heat and wear resistant.

CANNON SPECIAL.
M-40; 0.70-0.75 C, 4 Cr, 18-20 W, 0.50 Mo, 2.0-2.25 V, bal Fe.
For tools, cutters.

CANNON VANADIUM.
M-40; 1.0 C, 4 Cr, 18-20 W, 0.5-0.8 Mo, 3.5 V, bal Fe.
For tools, cutters; high speed steel.

CANON.
M-1043; C, alloy, bal Fe.
For machine tool parts; oil hardened.

CANON SUPERIOR.
M-1043; C, alloy, bal Fe.
For machine tool parts; oil hardened.

CANZLER.
German; 1 Ag, 0.05 P, bal Cu.
For welding rod; for mounting carbide tips, stainless and nickel alloys.

CANZLER BRASS.
M-728; 30 Zn, bal Cu.
For welding wire; brass.

CANZLER NO. 1.
M-728; 10 Sn, bal Cu.
For welding wire; bronze.

CANZLER NO. 4.
M-728; Cu.
For welding wire; copper.

CAP GILDING.
U.S.; 90 Cu, 10 Zn.
For ornamental window screens; commercial bronze.

CAPITAL-562.
M-1112; 0.80 C, 4.2 Cr, 6 W, 2 V, 5 Mo, bal Fe.
For lathe and planer tools, milling cutters; high speed steel.

CAPITO-VK5M.
M-1654; 0.20 C, 13 Cr, 1.2 Mo, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; 55 RA; B 92 Rock.
Heat treated: 240,000 TS; 200,000 YS; 8 El; 25 RA; C 50 Rock
For gears, shafts, surgical instruments, knives, scissors, cutlery
Corrosion resistant, hardenable.

CAPSULE METAL.
U.S.; 92 Pb, 8 Sn.
For bearing.

CARAS.
M-1405; C, alloy, bal Fe.
For molds; case hardened, oil hardened.

CARBIDE G1.
Germany; 94 WC, 6 Co.
For cutting tools; sintered carbide.

CARBIDE H1.
Germany; 94 WC, 6 Co.
For cutting tools; sintered carbide.

CARBIDE H2.
Germany; 91.5 WC, 1.5 TiC, 7 Co.
For cutting tools; sintered carbide.

CARBIDE L2.
Germany; 77-78 WC, 14-15 TiC, 8 Co.
For cutting tools; sintered carbide.

CARBIDE LO.
Germany; 88 WC, 5 TiC, 7 Co.
For cutting tools; sintered carbide.

CARBIDE T5K10.
Russia; 85 WC, 6 TiC, 9 Co.
For cutting tools; sintered carbide.

CARBIDE T15K6.
Russia; 79 WC, 15 TiC, 6 Co.
For cutting tools; sintered carbide.

CARBIDE WK3.
Russia; 97 WC, 3 Co.
For cutting tools; sintered carbide.

CARBIDE WK6
Russia; 94 WC, 6 Co.
For cutting tools, sintered carbide.

CARBIDE WK8.
Russia; 92 WC, 8 Co.
For cutting tools; sintered carbide.

CARBIDIE CD-18.
M-1695; Sintered carbide.
Special wear resistant die grade for extra abrasive stamping applications; gall resistant. Stamping and lamination tooling, drawing and forming; can tooling.

CARBIDIE CD-20.
M-1695; Sintered carbide.
Extreme wear applications where no shock is involved; highest compression strength Glass and plastic cut-off tooling; gages.

CARBIDIE CD-24X.
M-1695; Sintered carbide.
Wear applications in no-shock or light shock tooling, such as ceramic compacting;
will hold a highly polished, wear resistant finish.
Valve balls and seats, bearings and seals;
corrosion resistant uses,
pyrochemical liners and plungers, gages.

CARBIDIE CD-30.
M-1695, Sintered carbide.
Wear and die applications Light shock metal powder tooling, drawing, blanking, boring bars and tooling.

CARBIDIE CD-35
M-1695; Sintered carbide.
Dies and wear applications. Metal powder tooling wear resistance is important; blanking, wire, bar and tube drawing

CARBIDIE CD-35F.
M-1695, Sintered carbide.
Wear and gall resistant; will hold high polish.
Aluminum, stainless and brass draw applications, wire straightening, bearings and seals,
valve ball and seats.

CARBIDIE CD-36¼.
M-1695; Sintered carbide
Wear and die grade; moderate shock resistance.
Normal metal powder tooling; blanking and drawing; slitter knives

CARBIDIE CD-38¾.
M-1695, Sintered carbide.
Forming and blanking grade; wear resistant;
will resist light shock. Structural parts, wire bar and tube drawing.

CARBIDIE CD-40.
M-1695; Sintered carbide.
Die and blanking grade, non-ferrous material.
Wear resistant blanking, forming, drawing;
general purpose metal powder tooling;
slitter knives for paper and steel.

CARBIDIE CD-45.
M-1695; Sintered carbide.
Wear resistant ferrous blanking grade. Very light impact applications, forming dies, drawing, general can tooling.

CARBIDIE CD-50.
M-1695; Sintered carbide.
General all purpose die, stamping, drawing.
Will take moderate shock with good die resistance.

CARBIDIE CD-53.
M-1695; Sintered carbide.
Shock resistant, medium impact-shock applications, spring tooling.

CARBIDIE CD-60.
M-1695; Sintered carbide.
Moderate shock, cold heading grade.
Nail grippers, and tooling, spring tooling.

CARBIDIE CD-70.
M-1695; Sintered carbide.
Severe shock, cold heading grade Heavy bolt making and sizing Nail tooling.

CARBIDIE CD-337.
M-1695, Sintered carbide
High strength, wear resistance For cold forming, structural wear-impact applications, swaging hammers, mandrels, rotary
percussion applications.

CARBIDIE CD-355
M-1695, Sintered carbide.
Shock and wear resistant Rod mill rolls, guide inserts

CARBIDIE CD-650.
M-1695, Sintered carbide
Sub-micron material for use in the most abrasive and severe stamping and wear applications
Extreme strength, hardness, and shock resistance

CARBIUM
M-729, 4-5 Cu, bal Al.
For light alloy parts, heat treatable

CARBO
English, WC, Co.
For cutting tools; cemented.

CARBOBRONZE.
Eng; 92 Cu, 8 Sn, 0.3 P
For tubing, resists acid and alkalis

CARBOLOY O-30
M-31, Sintered cemented oxide
90,000 TrS, A 94.0 Rock
For high speed machining of cast iron and steel; high heat and wear resistance.

CARBOLOY 44A.
M-31, Sintered cemented carbide; 94 WC, 6 Co
320,000 TrS; A 91.0 Rock
For semi-roughing of cast iron, non-ferrous and non-metallics; medium high shock resistance.

CARBOLOY 55A.
M-31; Sintered cemented carbide; 87 WC, 13 Co.
390,000 TrS; A 88.2 Rock.
For heavy duty roughing of cast iron, non-ferrous and non-metallics; variety of die applications; high shock resistance

CARBOLOY 55B.
M-31; Sintered cemented carbide; 84 WC, 16 Co.
420,000 TrS; A 86.8 Rock.
For medium and large dies; cold work, piercing, blanking and drawing; extremely high shock resistance.

CARBOLOY 77B.
M-31; Sintered cemented carbide; 57 WC, 27 TaC, 16 Co.
390,000 TrS; A 85.0 Rock.
For cutting hot flash, extrusion of aluminum wire bar and tube.

CARBOLOY 78.
M-31; Sintered cemented carbide; 76 WC, 4 TaC, 12 TiC, 8 Co.
250,000 TrS; A 92.0 Rock.
For light-roughing and finishing of steels; high abrasion resistance.

CARBOLOY 78B.
M-31; Sintered cemented carbide; 79 WC, 4 TaC, 8 TiC, 9 Co.
260,000 TrS; A 91.2 Rock.
For medium roughing of steel; die applications.

CARBOLOY 90.
M-31; Sintered cemented carbide; 90 WC, 10 Co.
350,000 TrS; A 89.0 Rock.
For rock drilling; excellent wear resistance.

CARBOLOY 115.
M-31; Sintered cemented carbide; 88.5 WC, 11.5 Co
400,000 TrS; A 88.5 Rock
For percussive mining bits and large size impact punches: good shock and wear resistance.

CARBOLOY 120.
M-31, Sintered cemented carbide; 88 WC, 12 Co.
410,000 TrS, A 86.5 Rock
For rotary and percussive mining tools and small impact extrusion punches, impact and wear resistant

CARBOLOY 190
M-31; Sintered cemented carbide; 75 WC, 25 Co.
400,000 TrS; A 84.0 Rock.
For heavy impact die and punch applications; high toughness.

CARBOLOY 210.
M-31, Sintered cemented carbide; 28 WC, 2 TaC, 64 TiC, 2 Cr_3C_2, 4 Co.
100,000 TrS; A 94.5 Rock.
For finish machining of steel and cast iron; high wear resistance at elevated temperatures.

CARBOLOY 231.
M-31, Sintered cemented carbide, 90 WC, 10 Co
400,000 TrS, A 87.8 Rock.
For mining applications, shock resistant.

CARBOLOY 241
M-31, Sintered cemented carbide; 90 WC, 10 Co.
400,000 TrS, A 88.4 Rock
For mining applications; shock and wear resistant

CARBOLOY 248.
M-31, Sintered cemented carbide; 89 WC, 11 Co.
450,000 TrS; A 89.5 Rock.
For rock drilling and interrupted metal cutting; excellent wear resistance relative to shock resistance.

CARBOLOY 258.
M-31; Sintered cemented carbide; 87 WC, 13 Co
470,000 TrS; A 88.5 Rock.
For mining and for cold extrusion; shock resistant.

CARBOLOY 268.
M-31; Sintered cemented carbide; 84 WC, 16 Co.
490,000 TrS; A 87.0 Rock.
For mining and for impact extrusion; high shock resistance.

CARBOLOY 320.
M-31; Sintered cemented carbide; 64 WC, 4.5 TaC, 25.5 TiC, 6 Co.
200,000 TrS; A 93.0 Rock.
For high speed finishing of steel and high tensile cast irons; excellent wear resistance.

CARBOLOY 350.
M-31; Sintered cemented carbide, 71 WC, 12 TaC, 12.5 TiC, 4.5 Co.
200,000 TrS; A 92.4 Rock.
For light-roughing and semi-finishing of steel, ferrous castings, stainless steel and some high temperature alloys; excellent wear resistance and toughness.

CARBOLOY 370
M-31; Sintered cemented carbide; 72 WC, 11.5 TaC, 8 TiC, 8.5 Co.
250,000 TrS; A 91.2 Rock.
For heavy duty roughing of steels, ferrous castings, stainless steel and some high temperature alloys; excellent shock and wear resistance.

CARBOLOY 514.
M-31; Sintered TiC coated cemented carbide.
For finishing and precision finishing of steel and cast iron.

CARBOLOY 516.
M-31, Sintered TiC coated cemented carbide.
For finishing and precision finishing of steel and cast iron.

CARBOLOY 523.
M-31; Sintered TiC coated cemented carbide
For general purpose and finish machining of cast iron and non-ferrous materials.

CARBOLOY 608.
M-31; Sintered cemented carbide; 83 Cr_3C_2, 15 Ni, 2 W
100,000 TrS, A 89.5 Rock
For component applications that require high resistance to oxidation and corrosion.

CARBOLOY 779
M-31, Sintered cemented carbide; 91 WC, 9 Co.
340,000 TrS; A 89.5 Rock
For medium-size wire drawing dies, bar and tube dies, shape dies, cupping and compression dies; some mining tool and rock-drilling applications.

CARBOLOY 860.
M-31, Sintered cemented carbide; 91 WC, 4 TaC, 5 Co
270,000 TrS, A 92.0 Rock.
For machining high tensile cast iron, good wear resistance.

CARBOLOY 883.
M-31; Sintered cemented carbide, 94 WC, 6 Co.
290,000 TrS, A 92.0 Rock.
For general purpose machining of non-steel work materials, also used for small compacting dies, burnishing rings and nozzles; high wear resistance.

CARBOLOY 895.
M-31; Sintered cemented carbide; 94 WC, 6 Co.
250,000 TrS, A 92.9 Rock.
For light machining of cast iron and non-ferrous materials.

CARBOLOY 905.
M-31; Sintered cemented carbide; 92 WC, 4 TaC, 4 Co.
240,000 TrS; A 92.2 Rock.
For light finishing of cast iron, non-ferrous and non-metallic materials.

CARBOLOY 907.
M-31; Sintered cemented carbide; 74 WC, 20 TaC, 6 Co.
270,000 TrS; A 91.3 Rock.
For finish machining of fine-grained cast iron, malleable iron, aluminum and magnesium alloys; crater and abrasive resistant.

CARBOLOY 999.
M-31; Sintered cemented carbide; 97 WC, 3 Co.
230,000 TrS; A 92.9 Rock.
For machining cast iron, non-ferrous metals, and non-metallics; also for fine wire dies and small nozzles; excellent abrasion resistance.

CARBOLOY HM-1 HEVIMET.
M-31; 90 W, 7.5 Ni, 2.5 Cu.
Sintered alloy.
300,000 TrS; C 25 Rock.
For weights, counter balances, radiation shielding, vibration damping; high density tungsten alloy.

CARBOLOY HM-3 HEVIMET.
M-31; 90 W, 7.5 Ni, 2.5 Cu.
Sintered alloy.
For governor counter weights, radiation shielding, vibration damping; high density tungsten alloy.

CARBOMANG.
M-157; 0.9-1.0 C, 1.0-1.25 Mn, 0.45-0.60 Cr, 0.4-0.6 W, bal Fe.
For tools and dies, machine parts; castings; *oil hardenable; cast to shape.*

CARBON.
M-44; C, Ni.
For radio tubes; heat resistant.

CARBON.
M-90; 0.10-0.20 C, 0.3-0.6 Mn, 0.45-0.65 Mo, 0.10-0.20 Si, bal Fe.
Hot rolled: 60,000 TS; 35,000 YS; 40 El; 150 Brin.
For oil cracking still tubes, hot oil piping, high temperature steam piping; superior creep strength to plain C-steel.

CARBON ½ Mo.
M-90; 0.2-0.3 C, 0.75 max Mn, 0.3 max Si, 0.45-0.65 Mo, bal Fe.
Normalized and drawn: 70,000 TS; 50,000 YS; 30 El; 170 Brin.
For high temperature high pressure steam piping; high tensile and creep strength.

CARBON BRONZE.
England; 15 Pb, 10 Sn, bal Cu.
Cast: 28,000 TS; 6 El.
For bearings; plastic bronze.

CARBON COLD HEADER.
M-73; 0.9 C, bal Fe.
For cold heading dies; water hardening.

CARBON COLD HEADER NO. V.
M-73; 0.93 C, 0.25 Mn, 0.10 Cr, bal Fe.
For cold forming dies; water hardening.

CARBON COLD HEADER WITH Mo.
M-73; 0.9 C, 0.25 Mn, 0.3 Mo, 1 max Cr, bal Fe.
For large cold header dies; water hardening.

CARBON COLD HEADER WITH V.
M-73; 0.9 C, 0.25 Mn, 0.2 V, 0.1 max Cr, bal Fe.
For cold header dies and hammers; water hardening.

CARBONDALE SILVER.
U.S.; 66 Cu, 18 Ni, 16 Zn.
Hard: 96,000 TS; 2 El; 158 Brin.
Soft: 58,000 TS; 33 El; 77 Brin.
For spinning and drawing, flatware, spoons, forks, knives, etc., to be plated; German silver.

CARBON DRILL ROD.
M-114; 1.2 C, bal Fe.
For tools; water hardened.

CARBON-MOLYBDENUM STEEL.
M-176; 0.18-0.28 C, 0.4-0.6 Mo, 0.5-0.9 Mn, bal Fe.
65,000-87,000 TS; 145 Brin.

CARBON MOLY STEEL.
M-139; 0.25-0.45 C, 0.8-1.1 Cr, 0.15-0.25 Mo, bal Fe.
Heat treated: 197-401 Brin.
For castings, gears, shafts; abrasion and wear resisting, heat treated.

CARBON SHOE DIE.
M-38; 0.75 C, bal Fe.
For shoe dies; water hardening.

CARBON STEEL.
M-373; 0.7-1.4 C, bal Fe.
For tools, drills, taps; water hardened.

CARBON VANADIUM.
M-604; 0.45-0.55 C, 0.65-0.95 Mn, 0.15 Min V, bal Fe.
Normalized: 90,000 TS; 60,000 YS; 20 El; 40 RA.
For locomotive forgings, connecting rods, piston rods, axles; high strength and shock resistant.

CARBON-VANADIUM DRILL ROD.
M-342, M-115; 1.0 C, 0.2 V, bal Fe.
For drill rod, punches; water hardening.

CARBON VANADIUM STEEL.
M-1409; 0.8-1.3 C, V, bal Fe.
For shear blades, punches, chisels, heading and swaging dies; water hardened; Type W2.

CARBORTAM.
M-109; 16-17 Ti, 2.5-3.0 Si, 6.5-7.5 C, 1.25-1.0 B, bal Fe.
For steel making conditions, adds deep hardening properties.

CARBO TOOL.
M-334; 1.0 C, bal Fe.
For tools, dies, drills, taps; water hardening.

CARBURITE.
U.S.; 47-48 C, 28 Fe, 0.3 S, 0.2 P.
For recarburizer in steel; for steel making.

CARB-X.
U.S.; C, bal Fe.
Used in manufacturing cast iron molds; ferro-alloy, exothermic.

CARDINAL RAPID.
M-459; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed cutters; high speed steel.

CARECO.
U.S.; Pb-Sn-Sb.
For bearings; white bearing alloy.

CARILLOY CARBON-MANGANESE.
M-604; C, 1.5-2.0 Mn, 0.15-0.30 Si, bal Fe.
Quenched and tempered: 100,000-120,000 TS; 75,000 Elastic Limit; 20 El; 50 RA.
For forgings; Class L over 2" to 7" A.S.T.M., A-18.

CARILLOY CARBON-MANGANESE.
M-604; C, 1.5-2.0 Mn, 0.15-0.30 Si, bal Fe.
Quenched and tempered: 100,000-120,000 TS; 75,000 Elastic Limit; 18 El; 45 RA.
For forgings; Class L over 7" to 10" A.S.T.M. A-18.

CARILLOY CARBON-MANGANESE.
M-604; 0.55 max C, 1.1-1.5 Mn, 0.05 max P, 0.05 max S, bal Fe.
Quenched and tempered: 105,000 TS; 70,000 YS; 22 El; 40 RA.
For forgings; water hardened.

CARILLOY CARBON-MANGANESE.
M-604; C, 1.4 min Mn, 0.04 max P, 0.05 max S, bal Fe.
85,000 TS; 48,000 YS; 16 El.
For chain links.

CARILLOY CARBON-MANGANESE.
M-604; C, 1.4 min Mn, 0.04 max P, 0.05 max S, bal Fe.
Quenched and tempered· 105,000 TS; 60,000 YS; 16 El.
For chain links.

CARILLOY CARBON-MANGANESE.
M-604; 0.35-0.50 C, 1.5-2.0 Mn, 0.05 max P, 0.055 max S, 0.15-0.30 Si, bal Fe.
100,000-125,000 TS; 200-250 Brin.
For abrasion resisting parts; add 0.2 min Cu for corrosion resisting properties.

CARILLOY CARBON-MANGANESE.
M-604; 0 35-0.50 C, 1.5-2.0 Mn, 0.05 max P, 0.055 max S, 0.15-0.30 Si, bal Fe.
Quenched and tempered: 150,000 TS; 321 Brin.
For abrasion resisting parts; add 0.2 min Cu for corrosion resisting properties.

CARILLOY CARBON-MANGANESE-COPPER
M-604; 0.20-0.35 C, 1.0-1.3 Mn, 0.4-0.5 Cu, bal Fe.
For still tubes; corrosion resisting properties.

CARILLOY CARBON-MOLYBENUM.
M-604; 0.25 max C, 0.04 max P, 0.04 max S, 0.5-0.6 Mo, bal Fe
Annealed: 60,000 TS; 30,000 YS; 20 El; 40 RA.
For gears, shafts, axles; tough.

CARILLOY CARBON-MOLYBDENUM.
M-604; 0 15-0 25 C, 0.30-0.60 Mn, 0.15-0.30 Si, 0.90-1.10 Mo, 0 05 max P, 0.05 max S, bal Fe
For turbine diaphragms; carburizing grade.

CARILLOY CARBON-MOLYBDENUM.
M-604, 0 20-0.25 C, 0 65-0.95 Mn, 0.04 max P, 0.04 max S, 0.20-0 35 Si, 0 2-0.3 Mo, bal Fe
78,950 TS, 53,340 YS, 21 El; 59 1 RA; 156 Brin.
For auto forgings; test on 1³⁄₁₆" rounds.

CARILLOY CARBON-MOLYBDENUM
M-604, 0 38-0 45 C, 0 65-0 95 Mn, 0.04 max P, 0 04 max S, 0 20-0 35 Si, 0 2-0.3 Mo, bal Fe.
110,050 TS; 77,430 YS; 13.2 El, 48 1 RA.
For auto forgings, test on ½" rounds.

CARILLOY CARBON-MOLYBDENUM
M-604; 0 5-0.6 C, 0 65-0.95 Mn, 0.04 max P, 0.04 max S, 0.20-0.35 Si, 0 02-0 3 Mo, bal Fe
For auto forgings; water hardened.

CARILLOY CARBON-MOLYBDENUM.
M-604; 0.6-0 7 C, 0.65-0 95 Mn, 0.04 max P, 0.04 max S, 0 20-0.35 Si, 0.15-0.30 Mo, bal Fe.
143,700 TS; 100,100 YS; 8.5 El, 33.3 RA.
For springs; test on 1¾ × #7.

CARILLOY CARBON-VANADIUM.
M-604, 0.40-0.55 C, 0 65-0 95 Mn, 0 15 Min Si, 0.25 max Ni, 0.15 max Cr, 0 15 min V, bal Fe.
Normalized and tempered· 90,000 TS; 60,000 YS; 24 El; 48 RA.
For gears, shafts, axles; Class B under 5" diameter AAR-M-104-34.

CARILLOY CARBON-VANADIUM.
M-604; 0.40-0.55 C, 0.65-0.95 Mn, 0.15 min Si, 0.25 max Ni, 0.15 max Cr, 0.15 min V, bal Fe.
Normalized and tempered: 90,000 TS; 60,000 YS; 22 El; 44 RA.
For gears, shafts, axles; Class B 5" to 9" diameter ABR-M-104-34.

CARILLOY CARBON-VANADIUM.
M-604; 0.40-0.55 C, 0.65-0.95 Mn, 0.15 min Si, 0.25 max Ni, 0.15 max Cr, 0 15 min V, bal Fe.
Normalized and tempered: 90,000 TS, 58,000 YS; 21 El; 42 RA.
For gears, shafts, axles; Class B 9" to 13" diameter AAR-M-104-34.

CARILLOY CARBON-VANADIUM.
M-604; 0.45-0.55 C, 0.4-0.6 Mn, 0.18 min V, bal Fe.
For gears, shafts; water hardened.

CARILLOY CARBON-VANADIUM.
M-604; 0.10-0 15 C, 0.30-0.60 Mn, 0.04 max P, 0.04 max S, 0.10 max Si, 0.15-0.25 V, bal Fe.
For carburized parts; cold rolling.

CARILLOY CARBON-VANADIUM.
M-604, 0.35-0.45 C, Mn, Si, 0.15 min V, bal Fe.
For forgings, gears, shafts; water hardened.

CARILLOY CARBON-VANADIUM.
M-604; 0.60-0.75 C, 0.4-0.7 Mn, 0 04 max P, 0.05 max S, 0.10 min Si, 0 02 min V, bal Fe.
For tools, punches; water hardened.

CARILLOY CHROMIUM-MANGANESE-SILICON.
M-604; 0.17 max C, 1.05-1.40 Mn, 0.035 max P, 0 04 max S, 0 6-0 9 Si, 0.3-0.6 Cr, bal Fe.
75,000-90,000 TS; 45,000-54,000 YS.
For boiler plate; firebox quality, A S M.E., S-28, Grade A.

CARILLOY CHROMIUM-MANGANESE-SILICON
M-604, 0.25 max C, 1.05-1.40 Mn, 0.035 max P, 0.04 max S, 0 6-0.9 Si, 0.3-0.6 Cr, bal Fe
85,000-100,000 TS; 46,750-55,000 YS.
For boiler plate; firebox quality; A S M E , S-28, Grade B.

CARILLOY CHROMIUM-MOLYBDENUM
M-604, 0 7-0.8 C, 0 5-0 8 Mn, 0.15-0 25 Si, 1.0-1 3 Cr, 0.4-0 6 Mo, bal Fe.
For forgings, springs, mandrels, tools; oil hardened.

CARILLOY CHROMIUM-VANADIUM
M-604, 0 68-0.80 C, 0 25-0 40 Mn, 0.15 min Si, 0 4-0.6 Cr, 0.15-0 20 V, bal Fe.
For springs; strip.

CARILLOY HIGH-CARBON LOW-CHROMIUM.
M-604; 1 0-1.15 C, 0.25-0 40 Mn, 0.025 max P, 0.025 max S, 0.15-0.30 Si, 0.10-0 20 Cr, bal Fe
For flat wire, cold rolled heat treated.

CARILLOY HIGH-CARBON LOW-CHROMIUM.
M-604; 1.2-1.4 C, 0 40 max Mn, 0.04 max P, 0 05 max S, 0.18-0 30 Si, 0 2-0 4 Cr, bal Fe.
For razor blades; cold rolled heat treated.

CARILLOY HIGH-CHROMIUM-MOLYBDENUM.
M-604; 0.15 max C, 0.5 max Mn, 0.03 max P, 0 03 max S, 0.50 max Si, 4-6 Cr, 0.45-0.65 Mo, 0 05 max Al, bal Fe.
Drawn· 167,410 TS; 107,770 YS; 11.5 El; 27.2 RA.
For still tubes, high temperature work.

CARILLOY HIGH CHROMIUM NICKEL.
M-604; 0.6-0.8 C, 0.2-0.4 Mn, 0.04 max P, 0.04 max S, 0.1-0.2 Si, 2.25-2.75 Ni, 4.0-4.75 Cr, bal Fe.
Annealed.
For shear blades; tough.

CARILLOY HIGH NICKEL.
M-604; C, 0.4-0.8 Mn, 0.04 max P, 0.05 max S, 3.0 min Ni, bal Fe.
Annealed (minimum): 80,000 TS; 50,000 YS; 22 El; 40 RA.
For forgings; Class H under 12" diameter A.S.T.M., A-18.

CARILLOY HIGH NICKEL.
M-604; C, 0.4-0.8 Mn, 0.04 max P, 0.05 max S, 3.0 min Ni, bal Fe.
Annealed (minimum): 80,000 TS; 50,000 YS; 21 El; 38 RA.
For forgings; A-18, Class H over 12" to 20" diameter A.S.T.M.

CARILLOY HIGH NICKEL.
M-604; C, 0.4-0.8 Mn, 0.04 max P, 0.05 max S, 3.0 min Ni, bal Fe.
Quenched and tempered: 100,000 TS; 70,000 YS; 20 El; 41 RA.
For forgings; Class I up to 4" diameter A.S.T.M., A-18.

CARILLOY HIGH NICKEL.
M-604; C, 0.4-0.8 Mn, 0.04 max P, 0.05 max S, 3.0 min Ni, bal Fe.
Quenched and tempered: 100,000 TS; 65,000 YS; 20 El, 41 RA.
For forgings; Class I over 4" to 7" diameter A.S.T.M., A-18.

CARILLOY HIGH NICKEL.
M-604; C, 0.4-0.8 Mn, 0.04 max P, 0.05 max S, 3.0 min Ni, bal Fe.
Quenched and tempered: 90,000 TS; 60,000 YS; 20 El; 41 RA.
For forgings; Class I over 7" to 10" diameter A.S.T.M., A-18.

CARILLOY HIGH NICKEL.
M-604; C, 0.4-0.8 Mn, 0.04 max P, 0.05 max S, 3.0 min Ni, bal Fe.
Quenched and tempered: 85,000 TS; 55,000 YS; 20 El; 41 RA.
For forgings; Class I not over 20" diameter A.S.T.M., A-18

CARILLOY LOW NICKEL CHROMIUM
M-604; C, Mn, 0.04 max P, 0.05 max S, 0.15-0.30 Si, 1.0-1.5 Ni, 0.45-0.75 Cr, bal Fe.
Quenched and tempered. 100,000-120,000 TS; 75,000 YS; 20 El, 50 RA.
For forgings; Class L over 2" to 7" diameter A.S.T.M., A-18.

CARILLOY LOW NICKEL CHROMIUM
M-604; C, Mn, 0.04 max P, 0.05 max S, 0.15-0.30 Si, 1.0-1.5 Ni, 0.45-0.75 Cr, bal Fe
Quenched and tempered: 100,000-120,000 TS; 75,000 YS; 18 El; 45 RA.
For forgings; Class L over 7" to 10" diameter A.S.T.M., A-18.

CARILLOY LOW NICKEL CHROMIUM.
M-604; 0.35-0.45 C, 0.5-0.8 Mn, 0.04 max P, 0.045 max S, 1.0-1.5 Ni, 0.45-0.75 Cr, bal Fe.
Normalized, quenched and tempered: 105,000 TS; 70,000 YS, 20 El; 50 RA.
For motor shafts; Grade A 2" and under in diameter, G.E. Co. B5-C9S1.

CARILLOY LOW NICKEL CHROMIUM.
M-604; 0.35-0.45 C, 0.5-0.8 Mn, 0.04 max P, 0.045 max S, 1.0-1.5 Ni, 0.45-0.75 Cr, bal Fe.
Normalized, quenched and tempered: 100,000 TS; 65,000 YS; 20 El; 50 RA.
For motor shafts; Grade A over 2" to 4" diameter, G.E. Co. B5C9S1.

CARILLOY LOW NICKEL CHROMIUM.
M-604; 0.35-0.45 C, 0.5-0.8 Mn, 0.04 max P, 0.045 max S, 1.0-1.5 Ni, 0.45-0.75 Cr, bal Fe.
Normalized, quenched and tempered: 95,000 TS; 60,000 YS; 20 El; 50 RA.
For motor shafts; Grade A over 4" to 7" diameter, G.E. Co. B5C9S1.

CARILLOY MANGANESE-MOLYBDENUM.
M-604; 0.40-0.48 C, 1.3-1.6 Mn, 0.04 max P, 0.05 max S, 0.25 max Si, 0.15 min Mo, bal Fe.
For seamless drill pipe; tough

CARILLOY MANGANESE-MOLYBDENUM.
M-604; 0.10-0.20 C, 0.90-1.20 Mn, 0.04 max P, 0.05 max S, 0.15-0.30 Si, 0.35-0.50 Mo, bal Fe.
77,300 TS; 55,820 YS; 21.7 El; 58.7 RA.
For structural parts; test on ¾" plate.

CARILLOY MANGANESE-MOLYBDENUM.
M-604; 0.10-0.20 C, 1.3-1.6 Mn, 0.04 max P, 0.05 max S, 0.30-0.50 Si, 0.35-0.50 Mo, bal Fe.
97,750 TS; 64,200 YS; 21.5 El; 38.6 RA.
For structural parts; test on ½" plate

CARILLOY MANGANESE-MOLYBDENUM.
M-604; 0.20-0.30 C, 0.8-1.1 Mn, 0.04 max P, 0.05 max S, 0.10-0.20 Si, 0.20-0.30 Mo, bal Fe.
84,840 TS, 49,550 YS, 21.5 El; 41.2 RA
For structural parts, test on 6 × 6 × 15/16" angle.

CARILLOY MANGANESE-MOLYBDENUM.
M-604; 0.23-0.30 C, 0.90-1.20 Mn, 0.04 max P, 0.04 max S, 0.15-0.30 Si, 0.45-0.75 Mo, bal Fe.
For seamless tube, good weldability.

CARILLOY MEDIUM NICKEL
M-504, 0.2-0.3 C, 0.65-0.95 Mn, 0.045 max P, 0.05 max S, 0.15-0.35 Si, 2.5-3.0 Ni, 0.15 max Cr, bal Fe
Normalized and tempered: 80,000 TS; 55,000 YS; 28 El, 60 RA.
For forgings; Class C under 8" diameter AAR-M-104-34

CARILLOY MEDIUM NICKEL.
M-604; 0.2-0.3 C, 0.65-0.95 Mn, 0.045 max P, 0.05 max S, 0.15-0.35 Si, 2.5-3.0 Ni, 0.15 max Cr, bal Fe
Normalized and tempered 80,000 TS, 55,000 YS; 28 El, 55 RA
For forgings; Class C 8" and over in diameter AAR-M-104-34.

CARILLOY NICKEL-CHROMIUM-MOLYBDENUM.
M-604, 0.35-0.45 C, 0.5-0.8 Mn, 0.35 max Si, 1.5-2.0 Ni, 0.5-0.8 Cr, 0.05 max V, 0.3-0.4 Mo, bal Fe
For forgings, gears, shafts; Modified Spec., G.E. Co. B5A14S3

CARILLOY NICKEL-CHROMIUM-MOLYBDENUM
M-604, 0.5-0.6 C, 0.5-0.8 Mn, 0.2-0.3 Si, 1.0-1.5 Ni, 0.5-0.8 Cr, 0.20 min Mo, bal Fe.
For shear blades, tough, oil hardened

CARILLOY NICKEL-CHROMIUM-MOLYBDENUM
M-604; 0.55-0.65 C, 0.6-0.8 Mn, 0.2-0.3 Si, 1.5-2.0 Ni, 0.8-1.1 Cr, 0.3-0.4 Mo, bal Fe.
Annealed: 202 241 Brin
For gears, axles, crankshafts; tough, oil hardened

CARILLOY NICKEL CHROMIUM-MOLYBDENUM-VANADIUM.
M-604; 0.40 max C, 0.75 max Mn, 0.30 max Si, 3.25 max Ni, 1.25 max Cr, 0.25 max V, 0.3-0.5 Mo, bal Fe.
Normalized and annealed: 90,000 TS; 15 El; 24 RA.

For turbine rotor; radial body tests; G.E. Co. B31A1S1.

CARILLOY NICKEL STEEL
M-604; 0.08-0.18 C, 0.3-0.6 Mn, 0.4 max P, 0.045 max S, 0.05 max Si, 0.2-0.5 Ni, bal Fe.
For seamless tubes; good weldability.

CARILLOY NICKEL-VANADIUM-MOLYBDENUM.
M-604; 0.3-0.4 C, 0.5-0.8 Mn, 0.3 max Si, 2.5-3.25 Ni, 0.15 min V, 0.3-0.5 Mo, bal Fe.
Normalized and annealed: 90,000 TS; 15 El; 24 RA.
For gears, shafts, axles, crankshafts; shock resistant.

CARILLOY STRUCTURAL MANGANESE.
M-604; 0.40 max C, 1.8 max Mn, 0.10-0.30 Si, bal Fe.
Rolled. 90,000 TS; 55,000 YS; 30 El.
For structural purposes.

CARILLOY STRUCTURAL MANGANESE.
M-604; 0.35 max C, 1.8 max Mn, 0.10-0.30 Si, bal Fe
Rolled: 82,000-100,000 TS; 47,000 YS, 30 El.
For rivets.

CARILLOY STRUCTURAL NICKEL.
M-604; 0.45 max C, 0.70 max Mn, 0.04 max P, 0.05 max S, 3.25 min Ni, bal Fe
85,000-100,000 TS; 50,000 YS; 25 RA.
For structural parts, add 0.2 min Cu for corrosion resisting properties.

CARILLOY STRUCTURAL NICKEL.
M-604; 0.45 max C, 0.70 max Mn, 0.04 max P, 0.05 max S, 3.25 min Ni, bal Fe.
Annealed: 90,000-105,000 TS; 52,000 YS, 20 El, 35 RA
For bridge pins; A.S.T.M., A-8.

CARILLOY STRUCTURAL NICKEL.
M-604; 0.30 max C, 0.60 max Mn, 0.03 max P, 0.045 max S, 3.25 min Ni, bal Fe.
70,000-80,000 TS, 45,000 YS; 40 El.
For rivets; A.S.T.M., A-8.

CARILLOY STRUCTURAL NICKEL.
M-604, 0.45 max C, 0.70 max Mn, 0.04 max P, 0.05 max S, 3.25 min Ni, bal Fe.
95,000-110,000 TS; 55,000 YS; 25 El
For eye bars, A.S.T.M., A-8.

CARILLOY STRUCTURAL STEEL.
M-604; 0.45 max C, 0.70 max Mn, 0.40 max P, 0.05 max S, 3.25 min Ni, bal Fe.
95,000-110,000 TS, 55,000 YS; 16 El; 25 RA.
For bridge rollers; A.S.T.M., A-8.

CARILLOY STRUCTURAL STEEL
M-604; 0.45 max C, 0.70 max Mn, 0.04 max P, 0.05 max S, 3.25 max Ni, bal Fe.
90,000-105,000 TS; 52,000 YS; 20 El; 35 RA.
For eye bars; A.S.T.M., A-8.

CARIRON.
M-718; 2.96 T.C., 0.75 Mn, 1.2 Si, 1.55 Ni, bal Fe.
50,600 TS; 221 Brin.
For liners, pistons; Tr.S 4160; Def. 0.207.

CARLOY.
M-1146; C, Mo, bal Fe.
For tools; water hardened.

CARLTON.
M-1705; 0.95 C, 2.0 Mn, 2.2 Cr, 1.1 Mo, bal Fe. (contains lead).
Free machining grade of air hardening tool steel. AISI A4.

CARMELIA BRONZE.
Pb, Zn, bal Cu.
For machinery bearings; heavy duty.

CARMET.
M-1; WC.
For tools; cemented carbides.

CARMET CA-1.
M-1; WC + Co.
For tipped tools; for steel.

CARMET CA-2.
M-1; WC + Co.
For tipped tools; for finishing cuts

CARMET CA-3.
M-1, WC + Co.
For tipped tools; for roughing cuts.

CARMET CA-3.
M-1696; Sintered carbide.
For rough cutting operations on cast iron, non-ferrous metals and non-metallics. For gages.

CARMET CA-4.
M-1; WC + Co.
For tipped tools, for soft metals.

CARMET CA-4.
M-1696; Sintered carbide.
Cutting tools for finish cutting cast iron, non-ferrous metals and non-metallics. Also for gages.

CARMET CA-5
M-1, WC + Co.
For cutting tool bits for slow speeds and heavy cuts on steel, sintered; TrS. 200,000

CARMET CA-6
M-1; WC + Co.
For cutting tool bits, steel precision boring; sintered, for light precision cuts, Tr.S. 150,000.

CARMET CA-7.
M-1; WC, Co
For cutting tool bits for hard cast iron; sintered, wear resistant, Tr.S 190,000.

CARMET CA-7.
M-1696. Sintered carbide
Cutting tools for finish cutting of non-ferrous metals and non-metallics

CARMET CA-8.
M-1; WC, Co.
For cutting tool bits for light precision cuts on cast iron; sintered, high resistance to wear, Tr.S. 190,000.

CARMET CA-8
M-1696, Sintered carbide
Cutting tools for finish cutting of non-ferrous metals and non-metallics.

CARMET CA-9.
M-1, WC, Co
For cutting tool bits for soft plastics, gauge blanks, sintered, Tr.S. 220,000.

CARMET CA-10.
M-1; WC, Co
For cutting tool bits, dies, sintered, for heavy cuts; Tr.S. 320,000

CARMET CA-10.
M-1696; Sintered carbide.
Cold work dies for blanking dies.

CARMET CA-11.
M-1, WC.
86 Ra.
For colder header dies; sintered, Tr.S. 350,000.

CARMET CA-11.
M-1696; Sintered carbide.
Cold header dies, cold work dies for blanking.

CARMET CA-12.
M-1; WC.
89 Ra.
For cold forming dies; sintered; Tr.S. 300,000.

CARMET CA-12.
M-1696; Sintered carbide.
For cold forming dies; rough machining non-ferrous metals.

CARMET CA-20.
M-1; WC.
84 Ra.
For cold header dies; sintered; Tr.S. 375,000.

CARMET CA-21.
M-1; WC.
86 Ra
For blanking and cold work dies; sintered, Tr.S 275,000.

CARMET C.A. 51.
M-1; WC.
90 Ra
For high speed planer tools, heavy cuts on steel; sintered; Tr.S. 225,000.

CARMET CA-51.
M-1696, Sintered carbide.
For cutting tools, heavy roughing cuts on cast iron and on steel.

CARMET CA-225.
M-1696, Sintered carbide.
For cold header dies.

CARMET CA-604
M-1; WC, TaC, TiC.
For cutting tools for high speed machines, sintered carbides.

CARMET CA-606.
M-1, WC.
For cutting tools, dies; sintered carbides.

CARMET CA-606.
M-1696; Sintered carbide.
For cutting tools for finish cutting of steel.

CARMET CA-608.
M-1; TiC.
For cutting tools, sintered carbides

CARMET CA-609.
M-1, WC.
For cutting tools, dies; sintered carbides.

CARMET CA-610
M-1; TiC.
For cutting tools; sintered carbides.

CARMET CA-610.
M-1696; Sintered carbide.
For cutting tools, for roughing and general purpose cutting of steel.

CARMET CA-704.
M-1696; Sintered carbide.
For cutting tools, precision finishing and boring on steel.

CARMET CA-711.
M-1696; Sintered carbide
For cutting tools, finish cutting of steel.

CARMET CA-720.
M-1696; Sintered carbide.
For cutting tools, for roughing and general purpose cutting of steel.

CARMET CA-740.
M-1696, Sintered carbide.
For cutting tools heavy roughing interrupted cuts.

CARMET CA-815.
M-1; WC.
For hot extrusion dies, precision gauges; sintered carbides.

CARMET CA-815.
M-1696; Sintered chromium carbide.
Used for gages.

CARNOLIA.
M-405; Pb-Sn-Sb.
For antifriction alloy for bearings; Babbitt.

CARO.
91.6 Cu, 8.5 Sn, 0.19 P.
For tubes; corrosion resistant.

CAROBRONZE
M-251, 91.2 Cu, 8.5 Sn, 0.3 P.
60,000-95,000 TS; 50-20 El; 90-190 Brin.
For solid cold drawn tubes, bushes for highly stressed bearings; resists corrosion.

CARO BRONZE
M-730; 91.2 Cu, 8.5 Sn, 0.3 P
Annealed: 63,000 TS; 60 El.
Hard 99,000 TS; 12 El.
For bearings and wearing parts; wrought

CAROGA
M-1; 0.50 C, 1.0 Cr, 0.70 Mn, 0.15 V, bal Fe.
Oil hardened
For tools, gears, springs, oil hardened.

CARPALOY NO. 2.
M-32; 0.30 C, 13 Cr, bal Fe.
Hardened 260,000 TS, 11 El; 32 RA, 512 Brin.
For tools, cutlery, scissors, check valves, surgical instruments; superseded by "Carpenter Stainless Steel No. 2."

CARPALOY NO 3
M-32, 0.19 C, 20.94 Cr, 0.17 Ni, 0.92 Cu, bal Fe.
87,000 TS, 40,000 YS; 23 El; 52 RA.
For heat and corrosion resisting parts; superseded by "Carpenter Stainless Steel No. 3."

CARPENTER NO. 1-JR
M-32; 0.15 max C, 12-14 Cr, 3.25-4.5 Al, bal Fe.
At 70°F: 86,000 TS; 25 El, 57 RA.
At 1400°F 13,500 TS, 77 El, 93 RA
For magnetic cores, resistors; corrosion and oxidation resistant.

CARPENTER NO. 5-317.
M-32, 0.50 C, 1.0 Cr, 1.75 Ni, bal Fe.
Annealed: 91,000 TS, 65,000 YS; 27 El; 64 RA; 187 Brin
Heat treated. 305,000-125,000 TS, 266,000-100,000 YS; 5.2-22 El, 16-60 RA; 495-240 Brin.
For gears, clutches, shafts, crankshafts, propellers; shock resisting.

CARPENTER NO. 11 SPECIAL.
M-32; 1.05 C, 0.20 Mn, 0.20 Si, bal Fe.
Water hardening tool steel for drills, taps, reamers, punches, blanking dies, bushings.
AISI W1.

CARPENTER 19-9DL.
M-32; 0.28-0.35 C, 18-21 Cr, 9-11 Ni, 1.5 Mo, 1.5 W, 0.5 Cb, 0.3 Ti, bal Fe.
Annealed: 102,000 TS; 42,000 YS; 53 El; 58 RA; 188 Brin.
Hot rolled. 114,000 TS; 68,000 YS; 35 El; 50 RA; 241 Brin.
For turbine blades, supercharger wheels, blades; austenitic, stainless.

CARPENTER 19-9DX.
M-32; 0.28-0.35 C, 18-21 Cr, 8-11 Ni, 1.7 Mo, 1.5 W, 0.5 Ti, bal Fe.
Annealed: 102,000 TS; 42,000 YS; 53 El; 188 Brin.
Hot rolled: 114,000 TS; 68,000 YS; 35 El; 241 Brin.
For turbine wheels, buckets, blades.
Austenitic, stainless, non-hardenable.

CARPENTER 21-12 VALVE STEEL.
M-32; 0.2 C, 1.25 Mn, 20.5 Cr, 11.5 Ni, 0.8 Si, bal Fe.
At 500°F: 80,000 TS; 45 El.
At 1500°F: 45,000 TS; 20 El.
For exhaust valves; austenitic, resists corrosion and oxidation.

CARPENTER 21-12N VALVE.
M-32; 0.2 C, 1.25 Mn, 21.0 Cr, 11.5 Ni, 0.8 Si, 0.15-0.25 N, bal Fe.
At R.T.: 123,500 TS; 75,000 YS; 42 El; 241 Brin.
At 1200°F. 73,000 TS; 34,000 YS; 32 El; 130 Brin.
For exhaust valves.
Austenitic, corrosion and heat resistant.

CARPENTER 21-55N.
M-32; 0.20 C, 5.0 Mn, 0.5 Si, 21.0 Cr, 4.5 Ni, 0.30 N, bal Fe.
Annealed: 127,000 TS; 69,000 YS; 41 El; 47 RA; 255 Brin.
At 1200°F: 70,000 TS; 38,000 YS; 36 El; 48 RA; 144 Brin.
For internal combustion valves.
Good high temperature strength
Austenitic, corrosion resistant.

CARPENTER 22-3.
M-32; 0.10 C, 0.50 Mn, 0.25 Si, 3.1 Cr, 22.0 Ni, bal Fe
Annealed: 70,000 TS; 40,000 YS; 35 El; B 74 Rock.
For applications requiring high thermal expansion, bimetals.
High thermal expansion, austenitic, non-magnetic.

CARPENTER NO. 37-7FM.
M-32; 37 Ni, bal Fe.
For instruments; low coefficient of expansion.

CARPENTER 80-20.
M-32; 0 15-0 30 C, 0.6-1 0 Mn, 1.0 max Fe, 0.3 Si, 19-21 Cr, bal Ni.
Annealed: 121,000 TS; 60,000 YS; 35 El; 50 RA; 205 Brin.
For aircraft valves, aircraft engine exhaust systems.
Resists corrosion of leaded gasoline exhausts.

CARPENTER NO. 158.
M-32; 0.10 C, 1.5 Cr, 3.7 Ni, bal Fe.
For high duty clash gears, shafts, clutch parts; case-hardening steel.

CARPENTER NO. 158 PLASTIC MOLD STEEL.
M-32; 0.10 C, 0.5 Mn, 0.3 Si, 1.5 Cr, 3.5 Ni, bal Fe.
Oil hardenable case hardening steel;
designed for molds and cavities requiring high case hardness and good care strength.
Also used for case hardened gears.
AISI P6; SAE 3312.

CARPENTER NO. 345 HOT WORK DIE STEEL.
M-32; 0.35 C, 0.30 Mn, 1.0 Si, 5.0 Cr, 1.25 W, 1.5 Mo, bal Fe.
Hot work tool steel; for aluminum extrusion dies, dummy blocks, forging dies, die casting dies.
AISI H12.

CARPENTER NO. 404.
M-32; 0.05 max C, 11-12 Cr, 1.25-2.00 Ni, 0.03 max N, 1.0 max Mn, 0.5 max Si, bal Fe.
Heat treated: 108,000-163,000 TS; 95,000-125,000 YS; 23-10 El; 70-40 RA; 180-350 Brin.
For steam turbine buckets, blades and bucket covers; for highly stressed parts at temperatures up to 1050°F.

CARPENTER NO. 408 PUNCH STEEL.
M-32; 0.50 C, 0.50 Mn, 0.25 Si, 0.75 Cr, 3.0 Ni, bal Fe.
Heat treated: 275,000 TS; 250,000 YS; 8 El; C 56 Rock.
For punches, clutch parts, vise jaws, chuck jaws, feeder rolls.
Tough, wear resistant.

CARPENTER 430F SOLENOID QUALITY.
M-32; 0.06 C, 0.50 Mn, 0.03 P, 0.30 S, 0.50 Si, 17.5 Cr, 0.30 Mo, bal Fe.
Corrosion resistant soft magnetic steel for solenoids.
Properties vary with annealing treatment.

CARPENTER NO. 481.
M-32; 0.55 C, 0.8 Mn, 1.9 Si, 0.25 C, 0.4 Mo, bal Fe.
Oil hardening shock resistant steel.
For pneumatic tools, chipping chisels, rivet sets, shear blades, collets.

CARPENTER NO. 484-FM.
M-32; 1.0 C, 0.8 Mn, 0.3 Si, 5.25 Cr, 1.1 Mo, 0.2 V, plus alloy sulfides, bal Fe.
Free machining air hardening tool steel;
for large blanking dies, thread roller dies, coining dies, gages. AISI A2.

CARPENTER NO. 610-FM.
M-32; 1.50 C, 0.5 Mn, 0.3 Si, 12.0 Cr, 0.8 Mo, 0.9 V, plus alloy sulphides, bal Fe.
Air hardening, high carbon, high chromium tool steel, free-machining grade;
for blanking and forming dies, drawing dies, edging rolls, extrusion dies. AISI D2.

CARPENTER 636 ALLOY (TYPE 422).
M-32; 0.20-0.25 C, 1.0 max Mn, 1.0 max Si, 12.0-14.0 Cr, 0.50-1.0 Ni, 0.75-1.25 Mo, 0 75-1.25 W, 0.2-0.5 V, bal Fe.
Air or oil hardenable corrosion resistant steel.
Hardened, tempered 1200°F, tested at:
Room temp. 149,000 TS; 125,000 YS.
1100°F: 76,000 TS; 72,000 YS.
For buckets and blades in steam turbines, high temperature bolting, compressor parts.
AISI 422.

CARPENTER 709 TYPE 2.
M-32; 0.45 C, 0.55 Mn, 0.25 Si, 1.0 Cr, 0.5 Mo, 0.3 V, bal Fe.
Heat treated: 142,000-260,000 TS, 130,000-230,000 YS; 20-10 El; 60-41 RA; 340-510 Brin.
For steam turbine valves, pressure vessels; operating temperature to 1200°F.

CARPENTER NO. 822.
M-32; 0.40 C, 0.35 Mn, 1.0 Si, 5.0 Cr, 0.4 V, 1.5 Mo, bal Fe.
Hot work tool steel; for forging dies, die casting dies, hot heading dies, aluminum extrusion dies.
AISI H 11.

CARPENTER NO. 883.
M-32; 0.37 C, 0.35 Mn, 1.0 Si, 5.25 Cr, 1.0 V, 1.3 Mo, bal Fe.
Chrome hot work tool steel, air or oil hardenable; for forging dies, die casting dies, extrusion dies.
AISI H 13.

CARPENTER 901.
M-32; 0.10 max C, 1.0 max Mn, 11-14 Cr, 40-45 Ni, 5-7 Mo, 2.35-3.10 Ti, 0.5 max Cu, 0.35 max Al, 0.010-0.020 B, bal Fe.
At 70°F: 175,000 TS; 125,000 YS; 15 El; 19 RA.
At 1000°F: 156,000 TS; 113,000 YS; 17 El; 29 RA.
At 1500°F: 81,000 TS; 79,000 YS; 13 El; 20 RA.
For aircraft, gas turbines, rotors, compressor discs, hubs, shafts; precipitation hardened, heat and corrosion resistant to 1400°F.

CARPENTER A-286.
M-32; 0.08 C, 13.5-16.0 Cr, 24-47 Ni, 1.5 Mo, 2 Ti, 0.3 V, 0.35 max Al, bal Fe.
At 800°F: 138,000 TS; 93,000 YS; 18 El; 35 RA.
At 1200°F: 103,500 TS; 88,000 YS; 13 El; 14 RA.
At 1500°F: 36,500 TS; 65 El; 37 RA
For turbine blades, jet engine components; age-hardened, for service to 1300°F.

CARPENTER AMS 5700
M-32; 0.45 C, 14 Cr, 14 Ni, 2.5 W, 0.50 max Mo, bal Fe.
Annealed: 110,000 TS; 48,000 YS, 40 El; 45 RA; 216 Brin.
At 1500°F. 37,000 TS; 25,000 YS; 55 El, 58 RA; 93 Brin.
For aircraft valves, valve seat inserts, steam turbine bolts; austenitic, high heat resistance,

CARPENTER BARTO.
M-32, 0.50 C, 0.5 Mn, 0.25 Si, 1.0 Cr, 1.75 Ni, bal Fe.
Oil hardenable alloy steel, for expander punches, feeder rolls, clutch parts, vise jaws and chuck jaws.

CARPENTER CHROME-NICKEL STAINLESS WITH BORON
M-32; 0.08 C, 2.0 Mn, 1.0 Si, 18.0-0-20.0 Cr, 12.0-15.0 Ni, 2.0 max B (3 ranges), bal Fe
Modified 304 stainless,—three boron ranges for thermal neutron absorption

CARPENTER CONSUMET M-50 BEARING STEEL
See CARPENTER CONSUMET M-50 HIGH SPEED STEEL

CARPENTER CONSUMET M-50 HIGH SPEED STEEL.
M-32, 0.80 C, 0.25 Mn, 0.25 Si, 4.0 Cr, 0.10 Ni, 1.0 V, 4.5 Mo, bal Fe.
High speed steel; used largely for bearings in aircraft and gas turbine engines operating at temperatures up to 800°F
AISI M-50.

CARPENTER CORE IRON
M-32, 0.06 max C, 0.20 max Mn, 0.25 max Si, 0.1 max V, bal Fe.
For solenoid switches, armatures, high magnetic permeability

CARPENTER CUSTOM 450
M-32; 0.05 max C, 0.5 max Mn, 0.5 max Si, 14.5-16.5 Cr, 5.5-7.0 Ni, 0.5-1.0 Mo, 1.25-1.75 Cu, Cb = 8 × C min, bal Fe.
Martensitic age hardenable stainless steel
Annealed: 144,000 TS; 117,000 YS; 14 El.
Hardened: 196,000 TS, 184,000 YS; 14 El.

CARPENTER CUSTOM 455.
M-32, 0.03 C, 0.25 Mn, 0.25 Si, 11.75 Cr, 8.5 Ni, 1.2 Ti, 0.3 Cb, 2.25 Cu, bal Fe.
Martensitic, age hardenable, stainless steel.
Annealed: 140,000 TS; 115,000 YS, 12 El.
Hardened: 190,000-300,000 TS, 175,000-235,000 YS, 3-15 El; 40-50 Rock C
Properties vary depending on treatment
Good properties up to 800°F; for bolts, fasteners, valves

CARPENTER CUSTOM 630 (17 Cr-4 Ni).
M-32; 0.07 C, 15.5-17.5 Cr, 3.0-5.0 Ni, 3.0-5.0 Cu, 0.15-0.45 Cb + Ta, 1.0 max Mn, 1.0 max Si, bal Fe.
Martensitic, precipitation/age hardening stainless steel.
Aged: 125,000-200,000 TS, 85,000-185,000 YS; (depending on aging treatment).
For oil field valve parts, aircraft fittings, paper mill equipment, jet engine parts. AISI 630.

CARPENTER C-XB VALVE STEEL.
M-32; 0.80 C, 0.4 Mn, 2.25 Si, 20.0 Cr, 1.5 Ni, bal Fe.
Hardenable silicon-chrome alloy
At 1200°F: 39,500 TS; 29,500 YS; 33.5 El.
For exhaust valves, valve seat inserts, intake valves in internal combustion engines.

COLUMBIA EXTRA.
M-35; 0.7-1.2 C, 0.25 Si, 0.25 Mn, bal Fe.
For cold chisels, shear blades, punches, drills; Type W1, water hardened.

CARPENTER FOUR STAR.
M-32, 1.30 C, 0.3 Mn, 0.3 Si, 4.5 Cr, 4.5 Mo, 5.5 W, 4.0 V, bal Fe.
High carbon, high speed steel for extra wear resistance. for reamers, drills, lathe tools, thread chasers, broaches. AISI M4.

CARPENTER FREE CUT INVAR 36
M-32; 0.12 max C, 0.35 Mn, 36 Ni + Co, 0.20 Se, bal Fe
For low expansion alloy; free-cutting.

CARPENTER GLASS SEALING "27"
M-32, 0.15 max C, 28 Cr, bal Fe
Annealed 85,000 TS, 55,000 YS, 25 El, 185 Brin
For glass sealing, metal to glass

CARPENTER GLASS SEALING 42
M-32, 0.10 max C, 0.50 Mn, 0.25 Si, 41.5 Ni, bal Fe
Cold drawn: 120,000 TS, 3 El; 240 Brin.
Annealed: 82,000 TS, 30 El, 140 Brin
For glass to metal seals, for hard and soft glass.

CARPENTER GLASS SEALING "42-6."
M-32; 0.10 max C, 0.50 Mn, 0.25 Si, 42.5 Ni, 5.75 Cr, bal Fe
Strip and wire with thermal expansion matching characteristics of 0120 glass, for sealing into glass.

CARPENTER GLASS SEALING "45-6"
M-32, 0.10 max C, 0.3 Mn, 0.3 Si, 45 Ni, 6 Cr, bal Fe
Annealed 80,000 TS, 40,000 YS, 30 El, B 80 Rock.
For metal to glass sealing (0120 and 9010 glass).
Controlled coef expansion.
Vacuum melted, low gas content

CARPENTER GLASS SEALING 46.
M-32; 46 Ni, bal Fe
For metal to glass seals; controlled expansion.

CARPENTER GLASS SEALING 52.
M-32, 0.10 max C, 0.50 Mn, 0.25 Si, 51 Ni, bal Fe.
Annealed: 80,000 TS, 40,000 YS; 35 El; Rockwell B 83
For glass to metal seals; for soft glass and ceramics.

CARPENTER GLASS SEALING "52" PHOTO-ETCH QUALITY.
M-32; 0.10 max C, 0.50 Mn, 0.25 Si, 50.50 Ni, bal Fe.
Strip designed to produce sharp, square edges in photo-etching and to match expansion of soft glasses and some ceramics.

CARPENTER H-9 DOUBLE HEADER DIE STEEL.
M-32; 0.90 C, 0.4 Mn, 0.4 Si, bal Fe.
Water hardening tool steel; for solid and gripper cold heading dies, inserts, coining dies, knurls.
AISI W1.

CARPENTER H-46.
M-32; 0.15-0.20 C, 10-14 Cr, 0.3-0.6 Ni, 0.5-0.8 Mo, 0.2-0.4 V, 0.2-0.6 Cb, 0.06-0.10 N, bal Fe.
At 70°F: 151,000 TS; 124,000 YS; 20 El; 56 RA; 302 Brin.
At 1200°F: 60,500 TS; 56,200 YS; 30 El; 76 RA.
For jet aircraft engine compressor blades and rotor discs; good strength and ductility to 1200°F.

CARPENTER HIGH PERMEABILITY "49"
M-32, 0.05 C, 0.05 Mn, 0.35 Si, 48.0 Ni, bal Fe.
Annealed: 70,000 TS; 22,000 YS, 45 El
Flux density· 15,000 gausses; low hysteresis loss.
Available in 3 grades; for magnet cores, solenoids, laminations, transformers.

CARPENTER HY MU "80."
M-32; 0.03 C, 0.50 Mn, 0.35 Si, 80.0 Ni, 4.0 Mo, bal Fe.
Unoriented alloy with high initial permeability and maximum permeability with minimum hysteresis loss
For transformer cores, tape wound toroids, and laminations.

CARPENTER HY MU "800" PHOTO CHEM QUALITY.
M-32, 0.01 C, 0.50 Mn, 0.15 Si, 80.0 Ni, 5.0 Mo, bal Fe
Vacuum melted soft magnetic sheet for use with photochemical techniques for lamination or toroids.
Minimum permeability of 60,000 at 40 gauss

CARPENTER HY-RA80
M-32, 0.05 C, 0.5 Mn, 0.15 Si, 79 Ni, 4 Mo, bal Fe
For electrical equipment, electronic devices; square hysteresis loop properties, high permeability

CARPENTER HY-SAT 48 FM
M-32, 0.04 C, 0.80 Mn, 0.40 Si, 49.0 Co, 1.9 V, 0.20 Se, bal Fe
Ann. Bm· 22,000 gausses.
Br· 15,000 gausses.
Hc. 5.00 Oersteds
μ max· 1700.
For sonar applications, ultrasonic transducers

CARPENTER INVAR 36
M-32, 0.12 max C, 0.35 Mn, 36 Ni + Co, bal Fe.
Rolled. 90,000 TS, 70,000 YS; 20 El; 60 RA, B 90 Brin.
For precision instruments, radio parts, bi-metal; low coefficient of expansion.

CARPENTER INVAROD
M-32; 0.10 max C, 2.50 Mn, 0.20 max Si, 36.0 Ni, 0.75 Ti, bal Fe
Welding alloy for joining Invar "36" to itself or other metals without preheating or postheating

CARPENTER KW.
M-32; 1.3 C, 3.5 W, 0.3 Si, 0.3 Mn, bal Fe
For draw dies, punches, mandrels, gauges; water hardened.

CARPENTER LAPELLOY.
M-32; 0.25-0.35 C, 0.95-1.25 Mn, 0.50 max Si, 11.0-12.0 Cr, 0.50 max Ni, 2.5-3.0 Mo, 0.2-0.3 V, bal Fe.
Air or oil hardenable corrosion resistant steel.
Hardened; tested 1200°F: 60,000 TS; 50,000 YS.
For steam turbine buckets and blades, compressor blades, valve stems.

CARPENTER LAPELLOY "C."
M-32; 0.20-0.25 C, 0.65-1.00 Mn, 11-12 Cr, 0.50 max Ni, 2.50-3.00 Mo, 1.75-2.25 Cu, 0.06-0.10 N, bal Fe.
Heat treated: 135,000-203,000 TS; 105,000-170,000 YS; 17-18 El; 47-55 RA.
For compressor wheels, turbine shafts, compressor buckets, blades, bolts; for high stressed parts operating to 1200°F.

CARPENTER LOW EXPANSION 39.
M-32, 39 Ni, bal Fe.
For instruments; low expansion alloy.

CARPENTER LOW EXPANSION 42.
M-32, 42 Ni, bal Fe.
Annealed. 82,000 TS, 30 El; 140 Brin.
Cold drawn. 120,000 TS, 3 El; 240 Brin.
For low expansion and high temperature applications; coefficient of expansion 3×10^{-6}/°F at 70-650°F.

CARPENTER LOW EXPANSION 42Cb.
M-32, 42 Ni, Cb, bal Fe.
For instruments, low expansion alloy.

CARPENTER M-252
M-32, 0.10-0.20 C, 18-20 Cr, 9-10.5 Mo, 9-11 Co, 0.75-1.25 Al, 2.25-2.75 Ti, 0.02-0.15 Zr, 0.001-0.01 B, 5 max Fe, bal Ni
Heat treated· 175,000 TS, 110,000 YS, 25 El.
At 1500°F 91,000 TS, 84,000 YS; 24 El.
For jet engine and gas turbine buckets
Resists heat to 1600°F Precipitation hardening

CARPENTER MANIFLEX
M-32, 0.20 C, 1.25 Mn, 0.80 Si, 0.20 S, 21.0 Cr, 11.5 Ni, bal Fe
Free machining austenitic stainless for corrosion resistance and high temperature operation.
For shafts, bushings in manifold exhaust heat control valves in automotive engines

CARPENTER MEL-TROL AMS 5616
M-32; 0.15-0.20 C, 0.50 Mn, 0.50 Si, 12.0-14.0 Cr, 1.8-2.2 Ni, 0.50 max Mo, 2.5-3.5 W, bal Fe.
Air or oil hardenable corrosion resistant steel
Max heat treated strength· about 217,000 TS
Tested 1100°F· 135,000 TS, 120,000 YS, 18 El.
For steam turbine buckets and blades, gas turbine parts, high temperature bolts
AMS 5616, Greek Ascoloy

CARPENTER MEL-TROL HAMPDEN
M-32, 2.1 C, 0.35 Mn, 0.3 Si, 12.0 Cr, 0.5 Ni, bal Fe
Oil hardening high carbon, high chromium die steel with extra wear resistance; for slitting cutters, lamination dies, cold rolls, blanking and forming dies.
AISI D3

CARPENTER MEL-TROL HI SHOCK 60
M-32, 0.68 C, 0.5 Mn, 0.3 Si, 1.0 Cr, 0.5 Ni, 1.0 Mo, 2.5 Cu, 0.15 V, bal Fe.
Air or oil hardening tool steel, for large blanking and forming dies, trimming dies, shear blades, mandrels, forming tools.

CARPENTER MEL-TROL K-W.
M-32; 1.3 C, 0.3 Mn, 0.3 Si, 3.5 W, bal Fe.
Water hardening tool steel with extra wear and abrasion resistance; for burnishing tools, tube drawing dies, wire drawing dies, reamers.
AISI F2.

CARPENTER MEL-TROL MIRROMOLD.
M-32; 0.10 C, 0.20 Mn, 0.10 V, bal Fe.
Low carbon steel for easy cold hubbing and subsequent case hardening for plastic molds.
AISI P1.

CARPENTER MEL-TROL O-1.
M-32; 0.90 C, 1.2 Mn, 0.5 Cr, 0.5 W, 0.2 V, bal Fe.
Oil hardening tool steel; for blanking and forming dies, broaches, collets, thread gages, spindles.
AISI O1.

CARPENTER MEL-TROL SPEED STAR.
M-32; 0.82 C, 0.3 Mn, 0.25 Si, 4.25 Cr, 5.0 Mo, 6.25 W, 1.8 V, bal Fe.
High speed steel; for roughing tools as lathe tools, milling cutters, end mills, form tools, drills and reamers. AISI M2.

CARPENTER MEL-TROL STAR-ZENITH.
M-32; 0.72 C, 0.25 Mn, 0.20 Si, 4.0 Cr, 18.25 W, 1.15 V, bal Fe.
Tungsten high speed steel; for lathe and planer tools, form cutters, milling cutters, broaches, thread chasers, taps. AISI T1.

CARPENTER MEL-TROL SUPER SAMSON.
M-32; 0.10 C, 0.3 Mn, 0.2 Si, 5.0 Cr, 0.9 Mo, 0.25 V, bal Fe.
Low carbon, chromium air hardening steel to be case hardened for plastic molds or for die casting dies. AISI P4.

CARPENTER MEL-TROL TGS.
M-32; 0 20 C, 1.30 Mn, 0.20 Si, bal Fe.
Oil hardening carburizing grade steel.
For case hardened gears, guides, cams.

CARPENTER MEL-TROL VEGA MOLD STEEL.
M-32; 0.7 C, 0.3 Si, 2 0 Mn, 1.0 Cr, 1.35 Mo, bal Fe.
Air hardening die steel; for plastic molds that are molding clear plastics, tiles, etc. also for knife edges and load cells. AISI A6.

CARPENTER MOLY ASCOLOY
M-32; 0.08-0.15 C, 0 50-0.90 Mn, 0.35 max Si, 11.0-12.5 Cr, 2.0-3.0 Ni, 1.5-2.0 Mo, 0.25-0.40 V, bal Fe.
Martensitic, air or oil hardenable, corrosion resistant steel; hardenable to 44-48 Rock C.
Hardened; tested at 1200°F. 146,000 TS; 97,000 YS, 18 El.
For high temperature bolts, compressor parts in gas turbines, steam turbine buckets and blades

CARPENTER N-155
M-32, 0.08-0 16 C, 1.0-2.0 Mn, 1 0 max Si, 20.0-22.5 Cr, 19 0-21 0 Ni, 18.5-21.0 Co, 2.5-3 5 Mo, 2 0-3 0 W, 0.75-1 25 Cb + Ta, 0.50 max Cu, 0 10-0.20 N, bal Fe
Hardened. Room T : 118,000 TS; 59,000 YS; 40 El
1800°F: 19,000 TS.
For aircraft tail cones and tail pipes, exhaust manifolds, combustion chambers, afterburners

CARPENTER NIMARK I.
M-32; 0.03 max C, 18 0-19.0 Ni, 7.0-8.0 Co, 4.7-5.0 Mo, 0 3-0.5 Ti, 0.05-0 15 Al, 0 03 max Zr, 0 003 max B, 0.05 max Ca, bal Fe.
Maraging type alloy; as hardened: 255,000 TS; 250,000 YS; 12 El; 49 Rock C.
Weldable; for high strength parts and assemblies.

CARPENTER NIMARK II.
M-32; 0.03 max C, 19.5-20.5 Ni, 1.2-1.6 Ti, 0.15-0.35 Al, 0.4-0 6 Cb, 0.05 max Zr, 0.003 max B, 0.05 max Ca, bal Fe.
Maraging type alloy; as hardened: 265,000 TS; 255,000 YS; 12 El; 51 Rock C.
Weldable; for high strength parts and assemblies.

CARPENTER NIMARK 300.
M-32; 0.03 max C, 18.0-19.0 Ni, 4.7-5.1 Mo, 8.0-9.5 Co, 0.50-0.80 Ti, 0.05-0.15 Al, 0.03 max Zr, 0.005 max B, 0.05 max Ca, bal Fe.
Maraging type alloy; as hardened: 294,000 TS; 290,000 YS; 11 El; 52 Rock C.
Weldable; for high strength parts and assemblies.

CARPENTER PYROMET 80A.
M-32; 0.06 C, 20 Cr, 0 007 S, 2.35 Ti, 1.25 Al, 0.05 Cu, 1 0 Co, bal Ni.
Age Hardened: 145,000 TS; 90,000 YS; 39 El.
At 1200°F: 115,000 TS; 80,000 YS; 21 El.
For high temperature applications.
Heat treatable. High creep and fatigue resistance.
Oxidation and corrosion resistance.

CARPENTER PYROMET 88.
M-32; 0 03 C, 2.2 Mn, 16 4 Cr, 6.7 Fe, 3.05 Ti, bal Ni.
High strength, high temperature nickel base alloy, age hardenable; useful to 1500°F; good corrosion resistance.

CARPENTER PYROMET 90.
M-32; 0.07 C, 19.5 Cr, 18 0 Co, 2.4 Ti, 1.4 Al, bal Ni.
Age hardenable nickel base alloy.
Room Temp 179,000 TS; 117,000 YS; 33 El.
1600°F: 48,000 TS, 38,000 YS.
For high temperature applications; good resistance to scaling and corrosion

CARPENTER PYROMET 102
M-32, 0 10 max C, 14 0-16 0 Cr, 2.75-3 75 Nb, 2.75-3 75 Mo, 2.75-3 75 W, 5.0-9 0 Fe, 0 30-0 70 Al, 0 40-0 70 Ti, 0.003-0 008 B, bal Ni.
Non-magnetic, Ni-Cr base alloy; corrosion resistant and high temperature strength
80°F: 137,000-149,000 TS; 72,000-85,000 YS; 41-47 El
1500°F. 48,000-52,000 TS; 45,000-51,000 YS, 88-112 El.
For heat shields, piping for steam and gas turbine and rocket engines, furnace hardware.

CARPENTER PYROMET 355
M-32; 0.10-0 15 C, 0.50-1.25 Mn, 0.5 max Si, 15 0-16 0 Cr, 4.0-5.0 Ni, 2 5-3.25 Mo, 0 07-0.13 N, bal Fe
Precipitation hardenable stainless steel; wide range of mechanical properties after various heat treatments;—to 235,000 TS max; weldable, machinable in solution treated condition.
AISI 634.

CARPENTER PYROMET 538
M-32; 0 03 C, 8.0-10 0 Mn, 1.0 max Si, 18.0-21 5 Cr, 5.5-7 5 Ni, 0.15-0 40 N, bal Fe.
Strengthened austenitic stainless.
Room T 112,000 TS, 65,000 YS; 42 El.
1000°F. 71,000 TS, 29,000 YS; 35 El.
For steam and autoclave parts, airframe and aircraft engine, chemical processing equipment.

CARPENTER PYROMET 600.
M-32; 0.10 max C, 1 0 max Mn, 0.50 max Si, 14 0-17.0 Cr, 72 0 Ni, 0.50 max Cu, 6 0-10.0 Fe.
Non-magnetic nickel base alloy, corrosion resistant and temperature resistant.
1000°F: 84,000 TS; 28,500 YS; 47 El.
1600°F: 15,000 TS; 9,000 YS, 80 El.
AMS 5665, 5540, 5580.

CARPENTER PYROMET 625.
M-32; 0.10 max C, 20.0-23.0 Cr, 8.0-10 0 Mo, 5.0 max Fe, 0.40 max Ti, 1.0 max Co, 3.15-4.15 Cb + Ta, 0.40 max Al, bal Ni.

Non-magnetic, corrosion resistant and
high temperature alloy.
400°F: 116,000 TS; 43,000 YS; 57 El.
1800°F: 18,000 TS; 16,000 YS; 120 El.
For heat shields, furnace hardware, gas turbine
engine ducting, chemical plant hardware.
AMS 5666; 5599.

CARPENTER PYROMET 680.
M-32, 0.05-0.15 C, 20.5-23.0 Cr, 0.5-2.5 Co,
8.0-10.0 Mo, 0.2-1.0 W, 17.0-20.0 Fe, bal Ni.
Non-magnetic heat and corrosion resistant nickel
base alloy.
Room T.: 104,000 TS; 49,000 YS; 40 El.
1000°F: 94,000 TS; 41,500 YS, 45 El
1800°F: 21,000 TS; 17,000 YS; 43 El.
For gas turbine rotors, afterburner parts, hardware
for furnaces and chemical.
AMS 5536 etc (Reference Hastelloy X).

CARPENTER PYROMET 718.
M-32; 0.10 max C, 17.0-21.0 Cr, 50.0-55.0 Ni + Co,
1.0 max Co, 2.8-3.3 Mo, 4.75-5.50 Cb + Ta,
0.65-1.15 Ti, 0.35-0.85 Al, 0.001-0.006 B,
0.15 max Cu, bal Fe.
Precipitation hardenable nickel base alloy
Hardened, Room T. 210,000 TS; 175,000 YS; 22 El.
1400°F 110,000 TS, 110,000 YS, 27 El.
For jet engine parts as buckets, spacers, wheels,
high temperature fasteners.

CARPENTER PYROMET 800 PIPE & TUBING.
M-32; 0.10 C, 1.5 Mn, 1.0 Si, 19.0-23.0 Cr,
30.0-35.0 Ni, 0.15-0.60 Al, 0.15-0.60 Ti,
0.75 max Cu, bal Fe.
Non-magnetic Ni-Cr-Fe Alloy.
At 1000°F 72,000 TS, 31,700 YS; 38.5 El
At 1500°F 24,800 TS, 14,200 YS; 91 El.
Weldable, corrosion resistant, for
high temperature piping

CARPENTER PYROMET 860
M-32, 0.10 max C, 1.0 max Mn, 1.0 max Si,
12.0-16.0 Cr, 40.0-45.0 Ni, 5.0-7.0 Mo, 3.5-4.5 Co,
2.75-3.75 Ti, 0.75-1.50 Al, 0.008-0.012 B, bal Fe.
Austenitic Fe-Ni base precipitation hardening alloy.
Hardened Room T. 180,000 TS; 115,000 YS,
21 El.
1200°F: 159,000 TS, 125,000 YS; 19 El
1500°F: 106,000 TS; 103,000 YS, 16 El
For corrosion and scale resisting parts at high
temperatures; turbine engine parts, steam
turbine bolting.

CARPENTER PYROMET 882
M-32, 0.40 C, 1.0 Si, 5.0 Cr, 1.5 Mo, 0.40 V, bal Fe
Air hardened, tempered 1000°F (double).
At 500°F: 260,000 TS, 220,000 YS.
At 1000°F 215,000 TS, 182,000 YS
For forging dies, aluminum extrusion dies,
hot piercing and forming punches.
AISI 610, (Similar to AISI H 11)

CARPENTER PYROMET X-15.
M-32; 0.03 max C, 15.0 Cr, 20.0 Co, 2.9 Mo,
0.20 max Ni, bal Fe
Precipitation hardenable martensitic alloy.
Hardened: Room T.: 235,000 TS; 215,000 YS;
17 El.
1000°F: 190,000 TS, 170,000 YS, 18 El.
For highly stressed parts operating at temperatures
up to 1050°F.

CARPENTER PYROMET X-750
M-32; 0.08 max C, 14.0-17.0 Cr, 70.0 min Ni + Co,
1.0 max Co, 2.25-2.70 Ti, 0.4-1.0 Al,
0.70-1.20 Cb + Ta, 0.5 max Cu, 5.0-9.0 Fe.
Precipitation hardenable nickel base alloy.
Room T.: 161,000 TS; 92,000 YS; 22 El.
1400°F: 80,000 TS; 68,000 YS; 10 El.
For high temperature springs, parts for gas turbine,
jet engines, extrusion dies.
AISI 688; AMS 5667, 5668; (Reference:
Inconel X).

CARPENTER PYROMET X-751.
M-32, 0.04 C, 15.0 Cr, 1.0 Cb, 6.75 Fe, 2.5 Ti,
1.2 Al, 0.05 Cu, bal Ni
Age hardenable, high strength, high
temperature alloy
Hardened: 175,000 TS; 110,000 YS; 20 El.
For high temperature applications; good resistance to
corrosion and to scaling.

CARPENTER PYROTOOL 7.
M-32; 0.05 C, 19.0 Cr, 52.5 Ni + Co, 3.0 Mo,
5.25 Cb + Ta, 1.0 Ti, 0.6 Al, bal Fe.
Austenitic precipitation hardenable nickel base alloy
for high strength up to 1300°F.
Hardened, at 1300°F: 120,000 TS; 115,000 YS
For high temperature tooling, extrusion dies,
forging dies, rams, liners.

CARPENTER PYROTOOL 15
M-32; 0.03 C, 15.0 Cr, 20.0 Co, 2.9 Mo, 0.20 Ni,
bal Fe.
Low carbon martensitic alloy having good strength
up to 1050°F. Solution treatable.
Hardened; at 1100°F 145,000 TS; 125,000 YS
For arbors, cams, collets, dies, fixtures.

CARPENTER PYROTOOL A.
M-32; 0.04 C, 1.2 Mn, 0.5 Si, 14.5 Cr, 25.0 Ni,
1.5 Mo, 2.2 Ti, bal Fe.
Austenitic precipitation hardening iron base alloy.
Hardened: Room T 155,000 TS, 100,000 YS
At 1500°F 36,000 TS; 33,000 YS.
For extrusion dies, liners, forging dies

CARPENTER PYROTOOL EX.
M-32; 0.05 C, 0.2 Mn, 0.2 Si, 14.0 Cr, 42.5 Ni,
6.0 Mo, 4.0 Co, 3.0 Ti, 1.2 Al, bal Fe.
Austenitic precipitation hardenable nickel base alloy
for high strength in 1000-1500°F range.
Hardened at 1500°F 106,000 TS, 103,000 YS.
For high temperature tooling, extrusion dies,
forging dies, rams, liners

CARPENTER PYROTOOL M
M-32; 0.12 C, 0.2 Mn, 0.2 Si, 19.0 Cr, 10.0 Mo,
10.0 Co, 1.0 Al, 2.5 Ti, 2.0 Fe, bal Ni.
Austenitic precipitation hardenable nickel base alloy
for operation up to 1500°F
Hardened; at 1500; 91,000 TS, 84,000 YS.
For high temperature tooling, extrusion dies,
forging dies, mandrels, dummy blocks.

CARPENTER PYROTOOL V
M-32, 0.04 C, 0.25 Mn, 0.25 Si, 14.5 Cr, 27.0 Ni,
1.25 Mo, 3.0 Ti, 0.2 V, bal Fe
Austenitic precipitation hardenable iron base alloy
Hardened; at 1500°F. 60,000 TS; 49,000 YS.
For high temperature tooling, liners, extrusion
dies, forging dies, dummy blocks.

CARPENTER PYROTOOL W.
M-32, 0.05 C, 0.2 Mn, 0.2 Si, 19.5 Cr, 4.25 Mo,
13.0 Co, 3.10 Ti, 1.20 Al, 1.0 Fe, bal Ni.
Austenitic hardenable nickel base alloy, high strength
and hardness up to 1500°F
Hardened; at 1600°F. 76,000 TS, 75,000 YS
For high temperature tooling, extrusion
dies, forging dies.

CARPENTER R.D.S.
M-32; 0.70 C, 0.35 Mn, 0.25 Si, 1.0 Cr, 1.75 Ni,
bal Fe.
Oil hardening tool steel with extra toughness;
for collets, thread rolling dies, punches,
knuckle pins, slitting shears. AISI L 6.

CARPENTER SAMSON EXTRA PLASTIC MOLD STEEL.
M-32; 0.08 C, 0.40 Mn, 0.30 Si, 2.3 Cr, bal Fe.
Low carbon steel for easy cold hubbing and subsequent case hardening for plastic molds. AISI P5.

CARPENTER SEAT RING DIE STEEL.
M-32; 0.65 C, 3.0 Cr, 3.0 Mo, 1.0 V, 3.5 W, bal Fe.
Oil or air hardenable modified high speed tool steel; designed for hot forming of automotive valves; good wear resistance at elevated temperatures.

CARPENTER SIL. NO. 1.
M-32; 0.45 C, 0.50 Mn, 3.25 Si, 8.5 Cr, bal Fe.
At 77°F: 133,000 TS; 82,500 YS; 22.5 El; 49.0 RA; 269 Brin.
At 1000°F: 67,500 TS; 53,000 YS; 40.5 El; 71.0 RA; 125 Brin.
For intake valves, exhaust valve stems; hardenable, heat resistant.

CARPENTER SILICON CORE IRON A.
M-32; 0.05 C, 0.15 Mn, 1.0 Si, bal Fe.
Saturation B.) 21,000; Res. Ind. (Br) 6500; Hc 0.90; Max permeability 4500.
For motor armatures, pole pieces, solenoid switches, relays.

CARPENTER SILICON CORE IRON "A-FM."
M-32; 0.05 max C, 0.15 max Mn, 1.0 max Si, 0.18 P, bal Fe
Free machining silicon core iron.
DC U max 4500 at H = 1.36 Oersted.
Hc from 10,000 gausses 0.70/0.80 Oersted.
Br from 10,000 gausses 6000 gausses.
Saturation at H = 200 21,000 gausses.
For machined magnet cores.

CARPENTER SILICON CORE IRON "B."
M-32, 0.05 C, 0.15 Mn, 2.50 Si, bal Fe
Saturation (Bs)-Gausses 20,600.
Residual Induction (Br) from 10,000 Gausses: 6,000
Coercive Force (Hc) from 10,000 Gausses: 0.70
Max Permeability: 7000.
For solenoid switches, armatures, pole pieces

CARPENTER SILICON CORE IRON "B-FM"
M-32; 0.05 C, 0.40 Mn, 2.50 Si, 0.12 P, bal Fe
Free machining grade of Carpenter Silicon Core Iron "B". Properties and uses similar

CARPENTER SILICON CORE IRON C.
M-32; 0.05 C, 0.15 Mn, 4.0 Si, bal Fe.
Saturation (B.) 20,000; Res. Ind. (Br) 4000; Hc 0.60; Max permeability 4000.
For motor armatures, pole piece , solenoid switches, relays.

CARPENTER SOLAR.
M-32; 0.50 C, 0.40 Mn, 1.0 Si, 0.50 Mo, bal Fe
Water hardening tool steel with more than normal toughness; for chisels, pneumatic tools, rivet busters, screw drivers. AISI S2.

CARPENTER STAINLESS NO. 2 MOLD STEEL.
M-32; 0.35 C, 0.5 Mn, 0.5 Si, 13.0 Cr, bal Fe
Air or oil hardenable corrosion resistant steel; hardenable to 48-54 Rock C max; for plastic molds. AISI 420.

CARPENTER STAINLESS NO. 5 (TYPE 416).
M-32; 0.15 max C, 1.25 max Mn, 0.15 min S, 1.0 max Si, 12.0-14.0 Cr, bal Fe.
Free machining, air or oil hardenable corrosion resistant steel.
As hardened: 160,000-195,000 TS.
For machined parts as studs, bolts, shafts, lead screws, axles for resistance to rust.
AISI 416.

CARPENTER STAINLESS NO. 5-F.
M-32; 0.10 max C, 1.0 max Mn, 0.30 min S, 1.0 max Si, 13.0-14.5 Cr, 0.5 max Ni, 0.4-0.6 Mo, bal Fe.
Corrosion resistant steel, very free machining, not designed for heat treating.
As rolled: 90,000 TS, 75,000 YS; 15 El.
For valve trim, fuel nozzles, carburetor needles, studs, bolts, nuts, magnet cores.

CARPENTER STAINLESS NO. 7 (TYPE 329).
M-32, 0.15 max C, 25.0-30.0 Cr, 3.5-6.0 Ni, 1.0-2.0 Mo, bal Fe.
Precipitation hardenable, chromium stainless.
Annealed: 105,000 TS; 80,000 YS; 230 Brin.
Hardened: 32-50 Rock C
For valves, valve fittings, pump parts.

CARPENTER STAINLESS NO. 7-Mo (Type 329).
M-32, 0.20 max C, 23-28 Cr, 2.5-5.0 Ni, 1.0-2.0 Mo, bal Fe.
Welded stainless steel tubing, ferrite matrix with some austenite.
Annealed 105,600 TS, 80,000 YS, 25 El
For heat exchangers, paper & pulp, chemical industries Good corrosion resistance.

CARPENTER STAINLESS NO 10
M-32, 0.08 max C, 15-17 Cr, 17-19 Ni, bal Fe.
Annealed. 75,000 TS, 35,000 YS, 55 El, 72 RA; 145 Brin
For bolts, fasteners, cold headed and upset parts; austenitic, stainless, low work hardening.

CARPENTER STAINLESS NO. 20 Cb-3.
M-32, 0.06 max C, 2.0 max Mn, 1.0 max Si, 19.0-21.0 Cr, 32.5-35.0 Ni, 2.0-3.0 Mo, 3.0-4.0 Cu, Cb + Ta = 8 × C min/1.0 max, bal Fe
Austenitic stainless steel with superior resistance to 10-40% sulphuric acid and other chemicals
Weldable, for mixing tanks, heat exchangers, process piping, pump shafts and rods

CARPENTER STAINLESS NO. N-1 (TYPE 414).
M-32, 0.15 max C, 1.0 max Mn, 1.0 max Si, 11.5-13.5 Cr, 1.25-2.50 Ni, bal Fe.
Air or oil hardening, corrosion resistant steel
As quenched 210,000 TS, 155,000 YS, 15 El.
For high strength bolts, nuts, studs and other hardware operating up to about 900°F.
AISI 414

CARPENTER STAINLESS TYPE 302
M-32, 0.15 max C, 2.0 max Mn, 1.0 Si, 17.0-19.0 Cr, 8.0-10.0 Ni, bal Fe.
Austenitic 18-8 stainless steel
Annealed 85,000 TS; 35,000 YS; 60 El.
For salt water fishing tackle, dairy equipment, ice cream molds, camera parts. AISI 302.

CARPENTER STAINLESS CUSTOM FLO 302 HQ
M-32; 0.08 C, 2.0 max Mn, 1.0 max Si, 17.0-19.0 Cr, 8.0-10.0 Ni, 3.0-4.0 Cu, bal Fe
Austenitic stainless steel with low work-hardening teendencies.
Annealed: 73,000 TS; 27,000 YS; 65 El.
For upset head bolts, nuts, screws and other cold formed parts.

CARPENTER STAINLESS TYPE 303.
M-32; 0.12 max C, 2.0 max Mn, 0.04 max P, 0.18-0.35 S, 1.0 max Si, 17.0-19.0 Cr, 8.0-10.0 Ni, bal F.
Free machining austenitic stainless steel.

Annealed: 90,000 TS; 35,000 YS; 50 El; 160 Brin.
For machined parts as shafts, valves, valve bodies, studs, fittings; not hardenable by heat treating
AISI 303.

CARPENTER STAINLESS TYPE 303 Se.
M-32; Same as Carpenter Stainless Type 303 except 0.15-0.35 Se replaces the sulphur as free-machining agent

CARPENTER STAINLESS TYPE 304.
M-32; 0.08 max C, 2.0 max Mn, 1.0 max Si, 18.0-20.0 Cr, 8.0-12.0 Ni, bal Fe.
Austenitic 18-8 stainless steel.
Annealed: 85,000 TS; 35,000 YS; 60 El
For parts in food, dairy and beverage industries.
AISI 304.

CARPENTER STAINLESS 304 + B.
M-32, 0.08 max C, 18-20 Cr, 11-14 Ni, 2 min B, 2 max Mn, bal Fe.
Annealed: 100,000 TS; 50,000 YS; 10 El; 10 RA, 210-240 Brin.
For control rods and shielding for nuclear reactors, corrosion resistant.

CARPENTER STAINLESS TYPE 304L
M-32; 0.03 max C, 2.0 max Mn, 1.0 max Si, 18.0-20.0 Cr, 8.0-12.0 Ni, bal Fe.
Low carbon, austenitic, 18-8 stainless steel, for welding without subsequent heat treat.
Annealed: 75,000 TS, 28,000 YS, 60 El, 150 Brin
For welded assemblies in laundry, dairy, food and beverage industries AISI 304 L

CARPENTER STAINLESS TYPE 305
M-32, 0.12 max C, 2.0 max Mn, 1.0 max Si, 17.0-19.0 Cr, 10.5-13.0 Ni, bal Fe.
Austenitic stainless steel, work-hardens less than 18-8 type
Annealed 80,000 TS; 36,000 YS, 56 El, 156 Brin
Used for severe deep drawing and spinning operations, also cold headed bolts and screws.

CARPENTER STAINLESS NO 309
M-32, 0.20 max C, 2 max Mn, 22-24 Cr, 12-15 Ni, bal Fe
At 70°F, 80,000 TS, 58,000 YS, 52 El; 71 RA.
At 1200°F 52,000 TS, 31,000 YS, 36 El; 44 RA
For furnace parts, fire box sheets, high temperature containers, weld wire
Heat, oxidation and corrosion resistance

CARPENTER STAINLESS NO. 309 S
M-32, 0.08 max C, 2 max Mn, 22-24 Cr, 12-15 Ni, bal Fe
Annealed: 95,000 TS, 40,000 YS, 45 El; 65 RA; 160 Brin
For furnace parts, fire box sheets, high temperature containers, weld wire
Heat, oxidation and corrosion resistance.

CARPENTER STAINLESS NO 310
M-32, 0.20 max C, 2 max Mn, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed 95,000 TS, 45,000 YS; 50 El; 65 RA, 185 Brin
At 1200°F 58,000 TS; 22,000 YS, 32 El; 45 RA.
For furnace parts, heat treating boxes.
High oxidation and heat resistance for service up to 2100°F.

CARPENTER STAINLESS NO 310 S
M-32; 0.08 max C, 2 max Mn, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El, 65 RA; 185 Brin.
At 1200°F: 58,000 TS, 22,000 YS; 32 El; 45 RA.
For furnace parts, heat treating boxes
High oxidation and heat resistance for service up to 2100°F.

CARPENTER STAINLESS STEEL NO. 316.
M-32; 0.1 max C, 18 Cr, 11 Ni, 2.5 Mo, bal Fe
Annealed: 80,000 TS; 30,000 YS; 60 El; 70 RA; 150 Brin.
For chemical equipment; corrosion resistant, austenitic.

CARPENTER STAINLESS TYPE 316 L.
M-32; 0.03 max C, 2.0 max Mn, 1.0 max Si, 16.0-18.0 Cr, 10.0-14.0 Ni, 2.0-3.0 Mo, bal Fe.
Austenitic stainless steel, low carbon for improved weldability, extra corrosion resistance.
Useful to 1600°F.
For pulp handling equipment, photographic chemicals, inks, rayon, rubber, welded assemblies. AISI 316 L.

CARPENTER STAINLESS NO. 317.
M-32; 0.10 max C, 18-20 Cr, 11-14 Ni, 3-4 Mo, bal Fe.
Annealed: 85,000 TS, 150 Brin.
For chemical plant equipment; stainless, austenitic.

CARPENTER STAINLESS TYPE 321.
M-32, 0.08 max C, 2.0 max Mn, 1.0 max Si, 17.0-19.0 Cr, 9.0-12.0 Ni, Ti = 5 × C min, bal Fe.
Austenitic, 18-8 type stainless steel, weldable and elevated temperature grade.
At 1400°F 30,000 TS, 21,000 YS, 33 El
For aircraft collector rings, exhaust manifolds, expansion joints, hot chemical process equipment.
AISI 321.

CARPENTER STAINLESS NO 347 (TYPE 347).
M-32, 0.08 max C, 2.0 max Mn, 1.0 max Si, 17.0-10.0 Cr, 9.0-13.0 Ni, Cb + Ta = 10 × C min, bal Fe
Austenitic, 18-8 stainless steel, weldable and elevated temperature grade
At 1500°F 25,000 TS, 17,000 YS, 40 El
For welded assemblies in food, dairy, beverage, textile and chemical industries, and in elevated temperature operations, weld rods AISI 347

CARPENTER STAINLESS NO 348 (TYPE 348)
M-32, 0.08 max C, 2.0 max Mn, 1.0 max Si, 17.0-19.0 Cr, 9.0-13.0 Ni, Cb + Ta = 10 × C min, 0.10 max Ta, 0.20 max Co, bal Fe
Stabilized austenitic 18-8 type stainless steel, mainly for nuclear applications AISI 348

CARPENTER STAINLESS NO 404
M-32; 0.05 max C, 1.0 max Mn, 0.5 Si, 11.0-12.5 Cr, 1.25-2.0 Ni, 0.03 N, bal Fe.
Hardenable to 163,000 TS, weldable, tough, corrosion resistant, for stressed parts to 1050°F.

CARPENTER STAINLESS TYPE 405
M-32; 0.08 max C, 1.0 max Mn, 1.0 max Si, 11.5-14.5 Cr, 0.10-0.30 Al, bal Fe
Non-hardenable chromium corrosion resistant steel; weldable without hard weld metal;
for steam nozzles, partitions, fabricated and welded assemblies for mining equipment and chemical plants.
AISI 405.

CARPENTER STAINLESS TYPE 410.
M-32, 0.15 max C, 1.0 max Mn, 0.5 max Si, 11.5-13.0 Cr, bal Fe.
Air or oil hardenable corrosion resistant steel; as quenched hardness 35-44 Rock C.
For steam turbine buckets, gas turbine compressor blades, nuclear reactor rod mechanisms; weldable.
AISI 410, AMS 5613, 5504.

CARPENTER STAINLESS TYPE 416.
M-32; 0.15 max C, 1.25 max Mn, 1.0 max Si, 0.15-0.35 S, 12.0-13.5 Cr, bal Fe.
Free machining, air or oil hardenable corrosion resistant steel.
As hardened: 160,000-190,000 TS.
For machined hardware as studs, bolts, gears to resist rust and scaling up to about 800°F.
AISI 416; AMS 5610.

CARPENTER STAINLESS TYPE 420.
M-32; 0.15 min C, 1.0 max Mn, 1.0 max Si, 12.0-14.0 Cr, bal Fe.
Air or oil hardenable corrosion resistant steel.
As hardened: 190,000-260,000 TS; 140,000-185,000 YS.
At 1200°F: 48,000 TS; 42,000 YS.
For springs, valve parts, valves, gears, cams, pivots, bearings, plastic molds, magnets. AISI 420.

CARPENTER STAINLESS TYPE 420 F.
M-32; 0.15 min C, 12.0-14.0 Cr, 0.60 max Mo, 0.07 min S or Se, bal Fe.
Free machining, air or oil hardenable, corrosion resistant steel.
Properties similar to Carpenter Stainless Type 420 except not recommended for vessels containing gases or liquids under pressure, nor for welded assemblies. Good machinability.
AISI 420 F.

CARPENTER STAINLESS TYPE 430.
M-32; 0.12 max C, 1.0 max Mn, 1.0 max Si, 16.0-18.0 Cr, bal Fe.
Non-hardenable chromium corrosion resistant steel; for hub caps, body molding, radiator grills, gas tank caps, hardware. AISI 430.

CARPENTER STAINLESS TYPE 430 F.
M-32, 0.12 max C, 1.25 max Mn, 0.06 max P, 0.15 min S or Se, 1.0 max Si, 14.0-18.0 Cr, 0.60 max Mo, bal Fe.
Free machining, non-hardenable corrosion resistant steel
Cold drawn: 90,000 TS, 65,000 YS; 15 El.
For screw machined parts as studs, cap screws, shafts, that are non-rusting. AISI 430 F.

CARPENTER STAINLESS NO. 431.
M-32; 0.12-0.17 C, 1.0 max Mn, 1.0 max Si, 1.5-2.5 Ni, 15.5-17.0 Cr, bal Fe.
Air or oil hardenable, corrosion resistant steel.
As hardened: Room Temp.: 200,000 TS; 165,000 YS.
As hardened: At 1000°F: 105,000 TS; 20 El.
Designed for highly stressed and elevated temperature bolts, bomb rack fasteners, pump shafts, valve stems.
AISI 431.

CARPENTER STAINLESS TYPE 440A.
M-32, 0.60-0.75 C, 1.0 max Mn, 1.0 max Si, 16.0-18.0 Cr, 0.75 max Mo, bal Fe
Air or oil hardenable corrosion resistant steel.
Hardenable to 52-56 Rock C; 220,000 min TS.
For pivot pins, dental and surgical instruments, cutlery, valve parts, permanent magnets; resists scaling and softening to about 900°F.
AISI 440A.

CARPENTER STAINLESS NO. 440-B (TYPE 440-B).
M-32; 0.75-0.95 C, 1.0 max Mn, 1.0 max Si, 16.0-18.0 Cr, 0.75 max Mo, bal Fe.
Air or oil hardenable corrosion resistant steel.
Hardenable to 53-58 Rock C; 280,000 TS approx.
For cutlery, ball bearings, scissors.
AISI 440 B.

CARPENTER STAINLESS NO. 440 C.
M-32, 0.95-1.20 C, 1.0 max Mn, 1.0 max Si, 16.0-18.0 Cr, 0.75 max Mo, bal Fe.
Air or oil hardenable corrosion resistant steel.
Hardenable to 55-61 Rock C; 285,000 TS approx.
For bushings, cutlery, needle valves, ball and roller bearings and races, ball chuck valves.
Resists softening and scaling to about 900°F.
AISI 440 C.

CARPENTER STAINLESS TYPE 440 F.
M-32; 0.95-1.20 C, 16.0-18.0 Cr, 0.75 max Mo, 0.07 S or Se, bal Fe.
Free machining grade of Carpenter Stainless No. 440 C, properties and uses similar.
AISI 440 F.

CARPENTER STAINLESS TYPE 443.
M-32; 0.20 max C, 18.0-23.0 C, 0.90-1.25 Cu, bal Fe.
Heat resisting, non-hardenable, corrosion resisting steel.
Annealed: 90,000 TS; 50,000 YS; 22 El.
At 1300°F: 26,000 TS; 11,000 YS, 41 El
For furnace parts, miscellaneous hardware, magnetic cores

CARPENTER STAINLESS TYPE 446.
M-32; 0.15 max C, 24.0-30.0 Cr, 0.50 max Ni, bal Fe
Chromium corrosion resistant steel.

CARPENTER STENTOR
M-32; 0.90 C, 1.60 Mn, 0.25 Si, bal Fe.
General purpose oil hardening tool steel, for blanking and forming dies, broaches, collets, spindles, thread gages. AISI 02.

CARPENTER TEMPERATURE CAMPENSATOR "30" (TYPES 2, 3, 4 and 5).
M-32; Four types of 30% nickel-iron alloys whose magnetic permeabilities decrease at controlled rates with increase in temperature To compensate for temperature variation by using as shunts in watt-hour meters, speedometer, tachometers, voltage regulators.

CARPENTER TEMPERATURE COMPENSATOR "32" (TYPE 1).
M-32, 32% nickel-iron alloy whose magnetic permeability decreases at a controlled rate with increase in temperature,—to compensate for variations in ambient temperature.

CARPENTER TITANIUM 6-4.
M-32, 6.0 Al, 4.0 V, bal Ti.
Heat treatable, weldable, strong titanium alloy.
Annealed. 130,000 TS, 120,000 YS, 10 El.
Heat Tr.. 160,000 TS, 150,000 YS; 8 El.
Widely used titanium alloy for good strength to weight applications; corrosion resistant
AMS 4967, 4928

CARPENTER TITANIUM 6-6-2.
M-32; 5.5 Al, 5.5 V, 2.0 Sn, 0.5 Fe, 0.5 Cu, bal Ti.
Corrosion resistant high strength alloy.
Room Temp.; 180,000 TS; 170,000 YS; 6 El.
600°F: 150,000 TS, 132,000 YS; 15 El.
AMS 4971

CARPENTER T-K.
M-32, 0.35 C, 0.3 Mn, 0.3 Si, 3.5 Cr, 9.0 W, 0.4 V, bal Fe.
Air or oil hardenable hot work tool steel, for hot shear blades, hot gripper dies, die casting dies, hot punches, hot extrusion dies.
AISI H21.

CARPENTER U.D.R.
M-32; 1.0 C, 0.35 Mn, 0.25 Si, 0.50 Cr, bal Fe.
Heat treated: 320,000 TS; 300,000 YS, 1 El; C 60 Rock.

For bearings, wear plates, lathe centers, cams, swaging dies, rocker dies. Oil or water hardening.

CARPENTER V-57.
M-32; 0.05 C, 14 Cr, 26.5 Ni, 1.5 Mo, 3 Ti, 0.25 Al, 0.007 B, bal Fe.
Rolled: 175,000 TS; 125,000 YS; 21 El; 35 RA; 331 Brin.
For jet engine blades and buckets, turbine wheels, torque rings; vacuum melted superalloy, high heat resistance up to 1300°F.

CARPENTER VACUMELTROL 41.
M-32; 0.60-0.12 C, 18-20 Cr, 9-10.5 Mo, 10-12 Co, 3.0-3.3 Ti, 1.4-1.6 Al, 0.003-0.010 B, 5.0 max Fe, bal Ni.
Aged: 206,000 TS; 154,000 YS; 14 El
For jet engine and aircraft components, high temperature bolts; age-hardenable, useful to 1800°F.

CARPENTER VACUMET HYMU "800."
M-32; 0.01 C, 0.50 Mn, 0.15 Si, 80.0 Ni, 5.0 Mo, bal Fe.
Soft magnetic material with minimum permeability of 60,000 at 40 gauss.
For laminations or toroids

CARPENTER VACUMET NICOSEAL.
M-32; 0.02 max C, 0.30 Mn, 0.20 Si, 29.0 Ni, 17.0 Co, bal Fe
Vacuum melted low-expansion alloy for making hermetic seals with the harder Pyrex glasses and ceramic materials.
70-392°F: 2.89 in/in/°F × 10^{-6}

CARPENTER VACUMET NICOSEAL PHOTO-ETCH QUALITY.
M-32, 0.02 max C, 0.30 Mn, 0.20 Si, 29.00 Ni, 17.0 Co, bal Fe
Photo-etching quality strip grade of Carpenter Vacumet Nicoseal

CARPENTER VEGA-FM.
M-32, 0.70 C, 2.25 Mn, 0.3 Si, 1.0 Cr, 1.35 Mo, plus alloy sulfides, bal Fe
Air hardening, non deforming die steel, free-machining grade, for blanking, forming and trimming dies mandrels, punches, precision tools AISI A 6

CARPENTER V S M
M-32, 0.70 C, 1.1 Si, 3 Cr, 5.25 Mo, 0.5 Mn, bal Fe
Heat treated: 550-640 Brin
For valve seat inserts and stems, guides, spindles; resists heat checking and wear

CARPENTER WASPALLOY
M-32; 0.03-0.10 C, 18-21 Cr, 3.5-5.0 Mo, 12-15 Co, 2.6-3.25 Ti, 1.0-1.5 Al, 0.02-0.12 Zr, 0.003-0.008 B, 2.0 max Fe, bal Ni
At 70°F: 190,000 TS; 130,000 YS, 22 El, 25 RA.
At 1600°F 74,000 TS, 73,000 YS, 40 El; 55 RA
For gas turbine parts, jet engine components; age-hardenable, heat resistant.

CARRIAGE WHEEL BEARING.
Eng., 84 Cu, 16 Sn
For bearings; corrosion resistant.

CARTER WHITE GOLD.
Eng.; 83.3 Au, 16.7 Ni
For jewelry, ornaments, corrosion resistant.

CARTOS.
M-64; 0.93 C, 0.4 Mn, 0.6 Si, 0.09 V, bal Fe.
Annealed: 250 Brin.
Ht. Tr.: 620 Brin.
For shear knives, trimmers
Oil hardening, wear resistant.

CARTOS 2V72.
M-64; 0.8 C, 0.4 Mn, 0.6 Si, 0.1 V, bal Fe.
Water hardening tool steel; AISI W 2.

CARTOS 2V90.
M-64; 0.9 C, 0.4 Mn, 0.6 Si, 0.1 V, bal Fe.
Water hardening tool steel; AISI W 2.

CARTRIDGE BRASS.
M-33; 70 Cu, 30 Zn.
Annealed: 47,000 TS; 15,000 YS; 62 El.
Rolled: 76,000 TS; 64,000 YS; 8 El.
For cartridge cases, primer cups, springs; deep drawing.

CARTRIDGE BRASS-42.
M-8; 70 Cu, 30 Zn
¼ H-temper: 54,000 TS, 40,000 YS, 43 El; 63 Brin.
½ H-temper: 62,000 TS; 52,000 YS; 23 El; 120 Brin.
H-temper: 76,000 TS, 63,000 YS; 8 El; 156 Brin.
For cartridges, primers, shot shells, tanks, fasteners, deep drawing, high ductility.

CARTRIDGE BRASS 260.
M-279, M-8, 70 Cu, 30 Zn
Ann: 45,000-65,000 TS, 10,000-34,000 YS; 35-67 El
All purpose deep drawing brass. For all deep drawn brass parts
Cold rolled. 49,000-110,000 TS; 20,000-100,000 YS; 1-56 El
For less drastic forming, spring clips

CARTRIDGE GILDING
U S; 93 Cu, 7 Zn
For cartridge shells, ornaments, base for fire enameling, gilding metal.

CARTUN.
M-432, 1.35 C, 2.75 W, bal Fe.
For fast finishing tools, cutters; water or oil hardened

CAR-VAN
M-750, 0.75-1.1 C, 0.2 V, bal Fe.
For tools, dies, shear blades, punches; water hardening

CAR-VAN SPECIAL.
M-750, 0.80-1.35 C, 0.2 V, bal Fe
For tools, dies, drills, cutters, water hardening.

CASALLOY.
M-1569, M-1724, 0.10 C, 0.05 Si, 0.45 Mn, 1.0 Ni, bal Fe
Low alloy case hardening tool steel; for cams, collets, drill bushings, lathe centers, arbors.

CASAR.
M-1312; 1.3 C, 0.85 Mo, 3.8 V, 12 W, 4.3 Cr, bal Fe
For lathe and planer tools, reamers, broaches, taps, high speed steel.

CASAR C
M-1312, 1.35 C, 4.2 Cr, Mo, W, V, bal Fe.
For blanking and forming dies, engravers' tools; high speed steel

CASCADE.
M-73, 0.13 C, 0.12 Cr, 4 Ni, 0.5 V, bal Fe.
207-350 Brin.
For plastic mold die zinc die casting dies; can be nitrided.

CASINO.
M-1141; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For shapers, cutters; high speed steel.

CASONA.
M-1411; 0.10 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 64,000 TS; 40,000 YS; 28 El; 65 RA; 132 Brin.
For deep hobbing dies; case hardened.

CASTALOY.
M-157; 1.5-1.6 C, 12-14 Cr, 0.7-0.8 Mo, 0.45-0.55 Mn, bal Fe.
For dies; easily machined Rockwell "C"-26-30.

CASTALOY.
M-378; 4.1 Al, 0.04 Mg, bal Zn.
Die cast: 40,300 TS, 5 El, 74 Brin.
For chemical apparatus, clamps, holders; SAE903.

CAST COMPOSITE.
M-210; C, bal Fe.
For tools, blanking dies; water hardening.

CAST COMPOSITE.
M-365, 1.0-1.05 C, bal Fe.
For tools, drills, taps; water hardening

CASTDIE.
M-35; 0.35 C, 5.25 Cr, 1.35 Mo, 0.5 V, 0.95 Si, bal Fe.
For die casting dies; oil hardened.

CASTEEL 15
M-1166; 0.13-0.18 C, 0.6 Mn, 0.4 Si, bal Fe.
Normalized: 57,000-65,000 TS; 32,000-37,000 YS; 30-35 El, 50-55 RA; 110-125 Brin
For gears, pinions, shafts, case hardening.

CASTEEL 22.
M-1166; 0.18-0.25 C, 0.6 Mn, 0.4 Si, bal Fe
Normalized: 65,000-75,000 TS; 38,000-45,000 YS; 25-30 El, 45-50 RA, 130-145 Brin
For gears, pinions, housings, castings, case hardening.

CASTEEL 28
M-1166; 0.26-0.32 C, 0.7 Mn, 0.4 Si, bal Fe.
Normalized: 75,000-85,000 TS, 45,000-55,000 YS, 20-25 El; 36-45 RA, 140-160 Brin.
For structural and machinery parts, castings; water hardened

CASTEEL 40.
M-1166, 0.37-0.43 C, 0.7 Mn, 0.4 Si, bal Fe.
Normalized: 85,000-95,000 TS, 55,000-65,000 YS; 15-20 El, 25-35 RA; 165-180 Brin.
Heat treated: 90,000-110,000 TS; 62,000-70,000 YS; 18-23 El, 40-50 RA; 180-220 Brin.
For gears, pinions, shafts, housings, castings, water hardened

CASTINGWELD
M-118; C, bal Fe.
For welding electrodes, non-machinable, welds on cast iron.

CAST-I-NICKEL.
M-712; Ni.
For cast iron welding rod; flux coated, machinable.

CAST-I-STEEL.
M-712, 0.10-0.14 C, 0.4-0.6 Mn, 0.02 max Si, bal Fe.
For nonmachinable welds on cast iron; coated arc electrode.

CASTOR 3.
M-111; 0.72 C, 4.5 Cr, 18 W, 1.2 V, bal Fe.
For tools, cutters; high speed steel.

CASTOR 7.
M-111; 0.8 C, 4.5 Cr, 1.25 Mo, 18.5 W, 2.5 Co, 1.6 V, bal Fe.
For tools, cutters; high speed steel.

CASTOR 8.
M-111; 0.8 C, 4.5 Cr, 1.25 Mo, 18.5 W, 5.5 Co, 1.6 V, bal Fe.
For tools, cutters; high speed steel.

CASTOR 9.
M-111; 0.8 C, 4.5 Cr, 1 Mo, 18.5 W, 10.5 Co, 1.6 V, bal Fe.
For tools, cutters; high speed steel.

CASTOR 1939.
M-111, 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel

CAT. 497 STARRETT PRECISION GROUND DIE STOCK (see Starrett No. 497)

CATALOY
M-481, Pb-Cu-Sn.
For catalyst; for non-ferrous metals.

CATALOY NO 1
M-481; 20 Pb, 72 Cu, 4 Sn, 4 other elements
26,750 TS; 18 El; 25 RA, 50 Brin.
For bearings; heavy duty.

CATALOY NO 2.
M-481, 25 Pb, 68 Cu, 3 Sn, 4 others.
21,350 TS, 13 El, 25 RA, 50 Brin
For bearings; heavy duty

CATALOY NO 3
M-481, 30 Pb, 63 Cu, 3 Sn, 4 others.
Cast. 19,550 TS, 11.7 El; 19.5 RA, 39 Brin.
For bearings; heavy duty

CATALOY NO 4
M-481, 25 Pb, 70 Cu, 1 Sn, 4 others
Cast 13,700 TS, 10 El; 9.7 RA, 34 Brin
For bearings, heavy duty

CATALOY NO. 5
M-481; 40 Pb, 52 Cu, 8 others
Cast: 9,910 TS, 5.5 El, 9.8 RA; 27 Brin
For bearings, heavy duty.

CATALOY NO 6.
M-481; 40 Pb, 51 Cu, 1 Sn, 8 others.
Cast 10,500 TS; 5.5 El, 19.5 RA; 30 Brin.
For bearings; heavy duty.

CATALOY NO 7.
M-481; 50 Pb, 42 Cu, 8 others.
Cast 6,400 TS, 10 El, 8.6 RA, 13 Brin
For bearings, heavy duty

CATALOY NO 8S
M-481, 13 Pb, 80 Cu, 5 Sn, 2 others
Cast 30,700 TS, 18.8 El, 24.9 RA, 50 Brin
For bearings; heavy duty.

CATALOY NO 9N
M-481; 11 Pb, 80 Cu, 5 Sn, 4 others.
Cast: 31,000 TS, 14.1 El; 8.2 RA, 53 Brin.
For bearings; heavy duty

CATARACT METAL.
M-92; 19-21 Ni, 16-20 Zn, 2.5 max Fe, 2.5 max Pb, bal Cu.
Bar: 45,000-55,000 TS, 24,000 YP; 22 El; 28 RA.
For machinery parts, chemical apparatus, valves on superheated steam lines. Corrosion resistant.

CAT BRAND 14% W.
M-1409; 0.65 C, 14.5 W, 3.75 Cr, 0.5 V, bal Fe.
For drills, punches, taps, piercing and blanking dies; high speed steel.

CAT BRAND S.H.X.
M-1409, 0.65 C, 15.5 W, 3.9 Cr, 0.5 V, bal Fe.
For slitting saws; high speed steel.

CATHALOY-1.
M-945; 0.1 Al, bal Ni.
For television cathode tubes; high emission.

CATHALOY-2.
M-945; 4 W, bal Ni.
For television cathode tubes; high emission.

CATHALOY A-30.
M-945; 0 03-0.10 C, 0.05 max Cu, 0.10 max Fe, 0.03-0 08 Al, 0.01-0.06 Mg, bal Ni.
Tempered: 75,000-120,000 TS; 15,000-110,000 YS; 50-4 El, 125-260 Brin.
For electronic valves; cathode nickel.

CATHALOY A-31
M-945; 3 7-4 2 W, 0 10 max Cu, 0.01-0.06 Mg, 0 02-0 06 Si, bal Ni
Tempered. 85,000-140,000 TS; 15,000-125,000 YS; 50-4 El; 150-350 Brin.
For electronic valves; cathode nickel.

CATHALOY A32
M-945, 2 0-2 5 W, 0 05 Al, 0.02 Cu, 0.03-0.10 C, 0 01-0 06 Mg, bal Ni
85,000-140,000 TS, 15,000-125,000 YS, 50-4 El, 150-350 Brin
For cathodes in electron tubes; high emission and shock resistant

CATHALOY P-50
M-945, 0 04 max Cu, 0 05 max Fe, 0.05 max C, 0 01 max Ti, bal Ni
Tempered 75,000-120,000 TS, 15,000-110,000 YS; 50-4 El, 125-250 Brin.
For cathodes in electron tubes; ASTM Alloy 22

CATHALOY P-51
M-945, 3 75-4 25 W, 0 04 max Cu, 0 05 max Fe, bal Ni
Tempered 85,000-140,000 TS; 65,000 125,000 YS, 50 4 El, 150 350 Brin
For electronic tubes, cathodes, passive cathode material

CATHODE NICKEL
M-61, 96 99 Ni, selected additives
Annealed 60,000 TS
For cathodes in electron tubes, several types.

CAUSAL METAL
M-264, 3 C, 1-3 Cr, 5-7 Cu, 15 Ni, 1-2 Si, bal Fe
Cast. 20,000-35,000 TS, 125-200 Brin.
For valve bodies, paper mill and resisting parts, alloy cast iron, austenitic, corrosion resistant

CAV1.
M-495, 0 6 C, 0 9 Si, 0 9 Mn, 1 35 Cr, 0 15 V, bal Fe.
For tools, dies, shock resistant

CAV2.
M-459; 0 5 C, 1.5 Si, 0 75 Mn, 1 2 Cr, 0 15 V, bal Fe
For tools, dies, shock resistant

CAV3
M-459, 0.35 C, 1.5 Si, 0 7 Mn, 1 1 Cr, 0 15 V, 1 5-7 W, bal Fe.
For tools, dies; shock resistant.

CAZIN
Eng, 82.6 Cd, 17.4 Zn.
For solder for steel, M P. 263°C

Cb-10Hf-1Ti-0.5 Zr
M-1596, M-1537; 9-11 Hf, 0 7-1 3 Ti, 0.7 max Zr, bal Cb.
Cold Rolled· 105,000 TS, 96,500 YS, 5 El
Recrystallized. 59,000 TS; 45,400 YS, 26 El.
For high temperature applications, space vehicles.
Good TIG weldability.

Cb-10W-5Zr.
M-167; 10 W, 5 Zr, bal Cb.
Rolled: 130,000 TS; 128,000 YS; 2 El.
At 2400°F: 89,000 TS; 74,000 YS; 28 El.
Space vehicles, missiles, nuclear reactors.
High temperature alloy. Combines high strength with excellent ductility at high temp.

Cb-74.
M-48, 5 Zr, 10 W, bal Cb.
At 70°F· 88,000 TS; 70,000 YS, 26% El.
At 2200°F: 39,000 TS; 33,000 YS, 25% El.
(Recrystallized 1 hr. at 2700°F).
For space vehicles, nuclear reactors Good combination of density, strength and oxidation resistance at high temperatures.

Cb-752.
M-167; 10 W, 5 Zr, bal Cb.
Rolled: 130,000 TS, 128,000 YS, 2 El.
At 2400°F 89,000 TS; 74,000 YS, 28 El.
For space vehicles, nuclear reactors
High temperature alloy, combines high strength with excellent ductility at high temperature.

Cb-753
M-167, 5 V, 1.25 Zr, bal Cb
At 75°F. 85,000 TS.
At 2400°F 18,000 min TS.
For nuclear industry, aerospace equipment.
Low nuclear cross-section.
Good fracture ductility.

C B F CHROMIUM BRONZE
M-452, 1 5-3 5 Sn, 0 5-2.0 Cr, 0 5-3 Fe, 0 5 max Mn, bal Cu
47,000 TS, 21,000 YS; 30-40 El, 90-130 Brin
For engine valve guides, gears, rock drill twist nuts, heavy duty

C C A
M-38, 1 5 C, 12 Cr, 0 8 Mo, 0 25 V, bal Fe
For blanking dies, punches, plug gauges, wire drawing dies, non-deforming

C C CHISEL
M-260, M-38, 0 47 C, 0 7 Cr, 1 1 W, bal Fe
For punches, pneumatic chisels; shock and fatigue resistant.

C.C M (See Simonds CCM)

CCR
M-772, 2 25 C, 13 Cr, bal Fe
For tools, dies, non-deforming

C.C S DIE CASTING
M-362; 0.35 C, 1.15 Si, 5 25 Cr, 0 40 Co, 4 25 W, bal Fe
For Al or brass die casting dies, oil or air hardened

CD-18 See CARBIDIE CD-18.

CDC ALLOY 50
M-1187, 5 Al, 50 Mn, 45 Fe
For electrical resistors, low expansion.

C.D C. NO 595.
M-1187; 5 Cu, 95 Sn.
Wire, for electronic uses.

C.D.C. NO 720
M-1187, 60 Cu, 20 Ni, 20 Mn
Hardenable by cold work and/or heat treatment.
Ann: 98,000 TS, 80,000 YS; 30 El; 140 VHN.
Cold red. 80%: 150,000 TS; 130,000 YS; 280 VHN.
Hardened: 200,000-220,000 TS; 475-515 VHN.
For springs, diaphragms.

C.D.C. NO. 772.
M-1187; 72 Mn, 18 Cu, 10 Ni.
Wrought: 115,000 TS; 95,000 YS; 6.5 El; 220 VHN.
Elec. res.: 1050 ohms per cir. mil. ft.
Low temp. coefficient of resistance.
For low temp. resistance application, rheotats, circuit breaker parts, misc. elec. appliance controls.

CDC MANGANESE NO. 715.
M-1187; Mn, Ni, bal Cu.
For springs; corrosion resistant.

CDC MANGANESE ALLOY NO. 730.
M-1187; 40 Cu, 30 Ni, 30 Mn.
Soft: 85,000 TS; 30 El; 130 Brin.
Rolled: 145,000 TS; 2 El; 280 Brin.
Hard. 270,000 TS; 580 Brin.
For watch and clock parts; age hardenable, corrosion resistant.

C.D.C. MANGANESE ALLOY NO. 762.
M-1187; 62-65 Mn, bal Cu.
Quenched and aged: 78,000 TS; 38,000 YS, 35 El; 70-75 Rock B.
Damping capacity at torsile stress of 4000 psi-30.
High electrical resistivity and damping capacity.

C D.C. MANGANESE ALLOY NO. 780.
M-1187; 80 Mn, 20 Cu.
Quenched: 68,000 TS; 24,000 YS, 35 El.
Cold rolled: 130,000 TS, 115,000 YS; 9 El.
High electrical resistivity and high damping properties.

CDC VAN-AD
M-1187; 75 V, bal Ti.
For addition agent to titanium alloys; for alloying.

CEC IMPACT.
M-35; 0.55 C, 0.8 Mn, 2 Si, 0.4 Mo, bal Fe.
For punches, riveters, upsetters, dies, chisels; oil hardened, shock resistant.

CECO.
Eng.; 62.5 Cu, 32 Pb, 4.6 Sn, 0.9 Ni.
18,000 TS; 3 El; 0.35 RA; 52 Brin.
For bearings, bushings, heavy duty.

CECOLLOY.
M-474; 3.0 C, 0.90 Mn, 1.3 Si, 0.6 Ni, 0.5 Mo, bal Fe.
56,000 TS; 255 Brin.
For steam cylinder lines, valves; cast iron.

CECOLLOY A.
M-474; 3.0 T.C., 0 5 Mo, 0.60 Ni, bal Fe.
40,000-60,000 TS.
For anvils, frames for forges, forming dies, steam cylinder liners, large valves, series of synthetic alloys; made in air furnaces.

CECOLLOY B.
M-474; 2.8 T.C., 0.5 Mo, 0.35 Cr, bal Fe.
For liners, frames, castings, valves; shock resistant.

CECOLLOY C.
M-474; 3.0 T.C., 0.5 Mo, 1.5 Ni, bal Fe.
For liners, frames, castings, valves; shock resistant.

C.E.C. SMOOTH CUT.
M-35; 0.60 C, 0.85 Mn, 2.0 Si, 0.25 Cr, 0.25 Mo, 0.2 V, bal Fe.
Annealed: 107,000 TS; 64,000 YS; 27 El; 212 Brin.
Oil Hardened: 145,000-340,000 TS; 127,000-283,000 YP; 5-24 El; 20-44 RA; 293-611 Brin.
For shear blades, pneumatic tools, punches, chisels, caulking tools, rivet sets.
Type S5 shock resisting tool steel. Water or oil hardening.

CEKAS.
U.S.; 11.2 Cr, 59.7 Ni, 2 Mn, bal Fe.
For heat and corrosion resisting parts; stainless and corrosion resistant.

CEKAS.
M-1327; 0 16 C, 1.05 Cr, 0.25 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; case hardened, tough.

CEKAS M151.
M-1327; 0.15 C, 13 Cr, 1 Mo, bal Fe.
Annealed. 75,000 TS; 40,000 YS; 30 El; B 82 Rock.
Ht. Tr.: 135,000 TS; 105,000 YS; 10 El; C 30 Rock.
For flat springs, hardware, fittings, tableware, chemical plant and oil refining equipment.
Corrosion resistant. Hardenable.

CEKAS M152.
M-1327; 0.20 C, 13 Cr, 1 Mo, bal Fe
Annealed: 95,000 TS; 50,000 YS; 25 El; B 92 Rock.
Oil Hardened: 250,000 TS; 215,000 YS; 8 El; C 50 Rock.
For surgical instruments, cutlery, pivots, ball bearings, gears
Corrosion resistant, hardenable.

CELEBRATED 101.
M-1409; 0 75 C, 18 W, 4.2 Cr, 1.5 V, bal Fe.
For swaging dies, hobs, lathe and planer tools; high speed steel.

CELERO
M-357; 1 35 C, 0.25 Cr, 2 75 W, bal Fe
For finishing tools, plug gages; oil hardening

CELFOR
M-618, 0.2 C, bal Fe.
For gears, pinions, shafts, case hardening steel.

CELLO-VANADIUM.
M-81; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe
For dies, taps, reamers, hobs, milling cutters, master tools, broaches, forming dies, oil hardening, non-shrinking.

CELSIT.
Eng.; 25 Cr, 65 Co, 10 Mo
For tools, similar to "Stellite"; heat and corrosion resistant.

CELSIT.
M-27; C, Co, W, Cr, bal Fe.
For cutting tools; does not require heat treatment for hardening.

CELSIT K.
M-27; 2 C, 34 Cr, 16 W, 44 Co.
Annealed. 80,000 TS; 50,000 YS; 25 El; 45 RA; 187 Brin
For cutting tools; heat, wear and corrosion resistant.

CELSIT N
M-27; 2.4 C, 31 Cr, 18 W, 45 Co, bal Fe.
Welded: Rockwell C 68.
For hard facing electrodes; heat and abrasion resistant.

CELSIT P.
M-27; 2 C, 32 Cr, 14 W, 50 Co.
For corrosion resistant castings; heat, wear and corrosion resistant.

CELSIT SEO.
M-27; 3.5 C, 1.2 Mn, 31 Cr, bal Fe
Welded.
For hard facing electrodes; wear resistant.

CELSIT V.
M-27; 1.2 C, 25 Cr, 4 W, 65 Co, bal Fe.
Welded: Rockwell C 43.
For hard facing electrodes; for exhaust valves and dies.

CELSIT V-300.
M-459; 1.7 C, 28 Cr, 6 W, 33 Co, bal Fe.
For hard facing electrode; wear resistant.

CELSIT V-400.
M-459; 1.6 C, 26 Cr, 4.5 W, 4.5 Mo, 20 Co, bal Fe.
For hard facing electrode; wear resistant.

CELSIT VEO
M-459; 1.9 C, 30 Cr, bal Fe.
For hard facing electrode; wear resistant.

CELTO.
M-731; 0.2 C, bal Fe.
For welding electrodes; shielded arc.

CEMENTED TUNGSTEN CARBIDE.
M-57; 5.5 C, 86.5 W, 8 Co.
For hard cutting tools, tool tips; WC + Co; M H. 98

CENTANIN.
M-789, 67 Cu, 5 Ni, 27 Mn.
Annealed: 72,000-78,000 TS.
Temp. coef. resistance per °C ± 0.00002.
For electrical equipment and instruments
Resistance alloy. Max working temperature 300°C.

CENTAUR
M-261, C, bal Fe.
For tools, drills, taps; water hardened

CENTRAL A.
M-732, 12 Si, 2.5 Cu, 1.25 Mg, 1.25 Mn, 2.5 Ni, 0.25 Ti, bal Al
Cast 24,000 TS; 1 El; 110 Brin
Heat treated 33,000 TS; 1 El; 140 Brin.
For light alloy parts, heat treatable

CENTRALLOY
M-649, 0.15 C, 0.8 Ni, 0.2 Cr, bal Fe.
For bus and railway bodies, high strength.

CENTRAL V.
M-732, 12 Si, 1.25 Mg, 2.5 Mn, 0.25 Ti, bal Al.
Cast. 23,000 TS, 1 El, 100 Brin.
Heat treated 31,000 TS, 1 El, 130 Brin.
For light alloy parts, heat treatable.

CENTRARD
M-494; 2.7 C, 1.5-1.75 Cr, 1.5-1.75 Al, bal Fe.
Annealed: 45,000-56,000 TS, 250 Brin
For cylinder liners, general parts to resist severe abrasion, nitrogen hardened alloy cast iron

CENTRA STEEL.
M-690; 1.7 C, 2.25 Si, 0.40 Mg, 0.10 S, 0.05 P, 0.01 B, bal Fe.
For crankshafts, gears, agricultural equipment, castings, good wear resistance

CENTREX HT.
M-1422, C, alloy, bal Fe.
Pre-heat-treated to 150,000 TS, 115,000 YS; 24 El; 302 Brin
For gears, bolts, shafts, abrasion resistant.

CENTREX P & G.
M-1422; C, alloy, bal Fe.
Pre-heat-treated to 155,000 TS; 135,000 YS; 24 El; 302 Brin.
For gears, bolts, shafts; shock and fatigue resistant.

CENTREX-PBD.
M-1422; C, alloy, bal Fe.
Heat Treated: 248-293 Brinell.
For brake dies.
Resists severe wear and high impact forces.

CENTREX PRESS BRAKE SEE CENTREX-PBD.

CENTREX RHINO-CHEK.
M-1422; C, alloy, bal Fe.
Heat Treated: 370 Brinell; 175,000 TS, 150,000 YP.
For fan blades, lining chutes.
Wear and corrosion resistant.

CENTREX RHINO-TUF
M-1422; C, alloy, bal Fe.
Heat Treated: 175,000 TS; 150,000 YP; 360-400 Brin; (can be furnished harder).
For anchors, coal chutes, conveyers, furnace liners, grader blades, mixers.
Special heat treated wear and corrosion resistant plate

CENTRICAST MARK 2.
M-494, 3.3 C, 2.5 Si, 0.6 P, 0.3 Cr, bal Fe.
Cast: 36,000 TS; 241-302 Brin
For cylinder liners, general castings; cast iron.

CENTRICAST MARK 3
M-494; 3.2 C, 1.9 Si, 0.2 P, 1.4 Ni, 0.4 Cr, bal Fe.
Cast. 40,000 TS, 217-285 Brin
For gears, cylinder liners; heat treated castings.

CENTRICAST MARK 4.
M-494; 3.2 C, 2.1 Si, 0.8 Mn, 0.2 P, 2 Ni, bal Fe
Cast: 38,000 TS; 195-255 Brin
For gears, cylinder liners; alloy cast iron.

CENTRICAST MARK 5.
M-494; 3.3 C, 1.8 Si, 0.2 P, bal Fe.
Cast: 36,000 TS, 179-241 Brin.
For piston rings, liners, cast iron.

CENTRICAST MARK 9.
M-494, 3.1 C, 2 Si, 0.4 P, 0.7 Cr, bal Fe.
Cast 58,000 TS, 269-302 Brin.
For piston rings, automobile castings; cast iron

CENTRICAST MARK 10-HI-TEN
M-494, 3.3 C, 2.1 Si, 0.1 P, 1.6 Ni, 0.75 Al, bal Fe.
Cast: 63,000-90,000 TS; 10-3 El.
For rollers, shafts; nitriding cast iron.

CENTRICAST MARK 11.
M-494, 3.2 C, 2.3 Si, 0.7 Mn, 0.1 P, 0.2 Cr, 0.6 Ni, 0.15 Mo, bal Fe
Cast 52,000 TS, 207-255 Brin
For cylinder liners, cast iron, wear resistant

CENTRICAST MARK 12-4K6.
M-494, 3.4 C, 2.3 Si, 0.6 P, 0.3 Cr, bal Fe
Cast: 36,000 TS, 229-293 Brin
For automobile piston rings; cast iron, wear resistant

CENTRICAST MARK 14
M-494, 3.2 C, 2.4 Si, 0.6 P, 0.4 Cr, 0.6 Mo, bal Fe.
Cast: 45,000 TS, 255-293 Brin
For aircraft piston rings, cast iron, wear resistant.

CENTRICAST MARK 15
M-494, 2.9 C, 2.4 Si, 0.4 P, 0.9 Cr, 0.9 Mo, bal Fe.
Cast 58,000 TS, 269-302 Brin
For aircraft compression and piston rings, cast iron, wear resistant

CENTRICAST MARK 16.
M-494; 1.9 C, 1.9 Si, 0.06 P, 16 Cr, bal Fe.
Cast 78,000 TS, 269-321 Brin.
For piston rings, cylinder liners; heat and abrasion resistant.

CENTRICAST MARK 17.
M-494, 1.2 C, 2 Si, 33 Cr, bal Fe.
Cast: 78,000 TS; 285-341 Brin.
For liners and pump cylinders; heat and abrasion resistant.

CENTRICAST MARK 18.
M-494; 2.7 C, 2 Si, 14 Ni, 1.75 Cr, 7 Cu, bal Fe.
Cast: 31,500 TS; 175-235 Brin.
For cylinder liners; austenitic, cast iron, corrosion resistant.

CENTRICAST MARK 20.
M-494; 3.0 C, 2.5 Si, 0.1 P, 1.3 Cr, bal Fe.
Cast: 58,000 TS; 269-311 Brin.
For valve seats; heat resistant, cast iron.

CENTRICAST MARK 21.
M-494; 2.8 C, 2.7 Si, 0.2 P, 1.5 Cr, 1.0 Al, bal Fe.
Cast: 54,000 TS; 269-311 Brin.
For cylinder liners; nitriding cast iron.

CENTRICAST MARK 23.
M-494; 3.3 T.C., 2.1 Si, 0.3 Mn, 0.1 P, 1.6 Ni, bal Fe.
Normalized: 90,000 TS; 260 Brin.
Annealed: 60,000 TS; 223 Brin.
For rollers, cylinder liners; spheroidal cast iron

CENTURY-1141.
M-97; 0.37-0.45 C, 1.35-1.65 Mn, 0.08-0.13 S, 0.045 max P, bal Fe.
Hot Rolled: 98,000 TS; 60,000 YS; 25 El; 52 RA; 200 Brin.
Hardened: 185,000 TS; 168,000 YS, 12 El, 40 RA; 365 Brin.
For axles, shafts, screws, bolts, arbors, bushings, gears, lead screws.
Free-machining. Water hardenable.

CENTURY-1144.
M-97, 0.40-0.48 C, 1.35-1.65 Mn, 0.24-0.33 S, 0.045 max P, bal Fe.
Annealed: 94,000 TS; 54,000 YS, 24 El; 183 Brin.
Water Hardened: 175,000-295,000 TS; 155,000-188,000 YS; 4-11 El, 11-38 RA; 363-555 Brin.
For axles, shafts, tie-rods, arbors, ball joints, gears, pinions, clutches.
Free machining, water or oil hardening.

CERALLOY 75.
M-1497, 25 Fe, bal Misch Metal.
For additives for ductile cast iron; desulphurizer and graphite nodularizer.

CERALLOY 75M2.
M-1497; 23 Fe, 2 Mg, bal Misch Metal.
For additives for ductile cast iron; desulphurizer and graphite nodularizer.

CERALLOY 80A.
M-1497, 20 Al, bal Misch Metal.
For steel deoxidizer and desulphurizer, scavenger.

CERALLOY 90M.
M-1497; 10 Mg, bal Misch Metal.
For additives for ductile cast iron; desulphurizer and graphite nodularizer.

CERALLOY 400.
M-1497; 80 Th. bal Ce + Al.
For vacuum tube getter, continuous getter.

CERALLOY 420.
M-1497; 20 Fe, 2 Mg, bal Misch Metal.
For vacuum tube getter, anode in voltage regular gas tubes; flash getter.

CERALLOY MISCHMETAL 95 M.
M-1497; 5 Mg, bal mixed rare earth metals.
Ignition alloy.

CERALLOY MISCHMETAL 100X.
M-1497; 99.9 rare earth metals, typically 50 Ce + 27 La + 16 Nd + 5 Pr, bal other rare earth metals.
Additive for non-ferrous alloys.

CERALLOY MISCHMETAL FG.
M-1497; 4% Fe, bal mixed rare earth metals.
Additive for iron and steel; desulfurizer and graphite nodularizer.

CERALLOY MISCHMETAL M.
M-1497; 2.5% Mg, bal mixed rare earth metals.
Additive for magnesium alloys.

CERALUMIN-21.
M-452, 3.5-4.5 Cu, 0.5-1.0 Co, 1.2-2.5 Mg, bal Al
Cast. 54,000-58,000 TS; 20-22 El.
For sand and die castings for elevated temperature service.
High strength and hardness at elevated temperatures.

CERALUMIN 22.
M-452; Si, Cu, Ce, bal Al
For light alloy parts; forgings

CERALUMIN A.
M-452; 1.25 Si, 2.5 Cu, 0.8 Mg, 1.2 Fe, 1.5 Ni, 0.15 Ce, bal Al.
Heat treated: 51,000-60,000 TS; 45,000-54,000 YS; 1 El; 130-140 Brin.
For light alloy parts; heat treatable.

CERALUMIN "ASM."
M-452, 1-2 Cu, 0.25-1 Ni, 0.5 max Fe, 0.7-1.3 Si, 0.4-0.8 Mg, 0.03-0.3 Cb, bal Al
Sand cast: 38,000 TS, 4-7 El; 95 Brin.
Chill cast 47,000 TS, 14-21 El, 95 Brin
For castings. good corrosion resistance.

CERALUMIN B
M-452; 1.5 Cu, 1.5 Ni, 0.2 Mg 0.7 Fe, 1.5 Si, 0.05-0.3 Ce, bal Al
Sand cast: 26,000 TS; 20,000 YS; 2-3 El; 80 Brin
Permanent mold 31,000 TS, 20,000 YS, 4-9 El; 82 Brin
For pistons, cylinder heads, gear boxes, impellers, good castability

CERALUMIN C
M-452 2-3 Cu, 1-2 Ni, 1-1.5 Fe, 1-1.4 Si, 0.05-0.20 Ce, 0.5-1.0 Mg, 0.05-0.3 Cb, bal Al
Aged 63,000 TS, 55,000 YS, 9 El; 145 Brin
Permanent mold: 59,000 TS; 49,000 YS, 1-4 El, 135 Brin
For castings for high temperature use, age-hardenable

CERALUMIN D
M-452, 2-3 Cu, 1-2 Ni, 0.5-1.0 Mg, 1.2 Si, 1.2 Fe, 0.05-0.20 Ce, bal Al
Heat treated 28,000-40,000 TS; 25,000 YS, 5-1 El, 90-100 Brin
For cylinder heads, general castings, age-hardenable.

CERALUMIN F.
M-452, 1.3-3.0 Cu, 1.5-2.0 Ni, 0.05-0.3 Ce, 0.5-1.25 Mg, 0.03-0.3 Cr, 1.0 Fe, 0.9 Si, bal Al.
For light alloy castings, heat treatable.

CERAMISEAL.
M-61, 48 Fe, 27 Ni, bal Co.
For ceramic-to-metal seals; high temperature applications; M.P. 2590°F.

CERAMVAR.
M-61; 48 Fe, 27 Ni, 25 Co.
For ceramic-to-metal seals.
Expansion characteristics match aluminum.

CERROBASE.
M-216; 55.5 Bi, 44.5 Pb.
Cast: 6200 TS; 4000 YS; 64 El; 10 Brin.
For molds, tube filler, proof casting forging dies; M.P. 123.5°C; formerly "Basaloy."

CERROBEND.
M-216; 50 Bi, 26.7 Pb, 13.3 Sn, 10 Cd.
Cast: 5990 TS; 200 El; 9.2 Brin.
For filler for bending tube, low melting solder, sealing glass to metal; formerly called Bendalloy, M.P. 158°F.

CERROCAST.
M-216; 40 Bi, 60 Sn.
Cast: 8000 TS, 200 El, 22 Brin.
For wax pattern molds; M.P. 281-338°F

CERRODENT.
M-216, 38.1 Bi, 26.4 Pb, 31.7 Sn, 2.65 Cd, 0.06 Cu
15 Brin.
For dental models, M.P 75-118°C

CERROLOW 105
M-216, 7.97 Sn, 42.91 Bi, 21.7 Pb, 5.09 Cd, 18-33 In, 4 Hg.
For fusible alloy, M.P. 100-110°F

CERROLOW 117
M-216; 44.7 Bi, 22.6 Pb, 8.3 Sn, 5.3 Cd, 19.1 In
Cast: 5400 TS, 1.5 El; 9-12 Brin
For low melting alloys, solders, fuses, eutectic alloy, M.P 117°F.

CERROLOW 117 B
M-216; 11.3 Sn, 44.7 Bi, 22.6 Pb, 5.3 Cd, 16.1 In.
For fusible alloy; M.P 117-126°F

CERROLOW 136
M-216, 49 Bi, 18 Pb, 12 Sn, 21 In.
Cast: 6300 TS, 50 El, 14 Brin.
For low melting alloys, solder, fuses, M.P 136°F, eutectic alloy

CERROLOW 136 B
M-216, 15 Sn, 49 Bi, 18 Pb, 18 In
For fusible alloy, M.P 136-156°F

CERROLOW 140
M-216, 12.6 Sn, 47.5 Bi, 25.4 Pb, 9.5 Cd, 5 In
For fusible alloy, M.P 134-149°F

CERROLOW 147
M-216, 12.77 Sn, 48 Bi, 25.63 Pb, 9.6 Cd, 4 In
Cast: 4950 TS, 13.5 El, 11 Brin
For thermal safety controls, M.P 142-149°F

CERROLOW 174.
M-216, 57 Bi, 17 Sn, 26 In
For safety devices, fusible elements, solder, M.P 174°F

CERROMATRIX
M-216, 48 Bi, 14.5 Sn, 28.5 Pb, 9 Sb
Cast. 13,000 TS, 1 El, 19 Brin
For dental alloys, fusible alloy for die amounting, expands on cooling; M.P 218-4407

CERROSAFE
M-216, 42.5 Bi, 37.7 Pb, 11.3 Sn, 8.5 Cd.
Cast: 5400 TS, 200 El; 9 Brin
For toy casting sets, formerly "Saffalloy", M.P 158-194°F

CERROSEAL 25
M-216; 50 In, 50 Cd.
In glass to glass or glass to metal seals, M.P. 227-462°F

CERROSEAL 35.
M-216; 50 Sn, 50 In.
For soldering glass to metal; M.P 250-260°F; useful in vacuum and low vapor pressure.

CERROTRU.
M-216; 58 Bi, 42 Sn.
Cast: 8000 TS; 200 El; 22 Brin.
For castings, molds, patterns; zero volume change from molten to solid state, M.P. 280°F.

CERTANIUM 250.
M-1600; Composite of an austenitic matrix plus TiC and CrC and Silicides.
For hard surfacing.
Resists high stress abrasion. Hard and tough electrode for AC and DC welding.

CESCO DIAMOND
M-356; 0.5 C, 0.85-1.0 Mn, 2.2 Si, 0.5 Mo, 0.25-0.35 V, bal Fe.
Heat treated: 320,500-231,600 TS; 259,400-185,700 YS, 2.5 El; 5-27 RA, 659 Brin.
For hollow and solid drills, concrete busters, hammer pistons, springs, shock resistant.

CESCO DIAMOND SPECIAL.
M-356, 0.50-0.65 C, 2.0 Si, 1.0 Mn, 0.6-0.7 Mo, 0.34-0.36 V, bal Fe.
Heat treated: 350,000 TS, 290,000 YS; 6 El, 11 RA, 615 Brin
For chisels, concrete busters, drills, caulking and beading tools, shock and abrasion resistant.

CESCO SPECIAL
M-356; 0.55 C, 1.0 Mn, 0.4 Mo, 0.35 V, 2.0 Si, bal Fe.
For tools; shock resistant

C.E.S NO 2.
M-440, 0.36-0.50 C, 16-23 Ni, 7-11 Cr, bal Fe
For heat and corrosion resistant parts, heat and corrosion resistant

CETAL
M-299; 6.5 Si, 3 Cu, 10 Zn, bal Al
Cast: 26,000-31,000 TS, 0.5-3.0 El, 65-90 Brin
For light alloy parts, non-hardenable

CETO
M-1549, 80 Th, 15 Al, 5 Mischmetal
For getters.
Absorbs gases

C.F.S
M-73, 0.9-1.3 C, 0.5 Cr, bal Fe
For dies, draw dies; water hardened.

CHACE NO 772
M-582, 18 Cu, 10 Ni, bal Mn
Treatment: 50% Red
105,000 TS, 90,000 YS, 8.5 El, 220 Brin.
Uses: high expansion, high resistivity, Max temp 600°F

CHACE NO 1050
M-582, 36 Ni, bal Fe/100 Cu/22 Ni, 3 Cr, bal Fe.
Thermostatic bimetal; Low electrical resistivity

CHACE NO 2400.
M-582, 36 Ni, bal Fe/22 Ni, 3 Cr, bal Fe.
Thermostatic bimetal, range 0-300°F

CHACE NO. 2500
M-582, 50 Ni, bal Fe/25 Ni, 3 Cr, bal Fe
Thermostatic bimetal, max temp 1000°F.

CHACE NO 3700.
M-582, 40 Ni, bal Fe/22 Ni, 3 Cr, bal Fe
For thermostatic bimetal; range 100-550°F

CHACE NO 4700
M-582; 38 Ni, 7 Cr, bal Fe/19 Ni, 7 Cr, bal Fe.
For thermostatic bimetal, corrosion resistant.

CHACE NO 6125
M-582, 36 Ni, bal Fe/100 Ni/22 Ni, 3 Cr, bal Fe.
For thermostatic bimetal; range 0-300°F

CHACE NO. 6150.
M-582, 36 Ni, bal Fe/100 Ni/22 Ni, 3 Cr, bal Fe.
Thermostatic bimetal, range 0-300°F.

CHACE NO. 6650.
M-582; 36 Ni, bal Fe/18 Cu, 10 Ni, bal Mn.
For thermostatic bimetal; high deflection.

CHACE NO. 6850.
M-582; 36 Ni, bal Fe/18 Cu, 10 Ni, bal Mn.
For thermostatic bimetal; high electrical resistivity.

CHAIN BRONZE.
U.S.; 4.9 Sn, 0.1 P, bal Cu.
Rolled 28,000-69,000 TS; 15,000-40,000 YS; 30-6 El.
For chains, springs, diaphragms; high strength, corrosion resistant.

CHAIN IRON.
Eng.; 0.10 max Mn, Si, bal Fe.
For chains for cranes, slings, hoists, steam shovels, marine uses, wrought iron.

CHAMAX 00 STEEL.
M-1116; 0.95, 4.5 Cr, 18 W, 0.7 Mo, 1.75 V, 5 Co, bal Fe.
Air or oil harden to 62-67.5 Rc.
For lathe tools, milling cutters, gear cutters.
AFNOR: Z 95 WK 18.05.

CHAMAX 11 STEEL.
M-1116; 0.82 C, 4.5 Cr, 18 W, 0.8 Mo, 1.75 V, 11 Co, bal Fe.
Air or oil harden to 63-67 Rc.
For lathe tools and drills for special jobs—higher speeds, higher temp, special alloys.
AFNOR: Z 85 WK 18.10.
US-AISI T5 or T6.
Germany: S 18 1 2.10 (E 18 Co 10); W. Nr 1.3265

CHAMAX CV STEEL.
M-1116; 1.55 C, 4.3 Cr, 12.5 W, 0.8 Mo, 5 V, 5 Co, bal Fe.
Air or oil harden to 62-68 Rc.
For tools for machining stainless steels, for punches for silicon sheets.
AFNOR: Z 150 WKV 12.05 05.
US-AISI T15.
Germany: S 12.1 4.5 (EV 4 Co); W. Nr. 1.3202.

CHAMAX CV. 11 STEEL.
M-1116; 1.65 C, 4.4 Cr, 12 W, 0.8 Mo, 5 V, 10 Co, bal Fe.
Air or oil harden to 62-69 Rc.
For lathe tools for finish cuts at high speeds; also for machining special materials.
AFNOR: Z 160 WKV 12.10 05.

CHAMAX STEEL.
M-1116; 0.82 C, 4.5 Cr, 18 W, 0.8 Mo, 1.75 V, 5 Co, bal Fe
Air or oil harden to 63-66 Rc.
For lathe tools, form tools, gear cutters, counter bores, planing tools.
AFNOR: Z 85 WK 18 05.
US-AISI T4.
Germany: S 18 1.2.5 (E 18 Co 5); W. Nr 1.3255

CHAMET BRONZE, TYPE A.
M-33; 60 Cu, 39.25 Zn, 0.75 Sn.
Annealed: 63,000 TS; 30,000 YS, 40 El.
Hard: 75,000 TS; 53,000 YS, 20 El
For welding rod, bolts, screws; resists sea water.

CHAMET BRONZE B
M-33; 62.25 Cu, 37.1 Zn, 0.65 Sn.
Drawn: 62,000 TS; 35,000 YS; 35 El
For rivets, screws, bolts; corrosion resisting.

CHAMET LEADED BRONZE.
U.S.; 38.5 Zn, 0.75 Pb, 0.75 Sn, bal Cu.
For fittings, pipes, hardware; free-cutting, high strength.

CHAMFERTRODE.
M-717.
For chamfering and grooving electrodes, (AC-DC) on ferrous or non-ferrous.

CHAMPAGNOLE B.S.2.
M-1116; 0.57 C, 0.3 Cr, 0.85 Mn, 1.9 Si, 0.2 V, 0.3 Mo, bal Fe.
Oil or water hardening tool steel; for stamps, cold working dies, pneumatic tools, cold cutting tools for thick metal, shock resisting tools.
AFNOR: 60 SMD 08.03; AISI S5.

CHAMPAGNOLE C7.
M-1116; 0.75 C, bal Fe.
For tools, springs, punches; water hardened.

CHAMPAGNOLE C.8.
M-1116; 0.75 C, 0.5 Cr, 0.25 Mn, 0.25 Si, bal Fe.
Water hardening tool steel, for hand or pneumatic engraving tools, riveting hammers, masonry tools.
AFNOR: XC 80; AISI W5

CHAMPAGNOLE C 8 V M
M-1116, 0.80 C, 0.5 Cr, 0.4 Mn, 0.4 Si, 0.25 V, 0.25 Mo, bal Fe
Water hardening tool steel; for engraving tools, stamps, anvils, shock resisting hand and pneumatic tools
AFNOR: 80 CDV 02, AISI W 2.

CHAMPAGNOLE C9
M-1116; 0.95 C, bal Fe
For tools, springs, cutters, drills; water hardened.

CHAMPAGNOLE C10
M-1116; 1.1 C, bal Fe.
For tools, taps, water hardened

CHAMPAGNOLE C 12
M-1116, 1.2 C, 0.5 Cr, 0.25 Mn, 0.25 Si, bal Fe
Water or oil hardening tool steel, for files, rasps, threading tools, cutters for wood and paper, fine cutlery
AFNOR. XC 120, AISI W5

CHAMPAGNOLE Cr 3
M-1116; 1.35 C, 4.0 Cr, 0.5 Mn, 0.25 Si, 0.4 Mo, bal Fe
Oil hardening tool steel, for files, shears, plane blades, lock laminations
AFNOR: 130 C 16.

CHAMPAGNOLE Cr 5
M-1116; 1.0 C, 5.0 Cr, 0.5 V, 1.1 Mo, 0.6 Mn, 0.3 Si, bal Fe
Air or oil hardening tool steel; for stamping and drawing dies, shears, cold forming tube dies.
AFNOR: Z 100 CDV 05; AISI A2.

CHAMPAGNOLE Cr 5 T M
M-1116, 0.35 C, 5.0 Cr, 1.4 W, 0.4 V, 1.4 Mo, 0.25 Mn, 1.0 Si, bal Fe
Air or oil hardening tool and die steel, for hot work forming and forging
AFNOR: Z 35 CDWVS 05, AISI H12.

CHAMPAGNOLE Cr 5 T M S.
M-1116, 0.50 C, 4.7 Cr, 1.1 W, 0.35 V, 1.2 Mo, 0.3 Mn, 0.8 Si, bal Fe.
Air or oil hardening tool steel, for hot and cold working shear blades, dies, ejectors, bending tools, forming tools.
AFNOR: Z 50 CDWVS 05.

CHAMPAGNOLE Cr.5.V.4.
M-1116; 1.15 C, 5.0 Cr, 3.9 V, 1.1 Mo, 0.4 Mn, 1.0 Si, bal Fe
Air or oil hardening tool steel; for stamping and drawing dies requiring good abrasive wear, for crushers and grinders in stone and gravel work.
AFNOR: Z 110 CVDS 05.04.

CHAMPAGNOLE Cr.5.V.6.
M-1116; 1.42 C, 6.25 Cr, 5.9 V, 1.0 Mo, 0.3 Mn, 1.0 Si, bal Fe.
Air or oil hardening tool and die steel; for stamping silicon laminations, and abrasive materials.
AFNOR: Z 135 CVDS 06.06.

CHAMPAGNOLE Cr.5.V.M.
M-1116; 0.35, 5.5 Cr, 1.0 V, 1.1 Mo, 0.3 Mn, 1.0 Si, bal Fe.
Air or oil hardening tool and die steel; for hot work stamping copper and copper alloys; molds for plastics.
AFNOR: Z 35 CDVS 05; AISI H13.

CHAMPAGNOLE Cr.8 V 3.
M-1116; 0.83 C, 8.0 Cr, 2.5 V, 1.5 Mo, 0.3 Mn, 1.0 Si, bal Fe.
Air hardening tool and die steel; for cutting and shaping tools, shears.
AFNOR: Z 85 CVDS 08.03.

CHAMPAGNOLE Cr.12.
M-1116; 1.15 C, 1.3 Cr, 0.5 Mn, 0.25 Si, bal Fe.
Oil or water hardening tool steel; for drills threading and tapping tools, hand reamers.
AFNOR: 110 C5; AISI L3.

CHAMPAGNOLE Cr.E
M-1116; 2.0 C, 12.5 Cr, 1.0 W, 0.3 V, 0.3 Mo, 0.5 Mn, 0.4 Si, bal Fe.
Air or oil hardening tool steel; for Zendzimir rolls, wood working tools, brick making tools
AFNOR: Z 200 CW 13; AISI D3.

CHAMPAGNOLE Cr.E.4 V
M-1116, 2.30 C, 12.5 Cr, 4.1 V, 1.1 Mo, 0.7 Mn, 0.4 Si, bal Fe.
Oil or air hardening tool and die steel, for punches, shears, cutting tools for abrasive materials; work in sand and gravel
AFNOR. Z 230 CVD 13.04; AISI D7.

CHAMPAGNOLE Cr.E 15
M-1116; 1.55 C, 12.0 Cr, 0.8 V, 0.8 Mo, 0.25 Mn, 0.3 Si, 0.8 Co, bal Fe.
Air or oil hardening tool and die steel; for stamping dies for silicon laminations, swaging dies, gages
AFNOR. Z 155 CDVK 12; AISI D2.

CHAMPAGNOLE CRED.
M-1116; 2.25 C, 13 Cr, bal Fe
For tools, dies, punches; non-deforming.

CHAMPAGNOLE Cr.N.O
M-1116; 0.38 C, 1.6 Cr, 3.7 Ni, 0.3 Mo, 0.4 Mn, 0.3 Si, bal Fe.
Deep hardening alloy steel, air or oil hardening. For cold forming tools, cold-heading and rivet sets.
AFNOR: 35 NCD 15.

CHAMPAGNOLE Cr. T.
M-1116; 0.50 C, 0.7 Cr, 2.0 W, 0.15 V, 0.35 Mo, 0.35 Mn, 0.5 Si, bal Fe.
Oil or water hardening tool steel; for pneumatic tools, riveting hammers, chisels.
AFNOR: 50 WCS 20.03; AISI S1.

CHAMPAGNOLE C.W.3.
M-1116; 1.25 C, 3.0 W, 0.4 max Mn, 0.3 Si, bal Fe.
Water hardening tool steel; for dies for cartridge cases, threading brass and stamping light alloys and thin steel sheet.
AFNOR: 125 W30; AISI F2.

CHAMPAGNOLE D.C.33.
M-1116; 0.32 C, 3.0 Cr, 0.5 V, 2.6 Mo, 0.3 Mn, 0.3 Si, bal Fe.
Air or oil hardening tool and die steel; for hot work forging dies, shears and saws.
AFNOR: 32 CDV.12.30; AISI H10.

CHAMPAGNOLE T1.
M-1116; 0.5 C, 1.5 Cr, 2.2 W, 0.25 V, bal Fe.
For hot work tools and dies; hot work steel.

CHAMPAGNOLE T.2.
M-1116; 0.35 C, 2.3 Cr, 3.0 W, 0.2 V, 0.3 Mo, 0.3 Mn, 0.3 Si, bal Fe,
Oil hardening tool and die steel; for press and forging dies, shears, rivet hammers.
AFNOR: 35 WCD 30.10.

CHAMPAGNOLE T3.
M-1116; 1.3 C, 4.5 Cr, bal Fe.
For tools, dies; air or oil hardened.

CHAMPAGNOLE T5.
M-1116, 1.3 C, 4.5 Cr, bal Fe.
For tools, dies; air or oil hardened.

CHAMPAGNOLE T.6.
M-1116; 0.33 C, 3.0 Cr, 10.5 W, 0.4 V, 0.4 Mo, 0.3 Mn, 0.3 Si, bal Fe.
Air or oil hardening tool and die steel; for hot forging, thread rolling dies, extrusion dies for brass and bronze.
AFNOR: Z 30 WC 10.03; AISI H21/22.

CHAMPAGNOLE T.35.
M-1116, 1.03 C, 0.7 Cr, 3.7 W, 0.3 V, 0.4 Mo, 0.55 Mn, 0.3 Si, bal Fe.
Oil hardening tool steels; for drills, boring tools, taps, threading tools.
AFNOR: 100 WC 35.03; AISI F2.

CHAMPAGNOLE T C 12.
M-1116, 0.33 C, 12 Cr, 12 W, 1.0 V, 0.3 Mn, 0.5 Si, bal Fe.
Air or oil hardening tool and die steel; for extrusion dies, hot forging and threading dies; molds for brass and bronze castings.
AFNOR: Z 35 WCV 12.12; AISI H23.

CHAMPAGNOLE T C K.610.
M-1116; 0.20 C, 10.0 Cr, 6.5 W, 2.0 Mo, 0.3 Mn, 0.4 Si, 10.0 Co, bal Fe.
Air or oil hardening tool and die steel; for hot extrusion dies; withstands hot contact for longer time
AFNOR: Z 20 CKWD 10.10 07.02.

CHAMPAGNOLE T.E D.C. STEEL
M-1116; 0.80 C, 4.2 Cr, 12.5 W, 1.8 Mo, 1.8 V, 1.2 Co, bal Fe
Air or oil harden to 63-66 Rc
For twist drills, reamers, taps, cutters
AFNOR: Z 80 WDVK 12.02.02.

CHAMPAGNOLE T.E.D. CV STEEL.
M-1116; 1.3 C, 4.3 Cr, 12 W, 0.9 Mo, 4 V, bal Fe.
Air or oil harden to 63-66 Rc.
For slotting tools, gear cutters, form cutters, punches.
AFNOR: Z 130 WVD 12 04 01
Germany: S 12.1.4 (EV 4) W.Nr. 1.3302.

CHAMPAGNOLE T.E.M. 00 STEEL.
M-1116; 1.0 C, 4.2 Cr, 6.5 W, 5 Mo, 1.9 V, bal Fe.
Air or oil harden to 63-66 Rc.
For twist drills, reamers, lathe cutters, broaches.
AFNOR: Z 100 WDV 06.05.02.
US-AISI M2 (high carbon) high speed steel.

CHAMPAGNOLE T.E.M.02.C. STEEL.
M-1116; 1.0 C, 4.2 Cr, 6.5 W, 5 Mo, 1.9 V, 2 Co, bal Fe.
Air or oil harden to 63-67 RC.
For drills, reamers, lathe cutting tools, taps, gear cutters.
AFNOR: Z 100 WDVK 06.05. 02.02.

CHAMPAGNOLE T.E.M.02.V. STEEL.
M-1116; 1.08 C, 4.2 Cr, 6.3 W, 5.3 Mo, 2.4 V, bal Fe.
Air or oil harden to 62-67 Rc.
For drills, taps, threading form tools, lathe tools, hobs, broaches.
AFNOR: Z 110 WDV 06.05.02
US-AISI M3(1).

CHAMPAGNOLE T.E.M 03.V. STEEL.
M-1116; 1.2 C, 4.0 Cr, 6.3 W, 5 Mo, 3 V, bal Fe.
Air or oil harden to 62-66.5 Rc.
For drills, reamers, gear cutters, broaches, lathe tools, thread chasers
AFNOR· Z 120 WDV 06.05.03.
US-AISI M 3(2).
Germany: S 6 5.3(EMo5V3); W.nr 1.3344.

CHAMPAGNOLE T.E.M.05.C STEEL.
M-1116; 1.0 C, 4.3 Cr, 7.7 W, 5 Mo, 2.3 V, 5 Co, bal Fe.
Air or oil harden to 63-67 Rc.
For drills, taps, reamers, turning tools for machining hard metals.
AFNOR: Z 100 WDKV 07.05.05.02.
US-AISI M41.

CHAMPAGNOLE T.E.M.08.C. STEEL.
M-1116; 1.1 C, 4 Cr, 5 W, 6.7 Mo, 2 V, 8 Co, bal Fe.
Air or oil harden to 63-69 Rc.
For drills and lathe tools machining abrasive materials; for finish cuts.
AFNOR: Z 110 KDWV 08 07.05.02.

CHAMPAGNOLE T.E.M 60
M-1116; 0.60 C, 4.0 Cr, 6.5 W, 5.0 Mo, 1 9 V, 0.3 Mn, 0.3 Si, bal Fe.
Air or oil hardening tool and die steel;
for cold extrusion dies; for hot forming dies.
AFNOR: Z 60 WDCV 06.05.04.02; AISI H42.

CHAMPAGNOLE T.E.M C. STEEL.
M-1116; 0 85 C, 4.3 Cr, 6.5 W, 5 Mo, 1.9 V, 5 Co, bal Fe.
Air or oil harden to 62-67 Rc.
For drills and lathe tools for special work, high temperature, high speeds, special alloys.
AFNOR: Z 85 WDKV 06 05 05.02.
US-AISI M 35
Germany: S 6 5.2.5(EMo 5 Co 5), W.nr 1.3243.

CHAMPAGNOLE T.E M.CV. STEEL.
M-1116; 1.57 C, 4.3 Cr, 6.7 W, 5 Mo, 4.8 V, 5 Co, bal Fe.
Air or oil harden to 62-68 Rc.
For high speed finish cutting, particularly on hard and tough materials as stainless steels
AFNOR: Z 150 WDKV 06.05.05.05.
US-AISI-M15.

CHAMPAGNOLE T.E.M CV.11 STEEL
M-1116; 1.65 C, 4.3 Cr, 6.8 W. 5.3 Mo, 4.8 V, 11 Co, bal Fe.
Air or oil harden to 62-69 Rc.
For tool bits for finishing and high speed machining of stainless steels, and non-metallics.
AFNOR: Z 160 KWDV 10.06.05.05.

CHAMPAGNOLE T.E.M.V. STEEL.
M-1116; 1.28 C, 4.3 Cr, 5.6 W, 4.6 Mo, 4 V, bal Fe.
Air or oil harden to 63-66.5 Rc.
For drills, reamers, finish cutting lathe tools, by special temper for punches, files, chisels.
AFNOR: Z 130 WDV 06.05.04.
US-AISI M4.

CHAMPAGNOLE T.E M.V. 11 STEEL.
M-1116; 1.25 C, 4.3 Cr, 7.5 W, 6.3 Mo, 3 V, 11 Co, bal Fe.
Air or oil harden to 62-69 Rc.
For form tools, lathe tools, climb milling cutters for machining hard and tough steels.
AFNOR: Z 125 KWDV 11.08 06.03.
Germany: S 10.4.3.10(EW9Co10); W.nr 1.3207.

CHAMPAGNOLE T.S.R.
M-1116; 1.05 C, 0.85 Cr, 0 9 W, 0.15 V, 0.15 Mo, 0 95 Mn, 0.25 Si, bal Fe
Oil (or salt bath) hardening tool steel; for drills, cutting tools, forming tools, gages.
AFNOR: 100 MCW 04; AISI 01.

CHAMPAGNOLE T V.K 45.
M-1116; 0.40 C, 4.5 Cr, 4.5 W, 2 2 V, 0.4 Mo, 0.3 Mn, 0 3 Si, 4 5 Co, bal Fe
Air or oil hardening tool and die steel; for hot forging and thread rolling copper, brass and steel; hot punches, molds for brass.
AFNOR· Z 35 WKCV 05 05.04 02, AISI H 19.

CHAMPALOY
M-38, 0 75 C, 1.5 Ni, 0 75 Cr, 0 3 Mo, bal Fe.
Heat treated 208,000 TS, 180,000 YS; 450 Brin.
For tools, collets, jigs, shear blades, rolls; oil hardening.

CHAMPION 2.
M-712, 0 10 max C, 2 Cr, 0 5 Mo, bal Fe.
Welded: 70,000-75,000 TS, 35-30 El.
For welding rods for low alloy steels, subject to air hardening

CHAMPION 9.
M-712; 0 1 max C, 9 Cr, 0 5 Mo, bal Fe.
Welded 90,000-95,000.
For welding rods for low Cr alloys, high creep resistance

CHAMPION C-30.
M-712, 0.22-0.26 C, 0 45 Mn, 0 4-0 6 Mo, 0.10-0.15 V, bal Fe
Welded 215 Brin
For welding electrodes, for worn surfaces, wear resistant

CHAMPION NO 59
M-712; 3 C, 4 Cr, 4 Mo, bal Fe
550 Brin
For hard surfacing electrodes; for high carbon and manganese steel, abrasion resistant

CHAMPION 255
M-1683; 0 6 C, 0 8 Mn, 2.0 Si, 0.2 Cr, 0.2 Mo, 0 2 V, bal Fe.
Annealed· 107,000 TS; 64,000 YP; 27 El; 212 Brin.
Oil hardened. 145,000-340,000 TS; 127,000-283,000 YP, 5-24 El, 20-44 RA, 293-611 Brin.
For shear blades, pneumatic tools, punches, caulking tools.
Type S5 shock resisting tool steel. Oil or water hardening.

CHAMPION 308.
M-712; 0.07 max C, 18.5-20.0 Cr, 10.5-11.25 Ni, bal Fe.
Welded: 85,000-95,000 TS; 50-40 El.
For welding rods for stainless steel; stainless, austenitic; Type 308.

CHAMPION 309.
M-712; 0.10 max C, 22.5-24.0 Cr, 13-14 Ni, bal Fe.
Welded: 85,000-95,000 TS; 45-35 El.
For welding rods for stainless steel; resists oxidation to 2000°F; Type 309.

CHAMPION 309 CB.
M-712; 0.10 max C, 22.5-24.0 Cr, 13-14 Ni, 0.8-1.0 Cb, bal Fe.
Welded: 85,000-95,000 TS; 40-30 El.
For welding rods for stainless steel; prevents carbide ppt., austenitic.

CHAMPION 310.
M-712; 0.09-0.17 C, 25.0-26.5 Cr, 20-21 Ni, bal Fe.
Welded: 85,000-95,000 TS; 45-35 El.
For welding rods for 5% Cr steel, will not air harden, austenitic.

CHAMPION 310 CB.
M-712; 0.10 max C, 25.0-26.5 Cr, 20-21 Ni, 0.8-1.0 Cb, bal Fe.
Welded: 85,000-95,000 TS; 40-30 El.
For welding rods for stainless steel; resists carbide ppt., stabilized.

CHAMPION 310 Mo.
M-712; 0.10 max C, 25.0-26.5 Cr, 20-21 Ni, 2.0-2.5 Mo, bal Fe.
Welded: 85,000-95,000 TS; 45-35 El.
For welding rods for stainless steel; acid resistant, stainless, austenitic.

CHAMPION 316.
M-712, 0.07 max C, 17.5-19.0 Cr, 12.5-13.5 Ni, 2.0-2.5 Mo, bal Fe.
Welded: 85,000-95,000 TS; 50-40 El.
For welding rods for stainless steel, acid resistant, austenitic.

CHAMPION 316 CB
M-712, 0.07 max C, 17.5-19.0 Cr, 12.5-13.5 Ni, 2.0-2.5 Mo, 0.5-0.75 Cb, bal Fe.
Welded: 85,000-95,000 TS; 45-35 El.
For welding rods for stainless steel, stabilized, stainless.

CHAMPION 317.
M-712; 0.07 max C, 17.5-19.0 Cr, 12.5-13.5 Ni, 3.5-4.0 Mo, bal Fe
Welded: 85,000-95,000 TS, 50-40 El
For welding rods for stainless steel, stainless, austenitic.

CHAMPION 330.
M-712, 0.15 max C, 14.5-16.0 Cr, 34-35 Ni, bal Fe
Welded 65,000-70,000 TS; 30-25 El.
For welding rods for furnace construction; heat resistant.

CHAMPION 347.
M-712, 0.07 max C, 18.5-20.0 Cr, 10.5-11.25 Ni, 0.75-1.00 Cb, bal Fe.
Welded: 85,000-95,000 TS; 45-35 El.
For welding rods for stainless steel, stabilized, stainless; Type 347.

CHAMPION 410.
M-712; 0.10 max C, 12.0-13.5 Cr, 0.40-0.65 Mo, bal Fe.
Welded: 85,000-95,000 TS, 35-30 El.
For welding rods for oil refinery vessels; corrosion and heat resistant.

CHAMPION 430.
M-712; 0.10 max C, 15.25-16.75 Cr, bal Fe.
Welded: 75,000-80,000 TS, 35-30 El.
For welding rods to resist HNO_3; corrosion resistant.

CHAMPION 442.
M-712; 0.10 max C, 17.5-19 Cr, bal Fe.
For welding rods for high temperature applications; corrosion and heat resistant.

CHAMPION 446.
M-712; 0.13 max C, 27-28.5 Cr, bal Fe.
For welding rods for high temperature applications; resists oxidation at high temperature.

CHAMPION 502.
M-712; 0.10 max C, 4.5-6 Cr, 0.4-0.65 Mo, bal Fe.
For welding rods for oil refinery equipment; corrosion resistant.

CHAMPION DOUBLE SPECIAL.
U.S.; 1.22 C, 0.25 Mn, 7.53 W, bal Fe.
For tools, dies; oil hardening.

CHAMPION EXTRA.
M-38; 1.2 C, 1.25 W, 0.3 Cr, bal Fe.
For cutters, broaches, drills; oil hardening

CHAMPION GRAY DEVIL NO. 2.
M-712; 0.09 C, 0.35 Mn, bal Fe.
Welded: 78,000 TS; 67,000 YS; 24 El; 45 RA.
For welding rod; flux coated, E 6012.

CHAMPION HW1.
M-1683; 0.35 C, 5.0 Cr, 0.4 V, 1.5 W, 1.5 Mo, bal Fe.
Hot work tool steel, air or oil hardening, for forging and hot forming dies; AISI H12.

CHAMPION HW3.
M-1683; 0.35 C, 1 Si, 5 Cr, 1 V, 1.5 Mo, bal Fe.
Annealed. 98,000 TS, 74,000 YS; 28 El; 210 Brin.
Hardened: 135,000-290,000 TS; 100,000-228,000 YS; 3-16 El; 7-48 RA; C 27-55 Rock.
For forging and heading dies, compression tools, die casting dies, piercing and forming punches, bolt and swaging dies
Type H13 hot work steel, red-tough, shock and impact resistant.

CHAMPION HW21.
M-1683, 0.35 C, 3.5 Cr, 9.0 W, bal Fe.
Hot work tool steel, air or oil hardening, tungsten type; for hot forming operations. AISI H21.

CHAMPION S1.
M-1683; 0.50 C, 1.5 Cr, 2.5 W, bal Fe.
Oil hardening tool steel, shock resisting type.
AISI Type S1 shock resisting tool steel.

CHAMPION TOOL
U.S.; 0.77 C, 0.18 Mn, bal Fe
For tools, punches, water hardening.

CHAMPLAIN.
M-207, 0.90 C, 0.50 W, 0.50 Cr, 1.2 Mn, 0.2 V, bal Fe
Heat treated 170,000-280,000 TS; 155,000-272,000 YS; 2-4 El, 2-18 RA; 335-535 Brin.
For dies, knives, guides, shear blades, vise jaws, forming rolls
Oil hardening, non-deforming, tough

CHANNELER.
M-377; 1.0 C, 0.5 Mn, bal Fe
For stone cutting tools, augers, paving drills; water hardening.

CHANNELLER.
M-24; 0.80 C, 0.40 Mn, 0.30 Si, bal Fe.
For cutting soft stone, marble, limestone.
Type W1 water hardening too steel.

CHARDON-S.
M-1546; 0.60-1.10 C, bal Fe.
Annealed 100,000 TS, 52,000 YS; 20 El, 200 Brin.
Water hardened: 185,000-220,000 TS; 125,000-155,000 YS; 32-37 RA; 11-13 El; 330-600 Brin.
Uses: Tools, cutters, hammers, chisels, punches.
Water hardening, Type W1 tool steel.

CHARLES LEONARD.
M-261; 0.7-1.0 C, 0.3 Mn, 0.3 Si, bal Fe.
For tools, cutters, drills; water hardened; Type W1.

CHAR-PAC.
M-604; 0.17 C, 1.25 Mn, 0.35 Si, 0.25 Cu, 0.15 Ni, 0.12 Cr, 0.04 Mo, bal Fe.
Heat treated: 60,000 min YS; 80,000-100,000 TS; 15 min Charpy.
Normalized: 70,000-95,000 TS; 50,000 min YS.
For storage tanks, penstocks, bridges and buildings, pressure vessels.
Heat treated carbon steel plates.

CHARPY ALLOY.
Eng.; 5.6 Cu, 83.3 Sn, 11.1 Sb.
For bearings; Babbitt.

CHARPY PHOSPHOR BRONZE.
U.S.; 12.2-13.4 Sn, 0.4 P, bal Cu.
For bearings, gears, bushings; heavy duty.

CHASE ALLOY NO. 58.
M-33; 96.68 Cu, 1.1 Ni, 0.22 P.
Rolled: 88,000-110,000 TS; 80,000-100,000 YS.
For springs, electric conductors; now Phosnic Bronze.

CHASE 50 Re-50 Mo.
M-33; 47.5-48.5 Re, 51.5-52.5 Mo
Recrystallized: 150,000 TS; 123,000 YS; 16-20 El; 350 VHN.
Wrought: 240,000 TS; 210,000 YS, 600 VHN.
For electron tube components, high temperature furnace parts, nuclear and space propulsion and power generation systems, crucibles, thermocouple protection tubes. High strength and ductility to 4200°F.

CHASE 75W-25 Re.
M-33; 24.5-25.5 Re, 74.5-75.5 W.
Recrystallized: 190,000 TS.
Wrought: 310,000 TS.
For electron tube components, thermocouples, cathodes, resistance heating elements, nuclear reactor parts, high temperature furnaces
High strength and ductility to 3600°F.

CHASE "444" BRONZE.
M-33; 88 Cu, 4 Pb, 4 Sn, 4 Zn.
Rolled: 50,000-90,000 TS; 25,000-60,000 YS; 35-7 El.
For bearings, condenser tubes; corrosion resistant to brine, alkalis.

CHASE ADMIRALTY BRASS
M-33; 71 Cu, 1.0 Sn, 28 Zn.
Annealed: 60,000 TS; 47 El.
For condenser tubing and pipe; corrosion resistant

CHASE ARCHITECTURAL BRONZE.
M-33; 58 Cu, 3 Pb, 39 Zn.
Extruded: 60,000 TS; 22,000 YS, 25 El.
For extruded architectural shapes, hot workable.

CHASE BRIGHT EXTRUDED BRONZE.
M-33; 58.5 Cu, 38.7 Zn, 2.5 Pb, 0.3 Al.
Extruded: 62,000 TS; 24,000 YS, 20 El.
For architectural sections; free-cutting.

CHASE CUPRO-NICKEL, 30%.
M-33; 68.8 Cu, 30 Ni, 0.75 Mn, 1.45 Fe.
Annealed: 54,000 TS; 18,000 YS; 55 El.
For condenser tubes, heat exchange tubes; corrosion resistant to alkalis, sea water.

CHASE FORGING BRASS.
M-33; 59.75 Cu, 2 Pb, bal Zn.
Forged: 50,000-60,000 TS; 20,000-35,000 YS; 40-20 El.
For central forgings; hot workable.

CHASE FREE CUTTING BRASS.
M-33; 62 Cu, 3.25 Pb, bal Zn.
Annealed: 49,000 TS; 18,000 YS; 53 El.
Hard-20%: 63,000 TS; 48,000 YS; 20 El.
For screw machine work; free cutting.

CHASE HIGH LEADED BRASS.
M-33; 64 Cu, 2 Pb, 34 Zn.
Hard rolled: 75,000 TS; 60,000 YS; 7 El.
For stampings, meter and clock parts; free milling.

CHASE HIGH STRENGTH TANK BRASS.
M-33; 30 Zn, bal Cu.
Rolled: 53,000 TS; 20,500 YS; 52 El; 68 Brin.
For tanks, radiators; high yield strength, good drawability.

CHASE MANGANESE BRONZE
M-33; 58.0 Cu, 1.0 Sn, 38.9 Zn, 1.0 Fe, 0.1 Mn.
Annealed: 65,000 TS, 30,000 YS; 33 El.
Hard-15%: 82,000 TS; 60,000 YS; 25 El.
For high strength bolts; tough.

CHASE NICKEL SILVER (12%).
M-33; 64 Cu, 12 Ni, 24 Zn.
Annealed: 58,000 TS; 40 El
Hard drawn: 105,000 TS; 7 El.
For extruded shapes for architectural purposes; corrosion resistant.

CHASE TELNIC BRONZE.
M-33, 98.3 Cu, 1.1 Ni, 0.22 P, 0.5 Te, bal Zn.
Drawn hard 72,000 TS, 62,000 YS, 27 El; 50 RA.
Heat treated: 58,000 TS; 38,000 YS.
For forgings and screw machine parts; heat treatable.

CHATEAUGAY LOW PHOSPHORUS PIG IRON
M-257, 4.0 C, 0.75-4.05 Si, 0.1-2.0 Mn, 0.035 max. S and P, bal Fe
For casting rolls, gears, cylinders, steel and iron; produced from New York State ores

CHATILLON 709.
M-1486, 0.21 max C, 0.85-1.2 Cr, 0.9-1.1 Mo, 0.15-0.30 V, bal Fe
Heat treated 105,000-178,000 TS, 92,400-106,000 YS, 17-8 El
For steam turbine rotors and stators, high temperature bolts; creep resistant, structural steel

CHATILLON 3100
M-1117, 0.12 max C, 14-18 Cr, Mo, bal Fe
Annealed: 65,000-90,000 TS, 40,000-55,000 YS; 20-35 El; 40-60 RA; 130-160 Brin.
For hardware, fittings, oil burners, fasteners, storage tanks
Type 430 Mo stainless steel.

CHATILLON 3308.
M-1117, 0.08 max C, 17-19 Cr, 9-12 Ni, Ti, bal Fe.
Annealed. 85,000 TS, 35,000 YS; 55 El; B 80 Rock
Cold drawn. 95,000 TS; 60,000 YS; 40 El, B 90 Rock.
For exhaust stystems, oil refinery equipment, welded structures, superheaters
Type 321 stainless steel, stabilized, welding quality.

CHATILLON 3333.
M-1117; 0.15 max C, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed· 90,000 TS; 40,000 YS, 50 El; B 85 Rock.
Cold rolled: 150,000 TS; 110,000 YS, 30 El, B 100 Rock.
For chemical and pharmaceutical plant equipment, valve trim, food handling equipment.
Type 302 stainless steel, austenitic.

CHATILLON 3400.
M-1117; 0.08 max C, 16-18 Cr, 10-14 Ni, 2-4 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; B 80 Rock.
Cold rolled: 150,000 TS; 135,000 YS; 6 El; C 30 Rock.
For chemical plant equipment, agitators, digesters, valve trim, evaporators.
Type 18-8 Mo stainless steel, austenitic, acid resistant

CHATILLON 3408.
M-1117; 0.08 C, 17 Cr, 12 Ni, Mo, Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; B 82 Rock.
Cold rolled: 130,000 TS; 90,000 YS; 30 El; B 100 Rock.
For chemical plant equipment, agitators, welded structures.
Type 18-8 Mo Ti stainless steel, austenitic, welding grade

CHATILLON 5250.
M-1117; 0.95 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies, cutters; non-deforming.

CHATILLON 5650.
M-1117; C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe.
For hot work tools and dies, hot work steel

CHATILLON 5654.
M-1117; C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe.
For hot work tools and dies, hot work steel.

CHATILLON 5655.
M-1117; C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe.
For hot work tools and dies, hot work steel

CHATILLON 5755
M-1117, C, 19 W, 4 Cr, 2.2 V, bal Fe
For tools, dies, cutters, high speed steel.

CHATILLON 5815
M-1117, C, 18 W, 5 Co, 4 Cr, 1.3 V, bal Fe.
For tools, dies, cutters; high speed steel

CHATILLON 5820
M-1117, C, 18 W, 9 Co, 4 Cr, 2 V, bal Fe
For tools, dies, cutters, high speed steel

CHATILLON 5830
M-1117, 0.5 C, 1.5 Cr, 2.2 W, 0.2 V, bal Fe.
For tools, dies, hot work steel.

CHATILLON MF NO 1
M-1117; 2.25 C, 13 Cr, bal Fe
For tools, dies; non-deforming

CHATILLON MN Si
M-1117; 0.5 C, 0.7 Mn, 1.8-2.0 Si, bal Fe.
For tools, dies, punches; tough.

CHATILLON TSM NO. 2.
M-1117; 1.3 C, 4.5 Cr, bal Fe.
For tools, dies, air hardened.

CHATILLON W 18.
M-1117, C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, dies, cutters, high speed steel.

CHECK BRASS.
U.S.; 62 Cu, 38 Zn.
For fixtures, name plates; yellow brass.

CHECKNO.
M-334; 0.4 C, 3.5 Cr, 1 V, 8 W, bal Fe
For tools, hot working dies, punches; hot work steel.

CHECKNO NO. 1.
M-334; 0.45 C, 13.25 W, 3.5 Cr, bal Fe.
For extrusion dies and liners; oil hardened, hot work steel.

CHECKNO NO. 2.
M-334; 0.35 C, 3.5 Cr, 11 W, 0.45 V, bal Fe.
For extrusion dies and liners, punches; oil hardened, hot work steel.

CHECKNO NO. 3.
M-334; 0.28 C, 3.25 Cr, 8.5 W, 0.3 V, bal Fe.
For extrusion dies and liners, punches; oil hardened, hot work steel.

CHECKWATE 8.
M-1; 0.10 C, 1.0-2.0 Mn, 0.04 max P, 0.03 max S, 1.0 max Si, 18.5-21.5 Cr, 23.0-26.0 Ni, 1.75-2.75 Mo, bal Fe.
For balance weights Vacuum consumable electrode melted. Stainless, austenitic, non-magnetic.

CHECO.
U.S.; 89 Ag, 10 Sn, 1 Pt.
For dentures.

CHEMALLOY.
M-76; Cu, Mg, bal Zn.
For bearings, die castings; corrosion resistant.

CHEMALLOY A28.
M-47; C, 18-20 Cr, 8-10 Ni, bal Fe.
Cast: 75,000 TS; 35,000 YS; 50 El; 60 RA; 150 Brin.
For valves, pumps, condensers, anchors, conveyors; corrosion resistant.

CHEMALLOY A28C.
M-47, C, 18-20 Cr, 8-10 Ni, Cb, bal Fe
Cast: 80,000 TS; 35,000 YS; 45 El, 55 RA; 160 Brin.
For valve parts, pumps, anchors, condensers; for welded sections, corrosion resistant.

CHEMALLOY A28M.
M-47; C, 18-20 Cr, 8-10 Ni, 2-3 Mo, bal Fe.
Cast: 75,000 TS; 30,000 YS; 45 El; 60 RA, 170 Brin.
For valves, pumps, piping, retorts, condensers; resists acid pitting, corrosion resistant.

CHEMALLOY F6.
M-47, C, 4.5-6 Cr, 0.5 Mo, bal Fe.
Cast: 110,000 TS, 75,000 YS, 20 El; 40 RA; 230 Brin.
For dies, molds, valve trim, steam turbines, heat resistant to 1250°F.

CHEMALLOY F12.
M-47; C, 11-14 Cr, bal Fe
Cast: 95,000 TS, 75,000 YS; 25 El, 45 RA; 225 Brin.
For valve parts, gears, pumps, impellers, dies; heat resistant.

CHEMALLOY H2
M-47; 29 Mo, 6 Fe, bal Ni
Cast: 80,000 TS; 55,000 YS; 8 El; 210 Brin.
For pumps, valves, condensers, fittings, resists boiling HCl and H_3PO_4

CHEMALLOY H3.
M-47; 14 Cr, 16 Mo, 4 W, 6 Fe, bal Ni
Cast: 75,000 TS; 45,000 YS; 12 El; 195 Brin.
For valves, pumps, condensers, fittings, cylinder liners; resists free Cl_2 hypochlorites, sulphurous acid.

CHEMALLOY N1.
M-47; 15 Ni, 6 Cr, 2 Cu, bal Fe.
Cast: 30,000 TS; 12,000 YS, 150 Brin.
For pumps, valves, chains, filters, fittings, pump seals; corrosion resistant to alkalis; Ni-Resist Type 1

CHEMALLOY N4
M-47; 30 Ni, 5 Cr, 5 Si, bal Fe.
Cast: 30,000 TS; 15,000 YS; 165 Brin.
For valves, pumps, fittings, filters, rolls; stain resistant.

CHEMBRITE A608.
M-663; 0.10 C, 1.9 Mn, 0.68 Si, 0.06 Ni, 0.5 Mo, bal Fe.
Low alloy bare wire for machine welding to give welds of about 100,000 psi TS.
AWS E 70 S-1B.

CHEMBRITE A675.
M-663; 0.12 C, 1.19 Mn, 0.59 Si, bal Fe.
Bare mild steel welding wire for CO$_2$ and inert gas shielded arc welding.
AWS E 70 S-3.

CHEMBRITE A681.
M-663; 0.11 C, 1.64 Mn, 0.86 Si, bal Fe.
Mild steel bare wire for CO$_2$ and inert gas welding of steel.
AWS E 70 S-6.

CHEMICAL LEAD.
M-88; 99.93 Pb, 0.07 Cu, 0.005 Ag
Cast: 1,750 TS; 1,000 YS; 40 El; 90 RA; 5.5 Brin.
Rolled: 2,000 TS; 1,000 YS; 54 El; 5.5 Brin.
For tank linings, valves, pipes, fuses; M.E. 2,000,000.

CHENITE
English; Ti, V, Cr, Hf.
For cutting tools, dies; air hardening.

CHEVIS.
M-1405; C, alloy, bal Fe.
For punches, dies for sheet metal blanking and forming; water hardened.

CHEVRE NO. 2½.
M-1117; 1.1 C, bal Fe.
For tools, taps, drills; water hardened.

CHEVRE NO. 3.
M-1117; 0.95 C, bal Fe.
For tools, dies, springs; water hardened.

CHINA BRASS.
China; 56.6 Cu, 27-37 Zn, 0.2-1.0 Sn, 0-0.8 Pb.
For sheet, hardware, fittings; good workability

CHINESE BRONZE
China; 10-20 Pb, 1-14 Zn, 1-13 Sn, bal Cu.
For bearings, heavy duty.

CHINESE GERMAN SILVER.
China; 40.4-41 Cu, 25.4-26.5 Zn, 30.8-31.6 Ni, 2.6-2.7 Fe.
For electrical resistances, ornaments; corrosion resistant.

CHINESE SILVER.
China; 58 Cu, 17.5 Zn, 11.5 Ni, 2 Ag.
For ornaments, electrical parts; nickel silver.

CHINESE SPECULUM-1.
Eng.; 81 Cu, 11 Sn, 8.5 Sb.
For mirrors, optical grading.

CHINESE SPECULUM-2.
Eng; 81 Cu, 9 Pb, 8 Sb, 2 Sn.
For mirrors; (Elsner's).

CHIPPAWAY.
M-69; 0.6-1.4 C, bal Fe.
For pneumatic hammers, chisels, vise jaws, rock drills, punches; water hardening.

CHIPPER KNIFE.
M-357; 0.7 C, 1.15 Cr, 0.25 V, 0.7 Mo, bal Fe.
For shears, dies, chipper knives; oil hardening.

CHIPPEWA.
M-435; 0.45 C, 0.6 Mn, 0.25 Si, 0.4 V, 3 Cr, 0.25 Mo, bal Fe.
For mining bit shanks; hollow shank steel.

CHISEL 3581.
M-40; 0.55 C, 0.7 Mn, 0.2 V, 0.35 Mo, 1.6 Si, bal Fe.
For pneumatic tools, chisels; oil hardened, shock resistant.

CHITONAL.
M-624; 1.5 Si, 5 Cu, bal Al.
For light alloy parts, ship parts; bi-metal, coated "Avional."

CHITONAL-14.
M-624, M-541, 3.9-5.0 Cu, 0.5-1.2 Si, 0.2-0.8 Mg, 0.4-1.2 Mn, bal Al.
Annealed: 27,000-30,000 TS; 11,400-14,200 YS; 16-20 El.
TA-Temper: 66,800-75,400 TS; 58,300-66,800 YS; 6-12 El.
For general engineering components. Age hardenable, high strength

CHITONAL-24.
M-624, M-541, 3.8-4.9 Cu, 1.2-1.8 Mg, 0.3-0.9 Mn, bal Al.
Annealed 27,000 TS, 14,000 YS; 14-22 El;
TH06N-Temper: 74,000 TS; 62,000 YS; 10 El.
For aircraft structures, general engineering components
Age hardenable, high strength.

CHIZ-ALAIR
M-335, 0.50 C, 0.7 Mn, 0.25 Si, 3.25 Cr, 1.4 Mo, bal Fe.
Air hardening; for tools, dies
AISI S7 shock resisting tool steel.

CHIZ-ALLOY.
M-335; 0.5 C, 1.15 Cr, 2.5 W, 0.2 V, 0.75 Si, bal Fe
For hand and pneumatic chisels and punches, shock resistant, oil hardening, octagons and hexagons, AISI S1 tool steel

CHLORIMET NO. 2
M-46, 63 Ni, 32 Mo, 3 Fe, 0.10 C, 1 Si, 1 Mn
Heat treated: 80,000 TS, 55,000 YS, 5 El, 6 RA, 250 Brin
For chemical equipment, vats, vessels, castings; corrosion resistant to HCl, H$_2$SO$_4$, H$_3$PO$_4$ and brine

CHLORIMET NO 3
M-46, 60 Ni, 18 Mo, 18 Cr, 3 Fe, 0.07 C, 1 Si, 1 Mn.
Heat treated 75,000 TS, 50,000 YS; 10 El, 12 RA; 225 Brin.
For chemical equipment, vats, vessels, castings; corrosion resistant to hot H$_2$SO$_4$ and chlorides.

CHOYCE-77.
M-1683, 0.90 C, 1.2 Mn, 0.2 V, 0.5 W, 0.5 Cr, bal Fe.
Annealed. 84,000 TS, 60,000 YS; 26 El; 185 Brin
Heat treated: 145,000-280,000 TS; 125,000-272,000 YS; 2-8 El; 2-31 RA; 290-535 Brin
For blanking and bending dies, master tools, knurling tools, punches, cutters, master dies, gauges.
Type 01, oil hardening, cold work steel, shock resisting.

C.H.Q. DIE STEEL.
M-57; C, alloy, bal Fe.
For cold header dies; cold work steel.

CHRISTOFLE METAL.
Eng.; silver plated German Silver (2.0 Ag).
For cutlery, hardware; corrosion resistant

CHROGO "U-42."
40 Au, 45 Cu, 14 Ni, 1 Cr, traces Pt.
For dental alloy; corrosion resistant.

CHROMADOR STEEL.
M-470; 0.30 max C, 0.7-1.0 Mn, 0.7-1.0 Cr, 0.25-0.50 Cu, bal Fe.
Rolled: 83,000-98,500 TS; 52,000 YS; 17 El; 40 RA; 160-200 Brin.
For structural work, tanks, rivets; high tensile steel; resists corrosion.

CHROMAL.
Swedish; 2-4 Cr, Ni, Mn, bal Al.
Rolled: 55,000-60,000 TS.
For airplane parts, propellers, cooking utensils, milk and oil separators; non-hardenable.

CROMAL
M-342, 2-4 Cr, Ni, Mn, bal Al.
65,000-75,000 TS; 50,000-65,000 YS.
For airplane parts, milk and oil separators, pistons, propellers; corrosion resisting.

CHROMALLOY.
M-114, M-31, 0.20 C, 1.0 Cr, 1.0 Mo, 0.1 V, 0.75 Si, 0.5 Mn, bal Fe.
Heat treated: 138,000 TS; 117,000 YS; 7 El; 45 RA
For high temperature welded structures; good strength and weldability

CHROMALOID.
M-538; Cr, coated zinc
For plumbing fixtures; hardware; bonded Zn base.

CHROMALOY-V
M-408, 80 Ni, 20 Cr
Annealed 95,000 TS, 25-35 El; 185 Brin.
For heating and resistance elements, heat resistant to 1150°F

CHROMAL STEEL
Eng., 0.8 Cr, 0.8 Mn, 0.8 Mo, 0.3 C, bal Fe.
For gears, pinions, shafts, water hardening

CHROMAN ALLOY.
M-296, Ni, Cr, Mn, bal Fe
For heating elements, acid resisting

CHROMAN "Ao"
M 296, 88 Ni, 11 Cr, 1 Mn
For heating elements, acid resisting

CHROMAN "B"
M-296, 20 Fe, 64 Ni, 15 Cr, 1 Mn
At 20°C 87,000 TS, 48 El
At 500°C 73,000 TS; 46 El
For heating elements; acid and heat resistant.

CHROMAN B2 Mo
M-296, 61.4 Ni, 18.5 Cr, 14.5 Fe, 3 Mn, 2 Mo, 0.6 Si
For jet engine parts, heat and oxidation resistant.

CHROMAN "Bo"
M 296, 84 Ni, 15 Cr, 1 Mn
For heating elements, acid resisting

CHROMAN "C"
M-296, 10 Fe, 69 Ni, 20 Cr, 1 Mn.
For heating elements, acid resisting

CHROMAN "Co"
M-296; 79 Ni, 20 Cr, 1 Mn
For heating elements; acid resisting

CHROMAN "D"
M-296, 9 Fe, 65 Ni, 25 Cr, 1 Mn
For heating elements, acid resisting.

CHROMAN "E."
M-296, 16 Fe, 50 Ni, 33 Cr, 1 Mn
For heating elements; acid resisting

CHROMAX BRONZE.
U.S., 67 Cu, 15 Ni, 12 Zn, 3 Cr, 3 Al.
Cast: 70,000 TS.
For bearings.

CHROMAX (CAST).
M-44; 35 Ni, 15 Cr, 50 Fe.
Cast: 60,000 TS; 3.5 El; 2 RA; 168 Brin.
For furnace parts, carburizing boxes, enameling fixtures; resists abrasion, impact, strain, heat and corrosion.

CHROMAX (MALLEABLE).
M-44; 34-36 Ni, 19-20 Cr, bal Fe.
Annealed: 150,000 TS; 35 El.
For rheostats, electrical appliances; heat resist.

CHROMCARB N-6006.
M-717.
Electrode for hard but tough overlays on steel; AC-DC, for crusher jaws, clam shell bucket lips, dipper teeth Hardness C 57-60 Rock.

CHROMDIE.
M-627; 1.5 C, 12 Cr, 0.4 V, 1.0 Mo, bal Fe.
Hardened: 278,000 TS; 214,000 YS; 1 El; 567 Brin.
For blanking and drawing dies, wire drawing and stamping dies, broaches, hobs, punches, gauges, thread rolling dies
Type D2 air hardening, nondeforming tool steel, tough.

CHROME.
M-1405; 1.4 C, 0.35 Mn, 0.6 Cr, 0.2 Si, bal Fe
For reamer blades, impact extrusion dies; water hardened, wear resistant

CHROME 3½%.
M-1076, 3.5 Cr, 1.0 C, bal Fe.
For permanent magnets; Br-9500, Hc-60.

CHROME 6%.
M-1076; 6.0 Cr, 1.0 C, bal Fe
For permanent magnets, Br-8500, Hc-65.

CHROME ALLOY PRODUCTS KA-2
M-143, M-436; 0.13 C, 18.5 Cr, 9 Ni, bal Fe.
For stainless parts; corrosion and heat resistant.

CHROME ALLOY PRODUCTS KA-2 MO.
M-146, M-436, 0.14 C, 20 Cr, 9 Ni, 3 Mo, bal Fe.
For stainless parts, corrosion and heat resistant.

CHROME ALLOY PRODUCTS KA-2S.
M-146, M-436; 0.06 C, 20 Cr, 9 Ni, bal Fe.
For stainless parts; corrosion and heat resistant.

CHROME ALLOY PRODUCTS KNC-3
M-146, M-436, 0.17 C, 25 Cr, 19 Ni, 1.75 Si, bal Fe.
For furnace parts, corrosion and heat resistant.

CHROME ALLOY PRODUCTS STAINLESS NO 7
M-146, M-436, 0.25 C, 20.5 Cr, 1 Cu, bal Fe
For stainless parts; stainless

CHROME B.
M-344, C, Cr, bal Fe.
For cutting dies, non-deforming

CHROME "B-15"
M-344, C, 15 Cr, bal Fe.
For tools, cold and threading dies, punch stamps; non-deforming

CHROME BALL STEEL.
M-260, 1.0 C, 1.2 Cr, bal Fe.
Hardened: 650 Brin.
For balls, ball bearings; water hardening.

CHROME BEARING STEEL.
M-260; 1.0 C, 1.2 Cr, bal Fe.
Hardened: 650 Brin.
For ball bearing races; water hardening.

CHROME BRASS.
M-538; Cr coated brass.
For fabricated parts; easily formed, stamped, drawn.

CHROME CAST.
M-569; 1.1 min C, 16-23 Cr, bal Fe.
For heat, wear and corrosion resistant parts; heat, wear and corrosion resistant.

CHROME-COPPER.
M-538; Cr coated copper.
For stampings, display cases, refrigerators, kitchen equipment; pure Cu base bonded with Ni then Cr on surface.

CHROME-COPPER-NICKEL STEEL.
M-176; 0.65-0.85 Cr, 0.75 Ni, 0.12 C, 0.45-0.65 Cu, bal Fe.
Rolled: 65,000 TS; 35,000 YS; 30 El; 50 RA; 135 Brin.
For machinery parts; low temperature resistance.

CHROME DIE.
M-253, M-1; 0.5 C, 5 Cr, bal Fe.
For hot dies, punches, shears; hot work steel.

CHROME DRILL ROD.
M-38; 1.1 C, 1.1 Cr, bal Fe.
For drills, taps; water or oil hardening.

CHROME FIRMINY NO. 0.
M-1043; 1.15 C, 3.25 Cr, bal Fe.
For blanking, drawing and forming dies; oil hardened, wear resistant.

CHROME HOT DIE.
M-373; 0.8-1.0 C, 3-4 Cr, bal Fe.
For bolt and rivet dies, forging mandrels, piercing dies; hot work steel, air hardening.

CHROME HOT WORK.
M-365; 0.9 C, 3.75 Cr, bal Fe.
For tools, dies, mandrels; hot work steel.

CHROME IRON.
Eng; 13-14 Si, Cr, bal Fe.
For pumps, valves, corrosion resisting vessels; similar to "Duriron."

CHROMEL A.
M-65; 20.0 Cr, 0.5 Fe, 1.0 Si, bal Ni.
21 gauge wire: 120,000 TS.
Elec resistance: 650 ohms/circular mil ft.
For restance wire for heating elements up to 2150°F; corrosion and heat resistant.
Toasters, electric furnaces, electric ranges.

CHROMEL AA.
M-65; 20.0 Cr, 8.3 Fe, 2.0 Si, bal Ni.
21 gauge wire: 130,000 TS.
Elec. resistance: 700 ohms/circular mil ft.
Resistance wire for furnaces operating in controlled atmosphere to 2250°F, more resistant to reducing atmospheres.

CHROMEL C.
M-65; 16.0 Cr, 25.5 Fe, 1.3 Si, bal Ni.
21 gauge wire: 110,000 TS.
Elec. resistance: 675 ohms/circular mil ft
Resistance wire for heating elements up to 1850°F; corrosion and heat resistant. Flat irons, dryers, waffle and sandwich grills.

CHROMEL D.
M-65; 18.5 Cr, 44.0 Fe, 1.5 Si, bal Ni.
21 gauge wire: 105,000 TS.
Elec. resistance: 600 ohms/circular mil ft.
Resistance wire for heating elements to 1800°F.
Industrial furnaces operating to 1800°F.
Good hot strength.

CHROMEL P.
M-65; 90 Ni, 10 Cr (plus 9 minor constituents).
Ann: 95,000 TS.
EMF: positive.
Thermocouple wire—matched with Alumel for temperature measurement to 2400°F; corrosion and heat resistant.

CHROMEL R.
M-65; 80 Ni, 20 Cr.
Wire: 95,000-175,000 TS; 50,000 YS; 35 El.
Annealed: 95,000 TS; 25-35 El; 55 RA; B 85-90 Rock.
For precision wound resistors, potentiometers, heating elements.
High heat and oxidation resistant.

CHROME MAGNET.
M-115, M-1; 0.90-1.0 C, 0.15-0.25 Si, 3.5-4.0 Cr, bal Fe.
For permanent magnet; magnet steel

CHROME MAGNET M-31.
M-260, 0.85 C, 2.7 Cr, bal Fe.
For permanent magnets; oil hardening.

CHROME MAGNET NO. 154.
M-260, M-38; 0.9 C, 3.6 Cr, bal Fe.
For permanent magnets for speakers, meters, etc; high magnetic values.

CHROME MANGANESE STEEL.
M-176; 0.4 C, 0.5 Cr, 0.9 Mn, bal Fe.
Rolled: 100,000 TS; 55,000 YS; 25 El, 200 Brin
For machinery parts; water hardening.

CHROME-MOLY.
M-157, 2.75-3.0 C, 2-2.6 Si, 0.8-1.0 Mn, 0.4 Cr, 0.4-0.6 Mo, bal Fe
Cast: 35,000-45,000 TS, 230-270 Brin
For heavy dies; tough, close grained.

CHROMENAR 308 etc
M-677, one of 36 bare stainless steel wires to 24 AISI standard stainless steel grades plus 12 modified grades. For welding or build-up on stainless steels.

CHROMEND 1 MA
M-677, 0.5 C, 0.75 Mn, 0.6 Si, 0.8-1.1 Cr, 0.45-0.65 Mo, bal Fe.
Welded: 85,000-100,000 TS, 68,000-88,000 YS; 23-20 El, 65-50 RA.
For welding rod; repairing 1% Cr steel castings and pipe

CHROMEND 2M
M-677, 0.10 C, 2 Cr, 0.9 Mo, bal Fe
Welded: 150,000 TS; 120,000 YS, 4 El, 10 RA, 325 Brin
For welding rod, for low Cr steels

CHROMEND 2MA
M-677, 0.03 C, 0.7 Mn, 0.6 Si, 2.0-2.5 Cr, 0.9-1.2 Mo, bal Fe
Welded: 113,000 TS, 99,000 YS, 18 El, 48 RA,
Stress relieved (1350°F): 92,000 TS, 85,000 YS; 25 El; 72 RA.
For welding rod, type E9018-B3L, welding 2¼ Cr, 1 Mo steel.

CHROMEND 5M.
M-677; 0.10 C, 4-6 Cr, 0.5 Mo, bal Fe.
For welding rod

CHROMEND 14/75.
M-677, 75 Ni, 14 Cr, bal Fe.
For welding electrodes; "Inconel"; heat and corrosion resistant.

CHROMEND 16-8-2.
M-677, 0.05 C, 2.2 Mn, 0.3 Si, 16.0 Cr, 8.5 Ni, 1.5 Mo, bal Fe.
For welding electrodes; stainless steel for high temperature service free from sigma-phase embrittlement.

CHROMEND 307.
M-677; 0.07-0.17 C, 3.3-4.75 Mn, 0.25 max Mo, 18-20.5 Cr, 9-10.5 Ni, bal Fe.
Welded: 84,000-96,000 TS; 56,000-62,000 YS; 46-37 El; 49-35 RA.
For welding electrodes; for armor, coated.

CHROMEND 308.
M-677; 0.07 C, 19 Cr, 9 Ni, bal Fe.
For welding rod; stainless.

CHROMEND 308HC.
M-677, 0.14 C, 1.7 Mn, 0.4 Si, 20.0 Cr, 9.7 Ni, bal Fe.
For welding electrodes; specially coated for welding austenitic Cr-Ni stainless steel.

CHROMEND 308L.
M-677; 0.035 C, 1.8 Mn, 0 4 Si, 20.0 Cr, 9.8 Ni, bal Fe
For welding electrodes; stainless steel type 308L.

CHROMEND 309.
M-677; 0 10 C, 25 Cr, 12 Ni, bal Fe
For weld metal; stainless.

CHROMEND 309 Cb.
M-677; 0.10 C, 25 Cr, 12 Ni, 0 90-1.1 Cb, bal Fe.
For welding rod, corrosion and heat resistant.

CHROMEND 309Mo
M-677; 0.07 C, 1.8 Mn, 0 4 Si, 23.0 Cr, 12.8 Ni, 2 5 Mo, bal Fe
For welding electrodes, Mo-bearing stainless steel for root pass welding of 316, 316L, 319 Clad steel

CHROMEND 310
M-677, 0 10 C, 25 Cr, 20 Ni, bal Fe.
For welding rod, heat and corrosion resistant.

CHROMEND 310 Cb
M-677, C, 25 Cr, 20 Ni, Cb, bal Fe
For welding electrodes, stainless, austenitic

CHROMEND 310HC
M-677; 0 22 C (also 0 30 C, also 0 40 C), 1 8 Mn, 0 4 Si, 26 5 Cr, 21 0 Ni, bal Fe
For welding electrodes, welding ACI types CK-20, HK, HL, HN castings, supplied in three carbon ranges

CHROMEND 310 Mo
M-677, C, 25 Cr, 20 Ni, Mo, bal Fe
For welding electrodes, stainless, austenitic

CHROMEND 312.
M-677; C, 29 Cr, 9 Ni, bal Fe.
For welding rod; heat resistant.

CHROMEND 316
M-677, 0 08 C, 2 Mo, 18 Cr, 13 Ni, bal Fe.
For welding electrodes, stainless.

CHROMEND 316L
M-677; 0.035 C, 1.8 Mn, 0 4 Si, 19 5 Cr, 12.5 Ni, 2.2 Mo, bal Fe
For welding electrodes; stainless steel type 316L.

CHROMEND 317.
M-677; 0 07 C, 18 Cr, 12 Ni, 3 Mo, bal Fe.
For welding rod, corrosion resistant.

CHROMEND 318.
M-677; C, 18 Cr, 12 Ni, Mo, Cb, bal Fe.
For welding electrodes; stainless, austenitic.

CHROMEND 320.
M-677; 0.05 C, 1.1 Mn, 0 4 Si, 20.0 Cr, 34.0 Ni, 2 5 Mo, 0.6 Cb, 3 4 Cu, bal Fe.
For welding electrodes, Carpenter 20 Cb-3.

CHROMEND 330
M-677; C, 15 Cr, 35 Ni, bal Fe.
For welding rod; heat resistant.

CHROMEND 330HC.
M-677; 0.30 C (also 0.40 C), 1.6 Mn, 0.6 Si, 16.0 Cr, 34.0 Ni, bal Fe.
For welding electrodes; welding ACI types HT and HU castings; supplied in two carbon ranges.

CHROMEND 347.
M-677; 0.07 C, 19 Cr, 9 Ni, 0.8-1.0 Cb, bal Fe.
For welding rod; corrosion resistant.

CHROMEND 349.
M-677; C, 19 Cr, 9 Ni, W, Mo, bal Fe.
For welding electrodes; stainless, austenitic.

CHROMEND 410.
M-677; 0.10 C, 12 Cr, bal Fe
For welding rod; corrosion resistant.

CHROMEND 410Ni.
M-677, 0.04 C, 0 6 Mn, 0 4 Si, 12 Cr, 4 Ni, 0.8 Mo, bal Fe.
For welding electrodes, welding CA6NM castings.

CHROMEND 430.
M-677, 0 10 C, 16 Cr, bal Fe.
For welding rod; corrosion resistant.

CHROMEND 442
M-677, 0.10 C, 18 Cr, bal Fe.
For welding rod; corrosion resistant

CHROMEND 446
M-677, C, 28 Cr, bal Fe.
For welding rod; heat resistant.

CHROMEND 505
M-677, 0 2 C, 8-10 Cr, 1.5 Mo, bal Fe.
For welding electrodes, for high temperatures, corrosion resistant.

CHROMEND CMV.
M-677, Timken 17/22A(S) steel, 0 3 C, 1.25 Cr, 0 5 Mo, 0.25 V, bal Fe
Heat treated: 140,000-240,000 psi.
For welding electrodes

CHROME NICKEL.
M-297, 20 Cr, 77 Ni, 2 Mn.
Annealed 121,000 TS, 23 El.
Hard 195,000 TS, 1 El
For heat resistances, electrical heating elements, rheostats, max operating temperature 1150°C.

CHROME NICKEL IRON.
M-297; 20 Cr, 70 Ni, 8 Fe, 2 Mn.
Annealed 114,000 TS; 24 El
Hard drawn 182,000 TS, 1 El.
For electrical heating elements, rheostats, electrical measuring instruments, max operating temperature 1150°C

CHROME NICKEL SILVER.
M-538, Ni, Zn, bal Cu.
For automatic fabrication, sheets and strips; nickel silver sheet bonded with chromium, rust proof.

CHROME NICKEL SKATE BLADE.
M-38, 0 75 C, 1 25 Ni, 0 6 Cr, bal Fe.
For ice skate blades, oil hardening.

CHROME-NICKEL STEEL ARMOR PLATE.
Eng; 4 Ni, 2 Cr, 0 33 C, 0.32 Mn, 0.06 Si, 0.03 S, 0 14 P, bal Fe.
For armor plate, oil hardening.

CHROME ROLL.
M-85, 0.9 C, 1 Cr, bal Fe.
For tools, cutters, dies; water hardening.

CHROMESCO 1.
M-1490; 0.10-0.18 C, 0.40-0.65 Cr, 0.45-0.65 Mo, bal Fe.
Annealed: 65,000 TS; 40,000 YS; 18 El.
For oil refinery tubes and equipment.

CHROMESCO 3.
M-1495; 0.15 max C, 1.9-2.6 Cr, 0.80-1.2 Mo, bal Fe.
Annealed: 60,000 TS; 30,000 YS; 30 El; 163 Brin.
For oil refinery tubes and equipment; ASTM-A-200.

CHROME SILICON SPRING.
M-12; 0.5-0.6 C, 0.5-0.8 Mn, 1.2-1.6 Si, 0.5-0.8 Cr, bal Fe.
For springs; for moderate high temperature use.

CHROME STEEL.
M-538; Cr bonded to steel.
For floor plates, reflectors, trim and moulding, toasters; resists heat to 1050°F; Cr bonded to steel.

CHROMET.
German; 10 Si, bal Al.
For bearings.

CHROME TIN.
M-538; Cr coated Sn.
For fabricated parts; easily formed, stamped, drawn.

CHROMETOUGH.
M-1724; 0.55 C, 0.55 Mn, 0.50 Cr, 0.20 V, bal Fe.
Oil hardening general purpose tool steel; for boring bars, chisels, rivet snaps.

CHROME WEAR.
M-115; 2.3 C, 0.7 Mn, 0.4 Si, 5.25 Cr, 4.75 V, 1.1 W, 1.1 Mo, bal Fe.
Heat treatable to high hardness and wear resistance; for tube manufacturing rolls, brick mold liners.
Type A7 air hardening tool steel.

CHROMEX 2.
Russia; 1.2-1.7 C, 32-35 Cr, 1.2-2.0 Si, bal Fe.
For furnace equipment; heat resistant, cast iron.

CHROMEX 3.
Russia; 1.8-2.8 C, 32-36 Cr, 1.5-2.5 Si, bal Fe.
For furnace equipment; heat resistant, cast iron.

CHROMIC-A
M-98; 20 Cr, 80 Ni.
Annealed: 100,000 TS; 40,000 YS, 35 El.
For resistors, heating elements; high electrical resistance, for service to 2150°F.

CHROMIC-C.
M-98; 18 Cr, 60 Ni, bal Fe.
Annealed: 95,000 TS; 35,000 YS; 35 El.
For resistors, heating elements; high electrical resistance, for service up to 1750°F.

CHROMIDIUM-1.
M-185; 3.2 T.C., 0.7 C.C., 2.2 Si, 0.25-0.45 Cr, 0.8 Mn, bal Fe.
Cast: 35,000-45,000 TS; 35,000-45,000 YS; 0 El; 0 RA; 200-250 Brin.
For auto engine blocks, cylinders, brake drums; wear resistant, cast iron.

CHROMIDIUM 2.
M-185; 3.1-3.5 C, 2.0-2.4 Si, 0.75-1.0 Mn, 0.2-0.4 Cr, bal Fe.
Cast: 37,000 TS; 200-240 Brin.
For brake drums, brake discs; Tr.S. 72,000; cast iron.

CHROMIN.
Germany.
For anodes for Cr-plating.

CHROMIUM BORIDE B401.
U.S.; CrB.
Sintered.
For high heat applications; operating temperature range above 2000°F.

CHROMIUM COPPER-182.
M-8; 99.14 Cu, 0.85 Cr, 0.01 Si.
Hard Rod: 70,000 TS; 60,000 YS; 20 El; B 82 Rock.
Soft Rod: 35,000 TS; 15,000 YS; 40 El.
For cable connectors, electronic devices, resistance welding electrode tips, grid supports, circuit breakers Age hardenable. Corrosion resistant.
Hardened elect. cond. 80%.

CHROMIUM-COPPER 999.
M-8; 99.05 Cu, 0.85 Cr, 0.10 Si
Soft: 35,000 TS; 15,000 YS; 40 El; 877 Brin.
Hard: 72,000 TS; 61,000 YS; 20 El.
For electrical apparatus; high conductivity.

CHROMNICKEL.
M-297; 20 Cr, 77 Ni, 2 Mn.
For heating resistances up to 1100°C.

CHROMNICKEL I.
M-297; 78 Ni, 20 Cr, 2 Mn
For furnace parts, electric heating elements; heat and corrosion resistant.

CHROMNICKEL II.
M-297, 70 Ni, 20 Cr, 2 Mn, 8 Fe
For electrical heating elements; heat and acid resistant

CHROMODUR-22.
M-72; 0.20 C, 12 Cr, 1 Mo, 0.4 Ni, 0.3 V, bal Fe
Annealed 90,000 TS, 40,000 YS, 22 El; B 95 Rock.
Heat treated: 240,000 TS, 200,000 YS; 8 El; 24 RA; C 50 Rock.
For gears, knives, shafts, hardware, surgical instruments.
Corrosion resistant, hardenable

CHROMODUR-33
M-72; 0.20 C, 12 Cr, 1 Mo, 0.4 Ni, 0.3 V, 0.5 W, bal Fe
Annealed: 95,000 TS; 40,000 YS; 25 El; B 92 Rock
Heat treated. 240,000 TS, 205,000 YS; 10 El; C 48 Rock.
For cutlery, hardware, knives, oil refinery and chemical plant equipment.
Corrosion resistant, hardenable.

CHROMOLD-CVM.
M-115; 0.06-0.12 C, 0.15-0.25 Si, 0.10-0.40 Mn, 0.010 max S, 0.010 max P, 2.15-2.45 Cr, bal Fe.
Heat treated: 110,000-120,000 TS; 70,000-90,000 YS; C 20-25 Rock in core and C 64 in case.
Plastic molds cavities.
Vacuum melted Case hardening steel. Easy hubbing for mold cavities.

CHROMO-LOY.
M-507; 3.0 C, 2.0 Si, 0.43 Mn, 21.6 Cr, 4.2 Mo, 3.4 Ni, bal Fe.
Coated, hardfacing electrode.
As arc welded: 70,000 psi, approx.; 56 Rc.
For overlay or buildup on roll crushers, shovel teeth, bucket lips and oil field tool joints; tough and wear resistant.

CHROMO-N.
M-24; 0.23 C, 1.25 Si, 0.75 Ni, 10 Cr, 1.2 Mo, 1.0 V, bal Fe.
For extrusion mandrels, hot work tools and dies; hot work steel.

CHRO-MOW.
M-38; 0.35 C, 1.05 Si, 5.0 Cr, 1.25 W, 0.35 V, 1.35 Mo, bal Fe.
Air harden to 51-53 Rc.
For hot work punches, shell piercing tools, mandrels for Al & Mg extrusion.
Type H12 Hot work tool steel.

CHROMSOL.
M-48; 62 Cr, 5 Mn, 1.5 Si, 5.25 C, bal Fe.
For chromium additions to steel melts.
Steel alloying agent.

CHROM SPECIAL
M-1114; 1.5 C, 11.5 Cr, 0.75 Mo, bal Fe.
For tools, dies, non-deforming.

CHROM SPECIAL EXTRA.
M-1114; 2.25 C, 13 Cr, bal Fe.
For tools, dies, non-deforming.

CHROM SPECIAL SUPRA.
M-1114; C, alloy, bal Fe.
For tools, cutters.

CHROM-SUPER SERVICE.
M-736; Cr, Sb, Pb, bal Sn
Cast
For Babbitt; antifriction

CHROMTEC 10680.
M-717
Nickel base alloy powder for steel, stainless, nickel alloys.

CHROM-X.
M-1059, ferrochrome, C, Si.
For chromium addition to steel, for alloy steels

CHRONIFER F 14
M-1730, 0.8-0.12 C, 1.0 Si, 1.0 Mn, 13 Cr, bal Fe
Hardenable chromium stainless steel.
Werkstoff Nr 1.4006, AISI-SAE 410.

CHRONIFER F 17
M-1730, 0.10 max C, 1.0 Si, 1.0 Mn, 16.5 Cr, bal Fe
Non-hardenable chromium stainless steel.
Werkstoff Nr 1.4016, AISI-SAE 430.

CHRONIFER SPEZIAL.
M-1730, 0.12 max C, 1.0 Si, 2.0 Mn, 18 Cr, 9 Ni, bal Fe.
Non-hardenable, austenitic stainless steel.
Werkstoff Nr. 1.4300; AISI-SAE 302.

CHRONIFER SPEZIAL 4 SUPRA
M 1730; 0.07 max C, 1.0 max Si, 2.0 max Mn, 17.5 Cr, 11.5 Ni, 2.25 Mo, bal Fe
Austenitic stainless steel.
Werkstoff Nr. 1.4401; AISI-SAE 316.

CHRONIFER SPEZIAL D.
M-1730; 0.15 max C, 1.0 Si, 2.0 Mn, 0.15 S, 19.0 Cr, 9.0 Ni, bal Fe.
Free machining austenitic stainless.
Werkstoff Nr. 1.4305, AISI-SAE 303

CHRONIFER SPEZIAL EXTRA.
M-1730; 0.10 max C, 1.0 max Si, 2.0 max Mn, 18.0 Cr, 10.0 Ni, Ti = 5 × C min, bal Fe.
Stabilized austenitic stainless steel.
Werkstoff Nr. 1.4541; AISI-SAE 321.

CHRONIFER SPEZIAL SUPRA.
M-1730; 0.07 max C, 1.0 max Si, 2.0 max Mn, 18.0 Cr, 10.0 Ni, bal Fe.
Austenitic stainless steel
Werkstoff Nr. 1.4301; AISI-SAE 304.

CHRONIFER V-13.
M-1730; 0.17-0.22 C, 1.0 max Si, 1.0 max Mn, 13.0 Cr, bal Fe.
Hardenable chromium stainless steel.
Werkstoff Nr. 1.4021; (AISI 420).

CHRONIKA 1565.
M-1292; 0.2 C, 57 Ni, 15 Cr, bal Fe.
For high temperature applications; X15NiCr5715; heat resistant.

CHRONIKA 2035.
M-1292; 0.15 C, 30 Ni, 21 Cr, bal Fe.
For high temperature applications; X15NiCr3021; heat resistant.

CHRONIKA 2080.
M-1292; 0.15 C, 77 Ni, 18 Cr, bal Fe.
For high temperature applications; X15NiCr7718; heat resistant.

CHRONIKA 2520.
M-1292, 0.15 C, 2 Si, 24 Cr, 19 Ni, bal Fe.
For furnace parts, heat treat boxes; X15CrNiSi2419, corrosion and heat resistant.

CHRONIN
Eng; 83.7 Ni, 14.7 Cr.
For resistance alloy.

CHRONIN "85"
M-303; 13 Cr, 85 Ni, bal Cu, Fe, Mn, Al impurities.
Annealed: 100,800 TS; 30 El
For electric resistances, resistors, thermocouple element against Ni; heat resistant to 1200°C.

CHRONIN "100"
M-303, 18 Cr, 80 Ni, bal Cu, Fe. Mn, Al.
Annealed 117,000 TS, 30 El
For electric resistances, resistors, thermocouple element; heat resistant to 1200°C.

CHRONIN 110
M-303; 20 Cr, 80 Ni
For electrical equipment, heating elements, resistors, heat and electrical resistance.

CHRONIT 14
M-1309, 0.20 C, 13.0 Cr, bal Fe.
Annealed. 95,000 TS, 50,000 YS, 25 El, B 92 Rock
Hardened. 250,000 TS, 215,000 YS; 8 El, C 52 Rock
For cutlery, surgical instruments, rules, gears, valves springs, pivots.
Corrosion resistant. Hardenable

CHRONIT 14 M
M-1309, 0.18 C, 13.0 Cr, 0.6 Mo, 0.7 Ni, bal Fe.
Annealed: 100,000 TS, 55,000 YS, 20 El, B 95 Rock
Hardened. 240,000 TS; 210,000 YS; 8 El; C 50 Rock
For cutlery, surgical instruments, gears, springs, valve parts
Corrosion resistant. Hardenable

CHRONIT 14 MS.
M-1309; 0.18 C, 13.0 Cr, 0.6 Mo, 0.7 Ni, others bal Fe
Annealed 100,000 TS; 55,000 YS, 20 El; B 95 Rock
Hardened: 240,000 TS; 210,000 YS, 8 El, C 50 Rock.
For cutlery, surgical instruments, gears, springs, valve parts.
Corrosion resistant. Hardenable.

CHRONIT 14 N.
M-1309, 0.17 C, 13 Cr, 1.1 Ni, bal Fe.
Annealed: 95,000 TS; 52,000 YS, 22 El; B 92 Rock
Hardened: 220,000 TS; 180,000 YS; 12 El; B 48 Rock.
For cutlery, surgical instruments, gears, springs, valve trim.
Corrosion resistant. Hardenable.

CHRONIT 14 P.
M-1309; 0.10 C, 12.3 Cr, 0.6 Mo, 0.5 Ni, bal Fe.
Annealed: 85,000 TS; 45,000 YS; 30 El; B 85 Rock.
For chemical and oil refinery equipment, valve trim.
Corrosion resistant.

CHRONIT 18 M.
M-1309; 0.20 C, 16.5 Cr, 1.2 Mo, 1.2 Ni, bal Fe.
Annealed: 80,000 TS; 45,000 YS; 26 El; 140 Brin.
For hardware, burner parts, oil refinery equipment, fasteners, furnace parts, storage tanks.
Corrosion resistant.

CHRONIT 18 N.
M-1309; 0.20 C, 16.5 Cr, 1.2 Ni, bal Fe.
Annealed: 82,000 TS; 43,000 YS; 28 El; 140 Brin.
For hardware, burner parts, oil refinery equipment, furnace parts.
Corrosion resistant.

CHRONIT 30.
M-1309; 1.0 C, 28.0 Cr, bal Fe.
Cast, ann: 260-330 Brin.
Ferrite-carbide structure; stainless and acid resistant cast steel.
DIN G-X120 Cr 29.

CHRONIT 30 C.
M-1309; 1.50 C, 28.0 Cr, bal Fe.
Cast, ann: 260-330 Brin.
Ferrite-carbide structure; stainless and acid resistant cast steel.

CHRONIT 30 M.
M-1309; 1.0 C, 28.0 Cr, 2.25 Mo, 1.25 Cu, bal Fe.
Cast, ann: 260-330 Brin.
Ferrite-carbide structure: stainless and acid resistant cast steel.
DIN G-X 120 Cr Mo 292

CHRONIT 30 MW.
M-1309; 0.70 C, 28.0 Cr, 2.25 Mo, bal Fe.
Cast, ann: 219-280 Brin.
Ferrite-carbide structure; stainless and acid resistant cast steel.
DIN G-X CrMo292.

CHRONIT 30 W.
M-1309; 0.70 C, 28.0 Cr, bal Fe.
Cast, ann: 210-280 Brin.
Ferrite-carbide structure; stainless and acid resistant cast steel.
DIN G-X 70 Cr29.

CHRONIT 165 M.
M-1309; 0.07 C, 16.0 Cr, 2.0 Mo, 6.0 Ni, others, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; B 80 Rock.
Precipitation hardenable to about 400 Brin
For chemical and pharmaceutical plant equipment digesters, valve trim, acid containers, tanks.
Corrosion resistant.

CHRONIT 216 U.
M-1309; 0.05 C, 15.5 Cr, 10.0 Ni, 0.5 Cb, 2.20 Cu, bal Fe.
Annealed: 75,000 TS; 30,000 YS; B 80 Rock.
For chemical plant equipment, welded structures.
Welding grade, stabilized. Stainless, non-magnetic, austenitic.

CHRONIT 218.
M-1309; 0.15 C, 18.0 Cr, 9.0 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; B 85 Rock.
Cold rolled: 150,000 TS; 100,000 YS; 25 El; B 100 Rock.
For chemical and pharmaceutical equipment, valve trim, fasteners, molding, acid tanks, digesters.
Stainless, austenitic, non-magnetic.

CHRONIT 218 E.
M-1309; 0.10 C, 18.5 Cr, 10.0 Ni, Cb = 8 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; B 82 Rock.
Cold rolled: 130,000 TS; 90,000 YS; 30 El; B 100 Rock.
For welded structures, chemical plant equipment, vessels, agitators. Austenitic, stabilized.
Welding grade, stainless, non-magnetic.

CHRONIT 218 S.
M-1309, 0.07 C, 18.5 Cr, 10.0 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; B 82 Rock.
Cold rolled: 130,000 TS; 90,000 YS; 30 El; B 100 Rock.
For chemical plant equipment, tanks, evaporators, agitators, kettles.
Stainless, austenitic, non-magnetic.

CHRONIT 274 R.
M-1309; 0.40 C, 27.0 Cr, 4.0 Ni, bal Fe.
Cast, ann 95,000-120,000 TS; 4 El; 210-260 Brin.
Ferrite-austenite-carbide structure.
Stainless and acid resistant cast steel.
DIN G-X CrNi274

CHRONIT 274 RM.
M-1309, 0.40 C, 27.0 Cr, 2.25 Mo, 4.0 Ni, bal Fe.
Cast, quenched: 210-260 Brin; 95,000-120,000 TS, 4 El.
Ferrite-austenite-carbide, stainless and acid resistant cast steel.

CHRONITE 275 RM.
M-1309, 0.10 C, 27.0 Cr, 1.5 Mo, 5.0 Ni, bal Fe.
Cast, quenched. 85,000-110,000 TS, 50,000 YS; 8 El, approx. 240 Brin
Ferrite-austenite structure; stainless and acid resistant cast steel.
DIN G-X10 CrNiMo 275

CHRONIT 418
M-1309, 0.15 C, 18.0 Cr, 2.25 Mo, 10.0 Ni, bal Fe
Annealed 90,000 TS; 40,000 YS; 40 El; B 85 Rock
Cold rolled 150,000 TS; 135,000 YS, 6 El, C 30 Rock
For chemical plant and oil refinery equipment digesters, valve trim, evaporators
Stainless, austenitic, non-magnetic

CHRONIT 418 E.
M-1309, 0.10 C, 17.5 Cr, 2.25 Mo, 11.5 Ni, Cb = 9 × C, bal Fe.
Annealed: 90,000 TS, 40,000 YS, 40 El; B 85 Rock.
Cold rolled. 140,000 TS, 130,000 YS, 9 El, C 26 Rock
For welded structures tanks, vessels, chemical plant and oil refinery equipment austenitic.
Welding grade, stainless, non-magnetic.

CHRONIT 418 ES
M-1309, 0.10 C, 17.5 Cr, 2.25 Mo, 11.5 Ni, Cb = 9 × C, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 50 El; B 82 Rock.
Cold rolled: 130,000 TS; 98,000 YS; 22 El; C 28 Rock.
For acid tanks, evaporators, kettles, chemical plant equipment. Austenitic, stabilized.
Welding grade, stainless, non-magnetic.

CHRONIT 418 S.
M-1309; 0.07 C, 18.0 Cr, 2.25 Mo, 11.0 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; B 82 Rock.
Cold drawn: 125,000 TS; 95,000 YS; 20 El; C 26 Rock.
For chemical plant equipment, kettles, agitators, evaporators.
Stainless, austenitic, non-magnetic.

CHRONIT 1417.
M-1309; 0.07 C, 17.0 Cr, 4.5 Mo, 13.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 35 El; 160 Brin.
For chemical and oil refinery equipment, digesters, acid tanks, agitators.
Austenitic, non-hardenable.
Welding grade, stainless, non-magnetic.

CHRONIT 1613.
M-1309; 0.12 C, 16.5 Cr, 13.0 Ni, 0.5 Cb, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 35 El; B 90 Rock.
For chemical and oil refinery equipment; welded structures, tanks, agitators, vessels.
Austenitic, welding grade. Stainless, non-magnetic.

CHRONIT 1618
M-1309; 0.08 max C, 17.5 Cr, 2.25 Mo, 20.0 Ni, 2.0 Cu, Nb = 8 × C, bal Fe.
Cast, quenched; 65,000-92,000 TS; 25,000 YS, 15 El, 130-180 Brin.
Acid resistant chrome-nickel austenitic cast steel.
DIN G-X8CrNiMoCu1818.

CHRONIT 1810 MN.
M-1309; 0.10 C, 17.5 Cr, 10 Ni, 10 Mn, bal Fe.
Annealed: 100,000 TS; 50,000 YS, 60 El; B 90 Rock.
For cooking utensils, dairy and chemical equipment, springs, sinks
Stainless, non-magnetic, austenitic.

CHRONIT 1811 N.
M-1309; 0.05 C, 17.0 Cr, 10.5 Ni, bal Fe.
Annealed: 80,000 TS, 30,000 YS, 50 El; B 80 Rock
Cold Drawn: 125,000 TS; 85,000 YS, 20 El; B 98 Rock.
For chemical plant equipment, agitators, evaporators, digesters, kettles Stainless, non-magnetic, austenitic.

CHRONIT 2025
M-1309, 0.08 C, 20.0 Cr, 2.75 Mo, 25.0 Ni, 2.0 Cu, Cb = 8 × C, bal Fe
Annealed 95,000 TS, 45,000 YS, 45 El, B 90 Rock.
For furnace parts, heat treating boxes, carburizing boxes, valves, pumps, jet engine parts Non-hardenable Welding grade, heat resistant, austenitic.

CHRONIT CNM100.
M-27; 0.7 C, 1.3 Mn, 1 Si, 1 Cr, 1 Ni, bal Fe.
Heat treated: 227,600 TS; 350 Brin
For machine tool parts, oil hardened.

CHRONIT CR150H.
M-27; 1.0 C, 1.4 Cr, bal Fe
Heat treated: 213,400 TS, 400 Brin
For machine tool parts; oil hardened, wear resistant.

CHRONIT CR150W.
M-27, 0.55 C, 1.6 Cr, bal Fe.
Heat treated: 199,200 TS; 380 Brin.
For wear resistant machine tool parts; oil hardened, wear resistant.

CHRONIT CSFG.
M-27, 0.60 C, 0.6 Mn, 1.7 Si, 0.8 Cr, bal Fe.
Heat treated: 184,900 TS; 380 Brin.
For wear resistant machine tool parts; oil hardened, wear resistant.

CHRONIT SPEZIAL KG.
M-27; 2.0 C, 12 Cr, bal Fe.
For blanking and forming dies; oil hardened, non-deforming.

CHRONIT VHS.
M-27; 0.6 C, 1.4 Si, 1.1 Mn, bal Fe.
Heat treated: 171,000 TS; 350 Brin.
For wear resistant parts, beaters; oil hardened, tough.

CHRONIT VM.
M-27; 0.45 C, 1.8 Mn, bal Fe.
Heat treated: 199,200 TS; 400 Brin.
For grinding plates, chain links; wear resistant.

CHRONIT VMG.
M-27; 1.3 C, 25 Cr, 4 W, 67 Co, 2 max Fe.
Cast: Rock C 42-45.
For hardfacing. Wear and corrosion resistant.

CHRONIT VMH.
M-27; 0.9 C, 1.8 Mn, bal Fe.
Heat treated: 171,000 TS; 350 Brin.
For wear resistant parts, punches; oil hardened.

CHRONIT ZII.
M-27; 2 C, 2 Cr, bal Fe.
Heat treated: 185,000 TS; 370 Brin
For wear resistant parts; oil hardened.

CHRONITHERM 20.
M-1309; 0.10 C, 2.0 Si, 0.5 Mn, 24.0 Cr, 19.0 Ni, bal Fe
Annealed: 95,000 TS; 43,000 YS, 48 El; B 90 Rock.
For heating elements.
Heat and oxidation resistant, austenitic.

CHRONITHERM 20/Spez
M-1309; 0.10 C, 2.6 Si, 0.5 Mn, 24.0 Cr, 19.0 Ni, bal Fe
Annealed: 95,000 TS; 43,000 YS; 46 El; B 90 Rock
For heating elements
Heat and oxidation resistant, austenitic

CHRONITHERM 30
M-1309, 0.07 C, 2.3 Si, 1.0 Mn, 19.5 Cr, 33.0 Ni, bal Fe.
For heating elements.
Heat and oxidation resistant

CHRONITHERM 30/Spez.
M-1309, 0.07 C, 2.3 Si, 1.0 Mn, 19.5 Cr, 33 Ni, bal Fe.
For heating elements.
Heat and oxidation resistant

CHRONITHERM 60.
M-1309, 0.10 C, 0.8 Si, 1.0 Mn, 17.5 Cr, 62.0 Ni, bal Fe
For heating elements.
Heat and oxidation resistant.

CHRONITHERM 60/Spez
M-1309, 0.10 C, 0.8 Si, 1.0 Mn, 17.5 Cr, 62.0 Ni, bal Fe
For heating elements
Heat and oxidation resistant.

CHRONITHERM 80
M-1309, 0.06 C, 1.6 Si, 0.2 Mn, 19.0 Cr, 77.0 Ni, bal Fe.
For heating elements.
Heat and oxidation resistant.

CHRONITHERM 80/Spez
M-1309; 0.06 C, 1.6 Si, 0.2 Mn, 19.0 Cr, 77.0 Ni, bal Fe
For heating elements
Heat and oxidation resistant.

CHRONOS.
M-27; 1.2 C, 12.5 Mn, bal Fe.
Heat treated. 142,000 TS; 44 El.
For rails, crusher mantles, cams, tappets, guide rails, gravel mills; abrasion resistant, austenitic.

CHRYSIODE.
92 Ag, 8 Al.

CHRYSITE.
Eng.; 63 Cu, 37 Zn, 0.24 Pb.
For dental alloy.

CHRYSOKALK-1.
Eng.; 95 Cu, 4.5 Zn, 0.5 Pb.
For cheap jewelry; tarnishes easily.

CHRYSOKALK-2.
Eng.; 59 Cu, 40 Zn, 1 Pb.
For tubes.

CHRYSOKALK-3.
Eng.; 91 Cu, 7.9 Zn, 1-6 Pb.
For cheap jewelry.

CHRYSORIN.
Eng.; 72-63 Cu, 28-37 Zn.
40,000-56,000 TS; 20,000-35,000 YS; 78-35 El; 78-63 RA.
For tubes, pipes, plumbing; high strength.

CHUGAL.
Russia; 2.5-3.2 C, 1.6-2.3 Si, 5.5-20.0 Al, bal Fe.
For furnace equipment; cast iron.

C.H.W.
M-73; 0.5 C, 2.75 Cr, 0.5 V, 15.0 W, bal Fe.
For dies, punches, shear blades, trimmers, hot work steel.

C.I.G. NO. 400.
M-734; 10 Sn, bal Cu.
For bronze welding rod; fluxed.

C.I.G. NO. 401.
M-734; Mn, Sn, bal Cu.
For bronze welding rod; fluxed.

CIMET, CAST.
M-44; 27-29 Cr, 11-13 Ni, bal Fe
For pumps, screens, valves, furnace parts, mining machinery; corrosion resistant to acid mine waters and many chemicals.

CINDAL.
M-737; 0.8 Zn, 0.3 Mg, 0.3 Cr, bal Al.
27,000-58,000 TS; 5-20 El.
For light alloy parts; heat treatable.

CINDAL ALLOY "J-551."
M-298; 5 Si, bal Al
22,000-26,000 TS; 11,000-15,000 YS; 17 15 El.
Used to resist acetic acid, edible oils, acids, beer, cider, fruit juices; stainless and non-corrosive in sea water.

CINDALL "50 A."
M-298; Al alloy.
36,000 TS; 22,500 YS; 1-1.5 El; 140 Brin.
Domestic castings, light gear wheels, light pulleys, bearings and bushings; to replace cast iron where lightness and corrosion resistance are required.

CINDALL "E-11 A."
M-298; Al alloy.
31,500 TS; 14,000 YS; 5-8 El; 66 Brin.
For water pipes, carburetor parts; sand or chill castings subjected to atmospheric, sea water, or other corrosive influences; boron modified.

CINDALL "E-11 B."
M-298; Al alloy.
36,000 TS; 18,500 YS; 4-6 El; 72 Brin.
For propellers, water cooled cylinders, cylinder heads, pump impellers, stern tubes, water pump bodies; sand castings, boron modified.

CINDALL "J-12."
M-298; Al alloy.
15,500-21,200 TS; 11,000-13,000 YS; 11-9 El.
For resistance to industrial waters and alkaline solutions, radiators, water meters; non-hardenable.

CINDALL ALLOY "J-51."
M-298; Al alloy.
20,000-24,000 TS; 9,000-11,000 YS; 28-24 El.
For parts to resist sea water, fruit acids, beer and cider vats; non-corrosive to sea water.

CINDALL "L-316."
M-298, Al alloy.
29,000 TS; 16,000 YS, 2-4 El, 68 Brin.
For exhaust manifolds, automobile parts; sand and die castings.

CINIDUR.
England; 0.25 C, 19 Cr, 24 Ni, 2 Mo, 1 W, 2.25 Ti 1.0 Al, bal Fe.
For high temperature applications, heat and corrosion resistant.

CINIDUR
U.S.; 0.25 C, 19 Cr, 24 Ni, 2 Mo, 1 W, 2.25 Ti, 1 Al, bal Fe
For oil refinery equipment, furnace parts, heat resistant

CINSEAL
M-269; 29 Ni, 53 Fe, 17.5 Co, 0.5 Mn.
For telecommunications, hermetic seals, metal-to-glass seal

CIRCLE "C"
M-115, 0.77 C, 9 Co, 18.5 W, 4.5 Cr, 2 V, 1.0 Mo, bal Fe
For tools, cutters, drills, tools for milling, slotting, forming, super high speed steel; tough heavy duty

CIRCLE L 3 replaced by LEBANON 4140

CIRCLE L 5 replaced by LEBANON 4330.

CIRCLE L 8 replaced by LEBANON WC9

CIRCLE L 9 replaced by LEBANON WC1

CIRCLE L 10 replaced by LEBANON C5

CIRCLE L 11 replaced by LEBANON 442

CIRCLE L 12 replaced by LEBANON CA15

CIRCLE L 12M replaced by LEBANON CA15M.

CIRCLE L 13 replaced by LEBANON CA40

CIRCLE L 15 replaced by LEBANON CC50

CIRCLE L 17 replaced by LEBANON 17-4

CIRCLE L 19 replaced by LEBANON IC2

CIRCLE L 22 replaced by LEBANON CF8.

CIRCLE L 22 AGXM replaced by LEBANON CG8M

CIRCLE L 22L replaced by LEBANON CF3

CIRCLE L 22M replaced by LEBANON CF8C

CIRCLE L 22XM replaced by LEBANON CF8M.

CIRCLE L 22 XML replaced by LEBANON CF3M.

CIRCLE L 23 replaced by LEBANON CF20

CIRCLE L 30H replaced by LEBANON HH

CIRCLE L 31 replaced by LEBANON CE30.

CIRCLE L 31H replaced by LEBANON HE

CIRCLE L 32 replaced by LEBANON HT.

CIRCLE L 33 replaced by LEBANON 33

CIRCLE L 34 replaced by LEBANON CN7M.

CIRCLE L 41 replaced by LEBANON HX.

CIRCLE L 46 replaced by LEBANON CK20.

CIRCLE L 46H replaced by LEBANON HK.

CIRCLE L 91 replaced by LEBANON C-12.

CIRCLE L 109 replaced by LEBANON WC6A.

CIRCLE L 130 replaced by LEBANON CHW.

CIRCLE L 205A replaced by LEBANON 8630.

CIRCLE L 205Al replaced by LEBANON 8630-1.

CIRCLE L 205B replaced by LEBANON 8630-2.

CIRCLE L 205C replaced by LEBANON 8630-3.

CIRCLE L 205D replaced by LEBANON 8630-4.

CIRCLE L 206 replaced by LEBANON 8613.

CIRCLE L 209 replaced by LEBANON WC6.

CIRCLE L 219 replaced by LEBANON LC3.

CIRCLE L 431 replaced by LEBANON 431.

CIRCLE LA replaced by LEBANON 1040.

CIRCLE LB replaced by LEBANON WCA.

CIRCLE LB20 replaced by LEBANON WCB.

CIRCLE LCD4MCU replaced by LEBANON CD.

CIRCLE LHB replaced by LEBANON HAB

CIRCLE LHC replaced by LEBANON HAC.

CIRCLE LIN replaced by LEBANON INC.

CIRCLE LM replaced by LEBANON ME.

CIRCLE M.
M-57; 0.85 C, 6 W, 5 Mo, 4 Cr, 2 V, 8 Co, bal Fe.
For drills, hobs, reamers, taps, broaches, cutters, high speed steel, Type T5

CIRCULAR SAW BIT
M 38, 0.75 C, 0.3 Mo, bal Fe
For saw teeth, water hardening

CIRCULAR SAW PLATE 55.
M 38, 0.67 C, 0.75 Ni, 0.6 Cr, 0.2 Mo, bal Fe
For saws, oil hardening

CITROEN
English, 12 Cu, 0.1 Mg, 0.5 Mn, 0.5 Fe, 0.5 Si, bal Al
For pistons, cast

CK 15
M-459, 0.15 C, 0.25 Si, 0.37 Mn, bal Fe
Annealed 70,000 TS, 40,000 YS, 25 El, 60 RA, 145 Brin.
For gears, shafts, machine tool parts, case hardened.

CK 22
M-459, 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed. 73,000 TS, 41,000 YS, 22 El; 58 RA; 140 Brin
For fan blades, bushings, gears, camshafts, water hardened, case hardened.

CK 35
M-459, 0.35 C, 0.25 Si, 0.55 Mn, bal Fe
Hot rolled: 85,000 TS; 54,000 YS; 30 El, 53 RA; 185 Brin.
For gears, shafts, axles, bolts; water hardened.

CK 45.
M-459; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled. 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For gears, bolts, axles, shafts, machine tool parts; water hardened.

CK 60.
M-459, 0.61 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated: 160,000 TS, 113,000 YS; 12 El; 40 RA; 320 Brin.
For wheels, die blocks, springs, rails, girders; water hardened.

CLAMERS ALLOY.
25-5 Ni, 5-25 Co, bal Fe.
For electrical machinery; heat and corrosion resistant.

CLARITE.
M-35; 0.7 C, 18 W, 4 Cr, 1.1 V, 0.25 Mn, 0.6 Mo, bal Fe.
Ht. Tr. C 64 Rock; 400,000 bend strength, 300,000 torsion strength.
For lathe and planer tools, drills, punches, dies, cutters, springs
Type T 1 high-speed steel, high red-hardness.

CLARITE HW.
M-35; 0.55 C, 18 W, bal Fe.
For hot punches, chisels, upsetters; hot work steel, oil hardened.

CLARITE HW26.
M-35; 0.53 C, 18.0 W, 4.0 Cr, 1.0 V, bal Fe.
For punches, piercing tools, shear blades, forming rolls.
AISI Type H 26 hot work tool steel.

CLARITE HW50.
M-35; 0.53 C, 18 W, 4 Cr, 1 V, bal Fe.
For piercing punches, hot shell punches, hot blanking dies.
Hot work steel Type H 26

CLARITE-L
M-35, 0.60 C, 18 W, 1 V, 4 Cr, bal Fe.
For hot work tools and dies, punches, hot work steel

CLARITE M
M-35, 0.8 C, 18 W, 1 V, bal Fe
For hot work tools and dies; hot work steel

CLARK'S ALLOY
Eng, 75 Cu, 7.2 Zn, 14 Ni, 1.9 Co.
For chemical equipment, corrosion resistant

CLARK'S PATENT.
Eng, 75 Cu, 14 Ni, 7.2 Zn, 1.9 Sn, 1.9 Co.
For corrosion resisting parts; corrosion resistant.

CLARUS METAL
M-407, 1.5 Cu, 4 Si, bal Al.
For light alloy parts; will not oxidize, 60% stronger than Al.

CLASS "P."
M-210; 0.7-0.9 C, bal Fe.
For tools, punches, dies, engraved dies, trimming dies; water hardening.

CLAY-LOY
M-1529, 0.22 C, 1.25 Mn, 0.35 Si, 0.50 Cu, 0.20 V, bal Fe.
Rolled 70,000 TS, 50,000 YS.
For railroad and bus bodies; high strength, low alloy construction steel.

CLEBRIUM-1.
Eng.; 2 Ni, 13.1 Cr, 0.75 Mn, 3.6 Mo, 1.5 Si, 2.6 C, bal Fe.
For heat and corrosion resisting cast iron castings; high heat resistant.

CLEBRIUM-2.
Eng., 4.6 Ni, 18.3 Cr, 2.8 Mn, 2.0 C, 2 Cu, bal Fe.
For heat and corrosion resisting cast iron castings; heat and corrosion resistant.

CLEREMONT DRILL ROD.
M-38; 1.05 C, bal Fe.
For tools, pivots; drill rod.

CLEVITE NO. 8.
M-739; 7-9 Pb, 3.5-4.5 Sn, 4 Zn, bal Cu.
For wrist pin and transmission bearings; with steel backing.

CLEVITE NO. 10.
M-739; 9-11 Pb, 9-11 Sn, 0.5 max Zn, bal Cu.
For wrist pin and transmission bearings; with steel backing.

CLEVITE NO. 25.
M-739; 21.0-25 Pb, 3-4 Sn, 3 Zn, bal Cu.
For steering knuckle bushings; steel backing.

CLEVITE 77.
M-739; 22-26 Pb, 0.15-0.50 Sn, bal Cu, overlay 8-12 Sn, 2-3 Cu, bal Pb.
For bearings; with steel backing.

CLEVITE 100.
M-739; 9-11 Pb, 9-11 Sn, bal Cu.
For transmission bushings and washers; sintered on steel back.

CLEVITE 112.
M-739; 21-27 Pb, 1.75-2.75 Sn, bal Cu, overlay, 8-12 Sn, 2-3 Cu, bal Pb for bearings, with steel backing.

CLEVITE 153.
M-739; 3.5-4.5 Sn, 0.75-1.4 Cd, bal Al, overlay 8-12 Sn, 2-3 Cu, bal Pb.
For bearings, aluminum clad to steel.

CLEVITE 250.
M-739; 21-25 Pb, 3-4.0 Sn, bal Cu.
For transmission bushing and washers, sintered on steel back.

CLEVITE 500.
M-739; 44-58 Pb, 0.5-1.5 Sn, bal Cu, sintercast with steel backing.
For bearings.

CLICHIER METAL.
Eng ; 5 Pb, 80 Sn, 15 Bi.
For bearings, fuses; antifriction.

CLICHIER METAL.
Eng.; 33 Pb, 48 Sn, 9 Bi, 11 Sb.
For bearings, fuses; antifriction.

CLICHIER METAL.
Eng.; 50 Pb, 36 Sn, 14 Cd.
For bearings, fuses; antifriction.

CLICKER DIE.
M-357; 0.75 C, 0.25 Mo, bal Fe
For tools, knives; water hardening.

CLICKING DIE.
M-357; 0.4 C, 0.7 Cr, bal Fe.
For clicking dies; water hardening.

CLICKING DIE.
M-357; 0.55 C, 0.2 Mo, bal Fe.
For dies; water hardening.

CLIMAX 6-1.
M-151; 1.2-1.35 C, 5.5-6.75 Mn, 0.40-0.70 Si, 0.90-1.10 Mo, 0.05 max P, 0.50 max Cr, bal Fe.
Austenitic in water quenched condition.
Good abrasion resistance casting but less tough than Hatfield type manganese steel.
For ball-mill liners, ball mill discharge grates, grizzly screens, drag chain and crusher liners, scoop lips.

CLIMAX 6-2-1.
M-151; 1.05-1.20 C, 5.25-6.50 Mn, 0.30-0.70 Si, 1.5-2.0 Cr, 0.90-1.10 Mo, 0.05 max P, bal Fe.
Lean alloy casting, austenitic after quench.
Good abrasion resistance,-work hardenable.
For ball-mill liners and discharge grates, scoop lips, drag chain and crusher liners subject to rapid wear and moderate impact.

CLIMAX 12.
M-151; 3.0-3.5 C, 0.5-0.8 Mn, 0.5-0.8 Si, 11.0-14.0 Cr, 0.5-1.0 Mo, 1.0 max Cu, bal Fe.
Hardened: C 60-67 Rock.
For grinding balls, classifier wear shoes, shot blast wheel blades.
Martensitic casting.

CLIMAX 12-2 HCS.
M-151; 1.30-1.45 C, 12.0-14.0 Mn, 0.30-0.75 Si, 1.8-2.1 Mo, 0.05 max P, 0.50 max Cr, bal Fe.
Alloy casting, austenitic as quenched, work hardenable, high abrasion resistance and good toughness.
For crusher liners, scraper blades, heavy-duty grizzly screens.

CLIMAX 12-2 LCS
M-151, 1.15-1.30 C, 12.0-14.0 Mn, 0.30-0.75 Si, 1.8-2.1 Mo, 0.05 max P, 0.50 max Cr, bal Fe.
Alloy casting, austenitic as quenched, work hardenable, high abrasion resistance and good toughness
For crusher liners, scraper blades, heavy-duty grizzly screens

CLIMAX 15-2-1.
M-151, 2.8-3.5 C, 0.6-0.9 Mn, 0.4-0.8 Si, 14.0-16.0 Cr, 1.9-2.2 Mo, 0.8-1.2 Cu, bal Fe.
Casting, hardened: C 60-67 Rock
For rod and ball mill liners, tires and grinding rings for roller mill pulverizers

CLIMAX 15-3 HC.
M-151, 3.2-3.6 C, 0.70-1.0 Mn, 0.30-0.80 Si, 14.0-16.0 Cr, 2.5-3.0 Mo, bal Fe
High carbon grade martensitic white cast iron, hard and abrasion resistant
For shot blast impeller blades and liners, and sand pump impellers, jaw plates in small jaw crushers, garbage disposal wearing parts.

CLIMAX 15-3 LC
M-151, 2.4-2.8 C, 0.5-0.8 Mn, 0.30-0.80 Si, 14.0-16.0 Cr, 2.4-2.8 Mo, bal Fe.
Lower carbon grade martensitic white iron, hard and abrasion resistant
For heavier section castings for rod and ball mill liners, tires for roller mill pulverizers and heavy pulverized hammers.

CLIMAX 15-3 MC.
M-151; 2.8-3.2 C, 0.6-0.9 Mn, 0.30-0.80 Si, 14.0-16.0 Cr, 2.5-3.0 Mo, bal Fe.
Medium carbon grade martensitic white cast iron; hard and abrasion resistant
For die bushings in clay product molds, impact pulverizer blow bars, chute liners

CLIMAX 15-3 XHC.
M-151, 3.60-4.30 C, 0.70-1.0 Mn, 0.30-0.80 Si, 14.0-16.0 Cr, 2.5-3.0 Mo, bal Fe
Extra high carbon grade martensitic white cast iron; hard, brittle, abrasion resistant.
For unstressed liners and parts handling abrasive slurries without impact, and fluidized solids up to about 1200°F

CLIMAX 20-2-1.
M-151; 2.6-2.9 C, 0.6-0.9 Mn, 0.4-0.9 Si, 18.0-21.0 Cr, 1.4-2.0 Mo, 0.8-1.2 Cu, bal Fe.
Ann: C 38-43 Rock.
Hardened: C 60-67 Rock.
Alloy steel casting, martensitic as quenched.
For rod and ball mill liners, sand and dredge-pump parts, clay working machine parts, pulverizer impactor and blow bars.

CLIMAX ALLOY 42 replaced by CLIMAX 15-3.

CLIMAX 321.
M-151; 3.3-3.6 C, 1.75-2.25 Cr, 0.70-1.1 Mo, 2.75-3.25 Ni, bal Fe.
For ball mill parts, grinding balls, pug mill knives; martensitic, cast iron, abrasion resistant.

CLIMAX Cr13Mo.
M-151; 0.25-0.40 C, 0.4-0.6 Mn, 0.4-0.8 Si, 13-14 Cr, 0.6-0.75 Mo, bal Fe.
Annealed: 180-220 Brin.
Hardened: 500-550 Brin.
For grinding mill liners, sand and dredge pump castings.
Abrasion and corrosion resistant

CLIMAX FERROMOLYBDENUM.
M-151; 58-64 Mo, 1.0 max Si, 0.10 max C, bal Fe.
For metallurgical applications in steel and cast iron; Mo-additions.

CLIMAX MACHINERY.
M-38; 0.35 C, Mn, bal Fe
For shafts, gears, pinions.

CLIMAX POWDER METALLURGY MOLYBDENUM.
M-151; made from powder 99.95 min Mo.
Sintered parts and wrought products from sintered parts.
For glass melting electrodes, glass furnace hardware, electrical and electronic parts, furnace heat shields, heating elements and supports.

CLIMELT LOW-CARBON MOLYBDENUM.
M-151, 99.97 min Mo, 0.005 max C
Vacuum arc melted
For space power generator parts, grinding quills, chemical handling equipment, machined components

CLIMELT Mo-30W.
M-151, 30 W, bal Mo.
At 72° F 121,500 TS, 106,900 YS; 26 El; 40 RA; 198 Brin
At 1800° F. 65,700 TS; 25 El; 77 RA; 80 Brin.
For high temperature applications; high heat resistance, has excellent resistance to attack by molten zinc and certain other liquid metals

CLIMELT MOLYBDENUM
M-151; 99.94 min Mo, 0.03 max C.
Vacuum arc melted.
For rocket nozzle parts, electrical and electronic parts, spot welding tips, brazing contacts, boring bars, furnace heating elements and supports

CLIMELT TZM.
M-151, 0.01-0.04 C, 0.40-0.55 Ti, 0.06-0.09 Zr, bal Mo
At 72° F· 144,000 TS; 129,000 YS, 21 El; 46 RA; 172 Brin.
At 1600° F. 88,000 TS, 48,000 YS; 21 El, 76 RA; 82 Brin.
For high temperature applications, heat engines, heat exchangers; heat and corrosion resistant, high strength and hardness at elevated temperatures.

CLINCHING SCREW WIRE.
Eng.; 69 Cu, 29.5 Zn, 1.5 Pb.
For brass screws.

CLIPPER.
M-335; 0.73 C, 18.0 W, 4.0 Cr, 1.1 V, bal Fe.
For cutting tools.
AISI T1. High speed steel

CLOCK BRASS-243.
M-8; 37 Zn, 2 Pb, 62 Cu.
Hard: 75,000 TS, 60,000 YS, 10 El.
Soft: 45,000 TS; 17,000 YS; 50 El.
For clock gears and frame, meter parts; free milling.

CLOMO.
M-111; 0.97 C, 1.15 Cr, 0.32 Mo, bal Fe.
For hollow mine drills; oil hardening.

CLOVERLEAF.
M-741; Sn, Pb, bal Cu.
For bearings, bushings.

CLUNISE.
Eng.; 40 Cu, 32 Ni, 25 Zn, 2.6 Fe.
For decorative parts.

C.L.W.
M-73; 0.30 C, 3.5 Cr, 0.5 V, 9 W, bal Fe.
For extrusion and trimming dies, punches, shears; hot work steel.

CLYDALL 5 SPECIAL.
M-1569; 0.78 C, 4 Cr, 5.5 Co, 1.35 V, 18.5 W, bal Fe.
Annealed: 240 Brin.
For broaches, drills, lathe and planer tools; high speed steel.

CLYDALL 12 SPECIAL.
M-1569; 0.78 C, 4 Cr, 12 Co, 1.35 V, 22 W, bal Fe.
Annealed: 240 Brin.
For roll turning tools, tool bits, cutters; high speed steel.

CLYDE ALLOY.
M-742; 0.3-0.6 C, bal Fe.
For machinery parts; water hardening.

CLY-DIE.
M-233; 0.10-0.30 C, 13 Cr, bal Fe
Annealed: 95,000 TS, 50,000 YS, 25 El; 55 RA; 195 Brin
For plastic mold dies; corrosion resistant.

CLYDMO.
M-1569, 0.83 C, 4 Cr, 5 Mo, 1.8 V, 6.25 W, bal Fe.
Annealed 240 Brin
For lathe and planer tools, reamers, hobs, drills; high speed steel

CM.
M-365; 0.38 C, 1.0 Si, 5.0 Cr, 0.45 V, 1.25 Mo, bal Fe.
Air or oil hardening hot work tool steel for forging dies, and hot forming tools. AISI H11.

CM25.
Germ.; 0.3-0.4 C, Cr, 0.2 V, bal Fe.
For turbine blades for jet engines, water hardening.

CM 469.
M-1491, M 73; 0.03 C, 60 Cr, 25 Mo, 14 Fe.
For jet engine parts
High heat and oxidation resistant

CM 718.
M-1491; 0.08 C, 20 Cr, 52 Ni, 0.4 Co, 5.25 Cb, 3 Mo, 0.83 Ti, 0.55 Al, 0.004 B, 0.02 Cu, bal Fe.
Annealed: 120,200 TS, 53,400 YS, 0.45 El.
Aged: 191,000 TS; 172,000 YS, 22 El; C 45 Rock.
For aircraft structural parts operating at 800-1400° F
High oxidation and corrosion resistance.

C.M.A.1
M-452; 10-15 Mn, 7-8 Al, 2.5-3.5 Fe, bal Cu.
Cast: 94,000-105,000 TS; 40,000-49,000 YS; 20-35 El; 165-200 Brin.
For propellers, marine hardware.
Aluminum bronze.

C.M.A. BEARING METAL.
Eng.; Pb, alkali earth metals.
For bearings.

CMC.
M-459; 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe.
For gears, bolts, crankshafts, upsetters; oil hardened, tough.

CM L-605.
M-1491; 0.12 C, 1.65 Mn, 19.8 Cr, 9.9 Ni, 15.2 W, 1.6 Fe, bal Co.
At R.T.: 144,300 TS; 65,400 YS; 55 El.
At 1400° F: 73,000 TS; 49,000 YS; 20 El; C 25 Rock.
For jet engine afterburners, exhaust cone assemblies, nozzle diaphragm valves, high temperature springs, turbine buckets. Good oxidation and corrosion resistance.

CM N-155.
M-1491; 0.10 C, 1.5 Mn, 20.75 Cr, 19.85 Ni, 19.5 Co, 2.95 Mo, 2.35 W, 1.15 Cb, 0.2 Cu, bal Fe.
At R.T.: 112,000 TS; 57,000 YS; 41 El; B 77 Rock.
At 1500° F: 39,000 TS; 25,000 YS; 35 El.
For turbine rotors and blading, afterburner rings, rocket chambers. High oxidation and corrosion resistance.

C.M.P.
M-740; 0.2 C, 0.7 Ni, bal Fe.
For machinery parts; precision cold rolled strip steel.

CMP (3).
M-533; 0.95 C, 1.25 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, cutters; oil hardened, non-deforming.

CM-R41.
M-1491; 0.09 C, 19 Cr, 11 Co, 10 Mo, 3 Ti, 1.5 Al, bal Ni.
At 70° F: 206,000 TS; 154,000 YS, 14 El.
At 1500° F: 126,000 TS; 118,000 YS, 14 El.
For jet engine components and high speed airframes. Afterburners, turbine casings, combustion liners, fasteners.
Precipitation hardening. High temperature alloy. Vacuum melted

CMS.
M-459; 0.45 C, 1.3 Mn, 2.0 Cr, 0.3 Mo, bal Fe.
For upsetting tools, liners and containers in extrusion presses, forging die blocks; shock resistant.

C.M.S.
M-743; 0.10-0.20 C, 1.2-1.5 Mn, 0.075-0.15 S, bal Fe.
Rolled: 80,000 TS; 75,000 YS; 22 El, 49 RA; 192 Brin.
For machinery parts; free machining.

CMSZ.
M-48; 40-56 Cr, 4-6 Mn, 13-21 Si, 1.25-1.75 Zr, 3-5 C, bal Fe.
For ladle additions of Cr to cast iron; for harder and stronger iron.

CMSZ-4 MIXTURE.
M-48; 45-49 Cr, 4-6 Mn, 18-21 Si, 1.25-1.75 Zr, 3-4.5 C, bal Fe.
For ladle additions of Cr to cast iron; no increase in chill.

CMSZ-5 MIXTURE.
M-48; 50-56 Cr, 4-6 Mn, 13.5-16 Si, 0.75-1.25 Zr, bal Fe.
For ladle additions of Cr to cast iron; no increase in chill.

CMW.
M-365; 0.35 C, 5 Cr, 1.3 W, 1.7 Mo, 1 Si, bal Fe.
For hot work tools, die casting dies; hot work steel.

CM-WASPALLOY.
M-1491; 0.06 C, 0.08 Mn, 0.01 S, 0.004 P, 0.1 Si, 20.5 Cr, 14.2 Co, 4.2 Mo, 3.0 Ti, 1.5 Al, 0.03 Zr, 0.003 B, 0.05 Fe, 0.05 Cu, bal Ni.
Annealed: 121,400 TS; 69,700 YS; 54 El; B 90 Rock.
Aged: 186,000 TS; 138,000 YS; 26 El; C 39 Rock.
For jet engine turbine buckets and discs, high temperature bolts, missile systems
Precipitation hardened. High temperture strength.

CNK2.
M-459; 0.3 C, 18 Cr, 8 Ni, 1.5 W, bal Fe.
For cutlery, plastic mold dies, valves; stainless, austenitic.

C N M.
M-200; C, Cr, Ni, bal Fe.
For alloy steel castings; wear resistant.

C.N.S.
M-69; 1.5 C, 11-12 Cr, 0.8 Mo, 0.20 V, bal Fe.
For blanking, forming, drawing dies, punches, shear blades, cold work dies; air-hardening, nonshrinkable

C.N.S.-1 see JESSOP CNS-1.

C.N.S.-2.
M-69, 2.15 C, 12 Cr, 0.25 Co, 0.18 V, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

CNS2H.
M-459, C, Cr, Ni, W, bal Fe.
For mandrels, stamps, bakelite dies; oil hardened.

CNS-TH.
M-459; 0.25-0.3 C, 1-1.3 Cr, 4.5 W, 0.3-0.5 Mo, bal Fe.
For drop forging dies, oil or water hardening.

COANAILIUM
M-218; Al alloy
For marine parts, corrosion resistant.

COAST NO 1.
M-1060, 4.0 C, 16 Cr, 6 Ni, bal Fe.
Cast. 420-550 Brin
For hard facing welding rod; austenitic, wear and heat resistant

COAST NO 4.
M-1060, 4.0 C, 16 Cr, 6 Ni, 5 Si, bal Fe.
Cast. 600-630 Brin.
For hard facing welding rod, austenitic, wear and heat resistant.

COAST NO. 7.
M-1060; 3.0 C, 25 Cr, 12 Ni, 8 Mo, bal Fe.
Cast. 300-450 Brin.
For hard facing welding rod, heat and abrasion resistant.

COAST NO. 8.
M-1060, 3.0 C, 16 Cr, 6 Ni, 20 Co, bal Fe.
Cast· 400-530 Brin.
For hard facing welding rod, heat and abrasion resistant.

COAST NO. 9.
M-1060; 1.0 C, 29 Cr, bal Fe.
Cast: 450-550 Brin.
For hard facing welding rod; heat resistant; discontinued.

COAST NO. 10.
M-1060; 4 C, 16 Cr, 2 Ni, 8 Mo, bal Fe.
Cast: 480-600 Brin.
For hard facing welding rod; non-magnetic, hot abrasion resistant.

COAST NO. 11.
M-1060; C, Cr, Ni, bal Fe.
Cast: 450-560 Brin.
For hard facing electrode; corrosion resistant; discontinued.

COAST NO. 15.
M-1060; 4 C, 16 Cr, 4 Ni, 6.5 Mo, 20 Co, bal Fe.
Welded: 530-560 Brin.
For hard facing rod for acetylene welding; corrosion and wear resistant, tough, hard.

COAST NO. 17.
M-1060; 3 C, 40 Cr, 8 Mo, 30 Co, 1 Si, bal Fe.
Welded: 530-600 Brin.
For acetylene welding rod for chemical equipment; corrosion and abrasion resistant.

COAST NO. 18.
M-1060; 3.0 C, 25 Cr, 15 Ni, 8 Mo, 30 Co, 1 Si, bal Fe.
Cast: 400-470 Brin.
For hard-facing electrode; heat and abrasion resistant.

COAST NO. 19.
M-1060; 1 C, 35 Cr, 2 Cu, bal Fe.
Welded: 300-400 Brin.
For acetylene welding rod for rolling mills; heat and abrasion resistant.

COAST NO. 40
M-1060; 3 C, 30 Cr, 40 Ni, 14 W, bal Fe.
Welded: 380-420 Brin
For acetylene welding rod for valves; corrosion, heat and wear resistant.

COAST NO 50
M-1060, 93.25 Ni, 3.5 Si, 2.25 B, 1 others
Cast: 390-440 Brin
High temperature nickel brazing alloy, M.P. 1825°F
For thin walled joints, wide or close tolerance joints, oxidation resistant.

COAST NO. 50B.
M-1060; 2.5 Si, 1.5 B, bal Ni.
Metal powder for repair brazing of castings; overlays on dies and molds; machinable

COAST NO 50C.
M-1060; 3.0 Si, 1.8 B, bal Ni
Brazing alloy for casting repairs, overlays on dies and molds; machinable Metal powders.

COAST NO 52.
M-1060; 91.25 Ni, 4.5 Si, 4.5 B, 1 others.
Cast: 570-620 Brin.
For brazing alloy; M.P 1825°F; oxidation resistant High strength joints.

COAST NO. 52 SPECIAL.
M-1060; 4.5 Si, 0.15 C, 20.0 Co, 2.9 B, bal Ni.
For brazing high temperature alloys.
Brazing temperature 2150 2175°F.

COAST NO. 53.
M-1060; 82.1 Ni, 4.5 Si, 2.9 B, 7 Cr, 3 Fe, 0.5 others.
Cast: 570-620 Brin.
For brazing alloy, M.P. 1825°F, oxidation resistant.

COAST NO. 54.
M-1060; 0.35 C, 9.0 Cr, 2.5 Si, 2.1 Fe, 1.66 B, bal Ni.
Metal powder for repair or build-up on valves, valve seats; average hardness 38 Rock C; machinable.

COAST NO. 55.
M-1060; 0.35 C, 10.0 Cr, 4.35 Si, 4.0 Fe, 2.1 B, bal Ni.
Metal powder for build-up or repair on pump sleeves, wear rings; average hardness 45 Rock C.

COAST NO. 56.
M-1060; 72.5 Ni, 4 Si, 3.75 B, 16 Cr, 4 Fe, 1 others.
Cast: 570-620 Brin.
For brazing alloy; M.P. 1880°F; oxidation resistant.

COAST NO. 60.
M-1060; Ni-Cr-Si.
Alloy powder for nuclear brazing.

COAST NO. 62.
M-1060; Mn-Ni-Co.
Alloy powder for brazing wide gaps and for high temperature strengths with good corrosion resistance, on such alloys as Rene 41, 15-7 Mo, A-286, tungsten. AMS 4780

COAST NO. 80A
M-1060, Mo, Cr, W, bal Ni
For hard facing electrode; corrosion and abrasion resistant.

COAST NO 81.
M-1060; 30.0 Mo, 5.0 Fe, 2.0 B, bal Ni
Metal powder for repair or build-up of chemical and petro-chemical plant equipment, excellent corrosion resistance

COAST NO 90
M-1060, 3 C, 5 Cr, 3 Ni, bal Fe
For hard surfacing electrode; resists abrasion and impact, acetylene welded.

COAST NO 91A
M-1060; C, Cr, bal Fe
For hard facing electrode; abrasion and impact resistant.

COAST NO 92A
M-1060, C, Cr, Si, Mn, bal Fe.
For hard facing electrode, impact and abrasion resistant

COAST NO 96A
M-1060, C, Cr, Mn, Si, bal Fe
For hard facing electrode; work hardens, wear resistant

COAST NO 98A.
M-1060, Cr, Mn, Si, bal Fe
For hard facing electrode, corrosion and impact resistant

COAST NO 100X.
M-1060; 1 C, 3 Cr, 3 Ni, 7 Mo, bal Fe.
For hard facing electrodes, arc welding, can be forged.

COAST NO. 100X
M-1060; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
Cast: 450-530 Brin
For hard facing welding rod, high speed steel.

COAST NO. 101.
M-1060, 4.0 C, 16 Cr, 6 Ni, bal Fe.
Cast 420-550 Brin
For hard facing welding rod, austenitic, wear and heat resistant.

COAST NO. 104
M-1060; 4.0 C, 16 Cr, 6 Ni, 5 Si, bal Fe.
Cast: 530-600 Brin
For hard facing welding rod; austenitic, wear and heat resistant.

COAST NO. 107.
M-1060; 3.0 C, 25 Cr, 12 Ni, 8 Mo, bal Fe.
Cast. 300-430 Brin.
For hard facing welding rod; heat and abrasion resistant.

COAST NO. 108.
M-1060; 3.0 C, 16 Cr, 6 Ni, 20 Co, bal Fe.
Cast: 400-530 Brin.
For hard facing welding rod; heat and abrasion resistant.

COAST NO. 110.
M-1060; 4 C, 16 Cr, 2 Ni, 8 Mo, bal Fe.
Cast: 480-600 Brin.
For hard facing welding rod; non-magnetic, hot abrasion resistant.

COAST NO. 111.
M-1060; C, Cr, Ni, bal Fe.
Cast: 450-560 Brin.
For hard facing electrode; corrosion resistant; discontinued.

COAST NO. 112.
M-1060; 4.0 C, 16 Cr, 6 Ni, 8 Mg, bal Fe.
Cast: 520-590 Brin.
For hard facing electrode; resists heat and dry abrasion.

COAST NO. 115.
M-1060; 4 C, 16 Cr, 4 Ni, 6.5 Mo, 20 Co, bal Fe.
For hard facing rod for arc welding; corrosion and wear resistant.

COAST NO. 117.
M-1060; 3 C, 40 Cr, 8 Mo, 30 Co, 1 Si, bal Fe.
Welded: 530-600 Brin.
For arc welding rod for chemical equipment, corrosion and abrasion resistant.

COAST NO. 118.
M-1060; 3.0 C, 25 Cr, 15 Ni, 8 Mo, 30 Co, 1 Si, bal Fe.
Cast: 400-470 Brin.
For hard facing welding rod; heat and abrasion resistant.

COAST NO 119.
M-1060; 1 C, 35 Cr, 2 Cu, bal Fe.
Welded: 300-400 Brin.
For arc welding rod for rolling mills; heat and abrasion resistant.

COAST NO. 140.
M-1060; 3 C, 30 Cr, 40 Ni, 14 W, bal Fe.
For arc welding rod for valves, corrosion, heat and wear resistant.

COAST NO. 190.
M-1060; 3 C, 5 Cr, 3 Ni, bal Fe.
For hard surfacing electrodes; resists abrasion and impact, arc welded.

COAST NO. 1600-N.
M-1060; Mn-Cu-Ni.
Wire, powder or foil for brazing and welding 300 and 400 stainless steels, AM 350, H 11, and SAE 4130 steels.

COAST CM-119.
M-1060.
For hard facing, hot friction guides; resists molten Cu.

COAST METAL.
M-1060; Fe, Cr, Ni, Mo, C.
For hard facing rod; discontinued; wear and corrosion resistant.

COAST METALS NP.
M-1060; 50 Ni, 30 Fe, 12 Si, 4 P, 4 Mo.
For brazing stainless steel atomic fuel elements for service in 565°F. pressurized water.
Corrosion resistant.

COAST NO. X.
M-1060; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
Cast: 450-530 Brin.
For hard facing welding rod; high speed steel.

COAST NO. X.
M-1060; 1 C, 3 Cr, 3 Ni, 7 Mo, bal Fe.
For acetylene welding rod for hot shears; forgeable, tough.

COATING METAL 560.
M-88; 95 Pb, 2.5 Sn, 2.5 Zn.
For coated iron for roofing, pipes.

COBAFLUX "B."
M-24; 0.90 C, 4.5 Cr, 9 W, 19 Co., bal Fe.
For cutting tools.

COBAL 1.
M-111; 1 C, 6.5 Cr, 1 Mo, 7.5 Co, bal Fe.
For permanent magnets.

COBAL 3.
M-111; 0.95 C, 0.7 Mn, 5.7 Cr, 4.5 W, 15.5 Co, bal Fe.
For permanent magnets.

COBAL 4.
M-111; 0.85 C, 0.7 Mn, 5.5 Cr, 4.5 W, 35 Co, bal Fe.
For permanent magnets.

COBALT.
M-140; 0.74 C, 18 W, 4 Cr, 1 V, 5 Co, 0.8 Mo, bal Fe.
For lathe and planer tools, reamers, hobs, broaches, drills; high speed steel, oil hardened.

COBALT.
M-344; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For tools, cutters; high speed steel

COBALT I
M-459, 0.7 C, 18 W, 4 Cr, 1.6 V, 0.6 Mo, 9.5 Co, bal Fe.
For lathe and planer tools, hobs, drills, broaches; high speed steel, oil hardened.

COBALT 1
M-677; 2-3 C, 0.4-2.0 Si, 26-35 Cr, 11-14 W, 3 max Ni, 1 max Mo, bal Co.
For bare (1B) and coated (1C) hard-facing electrodes; grades R Co Cr-C and F Co Cr-C.

COBALT II.
M-459, 0.8 C, 4.2 Cr, 0.65 Mo, 1.6 V, 18.5 W, 5 Co, bal Fe
For lathe and planer tools, reamers, broaches, taps; high speed steel, oil hardened

COBALT 2.
M-677, 2-3 C, 1 max Si, 29-35 Cr, 16-19 W, 2.5 max Ni, bal Co
For bare hard-facing electrodes, abrasion resistant at high temperatures.

COBALT III
M-459; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For lathe and planer tools, drills, hobs, reamers; high speed steel, oil hardened.

COBALT III.
M-459; 0.8 C, 4.25 Cr, 0.6 Mo, 2.25 V, 12.5 W, 2.75 Co. bal Fe.
For tools, dies, cutters; high speed steel.

COBALT III, NX.
M-459; 0.8 C, 4.25 Cr, 0.6 Mo, 2 V, 10 W, 2.5 Co, bal Fe.
For tools, dies, cutters; high speed steel.

COBALT 6.
M-677; 0.9-1.4 C, 0.4-2.0 Si, 26-32 Cr, 3-6 W, 3 max Ni, 1 max Mo, bal Co.
For bare (6B) and coated (6C) hard-facing electrodes, grades RCoCr-A and ECoCr-A.

COBALT 7.
M-677; 0.2-0.4 C, 25-29 Cr, 2-4 Ni, 5-6 Mo, bal Co.
For bare (7B) and coated (7C) hard-facing electrodes; impact resistant, crack resistant.

COBALT 12.
M-677; 1-2-1.7 C, 26-32 Cr, 7-9.5 W, 3 max Ni, 1 max Mo, bal Co.
For bare (12B) and coated (12C) hardfacing electrades; grades RCoCr-B and ECoCr-B.

COBALT 17%
M-1076; 0.75 C, 6 W, 17 Co, bal Fe.
For permanent magnets; Br 9500 Hc 150.

COBALT 36%.
M-1076; 4 Cr, 5 W, 0.85 C, 36 Co, bal Fe.
For permanent magnets; Br. 8500, Hc 240.

COBALT 125
M-459; 1 C, 1.1 Mn, 8.5 Cr, 1.25 Mo, 6.25 Co, bal Fe.
For permanent magnets.

COBALT 160.
M-459, 1 C, 8.5 Cr, 1.5 Mo, 10.5 Co, bal Fe.
For permanent magnets.

COBALT 200.
M-459, 1 C, 8.5 Cr, 1.5 Mo, 15.5 Co, bal Fe.
For permanent magnets.

COBALT 300.
M-459. 0.9 C, 4.5 Cr, 0.3 Mo, 30 Co, 4.5 W, bal Fe.
For permanent magnets

COBALT ALUMINUM BRONZE
M-1228, 10.50 Al, 3.50 Fe, 2.50 Co, bal Cu
Cast 90,000 TS; 45,000 YS, 15 El, 20 RA, 180 Brin
Forged: 120,000 TS 80,000 YS, 10 El, 12 RA; 241 Brin
For pump bodies, shafting, heavy loaded bearings, impellers, steel mill slippers and screwdown nuts
Wear and corrosion resistant.

COBALT CHROME-FM.
M-73, 1.35 C, 12.5 Cr, 0.3 Ni, 3 Co, 8 Mo, 0.15 S, bal Fe
Hardened C 64-66 Rock
For burnishing tools, valves, punches, broaches.
High abrasion and corrosion resistance.
Non-deforming, air hardening.

COBALTCROM.
M-40, C, 3.7 Co, 13.6 Cr, bal Fe
For dies, broaches, cutters, valves; nonscaling.

COBALT CHROME.
M-73, 1.35 C, 12.5 Cr, 0.3 Ni, 3.0 Co, 0.8 Mo, bal Fe.
For broaches, burnishing tools, valves, punches, high abrasion resistance, non-deforming.

COBALTCROM KXK STAINLESS.
M-40; 1.0 C, 18 Cr, 1.1 Co, 0.2 V, 1.1 Mo, bal Fe.
For dies, press tools, pump valves; corrosion and abrasion resistant.

COBALTCROM PRK-HT
M-40, C, Co, Cr, bal Fe.
For welding rod; coated

COBALTCROM STAINLESS.
M-40, 3.3 Co, 18 Cr, 0.75 Mo, 1.10 C, 0.25 V, 0.30 Mn, bal Fe.
For special cutlery and corrosion resisting parts; air hardening steel; non-deforming.

COBALT HIGH SPEED.
M-81 0.7 C, 4 Cr, 18 W, 5 Co, bal Fe.
For high speed cutting tools, dies; high speed steel.

COBATLOY.
M-950; 1.5 C, 0.9 Mo, 12 Cr, 0.5 V, 3.25 Co, bal Fe.
For hot forming dies; abrasion resistant.

COBALT MAGNET.
M-373; C, alloy, bal Fe
For magnet.

COBALT MAGNET 37%.
M-73, 0.90 C, 2.5 W, 4 Cr, 37 Co, bal Fe.
For electrical equipment, permanent magnets; magnet steel.

COBALT MAGNET STEEL (17%).
M-260, M-38, C, Cr, W, Co, bal Fe.
For permanent magnets.

COBALT MAGNET STEEL (35%).
M-260, M-38; C ,Cr, W, Co, bal Fe
For permanent magnets.

COBALT SPECIAL
M-459; 0.7 C, 18 W, 1 Mo, 4 Cr, 2 V, 15 Co, bal Fe.
For planer and shaper tools, hobs, taps, drills; reamers; high speed steel, oil hardened.

COBANIC.
M-61, 55 Ni, 45 Co, 0.1 C, bal Fe
Annealed. 65,000-80,000 TS 38 El
For vacuum tube filament wire, heat and corrosion resistant

COBANIC
M 897, 54.5 Ni, 44.5 Co, 1 Fe.
Annealed 80,000 TS; 60,000 YS, 25 El.
For cathodes and filaments in electronic tubes, heat resistant

COBEND 1
M-677, 2.0-3.0 C, 26-33 Cr, 11-14 W, 3 Max Ni, 1 max Mo, bal Co.
Welded: 45-48 Rc
For hardfacing electrodes; Grade ECoCr-C, resists metal to metal wear

COBEND 6.
M-677; 0.9-1.4 C, 26-32 Cr, 3-6 W, 3 max Ni, 1 max Mo, bal Co
Welded: 37-40 Rc, work hardened: 47-51 Rc.
For hardfacing electrodes, grade ECoCr-A, resists abrasion, corrosion, galling, oxidation, erosion in 1200-1800°F range

COBEND 7
M-677 0.2-0.4 C, 25-29 Cr, 2-4 Ni, 5-6 Mo, bal Co.
Welded 34-37 Rc, work hardened 47-40 Rc.
For hardfacing electrodes, resistant to cracking, erosion, hot abrasion

COBEND 7W.
M-677, 0.25-0.45 C, 24-26 Cr, 4.5-6 W, 2-4 Ni, 4.5-6 Mo, bal Co
Welded: 35-37 Rc
For hardfacing electrodes; for cutting edge of hot forming tools.

COBEND 12.
M-677, 1.2-1.7 C, 26-32 Cr, 7-9.5 W, 3 max Ni, 1 max Mo, bal Co.
Welded 35-39 Rc.
For hardfacing electrodes; grade ECoCr-B.

COBENIUM
M-61, 40 Co, 20 Cr, 15 Ni, 7 Mo, 2 Mn, 0.04 Be, 0.15 C, bal Fe.
Cold worked: 250,000-300,000 TS; 240,000-290,000 YS; 1 El; 60 RA; 372 Brin.
For springs, high temperature applications; heat treatable, corrosion and heat resistant.

COBITE.
M-35 0.7 C, 18 W, 4 Cr, 0.65 Mo, 8 Co, 2 V, bal Fe.
For reamers, broaches, milling cutters, shaper and lathe tools; high speed steel; AISI Type T5.

COBRA.
M-1422; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
Hardened: C 64-66 Rock.
For cutters, lathe and planer tools, reamers, hobs, form cutters.
High-speed steel, Type T1, high red hardness.

COCHROME.
English; 60 Co, 24 Fe, 12 Cr, 2 Mn.
For heating elements, filaments; high heat resistance.

COCHROME.
M-503; 0.3 C, 1.2 Cr, 0.3 Mo, bal Fe.
For valve and valve fittings, castings for 250 lb steam pressure; high strength.

COCK BRONZE.
England; 8-10 Sn, 2-6 Zn, bal Cu.
For cocks, fittings, hardware; corrosion resistant.

CODE-ROD NO 120.
M-1096; 0.08-0.13 C, 0.45-0.65 Mn, 0.15-0.25 Si, 0.03 S, 0.03 P, bal Fe.
Welded: 70,000-75,000 TS; 60,000-65,000 YS; 22-27 El 50-55 RA.
For all-purpose welding rod; AWS-E6012.

COE BRONZE
M-8, 89.5 Cu, 10.5 Sn.
Hard sheet: 115,000 TS; 95,000 YS, 5 El; 190 Brin.
Soft Sheet: 60,000 TS; 40,000 YS; 65 El, 74 Brin.
For gears; tough.

Co-ELINVAR
U.S.; 57-60 Co, 25-35 Fe, 8-15 Cr
For instruments; constant modulus

Co-ELINVAR.
M-104, M-373; 36 Ni, 12 Cr, Co, bal Fe
For chronometers, hair springs controlled expansion.

COFLEX.
M-237; bimetal.
For thermostatic bimetal; corrosion resistant

COG BRONZE.
England, 11 Sn, 4 Zn, bal Cu
For cogs, worms, tough, corrosion resistant.

COGNE CX.
M-1450, 0.38-0.45 C, 13 Cr, bal Fe.
Annealed: 100,000 TS, 55,000 YS; 20 El; 50 RA; 210 Brin.
For bearings, valves, cutlery, surgical instruments; Type 420; corrosion resistant

COGNE FEOX.
M-1450; 0.07-0.12 C, 17 Cr, bal Fe.
Annealed. 80,000 TS 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, oil burners and heaters, dairy and food equipment; Type 430; corrosion resistant

COGNE FNOX.
M-1450; 0.25 max C, 17 Cr, 2 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS, 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431; corrosion and heat resistant.

COGNE IOX1.
M-1450; 0.13-0.18 C, 13 Cr, bal Fe.
Annealed: 85,000 TS; 45,000 YS; 25 El 55 RA; 200 Brin.
For valves, cutlery, surgical instruments, turbine blades; Type 410 and 420; corrosion resistant.

COGNE IOX3.
M-1450; 0.26-0.37 C, 13 Cr, bal Fe.
Annealed: 85,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For valves, cutlery, turbine blades, surgical instruments, Type 420; corrosion resistant.

COGNE IOXA.
M-1450; 0.06 C, 13 Cr, 0.2 Al, bal Fe.
Annealed: 70,000 TS 42,000 YS, 25 El; 160 Brin.
Cold Drawn. 85,000 TS, 70,000 YS; 20 El; 185 Brin.
For annealing boxes, quenching racks, oil refinery equipment; not hardenable.
Type 405 stainless steel, magnetic.

COGNE-IOXKM
M-1450, 0.11 C, 12.75 Cr, 0.5 Mo, bal Fe.
Annealed 75,000 TS; 35,000 YS; 30 El, B 92 Rock
For springs, table flatware, oil refinery equipment.
Corrosion resistant, hardenable

COGNE IOXO.
M-1450, 0.09-0.12 C, 13 Cr, 0.5 max C, bal Fe.
Annealed. 75,000 TS, 40,000 YS, 35 El, 70 RA 155 Brin
For turbine blades, valves, cutlery, surgical instruments, Type 403, corrosion resistant

COGNE IOXOO
M-1450; 0.08 max C, 13 Cr, bal Fe.
Annealed 75,000 TS, 40,000 YS, 35 El, 70 RA, 155 Brin.
For turbine blades, valves, cutlery, surgical instruments; Type 403 and 410; corrosion resistant

COGNE KXO2
M-1450, 0.15 max C, 13 Cr, 2 Ni, bal Fe
Annealed 80,000 TS, 40,000 YS, 32 El, 68 RA, 160 Brin
For oil refinery equipment, Type 414, corrosion resistant

COGNE LIOX
M-1450, 0.08-0.16 C, 12 Cr, 12 Ni, bal Fe
For valves, pump parts, corrosion resistant

COGNE NIOX
M-1450, 0.10 C, 18 Cr, 8 Ni, bal Fe.
Annealed 80,000 TS, 35,000 YS; 55 El, 75 RA; 155 Brin
For chemical plant equipment, mixers, tanks, filters; Type 301 and 302, austenitic, stainless

COGNE NIOX-C.
M-1450, 0.06 C, 18 Cr, 12 Ni, 0.5 Cb, bal Fe
Annealed 90,000 TS, 40,000 YS, 55 El, B 82 Rock
Cold Drawn: 100,000 TS, 65,000 YS, 40 El, B 95 Rock
For exhaust manifolds, steam pipes, radiant superheaters, welded structures
Type 347 stainless steel, stabilized, austenitic.

COGNE NIOX-D
M-1450; 0.11-0.16 C, 18 Cr, 8 Ni, bal Fe.
Annealed 80,000 TS, 35,000 YS, 55 El, 75 RA, 155 Brin
For chemical plant equipment, tanks, mixers, filters; Type 302, austenitic, stainless

COGNE NIOX-L.
M-1450; 0.03 max C, 18-20 Cr, 8-12 Ni, bal Fe.
Annealed: 77,000 TS; 30,000 YS, 60 El; 110 Brin.
Cold Drawn: 100,000-180,000 TS; 50,000-125,000 YS, 10-50 El; 180-330 Brin
For kitchen utensils, architectural trim, welded components, chemical and textile plant equipment.
Type 304L stainless steel.

COGNE NIOX-M.
M-1450; 0.10 max C, 19 Cr, 12 Ni, 3.5 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 48 El; 62 RA; 170 Brin.
For acid resistant chemical plant equipment; Type 317; stainless, austenitic.

COGNE NIOX-MT .
M-1450; 0.12 max C, 18 Cr, 8 Ni, 2.5 Mo, Ti, bal Fe
Annealed. 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For welded acid resistant chemical plant equipment, Type 316 Ti; stainless, austenitic.

COGNE NIOX-S
M-1450, 0.08 max C, 18-20 Cr, 8-12 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 150 Brin.
Cold Drawn: 100,000-180,000 TS; 50,000-125,000 YS; 10-50 El, 180-330 Brin
For kitchen equipment, architectural trim, welded components, chemical and textile plant equipment Type 304 stainless steel.

COGNE NIOX-T.
M-1450, 0.08 max C, 18 Cr, 8 Ni, Ti, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 55 El, 65 RA, 150 Brin.
For welded chemical plant equipment, tanks, mixers; Type 321, stainless, austenitic

COGNE RIOX
M-1450, 0.25 max C, 25 Cr, 20 Ni, 1.5 max Si, bal Fe
Annealed 100,000 TS, 45,000 YS, 50 El, 65 RA; 185 Brin
For furnace parts, valves, pumps, turbine and jet parts, Type 310 and 314, stainless, austenitic

COGNE SIOX
M-1450, 0.40 C, 10 Cr, 1 Mo, 2.5 Si, bal Fe
For oil refinery equipment, creep and heat resistant.

COGNE VIOX
M-1450, 0.20 max C, 24 Cr, 12 Ni, bal Fe
Annealed 90,000 TS, 40,000 YS, 50 El, 65 RA; 170 Brin
For furnace parts, heat treat boxes, pumps, oil burners, Type 309, corrosion and heat resistant

COINAGE BRONZE
U.S., 3-4 Sn, 1-2 Zn, bal Cu
For coins, corrosion resistant

COLALLOY
M-744; 2 Mg, 1 Mn, 1 Si, bal Al
Heat treated 12,000-61,000 TS, 20-110 Brin
For chemical and food handling equipment, corrosion resistant

COLD HEADER NO 4
M-336, 1.0 C, 0.3 Mn, 0.2 Si, bal Fe.
For cold heading dies; water hardened

COLD HEADER VANADIUM.
M-69; 1.0 C, 0.25 Mn, 0.2 Si, 0.20 V, bal Fe.
Water hardenable to 60 Rock C.
Can be tempered to desired hardness from 200°F to 800°F
For taps, dies, punches and pneumatic tools
AISI Type W 2 water hardening tool steel .

COLD HEADING #4
M-122, 63.5 Cu, 36.5 Zn.
60,000 TS; 35,000 YS, 42 El; 75 RA; 112 Brin.
For cold upsetting work, rivets, thread rolled products; for cold deformation.

COLD HOT (see Finkl Cold Hot).

COLD HUBBING DIE.
M-38; 0.7 C, bal Fe.
100 Brin.
For cold hubbing dies; carburizing steel.

COLDIE.
M-140; 0.90 C, 0.20 V, 0.25 Si, 0.25 Mn, bal Fe.
For blanking and forming dies, rivet sets; water hardened; Type W 2

COLD STRIKING DIE.
M-38, 0.9 C, bal Fe.
For dies for flatware; medium deep hardening

COLD TRIMMER DIE.
M-38; 0.95 C, 0.65 Cr, bal Fe.
For trimmer dies; oil or water hardening.

COLESCO.
77 Pb, 8 Sn, 14 Sb, 1 Cu.
For bearings

COLFORM "e.t.d." 1527.
M-669, 0.22-0.29 C, 1.20-1.50 Mn, 0.15-0.30 Si, bal Fe.
Cold finished: 120,000 min TS; 92,000 min YS; 14 El; 25-34 min Rc.
For cold forming or cold heading without subsequent heat treatment for strong parts.

COLFORM "e.t.d." 1541 A.
M-669, 0.40-0.45 C, 1.30-1.65 Mn, 0.15-0.30 Si, bal Fe
Cold finished: 150,000 min TS, 130,000 min YS; 120,000 min proof strength; 32 min Rc
For cold forming or cold heading without subsequent heat treatment for strong parts.

COLFORM "e.t.d." 1541 B.
M-669, 0.36-0.44 C, 1.35-1.65 Mn, 0.15-0.30 Si, bal Fe.
Cold finished: 140,000 min TS, 125,000 min YS; 10 El, 28 min Rc.
For cold forming or cold heading without subsequent heat treatment for strong parts

COL-GRAPH
M-35; 1.45 C, 0.8 Mn, 1.2 Si, 0.2 Cr, 0.25 Mo, bal Fe
For blanking dies, gages, machine parts, taps, wear plates
AISI Type 06 oil hardening tool steel.

COLLET BRASS
U.S., 61 Cu, 37 Zn, 2.5 Pb.
For hot forged parts, collets; free-cutting.

COLLEX.
M-501, M-912, 0.40 C, 0.40 Si, 0.30 Mn, 13 Cr, bal Fe
Annealed: 95,000 TS; 50,000 YS, 25 El; 55 RA; 200 Brin
For cutlery, valves, surgical instruments, Type 420, corrosion resistant

COLMO 1100
M-530, 0.10-0.15 C, 0.3 Si, 0.6 Mn, 0.6 Mo, 0.3 V, 0.3 Ti, bal Fe
For high temperature applications, high creep strength

COLMONOY NO. 1.
M-963; 0.9 C, 11 Cr, 2.5 B, 1.75 Si, 0.4 Mn, bal Fe.
Cast: 58-63 Rock C
For hard facing alloy, abrasion resistant.

COLMONOY NO. 2
M-963, 3.0 C, 8.25 Cr, 1.5 Ti, 1.25 Mn, 0.75 Si, bal Fe.
Weld: C 50 Rock (approx), M.P. 2150°F (approx).
Coated electrode for hard facing bucket lips, muller tires, grader blades; good abrasion resistance.

COLMONOY NO. 4.
M-963; 0.45 C, 10 Cr, 2 B, 2.25 Si, 2.5 Fe, bal Ni.
Cast: 35-40 Rock C.
For hard facing alloy; corrosion and heat resistant.

COLMONOY NO. 5.
M-963; 0.65 C, 11.5 Cr, 2.5 B, 3.75 Si, 4.25 Fe, bal Ni.
Cast: 45-50 Rock C.
For hard facing alloy; corrosion and heat resistant.

COLMONOY NO. 6.
M-963; 0.75 C, 13.5 Cr, 3 B, 4.25 Si, 4.75 Fe, bal Ni.
Cast: 56-61 Rock C.
For hard facing alloy; corrosion and heat resistant.

COLMONOY NO. 8.
M-963; 0.95 C, 26.0 Cr, 3.3 B, 4.0 Si, 1.0 Fe, bal Ni.
Weld: C 53-58 Rock.
For hard facing by spray welder.
Resists oxidation and corrosion.
High abrasion resistance.

COLMONOY No 15.
M-963; 93.0 Cu, 7.0 P.
Hardness: B 78-82 Rock; M P. 1460°F (approx.)
Powder for buildup or braze welding of copper and copper alloys.

COLMONOY NO. 20.
M-963; 0.25 C, 5 Cr, 1 B, 3 Si, 3.5 Fe, bal Ni.
Cast: 15-20 Rock C.
For glass mold repairs; corrosion and heat resistant

COLMONOY NO. 21.
M-963; 0 25 C, 5.0 Cr, 3.25 Si, 1 25 B, 1.0 Fe, bal Ni.
As cast: C 26-31 Rock; M.P. 2050°F (approx).
For medium hard facing for glass container molds; heat, impact and corrosion resistant.

COLMONOY NO. 22
M-963; 0 1 C, 3 15 Si, 0.75 Fe, 1.25 B, bal Ni
Cast: C 28-33 Rock: M P. 1925°F (approx).
Atomized powder for machinable buildup on shafts and worn or undersize parts; good impact resistance.

COLMONOY NO. 23A.
M-963; 0 1 C, 1.0 Fe, 2.3 Si, 1.25 B, bal Ni.
Cast: C 17-22 Rock; M.P. 1950°F (approx)
Atomized powder for machinable buildup on shafts and worn or undersize parts; good impact resistance

COLMONOY NO. 24.
M-963; 0.1 C, 2 3 Si, 1 0 Fe, 1.25 B, bal Ni.
Cast: C 17-22 Rock; M.P. 1950° (approx).
Atomized powder for machinable buildup on shafts and worn or undersize parts; good impact resistance.

COLMONOY NO. 43.
M-963; 0.45 C, 10.0 Cr, 2.75 Fe, 2.75 Si, 2 0 B, bal Ni.
Cast: C 35-40 Rock, M.P. 2025°F (approx).
For building up and surface finishing shafts and wear surfaces; machinable with carbide tools; impact resistance better than Colmonoy No. 53.

COLMONOY NO. 53.
M-963; 0.65 [illegible], 11 5 Cr, 4.25 Fe, 3.75 Si, 2.5 B, bal Ni.
Cast: C 45-50 Rock; M.P. 1950°F (approx).
For hard facing shafts, wear surfaces; good red hardness, corrosion resistance, and improved shock resistance.

COLMONOY NO. 56.
M-963; 0.7 C, 12.5 Cr, 2.75 B, 4 Si, 4.5 Fe, bal Ni.
Cast: 50-55 Rock C.
For hard facing alloy; abrasion, galling and corrosion resistant.

COLMONOY NO. 62.
M-963; 0.75 C, 14.5 Cr, 4.5 Si, 4.5 Fe, 3 5 B, bal Ni.
Cast· C 58-63 Rock; M.P. 1875°F (approx).
For hard surfacing shafts, sleeves, valve trim; good resistance to abrasion, corrosion and galling.

COLMONOY NO. 63.
M-963; 0.75 C, 14 5 Cr, 4.5 Fe, 4.5 Si, 3.5 B, bal Ni.
Cast: C 58-63 Rock; M P 1875°F (approx).
For hard surfacing by Fusewelder Torch, on shafts, sleeves, valve trim; good resistance to abrasion, corrosion and galling.

COLMONOY NO. 69.
M-963; 0.06 C, 15.0 Cr, 4 0 Si, 3 35 B, 2 75 Cu, 2.75 Mo, 2 5 Fe, bal Ni.
Cast· C 58-63 Rock; M.P. 1900°F (approx).
For hard surfacing, usually by Spraywelder, for shafts, sleeves, valve trim; good resistance to heat, abrasion, corrosion and galling

COLMONOY NO 70.
M 963; 0 4-0 7 C, 10-13 Cr, 1 7 3 2 B, 15-17 W, 2.5-4.0 Si, 2 5-4.0 Fe, bal Ni
As cast· 50-55 Rock C
For hard facing; wear, heat and corrosion resistant

COLMONOY NO 72.
M-963; 0 75 C, 13 0 Cr, 12 0 W, 3 6 Si, 3.5 Fe, 2 7 B, bal Ni
Cast C 58-63 Rock; M.P. 2050°F (approx)
For hard surfacing; excellent resistance to fretting corrosion and abrasion

COLMONOY NO 75.
M-963, 0 70 C, 13.5 Cr, 3 B, 4.2 Si, 4 75 Fe, WC, bal Ni
Rockwell C 54-59
For hard facing; resists galling and abrasion.

COLMONOY NO 221
M-963; 2 75 C, 16 Cr, 1 Si, 1 Mo, 1 5 Mn, bal Fe.
Weld metal· 43-48 Rock C
Electrode wire for hard facing; wear and abrasion resistant

COLMONOY NO HC240.
M 963, 4 3 C, 24 0 Cr, 3.0 Si, 2 9 Mn, bal Fe.
Cast C 60 Rock (approx)
Wire for semi-automatic welder for buildup of hard, abrasion resistant surfaces having good red hardness.

COLMONOY NO C-290
M-963, 0 45 C, 2 5 Si, 37 0 Ni, 1.5 B, 13.25 Cr, bal Fe
For hard facing by Spraywelder, building up shaft bearing surfaces

COLMONOY NO. 705.
M-963; Colmonox No. 63 with tungsten carbide particles added.
Cast· C 58-63 Rock; M.P 1900°F (approx).
For hard facing surfaces requiring extreme abrasion resistance as buffing fixtures.

COLMONOY SWEAT ON PASTE.
82 Cr, 18 B.
Rockwell C 70.
For welding hard facing alloy paste, wear and abrasion resisting.

COLONIAL NO. 6.

M-34, M-115; 0.95 C, 1.3 Mn, 0.5 Cr, 0.15 V, 0.5 W, bal Fe.

Hardened: 140,000 TS; 120,000 YS; 8 El; 30 RA; 302 Brin.

For blanking dies, chasers, gages, hobs, master tools; non-shrinking, oil hardening.

COLONIAL NO. 7.

M-115; 0.6-1.4 C, 0.18 V, bal Fe.

For tools, chisels, pneumatic riveters, cutting tools, thread cutting dies, tough, shock and vibration resistant.

COLONIAL NO. 14.

M-115; 0.6-1.2 C, bal Fe.

For tools; water hardening.

COLONIAL NO. 100.

M-1393, 4.5-5.7 Sn, 2.75-4.0 Pb, 1.0-9.5 Zn, bal Cu.

For bearings, pump impellers; free-cutting.

COLONIAL NO. 101.

M-1393; 4.5-5.75 Sn, 2-3 Pb, 9.5-16 Zn, bal Cu.

For bushings, bearings, pump impellers, free-cutting

COLONIAL NO 110.

M-1393, 4.5-5.5 Sn, 4.25-7.0 Pb, 2.0-7.0 Zn, bal Cu.

For pump impellers, bushings, bearings; free-cutting, red brass.

COLONIAL NO. 115.

M-1393, 4.0-5.5 Sn, 4.25-7.0 Pb, 4.0-10.0 Zn, bal Cu.

Cast: 33,000-46,000 TS. 17,000-24,000 YS; 15-35 El; 12-32 RA; 55-65 Brin.

For hardware, plumbing, red brass, free-cutting.

COLONIAL NO 120.

M-1393, 3.0-4.5 Sn, 6-10 Pb, 5-10 Zn, bal Cu

Cast 30,000-38,000 TS, 12,000-17,000 YS; 15-27 El; 12-25 RA, 50-60 Brin.

For hardware, plumbing; red brass, free-cutting

COLONIAL NO 123

M-1393, 2-4 Sn, 5-8 Pb, 6-18 Zn, bal Cu

Cast 29,000-39,000 TS; 13,000-17,000 YS; 18-30 El; 15-27 RA, 50-60 Brin

For hardware, plumbing, plumbers brass, free-cutting

COLONIAL NO. 125.

M-1393; 2-4 Sn, 5-8 Pb, 6-18 Zn, bal Cu.

Cast 30,000-40,000 TS, 12,000-16,000 YS, 20-35 El; 15-30 RA, 50-60 Brin.

For hardware, plumbing, plumbers brass, free-cutting.

COLONIAL NO 130.

M 1393, 1-3 Sn, 4-10 Pb, 8-20 Zn, bal Cu.

For hardware, plumbing; free-cutting

COLONIAL NO. 131

M-1393; 1-2 Sn, 1-2 Pb, 2-8 Zn, bal Cu.

For hardware, plumbing; free-cutting.

COLONIAL NO. 132.

M-1393; 1-3 Sn, 1-3 Pb, 86-88 Cu, bal Zn.

For hardware, plumbing; free-cutting.

COLONIAL NO 193.

M-1393; 21-23 Sn, 0.50 max others, bal Cu.

For bearings.

COLONIAL NO. 194.

M-1393; 18-20 Sn, bal Cu.

For bearings.

COLONIAL NO. 195.

M-1393; 16-18 Sn, bal Cu

For bearings.

COLONIAL NO. 196.

M-1393; 14-16 Sn, bal Cu.

For bearings.

COLONIAL NO. 197.

M-1393; 13-15 Sn, 1.5 max Zn, 0.2 Pb, bal Cu.

For bearings.

COLONIAL NO. 198.

M-1393; 12.5-14.5 Sn, 2.5-4.5 Zn, 1 max Pb, bal Cu.

For bearings.

COLONIAL NO. 199.

M-1393; 12-14 Sn, bal Cu.

For bearings.

COLONIAL NO. 200.

M-1393; 10.75-12.25 Sn, 0.75-1.25 Pb, 0.1 max Zn, bal Cu.

For bearings; free-cutting

COLONIAL NO. 201.

M-1393; 10.75-12.0 Sn, 0.8-1.2 Pb, 1-4 Zn, bal Cu.

For bearings.

COLONIAL NO. 205.

M-1393; 9.75-12.0 Sn, bal Cu.

For bearings.

COLONIAL NO. 206.

M-1393, 9-11 Sn, 1.0-2.5 Pb, bal Cu.

For bearings.

COLONIAL NO. 210.

M-1393, 9.0-10.7 Sn, 1-7 Zn, 0.2 max Pb, bal Cu.

For bearings.

COLONIAL NO. 215.

M-1393; 9.0-10.7 Sn, 1-7 Zn, 0.8-1.2 Pb, bal Cu.

For bearings.

COLONIAL NO. 220

M-1393; 9.0-10.7 Sn, 1.2-2.7 Pb, 1-5 Zn, bal Cu.

For bearings

COLONIAL NO. 221.

M-1393; 9.0-10.7 Sn, 2.7-4.2 Pb, 1-5 Zn, bal Cu.

For bearings.

COLONIAL NO 225.

M-1393, 7.5-9.7 Sn, 1-7 Zn, 0.2-0.4 Pb, bal Cu.

For bearings

COLONIAL NO. 230.

M-1393; 7.5-9.0 Sn, 0.80-1.2 Pb, 1-7 Zn, bal Cu.

Cast: 33,000-43,000 TS; 16,000-24,000 YS; 18-30 El; 15-30 RA; 60-75 Brin.

For bearings; Gun Metal.

COLONIAL NO. 235

M-1393, 7.5-9.0 Sn, 1.2-2.7 Pb, 1-6 Zn, bal Cu.

For bearings.

COLONIAL NO. 240.

M-1393; 7.5-9.0 Sn, 2.7-4.2 Pb, 1-6 Zn, bal Cu

For bearings.

COLONIAL NO. 241.

M-1393, 7.5-9.0 Sn, 4.2-6.2 Pb, 1-6 Zn, bal Cu.

For bearings.

COLONIAL NO. 242.

M-1393; 6-8 Sn, 0.5 max Zn, bal Cu.

For bearings.

COLONIAL NO. 245.

M-1393; 5.7-7.5 Sn, 1-2 Pb, 1-7 Zn, bal Cu.

Cast: 34,000-42,000 TS; 16,000-21,000 YS; 20-35 El; 16-30 RA; 60-70 Brin.

For valves, pump parts, free-cutting.

COLONIAL NO. 250.

M-1393; 5.7-7.5 Sn, 2.0-3.2 Pb, 2-6 Zn, bal Cu.

For bearings.

COLONIAL NO. 251.

M-1393; 5.7-7.5 Sn, 3.2-5.2 Pb, 1-6 Zn, bal Cu.

For bearings.

COLONIAL NO. 253.
M-1393; 4.5-5.7 Sn, 1-2 Pb, 1-9 Zn, bal Cu.
For bearings.

COLONIAL NO. 255.
M-1393; 4.0-5.7 Sn, 2.0-2.7 Pb, 1-4 Zn, bal Cu.
For bearings.

COLONIAL NO. 256.
M-1393; 3.0-4.5 Sn, 1.7-3.0 Pb, 1-9 Zn, bal Cu.
For bearings.

COLONIAL NO. 257.
M-1393; 3-4 Sn, 0.5-1.0 Pb, 85-90 Cu, bal Zn.
For bearings.

COLONIAL NO. 295.
M-1393; 15-17 Sn, 4-6 Pb, 0.25-1.0 Zn, bal Cu.
For bearings.

COLONIAL NO. 296.
M-1393; 12-14 Sn, 14-16 Pb, 0.5 max Zn, 0.5-1.0 Ni, bal Cu.
For bearings.

COLONIAL NO. 296.5.
M-1393; 10.5-12.5 Sn, 7-10 Pb, bal Cu.
For bearings.

COLONIAL NO 297.
M-1393; 9.5-11.5 Sn, 4.2-6.0 Pb, 0.75-1.5 others, bal Cu.
For bearings.

COLONIAL NO 298
M-1393; 9-11 Sn, 4.2-6.2 Pb, 1-5 Zn, bal Cu.
For bearings.

COLONIAL NO. 299.
M-1393; 9-11 Sn, 9-11 Pb, 0.15-0.75 Zn, bal Cu.
For bearings.

COLONIAL NO. 300.
M-1393; 9.0-10.7 Sn, 8.5-11.7 Pb, 0.25 max Sb, bal Cu.
For bearings

COLONIAL NO 301.
M-744; 0.1 C, 18 Cr, 8 Ni, bal Fe
Annealed. 72,000 TS; 57,000 YS; 32 El; 50 RA; 110 Brin
For chemical plant equipment, Type 301; stainless, austenitic

COLONIAL NO. 305.
M-1393; 9.0-10.7 Sn, 8.5-21.7 Pb, 0.75-1.5 others, bal Cu.
Cast: 27,000-37,000 TS, 15,000-22,000 YS; 6-12 El; 5-11 RA, 55-70 Brin
For bearings; bearing bronze

COLONIAL NO 310
M-1393; 7.5-9.0 Sn, 7.2-8.7 Pb, 0.75-1.5 others, bal Cu
For bearings.

COLONIAL NO. 311.
M-1393; 7.5-9.0 Sn, 7.2-8.7 Pb, bal Cu.
For bearings.

COLONIAL NO. 312
M-1393; 7.5-9.0 Sn, 8.7-11.0 Pb, 0.75-1.5 others, 3.0 max Zn, bal Cu.
For bearings.

COLONIAL NO. 313
M-1393; 7.5-9.0 Sn, 12-16 Pb, 0.25-0.50 Ni, bal Cu.
For bearings.

COLONIAL NO. 314.
M-1393; 7.5-9.0 Sn, 12-16 Pb, 0.25-0.75 others, bal Cu.
For bearings.

COLONIAL NO. 315.
M-1393; 5.5-7.5 Sn, 6.0-10.5 Pb, 4 max Zn, 0.75-1.5 others, bal Cu.
Cast: 30,000-38,000 TS; 17,000-21,000 YS; 12-20 El; 10-22 RA; 55-65 Brin.
For bearings, bushings; bearing bronze.

COLONIAL NO. 319.
M-1393; 5.7-7.5 Sn, 12-16 Pb, 0.75-2.0 others, bal Cu.
Cast: 25,000-30,000 TS; 14,000-20,000 YS; 10-18 El, 8-15 RA; 50-60 Brin.
For bearings, bushings; bearing bronze.

COLONIAL NO. 320.
M-1393; 5.7-7.5 Sn, 16.7-29.7 Pb, 3.0 max Zn, bal Cu.
For bearings

COLONIAL NO 321.
M-1393; 5.7-7.5 Sn, 16-29 Pb, 0.75-1.5 others, bal Cu
For bearings.

COLONIAL NO. 322.
M-1393, 4.0-5.7 Sn, 21-26 Pb, 1.5 max others, bal Cu
Cast: 23,000-30,000 TS, 11,000-15,000 YS; 7-16 El; 5-12 RA, 42-55 Brin.
For bearings, bushings, bearing bronze.

COLONIAL NO. 323.
M-1393; 4-6 Sn, 21.7-26.0 Pb, 0.5 max Zn, bal Cu.
For bearings.

COLONIAL NO 324
M-1393; 4.0-5.7 Sn, 26-32 Pb, 0.75-1.5 impurities, bal Cu
For bearings

COLONIAL NO 325.
M-1393, 4.5-5.7 Sn, 11.7-21.7 Pb, 3 max Zn, bal Cu.
For bearings

COLONIAL NO 326.
M-1393, 3.5-5.0 Sn, 8-10 Pb, 4 max Zn, bal Cu
For bearings.

COLONIAL NO 400
M-1393, 0.5-1.7 Sn, 2-4 Pb, 70-74 Cu, bal Zn
Cast: 35,000-40,000 TS, 12,000-14,000 YS, 25-40 El. 20-40 RA; 50-55 Brin
For plumbing, hardware; leaded yellow brass, free-cutting

COLONIAL NO 403
M-1393; 66-70 Cu, 0.5-1.7 Sn, 2-4 Pb, bal Zn.
Cast 30,000-38,000 TS, 11,000-15,000 YS, 20-35 El, 15-30 RA; 40-60 Brin
For plumbing, hardware, yellow brass, free-cutting

COLONIAL NO 405
M-1393, 66 max Cu, 0.5-1.7 Sn, 2-4 Pb, bal Zn.
For hardware, screw machine products, free-cutting, yellow brass

COLONIAL NO 405.1.
M-1393; 65 max Cu, 0.5-1.5 Sn, 0.5 max Pb, bal Zn
For hardware, screw machine products; yellow brass.

COLONIAL NO. 405.2.
M-1393, 65 max Cu, 0.5-1.5 Sn, 0.5-1.0 Pb, bal Zn.
For hardware, screw machine products; free-cutting, yellow brass.

COLONIAL NO 406
M-1393; 66 max Cu, 0.5-1.0 Sn, 1.0-1.5 Pb, bal Zn.
For hardware, screw machine products; free-cutting, yellow brass.

COLONIAL NO. 407.
M-1393; 66-72 Cu, 0.5 max Sn, 0.5 max Pb, bal Zn.
For hardware, screw machine products; yellow brass.

COLONIAL NO. 407.5.
M-1393; 90-95 Cu, 0.20 max Sn, 0.50 max Pb, bal Zn.
For clips, fasteners, springs; good corrosion resistance.

COLONIAL NO. 408.
M-1393; 83-86 Cu, 0.20 max Sn, 0.50 max Pb, bal Zn.
For clips, fuse parts, hardware; good corrosion resistance.

COLONIAL NO. 409.
M-1393; 61 max Cu, 1.5-2.0 Pb, bal Zn.
For screw machine products, hardware; free-cutting, yellow brass.

COLONIAL NO. 410.
M-1393; 5 max Sn, 10 max Pb, 9-14 Ni, bal Cu + Zn
Cast: 30,000-40,000 TS; 15,000-20,000 YS; 10-25 El, 7-20 RA; 50-60 Brin.
Nickel silver, leaded.

COLONIAL NO 411.
M-1393; 5 max Sn, 10 max Pb, 14-18 Ni, bal Cu + Zn
Cast: 35,000 45,000 TS; 17,000-24,000 YS; 15-30 El; 15-30 RA, 65-80 Brin
For bearings; nickel silver, leaded.

COLONIAL NO. 412
M-1393; 5 max Sn, 10 max Pb, 18-22 Ni, bal Cu + Zn
Cast. 40,000 60,000 TS; 17,000-30,000 YS; 15-25 El; 11-22 RA; 76-120 Brin
For bearings, nickel silver, leaded.

COLONIAL NO 413
M-1393, 5 max Sn, 10 max Pb, 22-27 Ni, bal Cu + Zn
For bearings, nickel silver, leaded

COLONIAL NO 414
M-1393; 5 max Sn, 10 max Pb, 27-33 Ni, bal Cu + Zn
For bearings, nickel silver, leaded

COLONIAL NO 415
M-1393; 1 max Sn, 0.1 max Pb, 8-13 Al, Cu + Zn
Cast. 70,000-87,000 TS; 25,000-30,000 YS; 22-38 El; 20-36 RA, 110-140 Brin
For hardware, propellers, gears, Al Bronze.

COLONIAL NO. 420.
M-1393, Zn, Mn, bal Cu.
Cast: 60,000-65,000 TS.
For hardware, propellers, gears, Mn Bronze.

COLONIAL NO. 421.
M-1393; 56-69 Cu, 0.75-2.0 Fe, 0.3 max Pb, 0.5 max Ni, bal Zn
Cast: 65,000-68,000 TS; 28,000-40,000 YS; 20-35 El; 20-40 RA; 115-150 Brin.
For propellers, gears, hardware; Bronze.

COLONIAL NO. 422.
M-1393; Zn, Mn, bal Cu.
Cast: 80,000-90,000 TS.
For hardware, gears, propellers; Mn Bronze.

COLONIAL NO. 423.
M-1393; Zn, Mn, bal Cu.
Cast: 90,000-100,000 TS.
For hardware, gears, propellers; Mn Bronze.

COLONIAL NO. 424.
M-1393; 60-68 Cu, 2-4 Fe, 1 max Ni, 0.1 max Pb, bal Zn.
Cast: 100,000-120,000 TS; 65,000-90,000 YS; 12-18 El; 5-18 RA; 190-235 Brin.
For hardware, gears, propellers; Mn Bronze.

COLONIAL NO. 500
M-1393; 90 min Cu, 2 max Sn, 2.0-5.5 Si, 2.5 max Fe, 1.5 max Mn.
For bolts, gears, fasteners; Si Bronze.

COLONIAL HIGH SERVICE.
Eng.; 0.90 Cu, 0.20 Mn, 0.14 V, bal Fe.
For tools, drills, taps; water hardening.

COLONIAL HIGH SPEED
M-34; 0.52 C, 0.28 Mn, 3.8 Cr, 18.25 W, 0.24 V, bal Fe.
For high speed cutting tools; high speed steel.

COLORADO METAL.
U.S; 57 Cu, 25 Ni, 18 Zn.
For electrical resistances, corrosion resisting parts; corrosion resistant.

COLORADO WATER HARDENING.
M-618, 0.9-1.0 C, bal Fe.
For tools, drills, taps; water hardened.

COLOSSO.
M-344; 0.3 C, 0.3 Cr, 0.5 Ni, 0.3 W, 0.1 V, 0.6 Mo, bal Fe
For tools, flogging and pneumatic tools, rivet sets; no drawing of temper.

COLTUF 28.
M-530, 0.16 max C, 1.2 Mn, 1.25 max Si, bal Fe.
Rolled; 63,000-72,000 TS, 38,000 YS; 25 El
For ship construction; high ductility, no noted embrittlement

COLUMAX
M-1010, 7.8 Al, 13.5 Ni, 25 Co, 3 Cu, 0.8 Cb, bal Fe
13,600 Br; 750 Hc, 7.5 × 10^6 BH max
Heat treatable, for permanent magnets.

COLUMAX-5
M-1192; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe.
Peak energy product 7,500,000.
Residual induction 13,500, Hc 750, 5000 TS; 8000 Tr.M R, C 50 Rock
For permanent magnets in electrical and magnetic equipment and instruments.
Similar to Alnico V-7, cast magnet, hardenable. Hard and brittle

COLUMBIA A 8
M-35, 0.56 C, 5.0 Cr, 1.25 W, 1.25 Mo, bal Fe.
For shear blades, forming rolls, heavy blanking dies, punches
Type A 8 air hardening tool steel

COLUMBIA CCB
M-35, 0.41 C, 0.80 Mo, 1.50 Cr, 4.25 Ni, bal Fe.
For forging dies, dummy blocks, backer blocks, hot shear blades.
Hot work tool steel

COLUMBIA DOUBLE SPECIAL.
M-35; 1.3 C, 3.2 W, 0.55 Cr, 0.4 Si, 0.25 Mn, bal Fe.
Annealed 200 Brin.
For machining chilled rolls, drawing and master dies; fast finishing.

COLUMBIA ELECTREX.
M-35; 1.0 C, 0.25 Si, 0.35 Mn, bal Fe
For drills, taps, punches, hobs, reamers; Type W 1; water hardened.

COLUMBIA EXTRA HEADERDIE.
M-35; 0.8-1.2 C, 0.25 Si, 0.25 Mn, bal Fe.
Water Hardened: 166,000-216,000 TS; 110,000-150,000 YS; 11-15 El; 32-37 RA; 330-600 Brin.
For taps, drills, reamers, punches, stamps, knurls, mandrels.
Type W 1 water hardening.

COLUMBIA EXTRA VANADIUM.
M-35; 1.0 C, 0.2 V, bal Fe.
For tools, cutters, dies; tough.

COLUMBIA SPECIAL.
M-35; 0.6-1.15 C, 0.25 Mn, 0.15 Cr, 0.02 V, 0.25 Si, bal Fe.
Annealed: 170 Brin.
For dies, punches, taps, reamers, knives, cutting and forming dies; water hardening carbon tool steel; AISI W 1.

COLUMBIA SPECIAL WIRE DRAWING.
M-35; 2.3 C, 10.5 W, 1.85 Cr, bal Fe.
For wire drawing ties; used unhardened.

COLUMBIA SPRING.
M-35; 0.95 C, 0.35 Mn, 0.25 Si, bal Fe.
For springs, clips, tools; water hardened.

COLUMBIA STANDARD.
M-35; 0.6-1.15 C, 0.25 Si, 0.3 Mn, bal Fe.
Annealed: 163 Brin.
For mandrels, forming rolls, machine parts, hammers; carbon tool steel. AISI W 2.

COLUMBIA STANDARD DIE BLOCK.
M-35; 0.8 C, 0.3 Si, 0.3 Mn, bal Fe.
For die blocks, general tools, Type W 1; water hardened.

COLUMBIA VANADIUM STANDARD.
M-35; 0.95 C, 0.2 V, 0.3 Mn, 0.25 Si, bal Fe.
For drills, hobs, reamers, cutters, broaches; Type W 2; water hardened.

COLUMBIUM 10W-2.5 Zr.
M-1537; 9-11 W 2-3 Zr, bal Cb.
Bar: 85,000-89,000 TS; 66,000-71,000 YS, 26-33 El; 64-70 Brin.
Sheet at 2000°F: 28,000 TS; 22,000 YS; 25 min El.
Bar at 2000°F: 36,500 TS; 27,500 YS; 32 El.
For space vehicles and nuclear reactors.
High strength at elevated temperatures.
Insensitive to notch stress concentration.

COLUMBIUM 10W-5 Zr.
M-1537; 10 W, 5 Zr, bal Cb.
Annealed: 102,000 TS; 85,000 YS; 12 El, 9 RA.
For space vehicles and nuclear reactors.
High strength at elevated temperatures.
Insensitive to notch stress concentration.

COLUMBIUM-10W-10 Hf.
M-1537; 9-11 W, 9-11 Hf, bal Cb.
Cold rolled: 130,800 TS; 122,200 YS; 4 El
Stress-relieved: 112,300 TS; 100,500 YS; 16 El.
Recrystallized: 88,500 TS; 71,500 YS; 26 El.
For space vehicles, missiles, high temperature components.
Good oxidation resistance and high temperature properties.

COLUMBIUM-15W-5 Mo-1 Zr.
M-53, M-31, M-1537; 15 W, 5 Mo, 1 Zr, bal Cb.
Annealed: 115,000 TS; 95,000 YS; 5 El; 8 RA.
At 2200°F: 43,500 TS; 39,000 YS; 22 El; 40 RA.
For missile and space vehicle components, high temperature fasteners.
High heat, oxidation and corrosion resistant.

COLUMBIUM C-103.
M-1596; 9.0-11.0 Hf, 0.7-1.3 Ti, 0.7 max Zr, bal Cb.
Cold rolled: 105,000 TS; 96,600 YS; 4.5 El.
Recrystallized: 58,800 TS; 45,400 YS; 26 El.
For high temperature applications, space vehicles.
Good TIG weldability.

COLUMBIUM C-129.
M-1596, M-1537; 10 W, 10 Hf, bal Cb.
Rolled: 131,000 TS; 123,000 YS; 5 El.
Stress relieved: 112,000 TS; 100,000 YS; 16 El.
Recrystallized: 85,000 TS; 71,000 YS; 30 El.
For high temperature service, space vehicles, reactors, missiles.
Recrystallized at 1900-2200°F. Heat resistant.

COLUMBIUM C-129-Y.
M-1596, M-1537; 9-11 W, 9-11 Hf, 0.05-0.3 Y, bal Cb.
Recrystallized: 89,800 TS; 75,700 YS; 25 El.
At 2000°F: 39,600 TS, 29,500 YS; 44 El.
At 3000°F: 11,000 TS; 9900 YS; 75 El.
For high temperature applications, space vehicles, missiles.
Good elevated temperature properties, combined with heat and oxidation resistance

COLUMBIUM Cb 132 M
M-114, M-1537, M-1596; 0.001 C, 1.5 Zr, 15 W, 5 Mo, 20 Ta, 58.5 Cb.
Extruded: 131,800 TS, 122,100 YS; 4 El.
At 2400°F: 56,700 TS, 49,200 YS, 37 El (extruded)
Heat treated 89,200 TS; 0.5 El.
At 2400°F: 58,300 TS; 49,900 YS; 20 El; (heat treated)
For jet engine and gas turbine blades.
High strength, high temperature alloy.

COLUMBIUM Cb-752
M-48, M-1537, 9-11 W, 2-3 Zr, bal Cb
Annealed sheet 78,000 TS, 58,000 YS; 20 min El.
At 2200°F: 28,000 TS; 22,000 YS; 25 min El.
For high temperature applications.
High heat and corrosion resistance.

COLUMBIUM D-10
M-1563; 0.0175 O_2, 0.0020 H_2, 0.01 N_2, 0.01 C, bal Cb
Recrystallized sheet: 30,000 min TS, 15,000 min YS, 15 min El.
Recrystallized bar: 25,000 min TS; 12,000 min YS; 25 min El.
For high temperature applications. High heat resistance.

COLUMBIUM D-11.
M-1563; 0.75-1.25 Zr, bal Cb.
Bar (Recryst.) 30,000 min TS, 16,000 min YS; 25 min El
Extruded: 40,000 TS; 20,000 YS; 25 El.
At 1800°F: 27,000 TS, 16,000 YS; 23 El.
Sheet (Recryst.): 35,000 min TS, 20,000 min YS; 12 min El.
For space vehicles and nuclear reactors.
High heat resistant.

COLUMBIUM D-14.
M-1563; 4.4-5.6 Zr, bal Cb.
At 78°F: 68,000 TS, 56,000 YS; 15 El.
At 2000°F: 32,000 TS; 22,000 YS; 40 El.
Stress relieved sheet. 55,000 min TS, 45,000 min YS; 12 min El.
For hot surfaces on space re-entry vehicles.
Moderate strength alloy for elevated temperature service.

COLUMBIUM D-36.
M-1563; 9.0-11.0 Ti, 4.0-6.0 Zr, bal Cb.
Sheet recrystallized: 80,000 TS; 71,000 YS; 20 El.

At 800°F: 65,000 TS; 45,000 YS; 18 El.
At 2000°F: 22,000 TS; 20,000 YS; 50 El.
Bar Recryst: 65,000 min TS; 58,000 min YS; 20 min El.
For space re-entry vehicles.
High heat resistance.

COLUMBIUM D-40.
M-1563; 15 W, Mo, 1 Zr, 0.06 C, bal Cb.
Cold rolled: 125,000 TS; 85,000 YS, 25 El.
At 2200°F: 50,000 TS; 30,000 YS; 22 El.
For space missiles and rocket components.
Heat resistant. Retains usable strength to 2500°F.

COLUMBIUM D-41.
M-1563; 19.0-21.0 W, 9.0-11.0 Ti, 5.5-6.5 Mo, bal Cb.
Extruded: 130,000 TS; 127,000 YS; 5.3 El.
At 2000°F: 56,000 TS; 53,000 YS; 26 El.
At 2400°F: 34,000 TS; 29,000 YS, 33 El.
For space vehicles and nuclear reactors. High heat resistant.

COLUMBIUM D-43.
M-1563; 10 W, 1 Zr, 0.1 C, bal Cb
Sheet: 92,000 TS, 78,000 YS, 22 El.
At 2000°F 50,000 TS; 45,000 YS; 15 El
For missiles and space craft.
High creep and rupture strength

COLUMBIUM SU-16.
M-1528, 11 W, 3 Mo, 2 Hf, 0.08 C, bal Cb.
At 2000°F, stress relieved bars have a stress rupture life of 1000 hrs. with a 28,000 stress.
At 2200°F the 1000 hr. rupture stress is 14,800. For applications requiring high strength at 2000-2500°F, aircraft gas turbine blades, space vehicles, military equipment
High temperature strength and excellent room temperature ductility

COLUMBIUM SU-31.
M-1528, 17 W, 3.5 Hf, 0.12 C, bal Cb
For gas turbine blades
High heat resistance and creep strength.

COLUMBIUM XB-88
M-118, 28 W, 2 Hf, 0.067 C, bal Cb
For gas turbine buckets.
Heat resistant. High rupture strength.

COLUMBUS K 03
M-1305; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2 V, 12 W, bal Fe.
For lathe and planer tools, hobs, taps, reamers, drills; high speed steel, oil hardened

COLUMBUS K 011
M-1305; 0.76 C, 10 C, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, milling cutters, drills, high speed steel, oil hardened.

COLUMBUS K 055.
M-1305, 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe
For lathe and planer tools, drills, taps, hobs; high speed steel, oil hardened

COLUMBUS K 0109.
M-1305; 0.8 C, 4.7 Co, 4.3 Cr, 0.7 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, taps, hobs, drills; high speed steel, oil hardened.

COLUMBUS MO.
M-1305; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel, oil hardened.

COLUMBUS SS10.
M-1306; 0.82 C, 4 Cr, 0.8 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, drills, reamers, hobs; high speed steel, oil hardened.

COLUMBUS SS11.
M-1305; 0.86 C, 4 Cr, 0.8 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel, oil hardened.

COLUMBUS SS13.
M-1305, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For special milling cutters, high speed steel, oil hardened

COLUMBUS SS19.
M-1305; 0.74 C, 4.1 Cr, 1 V, 18.5 W, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel, oil hardened.

COLVILLE STAINLESS IRON.
M-530; 16-17 Cr, 0.4 Mn, 0.1 C, bal Fe.
For heat and corrosion resisting parts, stainless and corrosion resistant.

COMALLOY.
M-England: 17 Mo, 12 Co, bal Fe
For permanent magnets, electrical and magnetic equipment.
Precipitation hardened, high permeability

COMANCHE.
M-1432, 0.9 C, 1.2 Mn, 0.5 Cr, 0.2 V, 0.5 W, bal Fe.
Oil hardening tool steel; AISI 01.

COMBARLOY
M-575, Ag, bal Cu
For commutator bars; high conductivity

COMET
M-32, 1.05 C, 0.25 Mn, bal Fe
For taps, reamers, dies for blanking, trimming and forming, water hardening; "Carpenter No 11."

COMET.
M-44, 65 Fe, 5 Cr, 30 Ni
85,000 TS; 47,000 YS, 37 El; 69 RA.
For dipping baskets, electric resistance wire, rheostats, max operating temperature 700°C; heat resisting

COMINCO NO. 2570.
M-1679; Zn alloy.
Forged: 60,000-72,000 TS, 45,000-60,000 YS; 14 El; 120 Brin
For industrial applications, hardware, fire fighting equipment, automotive parts, plumbing fixtures, solenoid valves

COMINCO NO 2573
M-1679; Zn alloy
Forged: 62,000-75,000 TS, 45,000-60,000 YS, 13 El, 125 Brin
For industrial applications, hardware, fire fighting equipment, automotive parts, plumbing fixtures, solenoid valves

COMINCO NO 3130.
M-1679; Zn alloy.
Forged: 35,000 TS, 23,000 YS; 30 El; 65 Brin.
For structural and pressure components, plumbing fixtures, solenoid valves Good creep resistance.

COMINCO NO. 3330.
M-1679; Zn alloy.
Forged: 48,000 TS; 35,000 YS, 20 El; 90 Brin.
For structural and pressure components, plumbing fixtures, valves, regulators. Good creep resistance.

COMMANDO.
M-435; 1.2 C, 0.25 Mn, 0.2 Si, bal Fe.
For dies; drill rod.

COMMANDO NO. 47.
M-373; 0.45 C, 1.4 Cr, 0.25 V, 0.25 Mo, 2 W, bal Fe.
For hot punches, tools; hot work steel, shock resistant.

COMMELL SPECIAL.
Eng.; 1.20 C, 0.21 Mn, 2.92 W, bal Fe.
For tools, dies, cutters; fast finishing tool steel.

COMMERCE H.
M-1248; Cu alloy.
Cast: 65,000-75,000 TS; 12,000-16,000 YS; 10-2 El; 116-165 Brin.
For resistance welding electrode; 10-15% electrical conductivity.

COMMERCIAL BRASS.
M-8; 65 Cu, 35 Zn.
Hard: 76,000 TS; 4 El; 153 Brin.
Soft: 45,000 TS; 60 El; 52 Brin.
For fixtures, radiators, ornaments; must be annealed.

COMMERCIAL BRONZE.
M-33; 90 Cu, 10 Zn.
Sheets: 32,000 TS; 10,000 YS; 40 El; 50 Brin.
Wire: 100,000 TS; 50,000 YS; 1 El.
For window screen wire, automobile radiators, hardware, ornaments.

COMMERCIAL BRONZE 25.
M-141; 90 Cu, 10 Zn
Hard: 61,000 TS; 54,000 YS; 5 El; 125 Brin.
Soft: 38,000 TS; 12,000 YS; 45 El; 53 Brin.
For weather stripping; corrosion resistant

COMMERCIAL BRONZE 220.
M-8; 10 Zn, bal Cu.
Sheet: 32,000 TS; 10,000 YS; 40 El; 50 Brin
Wire: 100,000 TS; 50,000 YS; 1 El.
For window screen wire, auto radiators, hardware; corrosion resistant.

COMMERCIAL BRONZE 226
M-8; 12.5 Zn, bal Cu.
Hard: 65,000 TS; 52,000 YS, 7 El, 125 Brin.
Soft: 39,000 TS; 13,000 YS, 45 El; 72 Brin.
For costume jewelry, slide fasteners; base for gold plate

COMMERCIAL CARBON DRILL ROD.
M-1702, 0.95-1.05 C, 0.3-0.5 Mn, 0.15-0.3 Si, bal Fe
AISI Type W 1 water hardening tool steel

COMMERCIAL CASTINGS B C
Eng.; 62 Cu, 30 Zn, 6 Sn, 2 Pb.
For name plates, oil cups, instrument cases.

COMMERCIAL DRILL ROD
M-1; 1.1 C, 0.25 Mn, bal Fe. For dowel pins, shafting, push rods, drills; water hardening.

COMMON FORMULA.
Eng., 55 Cu, 25 Zn, 20 Ni.
For electrical resistance; German silver

COMMON TOMBAC.
French, 28 Zn, 72 Cu.
Rolled: 42,000 TS; 25,000 YS; 35 El; 30 RA; 45 Brin.
For cartridge cases, condenser tubes, brazing; corrosion resistant; ductile.

COMMON TYPE METAL "A."
U.S.; 60 Pb, 10 Sn, 30 Sb.
For type metal.

COMMON TYPE METAL "B."
U.S.; 55.5 Pb, 40 Sn, 4.5 Sb.
For type metal.

COMMONWEALTH.
M-1034; 0.3 C, 2 Ni, bal Fe.
80,000 TS.
For trunk frames; tough.

COMO.
M-140, 0.7 C, 9 Mo, 1.5 W, 4 Cr, 1 V, 5 Co, bal Fe.
For lathe and planer tools, drills, hobs, reamers; high speed steel. AISI M-30.

COMOL-17.
M-38, 12 Co, 17 Mo, bal Fe.
Bar: 1,100,000 (BdHd) max., 10,000 Br, 230 Hc, 6900 Bo.
Bar: 125,000 TS; 50,000 Tr.S; C 60 Rock.
For electrical and magnetic equipment.
Permanent magnet High permeability.

COMOL-20
M-60, M-313; 12 Co, 20 Mo, bal Fe.
Cast: (BdHd) max. 1,250,000; residual flux density 8550
For electrical and magnetic equipment.
Permanent magnet High permability.

COMPAX
M-111, M-111a, 0.13 C, 1.4 Cr, 3.8 Ni, 0.5 Mn, bal Fe
Annealed: 100,000 TS, 200-220 Brin
Core Hardened: 145,000 TS; 112,000 YP; 290 Brin.
For plastic molds, large cavity dies for compression molding
Type P 6 tool steel, case hardening

COMPENSATOR ALLOY.
England, Fe Ni
For compensating shunts for electrical equipment, temperature sensitive, magnetic.

COMPLEX ENGLISH METAL
Eng., 87 Sn, 6 Sb, 2 Ni, 2 Cu, 1.5 W, 1 Zn, 0.5 Bi.
For bearings

COMPO.
M-632, 88.5 Cu, 10 Sn, 1.5 graphite.
Sintered: up to 20,000 TS, 5-10 El, 20-90 Brin
For self lubricating porous bronze bushings, porosity and oil content is 10 to 40% by volume.

COMPO 59-E
M-632, 36.5 Cu, 4 Sn, 58.5 Fe, Graphite
Sintered. 12,500 TS, 5.9 Density, 28% oil by volume
For light loaded, low cost bearings, for self-aligning bearings in motors

COMPO 60-Y
M-632, 89 Cu, 9.75 Sn, 1.25 Graphite
Sintered 10,000 TS, 6.0 Density; 30% oil by volume
High oil content plus MoS_2 for additional lubrication for very light loads, as cameras, instruments, light duty appliances

COMPO 61-A
M-632, 87 Cu, 9.5 Sn, 3.5 Graphite.
Sintered 6500 TS, 6.1 Density; 20% oil by volume
For bearings used in light duty applications where noise elimination is important.

COMPO 62-E.
M-632; 36.5 Cu, 4 Sn, 58.5 Fe, 1 Graphite
Sintered: 15,000 TS; 6.2 Density; 23% oil by volume
Good load bearing qualities; for fan motors, tractors and agricultural equipment.

COMPO 63-H
M-632, 89 Cu, 9.75 Sn, 1.25 Graphite.
Sintered. 12,000 TS; 6.3 Density; 27% oil content by volume.

For light loaded, self-aligning bearings in fractional horse power motors.

COMPO 66-H.
M-632; 89 Cu, 9.75 Sn, 1.25 Graphite.
Sintered: 14,700 TS, 6.6 Density; 23% oil by volume.
Standard bearing material, good load bearing qualities.
ASTM B438-67 Gr 1, Type II; SAE 841, PMPMA BT-0010-R.

COMPO 66-Q.
M-632, 90.0 Cu, 10 Sn.
Sintered: 16,000 TS; 6.6 Density; 25% oil by volume.
For bearings and parts requiring light machining, boring or staking, good load bearing qualities.
ASTM B438-67, Gr 1, Type II; SAE 841; PMPMA BT-0010-R

COMPO 66-R
M-632, 87 Cu, 9.5 Sn, 3.5 Graphite
Sintered 15,000 TS; 6.6 Density, 18% oil by volume.
For bearings having oscillating and reciprocating loads, for bearings die cast into place.

COMPO 70-H.
M-632, 89 Cu, 9.75 Sn, 1.25 Graphite.
Sintered: 18,000 TS, 7.0 Density, 15% oil by volume
For heavy duty bearings as in agricultural or construction equipment, and in industrial work.
ASTM B255-61, Type II; SAE 842, PMPMA BT-0010-S

COMPO 70-Q
M-632, 90 Cu, 10 Sn.
Sintered 19,500, 7.0 Density, 20% oil by volume
For bearings requiring heavy machining, severe staking, spinning, and where ductility is important, good for shock and high loading
ASTM B255-61, Type II, SAE 842, PMPMA BT-0010 S.

COMPO 70-R.
M-632, 87 Cu, 9.5 Sn, 3.5 Graphite.
Sintered 18,000 TS, 7.0 Density, 5% oil by Volume
For bearings for oscillating and reciprocating loads, for die casting thin walled bearings into place

COMPOSITE
M-345; C, bal Fe
For tools, dies, water hardening

COMPOSITE DIE.
M-261, C, bal Fe
For tools, dies, water hardening

COMPOSITION NO 1.
M-508, 6 Sn, 3 Pb, 4 Zn, bal Cu.
34,000 TS, 23,000 YS, 20 El, 75 Brin.
For centrifugal castings, general purpose

COMPOSITION BRASS.
84 85 Cu, 4-6 Zn, 4-6 Sn, 4-6 Pb.
26,000 TS, 12,000 YS; 15 El
For bearings, screws, hardware; (ounce metal)

COMSOL
M-200, Ag, Sn, Pb.
Cast: 56,000 TS; 40 El
For soft solder; M P 296°C, retains strength at high temperature.

CONDENSER FOIL.
Eng, 90 Pb, 9 Sn, 1 Sb.
For accumulators; accumulator metal.

CONDOR SPECIAL
M-253; 0.7-1.4 C, Mn, Si, bal Fe.
For drill rods, tools; see Pompton Special.

CONDULOY.
M-1037; 0.23-0.32 Be, 1.4-1.5 Ni, bal Cu.
Cast: 54,000 TS; 21,000 YS; 15 El; 14 RA; 110 Brin.
Heat treated: 84,000 TS; 64,000 YS; 4 El; 7 RA; 189 Brin.
For diaphragms, springs, instrument parts; age-hardenable, now Brush 35-C alloy.

CONEL.
M-942, 38.5 Ni, 3.3 Mn, 3.3 Si, 4.6 Cr, bal Fe.
Cold worked and annealed: 185,000 TS; 145,000 YS; 4 El.
For springs; low thermoelastic coefficient.

CO-NETIC A-152
M-1567; Fe, bal Ni.
Sheet: 21,000 YP, B 43-47 Rock.
For magnetic shielding.

CO-NETIC AA
M-1567; 20 Fe, bal Ni.
Sheet. 57,000 TS, 28,500 YP; B 47-53 Rock.
For electrostatic shielding.
High permeability

CO-NETIC B
M-1567, Fe, bal Ni.
Sheet 58,000 TS, 19,000 YP.
For magnetic shielding

CONFLEX 216.
M-1562, 10% copper layer on AISI 1065 steel
Heat treated: 215,000 TS; 185,000 YS, 5 El
For current carrying springs.
Magnetic, 16% conductivity

CONFLEX 316
M-1562, Carbon spring steel clad with Cu both sides, 90% steel, 10% Cu
Annealed: 74,000 TS; 65,000 YS, 25 El
Rolled: 130,000 TS, 110,000 YS, 2 El
Heat Treated 213,000 TS, 185,000 YS, 5 El
For current carrying springs. 16% conductivity.
High elasticity, low contact resistance.

CONFLEX 326
M-1562, Carbon spring steel clad with Cu both sides 80% steel, 20% Cu
Annealed. 70,000 TS, 61,000 YS, 25 El.
Rolled 120,000 TS, 110,000 YS, 2 El
Heat treated 204,000 TS, 177,000 YS; 6 El
For current carrying springs.
High elasticity, low contact resistance.

CONFLEX 335S
M-1562; Core of age-hardened 17-7 PH double clad with copper.
Aged 155,000 TS, 140,000 YS, 2.5 El
For current carrying springs
30-40% conductivity.

CONFLEX 545
M-1562, AISI 6150 steel double clad on a copper base.
Heat Treated: 145,000 TS, 133,000 YS; 4-5 El.
For flat or cantilever type springs Two thin copper layers clad on the outer surfaces to provide resistance to corrosion
Five layers bonded together Not brazed together. Copper is 45% of cross-section

CONFLEX 720.
M-1562; 20 Mn, 20 Ni, bal Cu.
Hardened: 102,650-175,600 TS, 49,800-149,300 YS; 0.5-15 El; 200-425 VHN
For springs, diaphragms, clips, watch cases, pen-caps.
Nonmagnetic, corrosion resistant. Age-hardenable.

CONGO.
M-140; 0.8 C, 4 Cr, 1.5 V, 4 W, 5 Mo, 12 Co, bal Fe.
For form tools, cut-off knives, reamer blades; high speed steel, oil hardened.

CONGO HOT WORK.
M-140; 0.1 C, 0.5 V, 3.5 Cr, 4 W, 5 Mo, 25 Co, bal Fe.
For brass die, casting dies ,master hobs; age-hardenable, air quenched.

CONICO.
50 Cu, 29 Co, bal Ni.
For magnets for electrical equipment; magnetically soft.

CONLY.
M-746; 4-5 Cu, bal Al.
For bicycles; tubes.

CON-PAC.
M-604; 0.17 C, 1.35 Mn, 0.40 Si, 0.30 Cu, bal Fe
Heat Treated: 80,000 min YS; 100,000 min TS.
For storage tanks, penstocks, bridges and buildings, railroad cars, trucks.
Heat treated carbon steel plates.

CONPERNIK.
M-118; 50 Fe, 50 Ni, trace Mn.
Annealed: 55,000 TS; 20,000 YS; 33 El.
For laminations for transformers, choke coils, high magnetic permeability.

CONQUEROR.
M-688; 0.9 C, 0.4 Mn, 0.3 Si, bal Fe.
For stone drills and tools, punches, chisels; tough and wear resistant.

CONQUEROR.
M-1406; 0.70-0-0.85 C, bal Fe.
Heat treated: 188,000 TS; 143,000 YS, 12 El, 35 RA; 385 Brin.
For press tools, chisels, springs; Type W1; water hardened.

CONQUEROR 14%.
M-1406; 0.65 C, 14 W, 4 Cr, 0.75 V, bal Fe.
For shear blades, punches, drills, taps; high speed steel.

CONQUEROR AA.
M-1406; 0.70 C, 17 W, 4 Cr, 1 V, 0.5 Mo, bal Fe.
For cutters, taps, reamers, hobs, drills; high speed steel.

CONQUEROR HOLLOW DRILL.
M-688; 0.75 C, 0.3 Mn, 0.2 Si, bal Fe.
For hollow stone drills, pneumatic tools; abrasion and shock resistant.

CONQUEROR L. C.
M-1406; 0.45 C, 14 W, 2.7 Cr, 0.4 V, bal Fe.
For forging and extrusion dies, mandrels; oil hardened, hot die steel.

CONQUEROR O.H.D.
M-1406; 1.0 C, 0.25 Mn, 1.6 Cr, 0.5 W, bal Fe.
For cutters, gages, drawing dies, rolls, reamers; cold work steel, oil hardened.

CONSERVALOY.
M-1; 0.60 C, 22 Cr, 8.5 Mn, 0.35 N, bal Fe.
For valves; corrosion and heat resistant.

CONSIL 852.
M-63; 85 Ag, 15 Cd0.
For electric contacts.
Internally oxidized.

CONSIL 866.
M-63; 86.6 Ag, 13.4 Cd.
For electric contacts.

CONSIL 880.
M-63; 88 Ag, 12 Cd.
For electric contacts.

CONSIL 900.
M-63; 90 Ag, 10 CdO.
For electric contacts.
Internally oxidized.

CONSIL 910.
M-63, 91 Ag, 9 Cd.
For electric contacts

CONSIL 983.
M-63; 1.7 Mg, 98.3 Ag
Annealed: 47,000 TS, 15 El; 57 Rock 30 T.
Cold Rolled: 63,000 TS; 5 El; 66 Rock 30 T.
For secondary emitter for television cameras
Elect. cond. 35.

CONSIL 995
M-63; 0.25 max Mg, 0.25 max Ni, 99.4 min Ag.
Annealed 28,000-34,000 TS; 30-40 El, 60-65 Rock 15 T
Cold Worked: 55,000 TS; 6-8 El; 50-60 Rock 30 T.
Hardened 68,000 TS; 56,000 YS; 5-15 El, 68 Rock 30 T.
For electrical contacts, cable connectors, spring clips, relay springs.
Air hardened High elect conductivity

CONSTAHL.
M-716; 0.1 C, 19 Cr, 9 Ni, bal Fe.
For stainless parts; stainless.

CONSTANT
M-1114; 0.95 C, 1.25 Mn, 0.5 Cr, 0.5 W, bal Fe
For tools, dies, non-deforming

CONSTANTAN.
M-44, M-61; 60-45 Cu, 40-55 Ni, 0-1.4 Mn
Annealed: 60,000-70,000 TS, 20,000-30,000 YS; 40-60 El, 50-70 RA, 100-120 Brin.
Rolled: 140,000 TS; 125,000 YS; 1 El; 5 RA; 300 Brin
For electrical resistances, thermocouples; high heat resistance

CONSTANTIN.
M-44; 44-46 Ni, 54 Cu, 0-0.4 Fe, 0-1.34 Mn
For resistance alloy, rheostats, thermocouples, heat resistant.

CONSTANT SPECIAL.
M-1114; 0.95 C, 1.25 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies; non-deforming.

CONSTRUCTAL 1.
M-116; Cu Zn, Mg, bal Al
For light alloy parts

CONSTRUCTAL 2.
M-116; 1.2 Cu, 0.9 Mg, 0.6 Si, 0.5 Ti, bal Al.
Aged: 54,000-60,000 TS; 18-25 El; 95-115 Brin.
For aircraft and heavy duty forgings; age-hardenable

CONSTRUCTAL 8.
M-116; 7 Zn, 2.5 Mg, 0.2 Si, 1 Mn, bal Al.
Heat treated: 67,000-74,000 TS; 15-18 El; 120-140 Brin.
For light alloy structural parts; heat treatable.

CONSTRUCTAL 20/42.
M-116; 4.5 Zn, 2.5 Mg, 0.4 Si, 0.6 Mn, 0.1 Cu, bal Al.
Aged: 65,000-71,000 TS; 51,000-60,000 YS; 10-12 El.
For light alloy parts; high strength, age hardenable.

CONSTRUCTAL 20/53.
M-116; 5.0 Zn, 3.0 Mg, 0.4 Si, 0.3 max Cr, 0.1 Cu, bal Al.
Aged: 71,000-77,000 TS; 64,000-68,000 YS; 8 El.
For light alloy parts; high strength, age-hardenable.

CONSTRUCTAL 87.
M-116; 0.28 Fe, 1.24 Mn, 6.87 Zn, 1.62 Mg, 0.75 Si, bal Al.
For light alloy structural parts; heat treatable.

CONSUMET 882.
M-32; 0.35 C, 5.0 Cr, 1.5 Mo, 0.4 V, bal Fe.
Ht. Tr.: 300,000 TS; 250,000 YS; 6 El; C 55 Rock.
For die casting dies, extrusion and forging dies, hot punches, aircraft structural fittings.
Vacuum melted Type H-11 tool steel.

CONTACT BRONZE.
M-141; 8.95 Zn, 1.9 Sn, 0.15 P, bal Cu.
Annealed: 48,000 TS; 54 El 67 Brin.
Hard: 78,000 TS; 7.5 El; 165 Brin.
Spring: 97,500 TS; 3 El; 190 Brin.
For electrical contacts, switches, springs; good spring properties.

CONTACT BRONZE 92.
M-141; 89 Cu, 0.15 P, 1.9 Sn, bal Zn.
Hard: 90,000 TS; 72,000 YS; 3 El; 185 Brin.
For electrical contacts; corrosion resistant.

CONTRACID.
M-296; 0.6 Be, 60 Ni, 15 Cr, 7 Mo, bal Fe.
For springs; corrosion resistant.

CONTRACID-B2M.
M-296; 60 Ni, 18 Cr, 2 Mo, bal Fe.
For clinical apparatus, surgical instruments, pumps, valves.
Corrosion and acid resistant.

CONTRACID B 2.5 M.
M-296, 19.5 Fe, 61 Ni, 15 Cr, 2.5 Mo, 2 Mn.
For chemical apparatus, surgical instruments; heat and corrosion resistant

CONTRACID B 4 M
M-296, 18 Fe, 61 Ni, 15 Cr, 4 Mo, 2 Mn
For chemical apparatus, surgical instruments; heat and corrosion resistant

CONTRACID B 6 W
M-296, 16 Fe, 61 Ni, 15 Cr, 6 W, 2 Mn
For chemical apparatus, surgical instruments, heat and corrosion resistant

CONTRACID B 7 M.
M-296, 16 Fe, 60 Ni, 15 Cr, 7 Mo, 2 Mn.
At 20°C 136,000 TS, 120,000 YS; 23 El.
At 500°C. 107,000 TS, 91,000 YS, 28 El.
For chemical apparatus, surgical instruments, heat and corrosion resistant.

CONTRACID B7MO.
M-296; 60 Ni, 15 Cr, 16 Fe, 2 Mn, 7 Mo.
For jet engine parts, heat and corrosion resistant.

CONTRACID B 10 W.
M-296; 12 Fe, 61 Ni, 15 Cr, 10 W, 2 Mn
At 25°C: 125,000 TS; 112,000 YS, 22 El.
At 500°C: 109,000 TS, 100,000 YS; 18 El.
For chemical apparatus, surgical instruments; heat and corrosion resistant

CONTRACID B W M C
M-296; 14 Fe, 58 Ni, 3 Co, 15 Cr, 3 Mo, 5 W, 2 Mn.
For chemical apparatus, surgical instruments; heat and corrosion resistant.

CONTRALOY.
M-184; C, 28 Cr, 15 Ni, bal Fe
For heat and corrosion resistant parts; now Michiana No. 63.

COOK A.L.Z.
M-1405; 0.4 C, 5 Cr, 0.1 W, 1 Si, 1.5 Mo, 0.6 V, bal Fe.
For punches, pneumatic tools; oil hardened, tough.

COOK B.K.V.
M-1405; 1.9 C, 0.35 Mn, 13.5 Cr, 0.6 Si, bal Fe.
For punches, plastic mold dies, form tools; air or oil hardened, non-deforming.

COOK C.K.K.
M-1405; 1.0 C, 1.4 Cr, 0.3 Mn, 0.25 Si, bal Fe.
For bearings, bushings, blanking and forming dies; water hardened, wear and abrasion resistant.

COOK C.M.C.
M-1405; 0.9 C, 1.3 Mn, 0.95 Cr, 0.3 Si, bal Fe.
For blanking and forming tools, taps, punches; oil hardened, non-deforming.

COOK C.R.P.
M-1405; 0.9 C, 1.3 Mn, 1.0 Cr, 0.25 Si, bal Fe.
For press tools, guages, master hobs, rollers; oil hardened, non-deforming.

COOK E.T.A.
M-1405; 0.9 C, 0.35 Mn, 0.2 Si, 0.1 V, bal Fe.
For drawing, pressing and forming dies; cold work steel, water hardened.

COOK H.D.Z.
M-1405; 0.4 C, 3 Cr, 9 W, 3 V, bal Fe.
For extrusion dies and rams, punches; hot work steel, oil hardened.

COOK I.L.O.
M-1405; C, alloy, bal Fe.
For drawing, forming and coining dies; water hardened

COOK M.K.Z
M-1405; 0.38 C, 3 Cr, 9 W, 0.4 Mo, 0.2 V, bal Fe.
For hot forging and extrusion dies and tools; hot work steel, oil hardened.

COOK M.Y.
M-1405; 0.58 C, 0.4 Mn, 1.0 Cr, 0.95 Si, 0.4 Mo, bal Fe
For chisels, caulking and riveting tools, oil hardened, shock resistant.

COOK'S ALLOY
Eng.; 56-69 Sb, 32-44 Zn.

COOK W Z
M-1405, 0.4 C, 3 Cr, 11 W, 0.2 V, 0.4 Mo, 0.35 Mn, bal Fe
For extrusion dies, die casting dies, tools; hot work steel, oil hardened.

COOPER.
Eng., 40-50 Au, 50-60 Pd.
For dental alloy; corrosion resistant.

COOPER ALLOY 5
M-36, 0.15-0.30 C 4.0-6.0 Cr, 0.40-0.60 Mo, bal Fe.
Cast 110,000 TS; 75,000 YS; 18 El; 30 RA; 200 Brin.
For corrosion resistant parts, oil refinery equipment; corrosion resistant.

COOPER ALLOY 14.
M-36; 0.12-0.35 C, 11-4 Cr, bal Fe.
Cast 75,000 TS; 50,000 YS; 20 El; 30 RA; 180 Brin.
For corrosion resistant castings, valve trim.

COOPER ALLOY 14A.
M-36; 0.10-0.15 C, 11.5-14.0 Cr, 1.25-2.5 Ni, 0.5 max Mo, bal Fe.
Annealed: 115,000 TS, 90,000 YS; 235 Brin.
For furnace parts, chemical and textile plant equipment. AISI 414. Corrosion resistant.

COOPER ALLOY 14 H.
M-36; 0.25-0.35 C, 1 max. Mn, 11-14 Cr, 0.75 max Ni, bal Fe.
Annealed: 99,000 TS; 55,000 YS; 27 El; 48 RA; 190 Brin.
Hardened: 250,000 TS; 225,000 YS; 0 El; 0 RA; 550 Brin.
For grinding parts, castings; wear and abrasion resistant.

COOPER ALLOY 14 I.
M-36; 0.12-0.20 C, 1 max. Mn, 11-14 Cr, 0.75 max Ni, bal Fe.
Cast: 115,000-120,000 TS; 90,000-100,000 YS; 25-20 El; 60-55 RA; 200-240 Brin.
For valve trim, fittings, pump parts; corrosion resistant.

COOPER ALLOY 14S.
M-36; 0.10 C, 12.5 Cr, 0.5 Ni, 0.75 Si, bal Fe
Heat treated: 197,000-116,000 TS; 139,000-96,000 YS; 16-23 El; 42-60 RA, 372-230 Brin.
For valves, valve trim, pump parts; corrosion resistant.

COOPER ALLOY 15.
M-36; 1.5-1.7 C, 12-14 Cr, 1.1-1.5 Mo, 0.75 max. Ni, 3.0-3.5 Co, 0.5-0.75 V, bal Fe.
Annealed: 235 Brin.
Hardened: 600 Brin
For grinding parts, castings; abrasion and wear resistant.

COOPER ALLOY 15A
M-36; 1.5 C, 12-14 Cr, 1 V, 1 Mo, bal Fe.
For valves, pump bodies; corrosion and heat resistant.

COOPER ALLOY 16.
M-36, 0.12-0.30 C, 16-20 Cr, bal Fe
Annealed: 70,000-100,000 TS; 50,000-75,000 YS; 12-5 El; 15-5 RA; 200-225 Brin.
For valve trim for high pressure steam, pump valves; stainless steel, formerly "Sweetaloy No. 16."

COOPER ALLOY 16C.
M-36; 0.30 C, 20-22 Cr, 1 Cu, bal Fe.
Cast: 70,000 TS; 35,000 YS; 3 El, 2 RA; 235 Brin
For rabble blades on ore roasting furnaces; heat resistant.

COOPER ALLOY 16 C3.
M-36; 0.3 max. C, 20-24 Cr, 0.75 max Ni, 0.9-1.2 Cu, bal Fe
Annealed: 70,000-95,000 TS, 35,000-70,000 YS; 7-2 El; 7-2 RA; 185-235 Brin.
For castings for copper plating solutions; corrosion resistant.

COOPER ALLOY 16 H
M-36; 0.95-1.1 C, 16-18 Cr, 0.75 max. Ni, 1 max. Mn, bal Fe.
Cast: 240 Brin
Hardened: 620 Brin.
For wear resistant castings; corrosion resistant.

COOPER ALLOY 17.
M-36; 0.20 max C, 18-20 Cr, 8-10 Ni, bal Fe
Annealed: 75,000-85,000 TS; 40,000-50,000 YS, 40-50 El; 40-55 RA; 180-160 Brin.
For oil refineries, canneries, dairies, pump valves, cocks, fittings; best general acid resisting base iron; "Sweetaloy No. 17."

COOPER ALLOY 17-4 PH.
M-36; 0.05 C, 16.5 Cr, 4.5 Ni, 0.65 Si, 2.8 Cu, bal Fe.
Heat treated: 165,000 TS; 144,000 YS; 19 El; 49 RA; 401 Brin.
For high strength, corrosion resistant parts and castings; heat treatable, stainless.

COOPER ALLOY 17C.
M-36; 0.07-1.0 C, 18 Cr, 8 Ni, bal Fe.
Cast: 84,000 TS; 42,000 YS; 47 El; 50 RA; 165 Brin.
For oil refineries, pumps, dyeing and bleaching equipment, corrosion and heat resistant.

COOPER ALLOY 17ELC.
M-36; 0.025 C, 20 Cr, 8.5 Ni, 1.25 Si, bal Fe.
Annealed: 85,000 TS; 43,000 YS; 54 El; 59 RA; 145 Brin.
For chemical plant equipment, stainless castings; stainless, austenitic.

COOPER ALLOY 17G.
M-36; 0.15-0.30 C, 17-20 Cr, 8-11 Ni, 0.5 max Mo, bal Fe.
Annealed: 80,000 TS; 38,000 YS; 46 El; 170 Brin.
For chemical plant equipment, agitators, mixers, filter presses, valve bodies, pump components.
MIL-S-17509 Cl I, corrosion resistant, austenitic.

COOPER ALLOY 17GM
M-36, 0.06-0.08 C, 17-19 Cr, 12-14 Ni, 0.5 max Mo, bal Fe
Annealed: 78,000 TS; 38,000 YS; 55 El; 140 Brin.
For chemical plant equipment, agitators, mixers, vessels, valve bodies, pumps
Corrosion resistant, austenitic

COOPER ALLOY 17 LL.
M-36, 0.2 max. C, 2 max. Si, 18-20 Cr, 8-10 Ni, 0.2-0.3 Se, bal Fe
W Q 75,000-85,000 TS, 40,000-50,000 YS; 55-40 El, 55-40 RA, 130-160 Brin.
For fittings, valves, pumps, corrosion resistant, free-cutting

COOPER ALLOY 17M-ELC
M-36, 0.025 C, 19 Cr, 12 Ni, 1.25 Si, 2.5 Mo, bal Fe.
Annealed: 84,000 TS, 43,000 YS, 46 El, 59 RA
For chemical plant equipment and castings; acid resistant, austenitic

COOPER ALLOY 17 Mo.
M-36, 0.20 max C, 18-20 Cr, 8-10 Ni, 3 Mo, bal Fe
Annealed 85,000 TS; 45,000 YS; 35 El; 35 RA; 155 Brin
For stainless, heat and corrosion resisting parts pumps; corrosion and heat resistant

COOPER ALLOY 17-S
M-36, 0.10 C, 18 Cr, 8-10 Ni, bal Fe
Cast 84,500 TS; 45,000 YS; 50 El, 50 RA; 165 Brin
For stainless parts, valves, pumps, fittings, stainless, corrosion resistant

COOPER ALLOY 17SCB
M-36, 0.8 C, 18-20 Cr, 8-10 Ni, Cb = 10 × C, bal Fe.
Cast. 80,000 TS, 40,000 YS; 47 El, 50 RA, 150 Brin
Annealed: 90,000 TS; 55,000 YS, 55 El, 55 RA; 140 Brin.
For stainless steel castings, pumps, oil refining; stainless, resists acids, stabilized tough welding.

COOPER ALLOYS 17 Se.
M-36; C, 18-20 Cr, 8-10 Ni, 0.30 Se, bal Fe.
Cast: 85,000 TS; 45,000 YS, 50 El; 50 RA; 165 Brin
For stainless parts; stainless, corrosion resistant; free machining.

COOPER ALLOY 17SELC.
M-36, 0.03 max C, 17-21 Cr, 8-12 Ni, bal Fe.
Annealed: 77,000 TS, 37,000 YS, 55 El; 140 Brin.
For autoclaves, filter press plates, pasteurizers, mixing kettles, pumps, pump sleeves, spray nozzles.
ACI-CF3; AISI 304, austenitic, stainless.

COOPER ALLOY 17 SLL.
M-36; 0.10 max. C, 2 max. Si, 18-20 Cr, 8-10 Ni, 0.2-0.3 Se, bal Fe.
W.Q.: 70,000-80,000 TS; 35,000-45,000 YS; 60-45 El; 60-45 RA; 130-160 Brin.
For fittings, valves, pumps; corrosion resistant, free-cutting.

COOPER ALLOY 17SM.
M-36; 0.08 max C, 19 Cr, 10 Ni, 1.25 Si, 2.5 Mo, bal Fe.
Water quenched: 90,000 TS; 55,000 YS, 50 El; 55 RA; 155 Brin.
For paper mill equipment; corrosion resistant, austenitic.

COOPER ALLOY 17SMELC.
M-36; 0.3 max C, 17-21 Cr, 9-13 Ni, 2-3 Mo, bal Fe.
Annealed: 80,000 TS; 42,000 YS; 50 El; 155-170 Brin.
For chemical plant equipment, acid mixers, filter presses, acid pumps, spray nozzles
ACI-CF3M; AISI 316 L.
Corrosion resistant, austenitic

COOPER ALLOY 17-S-Mo.
M-36; 0.10 max C, 18-20 Cr, 8-12 Ni, 2-3 Mo, bal Fe.
Cast: 85,000 TS; 45,000 YS; 50 El; 50 RA; 165 Brin.
For stainless, heat and corrosion resisting parts, valves; corrosion resistant, stainless.

COOPER ALLOY 17XM.
M-36; 0.08 max C, 18-21 Cr, 9-13 Ni, 3-4 Mo, bal Fe.
Annealed 80,000 TS, 42,000 YS; 50 El, 155-170 Brin.
For chemical plant equipment, acid mixers and pumps, valves, filter presses, spray nozzles.
ACI-CG8M; AISI 317.
Corrosion resistant, austenitic.

COOPER ALLOY 18
M-36, 0.35 max C, 20-22 Ni, 8-10 Cr, bal Fe.
Annealed: 79,000-65,000 TS; 46,500-35,000 YS; 20-30 El, 30-35 RA; 150-180 Brin.
For cracking coil plugs, in oil refineries, thermocouple wells, electric resistance grids; erosion, heat and corrosion resistant; "Sweetaloy No. 18."

COOPER ALLOY 18-8.
M-36; 0.1 C, 18 Cr, 8 Ni, bal Fe.
For stainless parts, austenitic, stainless.

COOPER ALLOY 19.
M-36; 0.35 max C, 27-30 Cr, 0.5-3 Ni, bal Fe.
Cast: 50,000-90,000 TS; 35,000-60,000 YS; 3-1 El; 5-1 RA; 170-205 Brin.
For equipment to resist S gases at high temp., corrosive acids, molten metals; excellent abrasion resistance; "Sweetaloy No. 19."

COOPER ALLOY 19A.
M-36; 0.35 max C, 26-30 Cr, 2-3 Ni, bal Fe.
Cast: 75,000-100,000 TS; 50,000-65,000 YS; 25-15 El; 25-15 RA; 190-210 Brin.
For furnace parts, stainless castings; heat and corrosion resistant.

COOPER ALLOY 19AH
M-36; 1.0 C, 28 Cr, 3 Ni, 0.75 Si, bal Fe.
Cast: 350 Brin.
For roasting furnace blades; corrosion, heat and abrasion resistant.

COOPER ALLOY 19 AM.
M-36; 0.10 max C, 28 Cr, 3 Ni, 0.75 Si, 1.5 Mo, bal Fe.
Cast: 90,000 TS; 75,000 YS; 10 El; 20 RA; 200 Brin.
For paper mill equipment; corrosion resistant.

COOPER ALLOY 19 AMO.
M-36; 0.35 max. C, 27-30 Cr, 2-4 Ni, 1.0-1.5 Mo, bal Fe.
Annealed: 90,000 TS; 75,000 YS; 10 El; 20 RA; 200 Brin.
For soot blower parts; acid mine water pumps; heat and corrosion resistant.

COOPER ALLOY 19B.
M-36, 0.10 max C, 26-30 Cr, 3-4 Ni, 1.0 max Si, 0.1 max Mn, bal Fe.
Cast: 90,000 TS; 65,000 YS; 18 El; 185 Brin.
For chemical and food processing equipment, fittings, gears, impellers, jet engine components.
ACI Type CC-10, heat and abrasion resistant

COOPER ALLOY 20.
M-36; 0.3-0.5 C, 34-37 Ni, 13-18 Cr, bal Fe.
Cast: 60,000-70,000 TS; 35,000-40,000 YS; 6-12 El; 6-12 RA; 165-185 Brin.
For furnace parts, enameling racks, tube supports, retorts; resists heat and flue gases at high temperature, "Sweetaloy No. 20."

COOPER ALLOY 20-10.
M-36; 0.12 max C, 20.5 Cr, 10.5 Ni, 1.25 Si, bal Fe.
Water quenched: 80,000 TS; 50,000 YS, 55 El; 55 RA; 150 Brin.
For stainless parts; stainless, austenitic.

COOPER ALLOY 21.
M-36, 0.3-0.5 C, 62-68 Ni, 12-18 Cr, bal Fe.
Cast: 60,000-75,000 TS, 30,000-50,000 YS; 4-10 El; 4-10 RA; 170-185 Brin.
For carburizing boxes, pots, retorts, heat resisting alloy; "Sweetaloy No. 21."

COOPER ALLOY 21A.
M-36; 0.2 max C, 18-20 Cr, 24-26 Ni, 2-4 Mo, 1.5 Si, bal Fe.
Annealed: 65,000 TS, 30,000 YS; 25 El; 25 RA; 130 Brin.
For heat and corrosion resisting parts; corrosion resistant to hot H_2SO_4.

COOPER ALLOY 21 B.
M-36; 0.07 max C, 1.0-1.5 Si, 2-4 Mo, 18-20 Cr, 22-25 Ni, 1-2 Cu, bal Fe
W.Q.: 65,000-75,000 TS, 30,000-40,000 YS; 45-25 El; 50-25 RA; 130-160 Brin.
For fittings, valves; corrosion resistant, austenitic.

COOPER ALLOY 21C.
M-36, 0.07-0.10 C, 15-20 Cr, 20-25 Ni, 3 Mo, 1.5 Si, bal Fe.
Cast
For acid resistant castings; stainless.

COOPER ALLOY 21 D .
M-36; 0.07 max. C, 3.0-3.5 Si, 2.5-3.0 Mo, 18-20 Cr, 0.4-0.7 Mn, 24-25 Ni, 1.5-2.0 Cu, bal Fe.
W.Q.: 65,000-75,000 TS; 30,000-40,000 YS; 40-25 El; 40-25 RA; 130-160 Brin.
For fittings, valves; corrosion resistant, austenitic.

COOPER ALLOY 21 E.
M-36; 0.15 max. C, 1.5 max. Si, 20 Cr, 80 Ni, 1 max. Mn.
Cast: 70,000-95,000 TS; 30,000-45,000 YS; 30-10 El; 30-10 RA; 160-190 Brin.
For heat resistant castings; Nichrome type alloy.

COOPER ALLOY 22.
M-36; 0.3-0.4 C, 24-28 Cr, 11-14 Ni, bal Fe.
Cast: 80,000-100,000 TS; 40,000-55,000 YS; 20-30 El; 20-30 RA; 165-190 Brin.
For sulfite pulp mills, digester fittings, pump valves, furnace parts; resists sulfurous acids and ammonia; "Sweetaloy No. 22."

COOPER ALLOY 22M.
M-36; 0.2-0.5 C, 24-28 Cr, 10-12 Ni, 3 Mo, bal Fe.
For valves, pumps, fittings; resists sulfite liquors.

COOPER ALLOY 22 P.
M-36; 0.3 max. C, 2 max. Si, 27-30 Cr, 1.5 max. Mn, 8-11 Ni, bal Fe.
Cast: 80,000-100,000 TS; 40,000-55,000 YS; 30-10 El; 30-10 RA; 170-210 Brin.
For furnace parts, sulfite fittings; heat and corrosion resistant, austenitic.

COOPER ALLOY 22PM.
M-36; 0.2-0.5 C, 29 Cr, 9 Ni, 3 Mo, bal Fe.
Cast: 90,000 TS; 60,000 YS; 30 El; 180 Brin.
For pumps, valve fittings; resists sulfite liquors.

COOPER ALLOY 22 S.
M-36; 0.2 max. C, 1.5 max Mn, 2 max. Si, 24-28 Cr, 11-14 Ni, bal Fe.
W.Q.: 80,000-90,000 TS; 35,000-55,000 YS; 45-25 El; 55-25 RA; 135-190 Brin.
For fittings, valves; corrosion and heat resistant to hot HNO_3.

COOPER ALLOY 22S Cb.
M-36; 0.10 max C, 25 Cr, 12 Ni, 1 Si, 1 max Cb, bal Fe.
Water quenched: 90,000 TS; 55,000 YS; 25 El; 25 RA; 175 Brin.
For corrosion and heat resistant parts; resists intergranular corrosion.

COOPER ALLOY 22 SMO.
M-36; 0.1 max. C, 2 max. Si, 24-28 Cr, 11-14 Ni, 2.5-3.5 Mo, bal Fe.
W.Q.: 85,000-95,000 TS; 45,000-70,000 YS; 25-15 El; 25-15 RA; 160-190 Brin.
For valves, fittings, pumps; corrosion resistant to hot sulfite liquors.

COOPER ALLOY 22 W.
M-36; 0.15-0.3 C, 0.75-2.0 Si, 20-25 Cr, 10-14 Ni, 2.5-3.5 W, bal Fe.
Normalize: 93,000 TS; 52,000 YS; 31 El; 30 RA; 185 Brin.
For highly stressed castings; heat and creep resistant, austenitic.

COOPER ALLOY 23.
M-36; 0.35-1.0 C, 15-19 Cr, 64-68 Ni, 2.5 max Si, 2.0 max Mn, 0.5 max Mo, bal Fe.
Cast: 65,000 TS; 36,000 YS; 9 El; 176 Brin.
Aged: 73,000 TS; 44,000 YS; 9 El; 185 Brin.
For autoclaves, carburizing boxes, cyanide pots, roller hearths, salt pots.
ACI-HX, heat and corrosion resistant.

COOPER ALLOY 24.
M-36; 0.35-0.75 C, 17-21 Cr, 37-41 Ni, 2.5 max Si, 2 max Mn, 0.5 max Mo, bal Fe.
As cast: 70,000 TS; 40,000 YS; 9 El; 170 Brin.
For carburizing retorts, cyanide pots, dipping baskets, muffles, lead pots.
ACI-HU, heat and corrosion resistant.

COOPER ALLOY 25.
M-36; 0.2-0.5 C, 19-23 Cr, 23-27 Ni, 2 max Si, 2 max Mn, 0.5 max Mo, bal Fe.
Cast: 68,000 TS; 38,000 YS; 17 El; 160 Brin; At 1400°F: 42,000 TS; 11 El.
For brazing fixtures, torch nozzles, trays, furnace parts, radiant tubes.
ACI-HN, heat and corrosion resistant.

COOPER ALLOY 25-20.
M-36; 0.20-0.30 C, 24-26 Cr, 19-20 Ni, bal Fe.
Cast: 65,000 TS; 45,000 YS; 22 El; 25 RA; 180 Brin.
For furnace parts; heat resistant over 1600°F.

COOPER ALLOY 25-20S.
M-36; 0.20 max C, 23-27 Cr, 19-22 Ni, 2 max Si, 1.5 max Mn, bal Fe.
Annealed: 76,000 TS; 38,000 YS; 37 El; 144 Brin.
For furnace parts, salt pots, heat treating boxes, digesters, pumps.
Heat and corrosion resistant, austenitic.
ACI Type CK-20.

COOPER ALLOY 26.
M-36; 0.2-0.6 C, 28-32 Cr, 18-22 Ni, 2 max Si, 2 max Mn, 0.5 max Mo, bal Fe.
Cast: 82,000 TS; 52,000 YS; 19 El; 192 Brin.
For enameling furnace parts, furnace skids, stack dampers, radiant tubes.
ACI-HL, heat and corrosion resistant.

COOPER ALLOY 27.
M-36; 0.2-0.5 C, 26-30 Cr, 14-18 Ni, 2 max Si, 2 max Mn, 0.5 max Mo, bal Fe.
Cast: 80,000 TS; 45,000 YS; 12 El; 180 Brin.
For billet skids, brazing fixtures, conveyor rollers, furnace rails, lead pots, retorts.
ACI-HI, heat and corrosion resistant.

COOPER ALLOY 28.
M-36; 0.2-0.4 C, 19-23 Cr, 9-12 Ni, 2.0 max Si, 2 max Mn, 0 5 max Mo, bal Fe.
Cast: 85,000 TS; 45,000 YS, 35 El; 165 Brin.
For arc furnace electrodes, annealing boxes, trays and baskets, burner tips, conveyor belts and chains
ACI-HF; AISI 302 B, corrosion resistant, austenitic.

COOPER ALLOY 29.
M-36; 0.2-0.5 C, 26-30 Cr, 8-11 Ni, 2.0 max Si, 2 max Mn, 0.5 max Mo, bal Fe.
Cast: 95,000 TS; 45,000 YS; 20 El; 200 Brin.
For billet skids, furnace chains and conveyors, oil burner parts, rabble arms and blades, recuperators.
ACI-HE, heat and corrosion resistant, austenitic.

COOPER ALLOY 30.
M-36; 0.5 max C, 26-30 Cr, 4-7 Ni, 2 max Si, 1.5 max Mn, 0.5 max Mo, bal Fe.
Cast: 85,000 TS, 48,000 YS; 16 El; 190 Brin.
For brazing furnace parts, furnace blowers, rabble shoes, salt pots, recuperators, gas burners.
ACI-HD, heat and corrosion resistant.

COOPER ALLOY 31.
M-36; 0.2 max C, 8-10 Cr, 1.0 max Si, 0.35-0.65 Mn, 0.9-1.2 Mo, bal Fe.
Annealed: 95,000 TS; 65,000 YS; 23 El; 180 Brin.
Normalized: 107,000 TS; 81,000 YS; 21 El; 220 Brin.
At 1100°F; 44,000 TS; 32,000 YS; 36 El; 58 RA.
For furnace rollers, refinery fittings, trunnions, fan blades.
ACI-HA castings, heat and corrosion resistant.

COOPER ALLOY 58.
M-36; 0.2 max C, 23 Cr, 58 Ni, 0.5 Si, 6 Mo, 7 Cu, 1.5 W, bal Fe.
Cast: 65,000 TS; 55,000 YS; 5 El; 5 RA; 175 Brin.
For H_2SO_4 equipment; "Illium G"; acid resistant.

COOPER ALLOY 60.
M-36; 0.05 max C, 58-62 Cr, 1.0 max Si, 0.3 max Mn, 1.5 max others, bal Ni.
Cast: 137,500 TS; 90,000 YS; 1.5 El; 1.0 RA; 375 Brin.
For furnace parts, where fuel oil containing vanadium pentoxide is burned.
Heat resistant.

COOPER ALLOY 531.
M-36; 0.1 max C, 10-14 Cr, 27-30 Ni, 3-4 Mo, 3-4 Cu, 0.4-0.6 Sb, 0.5-0.8 Si, bal Fe.
Cast: 50,000-70,000 TS; 40,000-50,000 YS.
For castings for oil refineries and chemical plants; corrosion and heat resistant.

COOPER ALLOY CD4MCu.
M-36; 0.04 C, 25-27 Cr, 4.75-6.0 Ni, 1.75-2.25 Mo, 2.75-3.25 Cu, bal Fe
Annealed: 112,700 TS; 81,000 YS, 28 El; 248 Brin.
Aged: 141,000 TS; 100,000 YS; 25 El; 302 Brin.
For pumps, valves, impellers, high pressure components
Precipitation hardening, corrosion and heat resistant.

COOPER ALLOY FA 20.
M-36, 0.07 max C, 1.5 max Si, 3.5 Mo, 19-21 Cr, 2.5 max Mn, 28-30 Ni, 4-5 Cu, bal Fe.
W.Q.: 65,000-85,000 TS; 40,000-50,000 YS; 45-35 El; 50-40 RA; 140-150 Brin.
For fittings, valves, pumps, corrosion resistant; austenitic.

COOPER ALLOY FA20Cb.
M-36, 0.07 max C, 19-22 Cr, 27.5-30.5 Ni, 2-3 Mo, 3-4 Cu, 1 max Cb, bal Fe.
Annealed 75,000 TS; 45,000 YS; 40 El; 145 Brin.
For fittings, valves, pumps.
ACI-CN7MCb, corrosion resistant, austenitic.

COOPER ALLOY KA-4.
M-36, 0.20 C, 18 Cr, 8 Ni, 3 Mo, bal Fe.
For stainless parts; corrosion resistant.

COOPER ALLOY KNC-3
M-36, 0.2-0.4 C, 24-28 Cr, 19-22 Ni, 1-3 Si, 1-2 Mn, bal Fe
Cast. 65,000-85,000 TS; 35,000-50,000 YS; 10-30 El, 10-30 RA, 170-195 Brin.
For heat and corrosion resistant parts; furnace parts; heat and corrosion resistant.

COOPER ALLOY MM
M-36, 0.25 C, 63 Ni, 1.5 Si, 2.5 Fe, bal Cu.
Cast 65,000 TS, 33,000 YS; 25 El; 28 RA; 150 Brin
For chemical plant equipment, corrosion resistant.

COOPER ALLOY MM-H.
M-36, 0.25 C, 63 Ni, 3 Si, 2 Fe, bal Cu.
Cast: 80,000 TS; 50,000 YS; 10 El; 14 RA; 225 Brin
For valve trim, valve parts, pump and turbine parts; corrosion and abrasion resistant.

COOPER ALLOY MM-S.
M-36; 0.25 C, 63 Ni, 4 Si, 2 Fe, bal Cu.
Age hardened: 130,000 TS; 100,000 YS; 2 El; 2 RA, 350 Brin.
For valve trim, pump and turbine parts, age-hardenable, corrosion resistant.

COOPER ALLOY P.H.20.
M-36; 0.07 max C, 21 Cr, 29 Ni, 3 Mo, 3 Cu, 1 max Cb, 0.15 N, bal Fe.
For corrosion resistant and non-galling castings; austenitic, stainless, age-hardenable.

COOPER ALLOY P.H.55A.
M-36; 0.08 max C, 3.0-3.75 Si, 20 Cr, 9 Ni, 4 Mo, bal Fe.
For corrosion resistant castings; austenitic, stainless, high strength.

COOPER ALLOY P.H.55B.
M-36; 0.08 max C, 20 Cr, 9 Ni, 5 Mo, 4 Cu, bal Fe.
For corrosion resistant castings; corrosion and shock resistant.

COOPER ALLOY P.H.55C.
M-36; 0.08 max C, 3.5 Si, 20 Cr, 9 Ni, 4 Mo, 3 Cu, bal Fe.
For corrosion resistant castings; stainless, austenitic.

COOPER ALLOY PH-55D.
M-36; 0.05 max C, 18-21 Cr, 9-12 Ni, 3-5 Si, 3.75-4.25 Mo, 0.75-1.25 Cb, 0.10 N, bal Fe.
For pump parts; precipitation hardening, corrosion and abrasion resistant.

COOPER ALLOY S-21 W.
M-36; 0.40 max C, 15 Cr, 25 Ni, 3.5 W, bal Fe.
For heat, erosion and corrosion resistant parts; heat and corrosion resistant.

COOPER ALLOY S-23.
M-36; 0.20 max C, 2.0 Cr, 40 Ni, bal Fe.
For temperature control application; low thermal expansion.

COOPER ALLOY V2B.
M-36; 0.07 max C, 19 Cr, 10 Ni, 2 Cu, 3.5 Mo, 3 Si, 0.15 Be, bal Fe.
Rolled 140,000 TS; 109,000 YS, 13 El, 16 RA; 302 Brin.
Cast: 109,000 TS, 88,400 YS; 16 El; 22 RA; 269 Brin.
Heat treated: 152,000 TS, 122,000 YS; 3 El; 2 RA; 365 Brin.
For valve discs, plug cocks, impellers, sleeves, stainless, non-galling, hardenable.

COOPERITE
Eng., 80 Ni, 14 W, 6 Zr
For cutting tools; extreme hardness.

COOPER'S SPECULUM.
Eng., 57.8 Cu, 27.3 Sn, 3.6 Zn, 1.2 As, 10 Pt.
For mirrors, reflectors

COPALOY.
M-545; Sn, Sb, Pb.
For bearings, antifriction

COPAN.
U.S; 80-90 Sn, 10-15 Sb, 2-5 Cu, 0.2 Pb.
For bearings; Babbitt.

COPEL.
M-65; 55 Cu, 45 Ni.
60,000 TS, 40 El.
For electrical instruments, rheostats, hot resistances; resistance alloy up to 800°F.

COPELMET-D.
M-1552; W + Cu.
For electrical contacts, welding electrodes.

COPELMET-P.
M-1552; W + Cu.
For electrical contacts, resistance welding electrodes.

COPELMET-PW.
M-1552; W + Cu.
For electrical contacts, resistance welding electrodes.

COPELMET-PW4.
M-1552; WC + Cu.
For facing of electrical contacts, spot, projection and butt welding electrodes, hot riveting dies.
Sintered carbide.

COPERNICK.
M-205; 50 Fe, 50 Ni.
For transformer cores; resistance alloy.

COPPCO 75.
M-682; 0.75 C, 0.30 Mn, 0.25 Si, bal Fe.
For cutters, tools, shears; Type W1; water hardened.

COPPCO 110.
M-682; 1.1 C, 0.30 Mn, 0.25 Si, bal Fe.
For cutters, knives, drills, hobs, reamers; Type W1; water hardened.

COPPCO 120.
M-682; 1.2 C, 0.3 Mn, 0.5 Si, 0.2 Cr, bal Fe.
For knives, drills, reamers, taps; Type W1; water hardened.

COPPCO 200.
M-682; 0.9 C, 1.15 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies, taps, guages, master tools; non-deforming, oil hardening.

COPPCO ACE.
M-682; 0.2-0.7 C, 1.5 Ni, 0.55 Cr, bal Fe.
For tools, cutters, dies, punches; oil hardening.

COPPCO ACE A TEMPER.
M-682; 0.7 C, 0.55 Cr, 1.5 Ni, bal Fe.
For punches, collets, forming dies, tough.

COPPCO ACE B TEMPER.
M-682; 0.50 C, 0.55 Cr, 1.5 Ni, bal Fe.
For collets, shear blades, pawls, tough.

COPPCO ACE-C TEMPER.
M-682; 0.20 C, 0.6 Mn, 0.55 Cr, 1.5 Ni, bal Fe.
For carburized tools and parts; tough

COPPCO CRO-TUNG
M-682, 0.5 C, 1.4 Cr, 2.5 W, bal Fe
For punches, chisels, tools; tough

COPPCO EXTRA.
M-682; 0.95 C, 0.25 Mn, bal Fe
For cold heading dies, pneumatic piston tools, tough.

COPPCO FAST FINISHING.
M-682; 1.3 C, 3.75 W, bal Fe.
For fast finishing tools, cutters, oil hardened

COPPCO HOT WORK NO 1.
M-682; 0.35 C, 0.9 Si, 5 Cr, 1.5 Mo, 1.1 W, bal Fe.
For hot work tools and dies, punches, hot work steel.

COPPCO SHOCK.
M-682, 0.55 C, 0.80 Mn, 1.5 Si, 0.2 Cr, 0.35 Mo, bal Fe.
For chisels, pneumatic tools; tough, resists shock.

COPPCO SPECIAL
M-682; 0.98 C, bal Fe.
For burnishing tools, dies, reamers, cutters; water hardening.

COPPCO STANDARD
M-682; 0.9 C, 1.2 Mn, bal Fe.
For broaches, gauges, milling cutters, reamers; non-deforming.

COPPCO UNIVERSAL.
M-682; 1.0 C, 0.25 Mn, 0.25 Si, bal Fe.
For pneumatic tools, punches, dies; water hardening.

COPPER 1[illegible] OF.
M-279; 99.95 min Cu.
Ann: 26,000-36,000 TS; 6000-12,000 YS; 20-44 El.
Cold Rolled: 34,000-60,000 TS; 30,000-58,000 YS, 1-33 El.
For electrical assemblies and severely formed parts; resists hydrogen embrittlement.

COPPER 104 OFS.
M-279; 99.95 min Cu + Ag, 0.027 min Ag.
Ann: 26,000-36,000 TS; 6000-12,000 YS; 20-44 El.
Cold Rolled: 34,000-60,000 TS; 30,000-58,000 YS; 1-33 El.
For electrical assemblies and severely formed parts; resistant to hydrogen embrittlement and elevated temperature softening

COPPER 110 ETP.
M-279; 99.9 min Cu.
Ann: 26,000-36,000 TS; 6,000-12,000 YS; 20-44 El.
Cold rolled: 34,000-60,000 TS; 30,000-58,000 YS; 1-33 El.
Drawn or formed electrical shells and parts; General purpose copper for electrical parts.

COPPER 0112, Low Oxygen ETP.
M-279, 99.90 min Cu, 0.02 max oxygen.
Ann. 26,000-36,000 TS, 6,000-12,000 YS, 20-44 El.
Cold rolled. 34,000-60,000 TS; 30,000-58,000 YS; 1-33 El.
Formed and deep drawn parts, excellent ductility (soft), good tear resistance.

COPPER 0117, Low Oxygen STP
M-279; 99.90 min Cu, 0.034 min Ag, 0.02 max Oxygen
Ann: 26,000-36,000 TS, 6000-12,000 YS; 20-44 El.
Cold rolled: 34,000-60,000 TS, 30,000-58,000 YS; 1-33 El
For commutator and collector rings, severly formed parts, resists softening at elevated temperatures

COPPER 122 DHP
M-279, 99.90 min Cu, 0.015 min P
Ann 26,000-36,000 TS, 6000-12,000 YS; 20-44 El.
For deep drawn copper shells, brazed or welded assemblies.
Cold rolled 34,000-60,000 TS, 30,000-58,000 YS. 1-33 El
For formed copper parts

COPPER 129 FRSTP
M-279, 99.9 min Cu, 0.054 min Ag.
Ann: 26,000-36,000 TS, 6000-12,000 YS, 20-44 El
Cold rolled 34,000-60,000 TS, 30,000-58,000 YS, 1-33 El.
Excellent solderability and high softening temperature
For radiator air channels, radiator fins

COPPER ALLOY Z30A
U.S., 57 min Cu, 1.5 max Pb, 30 min Zn.
Die cast 55,000 TS, 30,000 YS, 15 El, 108 Brin.
For die castings, hardware; yellow brass, good machinability

COPPER ALLOY ZS144A
80-83 Cu, 3.75-4.25 Si, bal Zn
Die Cast. 85,000 TS, 50,000 YS; 25 El; 70 Charpy; B 85-90 Rock.
For die castings.

COPPER ALLOY ZS331A.
63-67 Cu, 0.75-1.25 Si, bal Zn.
Die Cast: 70,000 TS, 35,000 YS; 25 El, 50 Charpy, B 68-72 Rock.
For die castings.

COPPER ALNICO.
M-271, 9-11 Al, 16-18 Ni, 12-13 Co, 5.5-6.5 Cu, bal Fe
For magnets; Alnico II.

COPPER ARC.
M-685; 0.2 C, 0.5 Cu, bal Fe.
For welding electrodes; for cast iron.

COPPER BEARING LOW-METALLOID.
M-377; C, 0.20 min Cu, bal Fe.
For culverts, building, general fabrication; hot rolled, annealed and galvanized sheets.

COPPER-BERYLLIUM 50.
M-1037, M-646; 0.38 Be, 1.55 Co, 1.0 Ag, bal Cu.
Annealed: 45,000 TS; 27 El; 67 Brin.
Cold rolled: 70,000 TS; 13 El; 132 Brin.
Aged: 120,000 TS, 14 El; 234 Brin.
For springs, contacts, diaphragms; corrosion and wear resistant.

COPPERCLAD.
M-725, Ni steel core with pure Cu sleeve.
For sealing in vacuum tubes; 42% Ni in steel.

COPPERIOR.
M-631; 0.1 C, Cu, bal Fe.
For roofing, culverts; corrosion resistant.

COPPER M3.
Russian, 99.86 Cu, 0.01 Pb, 0.03 Zn, 0.01 Fe, 0.02 Sn
Rolled 32,000 TS, 43 El; 69 RA

COPPER-NICKEL 30%.
M 297; 30-33 Ni, 70-67 Cu.
Annealed: 60,500 TS; 34 El.
For electrical resistors, condensers, corrosion resisting apparatus, corrosion resistant

COPPER-NICKEL 40%.
M 297; 40-45 Ni, 60-55 Cu
Annealed 70,000 TS, 38 El.
For electrical resistors, thermocouple element, heat resistant

COPPER NICKEL 67%
M-297, 67 Ni, 33 Cu
Annealed 71,500 TS, 35-40 El
For machine parts, in locomotives, ships, turbines, pumps, corrosion resisting containers, corrosion resistant

COPPER NICKEL 401
M-1499; 55 Cu, 45 Ni
For vacuum tube parts, parts for electron equipment, corrosion resistant

COPPEROID
M-531; C, 0.2 min Cu, bal Fe.
For sheets for construction purposes, automobile furniture, resists rust and atmospheric corrosion

COPPEROID
M-538, Cu coated Zn
For fabricated parts, easily stamped, formed, drawn

COPPEROID
U.S., Cu alloy
For bearings, copper bearing alloy

COPPER'S GOLD.
Eng., 81-67 Cu, 19-30 Pt, 0-4 Zn
For jewelry, ornaments, corrosion resistant.

COPPER-SILICON ALUMINUM 8-2.
M-137; 8 Cu, 2.5 Si, 0.8 Fe, bal Al
Cast: 17,000 TS, 1 El; 70 Brin.
For gear boxes, radiator tanks; non-hardenable.

COPPER-SILICON STEEL.
M-747.
Cast 107,000 TS; 92,000 YS, 1.7 El; 2.2 RA; 269 Brin.
For cast crankshafts.

COPPER'S MIRROR.
Eng.; 58 Cu, 28 Sn, 9.5 Pt, 3.5 Zn, 1.5 As.
For reflectors, mirrors; corrosion resistant

COPPER'S PEN METAL-1.
Eng.; 50 Cu, 25 Au, 25 Ag.
For pen points; corrosion resistant.

COPPER'S PEN METAL-2.
Eng.; 12 Cu, 38 Ag, 50 Pt.
For pen points; corrosion resistant.

COPPER STEEL.
M-377; C, 0.2 min Cu, bal Fe.
For building and general fabrication; bars, plates, shapes.

COPPER STEEL.
M-377; C, 0.20 min Cu, bal Fe.
For track bolts, spikes, tie plates; heat treated bolts.

COPPER STEEL.
M-377; C, 0.20 min Cu, bal Fe.
For woven wire fencing and barbed wire; wire products.

COPPER STEEL.
M-538, copper coated steel.
For fabricated parts; easily stamped, formed, drawn.

COPPER STEEL.
U.S.; 0.37 C, 0.17 Mn, 4 Cu, 0.22 Si, bal Fe.
Rolled: 138,000 TS; 116,000 YS; 11 El, 23 RA; 302 Brin
Annealed: 97,000 TS, 80,500 YS, 16 El; 42 RA, 212 Brin
For structural parts; corrosion resistant

COPPER TIN
M-538, copper coated Sn.
For fabricated parts; easily stamped, formed, drawn.

COPPERWELD WIRE
M-711, Cu on steel core; for cable; clad.

COPPRO NITRIDING G
M-682, 0.3-0.4 C, 0.9-1.4 Cr, 0.15-0.25 Mo, 0.85-1.2 Al, bal Fe
For nitrided parts; nitriding steel

COPPRO NITRIDING G-MODIFIED
M-682; 0.38-0.45 C, 1.4-1.8 Cr, 0.3-0.45 Mo, 0.85-1.2 Al, bal Fe
For nitrided aircraft parts ,nitriding steel

COPPRO NITRIDING H
M 682, 0.2-0.3 C, 0.9-1.4 Cr, 0.15-0.25 Mo, 0.85-1.2 Al, bal Fe
For nitrided parts, nitriding steel

COPREX
M-824, Cu alloy
For bearings; sintered

COP-SIL-LOY.
M-1217, Cu-Ag-Pb.
For reducing wear on friction surfaces; low coefficient of friction

COP-SIL-LOY.
M-1217, 47-53 Pb, bal Cu.
For special parts; sintered

CORBIN
Eng.; 87.5 Al, 12.5 Cu.
For pistons, non-hardenable.

CORE IRON
M-32; 0.06 C, 1 V, bal Fe.
For magnetic and electrical equipment; high permeability.

CORINTH.
M-1; 0.90 C, 0.30 Mn, bal Fe.
For tools, cutters, water hardening.

CORMET-A.
M-1506; nickel.
Sintered: 8200 TS; 8100 YS.
For non-contacting conveyor for extra sensitive materials; sintered pourous Ni, max operating temperature 575°F.

CORMIN BRONZE.
44 Cu, 37 Ni, 11 Sn, 8 Pb.
For hardware; corrosion resistant.

CORNISH BRONZE.
England; 9.6 Sn, 16.5 Pb, 0.8 P, bal Cu.
For bearings; heavy duty.

CORNIX-1.
M-501; 0.20 C, 0.4 Mn, 0.3 Si, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El; B 92 Rock.
For acid containers, mixers, chemical plant and oil refinery equipment.
Corrosion resistant, hardenable.

CORNIX-2.
M-1307; 0.20 C, 0.5 Mn, 12 Cr, 1.15 Mo, 0.5 Ni, 0.3 V, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; 50 RA, B 92 Rock.
Heat treated: 240,000 TS; 205,000 YS; 9 El; 26 RA; C 50 Rock.
For surgical instruments, hardware, oil refinery and chemical plant equipment.
Corrosion resistant, hardenable.

CORNIX-10.
M-912; 0.10 C, 16 Cr, 13 Ni, Cb, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 50 El, B 80 Rock
For acid containers, mixers, digesters, welded tanks and structures.
Type 16-13 Cb stainless steel, austenitic, corrosion resistant.

CORNIX-40.
M-912; 0.08 C, 16 Cr, 14 Ni, Mo, Cb, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 40 El; B 85 Rock.
For acid containers, mixers, digesters, welded tanks and structures.
Type 16-14 Mo Cb stainless steel, acid resistant, austenitic.

COROMANT C1.
M-101, M-101A, WC, Co.
For cutting tools; sintered carbide.

COROMANT C3
M-101, M-101a; WC, Co.
For finishing cutting tools; sintered carbide.

COROMANT C5.
M-101, M-101a, TaC, WC, Co.
For cutting tools for roughing; sintered carbide.

COROMANT C6.
M-101, M-101a; WC, TiC, Co
For general purpose cutting tools; sintered carbide

COROMANT C7.
M-101, M-101a, WC, TiC, Co.
For cutting tools, dies; sintered carbide.

COROMANT C8.
M-101, M-101a; WC, TiC.
For finishing cutters and tools; sintered carbide.

COROMANT F0A.
M-101, M-101a; Sintered carbide tool material.
For finish cuts and precision machining of steel; crater resistant grade.

COROMANT H05.
M-101, M-101a; Sintered carbide tool material.
Cutting tool for precision finishing of cast iron, hard irons and steels, and heavy metals.

COROMANT H1P.
M-101, M-101a; Sintered carbide tool material.
For cutting tools for machining cast iron; Good wear resistance and toughness.

COROMANT H13.
M-101, M-101a, Sintered carbide tool material.
Cutting tool for general purpose machining of cast iron, steels, hard and tough metals.

COROMANT H20.
M-101, M-101a; Sintered carbide tool material.
Cutting tool for general purpose rough machining cast iron and non-ferrous metals.

COROMANT R1P.
M-101, M-101a; Sintered carbide tool material.
Cutting tool for finish cuts on nickel base, high strength, heat resistant alloys.

COROMANT S1P.
M-101, M-101a, Sintered carbide tool material.
For light roughing and finishing cuts on steel; high wear resistance.

COROMANT S2.
M-101, M-101a; Sintered carbide tool material.
Cutting tool for general purpose machining of steel, tough.

COROMANT S4
M-101, M-101a, Sintered carbide tool material.
Cutting tool for rough machining of steel, good toughness and wear resistance

COROMANT S6
M-101, M-101a, WC, TaC, Co
For cutting tools for roughing, sintered carbide

COROMANT SH
M-101, M-101a, WC, TaC, Co.
For cutting tools for general machining; sintered carbide

CORONA EXTRA M
M-1310; 0.85 C, 9 W, 1 Mo, 4 Cr, bal Fe
For milling cutters, lathe and planer tools, hobs, high speed steel

CORONA EXTRA V.
M-1310, 0.86 C, 4.1 Cr, 0.9 Mo, 2.5 V, 12 W, bal Fe
For lathe and planer tools, drills, hobs; high speed steel

CORONA KOBALT 3.
M-1310, 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2 V, 12 W, bal Fe
For lathe and planer tools, drills, hobs, reamers, high speed steel

CORONA KOBALT 5
M-1310; 1.35 C, W, Cr, V, Co, bal Fe
For fast finishing cutters; high-speed steel.

CORONA KOBALT 5W
M-1310; 0.8 C, 4.7 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps, hobs, drills; high speed steel.

CORONA KOBALT 10
M-1310; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, milling cutters, hobs; high speed steel

CORONA PRIMA M.
M-1310; 0.95 C, W, Mo, Cr, V, bal Fe.
For cutters, drills, reamers, broaches; high speed steel.

CORONA PRIMA V.
M-1310; 0.82 C, 4.1 Cr, 0.8 Mo, 1.6 V, 8.7 W, bal Fe.
For reamers, drills, broaches, cutters; high speed steel.

CORONA PRIMA W.
M-1310; 0.74 C, 4 Cr, 1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

CORONA VIERBRENZ V.
M-1310; 1.3 C, 4.3 Cr, 0.8 Mo, 3.8 V, 12 W, bal Fe.
For cutters, fast finishing tools; high speed steel.

CORONEL.
Eng.; 65-70 Ni, 30-35 Cu.
Cast: 64,000 TS; 32,000 YS; 34 EL; 32 RA.
Rolled. 78,000 TS; 48,000 YS; 42 El; 35 RA.
For valves, pumps, turbine blades; similar to "Monel Metal".

CORONZE.
M-279; 2 8 Al, 1.8 Si, 0.4 Co, bal Cu.
Annealed· 82,000 TS; 54,000 YS; 36 El.
Spring Temper: 125,000 TS; 111,000 YS; 4 El.
For heat exchangers, glass to metal seals, springs, electrical contacts.
Aluminum bronze, corrosion and oxidation resistant. High strength.

CORONZE R 638
M-279, 95.0 Cu, 2.8 Al, 1.8 Si, 0.4 Co.
Ann. 77,000-87,000 TS, 41,000-67,000 YS, 29-42 El
Cold rolled· 90,000-130,000 TS; 70,000-114,000 YS, 2-30 El.
Soft-for-cans, bases, electronic parts; cold rolled for springs, terminals circuit frames.
Stress corrosion resistant, oxidation resistant, good strength.

COROSOLOY
M-964; C, alloy, bal Fe.
For hard surfacing electrodes; corrosion resisting

CORRESIST 13
M-1342, 0 12 max C, 0 4 Si, 13 Cr, bal Fe.
Annealed. 75,000 TS, 40,000 YS; 35 El; 70 RA, 155 Brin.
For turbine blades, valves, pumps, surgical instruments; Type 410; corrosion resistant.

CORRESIST 13H
M-1432, 0 25 C, 14.5 Cr, 1 max Ni, bal Fe.
Annealed· 95,000 TS; 50,000 YS, 25 El, 55 RA, 200 Brin.
For turbine blades, valves, pumps, surgical and dental instruments; corrosion resistant, hardenable.

CORRESIST-13HMo.
M-1342; 0.20 C, 13 Cr, 1 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El; 150 Brin.
Hardened: 180,000 TS; 150,000 YS; 16 El; C 42 Rock
For chemical and oil refinery equipment, valve trim, gauges, surgical instruments.
Corrosion resistant, hardenable, martensitic.

CORRESIST 17.
M-1342; 0.08 C, 0.4 Si, 17 Cr, bal Fe.
Annealed: 80,000 TS, 50,000 YS; 25 El; 50 RA; 150 Brin.
Cold drawn: 130,000 TS; 120,000 YS; 2 El; 185 Brin.
For oil refinery and dairy equipment, sinks, oil burners; Type 430; corrosion and heat resistant.

CORRESIST 17H.
M-1342; 0.10-0.25 C, 17 Cr, 2 Ni, bal Fe.
Heat treated: 113,800-135,100 TS; 85,300 min YS; 14 min El.
Ferritic-pearlitic chromium stainless.
For food production industries, for pumps, valves, tubes in chemical industries.

CORRESIST 17M.
M-1342; 0.1 max C, 1.8 Mo, 17 Cr, Ti = 7 × C, bal Fe.
Annealed: 90,000 TS; 55,000 YS; 22 El; 48 RA; 170 Brin.
For welded oil refinery and chemical plant equipment; corrosion resistant.

CORRESIST 18/8.
M-1342; 0.12 max C, 18 Cr, 19.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
For welded structures, chemical plant equipment, tanks; Type 347; stainless, austenitic.

CORRESIST 18/8 M.
M-1342, 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin
For welded acid resistant equipment, tanks, mixers; Type 316 Cb, stainless, austenitic.

CORRESIST 18/8 MW.
M-1342, 0.07 max C, 18 Cr, 2 Mo, 10.5 Ni, bal Fe.
Annealed: 85,000 TS, 35,000 YS, 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks; Type 316, stainless, austenitic.

CORRESIST 18/8 N.
M-1342, 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS, 35,000 YS; 55 El; 75 RA; 150 Brin
Cold drawn· 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302, stainless, austenitic.

CORRESIST 18/8 Nb.
M-1342; 0 07 max C, 18 Cr, 9 Ni, Nb = 8 × C, bal Fe
Quenched: 71,000-106,700 TS; 35,500 min YS, 40 min El
Stainless, austenitic, weldable.
For welded assesmblies in chemical industries, domestic appliances

CORRESIST 18/8 S
M-1342; 0.07 max C, 18 Cr, 9 Ni, bal Fe
Quenched. 71,100-99,600 TS; 28,400 min YS; 50 min El.
Austenitic stainless, for medical instruments, domestic appliances, parts for the chemical industry

CORRESIST 18/8 Ti.
M-1342; 0.07 max C, 18 Cr, 9 Ni, Ti = 5 × C, bal Fe.
Quenched· 71,100-106,700 TS; 35,500 min YS; 40 min El.
Stainless, austenitic, weldable.
For welded assemblies in food, chemical industries and domestic appliances.

CORRESIST 18/8 W.
M-1342; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El; 330 Brin.
For welded chemical plant equipment, tanks; Type 304; stainless, austenitic.

CORRESIST 18/10 MoNb.
M-1342; 0.07 max C, 18 Cr, 11 Ni, 2.2 Mo, Nb = 8 × C, bal Fe.
Quenched: 71,100-106,700 TS; 35,500 min YS; 40 min El.
Stainless, austenitic, weldable.
For welded assemblies in food and chemical industries.

CORRESIST 18/10 MoS.
M-1342; 0.07 max C, 18 Cr, 11 Ni, 2.2 Mo, bal Fe.
Quenched: 71,100-99,600 TS; 28,400 min YS; 45 min El.
Austenitic, excellent corrosion resistance.
For food and chemical industry.

CORRESIST 18/10 MoTi.
M-1342; 0.07 max C, 18 Cr, 11 Ni, 2.2 Mo, Ti = 5 × C, bal Fe.
Quenched: 71,100-106,700 TS; 35,500 min YS; 40 min El.
Stainless, austenitic, weldable.
For welded assemblies in food and chemical industries.

CORRESIST 18/20 MoCu.
M-1342; 0.07 max C, 18 Cr, 20 Ni, 2.2 Mo, 2 Cu, Nb = 8 × C, bal Fe.
Quenched: 71,100-106,700 TS; 32,700 min YS; 40 min El.
Austenitic, stainless; very resistant to attack by H_2SO_4.

CORRESIST 25/25 MoTi.
M-1342; 0.06 max C, 25 Cr, 25 Ni, 2.2 Mo, Ti = 5 × C, bal Fe.
Quenched: 71,100-106,700 TS; 35,500 min YS, 35 min El.
Austenitic, weldable, good corrosion resistance; for welded assemblies in food and chemical industries.

CORRESIST 28.
M-1342, 0.08 C, 28 Cr, bal Fe.
Annealed: 85,000 TS, 50,000 YS; 30 El, 55 RA; 180 Brin.
For furnace parts, heat treating boxes, retorts, heat resistant.

CORRESIST 28/5
M-1342; 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
Cast. 90,000 TS, 65,000 YS, 2 El; 212 Brin
Heat treated: 97,000 TS; 65,000 YS; 18 El, 210 Brin.
For cylinder liners, bushings, valve seats and bodies, Type CC-50; corrosion and heat resistant.

CORRESIST 28H
M-1342; 1.2 C, 1.3 Si, 29 Cr, bal Fe
For crushers, rollers, skids, grates, heat and wear resistant.

CORRESIST 28 MH.
M-1342; 1.2 C, 1.3 Si, 29 Cr, 2 Mo, bal Fe.
For crushers, rollers, skids, grates; heat and wear resistant.

CORRESIST G14
M-1342, 0.25 C, 14.5 Cr, 1 max Ni, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin
For cutlery, valves, turbine blades, surgical instruments; Type 420; corrosion resistant.

CORRESIST G17.
M-1342; 0.25 C, 17 Cr, 1.8 max Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For pumps, valves, marine hardware; Type 431; corrosion resistant.

CORRESIST G18/8.
M-1342; 0.15 C, 1.5 Si, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

CORRESIST G18/8 M.
M-1342; 0.15 C, 18 Cr, 2 Mo, 9.5 Ni, bal Fe.
Annealed· 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks; Type 316, stainless austenitic.

CORRESIST G18/8 Nb.
M-1342; 0.08 max C, 19 Cr, 9 Ni, Nb = 8 × C, bal Fe
Quenched. 64,000-92,400 TS; 28,400 min YS; 20 min El
Austenitic, stainless, weldable casting.
For welded assemblies in food, beverage and dairy industries

CORRESIST G18/8 S
M-1342, 0.07 max C, 19 Cr, 9 Ni, bal Fe.
Quenched 64,000 92,400 TS, 28,400 min YS, 20 min El.
Austenitic, stainless casting
For pumps, shafts, armatures in the chemical industry

CORRESIST G18/10 MoNb
M-1342, 0.10 max C, 18 Cr, 11 Ni, 2 2 Mo, Nb = 8 × C, bal Fe
Quenched 64,000-92,400 TS; 29,900 min YS, 20 min El
Austenitic, stainless, weldable casting
For parts and welded assemblies for use in chemical industry and food plants.

CORRESIST G18/10 MoS
M-1342, 0 07 max C, 18 Cr, 11 Ni, 2 2 Mo, bal Fe.
Quenched 64,000-92,400 TS, 29,900 min YS, 20 min El
Austenitic, stainless, high corrosion resistance; for parts used in chemical plants Casting.

CORRESIST G18/20 MoCu.
M-1342, 0 07 max C, 18 Cr, 20 Ni, 2 2 Mo, 2 Cu, Nb = 8 × C, bal Fe
Quenched 64,000-92,400 TS, 25,600 min YS, 15 min El
Austenitic, stainless, weldable, excellent corrosion resistance, casting
For pickling hooks for H_2SO_4.

CORRESIST G27/4.
M 1342; 0.4 C, 27 Cr, 4 Ni, bal Fe.
Cast. 90,000 TS, 65,000 YS, 2 El, 212 Brin.
Heat treated. 97,000 TS, 65,000 YS, 18 El, 210 Brin
For cylinder liners, bushings, valves, Type CC-50, corrosion and heat resistant

CORRESIST G28.
M-1342; 0 40 C, 29 Cr, bal Fe.
Cast 90,000 TS; 65,000 YS, 2 El; 212 Brin
Heat treated· 97,000 TS, 65,000 YS, 18 El; 210 Brin.
For valve bodies and seats, furnace parts, liners; heat resistant, Type CC-50

CORRESIST G28/5
M-1342, 0.3-0 5 C, 28 Cr, 5 Ni, bal Fe.
Annealed: 71,100-113,800 TS, 3 min El
Corrosion resistant; used in large pumps; casting

CORRESIST G28H.
M-1342; 1.2 C, 1.3 Si, 29 Cr, bal Fe.
For crushers, rollers, skids, grates, rabbles; heat and wear resistant.

CORRESIST G28HM.
M-1342; 1.2 C, 1.3 Si, 29 Cr, 2 Mo, bal Fe.
For crushers, rollers, grates, rabble arms; heat and wear resistant.

CORRESIST G28 Mo.
M-1342; 0.3-0.6 C, 28 Cr, 2.2 Mo, bal Fe.
Annealed: 210-280 Brinnell.
Ferritic, magnetic, stainless casting
For chemical plant, food industries, high temperature parts.

CORRIX METAL.
German; 88.1 Cu, 8.7 Al, 3.2 Fe.
Cast: 78,000-90,000 TS; 30-20 El; 30 RA.
For worm wheels, gears, marine and mining applications; corrosion resistant to acids and alkalis.

CORROCHROM-13G.
M-1309; 0.20 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 150 Brin.
Hardened: 240,000 TS; 170,000 YS; 12 El; C 47 Rock
For chemical and oil refinery equipment, surgical instruments, knives, gauges, valve trim.
Corrosion resistant Heat treatable.

CORROCHROM-13M.
M-1309, 0.40 C, 13.0 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El; 150 Brin
Hardened: 250,000 TS, 192,000 YS; 10 El, C 49 Rock
For surgical instruments, knives, cutlery, scissors, shears
Corrosion resistant. Heat treatable.

CORROCHROM 13T
M 1309, 0.20 C, 13.0 Cr, 1.2 Mo, bal Fe.
Annealed 95,000 TS; 50,000 YS; 25 El; 150 Brin
Hardened 180,000 TS, 150,000 YS; 16 El; C 42 Rock
For chemical and oil refining equipment, surgical instruments, valves, pump shafts
Corrosion resistant Heat treatable.

CORROCHROM-13W
M-1309, 0.12 C, 13.0 Cr, bal Fe.
Annealed 85,000 TS, 40,000 YS; 30 El, B 85 Rock.
Hardened. 150,000 TS, 110,000 YS, 22 El, C 38 Rock
For chemical and oil refinery equipment; valve trim.
Corrosion resistant, hardenable.

CORROCHROM-17A
M-1309, 0.13 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 85,000 TS, 45,000 YS, 25 El, 140 Brin
For furnace and heater parts, oil burners, hardware.
Non hardenable. Corrosion resistant. Free machining.

CORROCHROM-17F.
M-1309; 0.10 C, 17.5 Cr, bal Fe
Annealed: 80,000 TS, 45,000 YS; 28 El; 140 Brin.
Cold Rolled: 130,000 TS; 120,000 YS; 12 El, 190 Brin.
For automotive and architectural trim, hardware, oil burner parts, tanks, furnace parts.
Corrosion resistant, non-hardenable.

CORROCHROM-17N.
M-1309; 0.20 C, 17.0 Cr, 1.4 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 260 Brin.
Cold drawn: 130,000 TS; 110,000 YS; 15 El; 280 Brin.
For pump shafts, hardware, surgical instruments, valve trim.
Corrosion resistant. Type 431.

CORROCHROM-17T.
M-1309; 0.10 C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed: 88,000 TS; 48,000 YS; 20 El; 145 Brin.
For welded structures, tanks, hardware, trim, oil burners.
Non-hardenable. Corrosion Resistant. Welding grade.

CORROCHROM-18E.
M-1309; 0.90 C, 18.0 Cr, 1.2 Mo, 0.1 V, bal Fe.
Heat Treated: 280,000 TS; 265,000 YS; 3 El; C 55 Rock.
For dental and surgical instruments, bearings, pump and valve parts, bushings, nozzles.
Corrosion and wear resistant. Heat treatable.

CORROCHROM-18T.
M-1309; 0.10 C, 17.0 Cr, 1.7 Mo, Ti = 7 × C, bal Fe.
Annealed: 85,000 TS, 45,000 YS, 22 El, 140 Brin.
For welded structures, hardware, furnace and heater parts.
Non-hardenable. Corrosion resistant. Weldable grade.

CORROCHROM-170.
M-1309; 0.35 C, 16.5 Cr, 1.2 Mo, bal Fe.
Annealed: 125,000 TS; 95,000 YS, 20 El, C 24 Rock.
Cold Drawn: 130,000 TS; 110,000 YS, 15 El, C 26 Rock.
For pump shafts, valve trim, hardware, surgical instruments
Corrosion resistant Not hardenable.

CORROCHRONI-187F.
M-1309, 0.15 C, 17.0 Cr, 7.5 Ni, bal Fe.
Annealed: 90,000 TS, 40,000 YS, 50 El; B 85 Rock.
Half Hard 125,000 TS, 75,000 YS, 12 El, C 25 Rock
For chemical plant and oil refinery equipment, fasteners, valve and pump parts
Austenitic, stainless, non-magnetic.

CORROCHRONI-188C
M-1309, 0.12 C, 18.0 Cr, 9.0 Ni, bal Fe.
Annealed 90,000 TS, 40,000 YS, 50 El, B 85 Rock
Cold Rolled 140,000 TS, 120,000 YS, 25 El, B 100 Rock
For chemical plant and oil refinery equipment, hardware, fasteners, pump parts
Austenitic, stainless, non-magnetic.

CORROCHRONI-188T
M-1309; 0.15 C, 18.0 Cr, 0.2 S, 9.0 Ni, bal Fe
Annealed 90,000 TS; 35,000 YS, 50 El, 160 Brin.
Cold Drawn: 125,000 TS, 95,000 YS, 20 El; 277 Brin.
For screw machine products, rivets, fasteners, gears, shafts, fittings.
Free machining, stainless, non-magnetic.

CORROCHRONI-189F.
M-1309, 0.10 C, 18.0 Cr, 10.0 Ni, Ti = 5 × C, bal Fe
Annealed: 85,000 TS, 35,000 YS, 55 El; 150 Brin.
Cold Drawn: 95,000 TS; 60,000 YS; 40 El; 180 Brin.
For exhaust systems, welded structures, engine manifolds, refinery equipment. Austenitic, stabilized. Welding grade, stainless, non-magnetic.

CORROCHRONI-189N.
M-1309; 0.10 C, 18.0 Cr, 10.0 Ni, Cb = 8 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; B 80 Rock.
Cold Drawn: 100,000 TS; 65,000 YS; 40 El; B 95 Rock
For aircraft collector rings, exhaust manifolds, welded structures, superheaters.
Austenitic, nonhardenable. Welding grade, stainless, non-magnetic.

CORROCHRONI-189S.
M-1309; 0.07 C, 18.0 Cr, 10.0 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; B 80 Rock.
For chemical plant and pharmaceutical equipment, tanks, agitators, mixers.
Non-hardenable. Stainless, austenitic, nonmagnetic.

CORROCHRONI-1310K.
M-1309; 0.07 C, 17.0 Cr, 4.5 Mo, 13.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 70 El; B 70 Rock.
Cold Rolled: 150,000 TS; 125,000 YS; 15 El; C 30 Rock.
For textile and dye works equipment, paper and pulp mill equipment, chemical plant mixers and agitators.
Corrosion and heat resistant. Austenitic.
Type 317 stainless steel.

CORROCHRONI-1810A.
M-1309; 0.10 C, 17.5 Cr, 2.3 Mo, 11.5 Ni, Ti = 5 × C, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; B 83 Rock.
At 1000°F: 55,000 TS; 34,000 YS; 36 El; 69 RA.
For welded structures, chemical and pharmaceutical plant equipment, acid tanks, digesters, vessels.
Austenitic, non-hardenable.
Welding grade, acid resistant, non-magnetic.

CORROCHRONI-1810M.
M-1309; 0.10 C, 17.5 Cr, 2.3 Mo, 11.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; B 82 Rock.
At 1200°F: 45,000 TS. 30,000 YS; 32 El; C 66 Rock.
For welded structures, chemical and pharmaceutical plant equipment, digesters, acid tanks, mixers.
Austenitic, stabilized, non-hardenable.
Welding grade, stainless, non-magnetic.

CORROCHRONI-1810U.
M-1309, 0.07 C, 17.5 Cr, 2.3 Mo, 11.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 60 El; B 80 Rock.
Cold Drawn: 100,000 TS; 65,000 YS; 40 El; B 95 Rock.
For chemical and pharmaceutical plant equipment, acid containers, mixers, tanks, agitators.
Acid resistant, austenitic, non-magnetic.

CORROCHRONI-1812.
M-1309; 0.07 C, 17.5 Cr, 2.8 Mo, 13.0 Ni, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El; B 78 Rock.
Cold Rolled: 125,000 TS; 90,000 YS; 30 El; C 28 Rock.
For chemical and plastic plant equipment, digesters, tanks, agitators, valve trim.
Type 316, non-hardenable.
Austenitic, stainless, non-magnetic.

CORROCHRONI-1812C.
M-1309; 0.10 C, 17.5 Cr, 2.8 Mo, 13.0 Ni, Cb = 8 × C, bal Fe.
Annealed: 80,000 TS; 30,000 YS, 60 El; B 78 Rock
Cold Rolled: 125,000 TS; 90,000 YS; 30 El; C 28 Rock.
For chemical and plastic plant equipment, digesters, tanks, agitators, valve trim, welded structures.
Non-hardenable, austenitic.
Welding grade, stainless, non-magnetic.

CORRODUR 14.
M-1290; 0.25 C, 14 Cr, 1.0 max Ni, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, cutlery, valves; Type 420; corrosion resistant.

CORRODUR 16-13 N.
M-1290; 0.10 C, 16 Cr, 16 Ni, Cb = 8 × C, bal Fe.
For valves, pumps; corrosion and heat resistant.

CORRODUR 17-13 E3S.
M-1290; 0.10 C, 17 Cr, 13 Ni, 3 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 42 El; 60 RA; 170 Brin.
For acid resistant chemical plant equipment; Type 317; stainless, austenitic.

CORRODUR 17-13 E5S.
M-1290; 0.10 C, 17 Cr, 13 Ni, 5 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 42 El; 60 RA; 170 Brin.
For acid resistant chemical plant equipment; Type 317; stainless, austenitic.

CORRODUR 18.
M-1290; 0.25 C, 17 Cr, 1.8 max Ni, bal Fe.
For furnace parts, retorts, heat treating boxes; Type CB-30; corrosion and heat resistant.

CORRODUR 18-8.
M-1290; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
Cold drawn: 180,000 TS, 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks, agitators, filters; Type 302; stainless, austenitic.

CORRODUR 18-8 E
M-1290; 0.15 C, 18 Cr, 2 Mo, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El; 300 Brin.
For acid resistant, chemical plant equipment, tanks; Type 316; stainless, austenitic

CORRODUR 18-8 ES.
M-1290, 0.07 max C, 18 Cr, 2 Mo, 10 5 Ni, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn: 150,000 TS, 135,000 YS; 6 El; 300 Brin.
For acid resistant chemical plant equipment, tanks; Type 316, stainless, austenitic.

CORRODUR 18-8 ESS
M-1290; 0.12 max C, 18 Cr, 2 Mo, 10 5 Ni, Cb = 8 × C, bal Fe.
Annealed· 85,000 TS, 35,000 YS, 50 El; 65 RA; 160 Brin.
For welded acid resistant chemical plant equipment; Type 316 Cb, stainless, austenitic.

CORRODUR 18-8 S.
M-1290; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El; 330 Brin
For welded chemical plant equipment, tanks, vessels; Type 304; stainless, austenitic.

CORRODUR 18-8 SS.
M-1290; 0 07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El; 330 Brin.
For welded chemical plant equipment, tanks, mixers; Type 304; stainless, austenitic.

CORRODUR 20-25 E.
M-1290; 0.12 C, 25 Ni, 20 Cr, 2 Cu, 2 Mo, bal Fe.
Annealed: 100,000 TS; 50,000 YS; 45 El; 60 RA; 195 Brin.
For furnace parts, valves, pumps, turbines; corrosion and heat resistant.

CORRODUR 24-7 E.
M-1290; 0.27 C, 24 Cr, 7 Ni, 2 Mo, bal Fe.
For furnace parts, heat treat boxes, retorts; corrosion and heat resistant, austenitic.

CORRODUR 28-4.
M-1290; 0.4 C, 27 Cr, 4 Ni, bal Fe.
Cast: 90,000 TS; 65,000 YS; 2 El; 212 Brin.
Heat treated: 97,000 TS; 65,000 YS; 18 El; 210 Brin.
For cylinder liners, bushings, valve seats and bodies; Type CC-50; heat resistant.

CORRODUR 30.
M-1290; 1.2 C, 1.3 Si, 29 Cr, bal Fe.
For crushers, rollers, grates, rabble vanes; heat and wear resistant.

CORRODUR 30E.
M-1290; 1.2 C, 1.3 Si, 29 Cr, 2 Mo, bal Fe.
For crushers, rollers, grates, rabble arms; heat and wear resistant.

CORRODUR 30EH.
M-1290; 1 9 C, 29 Cr, 2 Mo, 2 Cu, bal Fe.
For crushers, rollers, grates, rabble arms; heat and wear resistant.

CORRODUR 30H.
M-1290, 1.8 C, 1.3 Si, 29 Cr, bal Fe
For crushers, rollers, grates, rabble arms; heat and wear resistant.

CORRODUR C14
M-1290, 0 22 C, 14.5 Cr, bal Fe
Annealed· 78,000-92,000 TS; 50,000 min YS; 3 min El
Heat treated 85,000-115,000 TS, 64,000-min YS, 12 min El.
Corrosion resistant casting.
Werkstoff Nr. 1 4027; DIN G-X22Cr 14.

CORRODUR C 14 N
M-1290, 0 19 C, 13.0 Cr, 0 50 Ni, bal Fe.
Annealed· 78,000-92,000 TS, 50,000 min YS; 10 min El.
Heat treated 85,000-115,000 TS, 64,000 min YS, 8 min El
Corrosion resistant casting
Werkstoff Nr. 1 4021, DIN G-X 20 Cr13

CORRODUR C 14 W
M-1290, 0 12 C, 12 5 Cr, 0.50 Ni, bal Fe
Annealed 71,000-92,000 TS; 42,500 min YS; 2 min El.
Heat treated: 85,000-112,000 TS; 57,000 min YS; 4 min El
Corrosion resistant casting
Werkstoff Nr. 1 4008; DIN G-X 12 Cr14.
ASTM A296 Gr.CA 15.

CORRODUR C 17.13 E3S.
M-1290; 0.05 C, 16.5 Cr, 13 5 Ni, 2.5 Mo, bal Fe.
Sol ann & age. 69,000 min TS; 30,000 min YS; 25 min El
Corrosion resistant casting.
DIN G-X5CrNiMo 1713.

CORRODUR C 17.13 ESS.
M-1290; 0.05 C, 17.0 Cr, 13.5 Ni, 4 75 Mo, bal Fe.
Sol. ann & age: 69,000 min TS; 35,000 min YS; 20 min El.
Corrosion resistant casting.
Werkstoff Nr. 1.4448; DIN G-X6CrNiMo1713.

CORRODUR C 18.
M-1290; 0.22 C, 17.0 Cr, 1.25 Ni, bal Fe.
Annealed: 85,000-106,000 TS; 57,000 min YS; 2 min El.
Heat treated: 106,000-128,000 TS; 85,000 min YS; 4 min El.
Corrosion resistant casting.
Werkstoff Nr. 1.4059; DIN G-X25CrNi17.

CORRODUR C 18.8.
M-1290; 0.10 C, 18.0 Cr, 8.5 Ni, bal Fe.
Sol. ann & age: 64,000-85,000 TS; 30,000 min YS; 25 min El.
Corrosion resistant casting.
Werkstoff Nr. 1.4312; DIN G-X10CrNi188.

CORRODUR C18.8 E
M-1290; 0.10 C, 18.0 Cr, 9.5 Ni, 2 25 Mo, bal Fe.
Sol. ann. & age: 71,000-92,000 TS; 30,000 min YS; 25 min El.
Corrosion resistant casting.
Werkstoff Nr. 1.4410; DIN G-X CrNiMo 189.

CORRODUR 18.8 ES.
M-1290; 0.07 C, 17.5 Cr, 10 5 Ni, 2.25 Mo, bal Fe.
Sol. ann. & age. 64,000-85,000 TS; 30,000 min YS; 25 min El.
Corrosion resistant casting.
Werkstoff Nr. 1.4408, DIN G-X6CrNiMo 1810

CORRODUR 18.8 ESS.
M-1290; 0 08 C, 17.5 Cr, 11 0 Ni, 2 25 Mo, Nb, bal Fe.
Sol. ann. & age: 64,000-85,000 TS; 30,000 min YS; 20 min El.
Corrosion resistant casting.
Werkstoff Nr. 1 4581; DIN G-X7CrNiMoNb 1810.

CORRODUR C 18.8 ESSD.
M-1290, 0 05 C, 17.0 Cr, 11.5 Ni, 2.25 Mo, 1.5 Mn, Nb, bal Fe.
Sol ann. & age 69,000 min TS; 30,000 min YS; 20 min El.
Corrosion resistant casting
DIN G-X5CrNiMoNb1712.

CORRODUR C 18 8 O.
M-1290, 0 10 C, 18.0 Cr, 8.5 Ni, 0.4 max Mo, bal Fe
Corrosion resistant casting

CORRODUR C 18 8 S.
M-1290, 0 07 C, 18.0 Cr, 9.5 Ni, bal Fe.
Sol ann & age· 70,000 min TS, 30,000 min YS; 25 min El
Corrosion resistant casting
Werkstoff Nr 1 4308, DIN G-X6CrNi 189.
ASTM A296 Gr CF 8

CORRODUR C 18.8 SS
M-1290; 0.8 C, 18.0 Cr, 10 0 Ni, Nb, bal Fe.
Sol. ann. & age· 70,000 min TS, 30,000 min YS; 20 min El.
Corrosion resistant casting
Werkstoff Nr. 1 4552; DIN G-X7CrNiNb189
ASTM A296 Gr CF 8C.

CORRODUR C 18.8 SSO
M-1290; 0.08 C, 18 0 Cr. 10 0 Ni, 0.4 max Mo, Nb, bal Fe.
Corrosion resistant casting.

CORRODUR C 18 E.
M-1290; 0 37 C, 16 5 Cr, 1 15 Mo, bal Fe.
Annealed: 85,000-106,000 TS, 64,000 min YS; 2 min El.
Heat treated. 106,000-128,000 TS, 85,000 min YS; 4 min El
Corrosion resistant casting.
Werkstoff Nr. 1.4122; DIN G-X35CrMo17.

CORRODUR C 20.25 E.
M-1290; 0.05 C, 25 0 Ni, 20.0 Cr, 3.25 Mo, 1.35 Cu, bal Fe.
Sol. ann. & age: 64,000-78,000 TS; 28,000 min YS; 15 min El.
Corrosion resistant casting.
Werkstoff Nr. 1.4500; DIN G-X7NiCrMoCu2520.

CORRODUR C 22.7.
M-1290; 0.16 C, 20.5 Cr, 4.25 Ni, bal Fe.
Sol. ann. & age: 85,000-100,000 TS; 54,000 min YS; 25 min El.
Corrosion resistant casting.
DIN G-X20CrNi214

CORRODUR C 24.7 E.
M-1290; 0.27 C, 23.0 Cr, 7.0 Ni, 2.25 Mo, 1.35 Cu, bal Fe.
As cast: 85,000-100,000 TS; 57,000 min YS; 4 min El.
Sol. ann. & age: 85,000-100,000 TS; 42,500 min YS; 6 min El.
Corrosion resistant casting.
DIN G-X30CrNiMo247.

CORRODUR C 28.4.
M-1290; 0.35 C, 27.0 Cr, 4.0 Ni, bal Fe.
As cast: 64,000-85,000 TS; 42,500 min YS; 4 min El.
Corrosion resistant casting.
Werkstoff Nr. 1.4340; DIN G-X40CrNi274.

CORRODUR C 30.
M-1290; 0.60 C, 29.0 Cr, bal Fe.
As cast: 57,000-64,000 TS.
Corrosion resistant casting
Werkstoff Nr. 1.4085; DIN G-X70Cr29.

CORRODUR C 30 E.
M-1290; 0.65 C, 28.0 Cr, 2.0 Mo, bal Fe.
As cast: 57,000-64,000 TS
Corrosion resistant casting.
Werkstoff Nr. 1.4136; DIN G-X70 CrMo292.

CORRODUR C 30 EH.
M-1290; 1.90 C, 29.0 Cr, 2.0 Mo, 1.35 Cu, bal Fe
Hardenable to 500 Brin max.
Corrosion resistant casting.
DIN G-X190CrMo292.

CORRODUR C 30 H.
M-1290; 1.80 C, 29.0 Cr, bal Fe.
Hardenable to 500 Brin max.
Corrosion resistant casting DIN G-X180Cr29

CORRODUR N 15.
M-1290; 2.9 C, 2.4 Si, 14.5 Ni, 6.0 Cu, 2.0 Cr, bal Fe.
Austenitic nickel-copper cast steel.
DIN G-X300 NiCuCr156.

CORRODUR Sp 120.
M-1290; 1.20 C, 29.0 Cr, bal Fe.
As cast. 57,000-64,000 TS.
Corrosion resistant casting.
Werkstoff Nr. 1.4086, DIN G-X120Cr29.

CORROFEST 13/1.
M-1293; 0.10 C, 13 Cr, bal Fe
Annealed: 75,000 TS; 40,000 YS, 35 El; 70 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA, 205 Brin.
For furnace parts, heat treat boxes, X10Cr13; heat resistant.

CORROFEST 13/2.
M-1293; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 50 RA; 195 Brin.
Heat treated: 250,000 TS; 215,000 YS; 8 El, 25 RA; 500 Brin.
For cutlery, knives, valves, surgical instruments; X20Cr13; corrosion resistant, hardenable.

CORROFEST 13/2 Mo.
M-1293; 0.2 C, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 22 El; 48 RA; 200 Brin.
For cutlery, knives, chemical plant equipment; X20CrMo13; corrosion resistant, hardenable.

CORROFEST 13/4.
M-1293; 0.4 C, 0.4 Si, 13 Cr, bal Fe.

CORROFEST 17/1.
M-1293; 0.1 max C, 0.4 Si, 17.5 Cr, bal Fe.
Annealed: 80,000 TS; 45,000 YS; 30 El, 55 RA; 170 Brin.
For furnace parts, heat treat boxes, X8Cr17; corrosion and heat resistant.

CORROFEST 17/1 Mo
M-1293; 0.1 max C, 0.4 Si, 17.5 Cr, 1 Mo, Ti = 7 × C, bal Fe
Annealed: 80,000 TS, 45,000 YS; 30 El; 55 RA, 170 Brin.
For chemical plant equipment, X8CrMoTi17; corrosion and heat resistant.

CORROFEST 17/2
M-1293; 0.22 C, 0.4 Si, 17 Cr, 1.5 Ni, bal Fe
Annealed: 80,000 TS; 45,000 YS; 30 El, 55 RA; 170 Brin.
For stainless machine tool parts, X22CrNi17, corrosion resistant. heat treatable

CORROFEST 17/9
M-1293, 0.9 C, 0.4 Si, 18 Cr, 1.15 Mo, 1 V, bal Fe.
For bearings, bushings, pivots, X90CrMoV18, corrosion resistant, hardenable

CORROFEST 18/8
M-1293; 0.15 max C, 0.4 Si, 18 Cr, 8 Ni, bal Fe
Annealed: 80,000 TS, 35,000 YS, 55 El; 65 RA, 150 Brin
Cold drawn: 180,000 TS, 125,000 YS, 10 El, 330 Brin
For chemical plant equipment, tanks, vessels, piping, Type 302; stainless, austenitic.

CORROFESTAL.
M-981, 0.5-2.0 Mg, 0.3-1.5 Si, 0-1.5 Mn, bal Al.
For light alloy parts; corrosion resistant, hardenable

CORROFOND M3
M-1445, 3 Mg, 0.3 Mn, bal Al
Cast: 21,000-29,000 TS, 8,000-12,000 YS, 10-6 El, 45-55 Brin
For light alloy parts; corrosion resistant

CORROFOND M5.
M-1445, 5 Mg, 0.4 Mn, bal Al
Heat treated: 28,000-33,000 TS, 13,000-17,000 YS, 12-8 El, 60-80 Brin
For light alloy parts, corrosion resistant

CORROFOND M7
M-1445; 7 Mg, 0.4 Mn, bal Al.
Heat treated: 37,000-42,000 TS; 19,000-22,000 YS; 11-5 El; 70-80 Brin.
For marine hardware, resists sea water corrosion, age-hardenable.

CORROFOND M-10
M-1445; 10 Mg, 0.4 Mn, bal Al.
Heat treated: 50,000-56,000 TS; 21,000-26,000 YS; 13-6 El; 75-85 Brin
For marine and aircraft parts; heat treatable, resists sea water corrosion.

CORROFOND S2.
M-1445; 2 Si, 0.65 Mg, 0.7 Mn, bal Al
Heat treated: 36,000-42,000 TS; 29,000-39,000 YS; 3-1 El; 90-105 Brin.
For light alloy parts.

CORROFOND S4.
M-1445; 4.2 Si, 0.5 Mn, 0.15 Ti, bal Al.
Cast: 19,000-26,000 TS; 7,000-13,000 YS; 15-9 El; 45-60 Brin.
For light alloy parts; corrosion resistant.

CORROFOND S45.
M-1445; 4 5 Si, 0.65 Mg, 0.7 Mn, bal Al.
Heat treated: 36,000-46,000 TS; 26,000-36,000 YS, 2-1 El; 90-105 Brin.
For light alloy parts; corrosion resistant, age-hardened.

CORRONEL 210.
M-121; 28 Mo, 6 Fe, bal Ni.
For chemical plant equipment, petroleum equipment, high corrosion resistance to HCl and acid chlorides

CORRONEL 220.
M-121; 28 Mo, 3 max Fe, 1 6-2.25 V, bal Ni.
Rolled· 157,000 TS, 82,000 YS; 37 El, 38 RA.
For chemical and petroleum plant equipment, pickling plant.
Acid resistant.

CORRONEL-230.
M-121, 0 08 max C, 0 6 max Si, 1 0 max Cu, 5 0 max Fe, 1 0 max Mn, 1.0 max Ti, 0 5 max Al, 35 0-37 0 Cr, bal Ni.
Annealed 105,700 TS; 46,000 YS, 43 El; 69 RA
For chemical and petrochemical industries, refinery equipment, mixers, agitators High corrosion resistance It resists non-oxidizing acid liquors

CORRONEL B
M-121, 66 Ni, 28 Mo, 6 Fe
For chemical plant equipment, acid resistant, resists hydrocloric and phosphoric acids

CORRONEL B
M-897, M 121, 66 Ni, 28 Mo, 6 Fe
Rolled 134,400 TS, 62,000 YS, 40 El; 40 RA; 250 Brin
For heat exchangers, pump parts, reaction vessels; corrosion resistant

CORRONIUM
Eng; 80 Cu, 15 Zn, 5 Sn
4,000 TS, 38 El, 37 RA, 90 Brin.
Cast or wrought.

CORRONON 1
M-1294, 0 12 max C, 0 4 Si, 13 Cr, bal Fe.
Annealed 90,000 TS, 45,000 YS; 28 El, 55 RA; 180 Brin
For turbine blades, cutlery, knives, X10Cr13, corrosion resistant

CORRONON-2.
M-1294, 0.2 C, 13 Cr, bal Fe
Annealed· 95,000 TS, 50,000 YS; 25 El; 50 RA, 195 Brin.
Heat treated· 250,000 TS, 215,000 YS; 8 El; 25 RA; 500 Brin.
For cutlery, knives, turbine blades; Type 320; corrosion resistant.

CORRONON-8.
M-1294, 0 12 max C, 0 8 Si, 0.8 Al, 6-5 Cr, bal Fe
For oil refinery equipment; X10CrA17; creep resistant.

CORRONON-9.
M-1294; 0.20 C, 13 Cr, 1 Al, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 50 RA; 195 Brin
Heat treated: 250,000 TS, 215,000 YS; 8 El; 25 RA; 500 Brin.
For cutlery, knives, turbine blades, surgical instruments; X20CrA113; corrosion resistant.

CORRONON-10.
M-1294; 0.12 max C, 1 Si, 1 Al; 18 Cr, bal Fe.
Annealed: 80,000 TS; 45,000 YS; 30 El; 55 RA; 170 Brin.
For oil refinery and chemical plant equipment; X10CrA118, corrosion and heat resistant.

CORRONON-11.
M-1294; 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe
For furnace parts and equipment, heat treat boxes; X20CrNiSi254; heat resistant

CORRONON-12
M-1294, 0 12 max C, 1.5 Si, 1 5 Al, 24 Cr, bal Fe.
For furnace parts and equipment, heat treat boxes; X10CrA124; heat resistant.

CORRONON-16
M-1294; 0 1 max C, 0.4 Si, 17.5 Cr, bal Fe.
Annealed· 80,000 TS, 45,000 YS, 30 El; 55 RA; 170 Brin.
For chemical plant and oil refinery equipment; X8Cr17, corrosion and heat resistant

CORRONON-16N.
M-1294, 0.22 C, 17 Ni, bal Fe.
For chemical plant equipment, X22Ni17, corrosion resistant

CORRONON-16S
M-1294, 0 1 max C, 17.5 Cr, Ti = 7 × C, bal Fe
Annealed. 80,000 TS, 45,000 YS, 30 El, 55 RA, 170 Brin.
For welded structures; X8CrTi17; heat resistant, stabilized

CORRONON-18
M-1294, 0 1 max C, 17 5 Cr, 1 Mo, Ti = 7 × C, bal Fe.
Annealed. 85,000 TS, 48,000 YS; 28 El; 52 RA; 180 Brin
For chemical plant equipment, X8CrMoTi17, heat and corrosion resistant

CORRONON-18H.
M-1294, 0 9 C, 18 Cr, 1.15 Mo, 1 V, bal Fe.
For bearings, linings, X90CrMoV18

CORRONON 20/10.
M-1294, 0 15 C, 2 Si, 19.5 Cr, 9 5 Ni, bal Fe
Annealed· 85,000 TS, 40,000 YS, 50 El, 60 RA, 180 Brin
For chemical plant equipment, X15CrNiSi199, corrosion and heat resistant.

CORRONON 23/20.
M-1294, 0.15 C, 2 Si, 24 Cr, 19 Ni, bal Fe
For furnace parts and equipment, heat treat boxes, corrosion and heat resistant, austenitic.

CORRONON 184E
M-1294; 0.12 max C, 18 Cr, 2 Mo, 10 5 Ni, bal Fe.
Annealed. 80,000 TS, 30,000 YS, 60 El, 80 RA, 135 Brin.
Cold drawn: 150,000 TS, 135,000 YS, 6 El; 300 Brin
For chemical plant equipment, mixers, agitators; filters; Type 316, stainless, austenitic

CORRONON 184S.
M-1294; 0.07 max C, 18 Cr, 2 Mo, 10 5 Ni, bal Fe.
Annealed: 80,000 TS; 30,000 YS, 60 El; 80 RA; 135 Brin
Cold drawn 150,000 TS; 135,000 YS, 6 El, 300 Brin.
For chemical plant equipment, mixers, agitators, filters; Type 316L; stainless, austenitic.

CORRONON 188.
M-1294; 0.12 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
Cold drawn: 180,000 TS; 135,000 YS; 10 El; 330 Brin.
For chemical plant equipment, tanks, vessels, mixers; X12CrNi18-8; austenitic, stainless.

CORRONON 188E.
M-1294; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
Cold drawn: 95,000 TS; 60,000 YS; 40 El; 60 RA; 185 Brin.
For welded structures, chemical plant equipment; Type 321; austenitic, stainless.

CORRONON 188S.
M-1294; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
Cold drawn: 180,000 TS; 135,000 YS; 10 El, 330 Brin
For kitchen equipment, architectural trim; Type 304; stainless, austenitic.

CORROSALLOY 13.
M-1485; 0.25 max C, 11.5-13.5 Cr, 1 max Ni, bal Fe.
Cast: 101,000 TS; 15 El; 160-260 Brin.
For chemical plant equipment; Brit. BS 1630 B, corrosion resistant.

CORROSALLOY 18.
M-1485; 0.25 max C, 1.0-1.3 Ni, 16-20 Cr, bal Fe.
Cast: 123,200 TS; 10 El; 250 Brin.
For chemical plant and oil refinery equipment; Brit. S 80, corrosion and heat resistant, hardenable.

CORROSALLOY DU.
M-1485; 0.10 max C, 28-30 Ni, 19-21 Cr, 2-3 Mo, 3.5-4.5 Cu, bal Fe.
Cast: 62,800 TS; 30 El; 160 Brin.
For chemical plant equipment; corrosion resistant to H_2SO_4.

CORROSALLOY H.T.
M-1485, 0.05 C, 1.0 max Si, 1.0 max Mn, 4.0 Ni, 17 Cr, 3.5 Cu, bal Fe.
Cast: 140,000 TS; 15 El; 290-330 Brin.
High strength and corrosion resistant alloy for pump and valve applications.

CORROSALLOY M.
M-1485; 0.12 max C, 10-12 Ni, 18-20 Cr, 2.5-3.5 Mo, Cb = 10 × C, bal Fe.
Cast: 78,500 TS; 25 El; 180-220 Brin.
For acid resistant chemical plant equipment, welded parts; Brit. BS 1632 B, stainless, austenitic.

CORROSALLOY NDP.
M-1485; 0.12 max C, 8-10 Ni, 18-20 Cr, Cb = 10 × C, bal Fe.
Cast: 78,500 TS; 30 El; 170-210 Brin.
For welded chemical plant equipment, mixers; Brit. BS 1631 B, stainless, austenitic.

CORROSALLOY S.
M-1485; 0.15 max C, 8-10 Ni, 18-20 Cr, bal Fe.
Cast: 78,500 TS; 30 El; 170-210 Brin.
For chemical plant and oil refinery equipment; austenitic, stainless, Brit. 1631 A.

CORROSIL.
M-1709; 0.70 C, 14 Si, bal Fe.
As cast: 514 Brin.
Corrosion and wear resistant iron, corrosion control anodes.

CORROSIRON.
M-192; M-23; 0.8-1.0 C, 13.5-14.5 Si, bal Fe.
Cast: 16,000 TS; 16,000 YS; 0 El; 0 RA; 350 Brin.
For acid pans, drains, pumps, valves, cocks; corrosion resistant, not forgeable.

CORROSIST B.
M-1485; 0.15 max C, 28-32 Mo, 6 max Fe, bal Ni.
Cast: 78,500 TS; 6 El; 250-300 Brin.
For pumps, valves, turbine parts, chemical plant equipment; resists HCl.

CORROSIST C.
M-1485; 0.15 max C, 17-20 Mo, 3-4 W, 8 max Fe, 14-16 Cr, bal Ni.
Cast. 74,000 TS; 10 El; 250-300 Brin.
For drains, pumps, chemical plant equipment; resists HCl and wet Cl_2.

CORROSIST D.
M-1485, 0.15 max C, 2.0-3.5 Cu, 5 max Fe, 9.0-10.5 Si, bal Fe.
Cast: 49,300 TS; 550-600 Brin.
For valves, pumps, drains, chemical plant equipment, resists boiling H_2SO_4, hard and brittle.

CORROSIST IL
M-1485; 0.15 max C, 22-24 Cr, 3.5-4.5 Mo, 7-8 Cu, 7 max Fe, bal Ni.
Cast 56,000 TS, 12 El, 190-220 Brin.
For chemical plant equipment; resists H_2SO_4.

COR-TEN A
M-604; 0.10 C, 0.40 Mn, 0.12 P, 0.05 S, 0.50 Si, 1.0 Cr, 0.02 min Ti, bal Fe
Plate 70,000 TS, 50,000 YS, 19 El.
For bridges, booms, derricks, mine cars, bus and truck bodies.
High strength-low alloy steel

COR-TEN B.
M-604, M-537; M-67, 0.10-0.19 C, 0.90-1.25 Mn, 0.25-0.40 Cu, 0.40-0.65 Cr, 0.02-0.10 V, bal Fe
Plate 70,000 TS, 50,000 YS, 19 El.
For structures, derricks, booms, mine cars, truck and bus bodies, bridges High strength-low alloy steel

COR-TEN C.
M-604, M-537, M-67, 0.12-0.19 C, 0.90-1.35 Mn, 0.25-0.40 Cu, 0.40-0.70 Cr, 0.04-0.10 V, bal Fe.
Plate 80,000 TS; 60,000 YS, 16 El
For structures, bridges, bus and truck bodies, booms, mine cars, derricks
High strength-low alloy steel.

CORVIC BRONZE
M-33, 98.5 Cu, 1.5 Sn
For chemical engineering equipment; corrosion resistant.

COSINT 1000
M-1526; 20 Co, 16 Cr, 5.5 W, 2.5 Mo, 5.5 Al, 2.5 Ti, 0.02 B, 0.3 Zr, bal Ni.
For high temperature applications; pre-alloyed powder, sintered, heat resistant.

COSMOLOY-F.
U.S.; 0.04 max C, 15 Cr, 3.8 Mo, 2.2 W, 3.4 Ti, 4.7 Al, 0.08 B, 0.07 Zr, bal Ni.
For high temperature applications; heat and corrosion resistant.

COTHIAS ALLOY.
Eng.; 93 Al, 6.5 Cu, 0.5 Zn.
For light weight castings.

COUGAR.
M-1432; 1.55 C, 0.04 Mn, 11.5 Cr, 0.9 V, 0.8 Mo, bal Fe.
AISI Type D2 Cold work tool steel, chromium type.

COURSIER.
M-1546; 0.60-0.70 C, bal Fe.
Hardened: C 58-60 Rock.
For cutting tools, drills, knives, hammers, chisels. Water hardening.

COUSSINAL A.
French; 3 Sn, 2 Pb, 3 Sb, bal Al.
For bearings; anti-friction.

COUSSINAL C.
French; 4 Sn, 4 Cu, 3 Mg, 1 Mn, bal Al.
For bearings; antifriction.

COVAN.
M-140; 0.90 C, 4.0 Cr, 2.0 V, 8.0 Mo, 8.0 Co, bal Fe.
High speed steel for cutting tools, Mo-Co type, good red hardness. AISI M34.

COVANDUR.
M-32; 0.04 C, 49 Co, 1.9 V, 0.2 Se, 0.6 Mn, bal Fe.
For electrical equipment, sonars, ultrasonic transducers. Soft magnet, high magnetic saturation.

COWLES.
Eng., 1.25-11 Al, bal Cu.
For strong corrosion resistant parts; corrosion resistant.

COWLES "A-1."
U.S.; 80 Cu, 10 Al.
For hardware, gears, Al-bronze

COWLES "A-2."
U.S.; 80 Cu, 10 Al.
For hardware, gears; Al-bronze.

COWLES ALUMINUM BRONZE
Eng; 88.4 Cu, 9.74 Al, 0.43 Fe, 1.36 Si.
For gears, trolley wheels, worm wheels; tough, wear resistant.

COWLES "B"
U.S., 92.5 Cu, 7.5 Al.
For hardware, gears, Al-bronze.

COWLES "C-1."
U.S., 94.5 Cu, 5.5 Al
For hardware, gears; Al-bronze.

COWLES "C-2"
U.S; 95 Cu, 5 Al
For hardware, gears; Al-bronze

COWLES "C-3"
U.S.; 95 Cu, 5 Al
For hardware, gears; Al-bronze.

COWLES "D."
U.S., 97.5 Cu, 2.5 Al
For hardware, gears; Al-bronze

COWLES "E"
U.S; 98.75 Cu, 1.25 Al.
For hardware; corrosion resistant.

COWLES HIGH MANGANESE BRASS.
U.S.; 80-67 Cu, 15-18 Mn, 5-13 Zn, 0.1 Al, Si.
For strong corrosion resistant parts; corrosion resistant

COWLES SPECIAL "A"
U.S.; 80 Cu, 11 Al.
For hardware, gears; Al-bronze.

CPI:
M-233; 0.5 C, 2.25 W, 1.5 Cr, 0.25 V, bal Fe.
For hot work dies; hot work steel.

CPT 64AV.
M-739; 0.02 C, 0.3 Fe, 6 Al, 4 V, bal Ti.
Sintered: 119,000 TS; 107,000 YS; Rock C 23.
Heat Treated: 146,000 TS; 133,000 YS; Rock C 27.
For aircraft bearing housings.
Heat treatable. Corrosion resistant.
Sintered powders.

CQ-2.
M-1697; Sintered carbide tool material.
General purpose machining of cast iron, non-ferrous and non-metallic materials.

CQ-3.
M-1697; Sintered carbide tool material.
For light roughing cuts and some finishing cuts on cast iron and non-ferrous metals.

CQ-4.
M-1697; Sintered carbide tool material.
Finish cutting and precision boring of cast iron and non-ferrous metals.

CQ-12.
M-1697; Sintered carbide tool material.
For roughing cuts on cast iron, steel and non-ferrous metals and for wear parts.

CQ-13.
M-1697; Sintered carbide tool material.
For wear parts; moderate shock.

CQ-14.
M-1697; Sintered carbide tool material.
For wear parts, will stand heavy shock.

CQ-15.
M-1697; Sintered carbide tool material.
For wear parts and light impact.

CQ-16.
M-1697; Sintered carbide tool material.
For wear parts and heavy impact applications.

CQ-23
M-1697; Sintered carbide tool material.
For cutting and forming plastics, glass and highly abrasive materials and laminates

CRAIG GOLD.
80 Cu, 10 Ni, 10 Zn.
For jewelry, ornaments.

CRALCLAD.
Japan, Al alloy.
For light alloy parts; clad duralumin.

CRALFER
England, 3 C, Mn, Si, Al, bal Fe.
For machinery castings; cast iron, growth resistant.

CRAMP ALLOY NO. 5.
M-309, 79.3 Cu, 10 Sn, 10 Pb, 0.70 P.
Cast: 28,000-32,000 TS; 18,000-19,000 YS; 4-8 El; 70 Brin.
For bearings for medium speeds and light loads, cross-head and mill bearings; SAE 64.

CRAMP ALLOY NO. 7.
M-309; 75 Cu, 18 Pb, 7 Sn.
Cast: 17,000-32,000 TS; 8,000-12,000 YS; 7-10 El; 45-50 Brin.
For bearings of low compressive load and where lubrication is poor; acid corrosion resistant.

CRAMP ALLOY NO 12
M-309; 87.75 Cu, 6.25 Sn, 4 Zn, 1.5 Pb, 0.5 Ni.
Cast: 32,000-38,000 TS; 16,000-18,000 YS; 20-25 El; 40-50 Brin.
For valves, fittings, cocks, pressure castings; similar to U.S. Navy Composition "M."

CRAMP ALLOY NO. 13.
M-308; 83 Cu, 13.5 Sn, 3.5 Zn.
Cast 23,000-32,000 TS; 13,000-15,000 YS; 4-2 El; 55-65 Brin.
For bearings for heavy duty as for bridges, trunnions, machines, center disks; corrosion resistant to weak sulfurous acid.

CRAMP ALLOY NO. 20.
M-309; 85 Cu, 5 Sn, 5 Zn, 5 Pb.
Cast: 30,000 TS; 25 El.
For bearings for general service; similar to "Ounce" metal.

CRAMP ALLOY NO. 45 (PARSONS Mn BRONZE).
M-309; 55-60 Cu, 38-42 Zn, 0.20 max Pb, 1.5 max Al, 3.5 max Mn, 1.5 max Sn, 0.4-2.0 Fe.
Cast: 65,000-75,000 TS; 33,000-38,000 YS; 30-20 El; 100 Brin.
For ship propellers, heavy duty bushings, bearings, spur and bevel gears, valve stems, valve bodies; corrosion resistant, tough

CRAMP ALLOY NO. 49 (SUPER STRENGTH BRONZE).
M-309; 60-70 Cu, 20-30 Zn, bal special alloy.
Cast: 90,000-115,000 TS; 45,000-68,000 YS; 25-10 El; 185-240 Brin.
For housing nuts, trunnion bearings, expansion plates, worms, worm wheels, spur and bevel gears, valve stems; resists high compressive loads and shock.

CRAMP ALLOY NO. 49A.
M-309; 60-70 Cu, 20-30 Zn, bal Mn, Fe, Al.
Cast: 120,000 TS; 90,000 YS; 10 El; 10 RA; 240 Brin.
For bushings, worms, bearings, gears, valve bodies. Mn-bronze, tough.

CRAMP ALLOY NO. 50.
M-309; 60-70 Cu, 20-30 Zn, bal Mn, Fe, Al.
Cast: 90,000 TS; 45,000 YS; 25 El, 20 RA; 175 Brin.
Forged: 93,000 TS; 50,000 YS; 20 El; 20 RA; 195 Brin.
For bushings, worms, bearings, gears, valve bodies, Mn-bronze, tough.

CRAMP ALLOY NO 50A.
M-309; 60-70 Cu, 20-30 Zn, bal Mn, Fe, Al.
Cast: 100,000 TS; 50,000 YS; 20 El, 18 RA; 150 Brin.
Forged: 105,000 TS; 60,000 YS; 18 El, 18 RA, 210 Brin.
For bushings, worms, bearings, gears, valve bodies, Mn-bronze, tough

CRAMP ALLOY NO. 54 (PARSONS WHITE BRASS SA)
M-309; 78-61 Sn, 4.5-5 Cu, 6-11 Sb, 3.5-13 Pb.
Cast: 12,250 TS; 10,750 YS; 2.7 El; 32-38 Brin.
For bearings for heavy duty service, main and cross-head bearings; Babbitt.

CRAMP ALLOY NO 69 (HYDRAULIC METAL).
M-309, 86.5 Cu, 11 Sn, 2 Zn, 0.50 Pb
35,000-40,000 TS, 16,500-18,500 YS; 10-8 El, 60-65 Brin.
For valve bodies, sleeves, pump parts, cylinder bodies, bearings; for high hydraulic pressures.

CRAMP ALLOY NO. 71 (CRAMP'S NICKEL BRONZE).
M-309; 87.5 Cu, 11 Sn, 1.5 Ni.
Cast: 45,000-50,000 TS, 25,000-27,000 YS; 20-15 El; 85-95 Brin.
For worms, worm gears, bevel and spur gears, high speed bearings, bushings, wearing parts; for high contact speeds and heavy loads

CRAMP ALLOY NO. 73.
M-309; 10 Sn, 10 Pb, 0.7 P, bal Cu.
Cast: 28,000-32,000 TS; 18,000-19,000 YS; 4-8 El; 70 Brin.
For bearings, bushings, shaft sleeves; SAE 64; bearing bronze.

CRAMP ALLOY NO. 78.
M-309; 85-89 Cu, 8-10 Al, 1.0-2.0 Fe.
Cast: 65,000-95,000 TS; 47,000-57,000 YS; 20-4 El; 130-190 Brin.
For acid resistant containers and parts; resistant to acid corrosion at high temperature.

CRAMP ALLOY NO. 83.
M-309; 87-89 Cu, 9-11 Al, 3-4 Fe.
Heat treated: 75,000-85,000 TS; 35,000-40,000 YS; 8-20 El; 165-185 Brin
For bearings, worm gears, spur gears; resists acid corrosion.

CRAMP ALLOY NO. 84.
M-309; 78-82 Cu, 9-11 Al, 3-6 Fe, 3-6 Ni.
Heat treated: 90,000-115,000 TS; 40,000-70,000 YS; 5-20 El, 5-15 RA; 172-300 Brin.
For structural parts; acid resisting.

CRAMP ALLOY NO. 91.
M-309, 87.5 Cu, 8 Sn, 4 Zn, 0.5 Ni.
Cast 35,000-45,000 TS, 17,500-21,000 YS; 30-20 El; 60-70 Brin.
For shaft liners, bushings, pump parts, valve fittings, flanges, connections, similar to "Composion G"

CRAMP ALLOY NO. 97 (CRAMP COPPER ALLOY).
M-309, 99-99.8 Cu.
17,000-22,000 TS, 5,000-7,000 YS, 40-30 El.
For electrical installations for high conductivity, elec cond 75-85%.

CRAMP ALLOY NO 99
M-309, 3.5 Si, 1.5 Fe, 4 Zn, bal Cu
Cast 45,000-55,000 TS, 20,000-28,000 YS; 23-15 El; 120-130 Brin
For gears, bushings, cross-head bearings; silicon bronze

CRAMP ALLOY NO 101 (PARSONS TURBADIUM)
M-309, 47-52 Cu, 40-46 Zn, 1.0-2.5 Ni.
Cast 65,000-75,000 TS, 33,000-40,000 YS, 18-15 El, 90 Brin.
For pump impellers, turbine runners, buckets for water wheels, resists erosive action of water.

CRAMP ALLOY NO. 114
M-309, 67 Ni, 29 Cu, 1.5 Fe, 0.9 Mn, 1.25 Si
Cast 65,000-80,000 TS, 32,500-45,000 YS, 25-40 El; 25-40 RA; 125-150 Brin
For impellers, valve seats, acid resistant; "Monel Metal"

CRAMP ALLOY NO 115
M-309, 5 Sn, 5 Ni, 2 Zn, bal Cu.
Heat treated 50,000-85,000 TS; 22,000-55,000 YS; 40-10 El, 95-150 Brin.
For gears, slippers, bearings, valve bodies; hardenable, heavy duty

CRAMP ALLOY NO 118
M-309; 63 Ni, 30 Cu, 2 Fe, 0.9 Mn, 3-4 Si.
Cast: 100,000-130,000 TS; 75,000-95,000 YS; 1-4 El, 250-325 Brin.
For valve seats; S-Monel, acid resistant.

CRAMP ALLOY NO. 151
M-309; 78-82 Cu, 8-11 Al, 3-6 Fe, 3-6 Ni.
Heat treated: 80,000-115,000 TS, 35,000-70,000 YS; 20-5 El; 172-300 Brin.
For ship propellers; heat treatable, non-galling, corrosion resistant.

CRAMP ALLOY NO. 174.
M-309; 0.20-0.35 Be, 1.4-1.5 Ni, bal Cu.
Cast: 50,000 TS; 20,000 YS; 16 El; 100 Brin.
Heat treated: 80,000 TS; 55,000 YS; 17 El; 210 Brin.
For welding wheels; heat treatable, 40% electrical conductivity.

CRAMP ALLOY NO. 175.
M-309; 0.30-0.90 Cr, 0.5 max Fe, 0.5 max Si, bal Cu.
Cast: 50,000 TS; 40,000 YS; 15 El; 90 Brin.
For welding wheels; heat treatable, 75% electrical conductivity.

CRAMP ALLOY NO. 176.
M-309; 4-5 Cu, 1 Fe, 1.5 max Si, 0.25 max Ti, bal Al.
Cast 32,000 TS; 16,000 YS; 8 El; 60 Brin.
For cylinder heads, gear cases, age-hardenable.

CRAMP ALLOY NO. 177.
M-309; 4-5 Zn, 0.40-0.65 Mn. 0.3-0.6 Cr, bal Al.
Cast. 31,000 TS, 7 El.
For gear cases, general castings; age-hardens at room temperature.

CRAMP ALLOY NO. 275
M-309; 2.6-3.8 T.C., 0.15-1.50 Si, 3-6 Ni, 0.5-2.5 Cr, 0.15-1.50 Mn, bal Fe.
Cast: 50,000-80,000 TS, 500-600 Brin.
For pump plungers, rolls for metal rolling, grinding plates, wear and abrasion resistant; "Ni-Hard."

CRAMP'S SUPER-STRENGTH BRONZE. GRADE "A"
M-309, 57 Cu, 28 Zn, bal hardeners of Mn, Fe, Al
Cast. 115,000 TS, 68,000 YS, 10 El, 10 RA, 240 Brin
Wrought 118,000 TS, 70,000 YS, 8 El; 8 RA
For bushings, bearings, gears, worms, die castings, shafts, valve stems, tube sheets, Mn bronze, C Y P 65000

CRAMP'S SUPER STRENGTH BRONZE, GRADE "B"
M-309, 57 Cu, 28 Zn, bal hardeners of Mn, Fe, Al
Cast 110,000 TS, 63,000 YS. 15 El, 15 RA, 225 Brin
Wrought: 115,000 TS, 65,000 YS; 15 El, 15 RA.
For bushings, bearings, gears, worms, die castings, shafts, valve stems, tube sheets, pump impellers, Mn bronze; C.Y P 60000

CRAMP'S SUPER-STRENGTH BRONZE, GRADE "C"
M-309; 57 Cu, 28 Zn, bal hardeners of Mn, Fe Al
Cast. 100,000 TS, 55,000 YS; 20 El, 18 RA, 200 Brin
Wrought 105,000 TS, 60,000 YS, 18 El, 18 RA
For bushings, bearings, gears, worms, die castings, pump impellers, valve stems; Mn bronze, C Y P 50000

CRAMP'S SUPER-STRENGTH BRONZE, GRADE "D"
M-309, 57 Cu, 28 Zn, bal hardeners of Mn, Fe, Al
Cast: 90,000 TS, 45,000 YS, 25 El, 20 RA, 185 Brin
Wrought: 93,000 TS, 50,000 YS, 20 El; 20 RA.
For bushings, bearings, valve stems, shafts, gears, worms, die castings; Mn bronze, C.Y.P. 40000.

CRANE.
M-387; 0.7-1.2 C, bal Fe.
78,000 TS; 41,000 YS; 150 Brin
For tools, cold chisels; water hardening

CRANE-1.
M-111; C, alloy, bal Fe.
For tool machinery parts; oil hardened.

CRANE NO. 1.
M-1109; 75 Pb, 12.5 Sn, 12.5 Sb.
25.2 Brin.
For bearings, Babbitt

CRANE NO. 2.
M-748; 0.3 C, 2 Ni, 0.75 Cr, 0.25 Mo, bal Fe.
Cast: 100,000 TS.
For castings, valve fittings; for service at 750-1100°F, high pressure service.

CRANE-2.
M-111; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, crankshafts, oil hardened, shock resistant.

CRANE NO. 2.
M-1109; 75 Pb, 10 Sn, 15 Sb.
25.6 Brin.
For bearings, Babbitt.

CRANE NO. 3
M-1109; 80 Pb, 5 Sn, 15 Sb.
25.4 Brin.
For bearings, Babbitt.

CRANE NO. 3 NICKEL ALLOY.
M-748, 0.3 C, 2.0-2.5 Ni, bal Fe.
Cast: 75,000 TS, 55,000 YS, 32 El; 55 RA.
For valves, fittings; low temperature applications.

CRANE NO 4.
M-1109, 92.5 Sn, 0.5 Pb, 3.5 Sb, 3.5 Cu.
22.6 Brin
For bearings, Babbitt

CRANE NO 4 CARBON-MOLYBDENUM.
M-748, 0.15-0.30 C, 0.4-0.6 Mo, 0.5-0.7 Mn, 0.2-0.6 Si, bal Fe.
Cast 80,000 TS, 50,000 YS; 26 El, 50 RA, 165 Brin
For valves and fittings, good creep resistance.

CRANE NO 5
M-1109, 89 Sn, 0.25 Pb, 3.75 Cu, 7 Sb
29.2 Brin
For bearings, Babbitt

CRANE NO 5 CHROME-MOLYBDENUM.
M-748, 0.15-0.30 C, 4.0-6.5 Cr, 0.4-0.65 Mo, 0.45-1.00 Mn, bal Fe
Cast. 105,000 TS; 78,000 YS; 22 El; 52 RA, 212 Brin
For valves, fittings, for temperature up to 1100°F.

CRANE 5 Cr-Mo
M-748, 0.30 C, 4-6 Cr, 0.55 Mo, bal Fe
Cast 110,000 TS, 80,000 YS; 18 El; 245 Brin.
For valves, fittings, piping; corrosion resistant.

CRANE NO 6.
M-1109, 85 Sn, 0.25 Pb, 10.75 Sb, 4 Cu.
30.8 Brin.
For bearings, Babbitt

CRANE NO 7.
M-1109, 81.5 Sn, 4 Pb, 10.5 Sb, 4 Cu
34.6 Brin
For bearings, Babbitt.

CRANE NO 7 CHROME-MOLYBDENUM
M-748, 0.18 max C, 1.0-1.5 Cr, 0.4-0.6 Mo, 0.75 Mn, bal Fe
Cast 78,000 TS; 52,000 YS, 28 El, 60 RA; 165 Brin
For valves, fittings, for temperature up to 1000°F.

CRANE NO. 8.
M-1109, 40 Sn, 48.5 Pb, 10.5 Sb, 1 Cu
23.1 Brin.
For bearings; Babbitt.

CRANE NO. 9 CHROME-MOLYBDENUM.
M-748; 0.18 max C, 2-3 Cr, 0.8-1.1 Mo, 0.7 Mn, bal Fe.
Cast: 85,000 TS; 60,000 YS; 25 El; 55 RA; 180 Brin.
For valves, fittings; high temperature steam service.

CRANE 18-8 Mo.
M-748; 0.10 C, 18-20 Cr, 9-10 Ni, 2-4 Mo, bal Fe.
Cast: 85,000 TS; 48,000 YS; 53 El; 150 Brin.
For valves, fittings; heat and abrasion resistant.

CRANE NO. 44 NICKEL ALLOY.
M-748; Ni, Sn, bal Cu.
For valve seats; wear resistant, resists dilute acids and alkalis.

CRANE NO. 49 NICKEL ALLOY.
M-748; Cu, Sn, bal Ni.
235 Brin.
For valves; corrosion resistant, for temperature up to 850°F.

CRANE CARBON CAST STEEL.
M-748; 0.25 C, 0.65 Mn, 0.4 Si, bal Fe.
Cast: 76,000 TS; 45,000 YS; 30 El; 50 RA; 155 Brin.
For valves, fittings; tough.

CRANE CAST MANGANESE BRONZE.
M-748; Zn, Mn, Pb, bal Cu.
60,000-80,000 TS.
For valve stems, yoke sleeves and bushings; wear resistant.

CRANELOY 20.
M-748; 0.07 max C, 29 Ni, 20 Cr, 2-3 Mo, 4 Cu, bal Fe.
Cast: 65,000-75,000 TS; 28,000-38,000 YS; 35-50 El; 50-40 RA; 120-150 Brin.
For chemical plant equipment, mixers; resists mixed acids, austenitic.

CRANE HARDENED STAINLESS STEEL.
M-748; 16-18 Cr, 0.6-0.8 C, bal Fe.
For discs, seats, valves; resists wear and galling.

CRANE SPECIAL BRASS.
M-748; Sn, Pb, bal Cu.
38,000 TS; 17,000 YS; 10 El
For valves, fittings; for temperatures up to 550°F.

CRANE STEAM BRASS.
M-748; 5 Sn, 5 Pb, 5 Zn, bal Cu
Cast: 37,000 TS; 16,000 YS; 26 El.
For valves, fittings; for temperature up to 450°F.

CRASCO NO. 7.
M-337; 1.05 C, 0.65 Cr, 0.4 Mn, 0.15 V, bal Fe.
For tools, dies; water or oil hardening.

CRASCO ALLOY.
M-337; C, W, Cr, bal Fe.
For tools, chisels; shock resistant

CRASCO BLACK LABEL.
M-337; 1.5 C, 0.4 Mn, 11-13 Cr, 0.8 Mo, 0.2 V, bal Fe.
For tools, dies, hot working dies and long run dies; air hardening, non-shrinking.

CRASCO BROACH STEEL.
M-337; C, alloy, bal Fe
For broaches, punches, dies, resists heavy pressures.

CRASCO DRILL ROD.
M-337; 1.05 C, 0.25 Mn, 0.25 Si, bal Fe.
For pivots, bearings, drill rod.

CRASCO FINISHING.
M-337; 1.4 C, 0.2 V, 4 Cr, 0.5 Si, 0.2 Mn, bal Fe.
For cutters, engravers' tools; fast finishing tool steel.

CRASCO GREEN LABEL.
M-337; 1.0 C, bal Fe.
For tools, dies; water hardening.

CRASCO HIGH SPEED.
M-337; 0.7 C, 4 Cr, 18 W, 1.1 V, bal Fe.
For tools, cutters, drills, reamers; high speed steel.

CRASCO HIGH SPEED MOLY NO. 2.
M-337; 0.83 C, 4.25 Cr, 6.4 W, 5 Mo, 1.8 V, bal Fe.
For tools, cutters, drills, broaches; high speed steel.

CRASCO RED LABEL.
M-337; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies; cutters, punches; oil hardening, non-shrinking.

CRASCO SHANK STEEL.
M-337; 0.95 C, bal Fe.
For tools, tool shanks; water hardening.

CRASCO SPECIAL VANADIUM.
M-337, 0.9-1.05 C, 0.15-0.25 V, bal Fe.
For tools, dies; water hardening.

CRASCO WHITE LABEL.
M-337, 1.0 C, bal Fe
For tools, dies, water hardening

CRASCO YELLOW LABEL
M-337, 0.45-0.50 C, 0.25 Mn, 0.95 Cr, 0.2 V, bal Fe
For gears, shafts; oil hardening.

CRASFLOY
M-451, C, Ni, Cr, bal Fe
For rolls, hard alloy

CRESCENT DOUBLE SPECIAL.
M-38, 1.3 C, 3.6 W, bal Fe.
For finishing tools, drawing dies; oil hardening.

CRESCENT EXTRA.
M-38, 0.7-1.0 C, bal Fe.
For punches, dies, cutters, general tools; water hardening

CRESCENT HOT WORK NO 2
M-38; 0.95 C, 3.75 Cr, bal Fe
For tools, gripper and header dies, bloom shears; hot work steel

CRESCENT RIM ROLL.
M-38, 1.0 C, 0.5 Cr, bal Fe
For shaping rolls, drawing dies, oil hardening.

CRESCENT SPECIAL
M-38, 1.0 C, bal Fe
For tools, dies, water hardening.

CRESCENT SPECIAL CARBON TOOL.
M-38, 0.9 C, 0.35 Mn, 0.2 Si, bal Fe
For blanking and coining dies, reamers, taps, striking dies; water hardened.

CRESCENT SPECIAL WIRE DIE
M-38, 2.3 C, 0.5 W, 0.3 Mo, bal Fe.
For wire drawing dies, oil hardening

CRESCENT TOOL
M-38, 0.7-1.0 C, bal Fe
For punches, dies, cutters, general tools, water hardening

CREST A.H.
M-1684; 1.0 C, 0.70 Mn, 5.5 Cr, 0.3 V, 1.15 Mo, bal Fe.
Air hardening tool steel for blanking and trimming dies, shear blades, rolling dies, broaches.
AISI A 2.

CRESTALOY.
M-749; 0.5 C, 1.5 Cr, 0.2 V, bal Fe.
For tools, wrenches; oil hardening.

CREST O.H.
M-1684; 0.90 C, 1.15 Mn, 0.65 Cr, 0.25 V, 0.5 W, bal Fe.
Oil hardening tool steel for blanking and bending dies, punches, knurling tools, gauges.
AISI O 1.

CRESTON NO. 5.
M-750; 0.75-1.1 C, bal Fe.
For cold battering tools; water hardening.

CRESTON NO. 6.
M-750; 0.8-1.2 C, bal Fe.
For tools, dies; water hardening.

CRESTON NO. 7.
M-750, 0.9-1.3 C, bal Fe.
For tools, dies, cutters; water hardening.

CRESTON #8.
M-750; 0.90-1.40 C, bal Fe.
For tools, dies, cutters; water hardening.

CREUSABRO 32.
M-1488; 0.20 C, 1.2 Mn, 1.3 Cr, 0.25 Mo, bal Fe.
Normalized: 142,000 TS; 106,000 YS; 10 El
For cement plant equipment, ventilators, screens, coal and mine equipment
Wear resistant.

CREUSABRO 41.
M-1488, 0.35 C, 0.8 Mn, 1.4 Ni, 2.75 Cr, 0.3 Mo, 0.4 max Si, bal Fe
Heat treated. 235,000 TS, 192,000 YS; 4.5 El.
For gears, wear parts, highly stressed components.
Abrasion resistant.

CREUSABRO 43.
M-1488, 0.4 C, 0.4 Mn, 3.75 Ni, 1.7 Cr, 0.4 max Si, bal Fe
Heat treated 242,000 TS, 192,000 YS, 4.5 El
For gears, gear rings, cams, punches, stamping dies
Abrasion resistant.

CREUSABRO M
M-1488, 1.2 C, 13 Mn, 0.6 Si, bal Fe.
Quenched· 128,000 TS, 50,000 YS, 35 El.
For shafts, scraper buckets, crushers, grinders, safes, helmets
Abrasion and wear resistant.

CREUSABRO ML.
M-1488, 0.45 C, 0.6 Mn, 2 Si, bal Fe
Heat treated 214,000 TS, 115,000 YS; 5 El
For conveyors, wear plates
Abrasion and wear resistant.

CREUSABRO MLD
M-1488; 0.45 C, 0.6 Mn, 0.6 max Ni-Cr-Mo, bal Fe.
Heat treated· 221,000 TS; 171,000 YS, 5 El.
For mining chisels, wedges, springs.
Abrasion resistant.

CREUSELSO 22.
M-1488, 0.15 max C, 0.3 max S, 0.5 Mn, 0.1 Si, bal Fe.
Normalized; 50,000-62,000 TS; 28,000 min YS.
For engineering and mechanical structures requiring resistance to brittle fracture.
Good weldability.

CREUSELSO 26
M-1488; 0.20 max C, 0.2 Si, 0.8 Mn, bal Fe.
Normalized: 59,000-72,000 TS; 34,000 min YS.
For engineering and mechanical structures requiring resistance to brittle fractures.
Good weldability.

CREUSELSO 31.
M-1488; 0.20 max C, 0.3 Si, 1.0 Mn, bal Fe.
Normalized: 65,000-78,000 TS; 40,000 min YS.
For engineering and mechanical structures requiring resistance to brittle fracture.
Good weldability.

CREUSELSO 38.
M-1488; 0.20 max C, 0.4 Si, 1.2 Mn, bal Fe.
Normalized: 72,000-93,000 TS; 50,000 min YS.
For pressure vessels, structural steelwork, bridges.
Good weldability. Resists brittle fracture.

CREUSELSO 42
M-1488; 0.24 max C, 0.4 Si, 1.4 Mn, bal Fe
Normalized· 78,000-93,000 TS; 57,000 min YS.
For penstocks, pressure vessels, structural steelwork, bridges.
Good weldability. Resists brittle fracture.

CREUSELSO 50.
M-1488, 0.20 C, 1.4 Mn, 0.4 Si, 0.25 Mo, bal Fe.
Rolled: 72,000 TS; 45,000 YS; 30 El; 150 Brin.
Heat treated: 100,000 TS, 62,000 YS; 20 El; 200 Brin.
For penstocks, pressure vessels, structural steelwork, bridges, derricks.
Good weldability. Resists brittle fracture.

CREUSOT 0.5DF03.
M-1488, 0.40 C, 0.5 Cr, 0.6 Ni, 0.2 Mo, bal Fe.
Oil hardened 142,000-200,000 TS; 120,000 YS; 9 El.
For gears, pinions, axles, crankshafts, fasteners, bolts.
AISI 8640 steel. Tough and shock resistant.

CREUSOT 0.5DF06
M-1488; 0.20 C, 0.5 Cr, 0.5 Ni, 0.2 Mo, bal Fe.
Oil hardened. 142,000-200,000 TS, 120,000 YS, 7 El.
For gears, pinions, bolts, fasteners, crankshafts, engine components
AISI 8620 Case hardening, tough, shock resistant.

CREUSOT 0.5F08
M-1488, 0.15 C, 0.55 Cr, 0.55 Mo, bal Fe.
Heat treated 65,000 TS, 40,000 YS, 22 El
For boilers, steam manifolds, reactors, superheater pipes, turbine casings
ASTM A356 Gr.5.

CREUSOT 1F3.
M-1488, 0.40-0.48 C, 0.75-1.2 Cr, 0.6-0.9 Mn, 0.4 max Si, bal Fe
Heat treated· 193,000 TS; 128,000 YS, 7 El.
For gears, bolts, shafts, axles, oil hardened.

CREUSOT 1F3/4
M-1488; 0.34-0.42 C, 0.75-1.2 Cr, 0.6-0.9 Mn, 0.4 max Si, bal Fe
Heat treated· 295,000 TS, 192,000 YS; 3 El.
For gears, bolts, crankshafts; oil hardened

CREUSOT IF4/5.
M-1488; 0.30-0.37 C, 0.80-1.2 Cr, 0.6-0.9 Mn, 0.4 max Si, bal Fe.
Heat treated· 280,000 TS; 175,000 YS; 4 El.
For gears, bolts, crankshafts; oil hardened.

CREUSOT 1F5/6
M-1488; 0.25-0.32 C, 0.80-1.2 Cr, 0.60-0.90 Mn, 0.40 max Si, bal Fe.
Heat treated: 235,000 TS, 150,000 YS; 5 El.
For gears, bolts, crankshafts, oil hardened.

CREUSOT 1FO3.
M-1488; 0.37-0.45 C, 0.6-0.9 Mn, 0.8-1.2 Cr, 0.15-0.35 Mo, bal Fe.
Heat treated: 200,000 TS; 144,000 YS; 8 El.
For gears, bolts, machine tool parts; oil hardened, tough.

CREUSOT 1FO4.
M-1488; 0.31-0.39 C, 0.85-1.2 Cr, 0.15-0.35 Mo, 0.6-0.9 Mn, bal Fe.
Annealed: 90,000 TS; 58,000 YS; 25 El; B 90 Rock.
Heat treated: 185,000 TS; 168,000 YS; 12 El; 370 Brin.
For gears, countershafts, bolts, fasteners, shafts, axles. Oil hardening, shock resistant.

CREUSOT 1FO5/6.
M-1488; 0.2-0.3 C, 0.6-0.9 Mn, 0.8-1.2 Cr, 0.15-0.35 Mo, bal Fe.
Heat treated: 242,000 TS, 150,000 YS; 5 El.
For gears, bolts, crankshafts, axles; oil hardened, tough.

CREUSOT 1FO7.
M-1488; 0.15-0.22 C, 0.85-1.2 Cr, 0.15-0.35 Mo, bal Fe.
Heat treated: 228,000 TS; 143,000 YS, 6 El.
For gears, bolts, camshafts, cams; case hardened, oil quenched.

CREUSOT 1FO8.
M-1488, 0.08-0.15 C, 0.8-1.2 Cr, 0.15-0.35 Mo, bal Fe.
Heat treated: 186,000 TS, 114,000 YS; 7 El.
For gears, bolts, camshafts, cams; case hardened, oil quenched.

CREUSOT 1FV2.
M-1488; 0.45-0.55 C, 1.2-1.6 Cr, 0.4 max Mn, 0.2 V, 0.4 max Si, bal Fe.
Heat treated: 213,000 TS, 143,000 YS, 7 El.
For gears, bolts, springs; oil hardened, shock resistant.

CREUSOT 1.1FO8.
M-1488, 0.13 C, 1 Cr, 0.55 Mo, bal Fe.
Heat treated. 65,000 TS; 45,000 YS, 22 El.
For boilers, steam manifolds, turbine casings, reactors, superheater pipes
ASTM A 387 Gr. B.

CREUSOT 1.2DF3.
M-1488; 0.40 C, 0.6 Cr, 1.2 Ni, bal Fe
Oil hardened: 114,000-157,000 TS; 100,000 YS, 9 El
For gears, clutches, connecting flanges, bolts, fasteners, shafts.
AISI 3140 steel, tough, shock resistant.

CREUSOT 1.2DF6.
M-1488; 0.20 C, 0.6 Cr, 1.2 Ni, bal Fe.
Heat treated: 107,000-142,000 TS; 92,000 YS; 10 El.
For bolts, levers, shafts, pins, fasteners, gears
Case-hardening.
AISI 3120 steel, tough, shock resistant.

CREUSOT 1.3FOV.
M-1488; 0.24 C, 1.25 Cr, 0.6 Mo, 0.25 V, bal Fe
Heat treated: 100,000 TS; 82,000 YS; 16 El, C 25 Rock.
For rotors, hot bolts, hardware, gears, shafts.
Tough, shock resistant.

CREUSOT 1.4DF3
M-1488; 0.30-0.38 C, 1.2-1.6 Ni, 0.8-1.2 Cr, bal Fe.
Heat treated: 295,000 TS; 200,000 YS; 4 El.
For gears, bolts, machine tool parts; oil hardened, tough.

CREUSOT 1.4DF5.
M-1488; 0.22-0.30 C, 1.2-1.6 Ni, 0.80-1.15 Cr, bal Fe.
Heat treated. 250,000 TS; 166,000 YS; 6 El.
For gears, bolts, machine tool parts; oil hardened, tough.

CREUSOT 1.4DF6.
M-1488; 0.16-0.22 C, 1.2-1.6 Ni, 0.85-1.2 Cr, bal Fe.
Heat treated: 222,000 TS; 143,000 YS; 7 El.
For gears, bolts, machine tool parts; case hardened, oil quenched.

CREUSOT 1.4DF7.
M-1488; 0.11-0.18 C, 1.2-1.6 Ni, 0.85-1.2 Cr, bal Fe.
Heat treated: 213,000 TS; 128,000 YS; 7 El.
For gears, bolts, machine tool parts; case hardened, oil quenched.

CREUSOT 1.4DF8.
M-1488, 0.07-0.12 C, 0.6-0.9 Mn, 1.2-1.6 Ni, 0.85-1.2 Cr, bal Fe.
Heat treated. 192,000 TS, 121,000 YS; 8 El.
For gears, bolts, machine tool parts; case hardened, oil quenched.

CREUSOT 1.4DFO6.
M-1488, 0.14-0.22 C, 1.2-1.6 Ni, 0.8-1.2 Cr, 0.1-0.3 Mo, bal Fe
Heat treated: 229,000 TS, 130,000 YS; 6 El.
For gears, bolts, camshafts, case hardened, oil quenched

CREUSOT 1.4DFO7/8.
M-1488; 0.10-0.16 C, 1.2-1.6 Ni, 0.8-1.2 Cr, 0.1-0.3 Mo, bal Fe.
Heat treated: 221,000 TS; 128,000 YS; 7 El.
For gears, bolts, camshafts, cams, case hardened, oil quenched

CREUSOT 1.5DFO.
M-1488; 0.55 C, 1.5 Ni, 1 Cr, 0.3 Mo, bal Fe.
Annealed 262 Brin, 110,000 TS.
Hardened: 208,000 TS; 180,000 PL; C 45 Rock.
For hot stamping dies, punches, brake dies, bushings, set screws
Type 1 6 hot work tool steel, oil harden, shock resistant

CREUSOT 1.5DFO2
M 1488, 0.28 C, 1.4 Cr, 1.5 Ni, 0.38 Mo, bal Fe.
Oil hardened: 200,000 TS, 170,000 YS, 8 El
For aircraft engine parts, propeller shafts, gears, linings, fasteners
Tough, shock resisting.

CREUSOT 1.5DFO6S.
M-1488; 0.20 max C, 0.6 Cr, 1.5 Ni, 0.25 Mo, bal Fe
For gears, bolts, shafts, bridge members, resists low temperature

CREUSOT 1.5DFOV1S
M-1488, 0.22 max C, 1.3 Cr, 1.5 Ni, 0.27 Mo, 0.17 V, bal Fe
For welded structures, bridge members; heat resistant to 550°C

CREUSOT 1.5DFOV4S
M-1488; 0.15 max C, 1.3 Cr, 1.5 Ni, 0.27 Mo, 0.17 V, bal Fe
For welded structures, bridge members; heat resistant to 550°C

CREUSOT 1.7DFOV.
M-1488; 0.55 C, 1.5 Ni, 1 Cr, 0.3 Mo, 0.1 V, bal Fe
For hot stamping dies, punches.
Oil hardening hot-work tool steel.

CREUSOT 1.8DFO 2/3.
M-1488; 0.40 C, 0.8 Cr, 1.8 Ni, 0.25 Mo, bal Fe.
Oil hardened: 156,000-214,000 TS; 128,000 YS, 9 El.
For gears, shafts, crankshafts, fasteners.
AISI 4340 steel. Tough and shock resistant.

CREUSOT 1.8DFO 6/7.
M-1488; 0.20 C, 0.8 Cr, 0.25 Mo, 1.8 Ni, bal Fe.
Oil hardened: 156,000-214,000 TS; 128,000 YS; 8 El.
For gears, pinions, cams, crankshafts, cam shafts, pawls.
AISI 4320 steel. Case hardening, tough and shock resistant.

CREUSOT 2D8.
M-1488; 0.15-0.23 C, 1.8-2.3 Ni, 0.6 max Mn, bal Fe.
Heat treated: 114,000 TS; 65,000 YS; 12 El.
For gears, bolts, camshafts, cams; case hardened, oil quenched.

CREUSOT 2D9.
M-1488; 0.10-0.15 C, 1.8-2.3 Ni, bal Fe.
Annealed: 70,000 TS; 43,000 YS; 32 El; 150 Brin.
For cams, fasteners, bolts, camshafts, gears.
Case hardening, tough, shock resistant.

CREUSOT 2D10.
M-1488; 0.07-0.14 C, 1.8-2.3 Ni, 0.5 max Mn, bal Fe
Rolled: 100,000 TS; 50,000 YS; 16 El
For gears, bolts, camshafts, cams; case hardened, oil quenched.

CREUSOT 2D11
M-1488, 0.10 max C, 1.8-2.3 Ni, 0.5 max Mn, bal Fe
Annealed 65,000 TS, 40,000 YS, 36 El, 140 Brin
For cams, camshafts, gears, pinions, fasteners
Case hardening, tough, shock resistant.

CREUSOT 2DF6S.
M-1488, 0.22 max C, 0.6 Cr, 2.0 Ni, bal Fe
For gears, bolts, shafts, bridge members; resists low temperature.

CREUSOT 2.2FO
M-1488; 0.10 C, 2.25 Cr, 1 Mo, bal Fe
Annealed 65,000 TS, 35,000 YS, 24 El
For boilers, steam manifolds, superheater pipes, reactors.
ASTM A 217-WC9

CREUSOT 3D8
M-1488, 0.14-0.22 C, 2.7-3.3 Ni, 0.6 max Mn, bal Fe
Heat treated 128,000 TS; 79,000 YS, 14 El.
For gears, bolts, camshafts, cams, case hardened, oil quenched

CREUSOT 3DF4/5
M-1488, 0.26-0.33 C, 2.7-3.3 Ni, 0.6-0.9 Cr, bal Fe
Heat treated: 150,000 TS, 100,000 YS, 13 El.
For gears, bolts, machine tool parts, oil hardened, tough

CREUSOT 3DF7/8
M-1488, 0.11-0.16 C 2.7-3.3 Ni 0.6-0.9 Cr, 0.3-0.6 Mn, bal Fe
Heat treated 207,000 TS, 120,000 YS, 9 El
For gears, bolts, machine tool parts; case hardened, tough

CREUSOT 3DF8
M-1488; 0.08-0.14 C, 2.7-3.0 Ni, 0.6-0.9 Cr, 0.3-0.6 Mn, bal Fe
Heat treated 166,000 TS, 100,000 YS; 12 El
For gears, bolts, camshafts, cams, case hardened, oil quenched

CREUSOT 3DFO2
M-1488, 0.25-0.35 C, 2.7-3.3 Ni, 0.60-1.0 Cr, 0.2-0.5 Mo, bal Fe
Heat treated 177,000 TS, 127,000 YS; 10 El
For gears, bolts, machine tool parts; oil hardened, tough

CREUSOT 3DFO5.
M-1488, 0.12-0.19 C, 3.0-3.6 Ni, 0.7-1.1 Cr, 0.15-0.35 Mo, bal Fe
Heat treated: 173,000 TS; 136,000 YS, 8 El.
For gears, bolts, camshafts, cams; case hardened, oil quenched.

CREUSOT 3DFO8.
M-1488; 0.08-0.13 C, 0.6-0.9 Cr, 2.7-3.3 Ni, 0.2-0.4 Mo, bal Fe.
Heat treated: 144,000 TS; 114,000 YS; 10 El.
For gears, bolts, camshafts, cams; case hardened, oil quenched.

CREUSOT 3FDO1.
M-1488; 0.30-0.38 C, 2.5-3.0 Cr, 1.2-1.6 Ni, 0.2-0.4 Mo, bal Fe.
Heat treated. 235,000 TS; 192,000 YS; 4 El.
For gears, bolts, machine tool parts; oil hardened, tough.

CREUSOT 3FO
M-1488, 0.25-0.35 C, 2.5-3.5 Cr, 0.30-0.60 Mo, bal Fe.
Heat treated: 178,000 TS; 128,000 YS; 9 El.
For gears, bolts, crankshafts; oil hardened, tough.

CREUSOT 3FP
M-1488, 0.3 C, 3 W, 3.2 Cr, Mo, V, bal Fe.
Annealed: 215 Brin.
For nail dies, riveting tools, punches.
Hot work tool steel, tough.

CREUSOT 3.5D8.
M-1488, 0.20 C, 3.5 Ni, 0.9 max Mn, 0.35 max Si, bal Fe
Heat treated 100,000-128,000 TS; 78,000 YS; 14 El
For cryogenic vessels, tanks, equipment.
Shock resistant at cryogenic temperatures.
ASTM A 203D

CREUSOT 3.5DF 3/4.
M 1488; 0.35 C, 1.6 Cr, 3.5 Ni, bal Fe.
Oil hardened 150,000-178,000 TS, 113,000 YS.
For highly loaded gears, pinions, rollers, swivels, clutches
AISI 3335 Tough, shock resistant.

CREUSOT 3.5DF 7/8
M-1488, 0.10 C, 1.6 Cr, 3.5 Ni, bal Fe.
Oil hardened 130,000-170,000 TS; 106,000 YS; 11 El
For shafts, gears, pinions, universal joints
AISI 3310 steel, tough, shock resistant
Case hardening

CREUSOT 3.5 DFO1.
M 1488, 0.3-0.4 C, 3.2-3.8 Ni, 1.2-1.7 Cr, 0.2-0.5 Mo, bal Fe
Heat treated 250,000 TS, 208,000 YS; 5 El
For gears, bolts, machine tool parts, oil hardened, tough.

CREUSOT 4DF2
M-1488, 0.30-0.38 C, 3.5-4.0 Ni, 1.5-1.9 Cr, bal Fe
Heat treated: 242,000 TS, 193,000 YS; 5 El
For gears, bolts, crankshafts, oil hardened, tough

CREUSOT 4DF6
M-1488, 0.08-0.15 C, 3.4-3.9 Ni, 0.7-1.1 Cr, bal Fe.
Heat treated 228,000 TS, 135,000 YS, 8 El.
For gears, bolts, camshafts, cams, case hardened, oil quenched

CREUSOT 4DFO1
M-1488, 0.30-0.40 C, 3.5-4.5 Ni, 1.5-2.0 Cr, 0.35-0.60 Mo, bal Fe.
Heat treated: 270,000 TS; 207,000 YS; 4 El.
For gears, bolts, machine tool parts, oil hardened, tough

CREUSOT 4DFO2
M-1488; 0.28-0.36 C, 3.5-4.5 Ni, 1.1-1.5 Cr, 0.35-0.60 Mo, bal Fe
Heat treated 242,000 TS, 200,000 YS; 4 El.
For gears, bolts, machine tool parts; oil hardened, tough

CREUSOT 4DFO2/3.
M-1488; 0.20-0.30 C, 3.8-4.5 Ni, 1.0-1.4 Cr, 0.35-0.60 Mo, bal Fe.
Heat treated: 192,000 TS; 135,000 YS; 9 El.
For gears, bolts, machine tool parts; oil hardened, tough.

CREUSOT 4DO2.
M-1488; 0.15-0.25 C, 3.7-4.4 Ni, 0.70-1.20 Mo, bal Fe.
Heat treated: 207,000 TS; 178,000 YS; 6 El.
For gears, bolts, camshafts; case hardened, oil quenched.

CREUSOT 4DO6.
M-1488; 0.09-0.15 C, 3.7-4.4 Ni, 0.70-1.2 Mo, bal Fe.
Heat treated: 172,000 TS; 135,000 YS; 8 El.
For gears, bolts, camshafts, cams; case hardened, oil quenched.

CREUSOT 4PFOV.
M-1488; 0.25 C, 4.2 W. 1.2 Cr, 0.4 Mo, 0.25 V, bal Fe.
Annealed: 238 Brin.
For piercing punches, mandrels, press dies.
Hot work tool steel.

CREUSOT 4.5DF1.
M-1488; 0.37-0.45 C, 4.0-4.6 Ni, 1.5-2.0 Cr, bal Fe.
Heat treated: 250,000 TS; 200,000 YS; 5 El.
For gears, bolts, crankshafts; oil hardened, tough.

CREUSOT 4.5DFO1.
M-1488; 0.35-0.45 C, 4.1-4.9 Ni, 1.4-1.8 Cr, 0.35-0.60 Mo, bal Fe.
Heat treated: 260,000 TS, 207,000 YS; 4 El.
For gears, bolts, machine tool parts; oil hardened, tough.

CREUSOT 5D6.
M-1488; 0.13-0.20 C, 0.4-0.7 Mn, 4.7-5.4 Ni, bal Fe.
Heat treated: 213,000 TS; 127,000 YS, 6 El.
For gears, bolts, machine tool parts; case hardened, oil quenched.

CREUSOT 5D6/7.
M-1488; 0 10-0 16 C, 0.6 max Mn, 4.7-5.4 Ni, bal Fe.
Heat treated: 200,000 TS; 125,000 YS; 8 El.
For gears, bolts, machine tool parts; case hardened, oil quenched.

CREUSOT 5D8.
M-1488; 0.08-0.14 C. 0.6 max Mn, 4.7-5.4 Ni, bal Fe.
Heat treated. 178,000 TS; 112,000 YS; 9 El.
For gears, bolts, machine tool parts; case hardened, oil quenched.

CREUSOT 5FAO.
M-1488, 0.17 max C, 5 Cr, 0.5 Mo, 1 Al, bal Fe.
Heat treated: 114,000 TS; 92,000 YS; 10 El; 240 Brin.
Annealed: 70,000 TS; 30,000 YS; 28 El; 160 Brin.
For heat exchanger tubes, fasteners, oil refinery equipment, valve trim, fittings.
Heat and corrosion resistant. Resists scaling to 1100°F.

CREUSOT 5FOP.
M-1488; 0.35 C, 5 Cr, 1.2 W, 1.2 Mo, 0.5 V, bal Fe.
Annealed. 238 Brin; 110,000 TS; 70,000 YS.
Hardened: 216,000 TS; 185,000 YS; C 58 Rock.
For forging dies, punches, shear blades, drills, screwing dies, bolt heading dies.
Type H 12 hot-work tool steel, tough, air or oil harden, shock resistant.

CREUSOT 5FOV.
M-1488; 0.35 C, 5 Cr, 1.5 Mo, 0.4 V, bal Fe.
Annealed: 235 Brin; 102,000 TS; 66,000 YS.
Hardened: 300,000 TS; 250,000 YS; 6 El; C 55 Rock.
For forging dies, punches, screwing dies, shear blades, gripper and header dies, high temperature bolts.
Type H-11 hot work tool steel, tough, shock resistant.

CREUSOT 9D6.
M-1488; 0.08 max C, 0.8 max Mn, 0.35 max Si, 8.5-10.0 Ni, bal Fe.
Normalized. 93,000 TS; 71,000 YS.
Sheets: 70,000 min TS; 60,000 min YS; 19 min El.
For liquid gas industry, storage or transportation tanks. Weldable cryogenic steel, good low temperature ductility.

CREUSOT 12FFB.
M-1488; 1.6 C, 12 Cr, 0.7 Mo, 0.3 V, bal Fe.
Annealed· 248 Brin, 120,000 TS.
Air hardened: 278,000 TS; 214,000 YS; C 56 Rock.
For shear blades, dies, wear plates, wood tools.
Type D 2 cold work tool steel, oil or air hardening. Nondeforming.

CREUSOT 12FFO.
M-1488. 1.9 C, 12 Cr, 1 Mo, 0 1 bal Fe.
Annealed· 248 Brin.
Hardened· C 64-65 Rock; 525,000 C.S.
For shear blades, dies, wood tools, blanking and lamination dies, rolls, knurls, thread rolling dies.
Wear and abrasion resistant
Type D 4 cold work tool steel, oil or air hardening. Non-deforming.

CREUSOT 13FF.
M-1488, 2 C, 13 Cr, bal Fe
Annealed 248 Brin.
Hardened. C 64-66 Rock.
For punches, cutting off tools, flanging and rolling dies, ceramic molds, shear blades for silicon steels, blanking and forming dies.
Type D 3 cold work tool steel, oil or air hardening, wear resistant

CREUSOT 13FFCo
M-1488; 2 C, 13 5 Cr, 1 Mo, 0.5 V, 3 Co, bal Fe.
Annealed· 277 Brin
Hardened. C 64-66 Rock.
For wood tools, shear blades, dies, blanking and forming dies, punches, ceramic molds.
Cold working tool steel, oil or air harden.
Non-deforming, wear resistant

CREUSOT 14FF.
M-1488; 1.5 C, 14 Cr, 1 Mo, 2 Co, bal Fe.
Annealed: 277 Brin, 120,000 TS; 80,000 El.
Hardened· C 63 Rock; 200,000 TS; 1 El.
For punches, cut-off blades, milling cutters, wood tools, shear blades, rolls, mandrels.
Type D 5 cold work steel, air or oil harden.

CREUSOT A 1B.
M-1488; 0.60-0.70 C, 0.45 max Si, 0.50-0.80 Mn, bal Fe.
Heat treated: 170,000 TS; 116,000 YS; 10 El; 38 RA; 350 Brin
For die blocks, rails, tie rods, springs; water hardened

CREUSOT A 1H.
M-1488; 0.60-0.68 C, 0.40 max Si, 0.65-0.90 Mn, bal Fe.
Heat treated: 165,000 TS; 115,000 YS; 12 El; 40 RA; 330 Brin.
For rails, springs, die blocks; water hardened.

CREUSOT A 2.
M-1488; 0.60 C, 0.65 Mn, 0.45 Si, bal Fe.
Annealed: 110,000-130,000 TS; 269 Brin.
Oil hardened: 170,000 TS; 145,000 YS; 7 El.
For springs, thrust bearings, cams, agricultural machinery, hammers.
AISI 1060 steel.

CREUSOT A 2B.
M-1488; 0.55-0.65 C, 0.45 max Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 325 Brin.
For die blocks, rails, tie rods, springs; water hardened.

CREUSOT A 3/4.
M-1488; 0.50 C, 0.65 Mn, 0.45 Si, bal Fe.
Annealed: 110,000 TS; 55,000 YS, 13 El; 210 Brin
Oil hardened: 120,000-150,000 TS; 90,000 YS.
For drive clutches, gears, cams, shafts, axles, hammers. AISI 1050 steel

CREUSOT A 3/4B.
M-1488, 0.45-0.55 C, 0.45 max Si, 0.50-0.80 Mn, bal Fe.
Annealed: 96,000 TS; 52,000 YS, 16 El, 23 RA; 170 Brin
For axles, gears, crankshafts, bolts, water hardened.

CREUSOT A 3B.
M-1488; 0.50-0.60 C, 0.45 max Si, 0.30-0.80 Mn, bal Fe
Heat treated. 150,000 TS, 110,000 YS; 15 El; 42 RA, 310 Brin
For die blocks, clutch discs, springs, water hardened.

CREUSOT A 3H.
M-1488, 0.48-0.58 C, 0.40 max Si, 0.50-0.80 Mn, bal Fe.
Annealed. 96,000 TS; 52,000 YS, 16 El, 23 RA; 170 Brin
For axles, gears, bolts, shafts, crankshafts; water hardened.

CREUSOT A 4/5B
M-1488; 0.40-0.50 C, 0.45 max Si, 0.50-0.80 Mn, bal Fe.
Hot rolled 98,000 TS; 59,000 YS, 24 El; 45 RA; 212 Brin
For axles, gears, bolts, shafts, water hardened

CREUSOT A 4/5H.
M-1488, 0.40-0.48 C, 0.40 max Si, 0.50-0.80 Mn, bal Fe
Hot rolled: 98,000 TS, 59,000 YS, 24 El; 45 RA; 212 Brin
For axles, gears, bolts, shafts, water hardened

CREUSOT A 4H
M-1488, 0.44-0.52 C, 0.40 max Si, 0.50-0.80 Mn, bal Fe.
Hot rolled 98,000 TS; 59,000 YS; 24 El, 45 RA, 212 Brin.
For axles, gears, bolts, shafts; water hardened.

CREUSOT A 5.
M-1488; 0.40 C, 0.65 Mn, 0.45 Si, bal Fe
Annealed: 98,000 TS; 50,000 YS; 36 El, 180 Brin.
Water hardened: 128,000-157,000 TS, 100,000 YS 9 El
For pins, axles, hammers, fasteners, gears, bolts, shafts. AISI 1040 steel, water harden.

CREUSOT A 5/6H.
M-1488; 0.34-0.40 C, 0.40 max Si, 0.50-0.80 Mn, bal Fe.
Hot rolled: 88,000 TS; 56,000 YS; 28 El; 52 RA; 190 Brin
For gears, bolts, crankshafts; water hardened.

CREUSOT A 5H.
M-1488; 0.38-0.45 C, 0.40 max Si, 0.50-0.80 Mn, bal Fe.
Hot rolled: 91,000 TS; 58,000 YS; 27 El; 50 RA; 200 Brin.
For gears, bolts, crankshafts; water hardened.

CREUSOT A 6/7.
M-1488; 0.30 C, 0.65 Mn, 0.45 Si, bal Fe.
Water hardened: 100,000-135,000 TS; 71,000 YS.
Annealed: 84,000 TS; 42,000 YS; 18 El; 163 Brin.
For shafts, crankshafts, gears, stub axles, levers, cylinders.
AISI 1030 steel, water harden.

CREUSOT A 6/7B.
M-1488, 0.25-0.35 C, 0.45 max Si, 0.50-0.80 Mn, bal Fe.
Hot rolled: 80,000 TS; 50,000 YS; 30 El; 56 RA; 165 Brin.
For gears, shafts, bolts, screws; water hardened.

CREUSOT A 6B.
M-1488; 0.30-4.40 C, 0.45 max Si, 0.50-0.80 Mn, bal Fe.
Hot rolled. 85,000 TS; 54,000 YS; 30 El; 53 RA; 185 Brin.
For gears, shafts, axles, bolts; water hardened.

CREUSOT A 6H.
M-1488, 0.30-0.36 C, 0.40 max Si, 0.50-0.80 Mn, bal Fe.
Hot rolled. 85,000 TS; 54,000 YS; 30 El, 53 RA; 185 Brin.
For gears, bolts, shafts, fasteners; water hardened.

CREUSOT A 7B.
M-1488, 0.22-0.32 C, 0.45 max Si, 0.50-0.80 Mn, bal Fe
Hot rolled: 70,000 TS; 45,000 YS, 31 El; 58 RA; 145 Brin
For gears, bolts, armature shafts, brackets; water hardened.

CREUSOT A 8B
M-1488, 0.20-0.30 C, 0.45 max Si, 0.50-0.80 Mn, bal Fe
Hot rolled: 70,000 TS; 45,000 YS; 31 El; 58 RA, 145 Brin
For gears, bolts, armature shafts, brackets; water hardened

CREUSOT A 9.
M-1488, 0.20 C, 0.65 Mn, 0.45 Si, bal Fe.
Water hardened: 79,000-114,000 TS; 52,000 YP.
Annealed 54,000 TS, 29,000 YS; 30 El; 140 Brin.
For slides, ship components, transmission shafts, fasteners, gears, pinions, cams.
AISI 1020 steel, case harden.

CREUSOT A 9B.
M-1488; 0.15-0.25 C, 0.45 max Si, 0.5-0.8 Mn, bal Fe.
Annealed: 73,000 TS; 42,000 YS; 22 El; 58 RA; 145 Brin
For bolts, cams, bushings, rivets, gears; case hardened, water quenched.

CREUSOT A 9H.
M-1488; 0.15-0.22 C, 0.35 max Si, 0.50-0.80 Mn, bal Fe.
Annealed: 73,000 TS; 41,000 YS; 22 El; 58 RA; 140 Brin
For fan blades, bushings, gears, bolts; case hardened, water quenched.

CREUSOT A 10.
M-1488, 0.16 max C, 0.04 S & P, bal Fe
Annealed: 55,000 TS, 32,000 YS; 26 El.
For boiler drums, steam manifolds, pressure vessels.
ASTM A- 285 Gr.A.

CREUSOT A 10B.
M-1488; 0.10-0.18 C, 0.30 max Si, 0.30-0.60 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 140 Brin.
For bolts, screws, nails, cams, bushings; case hardened.

CREUSOT A 10HC.
M-1488; 0.09-0.16 C, 0.35 max Si, 0.60-0.90 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For screws, bolts, gears, cams, bushings; case hardened, water quenched.

CREUSOT A 11.
M-1488; 0.10 C, 0.45 Mn, 0.30 max Si, bal Fe.
Water hardened: 64,000-100,000 TS; 43,000 YS.
Annealed: 55,000 TS, 29,000 YS; 30 El; 110 Brin.
For boiler plates, chains, rivets, tubes.
AISI 1010 steel.

CREUSOT A 11B.
M-1488; 0.06-0.15 C, 0.30 max Si, 0.30-0.60 Mn, bal Fe
Annealed: 64,000 TS; 40,000 YS; 28 El, 65 RA; 130 Brin.
For rivets, nails, bolts, nuts, fan blades.

CREUSOT A 11C.
M-1488; 0.06-0.12 C, 0.20 max Si, 0.30-0.60 Mn, bal Fe
Annealed: 64,000 TS; 40,000 YS; 28 El, 65 RA; 130 Brin.
For nails, rivets, bolts, cams; case hardened, water quenched.

CREUSOT A 11HC.
M-1488; 0.06-0.12 C, 0.15 max Si, 0.40-0.65 Mn, bal Fe.
Annealed: 64,000 TS, 40,000 YS, 28 El, 65 RA, 130 Brin .
For nails, rivets, bolts, nuts, cams, case hardened, water quenched

CREUSOT AM6/7S.
M-1488; 0.25 max C, 0.35 max Si, 0.60 min Mn, 0.04 max S and P, bal Fe
For pressure tanks, bridges, hoists, machinery parts

CREUSOT AM8/9S
M-1488; 0.22 max C, 0.35 max Si, 0.60 min Mn, 0.04 max S and P, bal Fe.
For pressure tanks, conduits, naval construction, good weldability

CREUSOT AM9/10S
M-1488, 0.18 max C, 0.25 max Si, 0.40 min Mn, 0.04 max S and P, bal Fe
For case hardened and structural parts, bridges, good weldability.

CREUSOT AM10/11S.
M-1488, 0.16 max C, 0.20 Si, 0.40 min Mn, 0.04 max S and P, bal Fe
For case hardened and structural parts, bridges, good weldability

CREUSOT AM11S.
M-1488; 0.12 max C, 0.20 max Si, 0.40 min Mn, 0.04 max S and P, bal Fe.
For case hardened parts, structural parts, bridges; good weldability.

CREUSOT A 0.
M-1488, 0.72 C, 0.65 Mn, 0.45 Si, bal Fe.
Annealed: 125,000-135,000 TS; 321 Brinell.
Ht. Tr.: 185,000 TS; 136,000 YS; 13 El; C 39 Rock.
For bands, springs, crusher components, hand tools, punches, hammers, shovels, harrows.
AISI 1070 steel, water harden.

CREUSOT A 0/1H.
M-1488; 0.67-0.75 C, 0.40 max Si, 0.60-0.85 Mn, bal Fe.
Heat treated: 174,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, rails, die blocks, clutch discs; water hardened.

CREUSOT A 0B.
M-1488; 0.65-0.80 C, 0.45 max Si, 0.50-0.80 Mn, bal Fe.
Heat treated. 175,000 TS; 130,000 YS; 12 El; 36 RA, 360 Brin.
For die blocks, rails, tie rods, springs; water hardened.

CREUSOT A/0H.
M-1488, 0.75-0.85 C, 0.40 max Si, 0.50-0.75 Mn, bal Fe
Heat treated: 190,000 TS; 145,000 YS; 12 El; 35 RA, 390 Brin.
For springs, rails, die blocks, tools, hammers, water hardened

CREUSOT A 00
M-1488, 0.80-0.93 C, 0.70-1.0 Mn, 0.4 Si, bal Fe
Water hardened: 345,000-400,000 TS
Annealed 100,000 TS; 55,000 YS, 20 El, 198 Brin.
For crusher bars, axes, tools, dies, springs, bearings.
AISI 1085 steel, water hardening.

CREUSOT B 2/3.
M-1488, 0.47-0.55 C, 0.001 B, 0.65-1.1 Mn, 0.3 Si, bal Fe
Heat treated. 320,000-213,000 TS, 177,000 YS, 6 El, 625 Brin
For reactor equipment, water hardened.

CREUSOT B 3/4
M-1488, 0.42-0.49 C, 0.001 B, 0.65-1.1 Mn, 0.3 Si, bal Fe
Heat treated: 290,000-165,000 TS, 578-322 Brin
For reactor equipment, water hardened.

CREUSOT B 4/5
M-1488, 0.37-0.44 C, 0.001 B, 0.65-1.1 Mn, 0.3 Si, bal Fe.
Heat treated. 280,000-157,000 TS, 534-311 Brin
For reactor equipment, water rardened

CREUSOT B 5/6
M-1488, 0.33-0.40 C, 0.001 B, 0.65-1.1 Mn, 0.3 Si, bal Fe
Heat treated 242,000-128,000 TS, 477-256 Brin
For reactor equipment, water hardened.

CREUSOT B 6
M-1488, 0.30-0.37 C, 0.001 B, 0.65-1.1 Mn, 0.3 Si, bal Fe
Heat treated 208,000-114,000 TS; 410-223 Brin
For reactor equipment, water hardened

CREUSOT BD5/6
M-1488, 0.32-0.39 C, 0.2-0.5 Cr, 0.2-0.4 Ni, 0.001 B, 0.08-0.15 Mo, bal Fe.
Heat treated: 178,000-260,000 TS; 150,000-228,000 YS, 9.5 El.
For reactor equipment, oil hardened.

CREUSOT BD8/9
M-1488, 0.17-0.23 C, 0.2-0.5 Cr, 0.2-0.4 Ni, 0.08-0.15 Mo, bal Fe
Heat treated: 186,000-144,000 TS; 156,000-135,000 YS; 6-9 El.
For bolts, gears, machine tool parts; case hardened, oil quenched.

CREUSOT BD9/10.
M-1488; 0.12-0.18 C, 0.2-0.5 Cr, 0.2-0.4 Ni, 0.08-0.15 Mo, 0.001 B, bal Fe.
Heat treated: 178,000 TS; 150,000 YS; 7 El.
For reactor equipment; oil hardened, case hardened.

CREUSOT BF1/2.
M-1488; 0.55-0.65 C, 0.3-0.7 Cr, 0.001 B, 0.65-1.0 Mn, bal Fe.
Heat treated: 330,000 TS; 650 Brin.
For reactor equipment; oil hardened.

CREUSOT BF4/5.
M-1488; 0.37-0.45 C, 0.65-1.1 Mn, 0.3-0.7 Cr, 0.001 B, bal Fe.
Heat treated: 222,000-193,000 TS, 185,000-157,000 YS, 7-8 El.
For reactor equipment; oil hardened.

CREUSOT C 1/2.
M-1488; 1.15 C, bal Fe.
Annealed: 205 Brin; 100,000 TS; 55,000 YS.
Hardened: Rock C 65; 220,000 TS; 155,000 YS.
For milling cutters, taps, reamers, drills, form tools, gauges
Type W 1 water hardening tool steel.
Wear and abrasion resistant.

CREUSOT C 4/5
M-1448, 0.80 C, bal Fe.
Hardened: Rock C 64
Annealed: 192 Brin, 115,000 TS, 65,000 YS
Tempered: 185,000 TS, 135,000 YS; 13 El, C 39 Rock
For cut off and flanging tools, drills, springs, hand tools, drills, hammers.
Type W 1 water hardening tool steel, wear and abrasion resistant

CREUSOT CF
M-1488, 1.0 C, 1.4 Cr, bal Fe
Annealed: 215 Brin, 110,000 TS, 88,000 YS.
Ht. Tr. 240,000 TS, 230,000 YS, 444 Brin
For taps, reamers, stamping dies, bearings, punches, bushings
Type 52100 steel, water or oil harden

CREUSOT CMP
M-1488, 1 C, 1 Mn, 0.5 Cr, 0.5 W, bal Fe
Annealed. 235 Brin, 85,000 TS, 70,000 YS
Ht. Tr. 250,000 TS, 225,000 YS, 8 El, C 50 Rock
For cold stamping dies, cutting tools, punches, rivet sets, upsetters
Type O 1 cold working tool steel

CREUSOT CMV.
M-1488, 0.9 C, 2 Mn, 0.1 V, bal Fe.
Annealed: 235 Brin, 110,000 TS
Hardened: C 63-65 Rock
For cutting tools, flanging tools, cold headers, upsetters, punches, molds, blanking and forming dies
Type O 2 cold work tool steel, deep hardening, shock resistant

CREUSOT DF3.
M-1488, 0.30-0.38 C, 2.5-3.0 Ni, 0.6-0.9 Cr, 0.35-0.65 Mn, bal Fe
Heat treated: 290,000 TS, 200,000 YS; 4 El.
For gears, bolts, machine tool parts, oil hardened, tough

CREUSOT DF4/5
M-1488; 0.25-0.33 C, 2.5-3.0 Ni, 0.6-0.9 Cr, 0.3-0.6 Mn, bal Fe.
Heat treated: 157,000 TS; 107,000 YS; 12 El.
For gears, bolts, machine tool parts; oil hardened, tough.

CREUSOT DF5
M-1488; 0.22-0.30 C, 2.5-3.0 Ni, 0.6-0.9 Cr, 0.3-0.6 Mn, bal Fe.
Heat treated: 150,000 TS; 101,000 YS; 12 El.
For gears, bolts, machine tool parts; oil hardened, tough.

CREUSOT DF6.
M-1488; 0.17-0.25 C, 2.5-3.0 Ni, 0.6-0.9 Cr, 0.35-0.65 Mn, bal Fe.
Heat treated: 165,000 TS; 107,000 YS; 10 El.
For gears, bolts, camshafts, cams; case hardened, oil quenched.

CREUSOT DF7.
M-1488; 0.11-0.18 C, 2.5-3.0 Ni, 0.6-0.9 Cr, bal Fe.
Heat treated. 213,000 TS; 128,000 YS; 7 El.
For gears, bolts, camshafts, cams; case hardened, oil quenched.

CREUSOT DF7/8
M-1488, 0.10-0.16 C, 2.5-3.0 Ni, 0.6-0.9 Cr, bal Fe
Heat treated. 200,000 TS, 115,000 YS; 8 El.
For gears, bolts, camshafts, cams, case hardened, oil quenched.

CREUSOT DF8.
M-1488, 0.08-0.14 C, 2.5-3.0 Ni, 0.6-0.9 Cr, bal Fe.
Heat treated: 157,000 TS, 94,000 YS, 11 El.
For gears, bolts, camshafts, cams; case hardened, oil quenched.

CREUSOT DFO3
M-1488; 0.23-0.33 C, 2.4-3.0 Ni, 0.5-0.8 Cr, 0.2-0.5 Mo, bal Fe
Annealed: 110,000 TS, 70,000 YS, 22 El, 220 Brin.
Oil hardened: 170,000 TS, 150,000 YS, 18 El, 350 Brin.
For gears, shafts, bolts, fasteners, fittings, hardware, dies
Water or oil harden, wear resistant

CREUSOT DMF
M-1488, 0.60-0.80 C, 7.9 Mn, 7-9 Ni, 3-4.5 Cr, bal Fe.
Annealed: 114,000 TS, 43,000 YS, 40 El
For corrosion resistant parts; stainless, austenitic

CREUSOT DOF1.
M-1488, 0.35-0.45 C, 4-5 Ni, 0.3-0.6 Cr, 0.7-1.2 Mo, bal Fe.
Heat treated: 270,000 TS, 208,000 YS, 4 El.
For gears, bolts, machine tool parts, oil hardened, tough

CREUSOT FO4
M-1488, 0.31-0.39 C, 0.85-1.2 Cr, 0.15-0.35 Mo, 0.6-0.9 Mn, bal Fe
Heat treated: 285,000 TS, 192,000 YS; 5 El
For gears, bolts, machine tool parts, oil hardened, tough

CREUSOT FO6S
M-1488, 0.28 max C, 1 Cr, 0.25 Mo, 0.6 Mn, bal Fe.
For construction members, heat exchangers

CREUSOT FO6/7S
M-1488, 0.25 max C, 0.25 Mo, 1.0 Cr, bal Fe.
For construction members, heat exchangers.

CREUSOT FO7S
M-1488, 0.22 max C, 0.7 Mn, 0.45 Cr, 0.45 Mo, bal Fe
For pressure tanks, gas cylinders.

CREUSOT FO8S
M-1488, 0.2 max C, 0.45 Cr, 0.45 Mo, 0.35 max Mn, bal Fe.
For pressure tanks, gas cylinders

CREUSOT FOV.
M-1488; 0.25 C, 1 Cr, 1 Mo, 0.25 V, bal Fe.
Heat Treated: 100,000 TS; 82,000 YS; 16 El
For rotors, discs, hot bolts.
ASTM A356 Gr. 9. Tough, shock resistant.

CREUSOT FP.
M-1488; 0.45 C, 2 W, 1 Cr, bal Fe.
Annealed: 205 Brin.
Hardened: C 55 Rock; 300,000 TS; 260,000 YS.
For shear and cut-off blades, punches, dies, chisels, riveting tools, cold battering tools.
Type S1 cold work tool steel, oil hardening.

CREUSOT FR.
M-1488; 0.90-1.1 C, 1.25-1.65 Cr, 0.45 max Mn, 0.40 max Si, bal Fe.
For bearings, liners, bushings; water hardened.

CREUSOT LMO.
M-1488; 1.4 C, 1 Si, 1 Mn, 0.25 Mo, bal Fe.
Annealed: 217 Brin.
For cutting tools, slides, dies.
Oil hardening, abrasion resistant.

CREUSOT M.
M-1488; 1.1-1.3 C, 11-14 Mn, 0.6 max Si, bal Fe.
Annealed: 128,000 TS; 50,000 YS; 35 El.
For wear resistant parts; work hardened, austenitic.

CREUSOT MF6/7S.
M-1488; 0.22 max C, 0.35 max Si, 1.3 Mn, bal Fe.
For pressure tanks, bridges, hoists, machinery parts.

CREUSOT ML.
M-1488; 0.40-0.50 C, 1.6-2.1 Si, 0.40-0.80 Mn, bal Fe.
Heat treated: 242,000 TS; 163,000 YS; 5 El.
For punches, pneumatic tools, springs; water or oil hardened, shock resistant.

CREUSOT MLD.
M-1488; 0.40-0.50 C, 1.6-2.1 Si, 0.40-0.80 Mn, bal Fe.
Heat treated: 242,000 TS; 170,000 YS, 5 El.
For punches, springs, pneumatic tools; oil hardened, shock resistant.

CREUSOT MO7.
M-1488; 0.15 C, 0.55 Mo, 1 Mn, bal Fe.
Heat treated: 70,000 TS; 40,000 YS; 20 El.
For boilers, steam manifolds, turbine casings, reactors, nuclear plants, superheater pipes.
ASTM A356 Gr. 2.

CREUSOT MV6/7S.
M-1488, 0.22 max C, 0.35 max Si, 1.4 Mn, bal Fe.
For pressure tanks, naval construction, machinery parts.

CREUSOT P1.
M-1488; 1.15 C, 2 W, bal Fe.
Annealed: 248 Brin.
Hardened: C 67 Rock.
For dies, drawing dies, drills, reamers, broaches, twist drills, burnishing tools.
Type F2 and F3 water hardening tool steel.

CREUSOT P2.
M-1488; 1.15 C, 5 W, 0.6 Cr, bal Fe.
Annealed: 240 Brin.
Hardened: Rock C 47.
For dies, drawing dies, drills, chisels, reamers, twist drills.
Type F2 water hardening tool steel.

CREUSOT S1SA.
M-1488; 0.35 C, 10 W, 3 Cr, 0.4 V, bal Fe.
Annealed 217 Brin.
Hardened: 243,000 TS, 215,000 YP; 12 El; 37 RA.
For nail dies, punches, shear blades, die casting dies, mandrels, extrusion dies and rams, trimmer dies.
Type H21 hot work tool steel, high red-hardness.

CREUSOT S2V.
M-1488; 0.75 C, 4 Cr, 13 W, 0.7 V, 0.5 Mo, bal Fe.
Annealed: 248 Brin.
For milling cutters, twist drills, lathe tools, reamers. High speed steel.

CREUSOT S3.
M-1488; 0.8 C, 4 Cr, 18 W, 1 V, bal Fe.
Annealed: 240 Brin; 100,000 TS; 75,000 YS; 14 El; 17 RA.
For milling cutters, twist drills, reamers, lathe tools, planning tools.
Type T1 high speed steel, good red-hardness.

CREUSOT S3V.
M-1488; 0.8 C, 4.5 Cr, 18 W, 1.8 V, 0.7 Mo, bal Fe.
Annealed: 255 Brin.
Hardened: C 63-65 Rock.
For milling cutters, twist drills, broaches, reamers, taps, lathe and planer tools.
Type T2 high speed steel, high red-hardness.

CREUSOT SO3.
M-1488; 0.8 C, 4.5 Cr, 6.5 W, 5 Mo, 2 V, bal Fe.
Annealed: 228 Brin
Hardened: C 63-65 Rock.
For milling cutters, twist drills, reamers, broaches, taps, chasers, saws, lathe tools.
Type M2 high speed steel, high red-hardness.

CREUSOT SS5.
M-1488, 0.8 C, 4.5 Cr, 18 W, 1.5 V, 1 Mo, 5 Co, bal Fe.
Annealed: 268 Brin.
Hardened. C 65 Rock.
For piercers, lathe and planing tools, cutters, reamers, broaches, taps, chasers, cut-off tools, drills
Type T4 high speed steel, high red-hardness.

CREUSOT SS5V.
M-1488, 1.5 C, 4.5 Cr, 14 W, 4 V, 0.5 Mo, 6 Co, bal Fe
Annealed 302 Brin.
Hardened C 64-66 Rock
For hard dies, lathe and planing tools, reamers, broaches, drills, blanking dies, form tools.
Type T15 high speed steel, high red hardness.

CREUSOT SS10
M-1488, 0.8 C, 5 Cr, 18 W, 1.7 V, 1 Mo, 10 Co, bal Fe
Annealed: 302 Brin
Hardened C 65 Rock.
For milling cutters, drills, broaches, reamers, taps, lathe and planer tools, shapers
Type T5 high speed steel, high red-hardness.

CREUSOT SS14V.
M-1488, 1.7 C, 4.5 Cr, 14 W, 4 V, 0.5 Mo, 14 Co, bal Fe
Annealed. 340 Brin.
Hardened: C 65-67 Rock
For lathe and planer tools, broaches, chasers, taps, milling cutters
High speed steel, high hot-hardness.

CREUSOT SS 15.
M-1488, 0.75 C, 5 Cr, 18 W, 1.7 V, 0.5 Mo, 15 Co, bal Fe
Annealed: 320 Brin.
Hardened: C 65 Rock.
For broaches, lathe and planer tools, drills, milling cutters, hobs, reamers.
Type T6 high speed steel, high red-hardness.

CREUSOT SV4.
M-1488; 1.3 C, 4.5 Cr, 12 W, 4.5 V, 0.8 Mo, bal Fe.
Annealed: 277 Brin.
For finishing tools, taps, reamers, twist drills.
High speed steel.

CRH 4-17.
M-1647; 0.1 C, 13 Cr, 0.45 Mo, 0.6 max Ni, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold Drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For oil refinery and chemical plant equipment, knives, hardware, table flatware.
Corrosion resistant.

CRILLEY METALS.
M-183; Hg, Sn, bal Cu. 23,000 TS
For bearings; C.S.-92,000.

CRISIL.
M-1620; 0.55 C, 0.5-0.8 Cr, 1.2-1.6 Si, 0.5-0.8 Mn, bal Fe.
Wire: 280,000-335,000 TS; 45 min RA.
For mechanical springs, operating under high stress and moderately high temperatures. Hard drawn steel wire.

CRISTITE 1
M-152, 17 W, 10 Cr, 3.5 C, 2.5 Mo, bal Fe.
For facing dredger, dipper or shovel teeth and bucket lips, agricultural implements, knives, tools, drills, chisels; resists abrasion and high temperature.

CRISTITE 2.
M-152; 17 W, 12 Cr, 3 C, 2 Mo, 0.75 Ti, 0.25 Hf, bal Fe
For hard facing electrode, wear resistant.

CRISTITE 3
M-152; 16 Cr, 3 C, 0.80 Ti, 0.28 Hf, 6 Ni, bal Fe
For hard facing electrode, wear resistant

CRITNIC
U.S., 97 Ni, Ti, 0.2 C
For heat and corrosion resistant parts, corrosion and heat resistant

CRM SPECIAL
M-459, 1.0 C, 1.1 Mn, 1.0 Cr, bal Fe.
For tools, dies; oil hardening

Cr-Ni ROTOR FM.
M-32; 0.55 C, 0.6 Mn, 0.3 Si, 1.5 Cr, 4.0 Ni, bal Fe.
Air hardening tool steel.

CRO-13 Mo
M-1648, 0.15 C, 13 Cr, 0.6 max Mo, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin
Cold Drawn: 100,000 TS, 85,000 YS; 17 El; 60 RA; 205 Brin
For oil refinery and chemical plant equipment, knives, hardware, table flatware.
Corrosion resistant

CROBALITE NO. 1.
M-1052; 48 Co, 30 Cr, 14 W
Welded. 550 Brin.
For hard facing electrode, corrosion and abrasion resistant.

CROBALITE NO. 2.
M-1052; 40 Co, 33 Cr, 18 W, carbides 620 Brin
For tools, cutters, dies; cast to shape, wear resistant.

CROBALITE NO. 3.
M-1052, 40 Co, 33 Cr, 20 W, carbides 630 Brin.
For tools, cutters, dies; cast to shape, wear resistant

CROBALITE NO. 6.
M-1052, 57 Co, 30 Cr, 5 W. 440 Brin.
For hard facing electrode; corrosion and abrasion resistant.

CROBALITE NO. 12.
M-1052; 52 Co, 30 Cr, 10 W. 480 Brin.
For hard facing electrode; corrosion and abrasion resistant.

CROBALT.
M-751; 40-50 Co, 25-30 Cr, 14-20 W.
Cast: 75,000 TS.
For cutters, tools; wear resistant.

CROBALT NO. 1.
M-1052; 48 Co, 30 Cr, 14 W, high C, bal Fe.
Cast: 75,000 TS; 0 El; 0 RA; 580-620 Brin.
For cutting tool bits, milling cutters.
High red-hardness.

CROBALT NO. 2.
M-1052; 40 Co, 33 Cr, 18 W, bal Fe.
Cast. C 61-62 Rock.
For cutters, tools, punches.
Cast alloy, wear resistant.

CROBALT NO. 3.
M 1052, 40 Co, 33 Cr, 20 W, bal Fe.
Cast C 63-64 Rock.
For cutters, tools, punches.
Cast alloy, wear resistant.

CROCAR
M-115, 12 Cr, 2.15 C, 0.75 V, 0.5 Co, 0.30 Si, bal Fe
103,000 TS; 51,000 YS, 14 RA, 212 Brin.
For thread rolling, threading, dies, extrusion dies, gages, heat, abrasion resisting

CROCAR FM.
M-115; 2.15 C, 12 Cr, 0.75 V, 0.5 Co, bal Fe
Annealed. 103,000 TS, 51,000 YS, 14 El, 212 Brin.
For thread rolling dies, extrusion dies, gages; oil or air hardened, free-cutting

CRODI.
M-435, 0.35 C, 0.5 Mn, 1.2 W, 5 Cr, 0.3 V, 1.4 Mo, bal Fe
For punches, dies, shear blades, extension dies, hot work steel.

CRODON
M-980, Cr-Fe
For anodes in electrolytic copper cells; electroplating alloy

CRODUR
M-1331, 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies, punches; oil or air hardened, nondeforming.

CRODUR SPEZIAL
M-1331, 2.1 C, 11.5 Cr, 0.7 W, bal Fe
For blanking and forming dies, punches; oil or air hardened, nondeforming.

CRODUR V
M-1331, 2.2 C, 11.5 Cr, 0.1 V, 0.2 Mo, bal Fe
For blanking and forming dies, punches, oil hardened, nondeforming

CRODUR ZAH
M-1331; 1.65 C, 11.5 Cr, 0.1 V, bal Fe
For blanking and forming dies, punches; air hardened, nondeforming.

CROFER 106
M-297, 0.12 max C, 6-7 Cr, 0.6-0.9 Si, 0.6-0.9 Al, bal Fe.
For oil refinery equipment; heat and creep resistant.

CROFER 113.
M-297, 0.12 max C, 12-14 Cr, 1.0-1.3 Si, 0.8-1.1 Al, bal Fe
For oil refinery equipment; heat and creep resistant.

CROFER 118.
M-287; 0.12 max C, 18 Cr, 0.95 V, bal Fe.
For oil refinery equipment, furnace parts; corrosion and heat resistant.

CROFER 118.
M-297; 0.12 max C, 17-19 Cr, 0.8-1.1 Si, 0.8-1.1 Al, bal Fe.
For oil refinery equipment; heat and creep resistant.

CROFER 124.
M-297; 0.12 max C, 23-25 Cr, 1.3-1.6 Si, 1.3-1.6 Al, bal Fe.
For oil refinery equipment; corrosion and heat resistant.

CROFER 218.
M-297; 0.12 max C, 18 Cr, 2 Si, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery and dairy equipment, bolts; Type 430; corrosion resistant.

CROFER 230.
M-297; 0.12 C, 29 Cr, bal Fe.
Annealed: 85,000 TS; 50,000 YS; 30 El; 55 RA; 180 Brin.
For furnace parts, heat treat boxes, heat resistant.

CROFER 1300.
M-297; 0.12 max C, 12-14 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For valves, cutlery, turbine blades, corrosion resistant.

CROFER 1300AL.
M-297; 0.06 C, 13 Cr, 0.2 Al, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 20 El; 180 Brin
For heat treating boxes, furnace parts, oil refinery equipment.
Type 405 stainless steel, ferritic, corrosion and heat resistant.

CROFER 1700.
M-297; 0.10 max C, 15.5-17.5 Cr, bal Fe
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil and chemical plant equipment, Type 430; stainless.

CROFER 1700Nb.
M-297; 0.08 C, 17 Cr, 8 Ni, 0.5 Cb, bal Fe
Annealed: 85,000 TS; 40,000 YS; 50 El; B 82 Rock.
For chemical plant equipment, welded tanks and structures.
Type 17-8 Cb. Welding grade, austenitic, stainless.

CROFER 1700Ti.
M-297; 0.10 max C, 16-18 Cr, Ti = 7 × C, bal Fe.
Annealed. 80,000 TS; 50,000 YS; 25 El, 50 RA; 150 Brin.
For welded oil and chemical plant equipment; Type 430Ti; stainless.

CROFER 1702Ti.
M-297; 0.10 max C, 16-18 Cr, 1.5-2.0 Mo, Ti = 7 × C, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431 Ti; stainless.

CROFER 1919.
M-297; 0.15 C, 19.5 Cr, 9.5 Ni, 2 Si, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

CROFER 2419.
M-297; 0.15 C, 2 Si, 24 Cr, 19 Ni, bal Fe.
Annealed: 100,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin.
For valves, pumps, turbine and jet parts; Type 310; stainless, austenitic.

CROFER 2420.
M-297, 0.15 C, 24 Cr, 19 Ni, 1.2 Mn, bal Fe.
Annealed: 100,000 TS; 45,000 YS, 50 El; 65 RA; 185 Brin.
For valves, pumps, turbine and jet parts; Type 310; stainless, austenitic.

CROFER 2504.
M-297; 0.2 C, 25 Cr, 4 Ni, bal Fe.
Cast: 90,000 TS; 65,000 YS; 2 El; 212 Brin.
For cylinder liners, valve seats and bodies; Type CC-50, corrosion and heat resistant.

CROFORM.
English; 60.0 Co, 30.0 Cr, 5.0 Mo, bal Fe
Cast: 100,000-119,000 TS, 50,000-95,000 YS; 5-4 El; 390 Brin.
For dental alloy; corrosion resistant.

CROLOY.
M-357; 1.5 C, 12-14 Cr, 1 V, 0.8 Mo, bal Fe.
For dies, gauges, broaches, wearing plates, non-deforming

CROLOY ½.
M-17, 0.10-0.20 C, 0.5 Mn, 0.5-0.8 Cr, 0.55 Mo, bal Fe.
Tubes 55,000 TS, 30,000 YS, 30 El, 150 Brin.
For oil refinery and heat exchanger tubes; creep resistant

CROLOY 1
M-17, 0.15 max C, 0.80-1.2 Cr, 0.45-0.60 Mo, bal Fe
Tubes 60,000 TS, 30,000 YS; 30 El, 170 Brin.
For high temperature service, resists high temperature and pressure

CROLOY 1¼.
M-17; 0.15 C, 1.0-1.5 Cr, 0.45-0.65 Mo, 0.5-1.0 Si, 0.5 Mn, bal Fe
Tube 60,000 TS, 25,000 YS, 30 El; 40 RA, 163 Brin
For oil refinery and heat exchanger tubes; good creep resistance

CROLOY 1¾
M-17, 0.15 max C, 1.45-2.0 Cr, 0.60-0.80 Mo, bal Fe
Tubes 60,000 TS, 25,000 YS; 30 El; 170 Brin.
For oil refinery equipment, heat exchangers; corrosion resistant to hot oils.

CROLOY 2
M-17; 0.15 C, 0.3-0.6 Mn, 1.75-2.25 Cr, 0.4-0.6 Mo, bal Fe
Annealed: 60,000 TS; 25,000 YS; 30 El; 163 Brin
For tubing for oil refineries, for high temperature use, resists oxidation

CROLOY 2 Si.
M-17, 0.2 C, 2 Si, 2 Cr, bal Fe.
Tube. 60,000 TS; 25,000 YP.
For heat exchangers in sulphuric acid plants
Good strength at high temperatures.
Resists SO_2 corrosion.

CROLOY 2¼.
M-17; 0.15 C, 0.3-0.6 Mn, 2.0-2.5 Cr, 0.9-1.1 Mo, bal Fe.
Annealed: 60,000 TS; 25,000 YS; 30 El; 163 Brin.
For tubing for oil refineries; for high temperature use.

CROLOY 3M.
M-17; 0.15 C, 0.3-0.6 Mn, 2.75-3.25 Cr, 0.8-1.0 Mo, bal Fe.
Annealed: 60,000 TS; 25,000 YS; 30 El; 163 Brin.
For tubing for oil refineries; high temperature use.

CROLOY 5.
M-17; 0.15 C, 4-6 Cr, 0.45-0.65 Mo, bal Fe.
Annealed: 60,000 TS; 25,000 YS; 30 El; 163 Brin.
For tubing for oil refineries; for high temperature use.

CROLOY 5Cb.
M-17; 0.12 max C, 4-6 Cr, 0.45-0.65 Mo, Cb = 10 × C, bal Fe.
Tubes: 60,000 TS; 25,000 YS, 30 El, 170 Brin
For oil refinery equipment, heat exchangers; corrosion resistant to hot oils

CROLOY 5M.
M-17, 0.15-0.20 C, 4-6 Cr, 0.45-0.65 Mo, bal Fe
Annealed: 60,000 TS, 25,000 YS, 30 El, 163 Brin.
For high temperature tubes, resists oxidation to 1200°F

CROLOY 5 Si
M-17, 0.15 C, 0.5 Mn, 4-6 Cr, 1-2 Si, 0.45-0.65 Mo, bal Fe
Annealed 60,000 TS, 30,000 YS; 30 El, 179 Brin.
For tubing for oil refineries, for high temperature use, resists oxidation

CROLOY 5 Ti.
M-17, 0.15 C, 0.5 Mn, 4-6 Cr, 0.5 Si, 0.45-0.65 Mo, Ti, bal Fe
Annealed: 60,000 TS, 30,000 YS, 30 El, 179 Brin.
For tubing for oil refineries, for high temperature use

CROLOY 7
M-17; 0.15 C, 7 Cr, 1.0 Si, 0.45-0.65 Mo, bal Fe
Annealed 60,000 TS, 30,000 YS, 30 El, 179 Brin
For tubing for oil refineries, for high temperature use

CROLOY 8M.
M-17, 0.15 max C, 1 Si, 7-9 Cr, 0.9-1.1 Mo, bal Fe
Tubes: 60,000 TS, 25,000 YS, 30 El, 170 Brin
For oil refinery equipment, heat exchangers; corrosion resistant to hot oils.

CROLOY 9
M-17, C, 9 Cr, 1 Mo, bal Fe
For tubing

CROLOY 9M
M-17; 0.15 max C, 0.5 Mn, 8-10 Cr, 0.9-1.1 Mo, bal Fe
Tubes 60,000 TS, 25,000 YS, 30 El, 179 Brin
For oil refinery and heat exchanger tubes, resists hot oils and creep.

CROLOY 12.
M-17; C, 12-14 Cr, bal Fe
Annealed: 70,000 TS; 150 Brin.
Heat treated: 180,000 TS, 350 Brin.
For tubing; heat and corrosion resistant.

CROLOY 12 Al.
M-17; 0.8 max C, 11.5-14.5 Cr, 0.1-0.3 Al, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 30 El; 60 RA; 150 Brin
For oil refinery equipment; corrosion resistant, slight response to hardening

CROLOY 15-15N.
M-17; 0.15 max C, 16 Cr, 15 Ni, 1.5 Mo, 1.4 W, 1 Cb, bal Fe.
Rolled: 75,000 TS; 30,000 YS; 35 El, 200 Brin.
For pipes for high temperature and pressure service; corrosion resistant, high temperature use to 1500°F.

CROLOY 16-1.
M-17; 0.03 max C, 14-16 Cr, 1.0-1.5 Ni, 0.75 Mn, 0.50 Si, bal Fe.
Tube: 60,000 TS; 35,000 YS; 20 El; 185 Brin.
For nuclear powered pressurized water plants, marine boilers; corrosion resistant to chlorides and caustics

CROLOY 16-6 PH
M-17; 0.03-0.12 C, 0.25-1.0 Mn, 1.0 max Si, 14-18 Cr, 5.5-8.5 Ni, 0.4-1.0 Ti, 1.0 max Al, bal Fe.
Solution Annealed. 127,000 TS, 110,000 YS, 14 El; 27 Rc.
Aged: 220,000 TS; 200,000 YS; 9 El; 45 Rc.
For chemical plant, textile and oil refinery tubular equipment.
Martensitic, preciptation hardening, stainless.

CROLOY 16-8-2.
M-17, 0.10 C, 15 Cr, 8 Ni, 1.5 Mo, bal Fe.
For welding rods; corrosion and heat resistant, nonmagnetic

CROLOY 16-13-3
M-17, 0.08 max C, 16-18 Cr, 11-14 Ni, 2-3 Mo, 2 max Mn, 0.75 max Si, bal Fe
At 70°F: 82,500 TS; 42,300 YS, 55 El; 72 RA; 200 Brin
At 1200°F 53,750 TS; 35,750 YS, 42 El, 55 RA.
For heat exchangers, staam piping, high temperature applications, corrosion resistant, austenitic.

CROLOY 16-13-8
M-17, 0.13 C, 1.5 Mn, 0.6 Si, 15.5-17.0 Cr, 2.5-3.25 Mo, 12.5-14.5 Ni, bal Fe.
For tubing, for high temperature use.

CROLOY 18
M-447, 0.12 C, 15-18 Cr, 0.5 max Ni, bal Fe
Annealed: 70,000-85,000 TS, 40,000-60,000 YS, 27-38 El, 140-180 Brin.
For tubing, corrosion resistant.

CROLOY 18-8.
M-447, M-17, 0.07 C, 18 Cr, 9.5 Ni, bal Fe
Annealed 75,000 TS; 3,000 YS, 50 El; 150 Brin
For tubing; stainless.

CROLOY 18-8S
M-17, 0.07 C, 0.6 Mn, 0.75 Si, 17-19 Cr, 8-10.5 Ni, bal Fe.
Annealed 75,000 TS, 30,000 YS; 35 El, 200 Brin.
For tubing; for high temperature use

CROLOY 18-8 STABILIZED.
M-17, 0.07 C, 0.6 Mn, 0.75 Si, 17-19 Cr, 10-12 Ni, Ti or Cb, bal Fe
Annealed 75,000 TS, 30,000 YS, 35 El; 200 Brin.
For tubing, for high temperature use

CROLOY 18-13-3
M-17, 0.10 max C, 18-20 Cr, 11-14 Ni, 3-4 Mo, bal Fe.
Annealed 85,000-90,000 TS; 40,000 YS; 45-50 El; 160 Brin
For chemical and oil refinery equipment, heat and corrosion resistant, austenitic.

CROLOY 19-9DL.
M-17; 0.28-0.55 C, 0.7-1.5 Mn, 18-20 Cr, 8-11 Ni, 1.0-1.7 Mo, 1.0-1.7 W, 0.4 Cb, bal Fe.
H R.: 118,000 TS; 69,000 YS; 58 El; 55 RA; 216 Brin
For jet engine and gas turbine components; corrosion and heat resistant.

CROLOY 25-12.
M-17, M-447; 0.15 max C, 2 max Mn, 0.75 max Si, 22-24 Cr, 12-15 Ni, bal Fe.
At R.T.: 95,000 TS; 48 El; 50,000 YS; B 85 Rock.
At 1500°F: 26,000 TS; 23 El.
For hot petroleum equipment; furnace parts; chemical plant equipment.
Excellent corrosion and oxidation resistance. Good creep properties.

CROLOY 25-20.
M-17; 0.15 C, 1.5 Mn, 0.75 Si, 24-26 Cr, 19-21 Ni, bal Fe.
Annealed: 75,000 TS; 30,000 YS; 35 El; 200 Brin.
For tubing; for high temperature use.

CROLOY 27.
M-447, M-17; 0.20 C, 27 Cr, 1 Ni, 0.12-0.25 N, bal Fe.
Annealed: 75,000-90,000 TS; 45,000-60,000 YS; 15-30 El; 160-195 Brin.
For tubing; acid and alkali resistant.

CROMA.
M-688; 0.35 C, 1.0 Cr, 0.8 Mn, bal Fe.
For machinery parts; formerly Lehigh Croma.

CROMADUR.
M-72; 0.15 max C, 18 Mn, 12.5 Cr, 1 V, 0.2 Ni, bal Fe.
For blading for gas turbine on jet engine; heat resistant.

CROMAL.
M-342, 2-4 Cr, Ni, Mn, bal Al.
65,000-75,000 TS, 50,000-65,000 YS
For airplane parts, milk and oil separators, pistons, propellers; corrosion resisting.

CROMAL
Russia: 1.8 C, 20-22 Cr, 2.2 Si, 3-4 Al, bal Fe.
For furnace equipment, corrosion resistant, cast iron.

CROMALOY.
M-408; 61 Ni, 15 Cr, 4 Mn, 20 Fe.
107,500 TS.
For electric heating devices; heat resistant to 950°C

CROMALOY IV
M-408; 80 Ni, 20 Cr.
134,500 TS.
For heating appliances for high temperature work; heat resistant up to 1150°C.

CROMANSIL.
M-48; 0.10 C, 0.4-0.6 Cr, 1.1-1.4 Mn, 0.7-0.8 Si, bal Fe.
Rolled: 65,000 TS; 45,000 YS; 45 El; 70 RA; 130 Brin.
For staybolts, boilers, pressure vessels, ship plates, tanks; ductile.

CROMANSIL.
M-48; 0.15 C, 0.4-0.6 Cr, 1.1-1.4 Mn, 0.7-0.8 Si, bal Fe.
Rolled: 140,000 TS; 101,000 YS; 38 El; 65 RA; 150 Brin. For staybolts, ship plates, tanks, pressure vessels.

CROMANSIL.
M-48; 0.20 C, 0.4-0.6 Cr, 1.1-1.4 Mn, 0.7-0.8 Si, bal Fe.
Rolled: 90,000 TS; 60,000 YS; 28 El; 62 RA; 200 Brin.
For boilers and pressure vessels; heat treated after welding.

CROMANSIL.
M-48; 0.25 C, 0.4-0.6 Cr, 1.1-1.4 Mn, 0.7-0.8 Si, bal Fe.
Rolled: 115,000 TS; 70,000 YS; 25 El; 60 RA; 220 Brin.
For seamless tubing, boilers, pressure vessels; good workability.

CROMANSIL.
M-48; 0.30 C, 0.4-0.6 Cr, 1.1-1.4 Mn, 0.7-0.8 Si, bal Fe.
Rolled: 140,000 TS; 90,000 YS; 20 El; 50 RA; 265 Brin.
Heat treated: 172,000 TS; 131,000 YS; 11 El; 32 RA, 364 Brin.
For heat treated parts, gears, buildings, bridges; Iz-11.

CROMANSIL.
M-604; 0.35 max C, 0.9-1.5 Mn, 0.60-0.95 Si, 0.30-0.70 Cr, bal Fe.
Minimum: 90,000 TS; 60,000 YS.
For light weight construction, corrosion resisting properties.

CROMAR.
M-1331, 1.0 C, Cr, Mo, V, bal Fe
For tools, dies, cutters, oil hardened.

CROMAR W
M-1331; 1.0 Cr, Mo, W, V, bal Fe
For engravers tools, reamers, broaches; high speed steel.

CROMAX F
M-210, 0.50-0.55 C, 0.20-0.35 Si, 0.50-0.80 Mn, 0.70-0.90 Cr, bal Fe.
For gears, housings, shafts; castings

CROMAX H.
M-210, 0.70-0.75 C, 0.20-0.35 Si, 0.50-0.80 Mn, 1.8-2.0 Cr, bal Fe
For machinery parts, wear plates; castings

CROMAZ-H
M-104; M-771, C, alloy, bal Fe
For furnace parts, heat treating boxes, high heat resistance to 1750°F.

CROMAZ-N
M-104, M-771; C, alloy, bal Fe.
For furnace parts, heat treating boxes, high heat resistance to 1750°F

CROMETEX NO 1.
M-1009, 0.38-0.43 C, 0.7 Mn, 0.3 Si, 0.8 Cr, 0.25 Mo, 1.8 Ni, bal Fe
For arbors, axles, gears, piston rods, shock resistant.

CROMEX-1
Russia, 0.5-1.0 C, 25-32 Cr, 1 Si, bal Fe.
For furnace parts and equipment, heat resistant.

CROMIMPHY 1
M-771, 0.15 max C, 11.5-13.5 Cr, bal Fe.
Heat treated: 120,000-135,000 TS; 110,000-117,000 YS; 16-15 El, 63-58 RA; 220-240 Brin.
For cutlery, valves, turbine blades; Type 410; corrosion resistant

CROMIMPHY NO. 1
M-104, M-771, 0.09-0.12 C, 13-18 Cr, bal Fe.
Heat treated: 92,000-114,000 TS; 71,000-91,000 YS; 25-13 El.
For cooking utensils, food handling equipment, turbine blades; corrosion resistant; Type 403.

CROMIMPHY 1 BIS.
M-104; 0.15 C, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, valves, cutlery; Type 410; corrosion resistant.

CROMIMPHY 1 bis Mo.
M-771; 0.17-0.20 C, 13 Cr, 0.6 Mo, 0.5 max Ni, bal Fe.
Annealed: 90,000 TS; 50,000 YS; 25 El; 50 RA.
Heat Treated: 240,000 TS; 210,000 YS; 9 El; C 50 Rock.
For oil refinery and chemical plant equipment, surgical instruments, cutlery.
Corrosion resistant, hardenable.

CROMIMPHY 2.
M-771; 0.10 C, 0.25 Si, 0.4 Mn, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 30 El; B 82 Rock.
Ht.Tr.: 135,000 TS; 105,000 YS; 10 El; C 30 Rock
For cutlery, knives, springs, shafts, table flatware.
AISI Type 410, corrosion and heat resistant.

CROMIMPHY NO. 2.
M-104, M-771; 0.19-0.27 C, 12-14 Cr, bal Fe.
Heat treated: 107,000-143,000 TS, 85,000-123,000 YS; 22-10 El; 150-300 Brin.
For surgical instruments, pump valves, pistons; Type 420; corrosion resistant.

CROMIMPHY 2C.
M-104; 0.35 C, 13 Cr, bal Fe
Annealed: 95,000 TS; 50,000 YS, 25 El, 55 RA; 196 Brin.
For turbine blades, valves, cutlery; Type 420; corrosion resistant.

CROMIMPHY 4.
M-771; 0.12 max C, 14-18 Cr, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 30 El, 55 RA; 150 Brin
Cold drawn 130,000 TS; 120,000 YS; 2 El; 185 Brin.
For oil refinery equipment, bolts, kitchen sinks, Type 430, stainless, ferritic

CROMIMPHY NO. 4.
M-104, M-771, 0.07-0.12 C, 16-18 Cr, bal Fe.
For chemical plant equipment, Type 430, corrosion resistant.

CROMIMPHY 4 BIS
M-104, 0.15 C, 17 Cr, 1.8 Ni, bal Fe
Annealed: 125,000 TS, 95,000 YS, 20 El; 55 RA, 260 Brin.
For pumps, marine hardware, valves, Type 431, corrosion and heat resistant

CROMIMPHY NO. 6
M-104, M-771; 0.10 max C, 30 Cr, bal Fe.
For furnace parts, rabble arms, pots; heat and corrosion resistant

CROMIMPHY 33.
M-771; 0.30 C, 12 Cr, 0.3 Mo, 1.0 Ni, bal Fe
Annealed: 95,000 TS; 50,000 YS, 25 El; 55 RA.
Heat Treated. 250,000 TS; 215,000 YS; 8 El; C 50 Rock.
For oil refinery and chemical plant equipment, cutlery, surgical instruments, shafts.
Corrosion resistant, hardenable.

CROMIMPHY 2100.
M-771; C, alloy, bal Fe.
For oil refinery equipment; oxidation resistant.

CROMIMPHY 2200
M-771; C, alloy, bal Fe.
For oil refinery equipment; oxidation resistant

CROMIMPHY A5.
M-771; 0.05 C, 0.25 Si, 0.4 Mn, 13 Cr, bal Fe.
Annealed: 75,000 TS, 40,000 YS; 35 El, 155 Brin.
For furnace parts, soot blowers, ladles, for nonferrous molten metals, stirring rods. Corrosion resistant.

CROMIMPHY A8.
M-771; 0.08 max C, 11.5-13 Cr, 0.1-0.3 Al, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 23 El; 70 RA; 150 Brin.
Heat treated: 175,000 TS; 145,000 YS; 21 El; 64 RA; 352 Brin.
For oil refinery and chemical plant equipment; Type 405; corrosion resistant.

CROMIMPHY A8Mo.
M-771; 0.08 C, 0.4 Mn, 0.5 Si, 13 Cr, 0.5 Mo, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 150 Brin.
Cold Drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For oil refinery and chemical plant equipment; knives, hardware, table flatware.
Corrosion resistant.

CROMIMPHY A10M.
M-771; 0.15 max C, 13 Cr, 0.5 Mo, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin
Cold Drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin
For oil refinery and chemical plant equipment; knives, hardware, flatware Corrosion resistant.

CROMIMPHY A15.
M-771, 0.15 min C, 12-14 Cr, bal Fe.
Annealed. 88,000 TS; 40,000 YS; 32 El; 68 RA, 170 Brin.
For cutlery, valve trim, turbine blades; Type 420; stainless, hardenable.

CROMIMPHY A15Mo.
M-771, 0.18 C, 0.4 Mn, 0.1 Si, 13 Cr, 0.5 Mo, bal Fe.
Annealed 90,000 TS, 38,000 YS, 26 El, 55 RA; B 90 Rock
Heat Treated 250,000 TS, 190,000 YS, 10 El, 32 RA, C 49 Rock
For cutlery, knives, bearings, hardware, surgical instruments.
Corrosion resistant, hardenable

CROMIMPHY A18Mo.
M-771, 0.25 max C, 13.0 Cr, 0.5 Mo, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; 55 RA; B 92 Rock.
Heat Treated 250,000 TS; 210,000 YS; 8 El, 25 RA, C 50 Rock
For surgical instruments, bearings, shafts, gears, knives, cutlery.
Corrosion resistant, hardenable

CROMIMPHY A20Mo
M-771; 0.22 C, 0.4 Mn, 0.2 Si, 12.5 Cr, 1.0 Mo, bal Fe
Annealed 95,000 TS, 40,000 YS; 25 El, 55 RA; B 92 Rock.
Heat Treated: 250,000 TS; 215,000 YS; 8 El; 25 RA; C 50 Rock
For surgical instruments, cutlery, hardware, bearings, knives.
Corrosion resistant, hardenable.

CROMIMPHY A1007 Mo.
M-771; 0.12 max C, 12.5-13.5 Cr, 0.5 Al, 0.7 Mo, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold Drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin
For oil refinery and chemical plant equipment, hardware, knives.
Corrosion resistant.

CROMIMPHY A2100.
M-771; 0.10 C, 12 Cr, 0.6 Mo, 0.25 V, bal Fe.
Annealed: 75,000 TS; 35,000 YS; 30 El; B 90 Rock.
For oil refinery and chemical plant equipment, springs, table flatware.
Corrosion resistant.

CROMIMPHY A2200.
M-771; 0.14-0.20 C, 10-13 Cr, 0.6-1.2 Mo, 0.3 V, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 25 El; B 95 Rock.
Hardened: 220,000 TS; 185,000 YS; 12 El; C 45 Rock.
For surgical instruments, bearings, valves, cutlery.
Corrosion resistant, hardenable.

CROMIMPHY A3100.
M-771; 0.06-0.10 C, 11-13 Cr, 0.8-1.2 Mo, 0.5 max Ni, 0.2-0.3 V, 0.8-1.2 W, bal Fe.
Annealed: 75,000 TS; 35,000 YS; 30 El; 70 RA; B 82 Rock.
Cold Drawn: 95,000 TS; 80,000 YS; 15 El; 60 RA; B 92 Rock.
For springs, table flatware, knives, chemical plant equipment.
Corrosion Resistant.

CROMIMPHY A3200.
M-771; 0.20-0.25 C, 11.0-12.5 Cr, 0.9-1.2 Mo, 0.2-0.3 V, 0.9-1.2 W, bal Fe.
Annealed: 90,000 TS; 40,000 YS, 25 El; B 92 Rock.
Hardened: 245,000 TS; 210,000 YS; 8 El; C 50 Rock
For cutlery, surgical instruments, gears, shafts, hardware.
Corrosion resistant, hardenable

CROMIN-1.
M-897, 9-11 Ni, 19-21 Cr, bal Fe.
For heating elements, useful operating temperature to 650°F.

CROMIN D.
M-61; 30.1 Ni, 63.9 Fe, 0.64 Mn, 0.2 C, 4-7 Cr
Annealed: 83,000 TS
For fans, irons, toasters, motor starters, resistance wire
Corrosion and heat resistant.

CROMINO 0.
M-1315, 0.12 max C, 13 Cr, bal Fe
Annealed: 75,000 TS; 40,000 YS; 35 El, 70 RA; 155 Brin.
For turbine blades, valves, cutlery, surgical instruments; Type 410; stainless

CROMINO 1.
M-1315; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS, 50,000 YS, 25 El; 55 RA; 195 Brin.
For turbine blades, valves, cutlery, surgical instruments, Type 420; stainless, hardenable.

CROMINO 2 .
M-1315; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For cutlery, valves, surgical and dental instruments; Type 420; stainless, hardenable.

CROMINO 8M.
M-1315; 0.9 C, 18 Cr, 0.2 Mo, bal Fe.
Annealed: 110,000 TS; 65,000 YS; 18 El; 35 RA; 220 Brin.
Heat treated: 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin.
For cutlery, valves, ball bearings, surgical instruments; corrosion and wear resistant, hardenable.

CROMINO 8MS.
M-1315; 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For screw machine products; Type 430F; stainless, free-cutting.

CROMINO 18.
M-1315; 0.08 C, 0.4 Si, 17 Cr, bal Fe.
Annealed 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
Cold drawn: 130,000 TS; 120,000 YS; 2 El; 185 Brin.
For oil refinery and food processing equipment, sinks, Type 430; stainless, ferritic

CROMO.
M-111; 0.4 C, 0.65 Mn, 1.1 Cr, 0.25 Mo, bal Fe.
For gears, shafts, bolts; oil hardening.

CROMO.
M-334; 0.9 C, 1-2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, chisels, bull-dozers; shock tool steel.

CROMODI.
M-1432, C, alloy, bal Fe
Heat treated: 280 Brin
For brake dies, preheat treated, non-deforming.

CROMODIE.
M-56, 0.35 C, 5 Cr, 1.5 Mg, 1 V, 1 Si, 0.3 Mn, bal Fe.
For punches, crimpers, dies; oil hardened, tough

CROMODIE-W
M-56, 0.31 C, 0.9 Si, 0.3 Mn, 5 Cr, 1.75 Mo, 0.25 V, 1.1 W, bal Fe.
For punches, crimpers, dies, oil hardened, tough.

CROMO HIGH V
M-24, M-341; 0.40 C, 5.0 Cr, 1.2 Mo, 1.5 V, bal Fe
Hot work tool steel, for die casting dies, shear blades, oil hardened, AISI H13

CROMOL
M-50, M-1414; 0.40 C, 0.65 Mn, 1.1 Cr, 0.30 Mo, bal Fe
Oil harden: 109,000-162,000 TS, 90,000-144,000 YS, 19-25 El, 54-64 RA; 49-86 Iz
For axles, shafts, crankshafts, gears, bolts, studs, propeller shaft joints
Impact resistant Oil hardening.

CROMOL C-9
M-451, C, Cr, Mo, V, bal Fe
Air hardened: 115,000-181,500 TS, 90,000-127,000 YS, 20-14 El, 63-46 RA, 217-375 Brin.
For rams, sow blocks, dies; alloy steel casting

CRO-MO-LOY
M-435, 1.0 C, 1.0 Mn, 5.0 Cr, 0.25 V, 1.0 Mo, 1 Co, bal Fe
For tools, dies, shear blades, air hardening, non-deforming

CRO-MOL C-10
M-451; C, Cr, V, bal Fe.
For dies; rams, sow blocks; castings.

CROMO N.
M-24, 0.25 C, 1.0 Mn, 1.0 Si, 1.0 Ni, 11.0 Cr, 1.0 Mo, 0.5 V, 0.95 W, 0.10 N, bal Fe.
For hot work applications, extrusion mandrels, forging die inserts, piercer punches, die casting dies

CROMO N.
M-341; 0.23 C, 0.6 Mn, 1.25 Si, 0.75 Ni, 10.0 Cr, 1.2 Mo, 1.0 V, 0.45 W, 0.10 N, bal Fe.
For die casting dies, extrusion mandrels, forging and extrusion tooling.
Resists heat checking and cracking.
Air hardening hot work tool steel.

CROMONITE.
M-451; C, alloy, bal Fe.
For chill rolls; wear resistant.

CROMOTEX NO. 2.
M-1009; 0.43-0.48 C, 0.8 Mn, 0.8-1.1 Cr, 0.2 Mo, 1.8 Ni, bal Fe.
For arbors, axles, gears, piston rods; shock resistant.

CROMOTUNG.
M-289; C, alloy, bal Fe.
For taps, drills, reamers, dies, punches; oil hardened, tough.

CROMO V.
M-24; 0.35 C, 5 Cr, 0.4 V, 1.5 Mo, bal Fe.
Heat treated: 220,000 TS; 186,000 YS; 13 El; 40 RA.
At 1000°F: 145,000 TS; 105,000 YS; 19 El; 65 RA.
For extrusion dies, gripper and header dies, aluminum and magnesium forging dies
Type H11 hot work steel. Resists heat checking.

CROMOVAN.
M-57; 1.4-1.7 C, 12-14 Cr, 0.5-1.0 Mo, 1-1.5 V, bal Fe
Annealed: 110,000 TS; 210 Brin.
Hardened: 278,000 TS, 214,000 YS; 1 El, 0.2 RA, 570 Brin.
For dies for trimming, blanking extrusion, swaging, pressing, thread rolling, etc, taps, punchers, reamers, broaches, shear blades; heat and wear resistant "Chromovan Triple Die Steel"; non-deforming.

CROMOVAN F M
M-57; 1.55 C, 12 Cr, 1 V, 1 Mo, 0.12 S. bal Fe.
For blanking and drawing dies, punchers, gages, air-hardened, non-deforming.

CROMO W
M-24; 0.35 C, 1.05 Si, 1.55 W, 1.65 Mo, 5.15 Cr, bal Fe
Heat treated 216,000 TS; 185,000 YS, 14 El, 52 RA; Rock C 56
For trimmer and hot forging dies, die casting dies, hot sheer blades, punches
Type H12 hot work steel, oil hardening

CROMO W-55
M-24, 0.55 C, 0.85-1.10 Si, 1.0-1.5 W, 4.8-5.1 Cr, 1.0-1.5 Mo, bal Fe
Annealed: 103,000 TS, 65,000 YS, 24 El; C 18 Rock
Heat treated: 290,000 TS; 235,000 YS, 9 El; 22 RA, C 54 Rock.
For blanking and beading dies, cold forming dies, pneumatic tools.
Type A8 hot work steel, air harden
Tough and shock resistant.

CROMO WV.
M-24; 0.35 C, 1.05 Si, 1.55 W, 1.65 Mo, 5.15 Cr, 0.8 V, bal Fe
Heat treated: 218,000 TS; 186,000 YS, 14 El, 53 RA; Rock C 56.
For trimmer and hot forging dies, die casting dies, hot shear blades, punches.
Hot work steel, oil or air hardening. Type H 12

CROMVA.
M-334; 0.5 C, 0.6 Mn, 1 Cr, 0.2 V, bal Fe.
For tools, die casting dies; oil hardening.

CROMVA.
M-334; 0.35 C, 1 Cr, 0.2 V, bal Fe.
For punches, dies, upsetters, crimpers; water or oil hardened.

CRONIFER II.
M-297; 65 Ni, 15 Cr, bal Fe.
Annealed: 92,400-106,600 TS; 30-25 El; 55-45 RA; 130 Brin.
For heat resistant parts; maximum operating temp. 1075°C.

CRONIFER II EXTRA.
M-297; 65 Ni, 15 Cr, bal Fe.
Annealed: 92,400-106,600 TS; 30-25 El; 55-45 RA; 130 Brin.
For heat resistant parts; maximum operating temp 1125°C.

CRONIFER III.
M-297, 30 Ni, 20 Cr, bal Fe.
Annealed: 92,400-99,500 TS; 32-30 El; 50 RA; 150 Brin. For heat resistant parts; maximum operating temperature 1100°C.

CRONIFER III EXTRA.
M-297; 30 Ni, 20 Cr, bal Fe
Annealed: 92,400-99,500 TS; 32-30 El, 50 RA; 150 Brin.
For heat resistant parts; max operating temp. 1150°C

CRONIFFR IV.
M-297; C, 20 Ni, 24 Cr, bal Fe.
Rolled: 85,000-108,000 TS; 43,000 YS.
For furnace parts, salt pots, heat treating equipment; heat resistant to 1050°C in continuous operation

CRONIFER IV-EXTRA
M-297, C, 20 Ni, 24 Cr, bal Fe.
Rolled 85,000-108,000 TS, 43,000 YS
For furnace parts, salt pots, heat treating equipment, heat resistant to 1100°C in continuous operation.

CRONIFFR 1212
M-297, 0.10 max C, 11.5-13.5 Cr, 12.0-14.0 Ni, bal Fe.
For valves, pumps, corrosion resistant.

CRONIFER 1613Nb
M-297, 0.10 max C, 15-17 Cr, 12-14 Ni, Nb = 10 × C + 0.4, bal Fe
For chemical plant equipment; stainless.

CRONIFER 1613NbN.
M-297, 0.10 max C, 15.5-17.5 Cr, 12.5-14.5 Ni, 1.1-1.5 Mo, 0.6-0.8 V, 0.1 N, Nb = 10 × C + 0.4, bal Fe.
For chemical plant equipment, stainless

CRONIFER 1616Nb
M-297, 0.10 max C, 15.5-17.5 Cr, 15.5-17.5 Ni, 1.6-2.0 Mo, Nb = 10 × C + 0.4, bal Fe
For chemical plant equipment, stainless

CRONIFER. 1704
M-297, 0.15 max C, 16-18 Cr, 3.5-5.5 Ni, 5.5-7.5 Mn, 0.17-0.25 N, bal Fe.
For chemical plant equipment, stainless, austenitic.

CRONIFER 1707.
M-297, 0.15 max C, 16-18 Cr, 7-8 Ni, bal Fe
Annealed. 80,000 TS, 35,000 YS, 55 El; 75 RA, 150 Brin
For chemical plant equipment; Type 301; stainless, austenitic

CRONIFER 1805
M-297, 0.15 max C, 17-19 Cr, 4-6 Ni, 7.5-10.0 Mn, 0.17-0.25 N, bal Fe.
For chemical plant equipment; stainless, austenitic.

CRONIFER 1808.
M-297, 0.15 max C, 0.4 Si, 18 Cr, 8 Ni, bal Fe.
Quenched: 78,100-106,000 TS; 50 El; 130-180 Brin.
For textile and food industries; stainless, austenitic.

CRONIFER 1809.
M-297; 0.07 max C, 0.4 Si, 18 Cr, 9 Ni, bal Fe.
Quenched: 78,100-99,500 TS; 50 El; 135-180 Brin.
For textile and food equipment; stainless, austenitic.

CRONIFER 1809 Nb.
M-297; 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
Cold drawn: 100,000 TS; 65,000 YS; 40 El; 60 RA; 205 Brin.
For welded chemical plant equipment, tanks, mixers; Type 347; stainless, austenitic.

CRONIFER 1809NC.
M-297; 0.03 C, 17-19 Cr, 9-11 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 65 El; 75 RA; 140 Brin.
For chemical plant equipment; Type 304L; stainless, austenitic.

CRONIFER 1809 Ti.
M-297, 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 55 El; 65 RA; 150 Brin.
Cold drawn: 95,000 TS; 60,000 YS; 40 El; 60 RA; 185 Brin.
For welded chemical plant equipment, tanks, filters; Type 321; stainless, austenitic.

CRONIFER 1810.
M-297, 0.07 max C, 0.4 Si, 18 Cr, 2 Mo, 10 Ni, bal Fe.
Quenched: 78,100-99,500 TS; 45 El; 140-180 Brin.
For chemical equipment; stainless, austenitic

CRONIFER 1810NB.
M-297; 0.10 max C, 16.5-18.5 Cr, 10.5-12.5 Ni, 2.0-2.5 Mo, Cb = 8 × C, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin
For welded chemical plant equipment, Type 316Cb, stainless, austenitic.

CRONIFER 1810 Ti.
M-297; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 50 El, 65 RA, 170 Brin.
For welded acid resistant chemical plant equipment; Type 316 Ti; stainless, austenitic.

CRONIFER 1812.
M-297; 0.07 max C, 16.5-18.5 Cr, 11.5-13.5 Ni, 2.5-3.0 Mo, bal Fe.
Annealed: 85,000 TS, 35,000 YS, 50 El; 65 RA; 160 Brin.
For acid resistant equipment; Type 316; stainless, austenitic.

CRONIFER 1812Nb
M-297, 0.10 max C, 16.5-18.5 Cr, 11.5-13.5 Ni, 2.5-3.0 Mo, Nb = 8 × C, bal F
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant equipment, Type 316Cb; stainless, austenitic.

CRONIFER 1812Ti.
M-297; 0.10 max C, 16.5-18.5 Cr, 11.5-13.5 Ni, 2.5-3.0 Mo, Ti = 5 × C, bal Fe.
Annealed, 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For welded chemical plant equipment, Type 316Ti; stainless, austenitic.

CRONIFER 1813.
M-297; 0.07 max C, 16.5-18.5 Cr, 11.5-13.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA 150 Brin.
For chemical plant equipment; Type 304; stainless, austenitic.

CRONIFER 1818Nb.
M-297; 0.07 max C, 16.5-18.5 Cr, 16.5-18.5 Ni, 2.0-2.5 Mo, 1.8-2.2 Cu, Nb = 8 × C, bal Fe.
For acid resistant equipment, stainless, austenitic.

CRONIFER 1818Ti.
M-297; 0.07 max C, 16.5-18.5 Cr, 16.5-18.5 Ni, 2.0-2.5 Mo, 1.8-2.2 Cu, Ti = 5 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant equipment; Type 316Ti; stainless, austenitic.

CRONIFER 1910 Nb
M-297; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Cb = 8 × C, bal Fe
Annealed: 85,000 TS; 40,000 YS, 50 El; 65 RA; 170 Brin
For welded acid resistant chemical plant equipment, Type 316 Cb, stainless, austenitic.

CRONIFER 2012
M-297, 0.20 max C, 19-21 Cr, 11-13 Ni, 1.8-2.3 Si, bal Fe
For high temperature applications; heat resistant.

CRONIFER 2504
M-297, 0.15-0.25 C, 24-26 Cr, 3.5-4.5 Ni, 0.8-1.3 Si, bal Fe
For furnace parts, salt pots, heat resistant

CRONIFER 2520
M-297, 0.20 max C, 24-26 Cr, 17-21 Ni, 1.8-2.3 Si, bal Fe
For high temperature applications, heat resistant

CRONIFER 2520NV
M-297, 0.20 max C, 23-25 Cr, 19-21 Ni, 1.0-1.5 Si, bal Fe
For furnace parts, heat treat boxes, austenitic, corrosion and heat resistant

CRONIFER 2525Ti
M-297, 0.06 max C, 24-26 Cr, 24-26 Ni, 2.0-2.5 Mo, Ti = 5 × C, bal Fe
For furnace parts, heat resistant equipment; corrosion and heat resistant

CRONIMO
M-38; 0.50 C, 3.25 Ni, 1.1 Cr, 0.25 Mo, bal Fe
For dies, oil hardening

CRONIRO
M-1493, 72 Au, 22 Ni, 6 Cr
M.P. 1787-1832°F
For high temperature brazing

CRONIT
Eng.; 60 Ni, 40 Cr
For resistance alloys

CRONITE
M-37; 63.5-67.0 Ni, 13.5-16.0 Cr, 1 Mn, 0.4 Si, 0.8 Al, bal Fe
At 20°C: 67,000-78,000 TS, 0.5-1.5 El, 200-250 Brin.
At 1000°C: 25,000 TS
For carburizing boxes, grids, fire doors, furnace parts; maximum operating temperature 1000°C, heat resistant

CRONITE 428
M-37; 12 Ni, 25 Cr, bal Fe.
For high temperature uses; corrosion and heat resistant.

CRONITE ORD.
M-37; 55 Ni, 18 Cr, bal Fe.
For high temperature uses; corrosion and heat resistant.

CRONITE SR.
M-37; 35 Ni, 20 Cr, bal Fe.
For high temperature uses; corrosion and heat resistant.

CRONITE W.X. 2.
M-37; Ni, Cr, Fe, W.
70,000-120,000 TS.
For drastic temperature conditions.

CRONITUNG.
M-260; C, alloy, bal Fe.

CRONIX.
M-297; 80 Ni, 20 Cr.
Annealed: 92,400-106,600 TS; 35-25 El; 55-50 RA; 145 Brin.
For heating elements; maximum operating temp. 1150°C

CRONIX EXTRA.
M-297, 80 Ni, 20 Cr.
Annealed: 92,400-106,600 TS; 35-25 El; 55-50 RA; 145 Brin.
For heating elements; maximum operating temp 1200°C.

CROTORITE.
M-179, 89.5 Cu, 0.06 Pb, 0.56 Fe, 6.32 Ni, 3.08 Al, 0.62 Mn
50,000-80,000 TS, 32-16 RA.
For paper mill machinery, corrosion resistant

CROTERITE IV
M-179, Ni, Al, Mn, bal Cu.
Annealed: 50,000 TS, 18,000 YS, 48 El; 95 Brin.
Hardened 100,000 TS, 20 El.
For paper mill equipment, pump rods, piston rods, turbine blading; tough, corrosion resistant

CROTERITE V
M-179, Al, bal Cu.
Cast 65,000 TS, 25,000 YS; 35 El, 25 RA; 100 Brin
Hard rolled: 90,000 TS, 40,000 YS, 30 El, 50 RA; 140 Brin
For pump rods, piston rods, valves, impellers, exhaust manifolds, worm wheels, gears, resists high temperatures and corrosion

CROTERITE 7
M-179, Cu, Al, Mn, 2 Fe, bal Zn.
Extruded 84,000 TS; 38,000 YS; 28 El; 25 RA; 140 Brin
Drawn: 84,000 TS, 42,000 YS, 25 El, 25 RA; 150 Brin.
For hardware, corrosion resistant

CROTUNG.
M-151; 0.15 C, 0.5 Mn, 0.5 Si, 5.0 Cr, 1.0 W, bal Fe.
66,500 TS; 25,000 YS; 36 El, 71 RA.
For dies, petroleum still parts; oil hardened.

CROUSE FUSIBLE ALLOY
England; 45 Bi, 25 Sn, 25 Pb, 5 Cd
For fusible alloy, fire extinguishers, M.P. 88°C.

CROVA.
M-1331; 1.15 C, 0.65 Cr, 0.1 V, bal Fe.
For cutters, drills, bearings; water hardened, wear resistant.

CROVA 31.
M-1331, 0.31 C, 0.65 Cr, 0.1 V, bal Fe.
For gears, bolts, fasteners, crankshafts; oil hardened, tough.

CROVA 50.
M-1331; 0.5 C, 0.95 Mn, 1.05 Cr, 0.1 V, bal Fe.
For gears, bolts, springs, crankshafts; oil hardened, shock resistant.

CROVA 115.
M-1331; 1.2 C, 0.65 Cr, 0.1 V, bal Fe.
For bearings, cutters, forming dies; water hardened, wear resistant.

CROVAN.
M-435; 0.35 C, 1 Si, 5 Cr, 1.4 Mo, 0.9 V, bal Fe.
At 1000°F: 186,200 TS; 149,100 YS; 18.6 El; 48.2 RA; 477 Brin.
For die casting dies, extrusion tools, plastic molds; resists thermal shock, non-deforming.

CROVANI.
M-1318; 0.58 C, 1.05 Cr, 0.1 V, bal Fe.
For springs, gears, bolts, studs, oil hardened, shock resistant.

CROW.
M-1, 1.2 C, 0.50 Cr, bal Fe.
For drills, reamers, cutlery dies, gages, tools, drawing dies; water hardening

CROWN
M-73; 0.5 C, 0.9 Cr, 0.2 V, bal Fe
For tools, shafting; high fatigue resistance.

CROWN.
M-261, 0.44 C, 1.3 Cr, 0.15 V, 2.3 W, bal Fe.
For hot or cold trimming dies, punches, chipping chisels, pneumatic tools, mandrels, hot heading dies
Oil hardening, shock resistant.

CROWN.
M-657; 88 Cu, 10 Sn, 2 Zn, 87 Cu, 9 Sn, 4 Zn, 87 Cu, 8 Sn, 5 Zn
Cast: 32,000 TS, 16,000 YS, 21 El
For bearings, pumps, engine castings, heavy duty.

CROWN "W"
M-387, 0.8 C, 2.5 W, bal Fe.
For tools, dies; oil hardened

CRUCAST CA-15
M-38; 0.11 C, 12.5 Cr, bal Fe
Annealed 95,000 TS, 65,000 YS; 25 El; 35 RA, 180 Brin.
Heat treated 120,000-190,000 TS; 105,000-160,000 YS, 18-5 El; 45-12 RA, 250-382 Brin.
For chemical plant equipment, castings, corrosion resistant, hardenable.

CRUCAST CB30
M-38, 0.17 C, 20 Cr, 1 Ni, bal Fe.
Annealed 75,000 TS; 50,000 YS, 4 El, 4 RA, 170 Brin
For chemical plant equipment, castings, corrosion resistant.

CRUCAST CF-8
M-38; 0.06 C, 19 Cr, 10 Ni, bal Fe
Annealed. 71,000 TS: 40,000 YS; 50 El; 50 RA, 140 Brin.
For chemical plant equipment, fittings, valve bodies; stainless, austenitic

CRUCAST CF-8C.
M-38, 0.06 C, 19 Cr, 10 Ni, 1 Cb, bal Fe.
Annealed: 73,000 TS, 42,000 YS; 50 El, 50 RA; 150 Brin.
For welded equipment, valve bodies, mixers, filters; austenitic, stainless

CRUCAST CF-8M.
M-38, 0.06 C, 19 Cr, 10 Ni, 2.4 Mo, bal Fe.
Annealed: 75,000 TS; 45,000 YS, 50 El, 50 RA; 160 Brin.
For chemical plant equipment, fittings, valve bodies, filters; stainless, austenitic, acid resistant.

CRUCAST CF16FA.
M-38; 0.12 C, 19 Cr, 10 Ni, 0.3 S, 0.6 Mo, bal Fe
Annealed: 71,000 TS; 40,000 YS, 45 El; 45 RA; 140 Brin.
For chemical plant equipment, castings; stainless, austenitic.

CRUCAST CF20
M-38; 0.17 C, 19 Cr, 10 Ni, bal Fe.
Annealed: 73,000 TS; 42,000 YS; 50 El; 50 RA; 150 Brin.
For valve bodies, pump bodies; corrosion resistant, austenitic.

CRUCAST HH.
M-38; 0.40 C, 25 Cr, 13 Ni, bal Fe
Cast: 80,000 TS; 40,000 YS; 18 El, 23 RA; 170 Brin.
For chain links, heat treating fixtures, furnace parts, austenitic, corrosion and heat resistant.

CRUCAST HK.
M-38, 0.40 C, 26 Cr, 20 Ni, bal Fe
Cast: 75,000 TS; 40,000 YS, 16 El; 17 RA, 165 Brin
For high temperature castings, furnace equipment, heat resistant to 2100°F; austenitic.

CRUCAST HT
M-38; 0.50 C, 15 Cr, 35 Ni, bal Fe.
Cast: 66,000 TS; 37,000 YS, 7 El; 8 RA, 160 Brin
For quenching fixtures, carburizing boxes; austenitic, corrosion and heat resistant

CRUCIBLE 13% Mn.
M-38; 1.2 C, 13 Mn, bal Fe
For railroad frogs and tracks, wear plates; work hardens, wear and abrasion resistant

CRUCIBLE 17 Cr-4 Ni
M-38; 0.07 max C, 1.0 max Si, 15.5-17.5 Cr, 3.0-5.0 Ni, 3.0-5.0 Cu, 1.0 max Mn, 0.15-0.45 Cb + Ta, bal Fe.
Prec Hard. 900°F 200,000 TS; 185,000 YS, 14 El, 420 Brin (Values vary with treatment)
Precipitation hardening stainless, for valves, pump parts, turbine blades, shafts, fasteners, gears, instrument parts.
AMS 5643 ASTM A 564-66

CRUCIBLE 35% NICKEL-IRON.
M-38; 35 Ni, bal Fe
Annealed: 70,000 TS; 24,000 YS, 36 El, 68 RA, 143 Brin
Cold drawn: 90,000 TS, 70,000 YS; 20 El, 60 RA, 185 Brin.
For instruments, geodetic parts, thermostats, controlled thermal expansion, low

CRUCIBLE 42% NICKEL-IRON
M-38, 42 Ni, 0.08 max C, bal Fe
Annealed 80,000 TS, 30,000 YS, 30 El
For metal to glass seals, thermostats, temperature controls; low coefficient of expansion (controlled).

CRUCIBLE 52 CB BEARING STEEL.
M-38, 0.75-0.90 C, 0.3-0.45 Mn, 0.6-0.9 Si, 0.8-1.1 Cr, 0.25 Ni, 0.50-0.65 Mo, bal Fe.
Oil hardenable to 62-66 Rc.
For bearings, bearing races, hardened shafts

CRUCIBLE 52 CB VAR BEARING STEEL.
M-38; 0.85 C, 0.35 Mn, 0.75 Si, 1.0 Cr, 0.10 Ni, 0.60 Mo, bal Fe.
Oil hardenable to 62-66 Rc.
For bearings, bearing races, hardened shafts.

CRUCIBLE 56
M-38; 0.40 C, 3.3 Cr, 0.6 Mn, 2.75 Mo, 0.4 V, 1 Si, bal Fe.
At 70°F: 300,000 TS; 240,000 YS.
At 1000°F: 230,000 TS; 200,000 YS.
For high temperature applications, shears, punches, heat resistant to 1000°F, hot work steel.

CRUCIBLE 120 ZA.
M-38; 12 Zr, 4.5 Al, bal Ti
For high temperature applications, heat and creep resistant.

CRUCIBLE 201
M-38, 0.15 max C, 5.5-7.5 Mn, 16-18 Cr, 3.5-5.5 Ni, 0.25 max N, bal Fe.
Annealed. 115,000 TS; 55,000 YS; 55 El, 185 Brin
½ H temper. 150,000 TS, 105,000 YS, 25 El.
For chemical plant equipment, stainless, austenitic

CRUCIBLE 202.
M-38, 0.15 max C, 17-19 Cr, 7.5-10.0 Mn, 4-6 Ni, bal Fe
Annealed: 100,000 TS, 50,000 YS, 60 El, 185 Brin
For chemical plant equipment, stainless, austenitic

CRUCIBLE 301
M-38, 0.2 max C, 7 Ni, 17 Cr, bal Fe
Annealed: 110,000 TS, 40,000 YS; 60 El; 165 Brin
Rolled 185,000 TS, 140,000 YS, 8 El, 410 Brin
For aircraft structural members, trailer bodies, diaphragms household utensils, Type 301, stainless, austenitic

CRUCIBLE 302
M-38, 0.2 max C, 18 Cr, 9 Ni, bal Fe
Annealed 90,000 TS, 40,000 YS, 60 El, 70 RA, 165 Brin
For aircraft structural members, chemical plant equipment, Type 302, stainless, austenitic

CRUCIBLE 302B
M-38, 0.2 max C, 9 Ni, 18 Cr, 2.5 Si, bal Fe
Annealed 90,000 TS, 40,000 YS, 50 El, 65 RA, 160 Brin
For heat treat fixtures, tube supports, high temperature applications, Type 302B, stainless, austenitic

CRUCIBLE 303
M-38, 0.20 max C, 0.30 S, 9 Ni, 18 Cr, bal Fe
Annealed 85,000 TS, 40,000 YS, 45 El, 60 RA, 170 Brin
For screw machine products, bolts, screws, fasteners, Type 303, free cutting, stainless.

CRUCIBLE 303 PLUS
M-38; 0.15 max C, 2.0 max Mn, 1.0 max Si, 0.20 max P, 0.15 min S, 17-19 Cr, 8-10 Ni, 0.6 max Mo, bal Fe
Ann 90,000 TS, 35,000 YS, 50 El, 170 Brin
Good machinability, austenitic, corrosion resistant
For stainless hardware to be made on automatic screw machines, fasteners, bolts, studs AMS 5640

CRUCIBLE 303 PLUS X
M-38, 0.15 max C, 2.5-4.5 Mn, 1.0 max Si, 0.20 max P, 0.15 min S, 17-19 Cr, 7.0-10.0 Ni, 0.6 max Mo, bal Fe
Ann 90,000 TS, 35,000 YS; 50 El, 170 Brin
Austenitic, good machinability, corrosion resistant
For stainless screw machine parts, studs, bolts, shafts, fasteners, chemical plants. AMS 5640

CRUCIBLE 304.
M-38; 0.08 max C, 9.5 Ni, 19 Cr, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 60 El; 70 RA, 160 Brin.
For architectural molding and trim; Type 304; stainless, austenitic.

CRUCIBLE 304L.
M-38; 0.03 max C, 9.5 Ni, 19 Cr, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 160 Brin.
For welded structures, chemical plant equipment; Type 304L; austenitic, stainless.

CRUCIBLE 304 PLUS.
M-38; 0.08 C, 2.0 max Mn, 1.0 max Si, 18-20 Cr, 8-12 Ni, bal Fe.
Ann. 85,000 TS; 35,000 YS, 60 El; 170 Brin.
Austenitic, non-magnetic, corrosion resistant, ductile
For shafts, bar and fountain equipment,
food and dairy equipment, valves,
marine equipment.
AMS 5639.

CRUCIBLE 305.
M-38; 0.12 max C, 11.5 Ni, 18 Cr, bal Fe
Annealed. 85,000 TS; 35,000 YS; 55 El; 70 RA, 180 Brin
For spun parts, cold heading, special drawing; Type 305; austenitic, stainless.

CRUCIBLE 307.
M-38; 0.08 max C, 4 Mn, 9.5 Ni, 20.5 Cr, bal Fe.
For welding electrodes; austenitic, stainless

CRUCIBLE 308
M-38, 0.08 max C, 11 Ni, 20 Cr, bal Fe.
For welding electrodes; austenitic, stainless

CRUCIBLE 309
M-38, 0.20 max C, 13.5 Ni, 23 Cr, bal Fe.
Annealed. 90,000 TS, 40,000 YS, 50 El; 65 RA; 160 Brin
For furnace parts, heat treat boxes, boiler baffles, Type 309, austenitic, corrosion and
heat resistant

CRUCIBLE 309B
M-38, 0.20 max C, 2-3 Si, 22-24 Cr, 12-15 Ni, bal Fe
For furnace parts and equipment,
heat treating boxes, heat resistant,
stainless, austenitic.

CRUCIBLE 309S
M-38, 0.08 max C, 13.5 Ni, 23 Cr, bal Fe
Annealed 90,000 TS, 40,000 YS; 50 El, 65 RA, 150 Brin
For furnace parts, heat treat boxes, baffles,
tube supports, Type 309S; austenitic, corrosion and heat resistant

CRUCIBLE 310
M 38, 0.25 max C, 20.5 Ni, 25 Cr, bal Fe
Annealed 100,000 TS, 45,000 YS, 50 El, 65 RA, 180 Brin
For furnace parts and equipment, heat treat boxes, pots; Type 310, austenitic, heat resistant

CRUCIBLE 310CB
M-38, 0.08 max C, 20.5 Ni, 25 Cr, 1 Cb, bal Fe
Annealed 100,000 TS, 45,000 YS, 50 El, 65 RA, 185 Brin.
For welded parts, valves, pumps, furnace parts, austenitic, stainless, heat resistant

CRUCIBLE 310S
M-38, 0.08 max C, 20.5 Ni, 25 Cr, bal Fe.
Annealed: 100,000 TS, 45,000 YS; 50 El; 65 RA, 180 Brin.
For furnace parts and equipment,
heat treat boxes, Type 310S, austenitic,
heat resistant.

CRUCIBLE 311.
M-38; 0.25 max C, 2.5 Si, 25 Ni, 19 Cr, bal Fe.
For heat and scale resistant parts;
austenitic, stainless.

CRUCIBLE 312.
M-38; 0.10 C, 9 Ni, 30 Cr, bal Fe.
For welding electrodes; ferritic-austenitic, stainless.

CRUCIBLE 314.
M-38; 0.25 max C, 2.25 Si, 20.5 Ni, 24.5 Cr, bal Fe.
Annealed: 100,000 TS, 50,000 YS; 45 El, 60 RA; 180 Brin.
For heat and scale resistant parts, furnace parts; austenitic, stainless, heat resistant.

CRUCIBLE 316.
M-38, 0.10 max C, 12 Ni, 17 Cr, 2.5 Mo, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El, 80 RA; 140 Brin.
Cold drawn 150,000 TS, 135,000 YS, 6 El; 300 Brin.
For chemical plant equipment, agitators, digesters, kettles, Type 316, stainless, austenitic.

CRUCIBLE 316L.
M-38, 0.03 max C, 12 Ni, 17 Cr, 2.5 Mo, bal Fe.
Annealed 80,000 TS; 30,000 YS, 60 El, 80 RA; 140 Brin.
Cold drawn. 150,000 TS; 135,000 YS;
6 El, 300 Brin.
For chemical plant equipment, agitators, kettles, digesters, Type 316L, stainless, austenitic

CRUCIBLE 316 PLUS.
M-38; 0.08 max C, 2.0 max Mn, 1.0 max Si,
16-18 Cr, 10-14 Ni, 2.0-3.0 Mo, bal Fe.
Ann: 85,000 TS; 35,000 YS, 55 El, 170 Brin.
Austenitic, very good corrosion resistance,
non-magnetic, weldable
For parts for food and beverage equipment,
pulp handling, chemical plants.
AMS 5648 AISI Type 316 stainless

CRUCIBLE 317
M-38; 0.10 max C, 12.5 Ni, 19 Cr, 3.5 Mo, bal Fe.
Annealed: 85,000-90,000 TS, 40,000-45,000 YS, 50-45 El, 160-170 Brin
For chemical plant equipment, evaporators, kettles, digesters; Type 317, austenitic, stainless.

CRUCIBLE 318
M-38, 0.08 max C, 14 Ni, 18 Cr, 2.5 Mo, 1 Cb, bal Fe
For welded parts, stabilized, austenitic, stainless

CRUCIBLE 321
M-38, 0.08 max C, 9.5 Ni, 18 Cr, 0.5 Ti, bal Fe.
Annealed 85,000 TS, 35,000 YS, 55 El, 65 RA, 165 Brin
Cold drawn: 95,000 TS; 60,000 YS, 40 El,
60 RA, 185 Brin.
For chemical plant equipment, welded construction; stainless, Type 321, austenitic, stabilized

CRUCIBLE 325
M-38, 0.4 C, 1.5 Si, 22 Ni, 8.5 Cr, 1.2 Cu, bal Fe
Annealed 80,000-110,000 TS, 40,000-75,000 YS, 55-30 El, 65-45 RA, 130-205 Brin.
For crude oil and refinery equipment, heat treat boxes, Type 325; heat resistant, austenitic

CRUCIBLE 329
M-38, 0.15 C, 4 Ni, 26.5 Cr, 1.25 Mo, bal Fe
Annealed 95,000 TS, 50,000 YS, 45 El;
60 RA, 160 Brin
For chemical plant equipment, Type 329,
heat resistant

CRUCIBLE 330
M-38; 0.25 max C, 34.5 Ni, 15 Cr, bal Fe
Annealed 80,000 TS; 40,000 YS, 30 El; 30 RA; 160 Brin.
For furnace parts and equipment, fixtures,
pyrometer tubes; Type 330; stainless, austenitic,
heat resistant

CRUCIBLE 347.
M-38; 0.08 max C, 10.5 Ni, 18 Cr, 1 Cb, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El, 70 RA; 180 Brin.
For welded structures, chemical plant equipment; Type 347; stainless, stabilized.

CRUCIBLE 347-F-Se.
M-38; 0.08 max C, 17-19 Cr, 9-13 Ni, Cb = 10 × C, P, Se, bal Fe.
For chemical plant equipment; free-cutting, stainless, austenitic.

CRUCIBLE 403.
M-38; 0.15 max C, 12 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 140 Brin.
Cold drawn. 100,000 TS; 85,000 YS, 60 El; 205 Brin.
For flat springs, hardware, cutlery, tableware, Type 403; corrosion resistant.

CRUCIBLE 405.
M-38, 0.08 max C, 12.5 Cr, 0.2 Al, bal Fe.
Annealed. 70,000 TS, 40,000 YS; 30 El, 60 RA; 150 Brin.
Cold drawn. 85,000 TS; 70,000 YS, 20 El; 60 RA, 185 Brin.
For welded parts, annealing boxes, quenching racks, non-hardenable, ferritic, stainless.

CRUCIBLE 406.
M-38, 0.10 C, 13 Cr, 4 Al, bal Fe.
Annealed: 86,000 TS; 68,000 YS; 25 El; 57 RA; 160 Brin
For electrical resistance parts; non-hardenable, ferritic, stainless.

CRUCIBLE 410.
M-38, 0.15 max C, 12 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El, 70 RA, 140 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 60 El, 205 Brin
For flat springs, hardware, cutlery, tableware, Type 410; corrosion resistant AMS 5613.

CRUCIBLE 414.
M-38; 0.15 max C, 2 Ni, 12 Cr, bal Fe.
Annealed 115,000-120,000 TS, 90,000-105,000 YS, 15-20 El; 60 RA, 235-255 Brin
For corrosion resistant parts, hardenable, martensitic, stainless

CRUCIBLE 416.
M-38; 0.15 max C, 0.30 S, 13 Cr, bal Fe
Annealed 75,000 TS, 40,000 YS: 30 El, 60 RA, 155 Brin
Heat treated 110,000 TS, 85,000 YS, 18 El, 55 RA, 230 Brin
For screw machine products, gears, shafts, Type 416, free-cutting, stainless.

CRUCIBLE 416 PLUS.
M-38, 0.15 max C, 1.25 max Mn, 1.0 max Si, 0.06 max P, 0.15 min S, 12-14 Cr, 0.60 max Mo, bal Fe
Ann: 75,000 TS, 40,000 YS; 30 El, 155 Brin.
Free machining, magnetic, hardenable, corrosion resistant.
For corrosion resistant hardware, screw machine parts, bolts, nuts, shafts.
AISI 416; AMS 5610.

CRUCIBLE 416 PLUS X
M-38; 0.15 max C, 1.5-2.5 Mn, 13 Cr, 1.0 max Si, 0.06 max P, 0.15 min S, 0.6 max Mo, bal Fe.
Ann: 75,000 TS; 40,000 YS; 30 El; 155 Brin.
Free machining, magnetic, hardenable, corrosion resistant.
Parts made on automatic screw machines, bolts, studs, nuts, shafts.
AISI 416. AMS 5610.

CRUCIBLE 420.
M-38; 0.35 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 190 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For cutlery, dental and surgical instruments, valve trim; Type 420, stainless, hardenable.

CRUCIBLE 420 DENSIFIED.
M-38; 0.3-0.4 C, 1.0 max Mn, 1.0 max Si, 12-14 Cr, bal Fe.
Air hardenable to 250,000 TS
For plastic molds, glass molds, injection molds.

CRUCIBLE 420F
M-38, 0.35 C, 0.30 S, 13 Cr, bal Fe.
Annealed 95,000 TS; 50,000 YS, 25 El, 55 RA; 190 Brin
Cold drawn 105,000 TS, 85,000 YS; 17 El, 50 RA; 215 Brin
For cutlery, dental and surgical instruments, valve trim, Type 420F, free-cutting, stainless.

CRUCIBLE 420 F-Se
M-38, 0.15 min C, 12-14 Cr, P, Se, bal Fe
For valves, cutlery, knives, free-cutting, corrosion resistant.

CRUCIBLE 420S
M-38, 0.20 C, 13 Cr, bal Fe
Annealed 95,000 TS, 50,000 YS, 25 El, 55 RA, 196 Brin
For corrosion resistant parts, cutlery, surgical instruments, hardenable, free-cutting, stainless

CRUCIBLE 422.
M-38, 0.23 C, 0.9 Mn, 0.14 Si, 0.7 Ni, 13.2 Cr, 0.25 V, 1 W, 1 Mo, bal Fe
At 80°F: 149,000 TS, 125,000 YS, 18 El, 52 RA,
At 1000°F. 96,000 TS, 82,000 YS, 25 El, 67 RA
For compressor blades, valves, furnace parts, stainless, ferritic

CRUCIBLE 422M
M-38, 0.28 C, 0.9 Mn, 0.2 Si, 0.2 Ni, 12 Cr, 0.5 V, 1.7 W, 2.2 Mo, bal Fe
Rolled 177,000 TS, 140,000 YS, 16 El, 46 RA, 350 Brin
Heat treated 253,000 TS, 180,000 YS, 11 El, 36 RA
For jet engine parts, blades, disks, valves, bearings, stainless, hardenable

CRUCIBLE 430
M-38, 0.12 max C, 16 Cr, bal Fe
Annealed 70,000 TS, 40,000 YS, 30 El, 55 RA, 140 Brin
Cold drawn 130,000 TS, 120,000 YS, 2 El
For kitchen sinks, chemical and dairy equipment, bolts, Type 430, stainless, ferritic

CRUCIBLE 430F
M-38, 0.12 max C, 0.30 S, 16 Cr, bal Fe
Annealed. 70,000 TS; 40,000 YS, 30 El, 55 RA; 140 Brin
Cold drawn. 130,000 TS; 120,000 YS; 2 El
For screw machine products, bolts, fasteners, gears; Type 430F; stainless, free cutting.

CRUCIBLE 430-F-Se
M-38, 0.12 C, 14-18 Cr, 0.15 min Se, bal Fe
For stainless parts, shafts, valves; free-cutting, corrosion resistant

CRUCIBLE 431.
M-38; 0.20 max C, 2 Ni, 16 Cr, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For corrosion resistant parts, valves, marine hardware; hardenable, martensitic, stainless.

CRUCIBLE 440A.
M-38; 0.65 C, 17 Cr, bal Fe.
Annealed: 95,000 TS; 55,000 YS; 20 El; 250 Brin.
Heat treated: 275,000 TS; 240,000 YS; 2 El; 555 Brin.
For cutlery, valves, dental and surgical instruments, bearings; Type 440A, stainless, hardenable.

CRUCIBLE 440B
M-38; 0.85 C, 17 Cr, bal Fe.
Annealed. 107,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin.
Heat treated: 280,000 TS, 270,000 YS; 3 El; 15 RA; 555 Brin.
For cutlery, valves, dental and surgical instruments, bearings. Type 440B; stainless, hardenable.

CRUCIBLE 440BM.
M-38; 0.95 C, 18 Cr, 0.5 Mo, bal Fe
Annealed: 107,000 TS; 62,000 YS, 18 El; 35 RA; 220 Brin
For corrosion and wear resistant parts, cutlery, bearings, hardenable, martensitic, stainless.

CRUCIBLE 440BMF.
M-38, 0.95 C, 0.30 Si, 18 Cr, 0.5 Mo, bal Fe
Annealed 107,000 TS, 62,000 YS, 18 El, 35 RA; 220 Brin.
For corrosion and wear resistant parts, free-cutting, hardenable, stainless.

CRUCIBLE 440C
M-38, 1.05 C, 17 Cr, bal Fe.
Annealed 110,000 TS, 65,000 YS, 15 El, 30 RA; 225 Brin
Heat treated 290,000 TS, 275,000 YS; 2 El, 12 RA, 575 Brin
For cutlery, valves, bearings, pivots; Type 440C, stainless, hardenable

CRUCIBLE 440 F-Se
M-38, 0.95-1.2 C, 16.5-18.5 Cr, P, Se, bal Fe
For bearings, valves, pivots; stainless, free-cutting, hardenable.

CRUCIBLE 442.
M-38, 0.25 max C, 20.5 Cr, bal Fe.
For corrosion and heat resistant parts; non-hardenable, ferritic, stainless

CRUCIBLE 446
M-38, 0.20 max C, 1.5 max Mn, 23-27 Cr, bal Fe
Ann 80,000 TS, 50,000 YS, 25 El, 86 Rock B.
Magnetic, corrosion resistant, non-hardenable, weldable.
For heat treat equipment, radio tube parts, rotary driers, and retorts, tank cars, combustion chambers
Type 446

CRUCIBLE 501.
M-38; 0.20 C, 4-6 Cr, bal Fe.
Annealed. 70,000 TS, 30,000 YS, 28 El; 65 RA; 160 Brin
Heat treated: 175,000 TS; 135,000 YS; 15 El, 50 RA; 370 Brin.
For furnace parts, valve trim, oil refinery equipment, Type 501, creep resistant.

CRUCIBLE 502.
M-38; 0.10 max C, 4-6 Cr, 0.5 Mo, bal Fe
Annealed: 75,000 TS; 35,000 YS; 26 El; 60 RA; 160 Brin.
For furnace parts, valve trim, oil refinery equipment; Type 502; creep resistant.

CRUCIBLE 1383.
M-38; 0.08 C, 11-13 Cr, 14-16 Ni, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 55 El; 72 RA; 116 Brin.
Cold worked: 80,000 TS; 60,000 YS; 50 El; 70 RA; 140 Brin
For corrosion resistant parts; stainless.

CRUCIBLE 3003.
M-38; 0.60 C, 4.5 Mn, 15 Ni, 12.5 Cr, 3 Al, bal Fe.
For corrosion resistant parts; age-hardenable, high strength, stainless.

CRUCIBLE 3311.
M-38; 0.15 C, 23 Ni, 21.5 Cr, 3.25 Al, bal Fe.
For corrosion resistant parts, age-hardenable, high strength, stainless.

CRUCIBLE 3329.
M-38; 0.40 C, 6.25 Ni, 24 Cr, 4.25 Mo, bal Fe.
For corrosion resistance and strength; hardenable by sigma phase, stainless.

CRUCIBLE A-40.
M-38, 0.10 C, 0.07 N, 0.01 H, bal Ti.
Rolled: 65,000 TS, 50,000 YS, 28 El; 50 RA.
For high temperature applications; for maximum ductility and formability

CRUCIBLE A 55.
M-38, 0.20 max C, 0.015 max H, 0.08 max N, bal Ti
Annealed: 75,000 TS, 65,000 YS, 25 El; 50 RA.
For non-structural aircraft parts, commercial titanium.

CRUCIBLE A 70
M-38, 0.05-0.15 C, 0.07 max N, bal Ti
Annealed 90,000 TS; 80,000 YS, 20 El, 40 RA.
For aircraft parts, commercial titanium.

CRUCIBLE A-110 AT
M-38; 5 Al, 2.5 Si, bal Ti.
Cold drawn: 125,000 TS; 120,000 YS, 18 El, 40 RA; 350 Brin
At 600°F: 88,000 TS, 67,000 YS, 17 El, 45 RA.
At 1200°F: 39,000 TS, 25,000 YS, 38 El, 59 RA.
For compressor blades, jet engine components, high fatigue and creep resistance

CRUCIBLE BETA III.
M-38, 11.5 Mo, 6 Zr, 4.5 Sn, bal Ti
Ht Tr 205,000 TS, 191,000 YS, 7 El, 29 RA
Annealed 122,000 TS, 107,000 YS, 20 El, 32 RA
For aircraft and structural fasteners
Heat treatable beta alloy

CRUCIBLE B 110 Mo
M-38, 30 Mo, bal Ti
For high temperature applications

CRUCIBLE B 120 VCA
M-38, 13.5 V, 11 Cr, 3 Al, bal Ti
Rolled 125,000 TS; 120,000 YS, 10 El
Aged: 200,000 TS, 180,000 YS, 5 El; 5-20 RA.
For missile and aircraft components, honeycomb structures, age-hardened, good formability.

CRUCIBLE C 105 VA
M-38, 14-17 V, 2.5 Al, 2.25-3.25 Al, bal Ti.
Solution-annealed 105,000 TS, 30,000 YS, 16 El; 30 RA.
Aged. 190,000 TS; 182,000 YS, 5 El, 17 RA.
For high temperature applications, aircraft and missile components; heat treatable, good formability and ductility.

CRUCIBLE C 110M.
M-38, 7-9 Mn, bal Ti.
Annealed: 130,000 TS; 120,000 YS; 15 El; 32 RA; 330 Brin
For structural airframe members, skins, stiffeners; good formability.

CRUCIBLE C 115 AMoV.
M-38; 4 Al, 3 Mo, 1 V, bal Fe.
Rolled: 115,000 YS.
For high temperature applications; serviceable to 1100°F, heat treatable.

CRUCIBLE C-120AM.
M-38; 4 Al, 4 Mn, bal Ti.
Rolled: 130,000 TS; 120,000 YS; 10 El.
For aircraft and jet engine components; heat resistant, low density.

CRUCIBLE C-120 AV.
M-38; 6 Al, 4 V, bal Ti.
Annealed: 140,000 TS; 130,000 YS; 15 El; 40 RA
Heat treated: 190,000 TS; 180,000 YS; 10 El; 30 RA.
For jet engine components, ordnance equipment; high temperature strength, creep resistant.

CRUCIBLE C 130AM
M-38; 4 Mn, 4 Al, 0.05 C, bal Ti
Rolled: 150,000 TS; 140,000 YS; 18 El, 40 RA, 330 Brin.
For jet engine components, airframe forgings, bolts, fasteners; good creep strength above 600°F.

CRUCIBLE C 130AMo.
M-38; 6.5 Al, 3.75 Mo, bal Ti
At room temperature. 160,000 TS; 150,000 YS; 15 El; 40 RA.
At 1000°F: 100,000 TS, 90,000 YS
For jet engine discs and blades, fasteners; age-hardenable, alpha-beta alloy.

CRUCIBLE C-135 AMo.
M-38; 6.3-7.3 Al, 3.5-4.5 Mo, 0.15 max C, 0.0125 max H, bal Ti
Rolled: 150,000-170,000 TS; 145,000-155,000 YS; 18-13 El, 45-30 RA
For jet engine components, compressors, missile parts, alpha-beta type, high temperature stability.

CRUCIBLE CCS.
M-38; 0.40 C, 1.15 Si, 0.3 Mn, 5.25 Cr, 4.25 W, bal Fe.
Hardened C 55-58 Rock.
For die casting dies, forging and extrusion tools, dummy blocks
Good high temperature properties
Type H 14 hot work steel, air harden.

CRUCIBLE CMC
M-38, C, Cr, Mn, bal Fe.
For jet engine and missile components, stainless, resists oxidation to 2100°F

CRUCIBLE COLLET
M-38; 0.60 C, 0.40 Ni, 0.80 Cr. 0.90 Mn, 0.20 Mo, bal Fe
For spring collets; oil hardened, shock resistant.

CRUCIBLE COPPER BOND.
M-38; copper welded to steel core.
For nails, staples, line wire, obsolete.

CRUCIBLE CSA39.
M-38; 27 Ni, 18 Cr, 9 Mo, 3 W, bal Fe.
For high temperature applications.

CRUCIBLE CSM NO. 2.
M-38; 0.30 C, 1.65 Cr, 0.45 Mo, bal Fe.
For plastic mold and die casting dies; oil hardened AISI P 20.

CRUCIBLE CVM.
M-38; 0.5 C, 1 Cr, 0.2 V, 0.8 Mn, bal Fe.
For plastic mold and die casting dies; oil hardened.

CRUCIBLE D 6.
M-38; 0.46 C, 0.75 Mn, 0.22 Si, 0.55 Ni, 1.0 Cr, 1.0 Mo, 0.08 V, bal Fe.
Heat treated: 150,000-299,000 TS; 140,000-211,000 YS; 18.4-8.5 El; 60.8-19.0 RA; 360-570 Brin.
For aircraft landing gear and structural components, rocket motor cases, pressure vessels, die blocks; deep hardening, ultra high strength.

CRUCIBLE D-319.
M-38; 0.07 C, 17.5-19.5 Cr, 11.0-15.0 Ni, 2.25-3.0 Mo, bal Fe
For chemical plant equipment; stainless, austenitic.

CRUCIBLE DIAMOND BRAND.
M-38, 1.65 C, 18 Cr, 1 V, bal Fe.
For wear resistant parts, dies; nondeforming, stainless

CRUCIBLE-F
M-1191, 0.4 C, 1.5 Ni, bal Fe
Cast: 80,000 TS, 45,000 YS; 180 Brin
For crankshafts, gears, machinery castings; oil hardening, shock resistant

CRUCIBLE FIVE PLY SAFE & VAULT STEEL
M-38, C, alloy, bal Fe
For safe, vault and jail construction, tough

CRUCIBLE HNM
M-38, 0.30 C, 3.5 Mn, 0.5 Si, 9.5 Ni, 18.5 Cr, 0.25 P, bal Fe
At 80°F 168,000 TS, 124,000 YS, 19.5 El, 31.5 RA, 380 Brin
At [illegible]0°F: 89,000 TS, 80,000 YS; 19.0 El, 38.5 RA
At 1800°F. 49,000 TS, 46,000 YS, 4.0 El; 16.5 RA
For aircraft and jet engine components, structural members, age hardened, stainless

CRUCIBLE HNM
M-38, 0.3 C, 0.5 Ni, 3.5 Mn, 18 Cr, bal Fe
Annealed 116,000 TS, 56,000 YS, 57 El, 192 Brin
Heat treated 168,000 TS, 124 000 YS, 19 El, 352 Brin
For corrosion resistant parts, hardenable, corrosion resistant

CRUCIBLE HOLDER BLOCK STEEL
M-38, 0.50 C, 1.25 Mn, 0.08 S, 0.65 Cr, 0.18 Mo, bal Fe.
Hardenable to 300,000 TS max
For backers for forging dies, brake dies, frames for plastic molds

CRUCIBLE HRB
M-38, 0.12 C, 2.25 Cr, 0.9 Mo, 0.15 Ti, 0.5 V, 0.025 B, 0.4 Mn, bal Fe
Heat treated 160,000 TS, 151,000 YS; 17 El, 60 RA
For high temperature bolts, compressor blades and wheels, high strength and good ductility to 1100°F

CRUCIBLE HTX
M-38, 0.45 C, 21 Cr, 8.5 Ni, 8.5 Mn, 1.5 Mo, 0.23 P, bal Fe.
For corrosion resistant parts, stainless.

CRUCIBLE JAIL BAR STEEL
M-38, C, Mn, Mo, bal Fe.
For jail bars; tough

CRUCIBLE M-252.
M-38; 0.15 C, 0.5 Mn, 19 Cr, 55 Ni, 10 Co, 10 Mo, 2.5 Ti, 1 Al, 2 Fe.
At 70°F: 175,000 TS; 98,000 YS; 25 El.
At 1600°F: 71,200 TS; 70,500 YS; 39.5 El; 55.5 RA.
For jet engine and gas turbine parts; oxidation resistant to 1800°F.

CRUCIBLE M-308.
M-38; 0.04 C, 13 Cr, 33 Ni, 3 Mo, 6.4 W, 2 Ti, 0.3 Al, 0.2 Zr, bal Fe.
For jet engine and gas turbine components; high oxidation resistance.

CRUCIBLE NCR124MOD.
M-38; 0.55 C, 5.0 Mn, 9.5 Ni, bal Fe.
Cold drawn: 120,000-125,000 TS; 90,000-100,000 YS; 16 El; 30 RA; 248-331 Brin.
For aircraft parts, bolts, studs; corrosion and heat resistant .

CRUCIBLE NITRARD NO. 1.
M-76 1.1 C, 12 Cr, Mo, V, bal Fe.
For dies; non-deforming

CRUCIBLE NITRIDING BM.
M-38; 0.35 C, 0.80 Mn, 0.10 S, 1.15 Cr, 0.2 Mo, 1.1 V, bal Fe
For gears, shafts, camshafts, cams; nitriding steel.

CRUCIBLE ORTHOPEDIC STEEL.
M-38; C, alloy, bal Fe.
For orthopedic braces.

CRUCIBLE PHV.
M-38; 0.27 C, 2.8 Ni, 1.15 Cr, 0.4 V, 0.25 Mo, 1.15 Al, bal Fe
Heat treated: 170,000 TS; 159,000 YS; 16 El; 365 Brin.
For dies; oil hardened, tough.

CRUCIBLE RENE 41.
M-38; 0.12 C, 19 Cr, 11.3 Co, 10 Mo, 3 Ti, 1.5 Al, bal Ni
At 70°F 206,000 TS; 154,000 YS, 14 El
At 1500°F 126,000 TS, 118,000 YS, 14 El
For jet engine components, after-burner parts, severely stressed high temperature applications

CRUCIBLE SA22
M-38, 0.22 C, 1.15 Mn, 1 Si, 1.15 Ni, 0.5 Cr, 0.4 Mo, bal Fe
Heat treated 156,000 TS; 129,000 YS; 15 El, 51 RA; 340 Brin
For structures, aircraft sheet components, good weldability, resists softening or tempering.

CRUCIBLE SCB
M-38, 0.08 max C, 13.5 Ni, 23 Cr, 1 Cb, bal Fe.
For welded parts, stabilized austenitic stainless steel

CRUCIBLE SELF-TEM.
M-38, 0.35 C, 0.70 Mn, 0.85 Cr, 0.50 W, 0.40 Mo, bal Fe
Heat treated 137,000 TS, 120,000 YS, 20 El, 65 RA; 300 Brin
For shafting, bolts, machinery parts; oil hardened, shock resistant

CRUCIBLE STAINLESS IRON
M-38, 0.2 C, 12-24 Cr, bal Fe
For stainless articles; stainless and corrosion resistant

CRUCIBLE STAINLESS STEEL
M-38, 11-30 Cr, C, bal Fe.
For stainless articles, corrosion resistant.

CRUCIBLE TXCR.
M-38, 0.40 C, 4.25 Mn, 0.80 Si, 2.4 Cr, 1.3 Mo, 3.75 Ni, bal Fe
Heat treated: 136,000 TS; 4.7 El; 4.0 RA; 380 Brin
For automotive exhaust valves; heat resistant.

CRUCIBLE UHS 260.
M-38; 0.35 C, 1.25 Mn, 1.5 Si, 1.25 Cr, 0.35 Mo, 0.2 V, bal Fe.
Heat treated: 270,000 TS; 230,000 YS; 11 El; 40 RA; 520 Brin.
For landing gears, bomb release hooks, axles; shock resistant, high strength.

CRUCIBLE VERSASTEEL.
M-38; 1.0 C, 0.3 Mn, 2.0 Si, 4.25 Cr, 1.15 V, 2.5 Mo, 0.30 W, bal Fe.
Heat treated: 232,000-360,000 TS, 204,000-307,000 YS; 2-15 El; 2.5-3.0 RA, C 47-61 Rock.
For thread chasers, drills, taps, reamers, dies, punches, thread rolling and swaging dies, slitter knives, cold shears.
Tough and wear resistant.

CRUCIBLE WASPALOY
M-38, 0.07 C, 19 Cr, 56 Ni, 14 Co, 4.3 Mo, 3 Ti, 1.3 Al, 1 Fe.
At 70°F. 188,000 TS; 115,000 YS, 28 El; 25.5 RA.
At 1400°F: 117,000 TS, 99,000 YS; 28 El; 41.0 RA
For jet engine turbine buckets and discs, high temperature bolts; high oxidation resistance.

CRUCIBLE WF11.
M-38: 0.15 C, 19-21 Cr, 9-11 Ni, bal Fe
Heat treated: 160,000 TS; 85,000 YS; 55 El
For aircraft turbine blades, after burners; corrosion and heat resistant.

CRUCIN
M-303, 44 Ni, 56 Cu
For kitchen utensils, kettles; corrosion and wear resistant.

CRUSADER XL
M-73, 1.2 C, 4.1 Cr, 6.0 W, 3.0 V, 5.0 Mo, alloy sulphides, bal Fe
Hardened. C 65 68 Rock
For form cutters, roll turning cutters, lathe and planer tools
Good machineability rating
Type M-3 Type 2 high-speed steel, high red-hardness and edge toughness.

CRUSCA 12B
M-38, 0.10 C, 3.5 Ni, 0.5 Mn, 1.6 Cr, bal Fe.
Heat treated 165,000 TS, 135,000 YS, 16 El; 50 RA, 380 Brin
For machine cut plastic molds; carburizing steel.

CRUSCA COLD HUBBING
M-38, 0.07 C, 0.15 Mn, bal Fe
Heat treated 60,000 TS, 40,000 YS, 30 El, 65 RA; 120 Brin
For cold hubbed dies for plastic molds, case hardening steel, water hardened.

CRUSCA FLAME HARDENING.
M-38, 0.70 C, 0.8 Mn, 0.3 Cr, bal Fe
For flame hardened parts, water hardening.

CRUSCA NEW PROCESS HOLLOW DRILL
M 38, 0.8 C, bal Fe
For tools, hollow drills, water hardening

CRUSCA SOLID DRILL.
M-38, 0.8 C, bal Fe
For solid drills, tools, water hardening.

CRUSCO STEEL.
M-153; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For piercing points, rolling mill plugs, dies, forming rolls, high abrasion resistance at high temperature.

CR-VICALLOY.
M-Japan; 12 (Cr + V), 52 Co, bal Fe.
For electrical and magnetic equipment.
Permanent magnet.

CRWXI.
M-459; 0.9 C, 1.7 Cr, bal Fe.
For rolls for steel mills; oil hardened.

CRYSTALLOY.
M-1664; 3 Si, bal Fe.
For transformers, lamination for motors and generators.
High magnetic permeability.

CS.
M-459; 0.8 C, 1 Cr, 0.8 Si, bal Fe.
For shears, knives, cutters; oil or water hardened.

CSA.
M-38; 0.20-0.30 C, 5 Mn, 18-20 Cr, 6 Ni, 1.5 Mo, 1.5 W, 0.4 Cb, bal Fe.
For discs and wheels for gas turbines; high heat resistance.

CSA.
M-459; 0.6 C, 1.6 Si, 0.6 Mn, 0.8 Cr, bal Fe.
For tools, springs, chisels; shock resistant.

CSA-G40.8.
M-1253; 0.15-0.22 C, 0.80 Mn, 0.008 max N, 0.35 max Si, bal Fe.
Rolled: 65,000-85,000 TS; 36,000-40,000 YS; 20 El.
For structures, bridges, buildings; high yield strength and good weldability.

CSF SOLDER ROLL STEEL.
M-1437; 5.5 Ni, low C, bal Fe.
For solder rolls and solder wiping mandrels.

C.S.M.
M-260, M-38; 0 7-1.4 C, 0.75 Mn, 0.75 Cr, bal Fe
For wrenches, valve parts, studs, bolts, chisels, springs, shafts, gears; tough, fatigue resistant.

CSM-2.
M-38; M-1214; 0.30 C, 0.75 Mn, 0.5 Si, 1 65 Cr, 0.40 Mo, bal Fe.
For Zn and Sn die casting dies; oil or water hardened.

C.S.M. STEEL.
M-259; 0.15 C, 0.30-0.70 Cr, bal Fe.
Oil treated: 110,000 TS; 25 El; 68 RA, 219 Brin
For springs, gears, axles, shafts, tough

CSN 13-123
M-Poland; 0.23 C, 1.1 Mn, 0.2 V, bal Fe
For gears, shafts, hardware.
Cast case hardening and water hardening.

CSP.
M-459; 1.2 C, 0.5 Cr, bal Fe.
For tools, drills, hobs; water hardening.

CSV1.
M-459; 0.61 C, 0.75 Mn, 1.2 Cr, 0.1 V, bal Fe
For springs, punches; oil hardened, shock resistant

C.T.C. FERRY.
M-121; 45 Ni, 55 Cu.
Annealed: 73,000 TS; 34,000 YS; 47 El; 77 RA; 155 Brin.
For instrument resistances; heat and corrosion resistant.

C.T. METAL.
M-815; Pb alloy.
For slush castings, statues, low M.P.

C.T.V. HOT WORK.
M-261; 0.40 C, 3.5 Cr, 2.4 W, 0.5 V, bal Fe.
For bolt and extrusion dies; hot work steel; oil hardening.

Cu-Be 50.
M-108; 0.5 Be, 2.5 Co, bal Cu.
Annealed: 5[illegible]000 TS; 25,000 YS; 30 El; B 30 Rock.
Ht. Tr.: 120,000 TS; 105,000 YS; 10 El; B 100 Rock.
For wire and strip springs, clips, connectors.
Age-hardenable. Corrosion resistant.
Non-magnetic and non-sparking.

Cu-Be 250.
M-108; 2 Be, 0.25 Co, bal Cu.
Ht. Tr.: 200,000 TS; 180,000 YS; 1-3 El.
For wire and strip springs, clips, connectors.
Non-magnetic, non-sparking
Age-hardenable. Corrosion resistant.

CUBE-ALLOY.
M-63; BeO, bal Cu.
At 68°F: 80,000 TS; 63,000 YS; 12 El, 50 RA.
At 1600°F: 23,000 TS; 22,000 YS; 2 El; 1 RA.
For motor windings, springs, magnet wire, cables, welding electrode tips.
Beryllia-strengthened copper.
High resistance to creep.

CuBe INJECTION MOLD.
M-108; 2.7 Be, 0.5 Co, bal Cu.
Ht. Tr.: 195,000 TS; 170,000 YS, 2 El.
For plastic injection molds and zinc die casting dies
Age-hardenable. Corrosion resistant.

CUBEX.
M-118; 3.2 Si, bal Fe.
For electrical and magnetic equipment, motors, transformers, cores.
Doubly grain oriented

CUFENIUM.
U S., 72-60 Cu, 22-20.5 Ni, bal Fe.
For tableware, nickel silver.

CUFENLOY-30.
M-319, 29.1 Ni, 0 5 Fe, 0 35 Mn, bal Cu
At 75°F· 77,000 TS; 61,000 YS, 58 El
At 700°F 62,000 TS, 19,000 YS, 62 El
At 1050°F 43,000 TS, 16,000 YS, 48 El
For heat exchanger tubes, high strength, ductility and stress corrosion resistance

CUFENLOY-40
M-319; 41 Ni, 2 Fe, 1 Mn, bal Cu
Rolled 85,000 TS
For high-pressure feed water heaters, high strength, high temperature alloy.

CUFERCO
M-118, 96 Cu, 2 Fe, 2 Co.
For spot welding tips, hardenable electric conductivity = 70% Cu.

CUIVRFLECT.
French, Cu alloy
For welding rods

CUIVRE POLI
France, 70 Cu, 30 Zn.
For cartridges, shell cases, condenser tubes; maximum ductility

CU-LEAD-ITE NO 1.
M-481, 70 Cu, 20 Pb, 10 Sn
Cast· 31,000 TS; 11 El; 12 RA, 68 Brin.
For nuts, parts for pneumatic tools subjected to severe pounding and abuse; tough, hard casting.

CU-LEAD-ITE NO 2.
M-481; 68 Cu, 25 Pb, 7 Sn
Cast. 25,000 TS, 16 El, 15 RA; 48 Brin.
For severe service such as bearings in rolling mills, wire mills, diesel engines, ball mills and gyratory crushers; heavy duty.

CU-LEAD-ITE NO 3.
M-481; 65 Cu, 30 Pb, 5 Sn.
Cast: 23,200 TS; 17 El; 18 RA; 43 Brin
For all round bearing service in high speed engines, locomotives, mills and railroads; heavy duty.

CU-LEAD-ITE NO. 4.
M-481; 60 Cu, 38 Pb, 2 Sn.
Cast: 18,500 TS; 14 El; 15 RA; 38 Brin.

For bearings for all small machinery, deep well pumps, conveyors, connecting rods, automobiles and trucks; heavy duty.

CU-LEAD-ITE NO. 5.
M-481; 50 Cu, 50 Pb.
Cast: 6000 TS; 20 El; 21 RA; 14 Brin.
For railroad locomotives, piston packers, metallic packing, bibs, etc.; withstands superheated steam.

CU-LEAD-ITE NO. 6.
M-481; 66 Cu, 34 Pb.
Cast: 8910 TS; 15 El; 16 RA; 28 Brin.
For small high speed machinery, pumps, electric drills, loose pulleys, small tools; heavy duty.

CULVER NCS.
M-1195, 0.50 C, 2 W, 1.65 Cr, 0.25 V, bal Fe.
Annealed: 70,000 TS; 30 El; 64 RA; 165 Brin.
Heat treated. 245,000 TS; 5 El; 18 RA; 525 Brin.
For punches, dies, chisels, pneumatic tools; shock resistant, oil hardened.

CUMANITE.
M-9; C, Mn, bal Fe.
For machine tool parts; wear resistant.

CUMBERLAND
M-213, 0.18-0.23 C, bal Fe.
Rolled: 60,000-70,000 TS, 35,000-45,000 YS; 35-25 El, 60-50 RA.
For shafts, gears; case hardening.

CUMLOY see WEST No. 9, 10, etc

CUNIC
M-602; 45 Ni, 55 Cu
Annealed 62,000 TS, 25 El.
For rheostats, shunts, thermocouples, low temperature resistance

CUNICO-1
M-38, M 1076, 50 Cu, 21 Ni, 29 Co
Rolled 85,000 TS, 210 Brin.
Annealed. 3400 Br, 710 Hc; 2000 Bo
For magnetic and electrical equipment
Permanent magnet, high coercive force

CUNIFE 1
M-1076, 60 Cu, 20 Ni, 20 Fe.
Permanent magnet, cold reduced.
Peak energy product (BdHd) max X 10^6 1.3
Residual Induction, Br, (kilogauss) 5.4.
Coercive force Hc (oersteds) 500.
Most ductile grade of permanent magnet

CUNILOY.
U.S., 25 Cu, 3.8 Mn, 1 Pb, bal Ni
For pump rods, valve parts; corrosion resistant.

CUNIP.
M-63; 1.1 Ni, 0.2-0.3 P, bal Cu
Wire or strip 57,000-98,000 TS, 3-5 El.
For electron tube components, cathode supports, tuning fingers, spring clips. Heat treatable
High strength and electrical conductivity.

CUNISIL 647.
M-8; 0.6 Si, 1.9 Ni, bal Cu .
Ht. Tr: 100,000 TS, 85,000 YS; 15 El; Rock B 95.
For electrical equipment, electrical hardware, machined mechanical fasteners.
Precipitation hardening. Corrosion resistant. 35% electrical conductivity.

CUNISIL 837.
M-8; 97.5 Cu, 1.9 Ni, 0.6 Si.
Precipitation hardened: 90,000 TS; 70,000 YS; 8 El; 90 Rock B.
For electrical apparatus; corrosion resistant.

CUPA.
M-204; Cu plated Al.

CUPAL.
M-127; Cu-clad Al sheet.
For panels for railroad cars; corrosion resisting.

CUPAL.
U.S; 80 Al, 20 Cu.
For copper-clad aluminum; 10 Cu-80 Al-10 Cu.

CUPALLOY
Russia; 0.5 Cr, bal Cu.
For electrical equipment, motors, high conductivity.

CUPALOY.
M-118, M-214; 0.5 Cr, 0.1 Ag, bal Cu.
Rolled: 70,000 TS; 65,000 YS; 15 El; 50 RA; 150 Brin
Cast: 55,000 TS, 35,000 YS, 30 El; 60 RA; 125 Brin
For commutators, slip rings, terminal studs; age-hardenable, high electrical conductivity.

CUPLAT.
M-1493; 40 Pt, 60 Cu.
For brazing cathode structures.
M.P. 1185-1216°C, corrosion resistant. Low vapor pressure.

CUPRALIUM.
German, 7-8 Cu, bal Al.
For light alloy parts; non-hardenable.

CUPRALIUM 12.
German, 11.5-12.5 Cu, bal Al
For light alloy castings, non-hardenable

CUPRALUM.
M-1193, lead clad copper.
For chemical plant equipment, acid resistant

CUPRALUMIN 8
8 Cu, 0.5 Fe, 1.5 Si, bal Al.
For light alloy parts; similar to Alcoa 12

CUPRALUMIN 12
12 Cu, bal Al
Cast 21,000-26,000 TS, 20,000-24,000 YS, 0.5-1.5 El, 80-90 Brin.
For light alloy parts, non-hardenable

CUPRANIUM
Eng., Ni, Zn, bal Cu
For corrosion resistant parts, corrosion resistant

CUPRO-ALUMINUM.
U.S., 10 Al, Fe, bal Cu.
For worm wheels, gears; aluminum bronze

CUPROCHROME.
M-61, 1 Cr, bal Cu.
Annealed. 40,000 TS, 27,000 YS, 25 El
For electron tubes; high conductivity

CUPRODIE see FINKL CUPRODIE

CUPROMAGNESIUM
U.S., 90 Cu, 10 Mg
For cast iron inoculant, graphite spheroidizer.

CUPROMANGANESE
U.S; 90 Cu, 10 Mn.
For staybolts, heat resisting parts; heat resistant.

CUPROMANGANESE TUBES
U.S., 96 Cu, 4 Mn.
For tubes; corrosion resistant.

CUPRON.
M-61; 55 Cu, 45 Ni.
Annealed: 62,000 TS.
For rheostats, voltmeters, shunts, resistances; similar to "Advance", "Ideal", "Constantan" and "Ia-Ia."

CUPRON.
M-897; 45 Ni, 55 Cu.
Annealed: 85,000 TS; 50,000 YS; 50 El.
For strain gauges, rheostats;
low temperature coefficient of resistance.

CUPRONAR 900.
M-677; deoxidized copper, 1.0 Sn.
For welding wire; AWS RCu, ECu.

CUPRONAR 910.
M-677; 2.8-4.0 Si, 0.5 Fe, 94 Min Cu.
For welding wire; silicon bronze, AWS RCuSi-A, ECuSi.

CUPRONAR 920A.
M-677; 4-6 Sn, 0.1-0.35 P, 93.5 min Cu.
For welding wire, phosphorus bronze, AWS RCuSn-A, ECuSn-A.

CUPRONAR 920C.
M-677; 7-9 Sn, 0.05-0.35 P, bal Cu.
For welding wire, phosphorus bronze, AWS ECuSn-C.

CUPRONAR 950.
M-677; 6-9 Al, 0.1 Si, bal Cu.
For welding wires; aluminum bronze, AWS ECuAl-A1.

CUPRO-NICKEL 5% 704
M-279; 93 Cu, 5.5 Ni, 1.5 Fe.
Available annealed or cold rolled.
For welded heat exchanger tubes, corrosion resistant

CUPRO-NICKEL 7% 705.
M-279, 93 Cu, 7 Ni
Ann: 36,000-42,000 TS, 35-42 El
Cold rolled: 39,000-70,000 TS; 1-32 El.
For resistance strips for fuses
Constant resistivity and melting temperature

CURRO-NICKEL 9% 725
M-8; 88.78 Cu, 9.0 Ni, 2.0 Sn, 0.22 Mn
Sheet, hard: 80,000 TS, 76,000 YS; 3 El; 90 Rb
Soft: 52,000 TS; 22,000 YS, 40 El; 42 Rb
For connectors used in telephone, computer and other electrical and electronic systems; tableware, boat hardware

CUPRO-NICKEL 10%.
M-33, 89.25 Cu, 10 Ni, 0.75 Fe.
Annealed 42,000 TS, 14,000 YS, 45 El.
For condenser tubes, heat exchanger tubes, corrosion resistant

CUPRO-NICKEL 10%-510.
M-141; 10 Ni, 0.85 Fe, bal Cu.
Annealed: 46,000 TS; 42 El.
Drawn: 75,000 TS, 10 El.
For condensers and heat exchangers; corrosion resistant.

CUPRO-NICKEL 10%-511
M-141; 88.85 Cu, 10 Ni, 1.15 Fe.
Hard: 50,000 TS; 45,000 YS; 18 El.
Soft: 45,000 TS; 15,000 YS; 40 El.
For condensers and heat exchangers; corrosion resistant.

CUPRO-NICKEL 10% 706.
M-8; 88.35 Cu, 10 Ni, 1.25 Fe, 0.40 Mn.
Hard tube: 60,000 TS; 57,000 YS; 15 El; B 68 Rock.
Soft tube: 44,000 TS; 22,000 YS; 46 El; [illegible] 25 Rock.
For condenser tubes, heat exchangers, marine equipment, oil refinery condensers and evaporators.
Resists general corrosion and stress corrosion cracking.

CUPRO-NICKEL 10% 706.
M-279; 88 Cu, 10 Ni, 1.4 Fe, 0.6 Mn.
Ann: 40,000-50,000 TS; 10,000-25,000 YS; 33-40 El.
Cold rolled: 54,000-88,000 TS; 48,000-84,000 YS; 1-30 El.
For heat exchanger tubes and plates.
Excellent salt water corrosion resistance.

CUPRO-NICKEL 10%-755
M-8; 10 Ni, 0.4 Mn, 1.25 Fe, bal Cu.
Soft: 44,000 TS; 22,000 YS; 46 El
Hard: 60,000 TS; 57,000 YS, 15 El.
For condenser tubes, resists sea water corrosion

CUPRO-NICKEL 20%-520.
M-141, 78.85 Cu, 20 Ni, 0.4 Fe, 0.75 Mn
Soft: 49,000 TS, 14,000 YS; 40 El.
For condensers and heat exchangers; corrosion resistant.

CUPRO-NICKEL 20%-710.
M-8, 78.75 Cu, 20 Ni, 0.75 Fe, 0.5 Mn
Annealed 50,000 TS, 22,000 YS, 45 El
For feed water heaters, corrosion resistant.

CUPRO NICKEL 25% 713
M-279, 75 Cu, 25 Ni.
Ann. 48,000-58,000 TS, 14,000-24,000 YS, 35-45 El
Cold rolled 54,000-94,000 TS; 16,000-89,000 YS, 2-38 El
For heat exchanger tubes and plates
Excellent salt water corrosion resistance

CUPRO NICKEL 30%-531
M-141, 67.75 Cu, 31 Ni, 0.5 Fe, 0.75 Mn
Soft 60,000 TS, 25,000 YS, 45 El, 75 Brin
For condensers and heat exchangers, corrosion resistant

CUPRO NICKEL 30%-702
M-8, 68.9 Cu, 30 Ni, 0.6 Mn, 0.5 Fe
Hard 77,000 TS, 70,000 YS, 5 El, 162 Brin
Soft: 55,000 TS, 22,000 YS, 40 El, 71 Brin
For condenser tubes, corrosion resistant

CUPRO-NICKEL, 30%-707
M-8, 64.15 Cu, 30 Ni 5.25 Fe, 0.60 Mn
Annealed 74,000 TS, 36,000 YS; 30 El
For heat exchanger tubes, high strength, corrosion resistant.

CUPRO NICKEL 30% 715
M-8, 68.9 Cu, 30 Ni, 0.60 Mn, 0.50 Fe.
Hard tube. 70,000 TS, 60,000 YS, 10 El, B 80 Rock
Soft tube 55,000 TS, 22,000 YS; 45 El, B 35 Rock
For vessel condensers, and salt water tubes, heat exchangers, cold headed fasteners
Tough and corrosion resistant

CUPRO-NICKEL 30% 715
M-279; 68.5 Cu, 31 Ni, 0.5 Fe.
Ann: 54,000-60,000 TS; 20,000-22,000 YS, 40-45 El
Cold rolled 58,000-94,000 TS
For heat exchanger tube and sheets.
Good corrosion resistance to high velocity salt water

CUPRO NICKEL 30% 716
M-8, 64.15 Cu, 30 Ni, 5.25 Fe, 0.60 Mn.
Soft tube. 74,000 TS; 36,000 YS; 30 El.
Drawn: 112,000 TS; 90,000 YS; 12 El.
For feedwater heater tubes, heat exchanger tubes, high pressure air and hydraulic lines
Corrosion resistant, high strength.
Elect. cond: 4.6.

CUPRO NICKEL 826.
M-8; 30 Ni, 0.6 Mn, 0.15 Si, bal Cu.
For welding rod; for steel and copper-nickel.

CUPRO-NICKEL NO. 300 ALLOY.
89 Cu, 11 Ni.
For corrosion resistant parts; corrosion resistant

CUPRO-NICKEL BULLET JACKETS
U.S.; 85 Cu, 15 Ni.
For bullet jackets; ductile.

CUPRO-NICKEL COMMERCIAL.
U.S., 98-60 Cu, 2-40 Ni.
For hardware; corrosion resistant.

CUPRO-NICKEL DRIVING BANDS.
U.S., 97.5-95 Cu, 2.5-5 Ni
For driving bands; corrosion resistant.

CUPRO-NICKEL LOCOMOTIVE TUBES
U.S., 97 Cu, 3 Ni
For locomotive tubes, corrosion resistant.

CUPROR.
U.S., 94 Cu, 5.8 Al.
For pump rods, valve stems; corrosision resistant

CUPRO-SILICON.
U.S.; 55 Si, bal Cu
For hardener for copper alloys

CUPROTEC 10180
M-717
Copper-base alloy powder for brazing thin walled copper alloy sections.

CUPROTHAL 30
M-70, M-1150, 2 Ni, bal Cu.
Annealed 30,000-60,000 TS, 60 max El
For heating and resistance elements, max operating temperature 600°F, nonmagnetic

CUPROTHAL 60
M-70, M-1150, 6 Ni, bal Cu
Annealed 35,000-70,000 TS, 55 max El
For heating and resistance elements, max operating temperature 600°F, nonmagnetic.

CUPROTHAL 90
M-70, M-1150, 11 Ni, bal Cu
Annealed 35,000-75,000 TS, 50 max El.
For heating and resistance elements,
max operating temperature 750°F, nonmagnetic.

CUPROTHAL 180
M-70, M-1150, 22 Ni, bal Cu
Annealed 50,000-100,000 TS, 40 max El
For heating and resistance elements, max operating temperature 1000°F, nonmagnetic

CUPROTHAL 294.
M-70, M-1150; 45 Ni, bal Cu
Rolled: 60,000-100,000 TS, 30 El
For resistors; low electrical resistance,
nonmagnetic maximum temperature 1000°F

CUPROTHERM
M-764, Cu-Cr.
For electrical equipment; high hardness.

CUPROVAC E.
M-1214; Cu.
For electrical equipment; gas free,
high purity copper.

CUROLOY.
M-136; 3.0 C, 1.2 Si, 0.9 Mn, alloy, bal Fe.
For rolls; alloy cast iron.

CURTISOL.
M-1502; silver alloy.
For solder for titanium alloys; M.P. 1300-1400°F.

CURTISS.
Eng.; 95.2 Al, 2.5 Cu, 1.5 Mg.
For pistons; heat treatable.

CUSIL.
M-1493; 72 Ag, 28 Cu.
M.P. 1436°F.
For high temperature brazing.
Eutectic alloy. Excellent flow.
High vapor pressure.

CUSILOY.
U.S., 95 Cu, 3-1 Si, 1-1.5 Sn, 0.7-1 Fe.
Soft. 50,000-60,000 TS; 15,000-20,000 YS; 50 El.
For wire; corrosion resistant.

CUSTOM 455.
M-32; 0.03 C, 11.75 Cr, 8.5 Ni, 1.2 Ti, 0.3 Cb, 2.25 Cu, bal Fe.
Hardened: 332,000 TS, 244,000 YS, 13 El, C 50 Rock.
For high temperature bolts, springs, valves.
Maraging, precipitation hardening, tough

CUTANIT.
M-261, M-486; Mo, Ti, WC.
For taps, tools, cutters; cemented carbides.

CUTLERY.
M-472, 0.30-0.40 C, 12-14 Cr, bal Fe.
123,000-157,000 TS, 500 Brin
For cutting tools, high tensile engineering requirements; corrosion resistant

CUTTER ALLOY
M-35, 1.05 C, 0.25 Mn, 0.25 Cr, 0.25 W, bal Fe.
Annealed: 110,000 TS.
For cutting tools for hard materials,
water hardening.

CUT TRODE
M-717, C, Cu, bal Fe.
For cutting electrodes; exothermic coating

CUYO
M-155, 0.2 C, 18 Cr, 8 Ni, bal Fe.
Annealed 75,000 TS
For stainless parts, furnace parts,
stainless and heat resisting

CUZINAL
M-141, 77 Cu, 2.1 Al, 0.03 As, bal Zn
Annealed: 50,000 TS, 65 El.
Drawn 85,000 TS, 10 El.
For condenser and heat exchangers,
embrittlement free

CV see DARWIN CV.

CV 30
M-459, 0.3 C, 0.3 Si, 0.2 Mn, 1.0 Cr, 0.2 Mo. bal Fe.
For gears, shafts, water hardening

CV 60.
M-459, 0.3 C, 0.3 Si, 0.4 Mn, 1.35 Cr, 0.55 Mo, bal Fe.
For gears, shafts; water hardening.

CV 70.
M-459; 0.15 C, 0.3 Si, 0.4 Mn, 1.0 Cr, 0.3 Mo, 0.25 V, bal Fe.
For gears, shafts; case hardened.

CV 110.
M-459; 0.3 C, 0.3 Si, 0.4 Mn, 1.4 Cr, 1.05 Mo, bal Fe.
For gears, shafts; water hardening.

CV 120.
M-459, 0.3 C, 0.3 Si, 0.4 Mn, 1.4 Cr, 0.55 Mo, 0.4 V, bal Fe.
For gears, shafts; water hardening.

CVFS.
M-459; C, Cr, Mn, bal Fe.
For springs; water hardening.

CV1 EXTRA.
M-459; 1.2 C, 0.7 Cr, 0.1 V, bal Fe.
For cutting tools, bearings; wear resistant; keen cutting edge.

C.V.M.
M-1067, 1.0 C, 0.7 Mn, 5 Cr, 1.1 Mo, 0.25 V, bal Fe.
For dies, blanking, trimming and forming dies; air hardening.

C-W.
M-1067, 0.9 C, 1.1 Mn, 0.5 Cr, 0.5 W, 0.35 Si, bal Fe.
For drills, milling cutters, dies; oil hardened.

C.W. CHISEL.
M-114; 0.7 C, bal Fe.
For tools, chisels, oil hardening.

CWM, S 431.
M-459; C, Cr, bal Fe.
Water treated: 78,500-100,800 TS; 50,000-72,000 YS; 27-22 El.

C.W. OIL
M-908, 0.85-0.95 C, 1.0-1.2 Mn, 0.4-0.6 Cr, 0.4-0.6 W, bal Fe
For tools, dies; non-deforming.

CY-2.
M-1697; Sintered carbide tool material
For general purpose and light roughing cuts on steel

CY-4.
M-1697; Sintered carbide tool material.
For wear parts, heavy shock but light impact

CY-5
M-1697; Sintered carbide tool material.
For general purpose machining of carbon and low alloy steels

CY-12
M-1697, Sintered carbide tool material
For roughing cuts on carbon and low alloy steel

CY-14
M-1697; Sintered carbide tool material.
For light roughing cuts and some finishing cuts on carbon and alloy steels.

CY-16.
M-1697, Sintered carbide tool material.
For heavy roughing cuts on carbon and alloy steels

CY-17.
M-1697; Sintered carbide tool material
For heavy roughing cuts at heavy feeds on carbon and alloy steels.

CY-31.
M-1697; Sintered carbide tool material.
For finish cutting and precision boring of carbon and alloy steels.

C.Y. ALLOY.
M-752; Homogeneous abrasion resisting alloy iron casting.
Cast: 30/35 tons/sq. in. TS.
For brake blocks, breaker bars, chute liners, ball mill liners.

CYCLO.
M-114; 0.7 C, 1.2 Mn, bal Fe.
For tools, dies, punches; oil hardening.

CYCLOPS 14 MV replaced by UNITEMP 14MV.

CYCLOPC 17A replaced by UNILOY 325.

CYCLOPS 67 replaced by CYCLOPS S 5.

CYCLOPS B-6.
M-114; 0.75 C, 18 W, 1 V, bal Fe.
For lathe tools, taps, reamers, twist drills, milling cutters, dies, lathe centers; high speed steel; wear and abrasion resistant.

CYCLOPS B 6X replaced by THERMOLD H 26.

CYCLOPS B-9.
M-114; 0.84 C, 0.25 Mn, 0.30 Si, 4.5 Cr, 18.5 W, 2.25 V, 0.5 Mo, bal Fe.
For drills, taps, broaches form tools, milling cutters; high speed steel.

CYCLOPS B-10
M-114; 0.80 C, 1.0 Mo, 18.5 W, 4.5 Cr, 2.0 V, 9.0 Co, bal Fe.
For cutters, lathe and planer tools, form tools, checking tools, cut-off tools.
High abrasion resistance and red-hardness.
AISI-T 5 High speed steel.

CYCLOPS B-44 replaced by THERMOLD H22

CYCLOPS B44J replaced by THERMOLD H21

CYCLOPS EXTRA replaced by CYCLOPS W1.

CYCLOPS K
M-114, C, Cr, W, bal Fe.
For hot work dies, punches, hot work steel.

CYCLOPS K-L DIE STEEL
M-39, 0.35 C, 6 Cr, 6 W, bal Fe
For coining dies, punches, hot heading dies, oil hardened

CYCLOPS K-M DIE STEEL
M-39, 0.45 C, 6 Cr, 6 W, bal Fe
For blanking, forming and gripper dies, hot piercers, water hardened

CYCLOPS L1
M-114, 1.05 C, 0.35 Mn, 0.30 Si, 1.4 Cr, bal Fe
Water hardened 237,000 TS, 226,000 YP, 444 Brin
Cold Drawn 107,000 TS, 87,000 YP, 17 El, 55 RA, 229 Brin
For gauges, knurls, knife edges, taps, dies, arbors, rolls
AISI Type L1 Oil hardening Wear resistant

CYCLOPS L2
M-114, 0.50 C, 0.70 Mn, 0.25 Si, 1.0 Cr, 0.2 V, bal Fe
Annealed 103,000 TS, 74,000 YS, 27 El; 52 RA, 201 Brin
Hardened 298,000 TS, 263,000 YP, 1 El, 5 RA; 610 Brin
For gears, forgings, arbors, crankpins, chuck jaws, die rings, gun barrels, jack screws, rivet sets, shear blades
Tough, shock resisting
AISI Type L2 Oil hardening Fatigue resistant

CYCLOPS L6
M-114, 0.75 C, 0.4 Mn, 0.25 Si, 1.0 Cr, 1.5 Ni, bal Fe
Heat treated. 190,000-305,000 TS, 178,000-280,000 YS, 5-12 El; 17-38 RA, C 43-61 Rock.
For arbors, blanking dies, clutch parts, forming dies, brake dies, punches, pinions, shear blades, spindles, swages
Tough and wear resistant
AISI Type L6 oil hardening tool steel.

CYCLOPS M4.
M-114; 1.3 C, 4.5 Mo, 5.5 W, 4.5 Cr, 4.0 V, bal Fe.
Hardened: C 64-66 Rock
For cutters, broaches, reamers, milling cutters, lathe and planer tools, taps. Counterbore tools
Good abrasion resistance, tough.
AISI Type M4. High speed steel.

CYCLOPS M42.
M-114; 1.10 C, 3.75 Cr, 1.2 V, 1.5 W, 9.5 Mo, 8.0 Co, bal Fe.
Ht. Tr.: 63-67 Rock C .
For finish machining, boring, precision turning, at high speeds; good temperature and wear resistance.
AISI Type M42 High speed tool steel.

CYCLOPS M-T.
M-39; 0.75 C, 1.0 V, 1.5 W, 7 Mo, bal Fe.
For tools; see Motung.

CYCLOPS N-9 replaced by CYCLOPS L6.

CYCLOPS S1.
M-114, 0.50 C, 0.35 Mn, 0.30 Si, 1.5 Cr, 2.25 W, 0.25 V, 0.30 Mo, bal Fe.
Hardened: 260,000-280,000 TS; C 48-55 Rock.
For bolt header dies, chipping and caulking tools, concrete drills, pneumatic tools, shear blades, track tools.
Type S1. Tough and fatigue resistant.

CYCLOPS S2.
M-114; 0.50 C, 0.45 Mn, 1.1 Si, 0.2 V, 0.5 Mo, bal Fe.
Water Harden: 235,000-323,000 TS; 229,000-300,000 YS; 4-10 El; 12-45 RA; C 47-58 Rock.
For hand and pneumatic tools, chisels, stamps, spindles, pipe cutters, rivet sets; flaring tools.
Tough and shock resistant
Type S2. Tough and shock resistant.

CYCLOPS S5
M-114, 0.55 C, 2.0 Si, 0.9 Mn, 0.4 Mo, bal Fe.
Heat Treated: 338,000 TS; 281,000 YS; 5 El; 600 Brin.
Heat Treated 220,000 TS; 207,000 YS; 11 El, 455 Brin
For shear blades, punches, pneumatic tools, rivet sets, chisels
Shock and impact resistant Type S5

CYCLOPS SCK
M-114; 0.70 C, 0.35 Mn, 1.0 Si, 8.5 Cr, 1.0 V, 1.4 Mo, 1.5 Ni, bal Fe.
Ht Tr: 55-61 Rock C
For cold shears, trimmers, woodworking chippers punches; air hardening; resists tempering. good wear resistance

CYCLOPS SPECIAL COLD HEADER replaced by CYCLOPS W2

CYCLOPS T-15.
M-114; 1.5 C, 12.5 W, 4.75 Cr, 5.0 V, 5.0 Co, bal Fe.
Oil harden. C 64-66 Rock
For heavy duty cutters, form tools, lathe and planer tools, broaches, milling cutters, blanking dies, punches.
High red-hardness and abrasion resist.
AISI-T15 High speed steel.

CYCLOPS W1.
M-114; 0.80-1.25 C, 0.25 Mn, 0.25 Si, bal Fe.
Annealed: 95,000 TS, 50,000 YS; 22 El; 195 Brin.
Water Hardened: 200,000-215,000 TS; 138,000-152,000 YS; 11-12 El; 400-600 Brin.
For punches, beading tools, cold heading dies, axles, drills, reamers, files, woodworking tools.
Wear and abrasion resistance.
Water hardening high carbon steel.

CYCLOPS W2.
M-114; 0.80-1.25 C, 0.25 Mn, 0.25 Si, 0.25 V, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 21 El; 200 Brin.
Water Hardened: 216,000 TS; 152,000 YS; 11 El; 32 RA; 600 Brin.
For punches, beading tools, cold heading dies, axles, drills, reamers, woodworking tools, files, die rings.
Wear and abrasion resistant.
Water hardening high carbon steel.

CYKLOP.
M-1315; 0.3 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion press rams and liners, punches; hot work steel, oil hardened.

CYKLOP Co.
M-1315; 0.3 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion press rams and liners, punches; hot work steel.

CYKLOP EXTRA.
M-1315; 0.65 C, 3.75 Cr, 0.85 Mo, 0.7 V, 8.5 W, bal Fe.
For lathe and planer tools, reamers, drills, hobs; high speed steel.

CYLINDER IRON.
M-165; 3-3.25 C, 0.40-0.75 Mn, 2-2.25 Si, bal Fe.
For engine cylinders, pistons, piston rings; cast iron.

CYLINDER IRON.
M-165; 3-3.5 C, 0.5-0.8 Mn, 1.75-2.75 Si, 1-1.5 Ni, 0.3-0.4 Cr, bal Fe.
For engine cylinders; cast iron.

CYMBAL METAL.
U.S.; 78 Cu, 22 Zn.
For architectural and ornamental parts; red brass.

CYPRUS BRONZE.
65 Cu, 30 Pb, 5 Sn.
17,000 TS; 6-8 El; 41 Brin.
For bearings, hardware; heavy duty.

D-1 DISSTON.
M-357, 0.8 C, bal Fe
For tools, general purpose.

D-2.
M-338, 3.0 max Mg, 1.5 Mn, bal Al.
Annealed: 28,000 TS; 24 El.
Hard rolled: 40,000 TS; 5 El
For light alloy parts, panelling; can be cold worked; corrosion resistant.

D-2.
M-739, 3.0-3.5 Cu, 7.25-7.75 Sb, 0.1-0.14 Te, bal Sn.
For engine bearings, steel backed Babbitt.

D-2 ALLOY.
M-28; 2.5 Mg, bal Al.
Annealed: 28,000 TS; 14,000 YS; 24 El; 46 Brin.
Hard rolled: 44,000 TS; 40,000 YS, 5 El, 76 Brin.
For sheets, tubes, light alloy parts; non-hardenable.

D-2-DISSTON.
M-357; C, bal Fe.
For tools; water hardening.

D2-SA TOOL.
M-357; C, bal Fe.
For tools; general purpose.

D-6-CO.
M-357, 0.8 C, 4 Cr, 6 Co, 1.75 V, 18 W, bal Fe.
For tools, cutters; high speed steel.

D7 ALLOY.
M-137; 2.2-2.8 Cu, 4.5-5.5 Si, 0.3-0.7 Mn, bal Al.
Cast: 26,000-36,000 TS; 8,000-12,000 YS; 10-5 El; 60-65 Brin.
For heavy duty castings; age-hardenable.

"D7" QUALITY.
M-179; Cu, bal Zn.
Extruded: 55,000 TS; 50 El; 45 RA.
For rivets; cold working qualities.

D8 ALLOY.
M-137; 2-4 Cu, 3-6 Si, 0.3-0.7 Mn, 0.35 max Ni, bal Al.
Cast: 22,000-35,000 TS; 10,000-30,000 YS; 3-2 El; 60-100 Brin.
For hydraulic units, gear cases; hardenable.

D8 (D8W; D8 WP).
M-106; 2-4 Cu, 4-6 Si, 0.3-0.7 Mn, bal Al.
Sand cast, Sol. treat (D8W): 22,400-26,800 TS, 12,300 YS; 2-3 El; 70 Brin; 1-3 Izod.
Chill cast, Sol. treat and age (D8WP) 45,000-47,000 TS; 40,000 YS; 1 El, 110 Brin; 0.6 Izod.
Castings for good strength, hydraulic pressure.
BS L79.

D9 ALLOY.
M-137; 3.2-4.0 Cu, 4.5-5.5 Si, 0.3-0.7 Mn, bal Al.
36,000-44,000 TS; 15,000-28,000 YS; 8-4 El; 75-105 Brin.
For light alloy parts; hardenable.

D 9 Mo.
M-357; 1.15 C, 0.2 Mo, bal Fe.
For taps, knives; water hardening.

D9-VA
M-357; 1.15 C, 0.6 Mn, 0.2 V, 0.6 Si, bal Fe.
For taps, twist drills, reamers, tools; water hardening

D-10.
M-989; brass and graphite
For oil-less bearing; powder metallurgy, operating temperature from 69-800°F.

D12 ALLOY
M-137; 6.2-7.2 Cu, 0.15-0.40 Mg, 5-6 Si, 0-1.25 Fe, bal Al.
Heat treated: 40,000-49,000 TS; 34,000 YS, 0 El, 130 Brin.
For pistons, cylinder heads; age-hardenable.

D 22 S.
M-459; C, Cr, Ni, Mo, bal Fe.
15-13 El.
For machinery parts, oil hardened

D-29 CHISEL STEEL.
M-357, 0.5 C, 1.4 Si, 0.4 Mo, bal Fe.
For chisels, shear blades.

D-29 KNIFE.
M-357, 0.65 C, 1.4 Si, 0.1 V, 0.4 Mo, bal Fe
For chipper knives; tough

D.70.
M-50; 0.03 max C, 4.0-4.5 Ni, 11.5-12.5 Cr, 4.0-4.5 Mo, 14.0-15.0 Co, Ti, Al, Nb, B, Zr, bal Fe.
For jet engine and gas turbine components, aircraft and aerospace equipment, missiles.
Stainless maraging steel. Low work hardening Precipitation hardening.

DACAR.
M-69; 0.7-1.2 C, bal Fe.
For machinery parts; water hardening.

DAIDO ST-1.
M-1545; 0.13-0.18 C, 1.35-1.85 Mn, 0.3-0.6 Si, 0.35 max Cu, bal Fe.
Rolled. 78,000 min TS; 51,000 min YP; 18% min El.
For buildings, bridges, agricultural equipment, structural members, case hardened parts.
Constructional steel, shock resistant.

DAIDO ST-2.
M-1545, 0.15-0.20 C, 1.2-1.5 Mn, 0.30-0.65 Si, 0.35 max Cu, bal Fe.
Rolled: 78,000 min TS; 51,000 min YP; 18% min El.
For buildings, bridges, structural members, agricultural equipment.
Constructional steel, tough.

DAIMLER BEARING METAL.
Eng.; 76 Cu, 3 Sn, 20 Zn, 1 Pb.
For bearings, bushings; corrosion resistant.

DAIRY METAL.
M-252; 68 Cu, 1.5 Sn, 28 Ni, 0.5 Pb, 2.0 flux.
For stainless filters; corrosion resisting.

DAIRYWHITE.
U.S.; Zn, Ni, bal Cu.
For dairy equipment; nickel silver, corrosion resistant.

DALTON FUSIBLE ALLOY.
England, 60 Bi, 15 Sn, 25 Pb.
For fusible alloy, fire extinguishers; M.P. 92°C.

DALZELL STEEL
M-530, 0.4-0.6 C, bal Fe.
For machinery parts, water hardened

DAMAR.
Eng., 76 Cu, 13 Pb, 11 Sn
For bearings; heavy duty

DAMASCITE.
M-211; Fe.
For molded iron parts, machine pads, strength of carbon steel.

DAMASCUS
M-754, Sn, Pb, bal Cu
For bearings.

DAMASCUS
M-73, 0.55 C, 0.25 Cr, 0.90 Mn, 0.20 V, 1.95 Si, bal Fe
For chisels, stamps, cold cutters, punches, shears, oil hardening

DAMASCUS BRONZE
England; 13 Pb, 10 Sn, bal Cu
For bearings, ornaments; plastic bronze

DAMPING
U.S.; 87 Mn, 13 Cu
For alloy for meters; low temperature resistance coefficient.

DAMSTADT BELL METAL
Germany, 74-72.5 Cu, 21.7 21.1 Sn, 2 12 Pb, 0.19-0.05 Fe, 2-2.6 Ni
For bells, corrosion resistant

DANA AUTO SPECIAL
M-1260, M-1261, 6.5 Sb, 3 Cu, bal Sn.
Cast 69 El, 24-25 Brin.
For engine bearings, shock resistant, Babbitt metal

DANA COMMON
M-1260, M-1261, 10 Sn, 13.5 Sb, 0.5 Cu, bal Pb.
Cast 42 El, 28-30 Brin
For transmission bearings; Babbitt

DANA DIESEL
M-1260, M-1261, 2 Pb, 6.5 Cu, 8 Sb, bal Sn
Cast 22 El, 30-31 Brin.
For diesel engine bearings, wear resistant, Babbitt metal.

DANA STEAM.
M-1260, M-1261, 11.5 Sb, 5.5 Cu, 3 Pb, bal Sn.
Cast 19 El, 33-35 Brin.
For steam turbine and generator bearings, wear resistant, Babbitt metal.

DANALLOY-I.
M-1606; Au-Ni-Mg, bal Ag.
Rolled: 82,000 TS, 78,000 YS.
For circuit board retainers, micro circuit back-up plates, relay contacts.

High heat and electrical conductivity.
Non-magnetic. Heat treatable.

DANALLOY-II.
M-1606; Au-Ni-Mg, bal Ag.
Rolled: 66,000 TS; 60,000 YS.
For circuit board retainers, micro-circuit back-up plates, relay contacts.
High heat and electrical conductivity. Non-magnetic. Heat treatable.

DANDELION METAL.
Eng.; 72 Pb, 18 Sb, 10 Sn.
For heavy duty machine bearings and locomotive cross-head linings; high strength Babbitt.

DANISH MINT.
Eng.; 92 Cu, 6 Al, 2 Ni.
For coinage; corrosion resistant.

DANNEMORA.
M-434; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For coining dies; high speed steel.

DANNEMORA NO. O.
M-350; C, W, bal Fe.
For tools, dies; oil hardened.

DANNEMORA AD 95.
M-1067; C, Cr, W, V, bal Fe.
For coining dies, oil hardening.

DANNEMORA BEST.
M-387; 0.9-1.1 C, bal Fe
For drills, reamers, punches, broaches; Type W1; water hardened.

DANNEMORA DB59.
M-608; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For cutters, hobs, high speed steel

DANNEMORA EXTRA BEST.
M-350, 0.7-1.2 C, bal Fe.
For tools, water hardened.

DANNEMORA SELF-HARDENING.
M-350, C, W, bal Fe.
For tools, cutters, dies; oil hardened.

DANNEMORA STANDARD.
M-387, 0.9-1.1 C, bal Fe
For tools, drills, taps; water hardened.

DANNEMORA VERY BEST.
M-387; 1.0-1.2 C, bal Fe.
For tools, cutters, drills; water hardened.

DARCET FUSIBLE ALLOY.
England; 50 Bi, 25 Sn, 25 Pb.
For boiler safety plugs, fire extinguishers; M.P 93°C.

DARGRAPH.
M-40; 1.45 C, 1.0 Si ,0.25 Mo, bal Fe.
Annealed: 84,500 TS; 49,500 YS, 25 El, 40 RA; 197 Brin.
Heat treated: 218,000-164,000 TS; 177,000-136,000 YS; 8.5-13 El; 14-23 RA; 388-302 Brin.
For wear plates, cams, cutters, dies, punches; oil hardened, wear resistant, graphite steel.

DARK RED GOLD.
Eng.; 50 Au, 50 Cu.
For onranments; corrosion resistant.

DART.
M-73; 0.42 C, 1.05 Si, 0.6 Mn, 3.3 Cr, 2.5 Mo, 0.37 V, bal Fe.
Hardened: 53-59 Rock C.
Hot work die steel with extra high carbon for higher hardness and wear resistance; forging dies, hot forming and press dies.
AISI Type H 10 hot work tool steel.

DARWIN.
M-487, M-40; C, alloy, bal Fe.
For high speed tools, hack-saw blades, tools, cutters; super high speed steel.

DARWIN-1.
M-40; 1.5 C, 12 Cr, 1 Mo, bal Fe.
For drawing and forming dies, punches; Type D2; air hardened, non-deforming.

DARWIN NO. 1 AIR HARDENING.
M-40; 1.45-1.60 C, 11-12 Cr, 0.20-0.35 V, 0.7-0.8 Mo, bal Fe.
For tools, dies; non-deforming.

DARWIN NO. 1 FM.
M-40; 1.5 C, 12 Cr, 0.3 V, 0.8 Mo, 0.2 S, bal Fe.
For dies, tools, punches, crimpers; air or oil hardened, good machinability, resists galling.

DARWIN 5V.
M-40; 1.50 C, 5.0 Cr, 5.0 V, 12.5 W, 5.0 Co, bal Fe.
High speed tool steel, Cr-W-V-Co type, for cutting tools for tough metal; good red hardness and good wear properties; AISI T15.

DARWIN 19.
M-40; 0.7 C, 18 W, 4 Cr, 2 V, 8 Co, bal Fe.
For tools, cutters, reamers; high speed steel.

DARWIN 93.
M-40; 0.30 C, 3.5 Cr, 0.30 V, 10 W, 0.4 Si, bal Fe.
For dies, hot work steel.

DARWIN NO. 505.
M-40, 0.65-0.75 C, 3.75-4.25 Cr, 17-18 W, 1.5-1.75 V, 7-8 Co, 0.7-1.0 Mo, bal Fe.
For tools, cutters; high speed steel.

DARWIN 505 SPECIAL.
M-40; 0.80 C, 4.0 Cr, 2.0 V, 18.0 W, 0.8 Mo, 9.0 Co, bal Fe.
High speed steel cutting tool, tungsten-cobalt type; good red hardness, AISI T5.

DARWIN NO. 1366.
M-40, M-487, 0.70 C, 4.5 Cr, 20 W, 2 V, 12 Co, bal Fe
For lathe and planer tools, form cutters, high speed steel, oil hardened.

DARWIN 3581.
M-40; C, alloy, bal Fe.
For chisels, tough and shock resistant.

DARWIN ACD.
M-40, C, bal Fe.
For dies; water hardening.

DARWIN "ALNI."
M-487; 59 Fe, 4 Cu, 24 Ni, 13 Al.
For permanent magnets; magnetic steel.

DARWIN BEST WARRANTED.
M-40, M-487; high C, bal Fe.
For tools; water hardening.

DARWIN "BKM."
M-40, M-487; C, Ni, Cr, bal Fe.
For Bakelite molds; oil hardening.

DARWIN BRAKE DIE STEEL.
M-40; C, Cr, Mo, bal Fe.
For brake dies; oil hardened.

DARWIN BRAND "H."
M-40; 0.95 C, 0.4 Cr, 0.2 V, 1.0 Mn, bal Fe.
For dies, blanking, forming and trimming dies, taps, broaches; oil hardening, non-deforming; resistant to wear.

DARWIN BRAND L-35.
M-40; C, alloy, bal Fe.
For heading dies.

DARWIN C C.
M-40; 0.55-0.65 C, 0.3-0.4 Cr, 0.60-75 W, 0.55-0.65 Mo, 0.95-1.1 Si, bal Fe.
For tools, punches; oil hardening.

DARWIN C.L. NO. 1.
M-40; C, alloy, bal Fe.
For arc welding electrodes, hard surfacing; coated, tough and abrasion resistant.

DARWIN COBALT MAGNET.
M-40; C, 3 Co, bal Fe.
For permanent magnets.

DARWIN COBALT MAGNET.
M-40; C, 6 Co, bal Fe.
For permanent magnets.

DARWIN COBALT MAGNET.
M-40; C, 9 Co, bal Fe.
For permanent magnets.

DARWIN COBALT MAGNET.
M-40; C, 15 Co, bal Fe.
For permanent magnets.

DARWIN COBALT MAGNET.
M-40; C, 35 Co, bal Fe.
For permanent magnets.

DARWIN C V.
M-40; 1.1-1.15 C, 0.2-0.4 Cr, 0.25-0.35 V, bal Fe.
For tools, taps, drills; water hardening.

DARWIN D-93.
M-40, M-487; C, alloy, bal Fe.
For hot working dies and tools; hot die steel.

DARWIN "DCI."
M-40, M-487; C, alloy, bal Fe.
For electrical equipment, magnetic parts; magnetic alloy.

DARWIN DUREX.
M-40, M-487; high C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, cutters, reamers, dies, gauges, punches; high speed steel.

DARWIN EE.
M-40; 1.35 C, 0.15 Cr, 4.0 W, 0.35 V, bal Fe.
For cutters, shears, tools; water hardening.

DARWIN EXTRA QUALITY.
M-40; M-487; 1.0 C, bal Fe.
For drills, taps, tools, cutters, reamers; Type W1, water hardened.

DARWIN EXTRA SPECIAL.
M-40, M-487; 1.1 C, bal Fe.
For drills, taps, hobs, reamers; Type W1; water hardened.

DARWIN EXTRA TOUGH.
M-40; C, alloy, bal Fe.
For punches, chisels, pneumatic tools; Type S6; oil hardened, shock resistant.

DARWIN FLAME HRD.
M-40; 0.50 C, 1.2 Mn, 0.5 Si, 1.4 Cr, 0.1 V, 0.4 Mo, bal Fe.
Air hardening tool steel for shafts, arbors.

DARWIN H.A.W.
M-40; 0.35 C, 5 Cr, 0.4 V, 1.5 Mo, bal Fe.
For shears, punches, hot work tools; Type H11; hot work steel.

DARWIN H.W.S.
M-40; 0.35 C, 5 Cr, 0.4 V, 1.5 W, 1.5 Mo, bal Fe.
For dies, punches, hot work tools; Type H12; hot work steel.

DARWIN I W I.
M-40; 0.40 C, 3 Cr, 9-10 W, 0.2-0.3 V, bal Fe.
For tools, dies, punches; hot work steel.

DARWIN LOW AIR.
M-40; 0.75 C, 2.0 Mn, 0.3 Si, 1.0 Cr, 1.35 Mo, bal Fe.
Air hardening tool steel; AISI A6.

DARWIN M3.
M-40; 1.0 C, 4 Cr, 2.7 V, 6 W, 5 Mo, bal Fe.
For reamers, drills, taps, lathe and planer tools; Type M3; high speed steel.

DARWIN MT-6.
M-40; 0.85 C, 6 W, 4 Cr, 1.5 V, 6 Mo, bal Fe.
For cutters, tools; high speed steel.

DARWIN N-32.
M-40; 0.38 C, 3-4 Ni, 0.6 Mn, bal Fe.
Oil hardened.
For chisels; oil hardened.

DARWIN OHT.
M-40, M-487; 0.9 C, 1.0 Mn, 0.5 Cr, 0.5 W, bal Fe.
For crimpers, punches, jaws, dies, cutters; Type O1; non-deforming, oil hardened.

DARWIN P-20.
M-40; 0.30 C, 0.75 Cr, 0.25 Mo, bal Fe.
Oil or water hardening tool steel for molds; AISI P20.

DARWIN PRK-33.
M-40; 3.7 C, 13.5 Cr, bal Fe.
For welding electrodes; air hardening.

DARWIN SPECIAL
M-40; 1 2 C, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, hobs, reamers, cutters; Type W1; water hardened.

DARWIN SPECIAL CARBON.
M-40; 0.9 C, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El, 30 RA; 400 Brin.
For drills, taps, hobs, reamers, lathe cutters; Type W1, water hardened.

DARWIN-SSC
M-40; C, bal Fe
For machine tool parts; water hardened.

DARWIN STANDARD.
M-40; 0.8-1.1 C, 0.25 Si, 0.25 Mn, bal Fe.
Water hardened. 166,000-216,000 TS; 110,000-150,000 YS, 11-15 El; 32-37 RA; 330-600 Brin.
For taps, drills, reamers, punches, stamps, knurls, mandrels.
Type W1 water hardening.

DARWIN TEMPER TOUGH.
M-40; 0.7 C, 0.75 Cr, 1.5 Ni, 0.25 Mo, bal Fe.
For brake dies, bushings, jigs, cams, chucks; Type L6; oil hardened.

DARWIN "TTS."
M-40, M-487; C, W, bal Fe
For tools; oil hardening.

DARWIN WARRANTED.
M-40, M-487; high C, bal Fe.
For tools; water hardening.

DARWIN "W" BRAND.
M-40; 0.45 C, 0.85-0.95 Cr, 1.0 W, bal Fe.
For tools, dies, punches; oil hardening.

DARWINS 6/5/2.
M-487; 0.85 C, 6 W, 4 Cr, 2 V, 5 Mo, bal Fe.
Heat treated: C 63-67 Rock.
For woodworking machine tools, taps, slitting saws, reamers, boring and planing tools, drawing dies.
High speed steel Type M2.

DARWINS 18/8.
M-487; 0.14 max C, 7.5-9.0 Ni, 17.5-19.0 Cr, bal Fe.
Annealed: 78,000 TS; 27,000 YS; 30 El; 130 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For food, chemical and brewing process equipment; Type 302; stainless, austenitic.

DARWINS 18/8 (316).
M-487; 0.14 max C, 17.5-19 Cr, 10-12 Ni, 2-3 Mo, bal Fe.
Bars: 78,000 TS; 27,000 YS; 30 El.
For equipment handling sulfite liquors; Type 316; stainless, austenitic.

DARWINS 18/8 (316a).
M-487; 0.08 max C, 17.5-19.0 Cr, 8.5-10.5 Ni, 1.25-2.25 Mo, 0.25-0.40 Ti, bal Fe.
Bars: 78,000 TS; 27,000 YS; 30 El.
For acid resistant chemical plant equipment; Type 316Ti; stainless, austenitic.

DARWINS 18/8 CB.
M-487; 0.10 max C, 17.5-19.0 Cr, 10-12 Ni, Cb = 10 × C, bal Fe.
Bars: 78,000 TS; 27,000 YS, 30 El.
For welded chemical plant equipment, Type 347; austenitic, stainless.

DARWINS 18/8 FZ.
M-487; 0.14 max C, 7.9-9.0 Ni, 17.5-19.0 Cr, 0.2 S, 0.5 max Mo, bal Fe
Bars: 78,000 TS, 27,000 YS; 30 El.
For stainless screw machine products; Type 303, free-cutting, stainless.

DARWINS 18/8 LC
M-487, 0.07 max C, 8.0-10.0 Ni, 17.5-19.0 Cr, bal Fe.
Annealed 78,000 TS; 27,000 YS; 30 El.
Cold drawn· 180,000 TS; 125,000 YS, 10 El; 330 Brin.
For welded chemical plant and dyeing equipment, Type 304; stainless, austenitic.

DARWINS 18/8 Mo
M-487, 0.14 max C, 17.5-19.0 Cr, 8-10 Ni, 3-3.5 Mo, bal Fe.
Bars 78,000 TS, 27,000 YS; 30 El.
For acid resistant equipment; Type 317, stainless, austenitic.

DARWINS 18/8 WDP.
M-487, 0.07 max C, 8-10 Ni, 17.5-19.0 Cr, Ti = 5 × C, bal Fe
Bars: 78,000 TS; 27,000 YS, 30 El
For welded structures and chemical plant equipment; Type 321, austenitic, stainless.

DARWINS 26
M-487, Ni, bal Fe.
For glass-to-metal seals, controlled expansion.

DARWINS 55
M-487; 0.2 max C, 23 Cr, 55 Ni, 4 Mo, 2 W, 10 max Fe, 5 Cu.
For chemical plant and pickling equipment; resists hot or cold H_2SO_4

DARWINS 168.
M-487; 0.75 C, 17 Cr, bal Fe.
For knives, bearings, cutlery, valves; Type 440A; stainless.

DARWINS 426.
M-487; Ni, bal Fe.
For glass-to-metal seals; controlled expansion.

DARWINS 654A.
M-487; 0.1 max C, 60 Ni, 20 Mo, bal Fe.
For chemical plant equipment; resists HCl and H_2SO_4.

DARWINS 655B.
M-487; 0.1 max C, 65 Ni, 27 Mo, bal Fe.
For chemical plant equipment; resists HCl and H_2SO_4.

DARWINS 656C.
M-487; 0.1 max C, 14 Cr, 58 Ni, 17 Mo, 5 W, bal Fe.
For chemical plant and high temperature equipment; resists HNO_3 and HCl.

DARWINS 1031.
M-487; Ni, bal Fe.
For thermostats; controlled expansion.

DARWINS 1366.
M-487; 0.73 C, 20 W, 4.5 Cr, 2 V, 12 Co, bal Fe.
Heat Treated: C 64-66 Rock.
For boring and turning tools, reamers, lathe and planer tools, broaches, milling cutters.
High speed steel Type T6, high red-hardness, abrasion resistant.

DARWIN'S COBALT FAST WORK.
M-487; C, Co, Cr, Mo, bal Fe
For press tools, cutters; oil hardened.

DARWINS D.C.C.M.
M-487; C, alloy, bal Fe.
For punches, crimpers, upsetters; cold work steel.

DARWINS DSC.
M-487, 0.30-0.40 C, 13-14 Cr, 1 max Ni, bal Fe.
Heat treated 100,000 TS; 20 El; 152-255 Brin
For cutlery, knives, valves; hardenable, stainless, EN56D.

DARWIN'S DUROR
M-487; C, alloy, bal Fe.
For files; water hardened.

DARWIN'S EXTRA.
M-487, C, alloy, bal Fe.
For files, water hardened.

DARWINS F.
M-487; Ni, bal Fe
For glass-to-metal seals; controlled expansion

DARWINS HS 22.
M-487, 0.75 C, 22 W, 5 Cr, 2 V, bal Fe.
For roll turning tools, lathe and planer cutters, hacksaws, high speed steel

DARWINS H W 1
M-487; C, alloy, bal Fe.
For pressure casting dies; hot work steel, resists thermal shock

DARWINS H W.2.
M-487, C, alloy, bal Fe.
For pressure casting dies; hot work steel, abrasion resistant

DARWINS H.W 3.
M-487, C, alloy, bal Fe
For extrusion and drawing dies, forging tools; hot work steel, oil hardened.

DARWINS H.W.4
M-487, C, alloy, bal Fe
For die casting dies, hot work steel, resists thermal shock

DARWINS H W.5.
M-487; C, alloy, bal Fe
For hot piercing and forming punches, bolt dies, forging tools; hot work steel, oil hardened.

DARWINS K-ALLOY.
M-487; 0.15 max C, 23 Cr, 23 Ni, 2 Mo, 4 Cu, bal Fe.
For chemical plant equipment; resists H_2SO_4

DARWINS N. 1932.
M-487; C, alloy, bal Fe.
For chisels, punches, upsetters; shock resistant, oil hardened.

DARWINS S61F.
M-487; 0.12 max C, 12-14 Cr, 0.2-0.3 S, 1 max Ni, bal Fe.
Heat treated: 100,000 TS; 20 El; 155-207 Brin.
For pump rods, valves, cutlery, surgical instruments; Type 410F; stainless, free-cutting.

DARWINS S61.
M-487; 0.12 max C, 12-14 Cr, 1 max Ni, bal Fe.
Heat treated: 100,000 TS; 20 El; 155-255 Brin.
For pump rods, valves, cutlery, surgical instruments; Type 410; stainless.

DARWINS S62.
M-487; 0.18-0.25 C, 12-14 Cr, 1.0 max Ni, bal Fe.
Heat treated: 100,000 TS; 20 El; 155-255 Brin.
For surgical instruments, chemical plant equipment; EN56C-D; stainless, hardenable.

DARWINS S62F.
M-487; 0.18-0.25 C, 12-14 Cr, 1 max Ni, 0.2-0.3 S, bal Fe.
Heat treated: 100,000 TS; 20 El; 152-255 Brin.
For screw machine products, bolts, screws; Type 420F; stainless, free-cutting.

DARWINS S80.
M-487; 0.12-0.18 C, 16-18 Cr, 1.6-2.0 Ni, bal Fe
Heat treated: 123,000 TS; 15 El; 248 Brin.
For pumps, fittings, valves; hardenable, stainless, EN57.

DARWINS S80F.
M-487; 0.15-0.25 C, 16-18 Cr, 1-3 Ni, 0.5 max Mo, 0.25 S, bal Fe.
Heat treated: 123,000 TS; 15 El; 248 Brin.
For pumps, fittings, valves; hardenable, stainless, free-cutting.

DARWIN'S TRIPLE LIFE.
M-487; C, alloy, bal Fe.
For files; water hardened.

DARWIN'S T.T.S.
M-487; C, 1.5 W, bal Fe.
For surgical instruments, taps, reamers, drills, cutters, hacksaws; water hardened.

DARWIN'S VANADIA.
M-487; C, W, alloy, bal Fe.
For hacksaw blades; water hardened.

DAUPHINOX-TPMo.
M-1649: 0.25 C, 13 Cr, 0.8 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El, 55 RA.
Heat Treated: 250,000 TS, 215,000 YS; 8 El; C 52 Rock.
For oil refinery and chemical plant equipment, bearings, cutlery, shafts, surgical instruments, scissors. Corrosion resistant, hardenable.

DAVIGNON.
Eng.; 58 Au, 37 Cu, 5 Al.
For jewelry, ornaments; corrosion resistant.

DAVIS METAL.
M-145; 1.5 Mn, 29 Ni, 2 Fe, 67 Cu, 0.5 C, Si.
Cast: 60,000 TS; 35,000 YS; 18 El; 120 Brin.
For valves and fittings, turbine blades, throttle valves; corrosion and heat resisting.

DAVIS METAL.
M-145; 0.2 C, 0.3 Mn, 1 Mn, 25 Ni, 6 Fe, 67 Cu, 0.8 Pb.
For valves, fittings.

DAWSON.
M-1705; 0.65 C, 0.9 Mn, 2.0 Si, bal Fe.
Shock resisting tool steel, water hardening AISI S4.

DAWSON'S BRONZE.
Eng.; 83.9 Cu, 15.9 Sn, 0.10 Pb, 0.05 As.
Cast: 30,000 TS; 146 Brin.
For journal bearings; very fluid.

DBL.
M-1; 0.80 C, 0.5-0.8 Si, 4.0 Cr, 5.5 W, 1.5 V, 3.5-4.0 Mo, bal Fe.
For tools, cutters; high speed steel.

DBL-2.
M-1; 0.8 C, 0.3 Mn, 0.3 Si, 4 Cr, 2 V, 6 W, 5 Mo, bal Fe.
For tools, cutters; high speed steel.

D.B.L. 2½.
M-1, 1.0 C, 4 Cr, 6.25 W, 2.5 V, 6.25 Mo, bal Fe.
High speed tool steel, W-Mo type for lathe and planer tools, form tools, broaches, drills, reamers, hobs, taps, AISI M3.

D.B.L. 3
M-1; 1.15 C, 4 Cr, 6 W, 3 V, 5.5 Mo, bal Fe.
High speed tool steel, W-Mo-V type for lathe and planer tools, broaches, form tools, hobs, taps, AISI M3.

DC (see FINKL DC).

D-C-33
M-335; 0.33 C, 1.05 Si, 1.55 W, 1.65 Mo, 5.15 Cr, bal Fe
Air hardening; for tools, dies
AISI H12 Hot work steel.

DCM ALLOY
M-937, M-31, M-167, M-1317; 0.08 max C, 15 Cr, 3.5 Ti, 0.08 B, 4.6 Al, 4.5-6.0 Mo, 4-6 Fe, bal Ni
Heat treated 140,000 TS, 116,000 YS; 5 El, 9 RA.
For turbine blades, jet engine components, age hardenable, high stress-rupture strength.

DCN 2W.
M-459, C, Cr, Ni, bal Fe.
22-19 El.
For machinery parts.

DCN 3W.
M-459, C, Cr, Ni, bal Fe
20 El
For machinery parts.

DCN 60
M-459, C, Ni, bal Fe.
For electric resistance wire

DCN 80
M-459; C, Ni, bal Fe.
For electric resistance wire.

DCNA.
M-459, C, Cr, Ni, bal Fe.
8-7 El.
For machinery parts; oil hardened.

DCN EXTRA
M-459, C, Cr, Ni, W, Mo, bal Fe.
16-13 El.
For machinery parts.

DCNO.
M-459; C, Cr, Ni, Mo, bal Fe.
10-8.
For machinery parts; oil hardened.

DCNR.
M-459; 0.38 C, 4.0 Ni, 1.3 Cr, 0.25 Mo, 0.1 V, bal Fe.
For forging dies, hot work rollers; oil or air hardened, tough.

DCN SPEZIAL.
M-459; C, Cr, Ni, W, Mo, V, bal Fe.
15-12 El.
For machinery parts.

D & D SPECIAL O.H.
M-755; 0.7 C, 0.8 Cr, 0.2 Mo, bal Fe.
For tools, dies; oil hardening.

D-DIE.
M-1704; 1.55 C, 11.5 Cr, 0.9 V, 0.8 Mo, bal Fe.
Air or oil hardening cold work tool steel, high carbon-high chromium type.
For punching and trimming dies, gages, broaches.
AISI D2.

DECOBRA.
Eng.; 74.4 Cu, 5.4 Zn, 19 Ni, 0.8 Fe, 0.4 Mn.
For ornamental parts, hardware; corrosion resistant.

DEEFIVE.
M-1097, 60-85 Au, bal Ag, Cu, Pt, Zn.
Cast. 112,000 TS; 1 El, 237 Brin.
For dentures, dental inlays; cast, hard.

DEEFOUR.
M-1097, 60-85 Au, bal Ag, Cu, Pt, Zn.
Cast. 113,000 TS, 1 El, 249 Brin
For dentures; cast, hard.

DEEFOURTEEN.
M-1097, 60-85 Au, bal Ag, Cu, Pt, Zn
Cast: 113,000 TS, 1 El, 243 Brin.
For dental inlays, dentures; cast, hard

DEELITE.
M-1097, 60-85 Au, bal Ag, Cu, Pt, Zn.
Cast 97,000 TS; 2 El; 189 Brin.
For dentures, dental inlays, cast, hard

DEEONE
M-1097; 60-85 Au, bal Ag, Cu, Pt, Zn
Cast: 32,000 TS, 20 El, 65 Brin.
For dental inlays, soft

DEEPEP
M-1097; 60 85 Au, bal Ag, Cu, Pt, Zn
Wrought 154,000 TS, 3 El, 270 Brin.
For dentures, wire.

DEESEVEN
M-1097, 60-85 Au, bal Ag, Cu, Pt, Zn.
Cast 95,000 TS, 1 El, 200 Brin
For dental inlays; cast, hard.

DEESIX
M-1097, 60-85 Au, bal Ag, Cu, Pt. Zn.
Cast 86,000 TS, 2 El, 189 Brin
For dentures, dental inlays; cast, hard

DEETHREE
M-1097, 60-85 Au, bal Ag, Cu, Pt, Zn.
Cast: 106,000 TS, 1 El, 219 Brin.
For dental inlays, dentures; castings, hard.

DEETWO.
M-1097, 60-85 Au, bal Ag, Cu, Pt, Zn.
Cast: 53,000 TS; 18 El, 105 Brin.
For dental inlays

DEFENDER BABBITT.
M-178, 82 Pb, 6.5 Sn, 11 Sb
Cast: 16,100 TS; 7,680 YS; 19.5 Brin.
For bearings; resists shock.

DEFIHEAT.
M-100; 0.30 C, 0.50 Mn, 0.75 Si, 25-30 Cr, bal Fe.
Annealed: 75,000-100,000 TS; 55,000-80,000 YS, 35-23 El; 65-45 RA; 160-200 Brin.
For stainless articles, furnace parts; corrosion and heat resistant.

DEFIRUST.
M-100, 0.12 max C, 0.40 Mn, 0.50 Si, 12-15 Cr, bal Fe.
Annealed: 75,000 TS; 44,000 YS; 37 El; 78 RA; 152 Brin.
Heat treated: 110,000-180,000 TS; 90,000-168,000 YS; 22-10 El; 65-50 RA; 229-352 Brin.
For stainless articles, turbine blades, valves; corrosion resisting, difficulty weldable.

DEFIRUST NO. 410.
M-100; 0.12 max C, 10-13.5 Cr, bal Fe.
For turbine blades; corrosion resistant.

DEFIRUST NO. 416.
M-100; 0.12 max C, 0.5 Si, 12-14 Cr, bal Fe.
For corrosion resistant parts; free machining.

DEFIRUST MACHINING.
M-100, 0.12 max C, 12-15 Cr, 0.50 max Si, 0.25-0.50 S, bal Fe.
Hardened: 122,500 TS; 90,000 YS; 18 El; 56 RA; 239 Brin
Annealed: 76,000 TS; 45,000 YS; 38 El; 62 RA; 156 Brin.
For bolts, nuts, screw machine products, stainless, free machining

DEFIRUST N.
M-100, 0.12 C, 10-13.5 Cr, 2.0 max Ni, bal Fe.
For corrosion resistant parts, corrosion resistant

DEFIRUST SPECIAL.
M-100; 0.12 max C, 0.40 Mn, 0.50 Si, 16-18 Cr, bal Fe.
Annealed: 75,000 TS, 42,000 YS; 37 El, 70 RA, 156 Brin.
Cold drawn: 105,000 TS; 85,000-65,000 YS, 15-23 El, 65-54 RA; 210-170 Brin
For stainless articles, nitric acid equipment, ornamental trim; non-hardenable, corrosion resistant.

DEFIRUST, TURBINE
M-100, C, 11.5-13.0 Cr, bal Fe
Tempered 105,000 TS, 77,000 YS, 23 El, 68 RA. 212 Brin.
For turbine blades, valves, structural and machine parts, corrosion resistant

DEFISTAIN.
M-100, 0.20 max C, 0.50 Mn, 0.50 Si, 17-19 Cr, 7-9 Ni, bal Fe
Annealed: 85,000 TS, 40,000 YS, 61 El, 75 RA, 160 Brin.
Cold worked 85,000-160,000 TS, 34,000-150,000 YS, 61-18 El, 75-52 RA, 135-260 Brin
For stainless articles, chemical apparatus, valves, trim, corrosion resistant, non-magnetic

DEFISTAIN, MACHINING
M-100: C, 18-20 Cr, 8-10 Ni, 0.30 S, bal Fe
Annealed. 90,000 TS, 35,000 YS, 53 El, 64 RA; 150 Brin
Cold drawn. 100,000 TS, 85,000 YS; 35 El; 50 RA; 215 Brin
For valve and pump parts, free machining, stainless.

DEFISTAIN, SPECIAL.
M-100, 0.07 max C, 19 Cr, 9 Ni, bal Fe
Annealed. 90,000 TS, 35,000 YS; 65 El, 70 RA; 142 Brin.
For welded structures especially if annealing after welding is impracticable, stainless, corrosion resistant

DEFISTAIN, SPECIAL.
M-100, 0.20 max C, 19 Cr, 9 Ni.
Annealed: 90,000 TS, 45,000 YS; 60 El; 65 RA; 150 Brin.
For welded structures especially if annealing after welding is impracticable; stainless; corrosion resistant.

DEGUSSA ALLOY.
Eng.; 66 Cu, 34 Zn, traces Fe.
For hardware, lamp fixtures, ornamental parts; yellow brass.

DELAIR.
M-452; 1.0 C, 5.0 Cr, 1.0 Mo, 0.4 V, bal Fe.
Annealed: 105,000 TS; 52,000 YS; 26 El; C 18 Rock.
Heat treated: 253,000 TS; 200,000 YS; 3 El; C 53 Rock.
For blanking and trimming dies, cutters, engravers tools, shear blades, broaches, thread rolling dies.
Type A 2 air hardening tool steel. Tough, wear resistant.

DELAWARE EXTRA.
M-432; 0.60-1.5 C, bal Fe.
For tools and parts, drills; water hardening.

DELAWARE H.S.
M-432; 0.82 C, 5 Mo, 6.5 W, 4 Cr, 2 V, bal Fe.
Heat treated: Rock C 63-67.
For lathe and planer tools, drills, taps, chasers, reamers, drawing dies.
Type M 2 high-speed steel. High toughness and wear resistant.

DELAWARE S.T.
M-432; C, Mn, Si, V, Mo, bal Fe.
Alloy tool steel, shock resisting type.

DELAWARE STANDARD.
M-432; 0.7-1.2 C, bal Fe.
For tools and parts, taps; water hardening.

DELCAR.
M-432; 0.60-1.4 C, bal Fe.
For drills, taps, springs, hobs, reamers, punches; Type W 1; water hardened.

DELCONDEX 10.
M-338; 10 Ni, 0.8 Mn, 0.8 Fe, bal Cu.
Cold drawn: 62,700 TS; 44,800 YS; 14 El; 145 Brin.
For condenser tubes, heat exchangers and fittings; resists impingement corrosion.

DELCONDEX 12.
M-338; 10 5 Ni, 1.4 Fe, 0.8 Mn, bal Cu.
For condenser tubes; corrosion resistant.

DELCONDEX 20.
M-338; 20 Ni, 0.5 Fe, 0.7 Mn, bal Cu.
For condenser tubes, boiler feed water heaters; excellent for brackish water

DELCONDEX 30.
M-338; 31 Ni, 0.8 Fe, 0.8 Mn, bal Cu.
Annealed: 60,500 TS; 20,200 YS; 42 El; 95 Brin.
Cold drawn: 82,900 TS; 67,200 YS; 14 El; 172 Brin.
For marine condenser tubes; resists sea water corrosion.

DELCONDEX 31.
M-338; 30.5 Ni, 0.6 Fe, 0.7 Mn, bal Cu.
For marine condenser tubes; corrosion resistant.

DELCONDEX 32.
M-338; 31 Ni, 2 Fe, 2 Mn, bal Cu.
For condenser tubes for marine construction; resists abrasion and sea water impingement.

DELCONION.
M-338; 5 5.Ni, 1.2 Fe, 0.6 Mn, bal Cu.
Cold drawn: 74,000 TS; 67,000 YS; 3 El; 146 Brin.
For sea water pipes and condensers; good formability.

DELCROME 50V.
M-41, M-1580; 27 Cr, 2.75 C, 0.75 V, bal Fe.
Cast: 51-54 Rc.
High wear resistance, heat treatable for machining.
Hardfacing electrode for cold abrasion application.

DELCROME 450.
M-1580; 12 Cr, 0.2 C, 86 Fe.
Cast: 45 Rock C.
For submerged arc welding; good general properties.

DELCROME-C.
M-1580; 21 Cr, 3.75 C, bal Fe.
Cast: C 54 Rock.
For tappet tips and rocker pads in internal combustion engines.
Wear resistant. Resists mineral abrasion.

DELCHROME R.
M-1580; 30 Cr, 3 W, 6 Mn, 61 Fe.
Cast: 53 Rock C.
For hard facing, especially on wearing parts of earth moving equipment.

DELETOTS ALLOY.
80 Cu, 18 Zn, 2 Mn For brass solder, cartridge cases; extremely ductile.

DELFER.
M-1580; 16.5 Co, 13.5 Cr, 5.5 W, 9 Mo, 2.5 C, bal Fe.
Cast: 100,000 TS; 600 Brin.
For hard facing electrodes for abrasion resisting castings.
Heat and wear resistant.

DELFER B
M-1580, 6 Co, 18 Cr, 3.2 C, 16 Mo, 2 V, bal Fe.
Hard facing electrode; for extreme conditions of abrasive wear by hard gritty particles; hardness 62 Rc.

DELHI GRADE A
M-15, M-76; 16-18 Cr, 0.10 max C, 0.5 max Si, 0.5 Mn, bal Fe
Rolled: 110,000 TS; 10 El; 25 RA; 200 Brin
Annealed 70,000 TS; 45,000 YS, 30 El; 60 RA; 160 Brin.
For ornamental work, tanks, max. operating temperature 1600°F., austenitic, corrosion resistant.

DELHI HARD
M-15, M-1; 17.5 Cr, 1 0 C, 0.12 Ni, 1.13 Si, bal Fe
Annealed 90,000 TS, 40,000 YS, 25 El; 50 RA; 195 Brin.
Heat treated. 225,000 TS, 185,000 YS, 9 El, 25 RA; 420 Brin.
For structures; see Silcrome 17.

DELHI IRON.
M-76, M-15; 16.5-18 Cr, 0.10-0.11 C, 0.75-1.0 Si, bal Fe
For replacing galvanized iron, for roofing, auto body sheets, see Silcrome 17.

DELHI IRON GRADE "S"
M-15, M-1; 11 5-14 Cr, 0.12 max C, 0.5 Si, 0.5 Mn, bal Fe
Annealed: 45,000 TS, 30,000 YS; 30 El; 60 RA; 130 Brin
Heat treated. 130,000 TS, 100,000 YS; 21 El; 68 RA; 235 Brin.
For turbine blades, pump rods, valves, cutlery, machine parts; see Silcrome 12.

DELHI SPECIAL.
M-15; 0.14 C, 0.46 Mn, 0.64 Si, 17 Cr, bal Fe.
At 70°F.: 65,000 TS; 40,000 YS; 32 El; 63 RA.
At 1500°F.: 10,000 TS; 8000 YS; 90 El; 98 RA.
For furnace linings, conveyors, furnace parts; heat and corrosion resistant

DELHI TOUGH IRON.
M-15, M-76; 17 Cr, 1.25 Si, 0.3 Mn, 0.07 C, bal Fe.
For corrosion resisting parts; corrosion resistant; see Silcrome 17.

DELLOY NO. 4.
M-756; Co-Cr-W.
For cutting tools.

DELLOY NO. 6.
M-756; Co-Cr-W.
For cutting tools.

DELLOY NO. 7.
M-756; Co-Cr-W.
For cutting tools.

DELLOY NO. 9.
M-756; Co-Cr-W.
For cutting tools.

DELLOYD
M-756; Co-Cr-W.
For hard facing welding electrodes; heat and corrosion resistant.

DELLOY DC-7.
M-756; WC + Co.
For cutters for iron and nonferrous; sintered carbide.

DELLOY DS-8.
M-756, WC + Co.
For cutters for steel, sintered carbide.

DELLOY G-P.
M-756, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutters, tools; high speed steel.

DELORO 1300K.
M-41, 0.05-0.12 C, 0.3-1.0 Mn, 0.5-1.0 Si, 27-29 Cr, 48-52 Co, bal Fe.
Cast 78,000 TS, 46,000 YS; 8 El, 250 Brin.
For furnace parts, grates, quenching baskets, salt bath electrodes.
Good oxidation resistance at 2200°F and excellent thermal shock resistance

DELORO ALLOY 45
M-41, M-1580, 7.5 Cr, 1.5 Fe, 4 Si, 1.5 B, bal Ni.
Cast: 35-42 Rc
Hardfacing electrode for abrasion and corrosion resistance

DELORO ALLOY 50.
M-41; M-1580, 10 Cr, 4 Mo, 4 Si, 1.5 B, bal Ni.
Cast: 49-52 Rc.
Hardfacing electrode for abrasion and corrosion resistance.

DELORO ALLOY 60
M-41, M-1580, 15 Cr, 4.5 Fe, 4.5 Si, 3 B, bal Ni.
Cast: 59-62 Rc.
Hardfacing electrode for abrasion and corrosion resistance.

DELORO ALLOY B
M-41, M-1580, 0.1 C, 29 Mo, 5 Fe, bal Ni.
Cast: 80,000 TS, 22-28 Rc
High corrosion and oxidation resistance for chemical industry.

DELORO ALLOY C.
M-41, M-1580; 17 Cr, 5 W, 0.1 C, 17 Mo, 6 Fe, bal Ni.
Cast: 80,000 TS, 23-31 Rc.
For hardfacing drop forging dies, readily machinable.

DELORO ALLOY RT1.
M-1580; 15 Cr, 4 W, 0.4 C, 53 Ni, 15 Mo, 5 Fe, 7 Nb.
Cast: 300 Brin, approx.
For hardfacing and build-up; corrosion resistant and resistant to abrasive wear and impact at high temperatures.

DELORO PW22.
M-1580; 1.2 Cr, 95 Ni, 2.5 Si, 1.3 B.
Cast: 200-250 Brin, approx.
For hardfacing and build-up; good corrosion resistance; machinable.

DELORO SF40.
M-1580; 7.5 Cr, 1.5 Fe, 4 Si, 1.5 B, bal Ni.
Cast: C 39 Rock.
For hard facing; machinable.
Abrasion and corrosion resistance.

DELORO SF50.
M-1580; 10 Cr, 4 Fe, 4 Si, 1.5 B, bal Ni.
Cast: C 51 Rock.
For hardfacing.
Wear and corrosion resistance.

DELORO SF60.
M-1580; 15 Cr, 4.5 Fe, 4.5 Si, 3 B, bal Ni.
Cast: C 60 Rock.
For hardfacing. Abrasion and corrosion resistant.

DELORO STELLITE 1.
M-41; 33 Cr, 13 W, 2.5 C, bal Co.
Cast: 80,000 TS; 51-58 Rc.
For hardfacing electrode; heat and wear resistant.

DELORO STELLITE 3.
M-41; 30 Cr, 13 W, 2.4 C, bal Co.
Cast: 80,000 TS; 51-58 Rc.
For castings; high abrasion and corrosion resistant.

DELORO STELLITE 4.
M-41; 31 Cr, 14 W, 1 C, bal Co.
Cast: 130,000 TS; 45-49 Rc.
High temperature strength and wear resistant castings.

DELORO STELLITE 6.
M-41; 26 Cr, 5 W, 1 C, bal Co.
Cast: 116,000 TS; 39-43 Rc.
For hardfacing electrode, heat, shock and wear resistant

DELORO STELLITE 7.
M-41, 26 Cr, 6 W, 0.4 C, bal Co.
Cast: 120,000 TS, 30-35 Rc.
Corrosion resistant and high temperature strength with good ductility and resistance to thermal shock.

DELORO STELLITE 8.
M-41; 30 Cr, 0.2 C, 6 Mo, bal Co.
Cast. 120,000 TS, 30-35 Rc
Thermal shock resistant, high temperature strength; corrosion resistant.

DELORO STELLITE 12.
M-41, 29 Cr, 9 W, 1.8 C, bal Co
Cast: 108,000 TS; 47-51 Rc.
For hardfacing electrode, heat and wear resistant.

DELORO STELLITE 20
M-41; 33 Cr, 18 W, 2.5 C, bal Co.
Cast: 80,000 TS; 55-59 Rc.
High abrasion and corrosion resistance.

DELORO STELLITE 100.
M-41; 34 Cr, 19 W, 2.0 C, bal Co.
Cast: 56,000 TS; 61-66 Rc.
Tool bits, milling cutter blades etc.

DELORO STELLITE X-40.
M-41; 25 Cr, 7 W, 0.3 C, 10 Ni, bal Co.
Cast: 96,000 TS; 30-35 Rc.
Corrosion resistant, high temperature strength and resistance to thermal shock.

DELSTEEL ALLOY.
M-432; C, Mn, S, V, Mo, bal Fe.
Alloy tool steel, shock resisting type. AISI S 5.

DELSTEEL ALLOY S.T.
M-432; 0.35-0.42 C, 0.2 V, 0.4 Mn, 0.5 Mo, 0.018 S, bal Fe.
Water quenched: 280,000 TS; 240,000 YS; 9.5 El; 29 RA; 570 Brin.
For chisels, rivet sets, shear blades; tough.

DELTA II.
M-764; 56.0-61.0 Cu, 2.0 max Ni, 0.2-3.0 Mn, 0.5-1.5 Fe, 0-0.5 Sn, 1.3-2.5 Al, 0-0.8 Si, 0-0.8 Pb, bal Zn.
Hard: 85,300 TS; 39,800 YS; 10 El; 140 Brin.
For ship propellers, hardware, bolts, valve stems, fittings.
High strength and corrosion resistance.

DELTA III.
M-764; 56.0-61.0 Cu, 2.0 max Ni, 0.2-3.0 Mn, 1.5 max Fe, 0.5 max Sn, 0.4-1.3 Al, 0.8 max Si, 1.0 max Pb, bal Zn.
Hard: 71,000 TS; 31,300 YS; 12 El; 120 Brin.
For ship propellers, marine hardware, bolts, valve stems, fittings.
High strength and corrosion resistant.

DELTA IV.
M-764; 56.0-61.0 Cu, 0-2.0 Ni, 0.5-3.0 Mn, 0.5-1.5 Fe, 0.5 max Sn, bal Zn.
Hard: 64,000 TS; 40,000 YS; 20 El; 110 Brin.
For ship propellers, marine hardware, bolts, valve stems.
High strength, corrosion resistant.

DELTA ALUMINUM BRONZE CA1.
M-156; 10 Al, 5 Fe, 5 Ni, 0.25 Mn, bal Cu.
Light drawn: 110,000 TS; 67,000 YS; 15 El; 220 Brin.
High strength aluminum bronze, corrosion resistant

DELTA ALUMINUM BRONZE CA2
M-156; 10.5 Al, 4.5 Fe, 4.5 Ni, 0.5 Mn, bal Cu.
Light drawn: 115,000 TS; 45,000 YS, 20 El; 160 Brin.
Strong, more ductile aluminum bronze, corrosion resistant.

DELTA ALUMINUM BRONZE CA3.
M-156; 9.2 Al, 4.2 Fe, 4.2 Ni, 0.25 Mn, bal Cu.
Light drawn: 100,000 TS; 47,000 YS; 25 El, 170 Brin.
For bronze parts subject to shock; 20 ft lb. Izod.

DELTA ALUMINUM BRONZE CA4
M-156; 11.5 Al, 5.5 Fe, 5.5 Ni, 1.5 Mn, bal Cu.
Light drawn: 130,000 TS, 60,000 YS; 5 El, 230 Brin.
For high strength hot-stampings

DELTA ALUMINUM BRONZE CA5.
M-156; 9.6 Al, 2.25 Fe, 1.5 Ni, 0.3 Mn, bal Cu.
Light drawn: 90,000 TS; 47,000 YS, 15 El, 170 Brin.
Wear resistant, for valve guides on internal combustion engines.

DELTA ALUMINUM BRONZE CA6.
M-156; 8.6 Al, 2 Fe, 0.2 Mn, bal Cu.
Light drawn: 90,000 TS; 43,000 YS; 25 El; 160 Brin.
High impact strength; for pump spindles, valve stems, etc.

DELTA ALUMINUM BRONZE CA7.
M-156; 9.6 Al, 2 Fe, 0.25 Mn, bal Cu.
Light drawn: 90,000 TS; 43,000 YS; 25 El; 160 Brin.
For corrosion resistant bolts and hardware.

DELTA ALUMINUM BRONZE CA8.
M-156; 9.4 Al, 0.25 Mn, bal Cu.
Light drawn: 78,000 TS; 37,000 YS; 25 El; 160 Brin.
Resistant to sulphuric acid.

DELTA ALUMINUM BRONZE CA9.
M-156; 10 Al, 0.25 Mn, 1.5 Pb, bal Cu.
Light drawn: 78,000 TS; 36,000 YS; 10 El; 155 Brin.
For machined parts.

DELTA ALUMINUM BRONZE CA10.
M-156, 6.75 Al, 2 Si, bal Cu.
Light drawn: 80,000 TS; 40,000 YS; 25 El; 170 Brin.
High strength machined parts; highly corrosion resistant.

DELTA ALUMINUM BRONZE CA11.
M-156; 6.2 Al, 0.9 Fe, 0.3 Mn, 2.2 Si, bal Cu.
Light drawn: 80,000 TS; 40,000 YS, 35 El.
Izod 25 ft. lbs.; for parts subject to shock.

DELTA ALUMINUM BRONZE CA12.
M-156; 6.2 Al, 0.7 Fe, 0.2 Mn, 2.2 Si, bal Cu
Light drawn: 80,000 TS, 45,000 YS; 35 El.
For parts subject to shock; Izod 30 ft. lbs.; non-magnetic

DELTA ALUMINUM BRONZE CA13.
M-156, 7 Al, bal Cu
Light drawn 67,000 TS; 25,000 YS; 30 El, 120 Brin.
For cold formed components

DELTA ALUMINUM BRONZE CA14
M-156, 10 Al, 3 Fe, 1.5 Ni, 3 Mn, 0.9 Sn, bal Cu.
Light drawn. 170 Brin
Wear resistant, for parts subject to stress corrosion

DELTA ALUMINUM BRONZE CA15.
M-156, 3 Al, 6.75 Ni, 0.5 Mn, bal Cu
Rolled. 90,000 TS, 50,000 YS, 20 El; 180 Brin.
For paper mill beater bars, etc.

DELTA ALUMINUM BRONZE CA16
M-156, 11 Al, 5.5 Fe, 4.5 Ni, 1.5 Mn, bal Cu
For high strength stamped parts.

DELTABRA.
M-338, 77 Cu, 2 Al, 0.03 As, bal Zn
Cold drawn 82,880 TS, 76,160 YS, 8 El
For condenser tubes, tanker heater tubes, resists sea water corrosion

DELTA BRONZE II.
M-156, M-103, 55-65 Cu, 30-44.9 Zn, 0.1-5.0 Fe.
Cast 76,000 TS, 10 El
Extruded: 84,000 TS, 14 El
For tubes, ornamental and sanitary fittings, automobile parts, corrosion resistant.

DELTA BRONZE III
M-156, M-103, 40-98 Cu, 1.8-45 Zn, 0.1-5.0 Fe, 0.1-10.0 Sn.
Cast 49,000 TS, 30 El.
Extruded: 72,000 TS; 29 El.
For solid drawn tubes for hydraulic purposes, condensers, gears, valves, pump parts, corrosion resistant.

DELTA BRONZE NO. VII.
M-156; Cu alloy
For valves, spindles, internal combustion engine parts; heat and corrosion resistant

DELTA BRONZE NO. VIII.
M-156; Cu alloy.
For marine parts, bearings having no casings; shock and wear resistant.

DELTA BRONZE NO. IX.
M-156; Cu alloy.
For bearings, antifriction lining; low frictional resistance.

DELTA BRONZE NO. IXa.
M-156; Cu alloy.
For bearings, antifriction lining; low frictional resistance.

DELTA COLD FORMING BRASS CF1.
M-156; 62.25 Cu, bal Zn.
Annealed: 55,000 TS; 17,000 YS; 50 El; 70 Brin.
Hard drawn: 120,000 TS; 70,000 YS; 4 El; 160 Brin.
For screws, rivets, nails cold formed.

DELTA COLD FORMING BRASS CF2.
M-156; 62.25 Cu, bal Zn.
Annealed: 55,000 TS; 17,000 YS; 50 El; 70 Brin.
Hard drawn: 120,000 TS, 70,000 YS; 4 El; 160 Brin.
Mainly for wood screws.

DELTA COLD FORMING BRASS CF3.
M-156; 63 Cu, 0.15 Si, bal Zn.
Annealed: 55,000 TS; 17,000 YS; 50 El; 70 Brin
Hard drawn: 120,000 TS, 70,000 YS; 4 El; 160 Brin.
Bent and welded into chain links; low fuming, easily welded.

DELTA COLD FORMING BRASS CF4.
M-156, 63.5 Cu, bal Zn.
Annealed: 55,000 TS; 17,000 YS; 50 El; 70 Brin.
Hard drawn· 120,000 TS; 70,000 YS, 4 El; 160 Brin.
Good ductility, for screws, rivets.

DELTA COLD FORMING BRASS CF5.
M-156; 65 Cu, bal Zn.
Annealed. 55,000 TS; 17,000 YS; 50 El, 70 Brin.
Hard drawn. 120,000 TS; 70,000 YS; 4 El; 160 Brin.
For cold forging, cold bending and forming

DELTA COLD FORMING BRASS CF6
M 156, 67 5 Cu, bal Zn.
Annealed 55,000 TS; 17,000 YS, 50 El, 70 Brin.
Hard drawn. 120,000 TS; 70,000 YS, 4 El; 160 Brin
Wire for metallizing.

DELTA COLD FORMING BRASS CF7.
M-156, 70 Cu, bal Zn
Annealed: 45,000 TS, 16,000 YS; 60 El; 60 Brin
Hard drawn 120,000 TS; 70,000 YS, 4 El; 170 Brin
For cold extrusion, spinning.

DELTA COLD FORMING BRASS CF8
M-156, 71 Cu, 0.04 As, bal Zn.
Annealed· 45,000 TS, 16,000 YS, 60 El; 60 Brin.
Hard drawn: 120,000 TS, 70,000 YS; 4 El, 170 Brin.
For redrawing and weaving wire, anti-dezincification.

DELTA COLD FORMING BRASS CF9
M-156, 80 Cu, bal Zn.
Annealed. 45,000 TS; 15,000 YS, 60 El, 60 Brin
Hard drawn· 110,000 TS, 70,000 YS; 4 El, 170 Brin.
Excellent cold working properties.

DELTA COLD FORMING BRASS CF10.
M-156, 85 Cu, bal Zn.
Annealed: 45,000 TS; 15,000 YS; 50 El; 60 Brin.
Hard drawn: 95,000 TS; 70,000 YS; 4 El; 150 Brin.
Excellent cold working properties; Red Brass.

DELTA COLD FORMING BRASS CF11.
M-156; 90 Cu, bal Zn.
Annealed: 40,000 TS; 12,000 YS; 45 El; 55 Brin.
Hard drawn: 80,000 TS; 65,000 YS; 4 El, 130 Brin.
Excellent cold working properties; Gilding brass.

DELTA COLD FORMING BRASS CF12.
M-156; 88 Cu, 1 Sn, bal Zn.
Annealed· 40,000 TS; 11,000 YS; 50 El; 50 Brin.
Hard drawn: 80,000 TS; 60,000 YS; 5 El; 155 Brin.
Excellent cold working properties; Fire Bronze.

DELTA COLD FORMING BRASS CF13.
M-156; 80 Cu, 2 Sn, bal Zn.
Annealed: 55,000 TS; 60 El.

DELTA COLD FORMING BRASS CF21.
M-156; 59 Cu, bal Zn.
Light drawn: 57,000 TS; 36,000 YS; 35 El; 110 Brin.
For windshield frame sections, etc; limited cold bending.

DELTA COLD FORMING BRASS CF22.
M-156; 60.5 Cu, bal Zn.
Light drawn: 60,000 TS; 30,000 YS; 35 El; 110 Brin.
For bending, cold forging, hot working; Muntz metal.

DELTA COLD FORMING BRASS CF23.
M-156; 60.5 Cu, 0.5 Pb, bal Zn.
Light drawn: 55,000 TS; 25,000 YS; 35 El; 100 Brin.
For nut blanking, etc.; leaded Muntz metal.

DELTA COLD FORMING BRASS CF24.
M-156; 60.5 Cu, 1 Pb, bal Zn.
Light drawn: 55,000 TS; 27,000 YS; 30 El; 100 Brin.
For machining and cold forming parts.

DELTA COLD FORMING BRASS CF25.
M-156; 61 Cu, 0.3 Pb, bal Zn.
Drawn: 75,000 TS; 5 El.
For bending and some machining.

DELTA COLD FORMING BRASS CF26
M-156; 63.5 Cu, 0.3 Pb, bal Zn.
Light drawn: 55,000 TS, 40 El.
For cold heading and drilling.

DELTA COLD FORMING BRASS CF27.
M-156, 63 Cu, 1.8 Pb, bal Zn.
Extruded product for subsequent rolling.

DELTA COLD FORMING BRASS CF28
M-156; 65 Cu, 1.1 Pb, bal Zn.
Extruded product for subsequent rolling.

DELTA COPPER C 1.
M-156; ETP or FRHC extruded and drawn 99 9 Cu.
Annealed. 33,000 TS, 15,000 YS; 50 El; 45 Brin.
Hard drawn: 55,000 TS; 50,000 YS; 5 El; 90 Brin.
Wire for rivets, etc.

DELTA COPPER C 2
M-156; ETP or FRHC Hot rolled and drawn 99.9 Cu
Annealed. 33,000 TS; 15,000 YS; 50 El; 45 Brin.
Hard drawn· 55,000 TS, 50,000 YS; 5 El; 90 Brin.
Wire for nails, etc.

DELTA COPPER C 3.
M-156, DHP 99.85 Cu
Annealed: 34,000 TS; 15,000 YS; 50 El; 45 Brin.
Hard drawn: 54 000 TS; 47,000 YS, 10 El, 95 Brin.
Tubes only, for water, gas, etc

DELTA HIGH TENSILE BRASS HT1.
M-156; 57 Cu, 1 Pb, 0.75 Sn, 0.75 Fe, 1.5 Mn, bal Zn.
Light drawn: 80,000 TS; 40,000 YS, 22 El; 135 Brin.
General purpose high tensile brass; for pump rods, valve spindles, etc.

DELTA HIGH TENSILE BRASS HT2.
M-156; 57.5 Cu, 1 Pb, 0.5 Sn, 0.75 Fe, 1 Al, 1.5 Mn, bal Zn.
Light drawn: 80,000 TS; 38,000 YS; 20 El; 120 Brin.
For pump rods, valve spindles; not suitable for plating.

DELTA HIGH TENSILE BRASS HT3.
M-156; 58.25 Cu, 0.65 Pb, 0.9 Sn, 0.9 Fe, 0.6 Al, 0.5 Mn, bal Zn.
Light drawn: 82,000 TS; 40,000 YS; 20 El; 135 Brin.
For pump rods, valve spindles; readily machinable.

DELTA HIGH TENSILE BRASS HT4.
M-156; 58.25 Cu, 0.9 Sn, 0.9 Fe, 0.6 Al, 0.5 Mn, bal Zn.
Light drawn: 82,000 TS; 40,000 YS; 20 El; 135 Brin.
For valve spindles, general marine work.

DELTA HIGH TENSILE BRASS HT5.
M-156; 58 Cu, 0.25 Pb, 1 Sn, 0.75 Fe, 1.5 Mn, bal Zn.
Light drawn: 82,000 TS; 43,000 YS; 20 El; 150 Brin.
For general purpose, plating and soldering.

DELTA HIGH TENSILE BRASS HT6.
M-156; 58 Cu, 1.2 Sn, 1.1 Fe, 0.3 Al, 0.2 Mn, bal Zn.
Light drawn: 72,000 TS; 36,000 YS; 25 El; 135 Brin.
For marine shafts, rolled tubes.

DELTA HIGH TENSILE BRASS HT7.
M-156; 57.5 Cu, 0.75 Sn, 0.75 Fe, 1.25 Mn, bal Zn.
Light drawn: 74,000 TS; 37,000 YS; 25 El; 135 Brin.
For parts subject to shock; Izod 20-25 ft, lbs.

DELTA HIGH TENSILE BRASS HT8.
M-156; 57 Cu, 1 Sn, 1 Fe, 0.75 Al, 1.5 Mn, bal Zn.
Light drawn: 85,000 TS; 42,000 YS; 25 El; 150 Brin.
For high pressure marine fittings.

DELTA HIGH TENSILE BRASS HT9.
M-156; 57 Cu, 0.75 Pb, 0.3 Sn, 1 Fe, 0.75 Al, 0.75 Mn, bal Zn.
Light drawn: 75,000 TS; 40,000 YS; 15 El; 120 Brin.
For special hot stampings.

DELTA HIGH TENSILE BRASS HT10.
M-156; 57 Cu, 0.75 Pb, 0.3 Sn, 1 Fe, 2.5 Al, 1.5 Mn, bal Zn.
For hot stampings; easily machined.

DELTA HIGH TENSILE BRASS HT11.
M-156; 58 Cu, 0.75 Pb, 0.75 Fe, 1.5 Al, 1 Mn, bal Zn.
Light drawn: 78,000 TS; 40,000 YS; 15 El.
For hot stampings; easily machined.

DELTA HIGH TENSILE BRASS HT12.
M-156; 57.5 Cu, 0.85 Pb, 0.65 Fe, 0.3 Al, 1.75 Mn, bal Zn.
Light drawn: 160 Brin.
For conveyer belt segments; hard wearing alloy.

DELTA HIGH TENSILE BRASS HT13.
M-156; 58 Cu, 2.25 Pb, 1 Sn, 0.35 Fe, 0.35 Al, 1.5 Mn, bal Zn.
Light drawn: 72,000 TS; 32,000 YS, 20 El; 115 Brin.
For valve spindles, bearing bushes; free machining.

DELTA HIGH TENSILE BRASS HT14.
M-156; 58.25 Cu, 1.5 Pb, 0.75 Sn, 0.75 Fe, 0.3 Al, 0.75 Mn, bal Zn.
For high pressure gas fittings; free machining.

DELTA HIGH TENSILE BRASS HT15.
M-156; 62 Cu, 0.4 Pb, 0.25 Sn, 1 Al, 0.4 Mn, bal Zn.
For golf ball moulds.

DELTA HIGH TENSILE BRASS HT16.
M-156; 65.8 Cu, 0.85 Sn, 1.4 Fe, 3 Al, 0.6 Mn, bal Zn.
Light drawn: 85,000 TS; 42,000 YS; 20 El; 155 Brin.
Wear and corrosion resistant brass.

DELTA HIGH TENSILE BRASS HT17.
M-156; 67.5 Cu, 1.4 Fe, 4.8 Al, 0.5 Mn, bal Zn.
Light drawn: 98,000 TS; 50,000 YS; 15 El; 185 Brin.
For bearing plates, wear strip.

DELTA HIGH TENSILE BRASS HT18.
M-156; 70 Cu, 2 Fe, 6 Al, 3 Mn, bal Zn.
Light drawn: 110,000 TS; 60,000 YS; 12 El; 220 Brin.
For gears, cams, press slides, etc.

DELTA HIGH TENSILE BRASS HT19.
M-156; 57.25 Cu, 1 Pb, 0.25 Sn, 0.5 Fe, 0.75 Al, 1 Mn, 2 Ni, bal Zn.
For gas water heating equipment; good hot corrosion resistance.

DELTA HIGH TENSILE BRASS HT20.
M-156; 57.25 Cu, 0.5 Pb, 1.5 Al, 2.5 Mn, 0.75 Si, bal Zn.
Light drawn: 90,000 TS; 40,000 YS; 15 El; 155 Brin
For bearings and bushings.

DELTA HIGH TENSILE BRASS HT21.
M-156; 58 Cu, 1.75 Al, 3 Mn, 1 Si, bal Zn.
Light drawn: 80,000 TS; 40,000 YS. 15 El, 130 Brin.
For gearbox components.

DELTA HIGH TENSILE BRASS HT22.
M-156; 60 Cu, 3 Pb, 2.5 Mn, bal Zn.
Resistance alloy; resistivity 17.

DELTA HIGH TENSILE BRASS HT23.
M-156; 56 Cu, 3 Pb, 6.3 Mn, bal Zn.
Resistance alloy; resistivity 20

DELTA HIGH TENSILE BRASS HT24
M-156, 58 Cu, 0.75 Sn, 0.5 Fe, 0.2 Mn, bal Zn.
Drawn. 80,000 TS, 60,000 YS, 15 El; 130 Brin
Metallizing wire.

DELTA, KRUPP.
M-72, 54-56 Cu, 41-42 Zn, 0.7-1.8 Pb, 0.86-1.28 Fe, 0.8-1.4 Mn
For high strength structural castings, tough

DELTAL
M-1356, 0.6-1.4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, 0.3 max Cr, bal Al
Annealed 21,000 TS, 80,000 YS, 24 El, 36 Brin
Hard 32,000 TS, 29,000 YS, 6 El
For structural members.

DELTAL.
M-1548, 0.3-1.5 Si, 0.2-1.5 Mn, 0.5-2.0 Mg, bal Al
Ht. Tr. 56,000 TS, 52,000 YS, 12 El; 120 Brin.
For general structures, scaffolds, rails, booms, water heater tubes.
Heat treatable, good fabricability

DELTA MANGANESE BRASS MB1.
M-156; 57 Cu, 1.25 Mn, 2.25 Pb, bal Zn.
Light drawn. 67,000 TS; 27,000 YS; 30 El, 95 Brin.
Architectural uses; good machinability.

DELTA MANGANESE BRASS MB2.
M-156; 57 Cu, 1.25 Mn, 1.25 Pb, bal Zn.
Light drawn. 67,000 TS; 27,000 YS; 30 El; 95 Brin.
Architectural uses; "warmer" appearance.

DELTA MANGANESE BRASS MB3.
M-156; 55.5 Cu, 1.25 Mn, bal Zn.
Architectural uses.

DELTA MANGANESE BRASS MB4
M-156; 57.75 Cu, 1.25 Mn, bal Zn.
Architectural uses, good cold bending.

DELTA MANGANESE BRONZE MB5.
M-156; 58.5 Cu, 0.35 Mn, 1.25 Fe, 1 Sn, bal Zn.
Light drawn: 70,000 TS; 35,000 YS; 15 El; 115 Brin.
American standard CA675.

DELTAMAX.
M-1; 50 Fe, 50 Ni.
For magnets, choke cores; grain-oriented.

DELTA-MU.
M-1089; 45 Ni, 5 Cr, bal Fe.
For magnetic cores; high electrical resistivity.

DELTA NAVAL BRASS N 1.
M-156; 61.5 Cu, 1.2 Sn, 0.2 Pb, bal Zn.
Light drawn: 55,000 TS; 24,000 YS; 25 El; 110 Brin.
Limited machining and hot stamping; good corrosion resistance.

DELTA NAVAL BRASS N 2.
M-156; 61.5 Cu, 1.2 Sn, bal Zn.
Light drawn: 55,000 TS; 22,000 YS; 30 El; 90 Brin.
For cold forming, instrument components; non-magnetic.

DELTA NAVAL BRASS N 3.
M-156; 58.5 Cu, 0.8 Sn, bal Zn.
Light drawn: 58,000 TS, 27,000 YS; 20 El; 100 Brin.
Good hot stamping, reasonable machinability

DELTA NAVAL BRASS N 4.
M-156; 60.75 Cu, 1.2 Sn, 1.5 Pb, bal Zn
Light drawn 55,000 TS, 20 El; 100 Brin
Good machining alloy.

DELTA NAVAL BRASS N 5.
M-156; 60.25 Cu, 0.75 Sn, bal Zn.
Light drawn: 60,000 TS; 27,000 YS; 25 El, 90 Brin
American standard CA 482

DELTA NAVAL BRASS N 6.
M-156; 60.25 Cu, 0.75 Sn, 0.6 Pb, bal Zn.
Light drawn: 60,000 TS, 27,000 YS, 20 El, 90 Brin.
American standard CA 482.

DELTA NAVAL BRASS N 7.
M-156, 60.25 Cu, 0.75 Sn, 1.5 Pb, bal Zn
Light drawn 60,000 TS, 27,000 YS; 20 El; 90 Brin
American standard CA 485

DELTA NAVAL BRASS N 8
M 156, 58 Cu, 1.2 Sn, 2 Pb, bal Zn
Light drawn 60,000 TS; 25,000 YS, 20 El, 100 Brin
Free machining alloy, also hot-stamping.

DELTA NAVAL BRASS N 9.
M-156, 60 Cu, 1.1 Sn, bal Zn
Drawn 80,000 TS, 15 El, 200 Brin.
For electrical switching parts.

DELTA NAVAL BRASS N 10
M-156, 61 Cu, 1.75 Sn, bal Zn
Light drawn: 60,000 TS, 20 El, 120 Brin
For electrical plug pins

DELTA NICKEL SILVER NS1
M-156; 45.5 Cu, 9.5 Ni, 2 Pb, 0.3 Mn, bal Zn
Light drawn: 90,000 TS, 45,000 YS, 20 El; 150 Brin.
For machining and hot stamping decorative and ornamental parts

DELTA NICKEL SILVER NS2.
M-156; 40 Cu, 13.25 Ni, 1.9 Pb, 2 Mn, bal Zn.
Light drawn. 90,000 TS, 58,000 YS; 15 El; 150 Brin.
For decorative and ornamental parts; colour of sterling silver.

DELTA NICKEL SILVER NS3.
M-156; 46.5 Cu, 9.25 Ni, bal Zn
Light drawn 80,000 TS; 30 El
For window fittings, warm pink color.

DELTA NICKEL SILVER NS4.
M-156; 51.5 Cu, 5.5 Ni, bal Zn.
For decorative purposes; yellow color.

DELTA NICKEL SILVER NS5.
M-156, 45.5 Cu, 9.5 Ni, 2 Pb, bal Zn.
Light drawn: 89,000 TS; 20 El; 130 Brin.
For instrument components; non-magnetic.

DELTA NICKEL SILVER NS6.
M-156; 49.5 Cu, 9.8 Ni, 0.35 Mn, bal Zn.
Rolled: 83,000 TS; 42,000 YS; 18 El; 145 Brin.
Rolled bar and sheet; lead free.

DELTA PHOSPHOR BRONZE PB1.
M-156; 5 Sn, 0.2 P, bal Cu.
Annealed: 60,000 TS; 30,000 YS; 50 El; 90 Brin.
Hard drawn: 130,000 TS; 70,000 YS; 4 El; 200 Brin.
Wire for redrawing, etc.

DELTA PHOSPHOR BRONZE PB2.
M-156; 7 Sn, 0.2 P, bal Cu.
Annealed: 60,000 TS; 30,000 YS, 50 El; 90 Brin.
Hard drawn: 130,000 TS; 70,000 YS, 4 El; 220 Brin.
For springs.

DELTA PHOSPHOR BRONZE PB3.
M-156; 8 Sn, 0.3 P, bal Cu.
Anealed: 60,000 TS, 30,000 YS; 50 El; 80 Brin.
Hard drawn: 130,000 TS; 70,000 YS; 4 El; 230 Brin.
For Fourdrinier wire in paper making.

DELTA PHOSPHOR BRONZE PB4
M-156; 6 Sn, 0.25 P, bal Cu.
Annealed. 60,000 TS; 30,000 YS; 50 El, 90 Brin
Hard drawn 130,000 TS, 70,000 YS; 4 El; 210 Brin
Wire for redrawing, etc.

DELTA PROPELLER BRONZE
M-156; Cu alloy
67,000 TS, 20 El.
For propellers, propeller blades, corrosion resistant, malleable.

DELTA STAMPING BRASS S 1
M-156, 57.25 Cu, 2 Pb, bal Zn
Light drawn: 60,000 TS, 30,000 YS, 20 El; 120 Brin
For general purpose hot brass stampings.

DELTA STAMPING BRASS S 2.
M-156; 59 Cu, 1.75 Pb, bal Zn.
Light drawn 60,000 TS; 25,000 YS; 25 El, 110 Brin.
For hot brass stampings, some cold formability

DELTA STAMPING BRASS S 3
M-156; 59.5 Cu, 2.25 Pb, bal Zn
Light drawn 60,000 TS; 25,000 YS; 25 El; 110 Brin.
For hot brass stampings, improved machinability.

DELTA STAMPING BRASS S 4
M-156, 55 Cu, 2.75 Pb, 0.2 Sn, bal Zn
For gas tap components, etc.

DELTA STAMPING BRASS S 5
M-156, 59 Cu, 1 Pb, bal Zn
Light drawn: 62,000 TS; 30,000 YS; 25 El; 110 Brin.
For hot brass stampings, also cold forming.

DELTA STAMPING BRASS S 6.
M-156; 58.5 Cu, 1.75 Pb, bal Zn
Light drawn 60,000 TS; 30,000 YS; 20 El, 110 Brin.
For hot brass stampings, non-magnetic.

DELTA STAMPING BRASS S 7
M-156, 57.5 Cu, 2 Pb, bal Zn.
Light drawn: 60,000 TS; 30,000 YS; 20 El; 120 Brin
For hot stamped instrument components; non magnetic

DELTA STAMPING BRASS S 8.
M-156, 58.25 Cu, 1.75 Pb, bal Zn.
Light drawn: 63,000 TS, 35,000 YS, 15 El; 120 Brin.
For valve bodies, etc.

DELTA STAMPING BRASS S 9.
M-156; 70 Cu, 1.75 Al, 0.03 As, bal Zn
For hot stamped water fittings; anti-dezincification.

DELTA T II.
M-764, 10 Al, 2 Mn, 2 Fe, bal Cu.
Rolled. 85,000 TS; 42,000 YS; 15 El; 150 Brin.
For paper and chemical industries, pump shafts, valve components
Aluminum bronze. Wear and corrosion resistant.

DELTOXAL.
M-1356; 2-4 Mg, 0.4 max Mn, 0.3 max Cr, bal Al.
Annealed: 28,000 TS; 13,000 YS; 30 El; 47 Brin.
Hard: 42,000 TS; 37,000 YS.
For aircraft and missile and marine parts; corrosion resistant to sea water.

DELTA TURNING AND RIVETING BRASS TR1.
M-156; 61.5 Cu, 2.25 Pb, bal Zn.
Light drawn: 55,000 TS; 35,000 YS; 25 El; 100 Brin.
Standard turning and riveting brass; good machinability.

DELTA TURNING AND RIVETING BRASS TR2.
M-156; 62.5 Cu, 2.25 Pb, bal Zn.
Light drawn: 55,000 TS; 30,000 YS; 25 El; 100 Brin.
Turning and riveting brass; machinable and ductile.

DELTA TURNING AND RIVETING BRASS TR3.
M-156; 60.5 Cu, 1.75 Pb, bal Zn.
Light drawn: 55,000 TS; 35,000 YS; 25 El; 100 Brin.
Good turning, riveting, hot stamping.

DELTA TURNING AND RIVETING BRASS TR4.
M-156; 61.5 Cu, 1.25 Pb, bal Zn.
Light drawn: 55,000 TS, 28,000 YS; 25 El; 100 Brin
Good machining and riveting.

DELTA TURNING AND RIVETING BRASS TR5
M-156; 60.5 Cu, 2.5 Pb, bal Zn.
Light drawn: 55,000 TS, 35,000 YS; 25 El; 100 Brin.
For machined instruments parts; non-magnetic.

DELTA TURNING AND RIVETING BRASS TR6.
M-156, 62.5 Cu, 1.25 Pb, bal Zn
Light drawn: 55,000 TS; 28,000 YS, 25 El; 100 Brin.
For cold shaped instrument parts; non-magnetic.

DELTA TURNING AND RIVETING BRASS TR7
M-156; 63.25 Cu, 1.8 Pb, bal Zn.
Light drawn: 55,000 TS; 30,000 YS. 25 El; 110 Brin
For machining and riveting; high purity.

DELTA TURNING BRASS T 1.
M-156, 57 Cu, 3 Pb, bal Zn.
Light drawn: 60,000 TS; 25,000 YS, 20 El, 120 Brin.
For general purpose machined components.

DELTA TURNING BRASS T 2.
M-156; 57.7 Cu, 2.75 Pb, bal Zn.
Light drawn; 60,000 TS; 25,000 YS; 20 El; 120 Brin.
For machined components; also hot stamping.

DELTA TURNING BRASS T 3
M-156; 57.7 Cu, 3.5 Pb, 0.3 Sn, bal Zn
Light drawn. 60,000 TS, 20 El; 100 Brin.
For high speed machining and intricate slotting and drilling.

DELTA TURNING BRASS T 4.
M-156; 58 Cu, 2 Pb, 0.6 Sn, bal Zn.
For roller bearing cages; good corrosion resistance.

DELTA TURNING BRASS T 5.
M-156; 61.5 Cu, 3.25 Pb, bal Zn
Light drawn: 55,000 TS; 30,000 YS; 25 El; 110 Brin
For automatic machining; also for thread rolling

DELTA TURNING BRASS T 6.
M-156; 65 Cu, 3.25 Pb, bal Zn.
Light drawn: 55,000 TS, 25 El, 110 Brin.
For very fine deep drilling, high purity.

DELTA TURNING BRASS T 7.
M-156; 57.5 Cu, 3 Pb, bal Zn.
Light drawn· 60,000 TS; 25,000 YS; 20 El; 120 Brin.
For machined instrument components; non-magnetic.

DELTA TURNING BRASS T 8.
M-156; 56.5 Cu, 2.25 Pb, bal Zn.
Light drawn: 60,000 TS, 25,000 YS; 20 El; 120 Brin.
For machined components and hot stamping.

DELTA TURNING BRASS T 9.
M-156; 56.25 Cu, 2.75 Pb, bal Zn.
Light drawn: 60,000 TS; 25,000 YS; 20 El; 120 Brin.
For hollow shapes as bolt sections; very good for plating.

DELTA TURNING BRASS T 10.
M-156; 57.5 Cu, 2.5 Pb, 0.5 Al, bal Zn.
Extruded: 55,000 TS; 25,000 YS; 25 El; 100 Brin
For hinges, lock sections; natural bright finish.

DELTA WELDING ALLOY W 1
M-156; 60.5 Cu, 0.4 Si, 0.4 Sn, bal Zn.
As welded· 56,000 TS; 40,000 YS; 20 El; 130 Brin.
For brazing copper and mild steel.

DELTA WELDING ALLOY W 2
M-156; 60.5 Cu, 0.3 Si, bal Zn.
Rod as manufactured: 75,000 TS; 15 El.
For brazing copper and mild steel.

DELTA WELDING ALLOY W 3.
M-156, 59.5 Cu, 0.2 Si, 0.3 Sn, bal Zn.
For brazing copper and mild steel

DELTA WELDING ALLOY W 4.
M-156, 59.5 Cu, 0.25 Si, 0.4 Sn, 0.4 Fe, 0.2 Mn, bal Zn.
Welded 56,000 TS
High tensile brass weld; for brazing copper and cast iron.

DELTA WELDING ALLOY W 5
M-156, 48.5 Cu, 9 Ni, 0.25 Si, 0.4 Mn, bal Zn.
Welded: 60,000 TS
Nickel silver weld metal, for brazing ferrous metals

DELTA WELDING ALLOY W 6
M-156, 48 Cu, 8.5 Ni, 0.25 Si, 0.3 Sn, 0.4 Mn, bal Zn.
Nickel silver weld metal, for brazing ferrous metals

DELTA WELDING ALLOY W 7
M-156, 48 Cu, 10 Ni, 0.15 Si, 0.02 P, bal Zn
Rod as manufactured· 100,000 TS, 56,000 YS, 15 El, 210 Brin
Nickel silver weld metal; for brazing ferrous metals

DELTA WELDING ALLOY W 8
M-156, 58.5 Cu, 0.5 Ni, 0.4 Si, 0.8 Sn, 0.4 Fe, 0.4 Mn, bal Zn
As welded· 60,000 TS
High tensile brass weld, for brazing copper and cast iron.

DELTA WELDING ALLOY W 9
M-156, 57.5 Cu, 0.1 Si, 0.8 Sn, 0.8 Fe, 0.3 Mn, bal Zn
Rod as manufactured 80,000 TS, 170 Brin
High tensile brass weld, for brazing copper and cast iron

DELTA WELDING ALLOY W 10
M-156, 7 Al, 0.4 Si, bal Cu
Welded 67,000 TS
For welding aluminum bronzes

DELTA WELDING ALLOY W 11.
M-156, 9.4 Al; 0.5 Mn, bal Cu.
As welded· 67,000 TS
For welding aluminum bronze, high impact strength

DELTA WELDING ALLOY W 12.
M-156; 9.75 Al, 2.25 Fe, 1.75 Mn, bal Cu.
As welded· 63,000 TS
For welding aluminum bronzes.

DELTUMIN
M-1548; 3.5-5.5 Cu, 0.2-1.5 Si, 0.1-1.5 Mn, 0.2-2.0 Mg, bal Al
Ht Tr.· 70,000 TS; 60,000 YS; 13 El; 135 Brin.
For fittings, hardware, aircraft engine components.
Heat treatable, high tensile and fatigue strength.

DE LUXE-9.
M-1145; 0.9 C, 0.25 Mn, 0.2 Si, bal Fe.
For header dies, reamers.

DE LUXE-10.
M-1145; 1.05 C, 0.25 Mn, 0.2 Si, bal Fe.
For dies, forming tools.

DE LUXE-12.
M-1145; 1.2 C, 0.25 Mn, 0.2 Si, bal Fe.
For cutters; for nonferrous metals.

DEM NO. 1
M-1066; 63 3 Ag, bal Cu.
For silver solder, M.P 1275°F.

DEM NO 2
M-1066; 66 7 Ag, bal Cu.
For silver solder, M.P. 1363°F

DEM NO 10.
M-1066; 22 2 Ag, bal Cu.
For silver solder, M P 1207°F

DEM NO. 22
M-1066; 50 Ag, bal Cu
For silver solder; M P 1255°F

DEM NO 23
M-1066, 60 Ag, bal Cu
For silver solder, M P 1248°F

DEM NO 37
M-1066, 9 Ag, bal Cu
For silver solder, M P 1510°F.

DEM NO 41
M-1066; 71 8 Ag, bal Cu
For silver solder, M P. 1434°F

DEM NO 43
M 1066, 54 Ag, bal Cu
For silver solder, M P 1223°F.

DEM NO 48
M-1066, 17 Ag, bal Cu
For silver solder, M P 1382°F

DEM NO 64
M-1066, 19-20 Ag, bal Cu
For silver solder, M P 1430°F.

DEM NO 65
M-1066, 40 Ag, bal Cu
For silver solder, M P 1233°F

DEM NO 66
M-1066, 64-66 Ag, bal Cu.
For silver solder, M P 1280°F

DEM NO. 69
M-1066, 44-46 Ag, bal Cu.
For silver solder, M P 1250°F.

DEM NO 71
M-1066, 49-51 Ag, bal Cu
For silver solder; M P 1160°F.

DEM NO. 73.
M-1066, 49-51 Ag, bal Cu
For silver solder; M.P 1195°F

DEM NO 102.
M-1066; 41.7 Au, bal Cu
For gold solder, M.P. 1436°F-1508°F.

DEM NO. 104.
M-1066; 41 7 Au, bal Cu.
For gold solder; M.P 1248°F-1318°F

DEM NO. 106
M-1066; 41.7 Au, bal Cu.
For gold solder; M.P. 1378°F-1410°F

DEM NO. 110.
M-1066; 58.3 Au, bal Cu.
For gold solder; M.P. 1395°F-1310°F.

DEM NO. 112.
M-1066; 50 Au, bal Cu.
For gold solder; M.P. 1420°F-1495°F.

DEM NO. 114.
M-1066; 33.3 Au, bal Cu.
For gold solder; M.P. 1360°F-1392°F.

DEM NO. 115.
M-1066; 33.3 Au, bal Cu.
For gold solder; M.P. 1245°F-1310°F.

DEM NO. 119.
M-1066; 25 Au, bal Cu.
For gold solder, M.P. 1350°F-1141°F.

DEM NO. 120.
M-1066, 41.7 Au, bal Cu
For gold solder; M P. 1378°F-1418°F.

DEM NO. 293.
M-1066; 50 Au, bal Cu
For gold solder; M P 1317°F-1255°F

DEM NO. 426
M-1066; 33 3 Au, bal Cu
For gold solder; M P. 1407°F-1522°F.

DEM NO. 429
M-1066, 50 Au, bal Cu.
For gold solder, M.P 1392°F-1373°F.

DEM NO 430.
M-1066, 58 3 Au, bal Cu
For gold solder, M P 1323°F-1248°F

DEM NO 431.
M-1066, 58 3 Au, bal Cu.
For gold solder; M.P 1495°F-1440°F

DEM NO SSFI-70
M-1066; 46 Ag, bal Cu.
For silver solder; M.P. 1171°F

DEM NO SSEI-82
M 1066, 46 Ag, bal Cu
For silver solder; M P 1165°F.

DEMARK
M-1078, Ti C, Co.
For thread gauging dies, sintered carbide.

DEMO BRONZE
61 Cu, 33 Pb, 4-6 Sn, 2-1 Ni
18,000 TS, 3 El; 0 35 RA, 52 Brin.
For bearings, utensils; C.U S.-56,000

DENAVIS.
M-755, 0 7 1 2 C, bal Fe.
For tools, cutters, water hardening.

DENAVIS HIGH SPEED
M-755; 0 7 C, 18 W, 4 Cr, bal Fe
For tools, cutters, reamers; high speed steel.

DENINE
M-435; 1.2 C, 1 5 W, bal Fe
For taps, drawing dies, water hardened.

DENSALLOY
M-1388; 90 W, 6 Ni, 4 Cu.
Sintered · 85,000-115,000 TS; 10-2 El, 400 Brin.
For balance weights, centrifugal clutches; sintered; heavy metal.

DENSE STEEL.
U S.; Cr, Si, Mo, C, bal Fe.
For tools.

DENSIFIED CRU-DIE.
M-38; 0.55 C, 0 9 Mn, 0 3 Si, 0.8 Ni, 1.05 Cr, 0.40 Mo, bal Fe.
Furnished in 4 hardness ranges (269-429 Brin) for forging large sections of tool steels, particularly for dies

DENSITE.
M-1423; 1.4 C, 11-13 Cr, 0.8 Mo, 0.2 min V, bal Fe.
For cutting, forming and trimming dies; air hardened.

DENSITE AH.
M-1423; 1.5 C, 12 Cr, 1 Mo, bal Fe.
For forming and drawing dies, punches; Type D 2; air hardened, non-deforming.

DENSO IRON.
M-95; 3 C, Cr, Mo, bal Fe.
For rolls; chilled iron.

DENTAL BURR (1%W).
M-38; 1.15 C, 1.25 W, bal Fe.
For dental burrs; oil hardening.

DENTAL BURR (3½%W).
M-38; 1.05 C, 0.75 Cr, 3.5 W, bal Fe.
For dental burrs; oil hardening.

DENTALLOY.
M-216; 38.14 Bi, 26.42 Pb, 31.67 Sn, 2.64 Cd, 1 Sb, 0.06 Cu.
Cast: 15 Brin.
For dental castings, models; see "Cerrodent."

DEOXIDIZED COPPER.
M-33; 99.9 + Cu, 0.02 P.
Annealed: 33,000 TS; 10,000 YS; 45 El.
Rolled: 50,000 TS, 45,000 YS, 6 El.
For condensers, evaporators; corrosion resistant.

DEOXIDIZED COPPER 105.
M-141; 99.9 min Cu, 0.02 P.
Hard: 55,000 TS; 50,000 YS; 8 El; 107 Brin.
Soft: 32,000 TS; 10,000 YS; 45 El; 40 Brin.
For deep drawing, water tubes; deoxidized copper.

DEOXIDIZED LEADED COPPER-129.
M-8; 0.80-1.2 Pb, 99.90 min Cu + Pb.
Hard: 51,000-60,000 TS; 46,000-55,000 YS; 14-10 El; 83-100 Brin.
For contact pins and inserts, screw machine products; high thermal and electrical conductivity, free-cutting, corrosion resistant

DEOXOLOY.
M-126.
For general brass and bronze deoxidizer.

DEOXOLOY.
M-1265; Cu alloy.
For deoxidizer for Cu alloys.

DEPAL.
M-757; 2 Cu, 2 Mn, 2 Ni, bal Al.
Cast: 20,000-26,000 TS; 10,000-14,000 YS; 1.5-3.5 El; 55-65 Brin.
For pistons, cylinder heads; age-hardenable.

DEURANCE METAL.
Eng.; 33.3 Sn, 44.5 Sb, 22.2 Cu.
For locomotive bearing; Babbitt

DEUTRO 18/8.
M-1300; 0.80-0.20 C, 2 max Mn, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 125,000 TS; 95,000 YS; 25 El; 55 RA; 277 Brin.
For oil refinery and chemical plant equipment; Type 302; stainless, austenitic.

DEUTRO 18/8 MS.
M-1300; 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 60-50 El; 75-60 RA; 150-190 Brin.
For chemical plant equipment, mixers, agitators, filters; Type 316; stainless, austenitic.

DEUTRO 18/8S.
M-1300; 0.08 max C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 60 El; 135 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 330 Brin.
For chemical plant equipment, welded structures; Type 304, stainless, austenitic.

DEUTRO 20/15.
M-1300, 0.2 max C, 22-24 Cr, 12-15 Ni, 2 max Mn, 1 max Si, bal Fe.
Annealed: 85,000-95,000 TS, 40,000-50,000 YS; 45-55 El; 150-185 Brin.
For heat treating boxes, oil refinery and chemical plant equipment; Type 309, austenitic, heat resistant.

DEUTRO 23/20
M-1300; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El, 65 RA; 180 Brin.
At 1200°F: 57,000 TS; 22,000 YS; 32 El, 45 RA
For furnace parts and equipment, heat treating boxes; Type 310, austenitic, heat resistant

DEVILS IRON
M-1, Si, bal Fe.
For core transformers, telephone components; soft magnet, grain oriented

DEW-AMS EXTRA.
M-459, 0.55 C, 0.20 Si, 0.70 Mn, 1.1 Cr, 0.45 Mo, 1.7 Ni, 0.10 V, bal Fe.
Heat treated: 230,000-250,000 TS.
For extrusion dies, stems, punches, rivet sets.
Hot work steel, tough

DEWARD.
M-1, 0.9 C, 1.5 Mn, 0.2 Si, 0.08 Cr, 0.3 Mo, bal Fe
Oil hardened 167,000-180,000 TS, 300-600 Brin
For gages, punches, dies, taps, reamers, cutters, saws
Type 02 non-deforming tool steel. Shock resistant

DEW CMS
M-459, 0.43 C, 0.20 Si, 1.30 Mn, 1.8 Cr, 0.20 Mo, bal Fe.
Heat treated 170,000-190,000 TS
For extrusion dies, liners, containers.
Hot work steel. Resists high pressure

DEW D12L
M-459, 0.55 C, 1.1 Cr, 0.75 Mo, 1.7 Ni, 0.1 V, bal Fe
For press dies and extrusion press stems, heavy duty forging dies, die inserts, upsetters.
Oil or air hardening. Tough, shock resistant

DEW E38Mo
M-459; 0.38 C, 1.0 Si, 5.3 Cr, 1.5 Mo, 0.45 V, bal Fe.
Heat treated: 300,000 TS; 250,000 YS, 6 El; C 55 Rock.
Annealed: 102,000 TS, 66,000 YS; 28 El; B 93 Rock
For aluminum and magnesium die casting dies, cold chamber die casting cylinders and pistons.
Air or oil hardening, good hot hardness, resists thermal shock.

DEW E38V.
M-459; 0.40 C, 1.0 Si, 5.3 Cr, 1.4 Mo, 1.0 V, bal Fe.
Annealed: 100,000 TS; 65,000 YS; 30 El; B 92 Rock.
Heat treated: 280,000 TS; 240,000 YS; 8 El; C 52 Rock.
For oil or water cooled mandrels, extrusion press dies, aluminum die casting dies.
Hot wear resistance, tough and shock resistance.

DEW E38W.
M-459; 0.38 C, 1.2 Si, 5.6 Cr, 1.5 Mo, 0.3 V, 1.5 W, bal Fe.
Annealed: 100,000 TS; 60,000 YS; 28 El; B 92 Rock.
Heat treated: 275,000 TS; 235,000 YS; 8 El; C 52 Rock.
For extrusion presses, die casting dies, forging dies, hot punches, gripper and header dies.
Hot work tool steel. Hot wear resistance. Tough and shock resistant.

DEW ECR.
M-459; 0.70 C, 0.3 Cr, 0.3 Mn, 0.25 Si, bal Fe.
Annealed: 110,000 TS; 60,000 YS; 20 El, 190 Brin.
For axes, hammers, crimpers, springs, punches.
Water hardening.

DEW GSE.
M-459; 0.52 C, 1.3 Si, 0.70 Mn, 13.5 Cr, 13.0 Ni, 1.2 V, 1.3 W, bal Fe.
For extrusion dies up to 1100°F.
Excellent hot hardness. Resists thermal shock.
Hot work steel, austenitic.

DEW SPEZIAL-MS.
M-459, 0.28 C, 1.2 Cr, 1.4 Mo, 0.25 V, 2.3 W, 2.3 Co, bal Fe
For die casting dies.
Hot work tool steel, insensible to hot checking.

DEW SPEZIAL W5
M-459, 0.3 C, 2.35 Cr, 0.55 V, 4.25 W, bal Fe
For hot screw, rivet and nut dies, press mandrels, extrusion dies, hot punches, piercers, shear blades, die casting dies
Hot work tool steel Good hot hardness

DEW WM559
M-459, 0.42 C, 0.60 Si, 0.40 Mn, 1.4 Cr, 0.45 Mo, 0.80 V, 0.45 W, bal Fe
Heat treated 170,000 TS
For extrusion dies, water cooled dummy blocks
Hot work steel.

DEWRANCE CM50
M-1489, 93.25 Ni, 3.5 Si, 2.25 B
For high temperature brazing; flow point 1055°C, high ductility.

DEWRANCE CM52
M-1489, 91.25 Ni, 4.5 Si, 2.9 B
For high temperature brazing; flow point 992°C, resists molten Ni, Hg, and Hg vapor

DEWRANCE CM53.
M-1489, 82 Ni, 7.1 Cr, 4.5 Si, 2.9 B.
For high temperature brazing, flow point 996°C, corrosion resistant

DEWRANCE CM56
M-1489, 71 Ni, 15 Cr, 4.5 Si, 3.5 B
For high temperature brazing; flow point 1030°C, corrosion resistant.

DEXITE NO 14.
M-207; 0.75 C, 0.8 Mn, 0.94 Cr, 1.8 Ni, 0.4 Mo, bal Fe.
Oil hardening tool steels, for dies, drills, shear blades, swaging dies.

DEXITE NO 15.
M-207; C, alloy, bal Fe.
For boring tools, cams, rollers, reamers, gauges; deep hardening.

DEXITE NO. 16.
M-207; C, alloy, bal Fe.
For chisels, shovel teeth, wrenches, crushers; abrasion resistant, water hardening, tough.

DEXITE AH.
M-207; 1.15 C, 0.8 Mn, 0.2 Si, 5.45 Cr, 0.35 V, 1.25 Mo, bal Fe.
Air hardening cold work tool steel, high carbon; good wear resistance.

DEXITE AH MODIFIED.
M-207; 0.55 C, 0.9 Mn, 0.25 Si, 3.5 Cr, 0.25 Ni, 0.25 V, 1.4 Mo, bal Fe.
Air hardenable tool steel.

DEX-TUNG.
M-207; 0.32 C, 0.93 Cr, 0.48 Mo, 0.47 W, bal Fe.
Heat treated: 177,000-265,000 TS; 170,000-208,000 YS; 19-14 El.
For gears, shafting, clutch parts, punches, collets, blacksmith tools; oil hardened.

D.G. ALLOY.
M-2a; 88 Cu, 7.5 Sn, 2.5 Ni, 2 Zn.
25-15 El; 70-80 Brin.
For shafts, staybolts, bearings, stuffing boxes; corrosion resistant.

D.G. CYCLONE
M-1724; 0.75 C, 4.5 Cr, 18 W, 1.25 V, 5.7 Co, bal Fe.
For tools, cutters; high speed steel.

D-H NO. 11
M-44; Cu-Ni.
For thermocouples, extension leads; 30 ohms/c.m.f.

D-H NO. 14.
M-44, 42 Ni, 5 Cr, bal Fe.
Cold drawn: 140,000 TS; 135,000 YS.
For high temperature applications; heat resistant.

D-H NO 30.
M-44, 2.25 Ni, bal Cu.
Rolled: 30,000-60,000 TS.
For corrosion resistant parts; corrosion resistant.

D-H 30 OHM ALLOY
M-44, 2 Ni, bal Cu
For electrical resistance; 30 ohms/c.m.f

D-H NO. 33.
M-44; 0.05 C, 3 Si, bal Ni.
For thermocouples, stable in reducing atmosphere.

D-H NO. 52
M-44; 50-51 Ni, bal Fe.
Wrought: 150,000-70,000 TS.
For glass to metal seal, grid wire; max operating temperature 500°C.

D-H60-OHM ALLOY.
M-44; 5 Ni, bal Cu
For electrical resistances; 60 ohms/c.m.f.

D-H 90 OHM ALLOY.
M-44, 10 Ni, bal Cu.
For electrical resistance, 90 ohms/c.m.f.

D-H NO. 95.
M-44, 10 Ni, bal Cu
For resistances, 90 ohms/c.m.f.

D-H NO. 99.
M-44; 99.5 Ni.
For electrical equipment, resistance thermocouples; heat and corrosion resistant.

D-H NO. 111
M-44; Cu, bal Ni
Rolled. 30,000-60,000 TS.
For corrosion resistant parts, corrosion resistant.

DH NO. 129.
M-44; Ni (pure).
For control of electron emission in the cathode of electronic tubes.
Trace element control.

D-H No. 133.
M-44; 3 Si, bal Ni.
Rolled: 75,000-150,000 TS.
For high temperature applications; heat and corrosion resistant.

D-H NO. 142.
M-44; 41 Ni, bal Fe.
Rolled: 70,000-150,000 TS.
For metal to glass seals, thermostats; matches 8160 glass expansion.

D-H NO. 146.
M-44; 46 Ni, bal Fe.
For electrical equipment; high permeability.

D-H NO. 146.
M-44; 46 Ni, bal Fe.
Rolled: 70,000-150,000 TS;
For seals with ceramic coated materials; special expansion properties.

D-H NO. 152.
M-44; 51 Ni, bal Fe.
Rolled: 70,000-150,000 TS.
For thermostats, glass seals, high frequency transformers; controlled expansion.

D-H180-OHM ALLOY.
M-44; 23 Ni, bal Cu.
For electrical resistance, 180 ohms/c.m.f.

DH NO. 241.
M-44; 19.5 Cr, 1.45 Si, 0.03 C, bal Ni.
For furnace heating elements, moving belts and conveyors, retorts.
High heat and oxidation resistant

DH NO 242.
M-44; 0.03 C, 1.2 Si, 19 5 Cr, 1.1 Cb, bal Ni.
For thermocouples, conveyor belts; high heat resistant; stable in reducing atmosphere.

DH NO 243.
M-44; 19.50 Cr, 1.45 Si, 1.8 Mn, 0.03 C, bal Ni.
For furnace heating elements, furnace belts and conveyors.
High heat and oxidation resistant.

D-H NO. 245.
M-44, 0 05 C, 20 Cr, 5 Al, 1 5 Si, bal Ni.
Wire: 130,000-180,000 TS; 70,000-130,000 YS; 40-10 El; 195-250 Brin.
For heating elements, for operating temperature to 2300°F.

D-H NO. 399.
M-44; 0.15-0.25 Si, bal Ni.
For cathode nickel; heat resistant; active type

D-H NO. 446.
M-44; 28 Cr, bal Fe.
For glass-to-metal seal; heat resistant.

DH NO. 499.
M-44; 100 Ni plus trace elements control for control of electron emission in the cathode of electron tubes.
For electron tube cathodes. Passive type.

DH NO. 520.
M-44; 35.0 Ni, 21.5 Cr, 2.0 Si, 1.0 Cb, 0.05 C, bal Fe.
For furnace heating elements, furnace belts and conveyors.
High heat and oxidation resistance.

DH NO. 525
M-44; 35 Ni, 19.5 Cr, 1.45 Si, 0.05 C, bal Fe.
Rolled: 150,000-70,000 TS; 35 El.
For high temperature resistors.
Heat resistant to 800°C.

D-H NO. 599.
M-44; 0.15-0.25 Si, bal Ni.
For cathode nickel; active type.

D-H NO. 799.
M-44; 0.12-0.20 Si, bal Ni.
For cathode nickel; active type.

D-H NO. 899.
M-44; 0 02-0.07 Si, bal Ni.
For cathode nickel; normal type.

D-H NO 999.
M-44; Ni.
For cathode nickel; passive type.

D-H A-NICKEL.
M-44; Ni
For magnetostriction, jewelry, mechanical parts.

D-H D-NICKEL.
M-44; 4-5 Mn, bal Ni.
For heating element lead wire, lamp fuse leads.

D-H DURANICKEL.
M-44; 93.5 Ni, 0 35 Fe, 0.3 Mn, 0.5 Si, 0.15 C, 4 5 Al
Wrought: 90,000-250,000 TS; 30,000-150,000 YS; 50-2 El; 65-15 RA, 140-380 Brin.
For electrical equipment, Z-Nickel Type A.

D-H-E-NICKEL
M-44; 2 Mn, bal Ni.
For lead wire lamp bulbs, grid wire radio tubes.

D-H Ni-HARD
M-1016; 4 5 Ni, 3.2 C, 1 5 Cr, 1 0 Si, bal Fe.
For ball and rod mill liners, pump casings, impellers; heat resistant castings.

D-H NIROSTA
M-44, 9 Ni, 18 Cr, bal Fe
Wrought 250,000 80,000 TS
For heat and corrosion resistant parts, heat and corrosion resistant, max operating temperature 800°C.

D-H NO. R. 63.
M-44, 4 Mn, 1 Si, bal Ni.
Wrought: 175,000-70,000 TS.
For spark plug electrodes, resistances; heat resistant to 750°C.

D-H PERMANICKEL
M-44, 0 2-0 6 Mn, 0.6 max Fe, 0.4 max C, 0.35 max Si, bal Ni
Age-hardened 180,000-230,000 TS; 130,000-175,000 YS; 10-2 El.
For springs, Z-Nickel Type B

D-H-S BRONZE NO 1
M-758, 62-66 Cu, 4.5-7.0 Al, 2.0-3.5 Fe, 3.0-4.0 Mn, bal Zn.
120,000 TS, 95,000 YS; 12 El; 12 RA, 240 Brin
For gears, bearings, valve stems; resists acid, wear and shock

D-H-S BRONZE NO. 2.
M-758; 62-66 Cu, 4.5-7.0 Al, 2 0-3.5 Fe, 3.0-4.0 Mn, bal Zn
115-000-120,000 TS, 90,000-95,000 YS; 12-16 El; 12-19 RA; 235-275 Brin
For worm gears, rolling mill housing nuts; resists acid, wear and shock.

D-H-S BRONZE NO. 3
M-758, 62-66 Cu, 4.5-7.0 Al, 2 0-3.5 Fe, 3.0-4 0 Mn, bal Zn.
105,000 TS; 60,000 YS; 17 El; 17 RA; 200 Brin.
For gears, bearings, resists acid, wear and shock.

D-H-S BRONZE NO. 4.
M-758; 62-66 Cu, 4.5-7.0 Al, 2.0-3.5 Fe, 3.0-4.0 Mn, bal Zn.
90,000 TS; 45,000 YS; 25 El; 25 RA; 185 Brin.
For gears, bearings; resists acid, wear and shock.

D-H Z-NICKEL.
M-44; 0.3 max C, 4.0-4.75 Al, bal Ni.
For high temperature applications; two types, see Duranickel or Permanickel.

DIABOLIQUE SATAN NO. 2.
M-1043; 1.15 C, 1.9 W, 0.45 Cr, bal Fe.
For cutters, tools; fast finishing tool steel; 115WC19.

DIALLIST.
M-1010; Ni-Al-Co-Fe.
For permanent magnets; high corercive force.

DI-ALLOY.
M-1080; Al, Cu, bal Zn.
For die castings.

DIALLOY.
M-820; C, Mn, Cr, Ni, Mo, bal Fe.
For battering tools, punches, high impact and fatigue resistance.

DIALOX.
M-1246; Al_2O_3
For cutting tools, wear parts; ceramic aluminum oxide.

DIALOY
M-349; 50 Bi, bal Pb, Sn, Cd.
For dental tooth impressions, dental bridge work, models; expands on solidifying.

DIAMANT
M-1114, 1.3 C, 4.5 W, bal Fe
For tools, dies, cutters; fast finishing steel

DIAMANT
M-1344; 1.42 C, W, V, bal Fe
For fast finishing cutters, engraving tools; water hardened

DIAMANT 3.
M-459, 1.35 C, 0.1 Cr, 0.1 V, bal Fe
For fluting tools; water or oil hardened

DIAMANT 5
M-459; 1.3 C, 0.2 Cr, 4.75 W, bal Fe.
For drawing dies; oil hardening.

DIAMANT 5.
M-1344, 1.3 C, 4.75 W, 0.2 max Cr, bal Fe
For fast finishing cutters, engravers tools; water hardened.

DIAMANT 12.
M-1344; 2.1 C, 11.5 Cr, bal Fe
For blanking and forming dies, oil or water hardened.

DIAMANT 44.
M-1291, M-1114; 1.4 C, 4 W, V, bal Fe.
For fast finishing cutters, engraver's tools
Water hardened, high wear resistance.

DIAMANT BRONZE.
German; Al, Si, bal Cu.
For propellers, hardware; corrosion resistant.

DIAMANTBRONZE.
M-330; 58 Cu, 1 Ni, 1 Mn, 1 Al, 1 Fe, bal Zn.
20 El.
For valve guage fittings; corrosion resistant.

DIAMANT EXTRA.
M-459; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For gun rifling tools, engraving tools; high speed steel.

DIAMANT EXTRA.
M-459; 1.5 C, W, Cr, V, bal Fe.
For fast finishing cutters, engravers tools; water hardened.

DIAMANT EXTRA DURO.
M-616; 1.3 C, 4.5 W, bal Fe.
For tools, dies, cutters; fast finishing steel.

DIAMANT HK.
M-1318; 1.42 C, W, V, bal Fe.
For fast finishing cutters, engravers tools; water hardened.

DIAMANT HOCHHART.
M-1308; 1.42 C, W, V, bal Fe.
For fast finishing cutters, engravers tools; water hardened.

DIAMANT R.
M-459, 1.42 C, W, V, bal Fe.
For fast finishing cutters, engravers tools, water hardened.

DIAMANT R.
M-459; 1.4 C, 0.3 Cr, 0.25 V, 3 W, bal Fe
For grooving tools; cold work steel.

DIAMANT R6.
M-1287, 1.42 C, W, V, bal Fe
For fast finishing cutters, engravers tools; water hardened

DIAMANT SPECIAL
M-1114, M-1291; 1.3 C, 5 W, 1.5 Cr, 0.5 V, bal Fe.
For punches, dies, upsetters, crimpers
Non-deforming, oil or water hardening, shock and wear resistant.

DIAMANT WDSA.
M-1314, 1.42 C, W, V, bal Fe.
For fast finishing cutters, engravers tools; water hardened.

DIAMEND 27
M-677; 0.9-1.1 C, 3.7-4.3 Mn, 0.5-1.0 Si, 11-13 Cr, bal Fe.
Welded. 260-300 Brin.
For hardfacing electrodes; work hardenable, for applications having severe impact

DIAMEND 63.
M-677, 0.9 C, 1.0 Mn, 0.7 Si, 5 Cr, 8.5 Mo, 2 Co, 1.0 V, 2.5 W, bal Fe
Welded 60 Rc
For hardfacing electrodes, high speed tool steel resistant to abrasion, oxidation, light impact to 1000°F.

DIAMEND 305
M-677; 0.1 C, 1.2 Mn, 0.6 Si, 2 Cr, 0.5 Mo, bal Fe.
Welded. 37 Rc
For hardfacing electrodes; pearlitic, machinable steel for build-up and repair of worn machine parts.

DIAMEND 350
M-677; 0.15 C, 1.0 Mn, 0.6 Si, 2 Cr, 0.4 Mo, bal Fe.
Welded: 37 Rc.
For hardfacing electrodes, pearlitic, machinable steel for repair of worn machine parts.

DIAMEND 500.
M-677; 0.4 C, 1.0 Mn, 0.6 Si, 3.5 Cr, 0.5 Mo, bal Fe.
Welded: 55 Rc.
For hardfacing electrodes; martensitic steel to withstand severe abrasion, heavy impact.

DIAMEND 600
M-677; 0.6 C, 1.0 Mn, 0.6 Si, 4 Cr, 0.5 Mo, bal Fe.
Welded: 60 Rc.
For hardfacing electrodes; martensitic steel to withstand severe abrasion with mild impact.

DIAMEND 605.
M-677; 0.6 C, 1.0 Mn, 0.9 Si, 4.5 Cr, 0.7 V, bal Fe.
Welded: 57 Rc.
For hardfacing electrodes; martensitic steel to resist severe abrasion especially on alloy steels.

DIAMEND B.
M-677; 2.0 C, 0.4 Mn, 0.5 Si, 4.5 Cr, bal Fe.
Welded: 55 Rc.
For hardfacing electrodes; martensitic cast iron general purpose electrode.

DIAMITE.
M-278; 3-5 Ni, 1-2 Cr, 3-3½ C, 1.1-1.5 Si, 0.6-0.9 Mn, bal Fe.
Cast: 600-725 Brin.
For liners for chutes, pulverizer hammers, sand pump parts, welding rod for hard facing; alloy white iron; resistant to abrasion.

DIAMITE.
M-790; WC.
For cutting tools; sintered carbide.

DIAMOND NO. 1 B.16.D.
M-1415; 1.25 C, 3 W, 0.15 V, bal Fe.
For drawing and burnishing dies; water hardened, wear resistant.

DIAMOND A.
M-85; 2.2 C, 0.4 V, 11.5 W, bal Fe.
For dies; air hardening.

DIAMOND A.11.
M-1415; 1.7 C, 7 W, bal Fe.
For turning and planing tools, cold drawing dies; fast finishing steel, wear resistant.

DIAMOND ALLOY.
M-759; 45 Co, 40 Mo, 15 Cr.
For cutters, tools; wear and abrasion resistant.

DIAMOND B.
M-85; 2 C, 12 Cr, 0.8 V, 0.4 Mo, bal Fe.
For cold work tools, blanking and forming dies; abrasion resistant, non-deforming, oil hardened.

DIAMOND BRAND.
M-85; 1.7 C, 0.45 Mn, 18.57 Cr, 0.55 V, bal Fe.
For tools, dies, valves, punches; rust and abrasion resisting.

DIAMOND BRONZE.
U.S.; 10 Al, 2 Si, bal Cu.
For pump parts, valves, marine parts. hardware; high strength; corrosion resistant.

DIAMOND D-406.
M-1726; Sintered carbide tool material.
Cutting tools for cast iron; blast nozzles, valve trim.

DIAMOND D-406N.
M-1726; Sintered carbide tool material.
Hard wear resistant material for valve trim; corrosion resistant.

DIAMOND D-409.
M-1726; Sintered carbide tool material.
Cutting tools for machining cast iron.

DIAMOND D-409N.
M-1726; Sintered carbide tool material.
For valve trim; corrosion resistant and erosion resistant.

DIAMOND E.
M-999; 0.6-1.4 C, bal Fe.
For punches, taps, springs, hobs, reamers; water hardened; Type W1.

DIAMOND G BRONZE.
M-741; Pb, Sn, bal Cu.
For bearings, bushings; tough.

DIAMOND M.
M-57; 1.35 C, 0.3 Cr, bal Fe.
For form cutters, tools, dies; water hardened.

DIAMOND OO.
M-261, M-486; 1.6 C, 0.6 Cr, 1 V, 5.5 W, bal Fe.
For finishing tools, form tools, rifling tools; for light cuts.

DIAMOND S.
M-373; C as desired, V optional, 0.025 max P, 0.025 max S, bal Fe.
Water hardening tool steel; AISI W1.

DIAMOND S-1.
M-288; 0.30 C, 18 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

DIAMOND S EXTRA
M-373; C as desired, 0.20 V, bal Fe.
Water hardening tool steel; AISI W2.

DIAMOND T.
M-288; 0.30 C, 12 Cr, 25 Ni, bal Fe.
For heat resistant parts; heat resistant.

DIAMONITE.
M-355; 95.65 W, 3.91 C, bal Fe.
For cutting tools, dies; W_2C + WC.

DIAPHRAGM BRASS
U.S.; 95 Cu, 3 Sn, 2 Zn.
For diaphragms, corrosion resistant.

DIAWELD.
M-72, 4.2-4.4 C, 1.8 Si, 5-6 Mn, 30 Cr, bal Fe.
For hard surfacing electrodes; corrosion resistant.

DIBRONZE.
M-13; Al, Fe, bal Cu
For bending and forming dies, deep drawing dies; Al Bronze, resists wear and galling.

DICA A.
M-69, 0.42 C, 0.75 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
For die casting dies; oil hardening.

DICA B.
M-69; 0.33 C, 4.8 Cr, 0.4 Mn, 1.5 Mo, 1.0 Si, 0.2 V, bal Fe.
For Al die casting dies, hot gripper and header dies; hot work steel, air or oil hardened

DICA B MOD.
M-69, 0.37 C, 1 Si, 5 Cr, 0.5 V, 1.35 Mo, bal Fe.
For upsetters, punches, shears, extrusion tools; hot work steel, oil hardened.

DICA B TOOL ROOM.
M-69, 0.42 C, 1 Si, 4.85 Cr, 0.35 V, 1.5 Mo, bal Fe.
For upsetters, punches, shears; hot work steel, oil hardened.

DICA B-VANADIUM.
M-69; 0.35 C, 5 Cr, 1 V, 1.5 Mo, bal Fe.
For Al and Mg die casting dies; Type H13, oil hardened.

DICA (FLAME HARD) CAST TO SHAPE.
M-69; 0.50 C, 0.75 Mn, 0.25 Si, 1.0 Cr, 0.20 Mo, bal Fe.
Hardness normally 250-300 Brin, or can be annealed.
For automobile bumper dies.
Oil hardening tool steel.

DICAL.
M-760; 12 Si, bal Cu.
For light alloy castings; die cast.

DICK'S BEARING BRONZE.
Eng.; 80 Cu, 10 Pb, 9.2 Sn, 0.8 P.
For bearings.

DICROME.
M-56; 0.60 C, 0.25 Si, 0.60 Mn, 0.60 Cr, bal Fe.
For punches, heading dies, axes; Brit. EN11.

DIDBY'S CUPRITIC ALLOY.
18 Cu, 18 Cr, 72 Fe.

DIECARB.
M-57; 4.6-5.6 C, 65-90 W, 6.25 Co, 0.5-2 Fe, 0-5 Ta.
For blanking and forming dies; shock resistant, sintered.

DIE CAST.
M-336; 0.45 C, 1.0 Si, 1.4 Cr, 2.2 W, 0.2 V, 0.3 Mo, bal Fe.
For aluminum die casting dies; non-warping.

DIE CAST NO. 1.
M-1423; 0.35-0.40 C, 1.3 Mo, 0.5 V, 1.0 Si, 5.2 Cr, bal Fe.
For blanking and forging dies; hot work steel, tough and wear resistant.

DIE CASTING ALLOY "A."
91-84 Sn, 2-9 Sb, 4.5-8 Cu.
For high grade bearings; anti-friction.

DIE CASTING ALLOY "B."
91-84 Sn, 10-17 Sb, 0-1 Cu.
For light duty bearings; anti-friction

DIE CASTING ALLOY "C"
80 Sn, 10 Pb, 10 Sb.
For light duty bearings, anti-friction

DIE CASTING ALLOY "D."
61-5 Sn, 25 Pb, 10.5 Sb, 3 Cu.
For light duty bearings, anti-friction

DIE CASTING ALLOY "E"
74 Zn, 15 Sn, 6 Al, 5 Cu.
For soft work die castings, anti-friction.

DIE CASTING ALLOY "F."
85 Zn, 8 Sn, 4 Cu, 3 Al
For standard die castings, anti-friction

DIE CASTING ALLOY "G"
82-75 Zn, 13.75 Al, 3 Cu
For hard die castings

DIE CASTING ALLOY "H"
46 Zn, 31 Sn, 20 Cu, 3 Sb
For hard die castings.

DIE CASTING ALLOY "I"
86.5 Zn, 10.75 Cu, 2.75 Al
For die castings

DIE CASTING ALLOY "J."
90-83 Zn, 5-11 Cu, 2-5 Al, 1-5 Sn
For die castings.

DIECRAT
M-1149, 0.75 C, 2.0 Mn, 0.3 Si, 1.0 Cr, 1.35 Mo, bal Fe.
Air hardening cold work tool steel; AISI A6.

DIEHARD BB
M-56; 1.5 C, 0.3 Si, 0.3 Mn, 12 Cr, 1.15 V, 1.3 Co, bal Fe
For dies; nondeforming

DIEHARD HCD
M-56; 2.0 C, 0.3 Si, 0.3 Mn, 12.9 Cr, bal Fe
For dies; nondeforming.

DIEHARD LC.
M-56; 0.85 C, 0.3 Si, 0.3 Mn, 12 Cr, 1.15 V, 1.3 Co, bal Fe.
For dies; nondeforming.

DIEHL GR. A.
M-822; 1.0 C, 0.3 Mn, 0.25 Si, bal Fe.
For drills, taps, reamers, hobs, broaches, cutters; Type W1; water hardened.

DIE L.
M-343; 1.45-1.55 C, 12.5-14 Cr, 0.65-0.75 Co, 1.1 V, bal Fe.
For dies, broaches, reamers; non-deforming.

DIEMAC.
M-1680; 3.2 C, 2.6 Si, 1.0 Ni, 0.6 Mo, 0.10 S, 0.10 P, bal Fe.
For casting dies, and permanent molds for Al, Zn, Pb, alloys and plastic casting by gravity or injection molding.

DIENETT GERMAN SILVER.
Eng.; 51 Cu, 32 Zn, 9.5 Pb, 6.4 Ni, 1.6 Sn
For ornamental, hardware novelties; free-cutting.

DIESEL BEARINGS.
Eng.; 80 Sn, 15 Sb, 5 Cu.
For bearings for Diesel engines, Babbitt.

DIESEL OIL ENGINE BABBITT
M-88, 9-11 Sb, 4-6 Cu, bal Sn.
34-4 Brin
For bearings for diesel engines, resists impact loading.

DIE STEEL.
M-373, 0.7 C, bal Fe.
For tools, dies; oil hardened

DIE STEEL NO. 13200
M-373, 0.7 C, bal Fe.
For dies, tools, punches; water or oil hardening

DIETEMPER-1
M-1431; 0.40 C, 1.5 Cr, 0.25 V, 1 Mo, 0.65 Mn, bal Fe
For forging and die casting dies, hot work steel, oil hardened

DIETEMPER-2
M-1431, 0.30 C, 2.75 Cr, 0.30 Mo, 9.5 W, 1.6 Ni, bal Fe
For extrusion dies, rams, punches, hot work steel, oil hardened.

DIEWEAR
M-820, 0.90 C, 1 Mn, 0.5 Cr, 0.5 W, bal Fe
For dies, punches, blanking and forming dies, Type Ol, oil hardened, non-deforming

DIEWELD.
M-607, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed tool steel welding electrodes; high speed steel

DI-HARD see XALOY 100

DI HW
M-1287, 1.3 C, 0.20 max Cr, 4.75 W, 0.3 Mn, bal Fe.
For bearings, liners, forming and blanking dies; water hardened

DI-IRON
M-664, 3.2 C, 2.2 Si, 1.5 Ni, 0.8 Cr, 0.15 Mo, bal Fe
Cast: 50,000-60,000 TS, 230-290 Brin
For dies, gears, housings, shafts; cast iron; Tr.S. 4100, Tr.D 320

DILATHERM 15.
M-27, 0.1 C, 36 Ni, bal Fe.
For minimum expansion; low coefficient of expansion.

DILATHERM 85.
M-27.
For heat conductors.

DILATHERM 90.
M-27; 0.1 C, 0.1 Si, 25 Cr, bal Fe.
For glass to metal seals; low coefficient of expansion

DILPHY.
M-771; Ni, bal Fe.
For thermostats; controlled coefficient of expansion; high expansion alloy.

DILVER.
M-104; 46-42 Ni, 54-58 Fe.
For heating elements, leads in electric light bulbs; similar to "Platinite."

DILVER O.
M-104, M-771; 25 Cr, bal Fe.
For glass sealing and for high temperature applications corrosion and heat resistant.

DILVER P.
M-104, M-771; 29 Ni, 17 Co, bal Fe
For glass sealing and for high temperature applications; corrosion and heat resistant.

DILVER Pl.
M-771, nickel alloy.
For electronic equipment; glass sealing alloy.

DILVER T.
M-771; nickel alloy.
For electronic equipment; glass sealing alloy.

DI-METAL NO. 2.
M-815; 3.5-4.5 Al, 2.5-3.5 Cu, 0.02-0.10 Mg, 1.0 max Fe, bal Zn.
Die cast: 48,000-52,000 TS; 8-5 El; 100-105 Brin.
For die castings; general purpose.

DI-METAL NO. 3.
M-815, 3.5-4.3 Al, 0.75-1.25 Cu, 0.03-0.08 Mg, 1.0 max Fe, bal Zn.
Die cast 40,000-41,000 TS; 10-5 El, 75-85 Brin.
For die castings; general purpose.

DI-METAL NO. 5.
M-815; 3.5-4.3 Al, 0.75-1.25 Cu, 0.03-0.08 Mg, 1.0 max Fe, bal Zn
Die cast: 45,000-48,000 TS; 7-3 El; 95-100 Brin.
For die castings; general purpose

DI-MOL.
M-357; 0.8 C, 4.0 Cr, 1.0 V, 1.5 W, 9 Mo, bal Fe
For hacksaw blades, cutters, tools, reamers; high speed steel.

DIMPALLOY.
England; Zn, bal Cu.
For brazing of brasses and bronzes.

DIP METAL.
70 Cu, 0.5 Sn, 0.5 Pb, 0.5 Ni, bal Zn.
Rolled: 35,000 TS; 50 El.
For hardware; free-cutting.

DIPPING BRASS.
U.S.; 67 Cu, 33 Zn.
For deep drawn, spun or stamped parts; high ductility.

DIPPIT.
M-565; 94.5 Pb, 5 Sn, 0.5 Cu.
For high melting solder.

"DI" QUALITY.
M-179; Cu, Mn, bal Zn
Extruded: 66,000 TS; 35,000 YS; 30 El, 25 RA; 120 Brin.
Drawn: 80,000 TS; 44,000 YS; 22 El; 20 RA; 130 Brin.
For hot stampings; manganese bronze.

DI R35.
M-1287; 1.42 C, W, V, 0.30 Mn, 0.25 Si, bal Fe.
For cutters, bearings, forming dies; water hardened.

DIRIGOLD.
M-594; 9-10 Al, 1.1-2.0 Ni, 0-1.7 Sn, bal Cu.
For strong corrosion resisting parts, ornamental castings; corrosion resistant.

DIRILYTE METAL.
M-761; 5 Al, bal Cu.
For tableware; color of gold Al bronze.

DISC ALLOY.
M-1490; 0.04 C, 0.9 Mn, 0.8 Si, 13.5 Cr, 26 Ni, 2.75 Mo, 1.75 Ti, 0.1 Al, bal Fe.
For furnace parts, retorts, combustion chambers, salt pots, heat treating equipment.
Heat and corrosion resistant.

DISCALOY.
M-118; 0.08 max C, 0.35 max Al, 0.6-1.0 Si, 0.6-1.0 Mn, 1.35-1.85 Ti, 2.5-3.5 Mo, 12-15 Cr, 24-28 Ni, bal Fe.
At 70°F. 145,000 TS; 106,000 YS; 19 El; 23 RA.
At 1200°F: 104,000 TS; 91,000 YS; 19 El; 24 RA.
At 1350°F: 82,000 TS; 74,000 YS; 14 El; 26 RA.
For turbine discs, bolts, extrusion dies, non-magnetic gears and pinions; austenitic, heat resistant.

DISCALOY 24
M-118; 0.36 C, 13.5 Cr, 26 Ni, 4 Mo, 1.6 Ti, 1 Si, 1.4 Mn, 0.1 Al, bal Fe.
For jet and gas turbine components; corrosion and heat resistant.

DISQUE E
M-884, 0.45 C, 0.70 Mn, 1.75 Si, bal Fe.
For agricultural equipment, plows; oil hardened, shock resistant

DISQUE H.
M-884, 0.55 C, 0.70 Mn, 1.75 Si, bal Fe.
For agricultural equipment, plows, oil hardened, shock resistant.

DISSTEEL 812
M-357, 1.8 C, 12 Cr, bal Fe.
For dies, non-deforming.

DISSTON 6-N-6
M-357, 0.8 C, 4 Cr, 1 V, 6 W, 6 Mo, bal Fe.
For cutting tools, taps, reamers, broaches; high speed steel

DISSTON 6N6 M2
M-357, 0.82 C, 4.25 Cr, 6.35 W, 5 Mo, 2 V, bal Fe.
For tools, cutters, high speed steel.

DISSTON 66.
M-357, C, 6 W, 6 Mo, 4 Cr, 1 V, 2 Cu, bal Fe
For cutting tools, high speed steel.

DISSTON NO 712
M-357; C, alloy, bal Fe.
For dies, tools, oil hardened

DISSTON NO 819
M-357, 1.25 C, 0.3 Mn, 0.4 Cr, bal Fe.
For lawn mower blades; tough.

DISSTON NO 821.
M-357; 1.2 C, 0.2 V, bal Fe
For tools; water hardening

DISSTON NO 825.
M-357; 0.9 C, 0.4 Mn, 2.25 Cr, bal Fe.
For lawn mower blades; tough.

DISSTON NO. 826.
M-357; 1.3 C, 0.2 V, bal Fe.
For tools; water hardening.

DISSTON NO. 827.
M-357; 0.7 C, 1.6 Ni, 1 Cr, 0.3 Cu, bal Fe.

DISSTON NO. 841.
M-357; 0.4 C, 0.3 Mn, 0.7 Cr, 0.2 Mo, bal Fe.
For lawn mower blades; tough.

DISSTON NO. 842.
M-357; 1.0 C, 0.3 Mn, 1.0 Cr, bal Fe.
For lawn mower blades; oil hardening.

DISSTON NO. 844.
M-357; 0.85 C, 0.8 Cr, 0.25 Si, bal Fe.
For finishing tools, cutters; oil hardened.

DISSTON NO. 871.
M-357; 0.55 C, 0.65 Mn, 0.2 Mo, bal Fe.
For cutting tools; oil hardened.

DISSTON NO. 872.
M-357; 0.35 C, 3.25 Cr, 9.25 W, 0.3 V, bal Fe.
For die casting dies; oil hardening.

DISSTON NO. 873.
M-357; 0.38 C, 5 Cr, 1.25 W, 1.35 Mo, 0.4 V, 1.0 Si, bal Fe.
For punching, shearing and forming dies; oil hardening, hot work steel.

DISSTON NO. 5170.
M-357; 0.7 C, 0.3 Mn, bal Fe.
For lawn mower blades; water hardening.

DISSTON NO. 5190.
M-357; 0.9 C, 0.3 Mn, bal Fe.
For lawn mower blades; water hardening.

DISSTON NO. 5390.
M-357; 0.9 C, 0.7 Mn, bal Fe.
For lawn mower blades; water hardening.

DISSTON NO. 51110.
M-357; 1.1 C, 0.3 Mn, bal Fe.
For lawn mower blades; water hardening.

DISSTON BEST see **BEST (DISSTON)**

DISSTON D 12 CO
M-357; C, alloy, bal Fe
For tools, dies, oil hardening.

DISSTON EXTRA see **EXTRA (DISSTON).**

DISSTON FAST FINISHING
see **FAST FINISHING (DISSTON).**

DISSTON HRW
M-140; 0.95 C, 3.75 Cr, bal Fe
For hot work dies; headers, punches, hot work steel, oil hardened

DISSTON SPECIAL see **SPECIAL (DISSTON).**

DISSTON STAINLESS A
M-357; 0.30 C, 14 Cr, bal Fe
For corrosion resistant parts; corrosion resistant.

DISSTON STAINLESS B.
M-357, 0.60 C, 17 Cr, bal Fe
For corrosion and heat resistant parts; corrosion and heat resistant.

DISSTON STAINLESS D.
M-357; 0.45 C, 1.0 Si, 8.75 Cr, 1.4 Mo, 2.0 Cu, bal Fe.
For stainless parts; stainless.

DISSTON STAINLESS IRON.
M-357; 0.10 C, 12-14 Cr, bal Fe.
For heat and corrosion resistant parts, heat and corrosion resistant

DISSTON STANDARD
see **STANDARD (DISSTON).**

DIVCO 40/60 NO. 180 SOLDER.
M-1121; 40 Sn, 60 Pb
For solder; rosin core.

DIXI NO. 3.
M-344; C, Cr, bal Fe.
For tools and dies.

DIXIE BRAND.
M-365; 0.7-1.4 C, bal Fe.
For tools, dies, drills; water hardening.

DIXOILBRONZ.
M-590; 10 Sn, 2 Zn, bal Cu.
For bearings, bushings, gears, liners; corrosion resistant.

D & J ANTIFRICTION METAL-1.
Eng.; 10 Sb, 80-85 Zn, 5-8 Sn.
For bearings, bushings; Babbitt.

D & J ANTIFRICTION METAL-2.
Eng, 1.6 Cu, 0.4 Sb, 52 Zn, 46 Sn.
For bearings, bushings; Babbitt.

DLP COPPER 120.
M-8; 99.9 + Cu, 0.01 P.
Hard: 45,000 TS; 40,000 YS, 10 El, 75 Brin.
Soft: 33,000 TS; 10,000 YS, 45 El; 42 Brin.
For electrical apparatus, high conductivity.

DM.
M-268; 19.76 Cu, 55.12 Fe, 0.57 Si, 0.87 Ni, 0.29 C, 15.18 Cr.
For corrosion resistant parts; formerly "Durbin"

DM2-45
M-376; 0.30-0.45 C, 0.7-1 Mn, 0.8-1.1 Cr, 0.5-0.7 Mo, bal Fe.
Heat treated: 125,000 TS, 105,000 YS; 16 El; 50 RA, 250 Brin.
For high temperature bolting; resists heat to 950°F.

D & M-7-G
M-40, C, alloy, bal Fe.
For arc welding electrodes, coated, hard surfacing, air hardening

D & M-7-0
M-40, C, alloy, bal Fe.
For arc welding electrodes; coated, self hardening

DM-35
M-376, 0.33-0.40 C, 1.0-1.5 Cr, 0.4-0.6 Mo, 0.55-0.75 Si, 0.45-0.65 Mn, bal Fe.
Heat treated 125,000 TS, 105,000 YS; 16 El, 50 RA, 250 Brin
For high temperature bolting, flanges, fittings, heat resistant

DM-45
M-376, 0.45 C, 0.55 Mn, 1.25 Cr, 0.50 Mo, 0.65 Si, bal Fe.
Normalized 146,000 TS, 108,000 YS, 17.5 El, 47.4 RA, 285 Brin
For gears, forgings, high temperature bolts; heat resistant to 950°F

D & M-92
M-40; C, alloy, bal Fe
For welding rods, shock resistant.

D & M-305.
M-40; C, bal Fe.
For arc welding rods, coated.

D-M-E NO 1.
M-1568, 0.28-0.34 C, 0.6-0.9 Mn, bal Fe.
Plate: 165-185 Brin
For plastic molds
AISI C1030, water hardening

D-M-E NO. 2.
M-1079, 0.42-0.49 C, 0.8-1.1 Cr, 0.15 min V, 0.6-0.9 Mn, bal Fe.
Hardened. 107,500 TS, 88,000 YS; 15.5 El; 33.8 RA; 225-300 Brin.
For die casting mold bases and molds, cavity plates; for Zn die casting.

D-M-E NO. 2H.
M-1568, M-1616; 0.55 C, 1.15 Mn, 0.20 Mo, 0.75 Cr, 0.08 max S, 0.035 max P, 0.25 Si, bal Fe.
Plate: 252-302 Brin; 150,000 TS; 130,000 YS; 20 El; 60 RA.
For plastic molds and die casting dies, holder blocks.
Free-cutting, water or oil hardening.

D-M-E NO. 3.
M-1568, M-1616; 0.36 C, 0.85 Mn, 0.25 Si, 1.0 Cr, 0.2 V, 0.5 Mo, bal Fe.
Plate: 262-311 Brin.
Heat Treated. 206,000 TS; 175,000 YP; 12 El; 418 Brin.
For cavity plates and inserts in die casting dies; zinc die casting dies, aluminum die casting dies.
Type P20 tool steel. Oil hardened.

D-M-E NO. 5.
M-1568, M-1616; 0.35 C, 5.0 Cr, 1.5 Mo, 1.0 V, bal Fe.
Annealed: 209 Brin.
Ht. Tr.: 270,000 TS; 240,000 YS; 10 El; 30 RA; 540 Brin.
For heavy duty compression tools, die casting dies, bolt dies, aluminum extrusion dies, plastic molds.
Vacuum degassed forgings. Type H13 tool steel, ground flat stock.

DMOC WEICH.
M-459; C, Cr, Mo, bal Fe.
14 El.
For machinery parts.

D & M-LT.
M-40; C, alloy, bal Fe.
For arc welding rods; coated

D & M-U2.
M-40; C, alloy, bal Fe
For welding rods; self hardening

DN-1.
M-459; C, Mn, Ni, bal Fe
20-16 El
For machinery parts

DN 3.
M-459; C, Ni, bal Fe.
21-17 El.
For machinery parts.

DN 5.
M-459; C, Ni, bal Fe.
20-16 El
For machinery parts

DN-15.
M-Germany, 0.4-0.6 C, 11-13 Ni, 4-6 Mn, 3 Cr, 0.5 Mo, bal Fe.
For aeronautical structures, gas turbines and internal combustion engines.
Austenitic steel, stainless Coefficient of expansion similar to that of aluminum

DN 15.
M-459; C, Ni, Mn, bal Fe
For non-magnetic parts; non-magnetic.

DN 25.
M-459; C, Ni, Mn, bal Fe.
For non-magnetic parts; non-magnetic.

DN 33.
M-459; C, Ni, bal Fe.
For wire for electrical apparatus.

DN 36.
M-459; C, Ni, bal Fe.
For wire for electrical apparatus.

DN 42.
M-459; C, Ni, bal Fe.
For wire for electrical apparatus.

D.N.S.
M-1724; 0.25-0.35 C, 0.5-0.7 Mo, bal Fe.
Heat treated: 85,000-120,000 TS; 60,000-95,000 YS; 40-31 El; 70-80 RA.
For nuts, gears, shafts, bolts, fasteners; water hardened

D.N.V. (see SIMONDS DNV).

DO-1.
M-1424; Sintered carbide.
For rough cutting and chip removal on cast iron and non-ferrous metals.

DO-2.
M-1424; Sintered carbide.
General purpose cutting tool for cast iron and non-ferrous metals; good resistance to wear.

DO-3.
M-1424, Sintered carbide.
Cutting tool for finish cutting on cast iron and non-ferrous metals.

DO-4.
M-1424, Sintered carbide.
Cutting tool for finishing and precision boring of cast iron and non-ferrous metals

DO-10
M-1424, Sintered carbide
For wear and shock resistance.

DO-11
M-1424; Sintered carbide.
For light impact duty

DO-13
M-1424, Sintered carbide
For medium impact duty

DO-14
M-1424, Sintered carbide
For heavy impact duty

DO-15
M-1424, Sintered carbide
Cutting tools for heavy roughing and interrupted cuts on steel

DO-16
M-1424, Sintered carbide.
For general purpose cutting tool on steel

DO-17
M-1424, Sintered carbide.
Cutting tools for finish cutting steel.

DO-18
M-1424; Sintered carbide.
Cutting tools for finish cutting and precision boring steel.

DO-30
M-1424; Sintered carbide
Cutting tools for rough machining of cast iron and non-ferrous metal.

DO-34
M-1424, Sintered carbide.
Cutting tools for general purpose machining and finishing of steel.

DO-35.
M-1424, Sintered carbide
Cutting tools for heavy, roughing, interrupted cuts on steel.

DO-36.
M-1424; Sintered carbide.
Cutting tools for general purpose machining of steel.

DO ALL AIR HARDENING AISI-A2.
M-1424; 1.0 C, 0.6 Mn, 5.25 Cr, 1.1 Mo, 0.25 V, 0.12 S, bal Fe.
Free machining, precision ground.
For dies, punches, taps, shear blades, reamers, gages.

DO ALL AIR HARDENING AISI-A6.
M-1424; 0.70 C, 2.1 Mn, 1.0 Cr, 1.3 Mo, 0.3 Si, 0.12 S, bal Fe.
Free machining, precision ground.
For blanking and coining dies, shear blades, jigs, and fixtures, punches.

DO ALL LOW CARBON AISI-1018.
M-1424; 0.18 C, 0.6 Mn, 0.2 Si, bal Fe.
Precision ground flat stock.
For patterns, jigs, fixtures, machine parts that do not require heat treatment.

DO ALL M41.
M-1424; 1.10 C, 4.25 Cr, 2.0 V, 6.75 W, 3.75 Mo, 5.0 Co, bal Fe.
High speed steel for cutting tools, tungsten-molybdenum-cobalt type; AISI M-41.

DO ALL OIL HARDENING AISI-O1
M-1424; 0.90 C, 1.2 Mn, 0.3 Si, 0.5 W, 0.5 Cr, 0.2 V, bal Fe.
Precision ground flat stock.
For blanking and trimming dies, cutters, punches, special gages.

DO ALL O H.
M-1424; 1.2 C, 0.55 Cr, 0.33 Mo, 0.75 Mn, bal Fe.
For dies, punches, gages, machine parts; oil hardened

DO ALLOY
M-1424, Co, Cr, W
Cast alloy for general purpose machining, high red hardness and shock resistance.

DO ALL T1
M-1424, 0.73 C, 4.0 Cr, 1.1 V, 18.0 W, bal Fe.
High speed steel, general purpose cutting tools, tungsten type, AISI T1.

DOBLINSCHE ALLOY.
German, 50 max Si, Co, bal.
For chemical construction, corrosion resistant

DOCTOR METAL.
Eng ; 88 Cu, 9.5 Zn, 2.5 Sn.
For corrosion resistant brass parts; corrosion resistant.

DODGE D-1.
M-762; 0.30 C, 1.2 Mn, 0.3 Cr, 0.3 Mo, bal Fe.
Cast: 80,000 TS; 55,000 YS; 22 El, 40 RA; 163 Brin.
For structural parts; water hardening

DODGE D-2.
M-762, 0.15-0.23 C, 0.5-0.7 Mn, 0.4-0.6 Mo, bal Fe.
Cast. 65,000 TS; 37,000 YS; 24 El; 36 RA; 143 Brin
For turbine castings, steam valves and fittings; creep resistant

DODGE D-2 A.
M-762; 0.20-0.28 C, 0.5-0.7 Mn, 0.4-0.6 Mo, bal Fe.
Cast 70,000 TS; 45,000 YS; 22 El; 35 RA; 149 Brin.
For valves, pump casings, turbines; water hardening.

DODGE D-2 B.
M-762; 0.20-0.28 C, 0.5-0.7 Mn, 0.5-0.8 Cr, 0.4-0.6 Mo, bal Fe.
Cast: 70,000 TS; 45,000 YS; 22 El; 35 RA; 143 Brin.
For high temperature applications; resists graphitization at high temperature.

DODGE D-2 C.
M-762; 0.15 max C, 0.5-0.7 Mn, 0.5-1.0 Si, 1.0-1.5 Cr, 0.45-0.65 Mo, bal Fe.
Cast: 70,000 TS; 40,000 YS; 22 El; 35 RA; 153 Brin.
For high temperature applications.

DODGE D3.
M-762; 0.30 C, 0.95 Cr, 0.20 Mo, bal Fe.
Annealed: 88,000 TS; 60,000 YS; 180 Brin.
Heat treated: 137,000 TS; 109,000 YS; 13.5% El; 31.2% RA.
Normalized: 115,000 TS; 95,000 YS; 16% El; 35% RA.
Uses: gears, bolts, shafts, housings, cylinders, fittings.
Type 4130 steel castings.

DODGE D-4
M-762; 0.38-0.44 C, 0.8 Mn, bal Fe.
Cast: 80,000-95,000 TS; 43,000-60,000 YS; 25-15 El; 35-20 RA; 143-174 Brin.
For gears, dies, wear plates, structural castings; water hardened.

DODGE D-5.
M-762, 0.38-0.43 C, 0.75-1.00 Mn, 0.8-1.1 Cr, 0.15-0.25 Mo, bal Fe.
Normalized. 100,000 TS; 65,000 YS; 15 El; 30 RA
For gears, shafts; suitable for nitriding

DODGE D-6.
M-762; 0.60-0.75 C, 0.7-0.9 Mn, bal Fe.
Cast: 85,000-110,000 TS; 45,000-65,000 YS; 20-10 El, 25-15 RA; 175-220 Brin.
For bending, blanking and forming dies; wear resistant

DODGE D-7.
M-762, 0.15-0.20 C, 0.4-0.6 Mn, 4.5-6.0 Cr, 0.4-0.6 Mo, bal Fe.
Cast: 90,000 TS; 60,000 YS; 18 El, 30 RA; 197-240 Brin.
For valve bodies, fittings, pump cases; resists corrosion.

DODGE D-8
M-762; 0.2 max C, 0.5-0.7 Mn, 1.0-1.5 Cr, 0.4-0.6 Mo, bal Fe.
Cast: 70,000 TS; 45,000 YS, 22 El, 35 RA; 153 Brin
For high temperature applications; creep resistant.

DODGE D-9
M-762; 0.15 max C, 0.7 Mn, 0.6 Si, 2-3 Cr, 0.8-1.1 Mo, bal Fe
Cast: 70,000 TS; 45,000 YS, 22 El; 45 RA; 163 Brin.
For high temperature applications, creep resistant.

DODGE D10.
M-762; 0.12 max C, 0.3 max Mn, 0.6 max Si, bal Fe
Cast: 48,000 TS; 29,000 YP; 30 El; 45 RA.
For electrical applications, motor and generator housings, pole pieces, magnetic chucks. High permeability.

DODGE D11.
M-762; 0.10 max C, 0.5-0.8 Mn, 3-4 Ni, bal Fe.
Cast: 70,000 TS; 40,000 YP; 28 El; 50 RA.
For gears, housings, bolts, shafts, fittings, valves, pumps.
Tough, oil hardening, shock resistant. Suitable for use to minus 150°F

DODGE D-12.
M-762, 0.18-0.20 C, 0.55-0.65 Mn, 2.25-2.75 Ni, bal Fe.
Cast: 75,000 TS; 48,000 YS; 24 El; 35 RA; 153 Brin.
For low temperature applications; tough.

DODGE D14.
M-762; 0.40 C, 1.8 Ni, 0.8 Cr, 0.25 Mo, bal Fe.
Annealed: 120,000 TS; 80,000 YS; 240 Brin.
Heat treated: 185,000 TS; 165,000 YS; 380 Brin.
Uses: Gears, pressure vessels, die blocks, bushings, shafts, dies, fittings.
Type 4340 steel castings; Tough, oil hardening.

DODGE DTS 30W8.
M-762; 0.30-0.35 C, 3.0-3.5 Cr, 8.0-9.0 W, 0.20-0.30 V, bal Fe.
At 80°F: 200,000 TS; 173,000 YS; 8% El; 30% RA.
At 1200°F: 108,000 TS; 85,000 YS; 4% El; 9% RA.
Uses: Brass forging dies and inserts, extrusion dies, punches, gripper and swaging dies, permanent molds.
Type H21 hot work steel castings; Red-hard.

DODGE DTS 40.
M-762; 0.35-0.45 C, 0.90-1.20 Si, 4.75-5.25 Cr, 1.20-1.50 Mo, 0.75-1.00 V, bal Fe.
At 80°F: 217,000 TS; 184,000 YS; 8% El, 14% RA.
At 1000°F: 155,000 TS, 125,000 YS; 8.8% El; 24% RA.
Uses: extrusion dies, gripper and header dies, hot punches, mandrels, trimming dies
Type H13 hot work steel. Will not heat check, air hardening. Tough castings.

DODGE DTS 60.
M-762; 0.55-0.65 C, 0.40-0.50 Ni, 1.2-1.3 Cr, 0.50-0.70 Mo, 0.12-0.18 V, bal Fe.
Heat treated. C 42-65 Rock.
For brake dies, bushings, cams, gears, jigs, chucks, shear blades, pinions, trimmer dies.
Tough, oil hardening, wear resistant

DODGE DTS 100.
M-762; 0.95-1.05 C, 5.0-5.5 Cr, 1.0-1.25 Mo, 0.35-0.45 V, bal Fe.
Ht. Tr.: 250,000 TS; 190,000 YS, C 50 Rock
For trimming and deep drawing dies, blanking and forming dies, cams, gauges, master tools, extrusion dies.
Type A2 tool steel. Air hardening Tough castings

DODGE DTS 150
M-762; 1.45-1.55 C, 11.5-12.5 Cr, 0.70-0.90 Mo, 0.18-0.24 V, bal Fe.
Heat treated: 278,000 TS, 214,000 YS; 1 El, C 57 Rock
For blanking and drawing dies, threading dies, burnishing tools, cams, collars, coining and forming dies
Type D-2 tool stel castings Air hardening, abrasion resistant.

DODGE DTS 165.
M-762; 1.55-1.65 C, 12.5-14.0 Cr, 0.3-0.45 V, 0.70-0.90 Mo, 0.70-0.90 Co, bal Fe.
Ht. Tr.: 280,000 TS; 210,000 YS, C 57 Rock
For drawing and blanking dies, cams, punches, gauges, trimming dies. Deep hardening, non-deforming castings. High wear and compression resistance. Type D2 air hardening tool steel.

DODGE DX.
M-762; 0.18-0.24 C, 0.4-0.6 Mn, bal Fe.
Castings: 60,000 TS; 30 000 YS; 26 El, 38 RA; 163 Brin.
For castings for locomotives, valves, fittings; weldable.

DODGE DZ.
M-762, 0.26-0.32 C, 0.6-0.8 Mn, bal Fe.
Cast. 70,000 TS, 30,000 YS, 24 El; 36 RA; 143 Brin.
For general castings, water hardening.

DOFASCO.
M-1033; 0.3 C, 2-3 Ni, 0.9-1.1 Cr, 0.3-0.4 Mo, bal Fe.
For valves, fittings, oil crusher roll shells; high pressure service to 1100°F.

DOFASCOLOY NO. 1.
M-1033; 0.18 max C, 1.0 max Mn, 0.90 max Ni, 0.60 max Cu, bal Fe.
Plate: 63,000 min TS; 42,000 min YS; 24 min El.
For tanks, trailers, trucks, auto frames, mine cars, buckets, stokers, cranes.
High strength, low alloy steel.

DOFASCOLOY NO. 2.
M-1033; 0.15 max C, 1.0 max Mn, 0.90 max Ni, 0.60 max Cu, bal Fe.
Plate: 65,000 min TS; 45,000 min YS; 19 min El.
For tanks, trailers, trucks, auto frames, mine cars, buckets, stokers, cranes, booms
High strength, low alloy steel

DOFASCOLOY 42 W
M-1033, 0.21 C, 1.35 Mn, 0.3 Si, 0.005-0.05 Cb, bal Fe
60,000 min TS, 42,000 min YS
For structural work.
ASTM Standard A 572.

DOFASCOLOY 45 W.
M-1033; 0.22 C, 1.35 Mn, 0.3 Si, 0.005-0.05 Cb, bal Fe
60,000 min TS, 45,000 min YS, 22 min El.
For structural work
ASTM Standard A 572

DOFASCOLOY 50 W
M-1033, 0.23 C, 1.35 Mn, 0.3 Si, 0.005-0.05 Cb. bal Fe
65,000 min TS, 50,000 min YS, 22 min El
For structural work
ASTM Standard A 572

DOFASCOLOY 55 W
M-1033, 0.25 C, 1.35 Mn, 0.3 Si, 0.005-0.05 Cb, bal Fe
70,000 min TS, 55,000 min YS, 20 min El
For structural work
ASTM Standard A 572

DOFASCOLOY 60W
M-1033, 0.26 C, 1.35 Mn, 0.3 Si, 0.005-0.05 Cb, bal Fe.
75,000 min TS, 60,000 min YS, 18 min El.
For structural work
ASTM Standard A 572

DOFASCOLOY M.
M-1033; 0.25 max C, 1.5 max Mn, 0.30 min Cu, bal Fe
Plate 63,000 min TS; 42,000 min YS, 24 min El.
For tanks, trailers, trucks, auto frames, cranes, booms, buckets, stokers.
High strength low alloy steel.

DOFASCOLOY MV.
M-1033, 0.22 max C, 1.25 max Mn, 0.20 min Cu, 0.02 min V, bal Fe.
Plate. 63,000 min TS; 42,000 min YS; min El.
For tanks, trailers, trucks, auto frames, booms, cranes, buckets, stokers.
High strength low alloy steel.

DOFASCOLOY P
M-1033; 0.16 max C, 0.60 max Mn, 0.12 max P, 0.035 max S, 0.15-0.35 Si, 0.90 max Ni, 0.60 max Cr, 0.60 max Cu, bal Fe.
Plate: 63,000 min TS; 42,000 min YS; 24 min El.
For tanks, trailers, trucks, auto frames, mine cars, buckets, stokers, cranes.
High strength low alloy steel.

DOFASCOLOY W.
M-1033; 0.25 max C, 0.50-1.25 Mn, 0.01 min Cb, bal Fe.
Gr. 45 W: 65,000 min TS; 45,000 min YS; 18 min El.
Gr. 50 W: 70,000 min TS; 50,000 min YS; 18 min El.
Gr. 55 W: 70,000 min TS; 55,000 min YS; 17 min El.
Gr. 60 W: 75,000 min TS; 60,000 min YS; 16 min El.
For trucks, tanks, trailers, cranes, booms.
High strength low alloy steel

DOHLEN-CSV35.
M-1348; 0.38 C, Cr, V, Si, bal Fe.
For machine tool parts, gears, shafts, fasteners, crankshafts.
Oil hardening, tough, shock resisting.

DOHLEN CSV45.
M-1348, 0.45 C, Cr, V, Si, bal Fe
For machine tool parts, springs, gears, bolts; oil hardened, tough

DOHLEN DELTA PEB.
M-1348, 0.55 C. 0.90 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe
For header dies, upsetters, punches; oil hardened, tough

DOHLEN DP1W
M-1348; 0.15 C 0.15-0.35 Si, 0.25-0.50 Mn, bal Fe
Annealed· 70,000 TS; 40,000 YS, 25 El, 60 RA, 145 Brin
For gears, cams, camshafts, machine tool parts, case hardening steel.

DOHLEN DP3W.
M-1348; 0.35 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Hot rolled 85,000 TS, 55,000 YS; 30 El, 53 RA; 185 Brin.
For gears, bolts, machine tool parts, fasteners, water hardened.

DOHLEN DP4W.
M-1348; 0.45 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Hot rolled· 98,000 TS, 60,000 YS, 24 El; 45 RA; 212 Brin.
For gears, bolts, machine tool parts, fasteners, water hardened

DOHLEN DP6W
M-1348, 0.60 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Heat treated 160,000 TS, 115,000 YS, 12 El, 40 RA, 325 Brin.
For gears, bolts, springs, rails, axles, shafts, water hardened

DOHLEN DP7 EXTRA.
M-1348, 0.70 C, 0.25 max S, 0.25 max Mn, bal Fe
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin
For springs, tools, rails, punches, mandrels, water hardened; Type W 1.

DOHLEN DP7 PRIMA.
M-1348; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, tools, rails, punches, mandrels; water hardened; Type W 1.

DOHLEN DP7W.
M-1348; 0.70 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, tools, punches, mandrels; water hardened; Type W 1.

DOHLEN DP8.
M-1348; 0.85 C, 0.25 max Si. 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 12 El; 33 RA; 400 Brin.
For tools, springs, drills, taps, cutters; Type W 1; water hardened.

DOHLEN DP8 PRIMA.
M-1348; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 12 El; 33 RA; 400 Brin.
For springs, tools, cutters, taps, drills; water hardened; Type W 1.

DOHLEN DP8W.
M-1348; 0.9 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated: 195,000 TS; 150,000 YS; 10 El; 30 RA, 410 Brin.
For springs, tools, cutters, dies, drills, taps; Type W 1; water hardened

DOHLEN DP10 EXTRA.
M-1348, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 100,000 TS; 53,000 YS, 21 El; 42 RA, 200 Brin
For springs, tools, cutters, dies, drills, taps; Type W 1, water hardened.

DOHLEN DP10 PRIMA
M-1348; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed 100,000 TS, 53,000 YS; 21 El. 42 RA, 200 Brin
For springs, tools, taps, drills, reamers; Type W 1, water hardened

DOHLEN DP11 EXTRA
M-1348, 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed 110,000 TS, 58,000 YS, 18 El; 40 RA, 210 Brin
For springs, tools, drills, taps, reamers, Type W 1, water hardened.

DOHLEN DP11 PRIMA
M-1348, 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed. 110,000 TS, 58,000 YS, 18 El, 40 RA, 210 Brin
For springs, tools, reamers, broaches, Type W 1, water hardened

DOHLEN DP12 PRIMA
M-1348, 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For cutters, tools, drills, taps, reamers, Type W 1, water hardened.

DOHLEN DSW1
M-1348, 0.3 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion press liners and rams, oil hardened, hot work steel.

DOHLEN DSW2
M-1348, 0.30 C 2.35 Cr, 0.6 V, 4.25 W, bal Fe
For hot work tools, dies, punches; hot work steel, oil hardened.

DOHLEN GSR.
M-1348, 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For punches, dies, shears, upsetters; oil hardened, tough.

DOHLEN KE.
M-1348, 0.20 C, 1.15 Cr, 1.25 Mn, bal Fe
For camshafts, cams, bolts; case hardened, tough.

DOHLEN P 53.
M-1348; 0.50 C, 1.05 Cr, 3.25 Ni, 0.5 Mn, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

DOHLEN SAR.
M-1348; 1.15 C, 0.65 Cr, 0.10 V, 0.30 Mn, bal Fe.
For blanking and header dies; oil hardened, abrasion resistant.

DOHLEN STANDARD.
M-1348; 0.90 C, 1.9 Mn, 0.10 V, bal Fe.
For punches, blanking and forming dies; oil hardened, non-deforming.

DOLER BRASS 1.
M-158; 65 Cu, 34 Zn, 1 Si.
Die cast: 65,000 TS; 35,000 YS; 15 El; 120 Brin.
For die castings; silicon brass.

DOLER BRASS 4.
M-158; 81.5 Cu, 14.5 Zn, 4.0 Si.
Die cast: 85,000 TS; 50,000 YS; 10 El; 170 Brin.
For die castings; corrosion resistant.

DOLER-MAG.
M-158; 9 Al, 0.1-0.3 Cu, 0.6 Zn, bal Mg.
Die cast: 34,000 TS; 23,000 YS; 4 El; 60 Brin.
For general purpose die castings.

DOLER-ZINC 3.
M-158; 4 Al, 0.04 Mg, 0.2 Cu, bal Zn.
Die cast: 41,000 TS; 10 El; 82 Brin.
For die castings, instrument housings, ornamental grill; C.S. 60,500, S.S. 30,900.

DOLER-ZINC 5.
M-158; 1 Cu, 4 Al, 0.04 Mg, bal Zn.
Die cast: 47,000 TS; 7 El; 90 Brin.
For die castings; C.S. 87,300, S.S. 38,400.

DOLER-ZINC 8.
M-158; 0.5 Mn, 0.25 Al, bal Zn.
Cast: 20,000 TS; 60 Brin.
For die castings, ornaments, instrument cases; solders readily.

DOLLAR BLUE CHIP.
Eng.; 0.62 C, 4.33 Cr, 17.82 W, 1.66 V, 3.93 Co, bal Fe.
For tools, cutters, reamers; high speed steel.

DOMAL AM80A.
M-1239; 8 Al, 0.2 Mn, bal Mg.
Cast: 24,000-27,000 TS; 10,000-12,500 YS; 4-7 El, 48-52 Brin.
Forged: 42,000-48,000 TS; 28,000-32,000 YS; 8-12 El; 54-58 Brin.
For aircraft castings, housings, crankcases; age-hardenable, high strength.

DOMAL AM100A.
M-1239; 10 Al, 0.1 Mn, bal Mg.
Cast: 22,000 TS; 12,000 YS; 1-3 El; 55 Brin.
Heat treated: 38,000 TS; 20,000 YS; 1-4 El; 80 Brin.
For high strength castings; age-hardenable.

DOMAL AS100.
M-1239; 10 Al, 0.5 Zn, bal Mg.
For die castings, instrument cases; high strength

DOMAL AZ21X.
M-1239; 1.2-2.0 Al, 0.4-0.75 Zn, 0.20 min Mn, bal Mg.
Extruded: 32,000 TS; 18,000 YS; 5 El.
Tube: 32,000 TS; 15,000 YS; 5 El.
Forged: 32,000 TS; 17,000 YS; 5 El.
For airframes, cowles, tanks, structures; good weldability and workability.

DOMAL AZ31B.
M-1239; 9 Al, 0.3 Mn, bal Mg.
Extruded: 37,000 TS; 28,000 YS; 12 El; 49 Brin.
For aircraft structures; high ductility.

DOMAL AZ31X.
M-1239; 2.5-3.5 Al, 0.6-1.4 Zn, 0.20 min Mn, bal Mg.
Extruded: 32,000-34,000 TS; 16,000-20,000 YS; 6-8 El.
Plate ½ Hard: 33,000-39,000 TS; 16,000-29,000 YS; 10-4 El.
For aircraft parts; good formability.

DOMAL AZ61A.
M-1239; 6.5 Al, 1 Zn, bal Mg.
Extruded: 44,000 TS; 30,000 YS; 14 El; 60 Brin.
For aircraft structures; strong and tough.

DOMAL AZ61X.
M-1239; 5.8-7.2 Al, 0.4-1.5 Zn, 0.2 min Mn, bal Mg.
Extruded: 39,000 TS; 24,000 YS; 9 El.
Forged: 38,000 TS; 22,000 YS; 6 El.
Tube: 36,000 TS; 16,000 YS; 7 El.
For aircraft parts; good weldability.

DOMAL AZ63A.
M-1239; 2.7-3.3 Zn, 0.2 min Mn, bal Mg.
Cast: 27,000 TS; 14,000 YS; 16 El; 50 Brin.
Heat treated: 40,000 TS; 24,000 YS; 10 El; 60 Brin.
For cylinder heads, pistons, high strength castings; age-hardenable.

DOMAL AZ80A.
M-1239; 8.5 Al, 0.5 Zn, bal Mg.
Extruded: 48,000 TS; 32,000 YS; 12 El; 60 Brin.
Heat treated: 52,000 TS; 36,000 YS; 5 El; 82 Brin.
For cylinder heads, valve and pump bodies; age-hardenable

DOMAL AZ80X.
M-1239; 7.5-9.2 Al, 0.2-0.8 Zn, 0.2 min Mn, bal Mg.
F-temper: 43,000 TS, 28,000 YS; 6 El
T6-temper: 47,000 TS; 30,000 YS; 2 El.
For aircraft parts; age hardenable.

DOMAL AZ91B
M-1239; 9 Al, 0.6 Zn, bal Mg.
Die cast· 33,000 TS, 22,000 YS, 3 El; 60 Brin.
For die castings, instrument housings; good strength.

DOMAL AZ91C
M-1239; 9 Al, 0.5 Zn, bal Mg.
Die cast: 38,000 TS; 19,000 YS; 9 El; 59 Brin.
Heat treated: 40,000 TS; 20,000 YS; 4 El; 66 Brin.
For general high strength castings; age-hardenable.

DOMAL-AZ91X.
M-1239, 8.3-9 7 Al, 0.4-1 0 Zn, 0.2-0 4 Mn, 0.1 max Si, bal Mg
Die cast. 33,000 TS, 22,000 YS, 3 El, 60 Brin.
Sand cast. 24,000 TS; 14,000 YS; 2 El; 52 Brin
Ht. Tr.: 40,000 TS; 19,000 YS; 4 El; 66 Brin.
For instrument housings, portable tools, casings.
Age-hardenable.

DOMAL AZ92A.
M-1239; 9 Al, 2 Zn, bal Mg.
Cast. 24,000 TS; 14,000 YS, 2 El; 65 Brin.
Heat treated: 40,000 TS; 23,000 YS; 2 El; 84 Brin.
For aircraft engine components; age-hardenable.

DOMAL EZ33.
M-1239; 2.0-3.5 Zn, 2.5-4.0 rare earths, 0.5-1.0 Zr, bal Mg.
T5-temper: 20,000 TS; 13,000 YS; 3 El.
For engine castings, diffuser and compressor casings; heat and creep resistant to 500°F.

DOMAL HZ32.
M-1239; 3.0 Th, 2.3 Zn, 0.7 Mn, bal Mg.
At 20°C: 30,000 TS; 13,000 YS; 7 El.
At 250°C: 14,900 TS; 9000 YS; 50 El.
At 350°C: 10,000 TS; 40 El.
For jet engine and missile components; high creep resistance to 660°F.

DOMAL M1B.
M-1239; 1.2 Mn, bal Mg.
F-temper: 33,000 TS; 27,000 YS; 44 El.
H24-temper: 37,000 TS; 28,000 YS; 7 El; 56 Brin.
For parts subjected to high stresses; good weldability and corrosion resistance.

DOMAL TA54A.
M-1239; 5 Sn, 3 Al, bal Mg.
Forged: 40,000 TS; 28,000 YS; 12 El; 52 Brin.
For pistons; high ductility.

DOMAL ZH62.
M-1239; 5.8 Zn, 1.8 Th, 0.7 Zr, bal Mg.
Cast: 40,000 TS, 24,000 YS; 8.5 El.
Sheet: 48,000 TS; 42,000 YS; 15 El.
Extruded: 49,000 TS; 42,000 YS; 20 El.
For aircraft engine and missile components; good formability and weldability.

DOMAL ZK31.
M-1239; 2.5-3.5 Zn, 0.5-1.0 Zr, bal Mg.
Extruded: 40,000 TS; 28,000 YS; 5 El.
Forged: 38,000 TS; 26,000 YS; 5 El.
For airframe structural parts, landing wheels, gear casings; heavy duty service.

DOMAL ZK60.
M-1239; 4.8-6.5 Al, 0.5 min Zr, 0.003 max Fe. bal Mg.
F-temper· 42,000 TS; 28,000 YS, 5 El
T5-temper. 44,000 TS; 32,000 YS, 4 El.
Cast: 35,000 TS; 18,000 YS, 8 El.
T6-temper· 42,000 TS; 26,000 YS; 5 El.
For aircraft structural members; age hardenable, shock resistant.

DOMESTIC.
M 389; 0.7-1.2 C, bal Fe
For tools, punches, taps; water hardening

DOMINIAL 170.
M-1352; 0.45 C, Cr, Ni, bal Fe
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant

DOMINIAL BA
M-1352, 1.05 C, 6 Cr, W, bal Fe.
For oil refinery equipment, creep and wear resistant

DOMINIAL BZM
M-1352, C, alloy, bal Fe
For gears, shafts, bolts, oil hardening

DOMINIAL CH
M-1352, 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies; oil or air hardened, nondeforming

DOMINIAL CH160W
M-1352, 1.65 C, 11.5 Cr, 0.2 Mo, 0.1 V, bal Fe
For blanking and forming dies, punches, air hardened, nondeforming

DOMINIAL CH165.
M-1352; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, punches; air hardened, nondeforming

DOMINIAL CHW
M-1352, 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For blanking and forming dies, punches; oil or air hardened, nondeforming.

DOMINIAL CM167.
M-1352; 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe
For gears, bolts, crankshafts, fasteners; oil hardened, tough.

DOMINIAL DAG.
M-1352; 1.45 C, 0.6 Mn, 1.4 Cr, bal Fe.
For bearings, sleeves, blanking dies; water hardened, wear resistant.

DOMINIAL DS.
M-1352; 0.38 C, 6 Cr, 0.9 Si, 0.1 V, bal Fe.
For oil refinery equipment, creep and heat resistant.

DOMINIAL DSW.
M-1352; 0.35 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For cold heading dies, crimpers, punches, upsetters; oil hardened, tough.

DOMINIAL DWK.
M-1352; 1.3 C, 0.2 max Cr, 4.75 W, bal Fe.
For engravers tools, cutters, oil hardened.

DOMINIAL EC4.
M-1352; 0.13 C, 3.5 Ni, 0.7 Cr, bal Fe.
For bolts, fasteners, gears, cams, camshafts; case hardening steel, shock resistant.

DOMINIAL EC5.
M-1352, 0.13 C, 1.1 Cr, 4.5 Ni, bal Fe.
For gears, cams, camshafts; case hardening steel, shock resistant.

DOMINIAL ECNL.
M-1352; 0.19 C, 1.25 Cr, 0.2 Mo, 3.75 Ni, bal Fe.
For gears, bolts, camshafts, fasteners; case hardening steel, shock resistant.

DOMINIAL EXTRA.
M-1352; 1.05 C, 1.2 Cr, 0.5 Mn, bal Fe.
For bearings, liners, sleeves, water hardened, wear resistant.

DOMINIAL FGS.
M-1352; 1.25 C, 1.15 Si, 0.7 Mn, 1.2 Cr, bal Fe.
For bearings, liners, sleeves; oil hardened, wear resistant

DOMINIAL GH
M-1352, 2.1 C, 11.5 Cr, bal Fe
For blanking and forming dies, punches, oil or air hardened, nondeforming

DOMINIAL KC15
M-1352, 0.45 C, 1.5 Cr, 1.0 Si, 0.1 V, bal Fe
For springs, gears, bolts, crankshafts, oil hardened, shock resistant

DOMINIAL KHP
M-1352; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe
For gears, pinions, cams, camshafts, case hardening steel

DOMINIAL KL.
M-1352, 0.55 C, 0.9 Si, 0.3 Mn, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For cold heading dies, crimpers, punches, upsetters; oil hardened.

DOMINIAL KST.
M-1352, 1.0 C, 0.2 Si, 0.25 Mn, 0.1 V, bal Fe
For cutters, drills, taps, reamers, broaches; Type W 2, water hardened.

DOMINIAL KTW.
M-1352; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, shafts, bolts, studs, crankshafts; oil hardened, tough.

DOMINIAL KZR.
M-1352, 1.4 C, 0.3 Cr, 0.1 V, bal Fe.
For engravers tools, cutters, taps, reamers; water hardened.

DOMINIAL MA.
M-1352, 0.3 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe
For upsetters, riveters, punches, crimpers, hot work steel, oil hardened.

DOMINIAL MAK.
M-1352, 0.3 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For upsetters, riveters, punches; hot work steel, oil hardened.

DOMINIAL MA SUPRA.
M-1352, 0.3 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion press rams, hot punches, shears; hot work steel, oil hardened.

DOMINIAL MC.
M-1352; 0.3 C, 2.5 Cr, 0.2 Mo, 0.15 V, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, tough.

DOMINIAL MK.
M-1352; 1.05 C, Mn, Cr, bal Fe.
For drills, taps, bearings, races; water hardened, wear resistant.

DOMINIAL MKST.
M-1352; 0.9 C, 0.1 V, 1.9 Mn, 0.25 Si, bal Fe.
For punches, forming dies, shears, crimpers; oil hardened, nondeforming.

DOMINAL N400.
M-1352; 0.45 C, Ni, Cr, Mo, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

DOMINIAL PD.
M-1352; 0.65 C, 3.75 Cr, 0.85 Mo, 0.7 V, 8.5 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

DOMINIAL PK.
M-1352; 0.45 C, 1.05 Cr, 0.2 V, 1.85 W, bal Fe.
For cold heading tools, punches, mandrels; oil hardened, tough

DOMINIAL PK17.
M-1352, 0.45 C, W, Cr, V, bal Fe.
For hot shears and punches, upsetters; hot work tools, oil hardened

DOMINIAL PW15.
M-1352, 0.55 C, 0.7 Cr, 0.18 V, 1.65 Ni, 0.18 Mo, bal Fe.
For gears, bolts, crankshafts, oil hardened, shock resistant.

DOMINIAL PWM.
M-1352; 0.56 C, 0.6 Mn, Cr, Mo, Ni, V, bal Fe.
For gears, bolts, crankshafts, axles, oil hardened, shock resistant.

DOMINIAL R 13F
M-1352; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 EL; 70 RA; 155 Brin.
Cold drawn: 100,000 TS, 85,000 YS, 17 El, 60 RA; 205 Brin.
For turbine blades, surgical instruments, valves, cutlery; Type 410; stainless.

DOMINIAL RAN.
M-1352; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS, 55 El; 75 RA; 150 Brin.
Cold drawn, 180,000 TS, 150,000 YS; 10 El, 250 Brin.
For chemical plant equipment, tanks, mixers, filters, Type 302, stainless, austenitic.

DOMINIAL RAS.
M-1352, 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe
Annealed: 85,000 TS, 35,000 YS; 55 El; 65 RA; 150 Brin.
Cold drawn: 95,000 TS; 60,000 YS; 40 El, 60 RA; 185 Brin.
For welded chemical plant equipment, tanks, mixers; Type 321; stainless, austenitic.

DOMINIAL RAS4.
M-1352; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 45 El; 60 RA; 160 Brin.
For welded acid resistant chemical plant equipment; Type 316 Ti; stainless, austenitic.

DOMINIAL RF.
M-1352; 0.4 C, 13 Cr, 0.4 Si, 0.3 Mn, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 200 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; stainless, hardenable.

DOMINIAL RM13.
M-1352, 0.2 C, 13 Cr, 0.4 Si, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El; 55 RA; 200 Brin.
For valves, cutlery, turbine blades, surgical instruments; Type 420; stainless, hardenable.

DOMINIAL RM13H
M-1352, 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 200 Brin
For valves, cutlery, surgical and dental instruments; Type 420; stainless, hardenable.

DOMINIAL RM13Mo.
M-1352; 0.2 C, 0.4 Si, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 200 Brin
For turbine blades, valves, cutlery; Type 420Mo, stainless.

DOMINIAL RM17.
M-1352, 0.22 C, 17 Cr, 1.5 Ni, 0.4 Si, bal Fe.
Annealed: 125,000 TS, 95,000 YS, 20 El; 55 RA; 260 Brin
Cold drawn 130,000 TS, 110,000 YS; 15 El; 35 RA; 270 Brin.
For pumps, valves, marine hardware; Type 431, stainless.

DOMINIAL RM174
M-1352, 0.35 C, 0.4 Si, 16.5 Cr, 1.15 Mo, bal Fe.
For chemical plant equipment, furnace parts; corrosion and heat resistant

DOMINIAL RM189.
M-1352, 0.90 C, 18 Cr, 2 Mo, bal Fe
For cutlery, valves, ball bearings, surgical instruments, Type 440B; corrosion resistant, hardenable.

DOMINIAL SES
M-1352, 1.15 C, 0.65 Cr, 0.1 V, 0.3 Mn, bal Fe.
For bearings, sleeves, cutters, water hardened, wear resistant

DOMINIAL SGW.
M-1352; 0.9 C, 0.3 Mn, 0.8 Cr, bal Fe.
For cutters, bearings, sleeves, water hardened, wear resistant.

DOMINIAL SN
M-1352; 0.5 C, 0.5 Mn, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, crankshafts, axles, fasteners; oil hardened, shock resistant.

DOMINIAL SP.
M-1352, 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
For punches, dies, upsetters, springs, crimpers, oil hardened, tough.

DOMINIAL SS50.
M-1352; 0.50 C, 0.85 Mn, 1.0 Cr, 0.09 V, bal Fe.
For gears, springs, bolts, studs, crankshafts; oil hardened, shock resistant.

DOMINIAL VSF.
M-1352; 0.90 C, 1.0 Mn, 0.37 Si, bal Fe.
For drills, taps, reamers, hobs, broaches; water hardened, wear resistant.

DOMINIAL W 44.
M-1352; 0.45 C, 1.35 Cr, 0.45 Mo, 0.8 V, 0.45 W, bal Fe.
For cold heading dies, upsetters, riveters; oil hardened, tough.

DOMINIAL WEH.
M-1352; 0.2 C, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel.

DOMINIAL WF.
M-1352; 1.2 C, 0.2 Cr, 0.1 V, 1.0 W, bal Fe.
For blanking and forming dies, cutters; water hardened, wear resistant.

DOMINIAL WF2.
M-1352, 1.15 C, W, bal Fe.
For blanking dies, cutters, punches; water hardened, wear resistant.

DOMINIAL WMK.
M-1352; 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For cold heading dies, punches, upsetters; oil hardened, tough.

DOMINIAL WR.
M-1352, 1.4 C, 1 Si, 0.18 V, 3.75 W, bal Fe .
For bearings, forming dies, cutters; water hardened

DOMITE 30
M-763, 3.2 C, 1.5 Ni, 2 Si, bal Fe
Cast. 30,000 TS, 180 Brin
For stamping dies, pulleys, cast iron, Tr S. 2200.

DOMITE 35
M-763, 3.5 C, 2.5 Si, bal Fe
Cast: 35,000 TS, 190 Brin
For pumps, die shoes, evaporators, cast iron, Tr S 2400

DOMITE 45
M-763, 3.3 C, 2.2 Si, bal Fe
Cast: 45,000 TS, 220 Brin.
For gears, flywheels, pump impellers; cast iron, Tr S 2800.

DOMITE 55
M-763, 3.1 C, 1.5 Si, bal Fe.
Cast: 55,000 TS, 250 Brin
For crankshafts, forming dies, gears, cast iron, Tr S. 3400.

DOMITE Ni-HARD.
M-763; 4.2-4.7 Ni, 3-3.6 C, 1.4-2.5 Cr, 0.5 Si, 0.4-6 Mn, bal Fe.
Cast: 50,000-60,000 TS, 600-725 Brin.
For wear resistant castings, wear and abrasion resistant.

DOMITE NODULOY.
M-763; 3.3 T.C 1.9 Si, bal Fe.
Cast. 115,000 TS, 2 El.
Annealed: 75,000 TS; 15 El.
For high strength castings; high ductility.

DOMITE WEAR RESISTING A.
M 763; high C, alloy, Si, bal Fe
Cast: 200 Brin.
For wheels, brake shoes, brick dies; pearlitic cast iron.

DOMITE WEAR RESISTING B.
M-763; high C, alloy, Si, bal Fe.
Cast: 300 Brin.
For iron liners, plow points, wheels; wear resistant cast iron.

DOMITE WEAR RESISTING C.
M-763; high C, alloy, Si, bal Fe.
Cast: 475 Brin.
For railway wheels, brake shoes; chilled cast iron.

DOMITE WEAR RESISTING D.
M-763; high C, alloy, Si, bal Fe.
Cast: 600 Brin.
For railway wheels, wear, parts; chilled cast iron.

DONAL.
M-1548; 0.3-0.5 Si, 1.0-2.0 Mn, bal Al.
Soft: 22,000 TS; 35 El, 30 Brin
Half hard. 26,000 TS; 21,000 YS; 5-15 El; 40-50 Brin.
For general structures, containers, heat exchangers, trim
Non-hardenable. Corrosion resistant.

DONAL.
M-764, 98.5 Al, 1.5 Mn.
For light alloy parts, die castings.

DONEGAL D-1.
M-1223; 0.20 C, 0.65 Mn, bal Fe
Annealed 60,000 TS; 30,000 YS, 24 El, 35 RA; 130 Brin
For machine tool parts, gears, shafts, ASTM Gr. WCA.

DONEGAL D-2
M-1223; 0.27 C, 0.65 Mn, bal Fe
Annealed 70,000 TS; 35,000 YS; 24 El, 35 RA, 140 Brin.
For machine tool parts, gears, housings, ASTM Gr WCB

DONEGAL D-3
M-1223, 0.40 C, 0.65 Mn, bal Fe
Normalized 80,000 TS, 40,000 YS, 18 El; 30 RA, 165 Brin
For gears, housings, shafts, machine tool parts, ASTM Gr 80-40

DONEGAL D-4
M-1223, 0.20 C, 0.65 Mn, 0.90 Ni, 0.65 Cr, 0.55 Mo, bal Fe
Normalized 70,000 TS, 40,000 YS, 20 El, 35 RA; 160 Brin
For gears, bolts, crankshafts, housings, ASTM Gr WC4, shock resistant.

DONEGAL D-5
M-1223, 0.20 C, 0.80 Ni, 0.70 Cr, 1.0 Mo, 0.60 Mn, bal Fe
Normalized 70,000 TS; 40,000 YS; 20 El, 35 RA: 160 Brin.
For gears, housings, machine tool parts, ASTM Gr WC5; case hardened, shock resistant.

DONEGAL D-6
M-1223, 0.20 C, 0.65 Mn, 1.25 Cr, 0.55 Mo, bal Fe.
Normalized 70,000 TS, 40,000 YS, 20 El, 35 RA, 160 Brin
For gears, housings, machine tool parts, ASTM Gr. W 6

DONEGAL D-7
M 1223, 0.30 C, 1.35 Mn, bal Fe
Normalized 90,000 TS, 60,000 YS, 20 El, 40 RA, 190 Brin.
For gears, bolts, crankshafts, machine tool parts; ASTM Gr 90-60; water or oil hardened.

DONEGAL D-8.
M-1223, 0.30 C, 1.3 Mn, 0.25 Mo, bal Fe.
Normalized: 90,000 TS; 60,000 YS; 20 El; 40 RA, 190 Brin.
For gears, bolts, crankshafts, machine tool parts; tough.

DONEGAL D-9.
M-1223; 0.18 C, 0.5 Cr, 1.0 Mo, 0.60 Mn, bal Fe.
Normalized: 70,000 TS; 40,000 YS; 20 El; 35 RA; 160 Brin.
For machine tool parts, ASTM Gr. WC9.

DONEGAL D-10.
M-1223; 0.30 C, 0.65 Mn, 0.60 Ni, 0.60 Cr, 0.50 Mo, bal Fe.
Normalized: 100,000 TS; 60,000 YS; 15 El; 30 RA; 202 Brin.
Water hardened: 150,000 TS; 125,000 YS; 10 El; 25 RA; 320 Brin.
For machine tool parts.

DONEGAL D-11.
M-1223; 0.20 C, 0.65 Mn, 0.55 Mo, bal Fe.
Normalized· 65,000 TS; 35,000 YS; 24 El; 35 RA; 145 Brin.
For machine tool parts, gears, shafts; ASTM Gr. WC1.

DONEGAL D-12
M-1223; 0.20 C, 0.50 Mn, 9.0 Cr, 1.0 Mo, bal Fe.
Normalized. 90,000 TS; 60,000 YS; 18 El; 35 RA; 190 Brin.
For oil refinery equipment; ASTM Gr. C 12; creep resistant.

DONEGAL D-13
M-1223; 0.25 C, 0.65 Mn, 2.5 Ni, bal Fe.
Normalized: 65,000 TS; 40,000 YS; 24 El; 35 RA; 179 Brin.
For gears, machine tool parts; ASTM Gr. CL2, tough.

DONEGAL D-14.
M-1223; 0.15 C, 0.65 Mn, 3.5 Ni, bal Fe.
Normalized: 65,000 TS; 40,000 YS; 25 El, 35 RA; 179 Brin.
For gears, bolts, machine tool parts; ASTM Gr. CL3, shock resistant.

DONEGAL D-15.
M-1223; C, alloy, bal Fe.
For armor; tough.

DONEGAL D-16.
M-1223; 0.20 C, 0.60 Mn, 5.0 Cr, 0.5 Mo, bal Fe
Normalized: 90,000 TS; 60,000 YS; 18 El; 35 RA, 190 Brin.
For oil refinery equipment; ASTM Gr. C 5, creep resistant.

DONEGAL D-20.
M-1223; 0.07 C, 18-22 Cr, 21-31 Ni, 2.5 Mo, 4.0 Cu, bal Fe
Cast. 65,000 TS; 30,000 YS, 30 El; 150 Brin
For chemical plant equipment; ACI Type CN-7M, austenitic, stainless.

DONEGAL D-21.
M-1223; 0.15 max C, 11-14 Cr, 1.0 max Ni, bal Fe.
Cast: 90,000 TS; 65,000 YS, 18 El; 30 RA; 200 Brin.
For chemical plant equipment, valves, cutlery; ACI Type CA15, corrosion resistant.

DONEGAL D-23.
M-1223; 0.20-0.40 C, 11.5-14.0 Cr, 1.0 max Ni, bal Fe.
Cast: 110,000 TS; 75,000 YS; 15 El; 25 RA; 220 Brin.
For valves, cutlery, chemical plant equipment; ACI Type CA40; corrosion resistant.

DONEGAL D-24.
M-1223; 0.30 max C, 18-22 Cr, 2 max Ni, bal Fe.
Cast: 65,000-95,000 TS; 30,000-60,000 YS; 15 El; 170-195 Brin.
For furnace parts, heat treating boxes; ACI Type CB30; corrosion resistant.

DONEGAL D-25.
M-1223; 0.50 max C, 26-30 Cr, 4 max Ni, bal Fe.
Cast: 55,000 TS; 190 Brin.
Heat treated: 97,000 TS; 65,000 YS; 18 El; 210 Brin.
For cylinder liners, bushings, valve seats; ACI Type CC50; corrosion resistant.

DONEGAL D-26.
M-1223, 0.30 max C, 26-30 Cr, 8-11 Ni, bal Fe.
Cast. 80,000 TS; 40,000 YS; 10-20 El; 20 RA; 170 Brin.
For furnace parts, salt pots, heat treating boxes; ACI Type CE30; austenitic, stainless.

DONEGAL D-27.
M-1223; 0.20 max C, 18-21 Cr, 8-11 Ni, bal Fe.
Cast 70,000 TS; 30,000 YS; 30 El; 160 Brin
For furnace parts, heat treating boxes, retorts; ACI Type CF20, stainless, austenitic.

DONEGAL D-28.
M-1223, 0.08 max C, 18-21 Cr, 8-11 Ni, bal Fe.
Cast: 70,000 TS, 28,000 YS, 35 El; 150 Brin.
For furnace parts, chemical plant equipment; ACI Type CF8; stainless, austenitic

DONEGAL D-29.
M-1223, 0.16 max C, 18-21 Cr, 9-10 Ni, 0.20-0.35 Se, bal Fe.
Cast· 70,000 TS; 30,000 YS; 25 El; 150 Brin.
For chemical plant equipment, ACI Type CF16F; free-cutting, stainless.

DONEGAL D-30.
M-1223, 0.08 max C, 18-21 Cr, 9-12 Ni, Cb = 8 × C, bal Fe.
Cast. 70,000 TS, 30,000 YS, 30 El, 150 Brin.
For welded chemical plant equipment; ACI Type CF8C; stainless, austenitic.

DONEGAL D-31.
M-1223, 0.08 max C, 18-21 Cr, 9-12 Ni, 2-3 Mo, bal Fe
Cast 70,000 TS, 30,000 YS, 30 El, 150 Brin
For acid resistant chemical plant equipment, ACI Type CF8M; stainless, austenitic.

DONEGAL D-32
M-1223, 0.20 max C, 22-26 Cr, 12-15 Ni, bal Fe.
Cast· 70,000 TS, 30,000 YS, 30 El; 150 Brin.
For furnace parts, heat treating boxes, retorts, ACI Type CH20, corrosion and heat resistant

DONEGAL D-33
M-1223; 0.20 max C, 23-27 Cr, 19-22 Ni, bal Fe.
Cast 65,000 TS, 28,000 YS, 30 El; 170 Brin
For retorts, pots, furnace equipment and parts; ACI Type CK20, corrosion and heat resistant.

DONEGAL D-40.
M-1223; 0.20-0.50 C, 24-28 Cr, 11-14 Ni, bal Fe.
Cast: 75,000 TS; 35,000 YS; 15 El; 200 Brin.
For furnace shafts, beams, rollers, tube supports; ACI Type HH, corrosion and heat resistant

DONEGAL D-41
M-1223, 0.20-0.50 C, 26-30 Cr, 8-11 Ni, bal Fe
Cast: 85,000 TS, 40,000 YS; 9 El; 170 Brin.
For furnace parts, retorts, salt pots; ACI Type HE, corrosion and heat resistant.

DONEGAL D-42.
M-1223, 0.20-0.60 C, 24-28 Cr, 18-22 Ni, bal Fe.
Cast. 75,000 TS; 35,000 YS; 15 El; 170 Brin.
For furnace parts, retorts, skids, stack dampers; ACI Type HK; corrosion and heat resistant.

DONEGAL D-43.
M-1223; 0.35-0.75 C, 13-17 Cr, 33-37 Ni, bal Fe.
Cast: 65,000 TS; 40,000 YS; 4-10 El; 12 RA; 180 Brin.
For salt pots, furnace parts, heat treating boxes; ACI Type HT; corrosion and heat resistant.

DONEGAL DC-40.
M-1223; 0.25 C, 0.75 Mn, 0.75 Si, 1.5 Ni, 19 Cr, bal Fe.
Annealed: 95,000 TS; 60,000 YS; 15 El; 195 Brin.
For chemical and food processing equipment, furnace parts; ACI-CB30; corrosion resistant.

DONEGAL DC-41.
M-1223; 0.10 C, 0.65 Mn, 0.8 Si, 0.5 Ni, 12.5 Cr, bal Fe.
Annealed: 95,000 TS; 78,000 YS; 22 El; 185 Brin.
Heat treated: 163,000-213,000 TS; 75,000-173,000 YS; 28-6 El; 59-9 RA; 185-415 Brin.
For chemical and food processing equipment, ship propellers; ACI-CA15; corrosion resistant.

DONEGAL DC-42.
M-1223; 0.3 C, 0.75 Mn, 0.75 Si, 3 Ni, 28 Cr, bal Fe.
Cast: 95,000 TS; 60,000 YS; 15 El; 193 Brin.
Annealed: 97,000 TS; 65,000 YS; 18 El; 210 Brin.
For bushings, impellers, cylinder liners, valve seats and bodies; ACI-CC50; corrosion resistant.

DONEGAL DC-43.
M-1223, 0.08 C, 0.75 Mn, 1.25 Si, 10.5 Ni, 19.5 Cr, Cb, bal Fe.
Cast: 70,000 TS; 30,000 YS; 30 El; 150 Brin.
For chemical and food processing equipment; ACI-CF8C; corrosion resistant, austenitic.

DONEGAL DC-44.
M-1223; 0.08 max C, 0.75 Mn, 1.25 Si, 9 Ni, 19.5 Cr, bal Fe.
Cast: 70,000 TS; 28,000 YS; 35 El; 150 Brin.
For chemical and food processing equipment; ACI-CF8; corrosion resistant, austenitic.

DONEGAL DC-45.
M-1223; 0.16 max C, 0.75 Mn, 1.25 Si, 9 Ni, 19.5 Cr, Se, bal Fe.
Cast: 70,000 TS, 28,000 YS; 30 El; 150 Brin.
For chemical and food processing equipment; ACI-CF16F, corrosion resistant, austenitic.

DONEGAL DC-46
M-1223; 0.08 max C, 0.75 Mn, 1.25 Si, 10 Ni, 19.5 Cr, Mo, bal Fe.
Cast: 70,000 TS, 30,000 YS; 30 El; 150 Brin.
For chemical and food processing equipment; ACI-CF8M; corrosion resistant, austenitic.

DONEGAL DC-47.
M-1223; 0.20 max C, 0.75 Mn, 1.25 Si, 9 Ni, 19.5 Cr, bal Fe.
Cast: 70,000 TS, 30,000 YS, 30 El, 150 Brin.
For chemical and food processing equipment, ACI-CF20, corrosion resistant, austenitic.

DONEGAL DC-48
M-1223; 0.20 max C, 0.75 Mn, 1.25 Si, 13.5 Ni, 24.5 Cr, bal Fe
Cast: 70,000 TS; 30,000 YS, 30 El; 170 Brin
For chemical plant equipment, furnace parts; ACI-CH20; corrosion and heat resistant.

DONEGAL DC-49.
M-1223; 0.20 max C, 0.75 Mn, 1.25 Si, 20.5 Ni, 25 Cr, bal Fe.
Cast: 65,000 TS; 28,000 YS; 30 El; 170 Brin.
For chemical plant equipment, furnace parts; ACI-CK20; corrosion and heat resistant.

DONEGAL DC-50.
M-1223, 0.05 C, 16.5 Cr, 4 Ni, 4 Cu, bal Fe.
Heat treated: 180,000-210,000 TS; 165,000-200,000 YS; 15-6 El; 60-30 RA; 375-440 Brin.
For chemical plant equipment; age hardenable, corrosion resistant.

DOPPLOY 30.
M-479; 2.0 Si, 0.8 Mn, 3.0 total C, 18.5 Ni, 2.5 Cr, bal Fe.
Cast: 35,000 TS.
For casting jacketed kettles, agitators, etc., corrosion resistant.

DOQUAT.
Russian; Fe-W.
For cutting tools; hard sintered alloy.

DORIUM "D."
70 Cu, 30 Zn.
For condenser tubes.

DORRENBERG A 50.
M-614; 0.56 C, Ni, Cr, Mo, V, bal Fe.
For crankshafts, punches, dies; oil hardened, shock resistant.

DORRENBERG CN60.
M-614; 0.15 C, Ni, Cr, bal Fe.
For gears, bolts, machine tool parts, case hardened, shock resistant.

DORRENBERG CP10V.
M-614; 2.1 C, 0.35 Si, 0.3 Mn, 11.5 Cr, bal Fe.
For blanking and forming dies, gages, punches; oil hardened, non-deforming.

DORRENBERG CPP.
M-614; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, gages, punches; air hardened, non-deforming.

DORRENBERG CPW.
M-614; 2.1 C, 0.25 Si, 11.5 Cr, 0.7 W, bal Fe.
For blanking and forming dies, gages, punches; oil hardened, non-deforming.

DORRENBERG DGS.
M-614; 0.58 C, Mn, Si, bal Fe.
For machine tool parts; oil hardened.

DORRENBERG DM1.
M-614; 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe
For gears, machine tool parts, oil hardened, tough

DORRENBERG DML.
M-614; 0.50 C, Cr, Mo, bal Fe.
For gears, bolts, studs, fasteners; oil hardened, shock resistant

DORRENBERG ECN4M.
M-614; 0.19 C, 1.25 Cr, 0.2 Mo, 3.75 Ni, bal Fe.
For gears, bolts, camshafts, cams, case hardened

DORRENBERG EPM1.
M-614; 0.19 C, 1.25 Cr, 0.20 Mo, 3.75 Ni, bal Fe
For gears, cams, camshafts, fasteners; case hardened, shock resistant.

DORRENBERG EPM2.
M-614; 0.20 C, 1.15 Cr, 1.25 Mn, bal Fe.
For gears, cams, camshafts, case hardened, tough.

DORRENBERG EXTRA NO. 10.
M-614; 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 325 Brin.
For tools, punches, springs, axes, hammers; water hardened.

DORRENBERG EXTRA 12
M-614; 6.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
For springs, tools, rails, hammers; water hardened.

DORRENBERG EXTRA 16.
M-614; 0.55 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Heat treated: 150,000 TS; 110,000 YS; 15 El; 45 RA; 310 Brin.
For tools, punches, hammers, water hardened.

DORRENBERG GWS2.
M-614; 0.90 C, 1.2 Cr, 1.15 Si, 0.70 Mn, bal Fe.
For punches, cutters, bearings, bushings; oil hardened, wear resistant.

DORRENBERG GWS4.
M-614; 1.25 C, 1.2 Cr, 1.15 Si, 0.7 Mn, bal Fe.
For cutters, dies, bearings, bushings; oil hardened, wear resistant.

DORRENBERG H24CN.
M-614; 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe.
For valve seats and bodies, bushings; corrosion and heat resistant.

DORRENBERG HC15
M-614; 0.12 max C, 2.2 Si, 13 Cr, bal Fe.
For oil refinery and chemical plant equipment; corrosion and heat resistant.

DORRENBERG HC17M.
M-614; 0.30 C, 16 Cr, Mo, bal Fe.
For oil refinery and chemical plant equipment; corrosion and heat resistant.

DORRENBERG HC22.
M-614; 0.20 C, 18 Cr, 1 Al, bal Fe.
For oil refinery equipment; corrosion and heat resistant.

DORRENBERG HC25.
M-614; 0.12 max C, 1.5 Si, 1.5 Al, 24 Cr, bal Fe.
For heat treating boxes, furnace parts and equipment; heat resistant.

DORRENBERG HC30.
M-614; 0.20 C, 29 Cr, 1 Al, bal Fe.
For heat treating boxes, furnace parts and equipment; heat resistant.

DORRENBERG HC50.
M-614; 0.40 C, 0.40 Si, 0.30 Mn, 13 Cr, bal Fe.
For cutlery, surgical instruments; corrosion resistant.

DORRENBERG HCN.
M-614; 0.15 C, 24 Cr, 19 Ni, bal Fe.
For furnace parts, pots, retorts; Type 314; corrosion resistant.

DORRENBERG HCNN.
M-614; 0.15 C, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment; Type 302; stainless, austenitic.

DORRENBERG MAB.
M-614; 1.1 C, W, Cr, V, bal Fe.
For cutters, dies, tools; oil hardened.

DORRENBERG MCM.
M-614; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, fasteners, shafts, oil hardened, tough.

DORRENBERG MS.
M-614; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
For gears, bolts, shafts, fasteners, water hardened

DORRENBERG NC15.
M-614; 0.45 C, Cr, Ni, bal Fe.
For gears, shafts, machine tool parts; oil hardened, shock resistant.

DORRENBERG NC15A.
M-614; 0.50 C, Ni, Cr, bal Fe.
For gears, shafts, machine tool parts; oil hardened, shock resistant.

DORRENBERG NCM1.
M-614; 0.55 C, 0.6 Mn, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For forging and heading dies, upsetters; oil hardened, tough.

DORRENBERG P 60.
M-614; 0.61 C, 0.85 Si, 0.75 Mn, 1.18 Cr, 0.10 V, bal Fe.
For dies, punches, gauges, shear blades; oil hardened, tough.

DORRENBERG PC130.
M-614; 0.38 C, Si, Cr, V, bal Fe.
For gears, shafts, machine tool parts; oil hardened, tough.

DORRENBERG PMV.
M-614; 0.58 C, 0.95 Mn, 1.0 Cr, 0.09 V, bal Fe.
For springs, gears, bolts; oil hardened, tough.

DORRENBERG PMVW.
M-614; 0.50 C, 1.0 Cr, 0.09 V, 0.85 Mn, bal Fe.
For springs, gears, bolts; oil hardened, shock resistant.

DORRENBERG PNC EXTRA.
M-614; 0.50 C, 1.05 Cr, 3.25 Ni, 0.5 Mn, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

DORRENBERG PV3W.
M-614; 0.85 C, 1.0 Cr, bal Fe.
For bearings, cutters, liners, bushings; water hardened, wear resistant.

DORRENBERG PV4.
M-614; 0.85 C, 1.15 Cr, bal Fe.
For bearings, cutters, liners, bushings, water hardened, wear resistant.

DORRENBERG PV5.
M-614; 1.15 C, 0.65 Cr, 0.1 V, bal Fe.
For bearings, cutters, liners, bushings, water hardened, wear resistant.

DORRENBERG PV15.
M-614; 1.0 C, 1.1 Cr, 0.07 Mn, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant

DORRENBERG PV35.
M-614; 1.5 C, Cr, Si, bal Fe.
For tools, dies; oil hardened.

DORRENBERG R 15.
M-614; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed 75,000 TS, 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, cutlery, valves, Type 410; stainless.

DORRENBERG R 17
M-614; 0.90 C, Si, Cr, Mo, bal Fe.
For bearings, liners, bushings; oil hardened, wear resistant.

DORRENBERG R 18.
M-614; 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin
For pumps, marine hardware, valves; Type 431; corrosion resistant.

DORRENBERG R 25.
M-614; 0.2 C, 13 Cr, 0.4 Si, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin
For turbine blades, valves, cutlery; Type 420, stainless.

DORRENBERG R 45.
M-614; 0.40 C, 0.30 Mn, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS, 50,000 YS; 25 El; 55 RA; 195 Brin.
For valves, cutlery, turbine blades; Type 420; stainless.

DORRENBERG SA.
M-614; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, vessels; Type 302; stainless, austenitic.

DORRENBERG SAT.
M-614; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, tanks, mixers; Type 321; stainless, austenitic.

DORRENBERG SAW.
M-614; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks: Type 304; stainless, austenitic.

DORRENBERG SB.
M-614; 0.1 max C, 18 Cr, 9.5 Ni, 2 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks, Type 316; stainless, austenitic.

DORRENBERG SBT.
M-614, 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed 85,000 TS, 35,000 YS; 50 El. 65 RA; 160 Brin
For welded acid resistant chemical plant equipment, Type 316Ti, austenitic, stainless

DORRENBERG SBW.
M-614; 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe
Annealed: 90,000 TS, 40,000 YS, 45 El; 60 RA, 180 Brin.
For acid resistant chemical plant equipment, tanks; Type 317, stainless, austenitic

DORRENBERG SPEZIAL NR. 2
M-614, 0.40 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Hot rolled. 91,000 TS; 58,000 YS; 27 El, 50 RA; 200 Brin.
For fishplates, gears, bolts, fasteners, water hardened

DORRENBERG ST2
M-614; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, punches, chisels, oil hardened, shock resistant.

DORRENBERG STP.
M-614; 0.67 C, 1.3 Si, 0.50 Mn, 0.5 Cr, bal Fe
For springs, punches, chisels; oil hardened, shock resistant.

DORRENBERG VNC4.
M-614; 0.40 C, Ni, Cr, Mo, bal Fe.
For gears, bolts, crankshafts, oil hardened, shock resistant.

DORRENBERG W 4
M-614, 0.30 C, 1.0 Si, 0.4 Mn, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For extrusion arms, punches, upsetters; oil hardened, tough.

DORRENBERG W 5.
M-614, 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For extrusion arms, punches, upsetters; oil hardened, hot work steel.

DORRENBERG W 9.
M-614; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams and liners, upsetters; oil hardened, hot work steel.

DORRENBERG WC11.
M-614; 0.30 C, 2.4 Cr, 0.25 V, 8.5 W, 2.0 Co, bal Fe.
For extrusion rams and liners, upsetters; oil hardened, hot work steel.

DORRENBERG WD1.
M-614; 1.2 C, 0.2 Cr, 0.1 V, 1.0 W, bal Fe.
For blanking and forming dies; oil hardened, wear resistant.

DORRENBERG Z 1A.
M-614; 1.1 C, Mo, V, bal Fe.
For cutters, blanking and forming dies; oil hardened, wear resistant.

DORRENBERG Z 1B.
M-614; 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, blanking and forming dies; oil hardened, non-deforming.

DORRENBERG Z 3C.
M-614; C, alloy, bal Fe.
For machine tool parts; oil hardened.

DOS SPEZIAL.
M-1291, 0.3 C, 2.5 Cr, 0.2 Mo, 0.15 V, bal Fe.
For gears, pinions, bolts, studs, crankshafts; oil hardened, shock resistant.

DOUBLE BRONZE
England; 6.5 Al, skin of pure Cu, bal Cu.
For electrical equipment; wire.

DOUBLE CLOCHE 0.1
M-1546, 1.3 C, 5 W, bal Fe.
Hardened C 63-65 Rock.
For cold work tools, punches, bending dies, piercing tools, bearings.
Cold working steel, shock and wear resisting.
Water or oil hardening.

DOUBLE CLOCHE 2 3.
M-1546, 1.10 C, 0.5 Cr, 2.1 W, bal Fe
Hardened. C 60-64 Rock.
For cold working tools, punches, hobs, bending dies, drills, cutters.
Oil or water hardening Cold working steel, shock resisting.

DOUBLE CLOCHE E.
M-1546, 1.45 C, 3.25 W, 0.3 Cr, 0.25 V, bal Fe
For cold working tools, bending dies, punches, reamers, cutters
Cold, working steel, shock and wear resistant
Oil hardening.

DOUBLE CONQUEROR.
M-1406; 1.1-1.4 C, bal Fe.
For roll turning tools, rock drills, punches; water hardened, wear resistant

DOUBLE EXTRA BEST
M-1408; high C, W, bal Fe.
For turning tools; oil or water hardened

DOUBLE EXTRA LION.
M-1415, 0.75 C, 19 W, 4 Cr, 1.2 V, 2 Co, 0.5 Mo, bal Fe.
For drills, reamers, lathe and planer tools, hobs, broaches, high speed steel.

DOUBLE GEANT.
M-1118; 0.7 C, 18 W, 9 Co, 4 Cr, 2 V, 1 Mo, bal Fe.
For tools, dies, cutters, high speed steel.

DOUBLE GRIFFIN.
M-1112; 0.35 C, 1.75 Cr, 3.5 Ni, 0.3 Mn, bal Fe.
For shears, punches, pneumatic tools; hot work steel, oil hardened, shock resistant.

DOUBLE GRIFFIN SUPER CHISEL.
M-1112; C, alloy, bal Fe.
For tools, chisels; tough.

DOUBLE MUSHET.
M-233; C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, cutters; high speed steel.

DOUBLE RAPID.
M-1405; 0.8 C, 4.5 Cr, 18.5 W, 5.5 Co, 0.3 Mo, 1.2 V, bal Fe.
For lathe and planer tools, reamers, drills, hobs; high speed steel.

DOUBLE SATAN.
M-1043; 0.55 C, 5 W, 3.5 Cr, bal Fe.
For hot work tools and dies; hot work steel, oil hardened.

DOUBLE SEVEN.
M-210; 1.25 C, 12.5 Cr, 2.7 Co.
For shear blades, cold forging dies, blanking dies; air hardened, non-deforming.

DOUBLE SEVEN.
M-365; 1.3 C, 13.3 Cr, 3-4.5 Co, 0.25 Mo, 1 Ni, bal Fe.
For tools, broaches, lamination dies; non-deforming.

DOUBLE SIX.
M-210; 1.9 C, 12.5 Cr, 0.8 Mo, 0.25 V, bal Fe.
For dies, plug and ring gages, press tools; oil or air hardened, non-deforming.

DOUBLE SIX.
M-365; 2.25 C, 14 Cr, bal Fe.
For blanking and drawing dies, gages; non-shrinking.

DOUBLE SIX SUPER.
M-210; 1.9 C, 12.5 Cr, 0.8 Mo, 0.25 V, bal Fe.
Ht. Tr.: 275,000 TS; 210,000 YS; 1 El; C 58 Rock.
For blanking, coining and drawing dies.
Plug and ring gauges, mandrels, press tools, reamers, broaches. Non-shrinking. Air hardening

DOUBLE SPECIAL.
M-38; 1.3 C, 3-6 W, bal Fe.
For tools, finishing tools; shallow hardening.

DOUBLE SPECIAL.
M-618; 1.4 C, 5 W, 0.8 Cr, bal Fe.
For turning and finishing cutters; fast finishing, water hardened.

DOUBLE SUPER EXPRESS.
M-1408; 0.7 C, 22 W, 5 Cr, 1 V, bal Fe.
For cutters for asbestos and rubber; high speed steel.

DOUBLE SUPER HYDRA.
M-1411; 0.80 C, 18 W, 4.5 Cr, 1.75 V, 5 Co, bal Fe.
For broaches, drills, reamers, lathe tools; high speed steel.

DOUBLE TWELVE.
M-210; 0.35 C, 12.0 Cr, 12.0 W, 1.0 V, bal Fe
For master hobs for beryllium-copper, mold inserts in the plastic industry, brass die casting molds, extrusion dies.
Oil hardening.

DOUBLE YOU CHROME.
M-1113; 2.25 C, 13 Cr, bal Fe.
For tools, dies; non-shrink.

DOUBLE YOU DIE.
M-1113; 0.9 C, 3.75 Cr, bal Fe.
For tools, dies; air hardened.

DOUBLE YOU HOT STUFF.
M-1113; C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe.
For tools, hot dies; hot die steel.

DOUX.
M-1495; 0.20 C, 0.25 Si, 0.80 Mn, bal Fe.
Annealed: 47,000 TS; 28,000 YS; 35 El; 137 Brin.
For oil refinery tubes.

DOVER.
M-1705; 1.0 C, 0.25 Mn, 0.25 Si, bal Fe.
Water hardening tool steel. AISI W 1.

DOW METAL O1 replaced by AZ80A.

DOWMETAL AM60X1.
M-43; 6 Al, 0.25 Mn, 0.0004 Be, bal Mg.
For cast automobile wheels.
Tough and ductile.

DOWMETAL AZ91B replaced by AZ91B.

DOWMETAL G replaced by AM100A.

DOWMETAL H replaced by AZ63A.

DOWMETAL HK31A see HK31A.

DOWMETAL J replaced by AZ61A.

DOWMETAL ZK60A see ZK60A.

DRACO.
M-39, M-114; 0.66-1.15 C, 0.2 V, bal Fe.
For tools, stamping dies, cold heading dies, taps; high strength and toughness.

DRACO 3460.
M-1117; 0.15 C, 23 Cr, 14 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; B 83 Rock.
For heat treating boxes, furnace parts, salt pots, brazing fixtures, combustion chambers.
Type 309 stainless steel, austenitic, heat resistant

DRACO DV.
M-114, 1 C, 0.3 Mn, 0.45 V, bal Fe.
For cold header dies, edge tools; shock resistant.

DRAGON
M-1, 0.35 C, 0.55 Mn, 0.70 Cr, 0.25 Mo, bal Fe.
For bucket teeth, keys, studs, bolts, water hardening.

DRAWALLOY 240.
M-765; 0.2 C, 18 Cr, 8 Ni, bal Fe.
Cast: 240-260 Brin.
For hard surfacing welding rods; austenitic, non-magnetic.

DRAWING BRASS.
M-8, M-33; 67-70 Cu, 30-33 Zn.
Hard: 77,000 TS, 67,000 YS; 15 El; 50 RA; 145 Brin.
For seamless tubes, condensers and evaporators; deep drawing.

DREADNOUGHT.
M-38, 0.80 C, 0.28 Mn, 4.0 Cr, 18 W, 1.03 V, bal Fe.
Oil or air.
For tools, dies, punches, general purpose tools; high speed steel; R.H.C. 64 min.

DREWOSTA.
M-1294; 1.42 C, W, V, bal Fe.
For engravers tools, forming and blanking dies; water hardened, wear resistant.

DRILL.
M-377; 0.85 C, 0.50 Mn, 0.25 Si, bal Fe.
For drills, chisels, shear blades, axes, hammers; water hardening.

DRILLALLOY.
M-432; 0.65 C, 0.70 Mn, 0.40 Mo, bal Fe.
For mine drills, tools; water hardened.

DRILL ROD.
M-341; 1.2 C, bal Fe.
For drills, tools; water hardened.

DRILL ROD BRASS.
U.S.; 62 Cu, 35.5 Zn, 2.5 Pb.
For automatic screw machine parts; drills and turns easily.

DRIL-TEC 88.
M-717; hard carbides in non-ferrous matrix.
For hard surfacing using torch.
Wear and abrasion resistant.
For earth moving equipment, etc.

DRITTEL SILVER.
German; 66.6 Al, 33.3 Ag.
For ornamental trade.

DRIVER 30 ALLOY.
M-61; 98 Cu, 2 Ni.
Annealed: 30,000 TS.
Cold worked: 60,000 TS.
For resistances, precision resistors, rheostats, instruments.
Max. operating temperature 600°F in air

DRIVER 60 ALLOY.
M-61, 94 Cu, 2 Ni.
Annealed: 35,000 TS.
Cold worked: 70,000 TS.
For resistances, resistors, rheostats instruments.
Max. operating temperature 600°F in air.

DRIVER 90 ALLOY
M-61; 88 Cu, 12 Ni.
Annealed: 35,000 TS.
Cold worked 75,000 TS.
For resistances, rheostats, precision resistors, instruments.
Max. operating temperature 800°F in air.

DRIVER 180 ALLOY
M-61, 78 Cu, 22 Ni
Annealed: 50,000 TS
Cold worked: 100,000 TS
For resistances, precision resistors, rheostats, instruments
Max. operating temperature 1000°F in air.

DRW COPPER.
M-558, Electrolytic tough pitch copper.
For electrical applications and general usage in rod and wire applications.

DSC HIGH C.
M-157; 0.25-0.80 C, bal Fe.
For springs, water hardened.

DS-LEAD.
M-1656; 99.9 Pb, 0.1 PbO.
Sheet: 6000 TS; 5800 YS; 18 El; 6500 CS.
At 300°F: 3250 TS; 20 El
For chemical construction, storage batteries, counterweights, roofing, gutters.
Dispersion strengthened, fine-grained, corrosion resistant.

DTD.
England, 0.40 C, 3 Cr, 0.8 Mo, 0.2 V, bal Fe.
For gas turbine parts; creep resistant.

D.T.D. 49B.
British; 0.35-0.45 C, 1.00-1.75 Si, 0.5-1.0 Mn, 12.5-14.5 Cr, 12.5-14.5 Ni, 2-3 W, bal Fe.
For aircraft valves; austenitic

DTD 424.
Brit., Cu, Si, bal Al.
For castings; age-hardenable.

DUALOY.
M-358; C, W, bal Fe.
For tools, dies; water hardening.

DUCOL STEEL.
M-530; 0.3-0.5 C, 1.7 Mn, bal Fe.
For machinery parts; water hardened.

DUCOL W 21.
M-530; 0.23 C, 1.7 max Mn, 0.5 max Ni, 0.25 max Cr, bal Fe.
Cold drawn: 83,000-97,000 TS, 46,000 YS; 18-14 El.
For bridges, rail cars, building structures; good weldability.

DUCOL W 25.
M-530; 0.2 max C, 1.5 max Mn, 0.5 max Ni, 0.3 max Cr, 0.3 max Mo, bal Fe.
Tempered: 83,000 min TS; 61,000 min YS; 15 min El.
For bridges, rail cars, building structures; good weldability.

DUCOL W 30
M-530, 0.18 max C, 1.4 max Mn, 0.8 max Cr, 0.5 max Ni, 0.25 max Mo, 0.1 max V, 0.5 max Cu, bal Fe.
Tempered: 85,000 min TS; 66,000 min YS; 15 min El.
For building structures, rail cars, bridges; good weldability.

DUCTALLOY.
M-128, M-1099; 3.0-3.5 T.C., 2.0-2.5 Si, 0.15 Mg, 0.6 Mn, bal Fe.
Cast: 115,000 TS, 1 El; 230 Brin.
Annealed: 60,000 TS; 20 El; 175 Brin.
For machinery castings, gears, shafts; ductile cast iron.

DUCTALLOY 60
M-1099; 3.4-4.0 C, 2-3 Si, 0.2-0.6 Mn, 2 max Ni, bal Fe.
Cast. 60,000-80,000 TS, 45,000-60,000 YS; 15-10 El, 140-200 Brin
For valve and pump bodies, compressor heads, gear housings, nodular iron, ferritic.

DUCTALLOY 80
M-1099, 3.3-3.8 C, 2-3 Si, 0.2-0.6 Mn, 2 max Ni, bal Fe
Cast 80,000-110,000 TS, 60,000-75,000 YS; 10-3 El, 230-280 Brin
For anvils for forging hammers, impellers, cams, roll dies, nodular iron, pearlitic.

DUCTALLOY A50.
M-1099; 2.7-3.3 C, 2.2-3.2 Si, 1.5-2.5 Mn, 20-26 Ni, bal Fe
Cast 50,000-68,000 TS, 25,000-38,000 YS, 40-20 El; 120-150 Brin
For pumps and valve impellers, grids; nodular iron, austenitic, corrosion resistant.

DUCTALUMINUM 356S
M-1099; 0.20-0.40 Mg, 6.5-7.5 Si, 0.20 max Cu, 0.5 max Fe, 0.2 max Ti, bal Al
Heat treated: 42,000 TS, 35,000 YS, 3 El.
For aircraft castings, age-hardenable.

DUCTALUMINUM 356T
M-1099, 0.2-0.4 Mg, 6.5-7.5 Si, 0.20 max Cu, 0.5 max Mn, 0.2 max Ti, bal Al.
Heat treated: 38,000 TS, 28,000 YS; 6 El.
For aircraft castings; age-hardenable.

DUCTILE CECOLLOY.
M-474; 3.3-3.6 T.C., 2.2-2.6 Si, 0.5 Mg, bal Fe.
Cast and annealed: 60,000-80,000 TS; 40,000-60,000 YS; 10-5 El.
For castings, forging hammer components; good machinability, ductile cast iron.

DUCTILEND 70.
M-677; 0.06 C, 0.6 Mn, 0.4 Si, 0.1 Mo, bal Fe.
For welding electrodes; class E7018.

DUCTILEND 70 Mo.
M-677; 0.05 C, 0.8 Mn, 0.6 Si, 0.6 Mo, bal Fe.
For welding electrodes; class E7018-Al, carbon-molybdenum steel.

DUCTILEND 80.
M-677; 0.6 C, 0.8 Mn, 0.5 Si, 0.9 Ni, 0.15 Mo, bal Fe.
For welding electrodes; class E8018-C3, 1% nickel steel.

DUCTILEND 85.
M-677, 0.05 C, 1.0 Mn, 0.5 Si, 1.5 Ni, O.3 Mo, bal Fe.
For welding electrodes; class E9018M, for joints in HY80 and steels of 90,000-100,000 psi TS range.

DUCTILEND 90.
M-677; 0.06 C, 1.5 Mn, 0.4 Si, 0.45 Mo, bal Fe.
For welding electrodes; class E9018-D1, manganese-molybdenum steel of 90,000 psi tensile strength range.

DUCTILEND 100
M-677; 0.05 C, 1.4 Mn, 0.5 Si, 1.8 Ni, 0.35, bal Fe.
For welding electrodes; class E10018-M, for joints in HY80 and steels of 100,000-110,000 psi TS range.

DUCTILEND 110.
M-677, 0.05 C, 1.6 Mn, 0.4 Si, 2.2 Ni, 0.4 Mo, bal Fe
For welding electrodes; class E11018-M, for joints in HY 80 and "T" steel, etc, of 110-000-120,000 psi TS range.

DUCTILEND 120.
M-677, 0.05 C, 1.9 Mn, 0.55 Si, 0.5 Cr, 2.2 Ni, 0.45 Mo, bal Fe.
For welding electrodes, class E12018-M for joints in HY100 and "T" steel, etc., of 120,000 psi TS.

DUCTILE IRON.
M-1267; 3.3 C, 2.5 Si, 0.7 Mn, 0.05 Mg, bal Fe.
Cast: 60,000-90,000 TS, 45,000-65,000 YS, 10-2 El, 163-277 Brin.
For gears, crankshafts, hydraulic castings, high strength ductile iron.

DUCTILE IRON, FERRITIC.
M-68; 3-4 T.C., 1-3 Si, 0.10-0.60 Mn, 0.10 max P, 0-2 Ni, bal Fe.
Annealed 60,000 TS, 45,000 YS, 15 El, 143-207 Brin.
For pressure castings, maximum toughness, ductile cast iron.

DUCTILE IRON, HARDENED.
M-68; 3-4 T.C, 1-3 Si, 0.10-0.60 Mn, 0.10 max P, 0-2 Ni, bal Fe.
Heat treated: 120,000 TS; 9,000 YS; 2 El, 269-388 Brin.
For gears, dies, machine tool parts, ductile cast iron.

DUCTILE IRON, PEARLITIC
M-68, 3-4 T.C., 1-3 Si, 0.10-0.60 Mn, 0.10 max P, 0-2 Ni, bal Fe.
Normalized: 100,000 TS; 70,000 YS; 3 El, 225-302 Brin.
For gears, crankshafts, agricultural equipment; wear resistant, ductile cast iron.

DUCTILE IRON, SEMI-PEARLITIC.
M-68: 3-4 T.C., 1-3 Si, 0.10-0.60 Mn, 0.10 max P, 0-2 Ni, bal Fe.
Cast: 85,000 TS; 55,000 YS, 3 El; 200-280 Brin.
For heavy machinery castings; wear resistant, ductile cast iron.

DUCTILITE.
M-1282; 3.3-3.5 C, 2.2-2.5 Si, 0.7 Mn, 0.05 Mg, bal Fe.
Cast: 70,000-100,000 TS; 15-5 El; 210-250 Brin.
For earth moving equipment; ductile cast iron.

DUCTILOY see NAX HIGH TENSILE.

DUCTLIRON TYPE GS.
M-1256; 3.3 C, 0.7 Mn, 2.2 Si, 0.05 Mg, bal Fe.
Cast: 75,000 TS; 55,000 YS; 1-4 El; 217-269 Brin.
For gears, shafts, machine tool housings; ductile cast iron.

DUCTLIRON TYPE GSF.
M-1256; 3.3 C, 0.7 Mn, 2.2 Si, 0.05 Mg, bal Fe.
Cast: 60,000 TS; 45,000 YS; 5-10 El; 207 Brin.
Annealed: 20 El; 170 Brin.
For gears, shafts, machine tool housings, ductile cast iron.

DUDLEY'S BEARING METALS.
Eng ; 98 Sn, 1.6 Cu, 0.3 Pb.
For bearings.

DUDLEY'S BRONZE "B."
Eng ; 77 Cu, 8 Sn, 15 Pb
For bearings, bushings, heavy duty

DUDLEY'S BRONZE "K"
Eng., 77 Cu, 10.5 Sn, 12.5 Pb.
For bearings, bronze castings, heavy duty.

DUDLEYS PHOSPHOR BRONZE
Eng , 80 Cu, 10 Sn, 9.6 Pb, 0.8 P.
30,000 TS, 6 El, 55 Brin
For bearings, heavy duty.

DUEX.
M-1546, 0.88 C, 17.5 W, 8 Co, 1.5 V, 1.2 Mo, bal Fe
Hardened. C 64-66 Rock
For lathe machining high manganese steels, heavy duty lathe and planer tools, broaches, hobs, boring tools.
High speed steel, oil hardening High red-hardness

DUFOUR WHITE GOLD
Eng , 75 Au, 21.5 Pb, 4.5 Pt
For ornaments; corrosion resistant.

DUKANE
M-755, 0.4 C, bal Fe.
For gears, shafts; water hardening.

DUKANE DRILL ROD.
M-370, 0.95-1.05 C, bal Fe
For dowel pins, mandrels, screw machine parts, shafts, small tools
AISI Type W1 Water hardening tool steel.

DUKE-KIDD
M-358, 0.9 C, bal Fe
For tools, drills, taps; water hardened.

DUKE'S METAL
Eng., 12 Cr, 1.5 C, 4 Co, 0.6 Si, 0.4 W, 0.2 Mn, bal Fe.
For tools, dies, corrosion and heat resisting parts, non-deforming

DUKE'S METAL
Eng.; 40 Ni, 30 Cu, 30 Fe.
For corrosion resistant and heat resistant parts; corrosion and heat resistant.

DUKEX.
M-358; C, W, bal Fe.
For cutting tools; water hardening.

DULLRAY.
M-121; 33-35 Ni, 3-5 Cr, bal Fe.
46,000 TS.
For electrical resistances, motor starter resistances; for temperatures below dull red; known as "Ferrozoid."

DUMAT.
M-118; 46 Ni, 54 Fe, sheath of Cu.
Rolled: 70,000 TS; 18 El.
For glass to metal seals, lead-in wires; thermal expansion similar to soft glass.

DUMET.
M-104; 54 Fe, 46 Ni, plated with Cu.
82,000 TS; 54,600 YS; 38 El; 65 RA.
For resistance alloy for sealing in leads in electric light bulbs and radio tubes; platinite wire with an oxidized Cu plated coating.

DUMORE.
M-289; 0.95-1.05 C, 5.0-5.5 Cr, 0.95-1.25 Mo, bal Fe.
For blanking, forming and drawing dies; air hardened.

DUMOST NO. 1.
M-97; 0.85 C, 0.30 Mn, 0.30 V, bal Fe.
For punching, shearing and forming dies; water hardening.

DUMOST NO. 2
M-97; 0.95 C, 0.30 Mn, 0.30 V, bal Fe.
For punching, shearing, forming dies; water hardening.

DUMOST NO. 3
M-97; 1.1 C, 0.3 V, bal Fe.
For tools, drills, taps; water hardening.

DUMOST NO. 16.
M-97, 1.6 C, 0.3 V, bal Fe.
For reamers, special tools, water hardened, keen cutting edge

DUNELT 3
M-1413, 0.08-0.13 C, 0.30 max Si, 0.4-0.7 Mn, bal Fe
Normalized 58,000 TS; 45,000 YS; 30 El, 60 RA; 130 Brin
For staybolts, case hardened

DUNELT 4.
M-1413; 0.25-0.35 C, 0.5-1.1 Mn, 0.10-0.20 S, 0.6 max P, bal Fe
Heat treated 78,500-101,000 TS; 15 El
For bolts, nuts, studs, free-cutting, water hardened

DUNELT 5
M-1413, 0.10-0.20 C, 1.0-1.5 Mn, 0.10-0.20 S, 0.06 max P, bal Fe.
Heat treated 78,500 TS, 15 El
For nuts, bolts, studs, case hardened, free-cutting

DUNELT 6.
M-1413, 0.35-0.45 C, 0.4-1.0 Mn, 0.30 max Si, bal Fe.
Heat treated 92,000-112,000 TS, 22-18 El.
For gears, pinions, shafts, axles, machinery parts, water hardened.

DUNELT 7.
M-1413, 0.10-0.20 C, 1.0-1.5 Mn, 0.2-0.4 S, 0.05-0.20 P, bal Fe.
Cold drawn. 78,000-103,000 TS; 15 El
For fasteners, bolts, screws, nuts, studs, case hardened, free-cutting

DUNELT 10
M-1413; 0.28-0.35 C, 2.75-3.25 Ni, 0.30 max Cr, bal Fe.
Heat treated 100,000 TS; 74,000 YS, 22 El; 192 Brin.
For axles, shafts, tie rods, bolts, connecting rods; oil hardened, shock resistant.

DUNELT 14.
M-1413; 0.10-0.18 C, 0.30 max Si, 0.5-0.9 Mn, bal Fe.
Heat treated: 72,000 TS; 20 El; 50 RA.
For cams, gears, camshafts; case hardened.

DUNELT 15.
M-1413; 0.10-0.15 C, 2.75-3.50 Ni, 0.30 max Cr, bal Fe.
Heat treated: 101,000-135,000 TS; 18 El; 45 RA.
For gears, cams, camshafts, valve tappets; case hardened, shock resistant.

DUNELT 16.
M-1413; 0.10-0.15 C, 3.0-3.5 Ni, 0.8-1.1 Cr, bal Fe.
Heat treated: 123,000 TS; 18 El.
For gears, cams, camshafts, worm gears; case hardened, shock resistant.

DUNELT 17
M-1413; 0.08-0.14 C, 4.6-5.4 Ni, 0.30 max Cr, bal Fe
Heat treated: 103,000 TS, 20 El.
For gears, cams, camshafts, valve tappets; case hardened, shock resistant

DUNELT 18.
M-1413, 0.10-0.16 C, 4.6-5.4 Ni, 0.30 max Cr, 0.30 Mo, bal Fe.
Heat treated: 145,000 TS; 14 El.
For gears, cams, camshafts, valve tappets; case hardened, shock resistant

DUNELT 20.
M-1413; 0.12-0.20 C, 1.5-2.0 Ni, 0.2-0.3 Mo, bal Fe
Heat treated. 101,000-135,000 TS, 18 El.
For gears, cams, camshafts, valve tappets; case hardened, shock resistant

DUNELT 21
M-1413, 0.15-0.25 C, 1.0 max Mn, 0.35 max Si, bal Fe.
Hot rolled 56,000 TS; 25 El
Cold drawn: 63,000 TS, 17 El
For fasteners, screws, bolts, machinery parts, case hardened

DUNELT 26.
M-1413, 0.35-0.45 C, 0.5-1.0 Ni, 0.4-1.0 Mn, 0.3 max Si, bal Fe.
Heat treated: 90,000-112,000 TS, 22 El
For axles, gears, crankshafts, connecting rods; oil hardened, tough.

DUNELT 33
M-1413, 0.30-0.45 C, 0.80-1.2 Cr, 0.6-1.0 Mn, 0.3 max Si, bal Fe
Heat treated: 100,000-145,000 TS, 24-18 El
For shafts, gears, bolts, studs, oil or water hardened, tough.

DUNELT 34
M-1413, 0.30-0.45 C, 0.90-1.5 Cr, 0.2-0.4 Mo, 0.5-0.8 Mn, bal Fe.
Heat treated: 112,000-168,000 TS; 22-15 El.
For crankshafts, connecting rods, bolts; oil hardened, tough

DUNELT 36.
M-1413, 0.35-0.50 C, 1.0-1.5 Cr, 0.15-0.25 V, bal Fe
Heat treated. 123,000-168,000 TS; 20-15 El; 241-341 Brin.
For crankshafts, connecting rods, bolts; oil or water hardened, tough

DUNELT 39.
M-1413, 0.15-0.30 C, 1.3-1.8 Mn, 0.30 max Si, bal Fe
Heat treated 90,000-125,000 TS, 20 El; 163-225 Brin.
For gears, cams, camshafts, bolts; case hardened, tough.

DUNELT 40.
M-1413; 0.3-0.4 C, 1.2-1.8 Mn, bal Fe.
Heat treated: 90,000-135,000 TS; 20 El, 163-293 Brin.
For gears, axles, crankshafts; oil or water hardened

DUNELT 41.
M-1413; 0.30-0.45 C, 1.1-1.4 Mn, 0.15 max S, bal Fe.
Heat treated: 90,000-125,000 TS; 15 El; 163-293 Brin.
For gears, shafts, crankshafts, axles; free-cutting, oil or water hardened.

DUNELT 50.
M-1413; 0.25-0.40 C, 1.2-1.8 Mn, 0.20-0.40 Mo, bal Fe
Heat treated: 100,000-145,000 TS; 22-16 El; 192-352 Brin.
For crankshafts, axles, studs, bolts, nuts; oil or water hardened, tough.

DUNELT 51.
M-1413; 0.30-0.40 C, 1.3-1.8 Mn, 0.35-0.55 Mo, bal Fe.
Heat treated: 123,000-168,000 TS; 20-16 El; 248-341 Brin.
For crankshafts, axles, studs, connecting rods; oil hardened, tough.

DUNELT 53.
M-1413; 0.5-0.6 C, 0.5-0.9 Mn, 0.8 max Ni, bal Fe.
Heat treated. 112,000-135,000 TS; 18-15 El; 223-286 Brin.
For gears, pinions, axles, shafts, bolts; oil hardened.

DUNELT 55.
M-1413; 0.25-0.33 C, 0.45-0.70 Mn, 2.75-3.75 Ni, 0.5-1.0 Cr, bal Fe.
Heat treated: 112,000-145,000 TS; 22-18 El; 223-311 Brin.
For crankshafts, connecting rods, propeller shafts, oil hardened, shock resistant.

DUNELT 60.
M-1413, 0.32-0.28 C, 3.0-3.75 Ni, 0.5-1.0 Cr, bal Fe.
Heat treated. 135,000-168,000 TS; 17 El; 262-352 Brin.
For crankshafts, connecting rods, propeller shafts; oil hardened, shock resistant.

DUNELT 61.
M-1413; 0.15 max C, 1.0 max Mn, 1.0 max Ni, 12 min Cr, bal Fe.
Heat treated: 78,000-103,000 TS; 25 El; 140-223 Brin
For valves, pump spindles, golf club heads, corrosion resistant, oil hardened.

DUNELT 62.
M-1413; 0.15-0.35 C, 12 min Cr, 1.0 max Ni, bal Fe.
Heat treated: 100,000-125,000 TS, 20 El; 192-269 Brin.
For chemical and textile plant equipment; corrosion resistant.

DUNELT 63.
M-1413; 0.25 max C, 15-20 Cr, 1 min Ni, bal Fe.
Heat treated: 125,000 TS; 15 El, 241 Brin.
For chemical and textile plant equipment, corrosion resistant.

DUNELT 64.
M-1413; 0.27-0.44 C, 2.3-2.8 Ni, 0.5-0.9 Cr, 0.4-0.7 Mo, bal Fe.
Heat treated: 123,000-225,000 TS, 18-20 El; 255-444 Brin.
For axles, gears, crankshafts, connecting rods, oil hardened, shock resistant.

DUNELT 65.
M-1413; 0.22-0.32 C, 2.75-3.25 Ni, 1.0-1.4 Cr, 0.65 max Mo, 0.25 max V, bal Fe.
Heat treated: 125,000-168,000 TS; 18-16 El, 248-352 Brin.
For axles, gears, crankshafts, shafts, bolts; oil hardened, shock resistant.

DUNELT 67.
M-1413; 0.15-0.35 C, 3.0-3.5 Cr, 0.3-0.8 Mo, 0.4 max Ni, bal Fe.
Heat treated: 103,000-168,000 TS; 20-15 El; 203-341 Brin.
For cylinders, crankpins, gears, bolts; oil hardened, tough.

DUNELT 69.
M-1413; 0.35-0.45 C, 3.25-3.75 Ni, 0.30 max Cr, bal Fe.
Heat treated: 123,000-145,000 TS; 20-18 El; 248-302 Brin.
For connecting rods, axles, crankshafts; oil hardened, shock resistant.

DUNELT 82M.
M-1413; 0.12-0.18 C, 3.8-4.5 Ni, 1.0-1.4 Cr, 0.15-0.35 Mo, bal Fe.
Heat treated: 190,000 TS; 12 El.
For gears, cams, camshafts, fasteners; case hardened, shock resistant.

DUNELT 83.
M-1413, 0.4-0.5 C, 3.0-3.75 Si, 0.5 max Ni, 7.5-9.5 Cr, bal Fe
Annealed: 255 Brin.
For heat resistant valves; corrosion and heat resistant

DUNELT 84.
M-1413; 0.30-0.50 C, 12-16 Cr, 2-4 W, 0.55 max Mo, bal Fe.
Annealed: 302 Brin.
For high duty valves, corrosion and heat resistant

DUNELT 88.
M-1413, 0.20 max C, 8-10 Ni, 16-20 Cr, bal Fe
Heat treated: 7[illegible],000 TS; 30 El
For chemical and dye plant equipment; stainless, austenitic.

DUNELT 90
M-1413, 0.9-1.1 C, 1.0-1.5 Cr, 0.30-0.75 Mn, 0.25 max Ni, bal Fe.
Annealed: 229 Brin
For ball and roller bearings, liners, oil and water hardened, wear resistant.

DUNELT 100.
M-1413; 0.35-0.45 C, 0.45-0.65 Mn, 1.3-1.8 Ni, 0.90-1.4 Cr, bal Fe
Heat treated: 125,000-145,000 TS, 18 El; 248-302 Brin
For gears, pinions, shafts, axles; oil hardened, shock resistant.

DUNELT 101.
M-1413, 0.35-0.45 C, 0.9-1.4 Cr, 0.20-0.35 Mo, 1.3-1.8 Ni, bal Fe
Heat treated: 112,000-224,000 TS, 20-8 El; 217-444 Brin.
For gears, pinions, shafts, axles, bolts; oil hardened, shock resistant

DUNELT 128.
M-1413; 0.25-0.35 C, 3.9-4.5 Ni, 1.1-1.5 Cr, bal Fe.
Heat treated. 224,000 TS; 10 El, 444 Brin
For camshafts, gears, bolts; oil hardened, shock resistant.

DUNELT 129.
M-1413; 0.25-0.35 C, 3.75-4.5 Ni, 1.0-1.5 Cr, 0.2-0.4 Mo, bal Fe.
Heat treated: 224,000 TS; 12 El; 444 Brin.
For gears, pinions, shafts, bolts; oil hardened, shock resistant.

DUNKIRK EZ.
M-1; 1.3 C, 1.0 Mn, 1.4 Si, 0.25 Cr, 1.25 Mo, bal Fe.

For dies, gauges, forming rolls, bushings, liners; free machining.

DUNNLEVIC & JONES ANTIFRICTION METAL.
Eng.; 60 Pb, 20 Sb, 20 Zn.
For bearings, bushings; Babbitt.

DUNNLEVIC & JONES RUSSIAN.
Russian; 80 Zn, 8 Cu, 12 Sb.
For bearings; antifriction.

DUPLEX.
M-627; 0.9-1.1 C, 0.2 Si, 0.2 Mn, bal Fe.
Water Hardened: 200,000-216,000 TS; 138,000-152,000 YS; 11-13 El; 32-35 RA; 388-600 Brin
For taps, drills, reamers, punches, stamps, knurls, mandrels.
Type W1 water hardening

DUPLEX C.H. NO. 1.
M-38; 0.10 C, 3.5 Ni, 1.5 Cr, bal Fe.
Heat treated: 195,000 TS; 170,000 YS; 15 El; 50 RA; 321-375 Brin.
For carburized parts, camshafts, connecting rods; case-hardened steel.

DUPLEX C.H. NO. 2.
M-38; 0.20 C, 1.7 Ni, 1.0 Cr, bal Fe.
Heat treated: 165,000 TS; 140,000 YS; 12 El; 50 RA; 260-302 Brin.
For carburized parts, gears, pinions, case-hardened steel

DUPLEX C.H. NO. 3
M-38; 0.15 C, 3 Ni, 0.7 Cr, bal Fe.
Heat treated: 170,000 TS, 155,000 YS; 14 El, 48 RA; 296-311 Brin
For carburized parts; case-hardened steel

DUPLEX GEAR NO 1.
M-38, 3.5 Ni, 1.25 Cr, 0.40 C, bal Fe
Annealed: 95,000 TS, 65,000 YS; 29 El; 62 RA; 187 Brin
Heat treated: 275,000 TS; 24,000 YS, 11 El; 37 RA, 490 Brin
For gears, shafts, axles, crankshafts; oil hardening.

DUPLEX GEAR NO. 2.
M-38, 1.5 Ni, 1.0 Cr, 0.50 C, bal Fe
Annealed: 98,000 TS; 60,000 YS; 25 El, 58 RA, 196 Brin.
Heat treated. 265,000 TS; 220,000 YS, 9 El; 28 RA; 512 Brin
For gears, shafts, axles, crankshafts, oil hardening

DUPLEX GEAR NO. 3.
M-38; 3.0 Ni, 0.75 Cr, 0.35 C, bal Fe
Annealed: 100,000 TS; 60,000 YS, 25 El; 59 RA
Toughened: 135,000 TS; 110,000 YS, 18 El, 56 RA, 311 Brin
For gears, shafts, axles, crankshafts; oil hardening

DU PONT D-14.
M-522; 5 Zr, bal Cb
Rolled: 75,000 TS; 60,000 YS.
For hot surfaces on space re-entry vehicles; high heat resistance.

DU PONT D-36.
M-522; 10 Ti, 5 Zr, bal Cb
Rolled: 80,000 TS; 70,000 YS
For hot surfaces on space re-entry vehicles, high heat resistance.

DUPONT FA 22.
M-522, 0.07 C, 29 Ni, 3 Cu, 2 Mo, bal Fe.
For chemical plant equipment; resists H_2SO_4.

DUPONT NO. 1364.
M-522; 0.07 max C, 2.5 Si, 0.75 Mn, 20.5 Cr, 28.5 Ni, Cu, bal Fe.
Cast: 72,000 TS; 35,000 YS; 45 El; 150 Brin.
For heat and corrosion resistant castings; heat and corrosion resistant.

DUPONT METAL.
M-308; 96 Cu, 3 Si, 1 Mn, 0.1 Fe.
For bolts, screws, turnbuckles for airplanes; same as "Everdur"; non-corrosive.

DUQUESNE SPECIAL.
M-451; C, Cr, Mo, bal Fe.
For rolls, subjected to severe service.

DUR 500.
M-459; 1.0 C, 1.8 Mn, 0.25 Si, 1.8 Cr, 0.1 Al, 0.2 Ti, bal Fe.
For welding electrode

DURABIL.
M-358; C, bal Fe.
For tools and dies; water hardening.

DURACAST No. 7 see WEST No 7, etc

DURACHROME.
M-513; 2.0 C, 1.25 Si, 3 Cr, 5 Mo, bal Fe.
For valve seat inserts; alloy cast iron.

DURACID
M-323, 16 Si, 3 C, bal Fe. Cast.
For chemical apparatus; corrosion resistant; cast iron.

DURAFLEX.
M-8, 1-10 Sn, 0.01-0.30 P, bal Cu.
O-temper 55,000 TS
H-temper: 72,000 TS
Spring temper: 91,000 TS.
For springs, clips, diaphragms, P-Bronze, high endurance limit

DURAL.
M-4, 91.7-93.9 Al, 6-4 Cu, 0.63-0.59 Mn, 0.46 Mg, 0.8 Fe, 0.2 Si, 0.11 Cr.
For light alloy parts, aircraft structures; age-hardenable

DURAL A
M-487; C, alloy, bal Fe.
For turning tools.

DURAL B
M-487, C, alloy, bal Fe.
For coal cutter picks, for welding of hard facing material, abrasion resistant.

DURAL C
M-487, C, alloy, bal Fe
For valve parts, dry battery manufacture; chemical and abrasive resistance.

DURALFA
M-658, Al alloy
For light alloy parts.

DURALIMIN
Russia; 4 Cu, bal Al.
For light alloy parts; age-hardenable.

DURALINE
M-435, 0.35 C, 1.3 Si, 3.5 Cr, 0.85 V, 4.25 Mo, bal Fe.
At 1000°F: 216,000 TS; 8.5 El; 28.3 RA; 633 Brin.
For extrusion tools and dies; high hot strength and hardness.

DURALINOX.
French; 4.5 Mg, 95.5 Al
For light alloy parts; formerly "Alumag."

DURALINOX.
M-767; 7 Mg, bal Al.
Rolled: 18-22 El.
For floors, partitions.

DURALINOX 5.
M-767; 5 Mg, 0.5 Mn, bal Al.
For light alloy parts; corrosion resistant.

DURALINOX P.
M-767; 12 Mg, 0.5 Mn, bal Al.
For light alloy parts; corrosion resistant.

DURALIT.
French; 3 Cu, 0.5 Ni, 0.5 Mg, 0.7 Si, 1 Ti, bal Al.
For forged connecting rods; age-hardenable.

DURALITE.
M-541, M-1219; 3 Cu, 0.7 Si, 0.5 Ni, 0.5 Mg, 1.5 Fe, 0.2 Ti, bal Al.
Aged: 55,000-67,000 TS; 41,000-51,000 YS; 18-10 El; 115-140 Brin.
For auto and aircraft parts, pistons; age-hardenable.

DURALITE 35.
M-541; 3.3-3.8 Cu, 1.3-1.6 Fe, 0.5-0.7 Si, 0.5-0.7 Mg, 0.05-0.15 Ti, 0.5-0.8 Ni, bal Al.
TA Temper: 56,000-65,000 TS; 42,000-50,000 YS; 9-15 El; 125-145 Brin.
For pistons, fasteners, bolts.
Age-hardenable. High strength.

DURALITE 35.
M-624; 3.3-3.8 Cu, 1.3-1.6 Fe, 0.5-0.7 Si, 0.55-0.75 Mg, bal Al.
Annealed. 28,000 TS; 18,000 YS; 15 El, 55 Brin.
TA-Temper: 64,000 TS; 50,000 YS; 9 El, 145 Brin.
For general engineering components, structures, fittings, fasteners, bolts.
Age-hardenable, high strength.

DURALLOY.
M-465; 1-3.5 Ni, 1-2 Cr, C, bal Fe.
For castings; cast steel.

DURALOY.
M-210, 1.3-1.4 C, 0.5 max Si, 13-15 Mn, 1.5-1.7 Cr, bal Fe.
For wear plates, tread plates, wear and abrasion resistant castings.

DURALOY.
M-1120, 0.25 C, 23-30 Cr, bal Fe.
Annealed: 95,000 TS; 60,000 TS; 25 El, 200 Brin
For heat treating boxes, furnace parts, fittings, valves, exhaust manifolds.
Type 446 stainless steel, heat and corrosion resistant

DURALOY NO 15-35
M-45; 0.3 C, 35 Ni, 15 Cr, bal Fe
Cast: 69,000 TS, 2 El.
For furnace parts; resists heat to 2100°F; can be forged or rolled only at high temperatures.

DURALOY "18-8."
M-45; 0.5 Mn, 0.2 max C, 7-10 Ni, 17-20 Cr, bal Fe.
Rolled: 115,000 TS; 80,000 YS; 50 El.
Cast: 80,000 TS, 35,000 YS, 35 El.
For stainless articles; stainless, resists heat to 1600°F.

DURALOY 18-8S.
M-45; 17-19 Cr, 7-9 Ni, 0.07 max C, 1.0 Mn, bal Fe.
Cast: 65,000 TS; 35,000 YS; 35 El; 180 Brin.
For stainless steel castings; heat and corrosion resistant.

DURALOY 18-8 SMO.
M-45; 17-19 Cr, 7-9 Ni, 0.07 max C, 2-4 Mo, 1.0 Mn, bal Fe.
Cast: 65,000 TS; 35,000 YS; 35 El; 180 Brin.
For stainless steel castings; heat and corrosion resistant.

DURALOY 25-20 Mo.
M-45; 24-26 Cr, 19-21 Ni, 0.20 C, 2-3 Mo, bal Fe.
Cast: 65,000 TS; 45,000 YS; 20 El; 185 Brin
For stainless steel castings; heat and corrosion resistant.

DURALOY "A."
M-45; 0.5 Mn, 0.2-1.0 C, 27-30 Cr, bal Fe.
Rolled: 80,000-90,000 TS; 60,000-70,000 YS; 10-27 El; 15-45 RA.
Cast: 40,000-50,000 TS; 30,000-40,000 YS; 1 El; 0-2 RA.
For valves and pump parts, furnace parts, rabble arms; resists oxidation, corrosion and abrasion.

DURALOY "B."
M-45; 0.5 Mn, 0.2 max C, 16-18 Cr, bal Fe.
Rolled: 95,000 TS; 75,000 YS; 35 El; 150 Brin.
Cast: 80,000-90,000 TS; 60,000-70,000 YS; 10-19 El; 160 Brin.
For valves and pump parts, furnace parts, rabble arms; resists heat to 1550°F; corrosion resisting.

DURALOY "C."
M-45, 0.3 C, 12-14 Cr, bal Fe.
Cast: 100,000-110,000 TS, 75,000-85,000 YS.
For furnace parts, heat resisting to 135°F.

DURALOY CA
M-45, 0.3 C, 12-14 Cr, bal Fe
For dies, extrusion liners; corrosion resistant.

DURALOY CA-15
M-45, 0.15 max C, 11-14 Cr, bal Fe
Heat treated. 100,000-203,000 TS; 75,000-173,000 YS; 28-6 El, 62-9 RA, 185-415 Brin
For pumps, valves, bushings, gears, impellers, ferritic, corrosion resistant, Type 410

DURALOY CA40
M-45, 0.30-0.40 C, 11-14 Cr, bal Fe
Annealed 95,000 TS, 60,000 YS; 25 El, 190 Brin
Heat treated. 220,000 TS, 165,000 YS, 1 El; 470 Brin
For fan blades, oil pump pistons, chemical plant equipment, heat resistant to 1200°F.

DURALOY CB
M-45, 0.2 C, 16-18 Cr, bal Fe.
Cast 90,000 TS; 70,000 YS, 15 El
For chemical equipment, pump parts, valves, corrosion resistant, resists heat to 1500°F.

DURALOY CB-30.
M-45, 0.30 max C, 18-22 Cr, bal Fe
For valve sleeves, chemical equipment impellers, corrosion resistant.

DURALOY CC
M-45, 0.2 C, 27-30 Cr, bal Fe.
Cast: 50,000 TS, 40,000 YS, 1 El.
For pumps, valves, rabble arms and blades; corrosion and heat resistant up to 2100°F.

DURALOY CC-50.
M-45, 0.50 max C, 26-30 Cr, max Ni, bal Fe.
For lead pots, pump and valve bodies, furnace parts; heat and corrosion resistant.

DURALOY CE30.
M-45, 0.30 max C, 26-30 Cr, 3-11 Ni, bal Fe.
Cast. 95,000 TS; 60,000 YS; 15 El; 170 Brin.
Annealed 97,000 TS; 63,000 YS; 18 El; 170 Brin.
For pumps, valves, pipe fittings, chemical plant equipment, ferritic, corrosion resistant.

DURALOY CF.
M-45; 0.1 C, 7-9 Ni, 17-21 Cr, bal Fe.
Heat treated: 75,000 TS, 40,000 YS, 50 El.
For pump parts, valves, digesters; corrosion resistant; resists oxidation up to 1500°F.

DURALOY CF-7.
M-45; 0.07 max C, 18-20 Cr, 8-10 Ni, bal Fe.
For valves, impellers, autoclaves, pipe fittings; corrosion resistant; austenitic.

DURALOY CF-7C.
M-45; 0.07 max C, 18-20 Cr, 8-10 Ni, Cb, bal Fe.
For corrosion resistant parts, welded structures; corrosion resistant, austenitic, stabilized.

DURALOY CF-7M.
M-45; 0.07 max C, 18-20 Cr, 8-10 Ni, 2-3 Mo, bal Fe.
For valves, autoclaves; acid resistant; austenitic.

DURALOY CF-7Se.
M-45; 0.07 max C, 18-20 Cr, 8-10 Ni, Se, bal Fe.
For valves, fittings, autoclaves; free-cutting, stainless, austenitic.

DURALOY CF-10.
M-45, 0.10 max C, 18-20 Cr, 8-10 Ni, bal Fe.
Cast.
For valves, autoclaves, impellers; austenitic, stainless.

DURALOY CF-10M.
M-45, 0.10 max C, 18-20 Cr, 8-10 Ni, 2-3 Mo, bal Fe.
For valves, fittings; resists salt water, austenitic, stainless.

DURALOY CF-16
M-45, 0.16 max C, 18-20 Cr, 8-10 Ni, bal Fe.
Annealed: 77,000 TS, 40,000 YS; 52 El, 150 Brin
For valves, impellers, autoclaves, stainless, austenitic, non-magnetic.

DURALOY CF-16M
M-46, 0.16 C, 18-20 Cr, 8-10 Ni, 2-3 Mo, bal Fe.
For valves, autoclaves, fittings; acid resistant, austenitic

DURALOY CG-7.
M-46, 0.07 max C, 20-22 Cr, 10-12 Ni, bal Fe
For valves, impellers, pump casings. austenitic, stainless

DURALOY CG-7C
M-45, 0.07 max C, 17-20 Cr, 10 Ni, Cb, bal Fe.
For valves, fittings, autoclaves. stabilized, austenitic, stainless

DURALOY CG-7M.
M-45, 0.07 C, 17-20 Cr, 10-14 Ni, 2-3 Mo, bal Fe
For paper and rayon industry equipment, valves, rolls, piping, stainless, austenitic

DURALOY CG-10
M-46; 0.10 max C, 20-22 Cr, 10-12 Ni, bal Fe
For valves, autoclaves, pipe fittings, stainless, austenitic.

DURALOY CG-16.
M-46; 0.16 max C, 20-22 Cr, 10-12 Ni, bal Fe.
For valves, impellers, autoclaves; austenitic, stainless

DURALOY CG-16SE
M-46, 0.16 max C, 17-20 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
For valves, fittings, autoclaves; austenitic, stainless, free cutting

DURALOY CH-10
M-45, 0.10 max C, 22-26 Cr, 12-15 Ni, bal Fe
For pump bushings, liners, roasting equipment, stainless, austenitic.

DURALOY CH-20.
M-45; 0.20 max C, 22-26 Cr, 12-15 Ni, bal Fe.
For chemical roasting equipment; heat and corrosion resistant

DURALOY CK25.
M-45; 0.2 C, 25 Cr, 20 Ni, bal Fe.
For carburizing and heat treating boxes; heat resistant.

DURALOY CM-25.
M-45; C, 19-22 Ni, 8-11 Cr, bal Fe.
For corrosion resistant parts; for special applications.

DURALOY CT-7.
M-45; 0.07 C, 15 Cr, 35 Ni, bal Fe.
For special food and dairy process equipment; heat and corrosion resistant.

DURALOY DF-20.
M-45; 0.20 max C, 18-20 Cr, 8-10 Ni, bal Fe.
For valves, autoclaves, impellers, stainless, austenitic

DURALOY "H"
M-45; 2.75 C, 27-30 Cr, bal Fe
Cast: 50,000-60,000 TS; 0 El; 450-500 Brin
For abrasion resisting castings, hard surface welding rods, heat resisting, abrasion resisting.

DURALOY H-2
M-45; 1.5 C, 12 Cr, bal Fe
For dies, conveyor bars and plates, molds; abrasion resistant, heat treatable.

DURALOY HA
M-45, 0.15 C, 11-14 Cr, 0.9-1.2 Mo, bal Fe
Annealed 95,000 TS, 65,000 YS, 23 El; 60 RA, 180 Brin
Normalized 107,000 TS, 81,000 YS, 21 El, 56 RA; 220 Brin.
For furnace rollers and conveyors, fan blades, heat and corrosion resistant

DURALOY HC
M-45, 0.5 max C, 26-30 Cr, 4 max Ni. 0.5 max Mo, bal Fe
Cast 70,000 TS, 65,000 YS; 2 El, 190 Brin.
Aged 115,000 TS, 80,000 YS, 18 El, 230 Brin.
For roasting furnaces, rabble arms, tuyeres, blowers, heat resistant

DURALOY HCA
M-45, C, 28 Cr, bal Fe
For screen conveyors, pumps, corrosion resistant

DURALOY HCN
M-45, C, 25 Cr, 12 Ni, bal Fe
For jig grates, heat and corrosion resistant.

DURALOY HD
M-45, C, 26-30 Cr, 3-7 Ni, bal Fe.
Cast
For oil and gas burner parts, heat and corrosion resistant.

DURALOY HE
M-45, C, 26-30 Cr, 8-11 Ni, bal Fe
For chains, conveyors, furnace parts; resists high S-atmosphere, corrosion resistant

DURALOY HF
M-46, C, 17-20 Cr, 8-10 Ni, bal Fe.
For furnace dampers, glass kiln convevor rolls; heat and corrosion resistant.

DURALOY HH
M-45, 0.2 C, 9-13 Ni, 23-28 Cr, bal Fe
Cast 70,000 TS, 45,000 YS, 50 El.
For furnace parts, soot blowers, kiln parts, resists oxidation up to 2100°F

DURALOY HI.
M-45; C, 26-33 Cr, 14-17 Ni, bal Fe.
For retorts for distillation of Mg, heat and corrosion resistant.

DURALOY HL.
M-45; 0.2 C, 9-13 Ni, 23-28 Cr, bal Fe.
For furnace parts; heat resistant.

DURALOY HN.
M-45; 18-22 Cr, 23-26 Ni, bal Fe.
For heat treating furnaces and boxes; heat and corrosion resistant.

DURALOY-HOM.
M-45; nickel alloy.
At 1600°F: 33,000 TS.
At 2000°F: 13,500 TS.
For high temperature castings; maintains high working strength to 2200°F.

DURALOY HP.
M-45; C, 28-32 Cr, 29-31 Ni, bal Fe.
For oil cracking equipment; heat and corrosion resistant.

DURALOY HT.
M-45; 0.2 C, 34-37 Ni, 13-17 Cr, bal Fe.
Cast: 60,000 TS; 35,000 YS; 5 El.
For furnace parts; retorts; heat resistant.

DURALOY HU.
M-45; C, 17-21 Cr, 37-41 Ni, bal Fe.
Cast.
For salt pots, retorts, annealing boxes; heat and corrosion resistant.

DURALOY HW.
M-45; 0.02 C, 14 Cr, 60 Ni, bal Fe.
Cast: 68,000 TS; 36,000 YS; 4 El; 179 Brin.
Aged: 75,000 TS; 38,000 YS, 4 El; 205 Brin
For furnace parts, retorts, heat treating boxes; corrosion and heat resistant.

DURALOY HX.
M-45; 0.2 C, 15-19 Cr, 64-68 Ni, bal Fe.
Cast: 75,000 TS; 50,000 YS; 14 El.
For furnace parts, transmission chains, combustion chambers.
Heat and corrosion resistant.

DURALOY MH.
M-45; C, 28 Cr, bal Fe.
For sand blast segments, sand pumps; heat and abrasion resistant.

DURALOY "N."
M-45; 0.25-0.50 C, 20-30 Cr, 8-14 Ni, bal Fe.
Rolled: 95,000-130,000 TS; 60,000-105,000 YS; 55-45 El; 65-50 RA; 160-260 Brin.
Cast: 85,000-110,000 TS, 40-30 El.
Resists heat to 2100°F; can be rolled or forged; for furnace parts, grids.

DURALOY NSMO.
M-45; 23-25 Cr, 11-13 Ni, 0.15 max C, 2-3 Mo, bal Fe.
Cast: 75,000 TS; 35,000 YS; 25 El; 195 Brin.
For stainless steel castings; heat and corrosion resistant.

DURALOY R.
M-45; C, 17 Cr, bal Fe.
For plungers, tumbler molds and valves; corrosion resistant.

DURALPLAT
M-457; base metal of Cu containing Duralumin coated with a Cu free Duralumin
For light alloy parts; Brit. Pat. 318999; high corrosion resistance.

DURALUM
Germ.: 79 Al, 11 Mg, 10 Cu, 0.5 P.
For light alloy parts; non-hardened.

DURALUMIN.
M-4; 3.5-4.5 Cu, 0.3-0.6 Mg, 0.0-0.8 Mn, 0.4-1.0 Fe, 0.0-1.0 Si, bal Al.
Annealed: 32,000-36,000 TS; 7,000-10,000 YS; 34 El; 45-55 Brin.
Heat treated: 63,000 TS; 30,000-40,000 YS; 18-25 El.
For airplane and dirigible construction; same as "Alcoa No. 17"; age-hardening alloy.

DURALUMIN 3L-1.
England; 4.5 Cu, bal Al.
For housings, cases, structures, screw machine products; age-hardenable, high strength.

DURALUMIN 3L-3.
England; 4.5 Cu, bal Al.
For housings, cases, structures, screw machine products; age-hardenable, high strength.

DURALUMIN 681A.
M-254, M-338, M-457; 4.5 Cu, 0.5 Mg, 0.6 Mn, bal Al.
For light alloy parts, age-hardenable.

DURALUMIN 681B.
M-768, M-457, M-254; 4.5 Cu, 0.5 Mg, 0.6 Mn, bal Al.
Heat treated: 65,000 TS; 45,000 YS
For light alloy parts, heat treatable.

DURALUMIN 681H.
M-254, M-768, M-338; 2.5 Cu, 0.5 Mg, bal Al
Heat treated: 51,000 TS; 25 El
For light alloy parts, heat treatable.

DURALUMIN 681K.
M-768; M-457, M-254, M-767; 0.2 Mg, bal Al.
Heat treated: 31,000 TS, 20 El
For light alloy parts; heat treatable.

DURALUMIN 6817B.
M-768; M-254, M-338, 0.6 Si, 4.5 Cu, 0.5 Mg, 0.8 Mn, bal Al.
Heat treated: 62,000-88,000 TS, 14-3 El; 128-175 Brin.
For light alloy parts, heat treatable

DURALUMIN "B"
M-338; 3.5-4.5 Cu, 0.4-0.7 Mn, 0.4-0.7 Mg, bal Al.
Untreated: 40,000 TS, 30,000 YS; 18 RA, 60 Brin.
Treated: 55,000 TS; 40,000 YS, 15 El; 20 RA; 115 Brin
For light alloy parts; Iz-15

DURALUMIN-C.
M-338, 5.5 Cu, 0.4 Pb, 0.4 Bi, bal Al.
Heat treated: 42,000 TS, 30,000 YS; 12 El.
For machined components, fasteners; good machinability, age-hardenable.

DURALUMIN DM31.
M-768, M-254, M-338; 0.6 Si, 4.0 Cu, 1.0 Mg, 1.2 Mn, bal Al
Heat treated: 71,000-74,000 TS; 57,000-60,000 YS, 10-12 El; 125-140 Brin.
For light alloy parts; heat treatable.

DURALUMIN E.
Eng., 3.0-4.5 Cu, 1.0 max Si, 1.0 max Mg, 1.2 max Mn, bal Al.
60,000 TS; 52,000 YS; 8 El.
For light alloy parts; heat treatable.

DURALUMIN E.
M-338, 1.5 Cu, 1.0 max Mg, 1.0 max Fe, 1.0 Si, 0.6 Mn, bal Al.
Heat treated: 50,000-58,000 TS; 40,000-49,000 YS; 15-8 El; 130-160 Brin.
For aircraft structural parts; age-hardenable.

DURALUMIN F.
M-338; 1.0 Mg, 0.5 Si, 0.25 Cr, 0.25 Cu, bal Al.
WP-temper: 40,400 TS; 33,600 YS; 10 El.
Annealed: 18,000 TS; 15 El.
For extrusions of intricate sections; age-hardenable.

DURALUMIN G.
M-338; 3.5-4.5 Cu, 0.7-1.5 Mn, 1.4-1.8 Mg, bal Al.
Rolled: 65,000 TS; 40,000 YS; 15-8 El.
Extruded: 69,000 TS; 45,000 YS; 15 El.
For aircraft structures and panels; age-hardenable.

DURALUMIN H.
M-338; 0.6 Mn, 1.0 Si, 0.6 Mg, bal Al.
Heat treated: 50,000-55,000 TS; 10-16 El.
For light alloy parts, formed sections and extruded rods; age-hardening alloy; corrosion resistant.

DURALUMIN HX.
M-338; 0-1 Cu, 0.7 max Fe, 0.5-1.2 Mg, 0-1 Mn, 0.7-1.2 Si, bal Al
Heat treated: 52,000 TS; 40,000 YS; 13 El; 100 Brin.
For light alloy parts; spinnings and pressings.

DURALUMIN IMITATION.
Eng.; 79 Al, 11 Mg, 10 Cu, 0.05 P.
For light alloy parts; age-hardened.

DURALUMIN J.
M-338; 2.25 Cu, 1.5 Mg, 0.9 Si, 1.2 Fe, 1 Ni, bal Al.
Aged. 56,000 TS; 38,000 YS, 8 El.
For aircraft structures and parts; age-hardenable

DURALUMIN K.
M-338, 1 Cu, 2.7 Mg, 0.4 Mn, 6 Zn, bal Al
Aged 72,000-78,000 TS, 60,000-67,000 YS, 7-5 El
For aircraft engine components; age-hardenable, high strength

DURALUMIN K
M-457; 0.5-2.0 Mg, 0.3-1.5 Si, 0-1.5 Mn, bal Al.
For light alloy parts, corrosion resistant, hardenable.

DURALUMIN K
M-1548, 0.3-1.5 Si, 1.5 Mn, 0.5-2.0 Mg, bal Al.
Heat treated 50,000 TS; 35,000 YS, 10-20 El; 100 Brin
For hardware, fasteners Age-hardenable

DURALUMIN KC.
M-338, 1.0 Cu, 2.75 Mg, 0.4 Mn, 6.0 Zn, Cr, bal Al.
Ht Tr 78,000 TS, 68,000 YS, 7 El
For aircraft engine components.
Heat treatable, high strength.

DURALUMIN L.
M-338; 1.5 Cu, 2.0-3.5 Mg, 0.5 Si, 0.5 Fe, 0.25-1.0 Mn, 0.2 Ti, 4.5-6.5 Zn, bal Al.
WP-temper: 72,000-78,000 TS; 60,500-67,000 YS; 7-5 El
For aircraft engine components; age-hardened, high strength

DURALUMIN LC.
M-338, 0.6 Cu, 2.6 Mg, 0.5 Mn, 6 Zn, 0.05 Cr, bal Al.
Ht. Tr : 73,000 TS; 62,000 YS, 5 El
For aircraft engine components.
Heat treatable, high strength

DURALUMIN M.
M-338, 1.5-3.0 Cu, 0.7 max Fe, 0.2-0.5 Mg, 0.7 max Si, bal Al.
Heat treated: 40,000 TS; 18,000 YS; 25 El; 90 Brin
For rivets.

DURALUMIN Q.
M-338; 4.2 Cu, 0.9 Mg, 0.5 Mn, bal Al.
For aircraft structures and components; age-hardenable.

DURALUMIN S.
M-338; 3.5-4.8 Cu, 0.8 Si, 1 max Mg, 1 max Fe, bal Al.
Heat treated: 62,000-75,000 TS; 54,000-62,000 YS; 12-8 El; 110-130 Brin.
For aircraft engine components; age-hardenable, high strength.

DURALUMIN SPECIAL "Y."
Eng.; 92.5 Al, 4 Cu, 2 Ni, 1.5 Mg.
For dirigible, airplane and motor car light alloy parts; age hardening.

DURALUMIN SUPER.
German; 5.5 Cu, 0.3 Fe, 1.0 Mg, 0.6 Mn, 0.6 Si, bal Al.
71,000-78,000 TS; 10-20 El; 130-140 Brin.
For light alloy parts; heat treatable.

DURALUMIN T.
M-338, M-457; 2.1 Cu, 0.5-1.5 Fe, 0.3-1.5 Mg, 2 max Ni, 1 max Mn, bal Al.
Heat treated: 62,000 TS; 41,000 YS; 12 El; 130 Brin.
For aircraft engine forgings, age-hardenable.

DURALUMIN, VICKERS
M-338; 3.5-4.5 Cu, 0.4-0.7 Mn, 0.4-0.7 Mg, 0.75 max Fe, 94.5 Al.
Sheets: 56,000 TS; 33,500 YS; 8-15 El.
Bars: 45,000-56,000 TS; 22,500-33,500 YS; 15 El, 20 RA.
For airplane and dirigible parts, crankcases, cylinder heads, pistons, airscrews; light alloy, age-hardening.

DURALUMIN W.
M-78, M-457; 4 Cu, 0.3 Fe, 1.5 Mg, 1 Ni, 0.2 Si, bal Al.
For light alloy parts, aircraft, age-hardenable

DURALUMIN W
M-1548, 3.5-4.5 Cu, 1.0-1.8 Mg, 1.8-2.2 Ni, bal Al
Heat treated: 60,000 TS, 35,000 YS; 10 El, 100-200 Brin
For fasteners, hardware, engine components
Heat treatable, high strength.

DURALUMIN X.
M 338, 0.75 Mg, 1 Si, bal Al.
WP-temper: 40,400 TS, 33,600 YS; 10 El
Annealed 18,000 TS; 15 El
For extrusions of intricate sections, age-hardenable

DURALUMIN Z
German, 4.3-5.0 Cu, 0.3 Fe, 0.9 Mg, 0.6 Mn, 0.6 Si, bal Al.
68,000-71,000 TS, 12-14 El, 130-135 Brin
For light alloy parts, heat treatable

DURAMIUM.
M-358: 0.7 C, 18 W, 4 Cr, 1 V, bal Fe
For reamers, hobs, drills, taps; high speed steel.

DURAMOLD A
M-24, 0.07 C, 0.35 Mn, 4.5 Cr, 0.5 Mo, bal Fe
For hobbing cavity molds, air hardening, wear resistant, high core hardness. AISI P4

DURAMOLD B
M-24, 0.07 C, 0.25 Ni, 0.95 Cr, 0.25 Mo, bal Fe
For cold hobbing cavity, molds, oil hardening, medium core hardness AISI P2

DURAMOLD N
M-24; 0.10 C 1.5 Cr, 3.25 Ni, bal Fe
Ht Tr 130,000-173,000 TS, 88,000-142,000 YS; 15-20 El, 262-340 Brin.
For plastic molds
Type P6 case hardening tool steel.

DURAMOLD Ni-Cr.
M-24; 0.10 C, 0.60 Cr, 1.25 Ni, bal Fe.
Ht Tr : 100,000 TS, 70,000 YS; 200 El.
For plastic molds cold hubbed.
Good core strength and toughness.
Type P3 tool steel Case hardened.

DURANA-1.
Germ.; 64-78 Cu, 29.5 Zn, 2.2 Sn, 1.7 Al, 1.5 Fe.
60,000-65,000 TS; 14 El.
For chemical equipment construction; also known as "Duranametal"; corrosion resistant.

DURANA-2.
Germ; 65 Cu, 30 Zn, 1.5 Al, 1.5 Fe, 2 Pb.
For chemical equipment; also known as "Duranametal"; corrosion resistant, high strength.

DURANA-3.
Germ.; 59 Cu, 40 Zn, 1 Sn, 0.3 Fe, 0.4 Pb.
For chemical equipment, high strength.

DURANAL.
German; 5-10 Mg, 0.6 Mn, 0.2 Si, bal Al.
For light alloy parts.

DURANALIUM.
M-457; 5-10 Mg, bal Al.
For light alloy parts, aircraft castings; corrosion resistant.

DURANALIUM.
M-1548; 0.3-0.6 Mn, 2.5-9.0 Mg, bal Al.
Bars: 26,000-57,000 TS; 8500-34,000 YS; 15-25 El, 45-100 Brin.
For hardware, fittings, fasteners. Age-hardenable.

DURANALIUM 2 S.
M-457; 2.0-2.5 Mg, 1-2 Mn, 0-0.2 Sb, bal Al.
Soft: 26,000 TS, 12,000 YS; 25 El; 45 Brin.
Hard: 45,000 TS, 36,000 YS; 3 El, 75 Brin
For light alloy parts; corrosion resistant.

DURANALIUM 2S.
M-1548; 1.0-2.0 Mn, 2.0-2.5 Mg, bal Al.
Bar: 26,000-34,000 TS; 8500-17,000 YS, 15-25 El; 50-60 Brin.
For light weight parts

DURANALIUM 3.
M-457; 2-4 Mg, 0.4 max Mn, 0.3 max Cr, bal Al.
Soft: 28,000 TS; 13,000 YS, 30 El; 47 Brin.
Hard: 42,000 TS, 37,000 YS, 8 El; 77 Brin
For light alloy parts; resists sea water corrosion.

DURANALIUM 3.5
M-457, 2-6 Mg, 0.25-0.75 Mn, bal Al.
Cast: 20,000-22,000 TS; 11,000-15,000 YS; 3-5 El, 54-58 Brin
For rivets, bolts, screws, corrosion resistant.

DURANALIUM 5.
M-457; 4-6 Mg, bal Al.
Soft: 35,000 TS; 18,000 YS; 26 El, 60 Brin.
Hard: 55,000 TS; 45,000 YS; 4 El; 105 Brin.
For light alloy parts, corrosion resistant.

DURANALIUM 7.
M-457; 7 Mg, 0.45 Mn, bal Al.
Rolled: 52,000 TS; 32,000 YS, 12 El; 115 Brin.
For seaplane pontoons, propellers; resists sea water corrosion.

DURANALIUM 9.
M-457; 8-10 Mg, bal Al.
Soft: 50,000 TS; 25,000 YS; 15 El; 80 Brin.
Hard: 65,000 TS; 45,000 YS; 10 El; 110 Brin.
For light alloy parts; corrosion resistant.

DURANCE BEARINGS.
German; 44.5 Sb, 33.3 Sn, 22.2 Cu.
For bearings, Babbitt.

DURAND'S ALLOY.
Eng.; 67 Al, 33 Zn.
For strong and tough light weight parts; non-hardenable

DURANIC
French; 96 Al, 2 Mn, 2 Ni.
23,000-26,000 TS; 1.0-2.5 El; 60-70 Brin.
For light alloy parts; non-hardenable.

DURANICKEL replaced by
DURANICKEL ALLOY 301.

DURANICKEL ALLOY 301.
M-1499; 96.5 Ni, 0.15 C, 0.25 Mn, 0.30 Fe, 0.005 S, 0.5 Si, 0.13 Cu, 4.38 Al, 0.63 Ti.
Annealed: 90,000-120,000 TS; 30,000-60,000 YS; 55-35 El; 135-185 Brin.
Annealed and aged: 150,000-190,000 TS; 110,000-140,000 YS, 30-20 El; 285-360 Brin
For extrusion press parts; molds used in glass industry; clips, diaphragms, and springs.
Corrosion resistant, high strength and hardness.

DURANMIUM.
M-358, C, W, bal Fe.
For high speed cutting tools, high speed steel.

DURAPERM.
M-1084; 84.5 Fe, 9.5 Si, 6.0 Al
Hard, brittle, soft-magnetic, alloy.
Saturation induction 9 K Gausses
Coercive force: .05 oersteds
(H max = 2.0 oersteds
For pole tips in magnetic recording heads which operate from audio through the video frequency range

DURAPLAT.
M-457, 3.5-5.5 Cu, 0.2-2 Mg, 1 Si, 1 Mn, bal Al.
For light alloy parts, Al ply alloy, bonded; corrosion resistant

DURASPUN
M-45, 0.2 C, 18 Cr, 8 Ni, bal Fe.
For sleeves, liners, centrifugally cast tubes, corrosion resistant

DURAWELD
M-1246, WC
For hard facing electrode, sintered

DURAWELD NO 1
M-769
For hard facing welding rods; wear resistant.

DURAWELD NO 2
M-769.
For hard facing welding rods, wear resistant

DURAWELD NO. 3.
M-769.
For hard facing welding rods, wear resistant

DURAWELD NO. 4.
M-769
For hard facing welding rods; wear resistant

DURAX
M-333; 0.50 C, 1.5 Cr, 2.5 W, bal Fe
For tools, dies, Type S1, oil hardened, shock resistant.

DURAX D.
M-459, 0.35 C, 1 Si, 1 Cr, 0.2 V, 2 W, bal Fe.
For pneumatic snaps, punches, oil hardened, shock resistant

DURAX EXTRA HART.
M-459, 0.80 C, W, Cr, V, bal Fe.
For cutters, tools, dies; oil hardened.

DURAX H.
M-459; 0.55 C, 1.2 Cr, 0.4 V, 2.0 W, bal Fe.
For heading and forming dies; upsetters; oil hardened, tough.

DURAX Mo3.
M-459, M-1496; 0.30 C, 0.30 Mn, 0.30 Si, 3.0 Cr, 2.8 Mo, 0.5 V, bal Fe.
Heat treated: 215,000-230,000 TS.
For extrusion dies, mandrels, die casting dies, hot work tools.
Hot work steel. Thermal shock resistant.

DURAX N.
M-459; 0.35 C, 1 Cr, 3.5 Ni, 0.2 V, 5.3 W, bal Fe
For extrusion and piercing mandrels; hot work steel, tough, oil hardened.

DURAX SPECIAL.
M-459, 0.35 C, 1.1 Cr, 0.2 V, 3.7 W, 1.0 Si, bal Fe.
For hot work tools, dies, upsetting tools, extrusion press components, shears, punches. Oil hardenable, tough.

DURAX W2.
M-459; 0.45 C, 1.2 Cr, 0.9 Si, 0.2 V, 2 W, bal Fe
For pneumatic rivet tools, shear cutters, tools
Oil hardening, shock resisting.

DURAX W3
M-459, 0.5 C, 1.5 Cr, 2.2 W, 0.2 V, bal Fe.
For riveting sets, hot chisels; oil hardened, tough

DURAX W5
M-459; 0.30 C, 2.3 Cr, 0.6 V, 4.25 W, bal Fe.
For cold work tools, upsetters, punches; oil hardened, tough

DURAZIT.
M-1246, WC.
For hard facing electrode; sintered.

DURAZIT I
M 1246; Co Cr-W
Cast 580 Brin
For chemical equipment, hard facing

DURAZIT II
M-1246, Co-Cr-W
Cast 460 Brin
For chemical equipment, hard facing

DURBAR
M-142, 70-72 Cu, 20-24 Pb, 4-10 Sn
For bearings, ornaments.

DURCILIUM
M 770, 94.3 Al, 4.0 Cu, 0.7 Mg, 0.5 Mn, 0.5 Si
Annealed 34,000 TS, 17,000 YS, 16 El, 45 Brin.
Hardened 61,000 TS, 37,000 YS, 16 El, 110 Brin
For light alloy parts, aircraft structures, age hardenable

DURCILIUM F
M-770, M-1275, 3.4-4.8 Cu, 0.7 Mg, 0.8 Si, 1 Fe, 0.4 1.2 Mn, 0.2 Ni, 0.2 Zn, 0.2 Ti, bal Al
W-temper· 58,200 TS, 42,600 YS, 8-13 El
For structural members, age-hardened

DURCILIUM-F.
M-1444, 3.4-3.8 Cu, 0.55-0.85 Mg, 0.6-0.9 Si, 1 Fe, 0.4 1.2 Mn, 0.2 Ni, 0.2 Zn, 0.3 Ti, bal Al.
WP-temper: 74,000 TS, 65,000 YS, 12 El.
W-temper: 65,000 TS, 36,000 YS, 16 El.
For aircraft structures; age-hardenable.

DURCILIUM K.
M-770; M-1275, 3.5-5.0 Cu, 0.4-1.2 Mg, 0.7 Si, 0.7 Fe, 0.4-1.2 Mn, 0.3 Ti, bal Al.
Heat treated: 53,800-56,000 TS; 31,400-33,600 YS; 15-10 El
For structural members, age-hardened, corrosion resistant.

DURCILIUM L.
M-770, M-1275; 3.5-5.8 Cu, 0.6 Mg, 1.5 Si, 1 Fe, 1.2 Mn, 0.3 Ti, bal Al.
W-temper: 53,800-56,000 TS; 31,400-33,600 YS; 15-10 El.
WP-temper: 62,000-67,200 TS; 53,800-58,200 YS; 8-6 El.
For structural members; age-hardened.

DURCILIUM M.
M-770, M-1275; 1-2 Cu, 0.5-1.2 Mg, 0.7-1.2 Si, 0.7 Fe, 1.0 Mn, 0.2 Ti, bal Al.
W-temper· 42,100 TS, 32,400 YS, 18 El.
WP-temper. 62,000 TS, 49,800 YS, 13 El
For aircraft and other structural members; age hardenable.

DURCILIUM-M
M-1444; 1.2 Cu, 0.5-1.25 Mg, 0.75-1.25 Si, 0.75 Fe, 1 Mn, 0.2 Ti, bal Al.
WP-temper· 62,700 TS 49,300 YS, 13 El
W-temper· 42,600 TS, 31,400 YS, 18 El.
For aircraft structures, age-hardenable.

DURCILIUM R
M-770, M-1275; 0.15 Cu, 0.4-1.5 Mg, 0.7-1.3 Si, 0.6 Fe, 1 Mn, 0.2 Ti, bal Al.
W-temper· 27,000 TS, 15,700 YS, 18 El.
WP-temper 40,400 TS; 33,600 YS, 10 El
For structural members; age-hardened, corrosion resistant.

DURCILIUM-R.
M-1444, 0.15 Cu, 0.4-1.5 Mg, 0.75-1.3 Si, 0.6 Fe, 1 Mn, 0.2 Ti, bal Al
WP-temper 47,100 TS, 40,400 YS; 12 El
P temper· 31,400 TS, 26,900 YS, 20 El
For aircraft and light alloy parts, age-hardenable, corrosion resistant

DURCILIUM W.
M-770, M 1275, 0.15 Cu, 0.4 0.9 Mg, 0.3-0.7 Si, 0.6 Fe, 0.2 Ti, bal Al
M-temper 15,700 TS, 11,200 YS, 15 El
W-temper. 24,600 TS, 15,700 YS, 23 El.
WP-temper 31,400 TS 26,900 YS, 14 El.
For structural members, age hardened

DURCILIUM-W
M-1444, 0.15 Cu, 0.4-0.9 Mg, 0.3-0.7 Si, 0.6 Fe, 0.2 Ti, bal Al
WP-temper 31,400 TS, 26,900 YS, 14 El
P-temper 24,600 TS, 15,700 YS, 23 El
For aircraft and light alloy parts, age-hardenable, corrosion resistant

DURCILIUM-Y
M-1444, Al alloy
Rolled 15,700 TS, 12 El.
For light alloy parts, corrosion resistant, good weldability

DURCILIUM-Z
M-1444, Cu, Mg, Si, Ti, bal Al
WP-temper· 76,500-88,500 TS, 67,000-80,000 YS, 10 El
For aircraft structures, age-hardenable.

DURCO 18-8
M-46, 0.10 min C, 18 Cr, 8 Ni, 1.0 Si, 0.6 max Mn, bal Fe
70,000 TS, 30,000 YS, 40-45 El, 40-45 RA; 150 Brin
For stainless parts, chemical plant and food handling equipment; corrosion resistant

DURCO 18-8-S.
M-46, 19-17 Cr, 9-7 Ni, 0.50 Mn, 1.0 Si, <0.07 C, bal Fe.
Cast· 70,000 TS; 30,000 YS; 40-50 El; 40-50 RA; 150 Brin.
For food handling and chemical plant equipment; corrosion resisting to HNO_3.

DURCO 18-8-S-Cb.
M-46; 0.07 max C, 18-22 Cr, 9-12 Ni, 1 max Cb, 2 max Si, 1.5 max Mn, bal Fe.
Annealed: 70,000 TS; 30,000 YS; 30 El; 40 RA; 150 Brin.
For corrosion resistant castings; corrosion resistant.

DURCO 18-8-S-Mo.
M-46; 0.07 max C, 18 Cr, 8 Ni, 1.0 max Si, 0.60 max Mn, 2-4 Mo, bal Fe.
70,000 TS; 30,000 YS; 40-45 El; 40-45 RA; 150 Brin.
For handling hot sulfite liquors in the pulp industries and H_3PO_4; corrosion resistant, stainless.

DURCO 18-8-S-Mo-Cb.
M-46; 0.07 max C, 18-22 Cr, 9-12 Ni, 2-3 Mo, 1 max Cb, bal Fe.
Annealed: 70,000 TS; 30,000 YS; 30 El; 40 RA; 150 Brin.
For corrosion resistant castings; corrosion resistant

DURCO 25-12.
M-46; 0.2 C, 22-26 Cr, 12-15 Ni, 2 max Si, 1 5 max Mn, bal Fe.
Annealed: 70,000 TS; 30,000 YS; 30 El; 40 RA; 150 Brin.
For heat and corrosion resistant castings; corrosion and heat resistant.

DURCO 25-12-S.
M-46; 0 07 max C, 22-26 Cr, 12-15 Ni, 1.5 max Si, 1.5 max Mn, bal Fe.
Annealed: 65,000 TS, 28,000 YS, 30 El; 40 RA, 150 Brin.
For heat and corrosion resistant castings, heat and corrosion resistant, ACI-CH-10

DURCO D-10.
M-46; 56 Ni, 23 Cr, 4 Mo, 2 W, 1 Mn, 8 Cu.
Cast: 60,000 TS; 5 El; 5 RA; 180 Brin.
For heat and corrosion resistant parts; non-magnetic.

DURCO D-12.
M-46; 0.12 max C, 12 Cr, bal Fe.
For valve and pump parts, corrosion resistant

DUREDGE.
M-333, 0.55 C, 1 6 Si, 0.4 Mo, 0.6 V, bal Fe.
For cutting tools, chisels, rivet sets, shear blades, will maintain keen cutting edge, hard and tough

DUREDGE.
M-336; 0.55 C, 0.75 Mn, 0.35 Mo, 2 0 Si, bal Fe.
For punches, shears, dies; water or oil hardening

DUREHETE.
M-1724; 0.40 C, 0.9 Cr, 1.0 Mo, bal Fe.
For high temperature use, turbine valves, bolts, pipe flanges, creep resisting steel; resists high pressure superheated steam.

DUREHETE 900
M-1724; 0.35-0.45 C, 1.0-1.5 Cr, 0.5-0.8 Mo, 0.5 max Si, bal Fe
Heat treated: 147,000 TS; 136,000 YS; 22 El.
For high temperature bolts, studs, fasteners, high creep resistance.
B.S. 970-En20B; ASTM A193-61T Gr 7A.

DUREHETE 950.
M-1724; 0.30-0.45 C, 1 0-1.5 Cr, 0.5-0.8 Mo, 0.2-0.3 V, bal Fe.
Heat treated: 144,000 TS; 135,000 YS; 25 El; 64 RA.
For high temperature bolts, studs, fasteners; heat resistant to 950°F.
B.S. 1506-661; ASTM A193-61T Gr B16.

DUREHETE 1050.
M-1724; 0.10-0.25 C, 0.9-1.3 Cr, 0.85-1.1 Mo, 0.6-0.8 V, bal Fe.
Heat treated: 130,000 TS; 115,000 YS; 20 El.
For bolting, fasteners, high temperature applications; heat resistant to 1050°F.

DUREHETE 1055.
M-1724; 0.15-0.25 C, 0.9-1.3 Cr, 0.85-1.1 Mo, 0 6-0.8 V, 0.05-0.20 Ti, 0.001-0.01 B, bal Fe.
Heat treated: 122,000 min TS; 100,000 min YS; 43 min El.
For bolts required to operate at 500-565°C.
For use in steam power plant.

DURENER MN20.
M-457; 0.5-1.5 Mn, 0 3 max Cr, bal Al.
Soft: 16,000 TS; 6000 YS, 40 El.
Hard: 29,000 TS; 27,000 YS; 10 El.
For cooking utensils, heat exchangers, tanks, furniture; good forming and welding properties.

DURENER Z8.
M 457, Zn, Cu, Mg, bal Al.
For light alloy parts

DUREX.
M-839; 4.4-4.7 total C, 10 Sn, 83.22 Cu, 0 60 impurities
30-40 Brin
For bearings (porous to absorb oil—25% oil by volume), carbon present as graphite

DUREX.
M-487; 0 7 C, 18 5 W, 4 5 Cr, 1 0 V, bal Fe
For shaping and planing tools, broaches, hobs; high speed steel.

DUREX BRONZE
M-839; 95 Cu, 5 Sn.
Cast 30,000-40,000 TS; 65-100 Brin
For bearings; sintered.

DUREX BRONZE NO 46.
M-839, 10 Sn, 1 2 graphite, bal Cu.
Sintered: 13,000-25,000 TS, 2 0 El; 25-40 Brin.
For bearings, sintered, C.S. 79000

DUREX IRON NO 62
M-839; 1 0 C, bal Fe.
Sintered: 28,000 TS; 0 5 El
For bearing, sintered, C.S. 160,000

DUREX IRON NO 93
M-839, 7 5 Cu, bal Fe.
Sintered 15,000-35,000 TS, 1-7 El; 90 Brin.
For bearings; sintered alloy

DUREX IRON 362
M-839; 20 Cu, 1 C, bal Fe.
75,000 TS; 1 El, 185 Brin
For gears, cams; copper infiltrated sintered steel.

DURICHLOR.
M-46; 14 min Si, 3 min Mo, bal Fe
Cast: 17,000 TS
For pumps, valves, pipes, fittings, exhaust fans, resists HCl corrosion; cast alloy

DURIMET-20.
M-46; 29 Ni, 20 Cr, 2-3 Mo, 4 Cu, 1 Si, 0 07 max C, bal Fe.
Cast: 65,000-75,000 TS; 28,000-38,000 YS; 35-50 El, 40-50 RA, 120-150 Brin.
Wrought. 85,000 TS, 35,000 YS; 50 El; 150 Brin.
For chemical plant equipment, corrosion resistant to mixed acids.

DURINVAL.
M-104, M-771; 42 Ni, 2 Al, 2 Ti, bal Fe.
For chronometer springs; age-hardenable, corrosion resistant.

DURIRON.
M-46; 82.2 Fe, 14.5 Si, 0.66 Mn, 0.8 C.
10,000 TS.
For insoluble anodes, agitators, crucibles, condensers, kettles, evaporators; very brittle, non-corrosive.

DURITAS.
M-261, M-486; WC.
For dies, nibs; cemented carbides.

DURITE.
M-35; C, W, bal Fe.
For tools, dies; hot work steel.

DURMES.
M-457; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, 0.5-2.5 Pb, Sn, Cd, Bi, bal Al.
For screw machine products; free-cutting.

DURO 6.
M-459; 0.71 C, 0.22 Si, 0.27 Mn, bal Fe.
For springs, tools, axes, rails, crimpers; Type W 1; water hardened.

DURO 70.
M-459; 0.56 C, 0.3 Si, 0.55 Mn, bal Fe.
For shafts, rails, axles, gears, crankshafts; water hardened.

DURO-CHIP.
M-750; 0.6 C, 0.7 Mn, 1.85 Si, 0.5 Mo, 0.25 V, bal Fe.
For hand and pneumatic chisels, caulking tools; shock resistant, oil hardening.

DUROCHROME.
M-513, C, Si, Cr, Mo, bal Fe
For valve seat inserts, cast iron, wear resistant.

DUROCYL
M-185, 3 C, 2 Si, 0.8 Mn, 0 3 Cr, bal Fe
Cast 38,000 TS; 240 Brin
For cylinder liners, wear plates; centrifugally cast iron.

DURODE
M-575; Cu alloy.
For spot welding electrodes, high conductivity.

DURODE CC.
M-575, Cu alloy.
For resistance welding electrode, high electrical conductivity.

DURODE XH.
M-575, Cu alloy.
For resistance welding electrode, high electrical conductivity.

DURODI.
M-55; 0 5-0.6 C, 0 90 Mo, 0 55 Mn, 0 8 Cr, 1 6 Ni, bal Fe.
Heat treated: 225,000-130,000 TS; 200,000-120,000 YS; 15-26 El; 43-51 RA; 460-275 Brin.
For hot work die steel, punches, upsetting and gripping dies, shear knives, tough steel, air hardening, non-distorting.

DURODIE.
M-261; 0.4 C, 3.3 Cr, 2.7 W, 0.3 V, bal Fe.
For bolt dies, hot extrusion dies, swaging dies; hot work steel.

DURO HIGH SPEED.
M-81; 0.8 C, 18.5 W, 4 Mo, 4 Cr, 7 Co, bal Fe.
For heavy duty cutters; high speed steel.

DUROLITH.
Germ.; Zn base alloy.
For die castings; Br. P. 411557.

DURON.
M-459; 0.50 C, Si, Cr, V, bal Fe.
For shafts, gears, springs, crankshafts; oil hardened, shock resistant.

DURON H.
M-459; 0.6 C, 0.85 Si, 0.75 Mn, 1.18 Cr, 0.1 V, bal Fe.
For springs, shafts, axes, crankshafts; oil hardened, shock resistant.

DURON W.
M-459; 0.40 C, Si, Mn, Cr, V, bal Fe.
For gears, shafts, crankshafts; oil hardened, shock resistant.

DURONZE I.
M-141; 97 Cu, 1 Si, 1.5 Sn.
Annealed: 45,000 TS.
Cold drawn: 135,000 TS.
For general use, bolts, cable, hardware, cap screws; corrosion resisting.

DURONZE II (BRIDGEPORT 632).
M-141; 3 Si, bal Cu.
Sand cast: 50,000 TS; 40 El; 50 RA; D 93 Brin.
Annealed: 70,000 TS; 55 El; 65 RA; F 85 Brin.
For pole line hardware, marine hardware, water storage tanks, chemical vats, range boilers; strong, hot forging alloy; corrosion resistant.

DURONZE III.
M-141; 2.5 Si, bal Cu.
Forged: 90,000 TS; 50,000 YS; 27 El, 35 RA; 165 Brin.
Annealed: 90,000 TS, 30 El; 35 RA; 160 Brin.
For boat shafting, pump rods, pinions, gears; corrosion resistant.

DURONZE IV.
M-141; 5 Al, bal Cu.
Annealed: 65,000 TS, 45 El.
For condenser tubes, sea water corrosion resistant.

DURONZE 606.
M-141, 3.0 Si, 0 95 Mn, bal Cu
Hard: 90,000 TS; 45,000 YS; 18 El; B 85 Rock.
Soft 55,000 TS, 22,000 YS, 55 El, B 50 Rock
For bolts, gears, valve stems, marine hardware, clutch disks. Corrosion resistant, tough, wear resistant.

DURONZE 609
M-141, 2 Si, bal Cu
Hard: 75,000 TS, 40,000 YS, 10 El; 138 Brin.
Soft: 50,000 TS, 20,000 YS, 40 El, 63 Brin
For bolts, cold headed parts, gears, shafts, formerly Duronze V; corrosion resistant.

DURONZE 632
M-141; 2 95 Si, 0.10 Fe, bal Cu.
Annealed 63,000 TS, 30,000 YS, 55 El, F 90 Rock.
Hard 90,000 TS, 45,000 YS; 18 El; B 85 Rock.
For poleline hardware, nuts, bolts, wire and cable connectors, cap screws, springs, conduits, rivets. 7% elect. cond.—corrosion resistant.

DURONZE 707
M-141; 91 Cu, 2 Si, 7 Al
For bolts, gears, valve stems, marine hardware; tough, corrosion resistant

DURONZE 708.
M-141, 6.75 Al, 1.75 Si, bal Cu.
Annealed: 85,000 TS; 40,000 YS; 30 El, 165 Brin.
For valve parts, bolts, fasteners; corrosion and wear resistant, hot forgeable.

DUROPLAT.
German; Al coated Duralumin.
For bimetal parts.

DURSILIUM.
France; 4-5 Cu, bal Al.
For light alloy parts; age-hardenable.

DUTCH BOY NO. 1 JOURNAL.
M-88; Sb, Cu, bal Sn.
Cast: 32.4 Brin.
For heavy pressure bearings;
Babbitt, resists heavy crushing strains.

DUTCH BOY 111.
M-88, 50 Pb, 50 Sn.
Cast: 6400 TS; 40 El; 12.7 Brin.
For solder; M.P. 361-414°F; S.S. 5800.

DUTCH BOY 222.
M-88; 55 Pb, 45 Sn.
Cast: 6600 TS; 40 El; 12.7 Brin.
For solder; M.P. 361-424°F; S.S. 5700.

DUTCH BOY 333.
M-88; Pb, Sn.
Cast: 6400 TS; 41 El; 12.6 Brin.
For solder; M.P. 361-437°F, S.S 5500.

DUTCH BOY 444.
M-88; Pb, Sn.
Cast: 6600 TS; 40 El; 13.3 Brin.
For solder; M.P. 361-437°F; S.S. 5625.

DUTCH BOY 555.
M-88; Pb, Sn.
Cast: 6700 TS, 39 El; 13.3 Brin.
For solder; M.P. 361-448°F; S.S. 5525.

DUTCH BOY 666.
M-88; Pb, Sn.
Cast: 7000 TS, 35 El; 14.0 Brin.
For solder; M P. 361-460°F; S S. 5450.

DUTCH BOY 777.
M-88; Pb, Sn.
Cast: 7000 TS; 33 El; 13.9 Brin.
For solder, M P. 361-460°F; S S. 5375.

DUTCH BOY 888.
M-88; Pb, Sn.
Cast: 70,000 TS; 30 El; 13.9 Brin.
For solder; M.P. 361-468°F; "Plumbers solder"

DUTCH BOY BEARING METAL.
M-88; Sb, Cu, bal Sn.
Cast: 23.5 Brin.
For bearings for machinery and general mill work;
Babbitt, for slow moving machinery.

DUTCH BOY GENUINE BABBITT.
M-88; 88.9 Sn, 7.4 Sb, 3.7 Cu.
Cast: 26.7 Brin.
For bearings; Babbitt.

DUTCH BOY P-A-F.
M-88; Pb-Sn-Sb-Cu.
For bearings; Babbitt.

DUTCH BOY STERLING JOURNAL.
M-88; Sb, Cu, bal Sn.
Cast: 23.3 Brin.
For bearings for stationary gas engines;
Babbitt, resists heavy crushing strains.

DUTCH METAL.
76-80 Cu, 24-20 Zn.
Cast: 38,400 TS; 22,750 YS; 33 El; 33 RA; 45 Brin.
Hard rolled: 66,900 TS; 66,900 YS; 12 El;
42 RA; 145 Brin.
For cheap jewelry, gold leaf; red brass.

DUTCH SILVER.
Eng.; 81.5 Sn, 8.8 Sb, 9.6 Cu.
For tableware, novelties, art metal pieces;
corrosion resistant.

DUTCH WHITE METAL.
Eng.; 81.5 Sn, 8.8 Sb, 9.6 Cu.
For bearings, antifriction purposes; Babbitt.

DUTRAX.
M-358; C, bal Fe.
For machinery parts.

DUTRAX 3.
M-333; 0.45 C, 0.8 Cr, 1.1 W, 0.25 Mo, bal Fe.
For plastic mold dies; oil hardening.

DUTRAX 7.
M-333, 0.45 C, 1.25 Cr, 2.15 W, 0.2 Si, bal Fe.
For plastic mold dies; oil hardening.

DUVAL AU.
M-1115; 0.95 C, 0.3 Mn, 0.25 Si, bal Fe.
For drills, taps, punches, springs, tools;
Type W 1; water hardened.

DUVAL DU-MUV.
M-1115; 0.8-1.0 C, 0.3 Mn, 0.2 Si, bal Fe.
For cutters, drills, reamers, taps, broaches, springs;
Type W 1; water hardened.

DUVAL EXTRA F
M-1115; 0.7 C, 18 W, 5 Co, 4 Cr, 1.3 V, bal Fe.
For lathe and planer tools, reamers, drills,
taps, broaches, high speed steel, oil hardened.

DUVAL MU.
M-1115; 1.10 C, 0.3 Mn, 0.25 Si, bal Fe
For taps, drills, cutters, reamers;
Type W 1, water hardened

DUVAL SF1
M-1115; 0.9-1.1 C, 0.5-1.0 Cr, 3.5-4.5 W, 0.1 V,
bal Fe
For cold work tools, headers, forming dies;
cold work steel, oil hardened.

DUVAL SF2
M-1115; 0.5 C, 1.5 Cr, 2.25 W, 0.2 V, bal Fe.
For tools, dies, shears, punches,
hot work steel, oil hardened.

DUVAL U 7.
M-1115, 0.70 C, 0.3 Mn, 0.25 Si, bal Fe.
For springs, punches, tools, crimpers;
Type W 1; water hardened.

DUVAL U 8.
M-1115; 0.75 C, 0.3 Mn, 0.25 Si, bal Fe
For punches, drills, springs, dies, tools; Type W 1,
water hardened

DUVAN.
M-358, C, V, bal Fe.
For tools, drills, water hardening.

DUX 4.
M-1724, 0.5 C, 1.0 Cr, 2.25 W, 0.6 Si, bal Fe.
For chisels, caulking tools; shock resistant.

DYCAST NO. 1.
M-73; 0.40 C, 5 Cr, 0.30 Mn, 0.50 V, 0.80 Mo,
1.0 Si, bal Fe
For die casting dies and cores; resists heat checking,
hot work steel.

DYCRO.
M-1433; 1.5 C, 12 Cr, 0.25 V, 0.8 Mo, bal Fe.
For blanking and forming dies, broaches;
air hardened, non-deforming.

DYCRO-1.
M-1431; 1 C, Cr, Mn, Mo, bal Fe.
For tools, dies; air hardened.

DY-KROME.
M-750; 1.5 C, 12 Cr, 0.2 V, 0.8 Mo, bal Fe.
For blanking dies, broaches, cold extrusion dies;
air hardening.

DYMAL.
M-750; 0.9 C, 0.5 Cr, 1.15 Mn, 0.5 W, bal Fe.
For Bakelite molding dies, gages, hobs,
forming tools; non-deforming.

DYMAL AH.

M-750; 1.65-2.1 C, 0.25 Mn, 11-13 Cr, 0.35 V, 0.90 Mo, bal Fe.

For dies, tools; nondeforming.

DYMAL OH.

M-750; 0.90 C, 1.1 Mn, 0.5 Cr, 0.5 W, 0.2-0.3 V, bal Fe.

For dies, hobs, milling cutters, gauges; oil hardening.

DYNABRAZE 145 FC.

M-717;

Flux coated bronze rod for brazing steel and cast iron. Bonding temp; 1400-1600°F. 65,000 TS.

DYNACUT.

M-73, 1.2 C, 2.7 W, 3.75 Cr, 1.6 V, 8.0 Mo, 8.2 Co, bal Fe.

Hardened: C 65-66 Rock.

For cutters, in heavy duty machining, drills, reamers, broaches.

Type M-43 high-speed steel, wear resistant. High red hardness.

DYNAFLEX.

M-73, 0.40 C, 0.30 Mn, 0.90 Si, 5.0 Cr, 1.3 Mo, 0.45 V, bal Fe

Air hardened: 300,000 TS; 250,000 YS; 7 El; 30 RA; 525 Brin

For punches, upsetters, extrusion dies, hot work steel; AISI Type H 11.

DYNALLOY II

M-537; 0.15 C, 0.80 Mn, 0.30 Si, 0.45 Cu, 0.10 Mo, 0.55 Ni, bal Fe

Rolled 62,000 TS, 45,000 YS, 25 El

For railroad and agriculture equipment, mine cars, high strength, low alloy construction steel.

DYNALLOY 600

M-266, 58 Cu, 0.8 Si, 1.5 Al, 2.5 Mn, bal Zn

HH Temper: 75,000-100,000 TS, 40,000-65,000 YS; 12-18 El; B 82-88 Rock.

Forged 68,000 TS, 34,000 YS, 18 El; B 78 Rock.

For bearings, worms and worm wheels, bushings.

Forgeable bearing alloy, corrosion resistant.

DYNALLOY 601

M-266; 61 Cu, 0.8 Si, 2.5 Mn, bal Zn.

HH Temper: 70,000-85,000 TS, 40,000-65,000 YS, 15-25 El; B 70-87 Rock.

For bearings, worm wheels, bushings.

Mate with soft member. Corrosion resistant

DYNALLOY 602

M-266; 61 Cu, 1.0 Pb, 1.0 Si, 2.5 Mn, bal Zn.

HH Temper. 70,000-85,000 TS; 40,000-65,000 YS; 15-25 El; B 70-87 Rock.

For bearings, bushings, gears.

Leaded forgeable bearing alloy, corrosion resistant

DYNALLOY 603.

M-266; 59 Cu, 1 Pb, 1 Si, 2.5 Mn, bal Zn.

Heat treated 75,000 TS, 45,000 YS; 20 El; B 85 Rock.

For bearings, bushings, gears.

Forgeable leaded bearing alloy, corrosion resistant.

DYNALLOY 604.

M-266, 61 Cu, 2.5 Pb, 1 Si, 2.5 Mn, bal Zn.

HH Temper: 65,000-80,000 TS; 40,000-60,000 YS; 10-20 El; B 75-86 Rock.

For bearings, pump gears, valve stems.

High leaded bearing alloy, corrosion resistant.

DYNALLOY 605.

M-266; 62 Cu, 0.6 Pb, 1 Si, 2.5 Mn, bal Zn

HH Temper: 70,000-75,000 TS; 45,000-55,000 YS; 18-25 El; B 75-82 Rock.

For bearings, pump gears, valve stems.

Low leaded bearing alloy, corrosion resistant.

DYNALLOY 6731 (603).

M-266; 2.75 Mn, 1.0 Pb, 1.0 Si, 60 Cu, bal Zn.

Forged: 50,000 TS; 30,000 YS; 15 El; B 65 Rock.

Heat treated: 75,000 TS; 45,000 YS; 20 El; B 82 Rock.

For gears, bushings, bearings, pump barrels, machinery parts.

Leaded forging brass.

DYNAMAX.

65 Ni, 33 Fe, 2 Mo.

For toroidal cores; high permeability.

DYNAMIC C-1.

M-451; 0.2-0.3 C, 0.5-0.8 Mn, bal Fe.

For cast steel parts; pearlitic.

DYNAMIC C-1-3.

M-451, 0.25-0.35 C, 0.6-0.8 Mn, bal Fe.

For castings; water hardening

DYNAMIC C-1-4.

M-451; 0.35-0.45 C, 0.65-0.85 Mn, bal Fe.

For gears, pinions, coupling boxes; water hardening.

DYNAMIC C-1-5.

M-451, 0.4-0.5 C, 0.65-0.85 Mn, bal Fe.

For gears, pinions, power shovels; water hardening.

DYNAMIC C-1-6.

M-451; 0.5-0.6 C, 0.65-0.85 Mn, bal Fe.

For cams, bottom plates; wear hardening

DYNAMIC C-1-7.

M-451; 0.7-0.8 C, 0.65-0.85 Mn, bal Fe.

For castings, abrasion resistant.

DYNAMIC C-2.

M-451; 0.25-0.35 C, 0.9-1.4 Mn, 0.25-0.45 Ni, 0.05-0.15 Mo, bal Fe

Cast 85,000 TS, 52,500 YS; 30 El, 57 RA

For tractor frames, locomotive castings; resists shock and impact; Iz-45

DYNAMIC C-2-A

M-451, 0.35-0.45 C, 1.0-1.5 Mn, 0.25-0.45 Ni, 0.05-0.15 Mo, bal Fe.

For crawler shoes, gears, sprockets; wear resistant.

DYNAMIC C-3.

M-451, 0.25-0.35 C, 1.0-1.5 Mn, 0.1-0.2 Mo, bal Fe.

Cast: 96,000 TS, 68,000 YS, 24 El, 48 RA.

For sprockets, spindles, wheel centers, crossheads, gears, wear resistant; resists shock and impact.

DYNAMIC C-3A

M-451, 0.4 C, 1.2 Mn, 0.15 Mo, bal Fe

Cast.

For gears, racks, sprockets, wear resistant

DYNAMIC C-4

M-451; 0.25 C, 0.9 Mn, 0.8 Cr, 1.9 Ni, 0.5 Mo, bal Fe

Heat treated: 120,000 TS; 100,000 YS; 15 El, 30 RA; 321 Brin.

For rolling mill pinions; impact resistant.

DYNAMIC C-5.

M-451, 0.3 C, 1 Mn, 0.7 Ni, 0.4 Mo, bal Fe.

Cast.

For rams, saw blocks.

DYNAMIC C-6

M-451, 0.4-0.7 C, 3 Cr, 0.4 Mo, bal Fe.

Cast

For sand mills, rock crushers; abrasion resistant.

DYNAMIC C-7.

M-451, 0.4 C, 0.9 Mn, 0.5 Cr, 1.5 Ni, 0.5 Mo, bal Fe.

Cast.

For steel castings, crane wheels; high strength.

DYNAMIC C-8.
M-451; 0.25-0.35 C, 1.0-1.5 Mn, 0.3-0.7 Cr, 0.4-0.8 Ni, 0.2-0.4 V, bal Fe.
For gears, sprockets; tough, high impact resistant.

DYNAMIC C-9.
M-451; C, Mn, V, bal Fe.
Cast.
For steel castings; air hardened.

DYNAMIC C-10.
M-451; C, Cr, Mo, bal Fe.
Cast.
For die blocks, crane wheels; wear resistant.

DYNAMO.
M-200; 0.12 C, 0.2 Si, 0.1 Mn, bal Fe.
For electrical purposes; high magnetic permeability.

DYNAMO.
M-368; 0.7-0.9 C, bal Fe.
For tools, dies, jigs; water hardening.

DYNAMO SHEET STEEL.
U.S.; 3-4 Si, < 0.1 C, < 0.3 Mn, < 0.03 P + S, bal Fe.
For laminated sheets for dynamos, electrical equipment; Hadfields silicon steel type.

DYNAMO STEEL.
M-331; 0.09 C, bal Fe.
For dynamo parts; high permeability.

DYNATRODE 666.
M-717;
Electrode for AC-DC welding of mild steel; strength 70,000 psi.

DYNATRODE 777.
M-717;
Mild steel electrode for AC-DC welding of mild steel. 76,000 TS.

DYNAVAN.
M-73; 1.55 C, 12.5 W, 4.7 Cr, 5 V, 5 Co, bal Fe.
Hardened: C 64-66 Rock.
For cutting tools, blanking dies, broaches, drills, milling cutters.
Type T-15 high-speed steel. Heat and abrasion resistant. High red-hardness.

DYNAVAR.
M-1084; 0.15 C, 2 Mn, 15 Ni, 7 Mo, 20 Cr, 0.04 Be, 40 Co, bal Fe.
Aged: 330,000-360,000 TS; 260,000-280,000 YS; 560-600 Brin.
Rolled: 260,000-290,000 TS; 200,000-220,000 YS; 480-500 Brin.
For springs, flapper valves, valve parts, electronic components; corrosion resistant, age-hardenable, non-magnetic.

DYN-EL.
M-537; 0.12 C, 0.6 Mn, 0.4 Cu, bal Fe.
Heat treated: 72,000 TS, 58,000 YS; 28 El; 60 Brin.
For railroads, trucks, buses.

DYNELEC.
M-691; 2.5 Si, bal Fe.
For armatures, electric motors and generators; high permeability.

DYN-GZ10.
M-1218, M-1218a; 89.25 Cu, 10 Sn, 0.5 Ni, 0.25 P.
Cast: 29,000-50,000 TS; 16,000-27,000 YS; 29-8 El; 70-85 Brin.
For nuts, bearings, valve guides, bushings; phosphor bronze, tough.

DYN-GZ14.
M-1218, M-1218a; 86.15 Cu, 11.5 Sn, 2 Ni, 0.3 P.
Cast: 27,000-42,500 TS; 16,000-25,000 YS; 25-6 El; 90-110 Brin.
For worm wheels, toggle pads, bearings; phosphor bronze, shock resistant.

DYN-RM.
M-1218, M-1218a; 83.2 Cu, 10 Sn, 2.5 Ni, 4 Pb, 0.3 P.
Cast: 25,000-41,000 TS; 16,000-22,500 YS; 20-6 El; 80-100 Brin.
For mill bearings, bushings, liners; phosphor bronze, shock resistant.

D.Y.O.
M-32; 0.3 C, 0.3 Mn, 0.25 Si, 4 Cr, 14.5 W, 0.5 V, bal Fe.
Heat treated: 205,000 TS.
For tools, forging dies; red-hard, hot work steel.

DYSOID.
Eng.; 63 Cu, 18 Pb, 10 Sn, 10 Zn.
For hardware; free-cutting.

DZ.
M-459, C, bal Fe.
For scales, rules; water hardened.

D-Z-L MARINE NICKEL GENUINE.
M-178; 88 Sn, bal Sb and Cu.
Cast: 17,0000 TS; 9510 YS; 29.6 Brin.
For bearings subject to shock and heat; pouring temperature 850-925°F.

E1 DYNAMO.
Russia; 0.10 max C, 1.0 Si, 0.03 max Mn, bal Fe
For motor stators and rotors; high permeability.

E2 DYNAMO.
Russia, 0.10 max C, 0.03 max Mn, 2.0 Si, bal Fe.
For motor stators and rotors; high permeability

E3 TRANSFORMER.
Russia; 0.10 max C, 0.30 max Mn, 3 Si, bal Fe.
For transformers; high permeability.

E4 TRANSFORMER
Russia; 0.10 max C, 0.30 max Mn, 4.0 Si, bal Fe
For transformers; high permeability.

E18 Co5.
M-Germany; 0.78 C, 4.2 Cr, 0.6 Mo, 18.8 W, 1.53 V, 5.72 Co, bal Fe.
Hardened C 64-66 Rock
For tools and cutters, reamers, taps, broaches, lathe and planer tools.
High speed steel, type T 4, high red-hardness.

E18 Co10.
M-Germany; 0.75 C, 18 W, 4 Cr, 1.5 V, 0.7 Mo, 10 Co, bal Fe.
Hardened: C 64-66 Rock.
For lathe and planer tools, drills, reamers, form cutters, broaches, form tools, gear cutters.
For heavy duty work.
High speed steel, Type T5. Red-hard.

E20M.
M-459; 0.2 C, 1.2 Mn, 1.2 Cr, bal Fe.
For bakelite molds; water or oil hardened.

E 21 S.
M-459; C, Cr, Mo, Ni, bal Fe.
Oil treated: 150,000-177,000 TS; 128,000-157,000 YS; 12-9 El.
For machinery parts; gears, shafts; oil hardening, shock resistant.

E 22 S.
M-459; C, Cr, Ni, Mo, bal Fe.
Oil treated: 171,000-199,000 TS; 150,000-177,000 YS; 1-8 El.
For machinery parts; oil hardening.

E NO. 25.
M-69; 1.0 C, 0.35 Mn, 0.25 V, bal Fe.
For tools, concrete breakers; water hardened.

E38 Mo.
M-459, M-1496; 0.38 C, 1.0 Si, 5.3 Cr, 1.5 Mo, 0.45 V, bal Fe.
Annealed: 102,000 TS; 66,000 YS; 28 El; 197 Brin.
Hardened: 300,000 TS; 250,000 YS; 6 El; C 55 Rock.
For Al & Mg die casting dies, components for die casting machines.
Air or oil hardening. Thermal shock resistant, Type H11.

E38 V.
M-459, M-1496; 0.4 C, 1.0 Si, 5.3 Cr, 1.4 Mo, 1.0 V, bal Fe.
Annealed: 98,000 TS; 74,000 YS; 28 El; 210 Brin.
Hardened: 220,000 TS; 182,000 YS; 12 El; 430 Brin.
For extrusion press mandrels, aluminum die casting dies.
Air or oil hardening. Thermal shock resistant, Type H13.

E38 W.
M-459, M-1496, 0.38 C, 1.2 Si, 5.6 Cr, 1.5 Mo, 0.3 V, 1 5 W, bal Fe.
Ht Tr. 216,000 TS; 185,000 YP; 14 El; 53 RA.
For metal extrusion press components, die casting dies, forging dies, hot shear blades.
Air or oil hardening Thermal shock resistance Type H12.

E 724Z.
M-459; C, Cr, Ni, bal Fe
Oil treated. 171,000-193,000 TS; 150,000-171,000 YS, 13-10 El.
For gears, shafts; oil hardening, tough.

E1318.
Russia, 0 6 max C, 16-18 Cr, 4.5-6 5 Al, 0.6 max Ni, bal Fe.
For electrical resistance and heating elements; applications to 1100°C.

E1340
Russia, 0.15 max C, 23-27 Cr, 4-7 Al, 0.6 max Ni, bal Fe.
For electrical resistance and heating elements; applications to 1200°C.

E1503.
Russia, 0.5-0.6 C, 7.5-9 5 Mn, 0.7 Si, 3.8-4.5 Cr, 8-10 Ni, bal Fe.
For instrument parts, nonmagnetic.

E1919
M-Russia; 0.83 C, 10.0 Co, 4.0 Cr, 1.8 V, 10.0 W, bal Fe.
Ht. Tr.: Rock C 64-66.
For cutters, lathe and planer tools, form cutters, drills.
High speed steel. High red-hardness.

E1931.
M-Russia; 1.49 C, 4 0 Cr, 4.4 V, 10.6 W, 4.9 Co, bal Fe.
Hardened: C 65-68 Rock.
For cutters, drills, broaches, milling cutters, taps, reamers.
High red-hardness Abrasion resistant. High speed steel. Type T 15.

E1940.
M-Russia; 0.83 C, 4.0 Cr, 2.1 V, 18.0 W, 5.0 Co, bal Fe.
Hardened: C 62-65 Rock.
For cutters, boring tools, lathe and planer tools, gun-barrel drills, roll turning tools.
High speed steel, type T4. Red-hard.

E-52100 WIRE.
M-12; 0.95-1.10 C, 0.2-0.5 Mn, 0 03 max P, 0.35 max S, 0.15-0.30 Si, 1.3-1.6 Cr, bal Fe.
For roller and ball bearings; water hardened.

EAGLE A BABBITT.
M-88; Sn, Sb, bal Pb.
At 70°F: 23.5 Brin.
At 212°F: 11.9 Brin.
For bearings, bushings; Babbitt.

EAGLE MUSIC WIRE.
M-774; 0.9 C, bal Fe.
For wire, springs; water hardened.

"E" ALLOY.
M-311; 20 Zn, 2.5-3 Cu, 0.2-1 Si, 0.5 Mg, 0.5 Mn, Fe, bal Al.
Hot rolled: 67,000 TS; 53,000 YS; 15 El.
For light weight structures; non-hardenable.

EARLUMIN.
Spain; 4-5 Cu, bal Al.
For light alloy parts; age-hardenable.

EASTERN 12R.
M-775, 6-8 Cu, 1-4 Si, 2.5 Zn, 1-4 Fe, 0.6 Mg, bal Al
Cast: 19,000 TS; 14,000 YS; 2 El.
For light alloy parts, Aluminum 113, SAE33.

EASTERN NO 20.
M-1014; 0 07 max C, 24-30 Ni, 19-21 Cr, 2-3 Mo, 3-4 Cu, 2 max Mn, bal Fe.
Sheet 90,000 TS, 50,000 YS; 35 El; B 90 Rock.
At 1000°F 76,000 TS, 32,000 YS; 48 El; 60 RA.
For acid handling equipment, pickling racks, mixing tanks. Austenitic, stainless. Carpenter 20. Acid resistant.

EASTERN 29-9
M-775; C, 29 Cr, 9 Ni, bal Fe.
Cast: 97,000 TS, 49,000 YS; 28 El; 90-95 Brin.
For valves, pumps, headers, corrosion resistant.

EASTERN 36.
M-775, 0.1 C, 2.3-3.1 Si, 0.03 Mg, 0.2 Zn, 0.6 Fe, 0.2 Mn, bal Al.
Cast 17,000 TS; 5500 YS; 20 El.
For light alloy parts.

EASTERN NO 41
M-1014, 0.09 C, 19 Cr, 11 Co, 10 Mo, 3 Ti, 1.5 Al, bal Ni
Heat treated. 206,000 TS, 154,000 YS, 14 El.
At 1400°F. 160,000 TS, 136,000 YS. 11 El.
For jet engine components, afterburners, turbine casings, combustion liners, turbine buckets
Similar to Rene 41, High strength at 1600-1800°F.

EASTERN NO. 155.
M-1014; 0.15 C, 0 65 Si, 1-2 Mn, 22 Cr, 20 Ni, 3 Mo, 1 Cb, 3 W, 20 Co, bal Fe.
Sheet: 118,000 TS; 56,000 YS; 49 El.
At 1000°F: 94,000 TS; 40,000 YS; 54 El.
For aircraft cabin heaters, exhaust stacks, afterburners, rocket chambers. Similar to Multimet N-155. High heat and corrosion resistance.

EASTERN NO. 200.
M-1014; 99 Min Ni, 0.25 max Cu, 0.35 max Mn, 0.15 max C, 0.40 max Fe.
Hard: 115,000 TS; 105,000 YS; 2 El; B 90 min Rock.
Soft: 55,000 TS; 15,000 YS; 55 El; B 70 max Rock.
For production and handling of fluorine and

bromine, food processing equipment, chemical shipping drums.
Similar to Inco 200, high corrosion resistance, good cryogenic ductility.

EASTERN NO. 286.
M-1014; 0.05 C, 1.5 Mn, 15 Cr, 0.3 V, 26 Ni, 1.2 Mo, 2.2 Ti, 0.2 Al, bal Fe.
Aged: 155,000 TS; 105,000 YS; 24 El; 302 Brin.
At 1200°F: 110,000 TS; 88,000 YS; 13 El; 14 RA.
For jet engine and supercharger components, fasteners, turbine parts.
Similar to A-286 alloy, age-hardenable. High heat and corrosion resistance.

EASTERN 500T.
M-775; 0.4-1.0 Cu, 0.35 Si, 0.2-0.5 Mg, 7-8 Zn, 1 Fe, 0.6 Mn, bal Al.
Aged: 30,000 TS; 22,000 YS; 3 El.
For light alloy parts; Alloy ZC81A.

EASTERN NO. 530
M-1014; 0.08 max C, 3-4.5 W, 14-16 Cr, 15-17 Mo, bal Ni.
Sheet: 129,000 TS; 64,000 YS; 37 El; 31 RA.
At 1200°F: 95,000 TS; 46,000 YS; 22 El; 22 RA.
For chemical and petroleum equipment, oil refinery components, exhaust stacks, combustion chambers.
Similar to Hastelloy C, corrosion and heat resistant.

EASTERN NO 600.
M-1014; 14-17 Cr, 6-10 Fe, bal Ni.
Annealed. 90,000 TS; 40,000 YS, 45 El; B 75 Rock.
Cold Drawn: 150,000 TS; 125,000 YS; 10 El; C 30 Rock.
For regenerators, coolers, heaters, furnace muffles, combustion liners, thermocouple tubes
Similar to Inconel. High oxidation and corrosion resistance.

EASTERN NO. 605
M-1014; 0.05-0.15 C, 1-2 Mn, 19-21 Cr, 14-16 W, 9-11 Ni, 3 max Fe, bal Co.
Annealed: 155,000 TS; 75,000 YS; 60 El; C 22 Rock.
At 1000°F. 82,000 TS; 38,000 YS; 24 El
For gas turbine and jet engine components, fasteners
Similar to Haynes 25 and L-605 alloy.
High heat and corrosion resistant.

EASTERN NO. 702.
M-1014; 14-17 Cr, 2.7-3.7 Al, 0.25-1.0 Ti, bal Ni
Age-Hardened 142,000 TS; 82,000 YS; 38 El.
At 1000°F: 120,000 TS; 74,000 YS, 40 El.
For combustion liners, jet engine turbines.
Age-hardenable.
Similar to Inconel 702. High oxidation and corrosion resistant.

EASTERN NO. 718.
M-1014; 17-21 Cr, 4.5-5.7 Cb, 2.8-3.3 Mo, 0.2-1.0 Al, 0.3-1.3 Ti, 50-55 Ni, bal Fe.
Annealed: 130,000 TS; 60,000 YS; 45 El.
Age-Hardened: 190,000 TS; 150,000 YS; 25 El.
For aircraft and jet engine structural components.
Similar to Inconel 718, age-hardenable. Oxidation and corrosion resistant.

EASTERN NO. 750.
M-1014; 14-17 Cr, 5-9 Fe, 2.2-2.7 Ti, 0.4-1.0 Al, 0.7-1.2 Cb, bal Ni.
Heat treated: 170,000 TS; 115,000 YS; 18 El; 25 RA.
For gas turbine wheels, and rotor blades, turbo superchargers, jet engine afterburners, pressure vessels.
Similar to Inconel X-750, tough, age-hardenable, corrosion and oxidation resistant.

EASTERN NO. 801.
M-1014; 32 Ni, 1 Ti, 0.04 C, 0.75 Mn, 44.5 Fe, 0.007 S, 0.15 Cu, 20.5 Cr.
Sheet: 90,000 TS; 40,000 YS; 40 El.
At 1000°F: 75,000 TS; 30,000 YS; 35 El.
For combustion liners, furnace parts, heaters, high temperature parts. Excellent oxidation resistance to 1700°F. Similar to Incoloy T.
High tensile and rupture strength.

EASTERN NO 1030
M-1014, 12-15 Co, 3.5-5.0 Mo, 2.75-3.25 Ti, 1.0-1.5 Al, 0.02 0.15 Zr, 0.001-0.01 B, 18-21 Cr, bal Ni.
Heat treated: 188,000 TS; 115,000 YS; 28 El; 25 RA
At 1400°F: 117,000 TS; 99,000 YS; 28 El, 41 RA.
For jet engine turbine buckets, discs, fasteners, combustion chambers Similar to Waspaloy, high temperature strength, oxidation resistant.

EASTERN 32510
M-775; Malleable Iron Casting
Cast: 50,000 TS, 32,500 YS, 10 El; 110-135 Brin.
Excellent machinability
ASTM A47-52 Grade 32510.

EASTERN 35018.
M-775; Malleable Iron Casting
Cast: 53,000 TS, 35,000 YS, 18 El; 110-135 Brin
Good machinability
ASTM A47-52 Grade 35018

EASTERN FS-18-8FM
M-1014, 0.15 max C, 17-19 Cr, 8-10 Ni, 0.07 min P or S, 0.6 max Zr, bal Fe.
Annealed 80,000 TS; 35,000 YS, 50 El, 65 RA; 150 Brin
For shafts, gears, chemical plant equipment, Type 303; free-cutting, stainless

EASTERN ES-18-11.
M-1014; 0.12 max C, 17-19 Cr, 10-13 Ni, 0.03 max S, 0.04 max P, bal Fe
For spun and formed parts, Type 305, stainless, austenitic.

EASTERN ES-18-12-3Mo
M-1014, 0.08 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin
For chemical plant equipment; Type 316, stainless, austenitic.

EASTERN ES-18-12-3Mo-L.
M-1014, 0.03 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed 85,000 TS, 35,000 YS, 55 El; 70 RA; 155 Brin.
For chemical plant equipment, welded structures; Type 316L; stainless, austenitic.

EASTERN ES-18-12-4Mo.
M-1014, 0.08 max C, 18-20 Cr, 11-14 Ni, 3-4 Mo, bal Fe
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For chemical plant equipment, mixers, agitators; Type 317; stainless, austenitic.

EASTERN G-35.
M-775; C, bal Fe.
35,000 TS; 0 El; 215 Brin.
For pressure fittings, cams, castings; gray cast iron.

EASTERN G-40.
M-775; C, alloy, bal Fe.
40,000 TS; 0 El; 240 Brin.
For die blocks, stoker parts, castings; heat resistant cast iron.

EASTERN GR.P1.
M-775; 3 C, Si, Mn, bal Fe.
Cast: 70,000 TS; 48,000 YS; 10 El; 187 Brin.
For gears, shafts, housings; pearlitic malleable iron.

EASTERN GR.P2
M-775; 3 C, Si, Mn, bal Fe.
Cast: 75,000 TS; 50,000 YS; 8 El; 201 Brin.
For gears, shafts, housings; pearlitic malleable iron.

EASTERN GR.P3.
M-775; 3 C, Si, Mn, bal Fe.
Cast. 80,000 TS; 60,000 YS, 5 El; 217 Brin.
For gears, shafts, housings; pearlitic malleable iron.

EASTERN GR.P4.
M-775, 3 C, Si, Mn, bal Fe.
Cast· 85,000 TS; 55,000 YS; 4 El; 207 Brin.
For gears, shafts, housings; pearlitic malleable iron.

EASTERN GR P5
M-775, 3 C, Si, Mn, bal Fe
Cast· 75,000 TS; 50,000 YS, 4 El, 201 Brin.
For gears, shafts, housings; pearlitic malleable iron.

EASTERN GR P6.
M-775, 3 C, Si, Mn, bal Fe.
Cast: 65,000 TS, 45,000 YS; 10 El, 187 Brin.
For gears, shafts, housings, pearlitic malleable.

EASTERN H-55.
M-775, 2.2 C, 1.3 Si, alloy, bal Fe
Cast 55,000 TS, 0 El, 270 Brin.
For lapping plates, rolls, pressure fittings, castings; gray cast iron Tr. S. 3200

EASTERN H-60
M-775, 2.2 C, 1 Si, 0.5 Mn, bal Fe
Cast. 60,000 TS, 0 El, 270 Brin.
For manhole covers, cylinders, rolls, brake drums, die blocks; gray cast iron, wear resistant.

EASTERN H-65.
M-775, 2.2 C, 1 Si, alloy, bal Fe
Cast· 65,000 TS, 0 El, 300 Brin.
For die blocks, stoker parts, castings; heat resistant cast iron up to 1200°F.

EASTERN N.
M-775; C, 16 Cr, bal Fe.
Annealed 50,000 TS, 0 El, 195 Brin
For carburizing and annealing boxes, castings, furnaces; heat resistant cast iron to 1500°F.

EASTERN N-1.
M-775, C, 28 Cr, 12 Ni, bal Fe
Cast. 75,000 TS, 60,000 YS; 2 El, 260 Brin
For rabble arms, pump parts, furnace parts, heat resistant cast iron.

EASTERN N-2.
M-775; C, 28 Cr, bal Fe.
Cast· 50,000 TS; 40,000 YS; 1 El, 225 Brin.
For annealing boxes, lead pots, pump and valve bodies, heat resistant cast iron to S atm.

EASTERN N-3
M-775; C, 23 Cr, bal Fe.
Cast· 65,000 TS; 50,000 YS; 1 El; 260 Brin.
For glass industry, stainless castings, glass molds, stainless, resists scaling to 1600°F.

EASTERN N-4.
M-775; C, 20 Cr, 64 Ni, bal Fe.
Cast. 60,000 TS, 45,000 YS; 2 El; 250 Brin.
For carburizing boxes, glass molds, pyrometer tubes; heat resistant to 1800°F.

EASTERN N-5.
M-775; C, 20 Cr, 38 Ni, bal Fe.
Cast: 65,000 TS; 45,000 YS; 4 El; 235 Brin.
For furnace parts, grids, rollers, hearth plates; heat resistant to 1650°F.

EASTERN N-6.
M-775; C, 8 Cr, 22 Ni, bal Fe.
Cast: 75,000 TS; 40,000 YS; 20 El; 160 Brin.
For ship propellers, pump and valve bodies; stainless, heat resistant to 1800°F.

EASTERN N-8.
M-775; C, 23 Cr, bal Fe.
Cast: 65,000 TS, 55,000 YS; 0 El; 555 Brin.
For heat resistance; abrasion resistant.

EASTERN "Z" METAL.
M-775; 2.0-2.6 C, 1 Si, 1 Mn, bal Fe.
Cast: 75,000 TS; 50,000 YS; 12 El; 180 Brin.
For air drill parts, sprockets, gears, unions; malleable cast iron.

EASTON PM 216.
M-1710, 0.80 C (incl. 0.75 graphite), 0.43 Mn, 0.41 Ni, 0.73 Mo, 2.05 Cu, bal Fe.
140-300 mesh metal powder for sintering.
Produces hardenable steel.

EASTON RZ 365
M-1710; 98.7 Fe, 0.22 Mn, 0.06 C (typical).
140-300 mesh iron powder for sintering.

EASTON RZ 365 MM.
M-1710; 0.11-0.14 C, 0.55 Mn, 98.6 Fe.
140-300 mesh powder for sintering.

EASTON RZ 365 S
M-1710, 0.08 C, 0.17 Mn, 0.31 S, 98.5 Fe.
140-300 mesh iron powder for sintering.
For free machining material

EASTON RZ 4600.
M-1710, 0.08 C, 1.84 Ni, 0.30 Mo, 0.21 Mn, bal Fe.
140-300 mesh metal powder for sintering.
Mixed with varying amounts of graphite before sintering will permit product similar in composition to AISI 46XX.

EASY
M-686, 65 Ag, 20 Cu, 15 Zn.
For silversmithing solder for sterling, M.P. 1280-1325°F

EASY-FLO.
M-63, 50 Ag, 15.5 Cu, 16.5 Zn, 18 Cd.
For brazing, M.P. 1175-1200°F; corrosion resistant. AMS 4770C, AWS BAg-la

EASY-FLO 3.
M-63; 50 Ag, 15.5 Cu, 15.5 Zn, 16 Cd, 3 Ni.
M.P. 1170°F, Flow P 1270°F.
For brazing stainless steels with corrosion resisting joints; brazing carbide tips.
AMS 4771 A, AWS BAg-3.

EASY-FLO 30
M-63, 30 Ag, 27 Cu, 23 Zn, 20 Cd.
M.P 1125°F, Flow P. 1310°F
60,000 TS expected when joining 1020 steel.
General purpose brazing alloys, particularly for leak tight joints.
AWS BAg-2a.

EASY-FLO 35.
M-63; 35 Ag, 26 Cu, 21 Zn, 16 Cd.
M.P. 1125°F; Flow P. 1295°F.
General purpose low melting brazing alloy for brazing ferrous and non-ferrous alloys.
AMS 4768A; AWS BAg-2.

EASY-FLO 45.
M-63; 45 Ag, 15 Cu, 16 Zn, 24 Cd.
M.P. 1125°F; Flow P. 1145°F.
For brazing ferrous and non-ferrous alloys; lowest flow point of silver braze alloys.
AMS 4769 A; AWS BAg-1.

EATONITE.
M-947; 2.0-2.75 C, 37-41 Ni, 14 W, 27-31 Cr, 9-11 Co, 1 max Si, 8 max Fe.
At 1300°F; 302 Brin.
For valve facing, valve seats and faces; retains hardness at high temperature.

E.B. ALLOY.
M-1, M-435; 0.50 C, 4 Cr, 0.4 V, 0.5 Mo, bal Fe.
Heat treated: 217,000-308,000 TS; 176,000-229,000 YS; 6-13 El; 6-34 RA; 44-56 Rock C.
For shears, header dies, hot work steel, air or oil hardening.

"E.B.D." BEARING.
Eng.; 90-88 Cu, 10 Sn, 5 P + Sn, 2 Zn.
For bearings; strong.

E-BRITE 26-1.
M-663; 0.005 max C, 0.40 max Si, 0.40 max Mn, 25-27.5 Cr, 0.75-1.25 Mo, 0.0150 max N, 0.5 max Cu + Ni, bal Fe.
Ann: 70,000 TS; 45,000 YS; 42 El; 86 RA.
(Supplied as ingots for remelting.)
Good resistance to impact, intergranular corrosion, pitting and crevice corrosion, and immune to chloride stress cracking.
For parts for marine and desalting equipment, food processing, petroleum industries.

"EB" SILVER BRAZING ALLOY.
M-63; 57 Ag, Mn, Sn, bal Cu
For silver brazing of carbides; M.P. 1120-1345°F.

E.C. 124.
Eng.; 12 Si, 1 Cu, 0.5 Mg, 1 N, bal Al.
For light alloy parts; cast or pressed.

ECCENTRIC RING.
Eng.; 84 Cu, 14 Sn, 2 Zn.
For bearings, bells.

ECLAIR.
M-1043, 0.62 C, 14 W, bal Fe.
For hot work tools; oil hardened.

ECLAIR 33.
M-1043; 0.82 C, 6 W, 4.5 Mo, 1.5 V, bal Fe.
For lathe and planer tools, reamers, cutters; oil hardened.

ECLAIR 44.
M-1043; 0.82 C, 10 W, 1.5 V, 0.65 Mo, bal Fe.
For lathe and planer tools; oil hardened.

ECLAIR 55.
M-1043; 0.82 C, 10 W, 3 Co, 1.5 V, 0.7 Mo, bal Fe
For lathe and planer tools, reamers, oil hardened

ECLAIR 88.
M-1043; 0.82 C, 6.5 W, 5 Mo, 2 V, bal Fe.
For lathe and planer tools, drills, hobs, taps; oil hardened.

ECLAIR 99.
M-1043; 0.92 C, 10 W, 9 Co, 2 V, 0.6 Mo, bal Fe.
For dies; oil hardened.

ECLIPSE 75.
C, alloy, bal Fe.
For cold hobbing tools; water hardened.

ECLIPSE BRONZE.
M-241; Sn, bal Cu.
For hardware; white nickel bronze.

E.C.N. ALLOY.
M-107; C, Ni, Cr, bal Fe.
At 20°C.: 67,000-78,000 TS.
At 1000°C.: 33,000 TS.
For case-hardening boxes, glass molds, retorts, stills, fire boxes, muffles, crucibles, pumps; highly resistant to heat and corrosion.

E Co 3.
M-Germany; 0.8 C, 12 W, 4 Cr, 1.9 V, 0.85 Mo, 3 Co, bal Fe
Hardened: C 64-67 Rock.
For lathe and planer tools, reamers, broaches, drills, form cutters, taps, hobs.
High red-hardness.
High speed steel, Type T8.

ECONO.
M-140; 0.4 C, 0.2 Mn, 3.75 Cr, 0.75 V, 1.1 W, 5.75 Mo, bal Fe.
For tools, cutters, hot work dies; hot work steel.

ECONO NO. 1-V
M-1683; 1.05 C, 0.25 V, bal Fe.
Water hardening tool steel; AISI W2.

ECONO-2.
M-1683; 0.75 C, 1.25 Ni, 0.80 Cr, 0.25 Mo, 0.15 V, bal Fe.
Heat treated: 121,000-208,000 TS; 90,000-180,000 PL, C 29-45 Rock
For brake dies, bushings, cams, shear blades, gears, set screws, swaging and forming dies, punches
Type L6, tough, oil hardening

ECONO-5.
M-1683, 1.0 C, 5 Cr, 1 Mo, 0.4 V, 0.4 Mn, bal Fe
Annealed: 103,000 TS; 52,000 YS, 26 El; C 18 Rock
Hardened. 178,000-253,000 TS, 146,000-200,000 YS; 3-12 El, 7-32 RA, C 41-53 Rock.
For blanking and trimming dies, shears, cutters, gauges, lamination dies
Type A2, air hardening, nondeforming, cold work tool steel, tough

ECONOMET.
M-59; 0.35-0.75 C, 8-12 Cr, 28-32 Ni, bal Fe.
For heat treating boxes, furnace parts
Heat and abrasion resistance

ECONOMET 4.
M-59; 0.36-0.50 C, 16-23 Cr, 7-11 Ni, bal Fe
For heat and corrosion resistant parts, stainless, heat and corrosion resistant

ECONOMY HARDFACE
M-9, 1.0 C, 5 Cr, 1.7 Mo, bal Fe.
Welded. 450-550 Brin.
For hard facing electrode, abrasion resistant, air hardened.

ECONOMY HARDFACE C.
M-9, 0.5 C, 3 Cr, 1.7 Mo, bal Fe
Welded: 500 Brin.
For hard facing electrode; wear and abrasion resistant

EDAL.
Ger; 5 Mg, bal Al.
Cast: 40,000-64,000 TS; 21,000-43,000 YS, 5-31 El; 1 RA.
For welding rods, light alloy parts, heat treatable.

EDCO PHOSPHOR BRONZE
M-1035; 91.5 Cu, 8.25 Sn, 0.25 P.
Cast: 30,000 TS; 7-10 El; 163 Brin.
For welding rod, M.P. 1010°C.

EDELBRONZE.
M-557; Sn, bal Cu.
For chemical plant and textile industry equipment; corrosion resistant.

EDELMESSING.
German; Zn, alloy, bal Cu.
For ornamental hardware; high tensile brass.

EDELSTAHL-MTS5.
M-459; 0.20 C, 11.5 Cr, 1 Mo, 0.4 Ni, 0.3 V, bal Fe.
Annealed: 92,000 TS; 38,000 YS; 26 El; B 90 Rock.
Hardened: 235,000 TS, 195,000 YS, 10 El; C 46 Rock.
For valves, bearings, cutlery, surgical instruments. Corrosion resistant, hardenable.

EDELSTAHL-MTS6.
M-459; 0.17 C, 11.5 Cr, 0.6 Mo, 0.6 Ni, 0.25 V, bal Fe.
Annealed. 80,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened. 200,000 TS, 165,000 YS, 12 El, C 45 Rock.
For table hardware, surgical instruments, springs, cutlery Corrosion resistant, hardenable.

EDELWEISS AKRO 6.
M-1308, 0.12 max C, 0.8 Si, 0.8 Al, 6.5 Cr, bal Fe
For oil refining equipment; creep and heat resistant.

EDELWEISS ALSICRO 8.
M-1308, 0.12 max C, 0.8 Si, 0.8 Al, 6.5 Cr, bal Fe.
For oil refining equipment, creep and heat resistant.

EDELWEISS R1
M-1308, 0.15 C, 2 Si, 24 Cr, 19 Ni, bal Fe
For furnace parts, heat treating boxes, Type CK-20; corrosion and heat resistant

EDELWEISS R1G
M-1308, 0.4 C, 2 Si, 25 Cr, 19 Ni, bal Fe
Cast 75,000 TS, 50,000 YS; 17 El, 170 Brin.
Aged 85,000 TS, 50,000 YS, 10 El, 190 Brin
For furnace parts, retorts, heat treating boxes, Type HK, corrosion and heat resistant

EDELWEISS R9
M-1308; 0.15 max C, 20 Cr, 14.5 Ni, 0.9 Mo, 1.2 Cb, 0.8 Ti, bal Fe
For furnace parts, heat treating boxes, retorts; corrosion and heat resistant.

EDELWEISS R9G
M 1308, 0.4 C, 22 Cr, 2 Si, 9.5 Ni, bal Fe.
Cast: 85,000 TS; 45,000 YS, 35 El, 165 Brin.
For heat treating boxes, chains, conveyor belts, corrosion and heat resistant

EDELWEISS R16
M-1308, 0.15 C, 19.5 Cr, 9.5 Ni, 2 Si, bal Fe
Cast 72,000 TS; 36,000 YS; 35 El; 40 RA, 145 Brin.
For chemical plant equipment, mixers, filters; Type CF-16F, corrosion and heat resistant.

EDELWEISS R25.
M-1308; 0.12 max C, 1.5 Si, 1.5 Al, 24 Cr, bal Fe.
For furnace parts, oil refinery equipment, heat and creep resistant

EDELWEISS R25N.
M-1308; 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe.
Cast. 90,000 TS; 65,000 YS; 2 El; 212 Brin.
For furnace parts, retorts, heat treating boxes, corrosion and heat resistant.

EDELWEISS R25NG.
M-1308; 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
Cast. 90,000 TS; 65,000 YS; 2 El; 212 Brin.
Heat treated· 97,000 TS; 65,000 YS; 18 El; 210 Brin.
For cylinder liners, bushings, valve seat and bodies, Type CC-50; heat resistant.

EDGAR ALLEN NO. 5 HOT DIE.
M-210; 0.32 C, 3.25 Cr, 9.5 W, 0.35 V, bal Fe.
For hot shear blades, press and form dies, piercers; hot work steel, oil hardened.

EDGAR ALLEN 66.
M-210; 2.25 C, 13 Cr, bal Fe.
For dies; non-deforming.

EDGAR ALLEN A.13.
M-210; 0.40 C, 1.15 Cr, 1.5 Ni, 0.3 Mo, 0.6 Mn, bal Fe.
Heat treated. 224,000-251,000 TS; 215,000-224,000 YS; 10-12 El, 477-512 Brin.
For arbors, axles, beaters, bolts, connecting rods; shock resistant, oil hardened.

EDGAR ALLEN A.100.
M-210; 0.32 C, 0.65 Cr, 2.5 Ni, 0.55 Mo, bal Fe.
Heat treated: 160,000-275,000 TS; 138,000-230,000 YS; 11-18 El; 32-58 RA; 300-450 Brin.
For arbors, boring bars, collets, dies, gears, tough, oil hardened.

EDGAR ALLEN AM.1
M-210; 0.35 C, 1.35 W, 5 Cr, 1.5 Mo, 0.45 V, bal Fe
For Al and brass extrusion dies, heading tools; hot work steel, resists heat checking.

EDGAR ALLEN AM.3.
M-210, 0.40 C, 5 Cr, 1.35 Mo, 1.1 V, bal Fe.
For Al die casting dies, extrusion and forming tools, hot work steel, resists heat checking.

EDGAR ALLEN DOUBLE 12.
M-210, 0.3 C, 12 Cr, 12 W, bal Fe.
Ht. Tr.: C 38-42 Rock
For liquid hobbing of beryllium copper cavity molds for plastics, brass and copper extrusion dies Air or oil hardening
Hot work steel, Type H23.

EDGAR ALLEN FIVE PLY STEEL.
M-210, C, bal Fe
For engineering construction, manufactured in plates containing 3 layers of soft steel and 2 layers of hard steel.

EDGAR ALLEN GENUINE DOUBLE SHEAR STEEL.
M-210, C, bal Fe
For carving knives, water hardening

EDGAR ALLEN IMPERIAL.
M-210; 1.4 C, 0.75 Cr, 4.5 W, bal Fe.
For cutting tools, drills, reamers, textile needles.
Water hardening. Wear resistant.

EDGAR ALLEN K-9
M-210, 0.95 C, 0.75 Cr, 0.85 Mn, 0.5 W, bal Fe.
For dies, stay taps, broaches, milling cutters, plug gauges, oil hardened, tough.

EDGAR ALLEN N.I F.E 30.
M-210, 70 Fe, 30 Ni.
For compensating shunts for electrical equipment, thermo-sensitive, magnetic

EDGAR ALLEN SPECIAL CHROME.
M-210; C, Cr, bal Fe.
For thread rolling dies, retains hardness at high temperatures.

EDGAR ALLEN STAGPICK.
M-210; C, Cr, V, bal Fe.
For coal cutter picks; tough, hard and shock resisting

EDGAR ALLEN TOOL CLASS "C."
M-210, 0.6-1.35 C, bal Fe.
For spiral springs, chisels, punches, shear blades, drills, reamers, taps, dies; water hardening.

EDGAR ALLEN TOOL CLASS "V."
M-210; 0.6-1.35 C, bal Fe.
For spiral springs, chisels, punches, shear-blades, drills, reamers, taps; water hardening.

EDGAR ALLEN V.S. 4.
M-210; 1.05 C, 0.30 Mn, 0.25 V, bal Fe.
For cold heading dies; Type W2; water hardened.

EDGAR ALLEN YWA.
M-210; 0.28 C, 0.45 Si, 1.3 Cr, 3.4 Ni, 5.8 W, 0.25 V, bal Fe.
For extension dies, mandrels; oil hardened, shock resistant.

EDM alloy "A."
M-57; Cu, bal W.
For electric discharge machining electrodes.
Copper infiltrated tungsten.

EDM alloy "S."
M-57; 85.91 W, 9.15 Ag.
Sintered: 100,000 TS; B 100 Rock.
For EDM electrodes for electric discharge machining.
Silver infiltrated tungsten.

EDM alloy "SA."
M-57; 75 W, 25 Ag.
Sintered: 125,000 TR.S.; B 100 Rock.
For electric discharge machining electrodes
Silver infiltrated tungsten.

EDWARDS SPECULUM.
German; 70-63 Cu, 25-32 Sn, 2.4-1.6 As, 2.6-0 Zn.
For reflectors, mirrors; corrosion resistant

EE (see Darwin EE).

EEL BRAND ANTIFRICTION METAL.
M-526; 75 Pb, 6 Sn, 0.9 Cu, 1.5 Cd, 1 Ni, 0.1 P, 0.5 As, Sb.
For bearings, antifriction metal, Babbitt.

EGALITE.
M-161; Al alloy.
For light alloy parts; subject to special process while in molten state.

EHRHARDS B.M.
England; 84.4 Zn, 0.2 Sn, 10.9 Cu, 1.2 Pb, 2.5 Al
For bearings; will not resist heat or live steam.

EHRHARDS TYPE.
Eng.; 89 Zn, 3 Cu, 6 Sn, 2 Pb.
For type metal.

EHRHARDT'S METAL.
German; 89 Zn, 4 Cu, 4 Sn, 3 Pb
For bearings, bushings; Babbitt

E.H.W. NO. 1.
M-73; 0.25 C, 15 W, 4 Cr, bal Fe.
For hot work tools and dies, hot work steel.

E.H.W. NO. 3.
M-73; 0.3 C, 4 Cr, 9 W, 0.5 V, bal Fe.
For tools, punches, dies; hot work steel.

"E.H.W." STEEL.
M-73; 0.25-0.35 C, 8.9-9.5 W, 3-3.6 Cr, bal Fe.
For hot working dies, gripper and header dies for automatic bolt machines; oil hardening.

EI 435.
M-Russia; 0.10 C, 20 Cr, 0.2 Ti, bal Ni.
Heat treated: 103,000 TS; 60,000 YS; 50 El, 50 RA.
For gas turbine and jet engine components, combustion chambers.
Heat and oxidation resistant.

EI 437.
Russia; C, alloy, bal Fe.
For machine tool parts; oil hardened.

EI-437.
M-Russia; 0.03-0.05 C, 20-21 Cr, 2.5-2.8 Ti, 0.8-1.0 Al, bal Ni.
Heat treated: 147,000 TS; 41 El; 35 RA; C 35 Rock.
For turbine buckets and discs, rotor blades.
High creep strength.
High heat resistant. Similar to Nimonic 80A.

EI-437B.
M-Russia; 0.08 C, 20 Cr, 0.7 Al, 2.6 Ti, 0.005 B, bal Ni.
Heat treated: 132,000 TS; 80,000 YS; 45 El, 36 RA.
At 800°C: 62,000 TS; 53,000 YS; 8 El; 10 RA
For turbine buckets and discs. High creep strength
Boron modified Nimonic 80A.
High heat and corrosion resistant.

EI-802.
M-Russia, 0.11-0.18 C, 11-13 Cr, 0.5 Mo, 0.5-1.0 Ni, 0.15-0.30 V, 0.7-1.0 W, bal Fe
Annealed: 85,000 TS, 40,000 YS, 22 El; B 95 Rock.
For cutlery, valves, bearings, surgical instruments.
Corrosion resistant, hardenable.

EI-993
M-Russia; 0.20 C, 12 Cr, 0.4 Cb, 0.04 Mo, 0.1 Ni, 0.3 V, 0.6 W, bal Fe.
Annealed: 95,000 TS, 42,000 YS; 24 El; B 95 Rock
Hardened. 240,000 TS, 195,000 YS; 10 El, C 48 Rock.
For bearings, cutlery, hardware, surgical instruments, valves
Corrosion resistant, hardenable

EIGHTEEN PER CENT.
Eng; 65 Cu, 17 Zn, 18 Ni
For base for silver plated flatware, nickel silver

EINHEITSMETALL.
German, 79 Pb, 14 Sb, 5.3 Sn, 1.5 Cu.
For bearings, bushings, Babbitt.

E.I S 49
M-64, 0.85 C, 5 Cr, 0.25 Mn, bal Fe
Hardened. 560 Brin
For trimmers, dies, shears, for heavy shearing

EIS 77.
M-64, 0.35 C, 4 Cr, 12 W, 0.25 V, bal Fe.
For hot work dies, shears, punches; oil or air hardened.

EIS 96.
M-64; 0.55 C, 0.8 Mn, 1 Cr, 0.45 Mo, 0.08 V, bal Fe
For plastic molding dies, oil hardened.

EIS 718.
M-64; 0.35 C, 4.95 Cr, 1.25 W, 1.5 Mo, 1.0 Si, bal Fe
For hot work dies, shears, punches; oil or air hardened.

E.I.S. B-76.
M-64; 1.0 C, 0.6 Cr, 1.2 Mn, 0.20 V, 0.5 W, bal Fe.
For dies, cold blanking and forming dies; non-deforming, oil hardened.

E.I.S. C-57.
M-64; 0.6 C, 1 Cr, 2 Ni, 0.12 V, 0.8 Mo, bal Fe.
For shear blades, knives, punches, upsetters; hot work steel, oil hardened.

EISENBRONZE-1.
German; 57.5 Cu, 39.5 Zn, 1 Sn, 0.3 Pb, 1.3 Fe, 0.3 Al.
For marine parts, hardware; iron bronze.

EISENBRONZE-2.
German; 82.5 Cu, 4.45 Zn, 8.55 Sn, 3.95 Fe.
For marine parts, hardware; iron bronze.

EISENNICKEL 36.
M-303; 36 Ni, bal Fe.
For bimetal thermostats; controlled expansion.

EISENNICKEL 42.
M-303; 42 Ni, bal Fe.
For bimetal thermostats; controlled expansion.

EISENNICKEL 48.
M-303; 48 Ni, bal Fe
For glass to metal seals, controlled expansion.

EISENNICKEL 50.
M-303; 50 Ni, bal Fe
For glass to metal seals; controlled expansion.

EISENNICKEL 60.
M-303; 60 Ni, bal Fe.
For glass to metal seals, controlled expansion.

EISFNNICKEL 75.
M-297, 78 5 Ni, bal Fe
For magnetic and electrical equipment, motors; soft magnet, high permeability

EIS-H5.
M-64, 0.55 C, 1 Cr, 0 45 Mo, 0.08 V, 0 8 Mn, bal Fe
For plastic mold dies, oil hardened

E I S H-41
M 64, 1.0 C, 4 Cr, 0 15 V, 0.25 Mo, bal Fe
For hot work dies, trimmers, oil or air hardening

EIS-H720
M-64, 0 40 C, 5 25 Cr, 1 15 Mo, 1 V, bal Fe
For die casting dies and inserts, Type H11, air hardened

EIS-H-721.
M-64; 0 35 C, 0 35 Mn, 5 Cr, 1 55 Mo, 1 25 W, 1 Si, 0 2 V, bal Fe
Air hardened. 550 Brin.
For dies, inserts, punches, liners, rams; hot work, press, upsetter, extrusions

EISLERS BRONZE
U.S , 6 Zn, bal Cu
For electrical contacts, springs, good conductivity.

E I S R-43
M-64; 1.5 C, 12 Cr, bal Fe
For shear blades, trimmers, air hardened, light shearings

E I S R-97.
M-64, 0 5 C, 0 4 Cr, 1.0 Mn, 0 4 Mo, 2.1 Si, bal Fe
For dies, inserts, shear knives, oil hardened, heavy shearing

EIS-R-718.
M-64; 0.35 C, 5 Cr, 2 Mo, 1 Si, bal Fe.
Air hardened: 550 Brin.
For dies, inserts, punches; hot work, press, upsetter, extrusions.

EIS-R-720.
M-64, 0 4 C, 0.4 Mn, 5.25 Cr, 1.15 Mo, 1 V, bal Fe.
Air hardened 560 Brin.
For dies and inserts, die casting

E.I.S. T-51.
M-64, 0.6 C, 0 7 Mn, 1.4 Ni, 0.7 Cr, 2.2 W, 0.2 V, bal Fe.
For trimming and forming dies; oil hardened, hot or cold work steel.

EIS-T-71.
M-64; 0.5 C, 0 3 Mn, 1.2 Cr, 2.4 Ni, 1 Si, bal Fe
Oil hardened: 560 Brin.
For shear knives, punches; cold heavy duty, cold and semi-hot.

E.I.S. T-73.
M-64; 0.30 C, 3.5 Cr, 0 35 V, 10 W, bal Fe.
For inserts, dies, punches; hot work brass forgings.

EIS-T77.
M-64; 0.33 C, 4 Co, 12 W, 0 25 V, 0.3 Mn, bal Fe.
For hot shearing dies, extrusion liners; oil hardened, hot work steel.

E.I.S T-79.
M-64; 0.4 C, 5 Cr, 0.2 V, 4.0 W, 0 6 Mo, bal Fe.
For hot work dies, inserts; heavy shearing.

E I.S. T-717.
M-64; 0.35 C, 5 Cr, 1.35 Mo, 1 2 W, 1 Si, bal Fe.
For shears, knives, oil hardened.

EIS-T721.
M-64, 0.3 C, 5 Cr, 1.5 Mo, 1 25 W, 0 2 V, bal Fe.
For die casting dies, oil hardened, hot work steel.

EIS-V2.
M-64, 0 8 C, 0 4 Mn, V, Si, bal Fe
Water hardened 600 Brin
For shear knives, cold heavy duty.

EIS-V3.
M-64; 0 95 C, 0 4 Mn, Si, V, bal Fe.
Water hardened 620 Brin.
For shear knives, trimmers, cold light shearing

EK5.
Russia; 0 9-1 0 C, 5 5-6 5 Cr, 5 5-6.5 Co, bal Fe
For permanent magnet, heat treated

EK15
Russia, 0 9-1.0 C, 7 5-8 5 Cr, 14-16 Co, 1.5 Mo, bal Fe
For permanent magnet, heat treated

EK30A
Various foundries, 3 0 RE (Ce, etc), 0 3 Zr, bal Mg
T6-Temper 20,000-23,000 TS, 14,000-16,000 YS; 2-3 El
At 600°F 12,000 TS, 8,000 YS, 70 El.
Magnesium sand casting, good pressure tightness, weldability and corrosion resistance
For parts operating at 350-500°F ASTM B80 57T.

EK41A
Various foundries, 4 0 RE (Ce, etc), 0 6 Zr, bal Mg
T6-Temper 22,000-25,000 TS, 16,000 18,000 YS; 1-3 El
At 600°F· 13,000 TS, 9,000 YS, 53 El
Magnesium sand casting with good pressure tightness, weldability and corrosion resistance.
For parts operating at 350-600°F
ASTM B80-57T, B199 57T, AMS 4440, 4441.

EK-81.
M-114, 1 35 C, 12 75 Cr, 0 8 Mo, 3 Co, bal Fe
For blanking and forming dies, punches; air hardening

EKH3.
Russia, 0.9-1 1 C, 0 4 max Mn, 2 8-3 8 Cr, bal Fe.
For permanent magnet; heat treated

ELASTIC.
M-1318, 0 50 C, 1.0 Cr, 0.09 V, bal Fe
For gears, springs, bolts, studs, countershafts; oil hardened, shock resistant.

ELASTIC NO. 4.
M-349; 81 Au-Pt, bal Cu, Ag, Zn.
Soft· 117,500 TS; 86,500 YS, 15 El.
Heat treated 173,000 TS; 131,500 YS, 7 El.
For dental wire clasps, orthopedic appliances; M.P. 1925°F.

ELASTUF 44.
M-307, M-213; 0.5 C, 0.90 Cr, 0.90 Ni, 0.55 Mo, bal Fe.
Heat treated: 185,000-220,000 TS; 160,000-200,000 YS; 17-10 El; 50-30 RA; 42-46 Rc.
For gears, shafts, compression dies; preheat treated bars.

ELASTUF Pb.
M-307; 0.50 C, 0.92 Mn, 0.93 Cr, 0.20 Mo, 0.15-0.35 Pb, bal Fe.
Hard: 150,000 TS; 115,000 YS; 17 El; 52 RA; 302 Brin.
For gears, shafting; free-cutting, preheat treated.

ELASTUF PENN Machinery Steel.
M-307; M-213; 0.4-0.48 C, 1.25 Mn, bal Fe.
Hot rolled: 100,000-125,000 TS; 50,000-75,000 YS; 16-15 El; 32-30 RA; 197-217 Brin.
For spindles, lead screws, shafts, chuck and jack screws, bolts, arbors, gears; tough, excellent machinability.

ELASTUF STRAINFREE.
M-307; 0.44 C, 1.45 Mn, 0.03 P, 0.28 S, bal Fe.
Cold drawn, stress tempered, 100,000 min YS.
For gears, shafting; free cutting.

ELASTUF TYPE A2.
M-307; 0.50 C, 0.85 Mn, 1.03 Cr, 0.35 Mo, 0.07 V, bal Fe.
Pre-hardened: 125,000 min YS; Avg. hardness 321 BHN.
For gears, shafts, axles, boring bars, crankshafts.

ELCOMET K
M-263; 22 Ni, 23 Cr, 1.25-1.0 Si, 3.5-4.0 Cu, 2.0 Mo, 0.30 Mn, 0.12 max C, bal Fe.
For spinner heads, valves, pumps; resists abrasion and corrosion.

ELECKTRO.
M-1311; 0.85 C, 0.25 Si, 0.25 Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El, 30 RA; 400 Brin.
For springs, tools, drills, taps, reamers; Type W1; water hardened.

ELECKTROBRONZE.
M-330; 10 Al, Mn, Fe, bal Cu.
For valve gages, fittings; Al-bronze, corrosion resistant.

ELECTALLOY NO. 2.
M-1208; 2.7-3.2 G.C., 0.4-0.7 C.C., 2.0-2.9 Si, 0.8-1.2 Ni, 0.9-1.3 Mo, 0.4 Cr, bal Fe
Cast: 60,000 TS
For piston rings; cast iron, wear resistant.

ELECTALLOY NO. 3.
M-1208; 2.8-3.2 T.C., 0.7-1.15 C.C., 2.1-2.7 Si, 0.5-1.2 Mn, 0.6-1.2 Mo, 0.8-1.2 Cr, bal Fe.
Cast: 70,000 TS
For piston rings; cast iron, wear resistant.

ELECTALLOY NO. 4.
M-1208, 3.75-3.85 T.C., 2.8 max Si, 0.7 Mn, 1 Ni, 0.9 Mo, 0.3 Cr, bal Fe.
Cast: 50,000 TS.
For piston rings; cast iron, wear resistant.

ELECTRA JAP.
M-114; 1.2 C, 0.6 Mn, 0.55 Cr, bal Fe.
For taps, edge tools; water or oil hardening.

ELECTRA JAP M.
M-114; 1.2 C, 0.85 Mn, 0.5 Cr, 0.6 Mo, bal Fe.
For taps, edge tools; water or oil hardening.

ELECTREX.
M-35; 0.90 C, 0.35 Mn, bal Fe.
For brake dies, shafts, arbors; water hardening.

ELECTRICAL GOLD ALLOY.
Eng.; 70 Au, 25 Ag, 5 Ni.
For contacts.

ELECTRIC SPINDLE.
M-38; 0.70 C, 1.15 Mn, 0.5 Cr, bal Fe.
For machine tool spindles; water or oil hardening.

ELECTRITE NO. 1.
M-73; 0.70 C, 4 Cr, 18 W, 1.0 V, 0.30 Mn, bal Fe.
For twist drills, reamers, milling cutters, tools; high speed steel.

ELECTRITE 5.
M-73; 0.6 C, 18 W, 4 Cr, 1 V, bal Fe.
For bolt trimmers, header inserts, punches; high speed steel.

ELECTRITE NO. 5XL.
M-73; 0.6 C, 18 W, 4 Cr, S, 1 V, bal Fe.
For bolt trimmers, header inserts, punches, cutters; high speed steel.

ELECTRITE NO. 7.
M-73; 0.65 C, 6.5 W, 5 Mo, 4 Cr, 2 V
For extrusion dies, header inserts; high speed steel.

ELECTRITE NO 7XL.
M-73; 0.65 C, 6.5 W, S, 5 Mo, 4 Cr, 2 V, bal Fe.
For extrusion dies, header inserts, high speed steel

ELECTRITE NO. 19.
M-73; 0.84 C, 4 Cr, 0.25 Mn, 2 V, 18 W, bal Fe.
For tools, cutters, blanking and boring tools, broaches; abrasion resistant, high speed steel.

ELECTRITE NO. 19XL.
M-73; 0.84 C, 4 Cr, 2 V, S, 18 W, bal Fe.
For lathe and planer tools, hobs, drills, taps, high speed steel

ELECTRITE CO-6.
M-73, 0.9 C, 6 W, 4 Cr, 2 V, 5 Mo, 9 Co, bal Fe
For tools, cutters, high speed steel

ELECTRITE Co-6XL
M-73; 0.9 C, 6 W, 4 Cr, S, 2 V, 5 Mo, 9 Co, bal Fe
For lathe and planer tools, reamers, broaches, taps, high speed steel.

ELECTRITE CO-12.
M-73, 0.86 C, 4.0 W, 4.1 Cr, 1.8 V, 5.0 Mo, 12.0 Co, bal Fe.
Hardened: C 64-68 Rock
For high speed lathe tools; very good red hardness
AISI Type M6 High speed tool steel.

ELECTRITE COBALT.
M-73; 0.7 C, 5 Co, 18 W, 4 Cr, 1 V, bal Fe
For tools for heavy hogging cuts, high speed steel

ELECTRITE COBALT XL.
M-73; 0.7 C, 5 Co, 18 W, S, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel

ELECTRITE CORSAIR XL.
M-73, 1.02 C, 6.1 W, 4 Cr, 2.4 V, 6 Mo, S, bal Fe.
For broaches, form tools; high speed steel.

ELECTRITE CROMOLON
M-73; 0.9 C, 1.5 W, 9 Mo, 8 Cr, 1.5 V, 4 Co, bal Fe.
For taps, cutters; high speed steel.

ELECTRITE CRUSADER-XL.
M-73; 1.2 C, 4.1 Cr, 6.0 W, 3.0 V, 5.0 Mo, alloy sulphides, bal Fe
Hardened: C 65-68 Rock.
For form cutters, roll turning tools, lathe and planer tools.
Good machinability rating.
Type M3 Type 2 high-speed steel, high-red hardness and edge toughness.

ELECTRITE DOUBLE SIX.
M-73; 0.85 C, 5.5 W, 4 Cr, 1.5 V, 4.5 Mo, bal Fe.
For countersink and counterbore tools; high speed steel.

ELECTRITE DOUBLE SIX M-2.
M-73; 0.83 C, 6.5 W, 5 Mo, 4 Cr, 2 V, bal Fe.
For cutting tools, drills, taps, broaches, reamers; high speed steel.

ELECTRITE DOUBLE SIX M-2XL.
M-73; 0.8 C, 4 Cr, 6 W, 6 Mo, 2 V, bal Fe.
For lathe and planer tools, reamers, hobs, taps; high speed steel.

ELECTRITE DYNACUT
M-73; 1.2 C, 2.7 W, 3.75 Cr, 1.6 V, 8.0 Mo, 8.2 Co, bal Fe.
Hardened: C 65-66 Rock.
For cutters in heavy duty machining, broaches, chasers, drills
Type M-43 high-speed steel, wear resistant High red-hardness.

ELECTRITE DYNAMAX.
M-73; 1.08 C, 1.5 W, 3.75 Cr, 1.15 V, 9.5 Mo, 8.0 Co, bal Fe
Hardened: C 65-70 Rock
For cutting tools requiring long production runs or heavy duty machining, very high wear resistance; good red hardness.
AISI Type M-42 High speed tool steel.

ELECTRITE DYNAVAN.
M-73; 1.5 C, 4.5 Cr, 13.5 W, 4.75 V, 5 Co, 0.5 Mo, bal Fe
For inserted blade cutting tools; high speed steel.

ELECTRITE DYNAVAN XL
M-73, 1.5 C, 4.5 Cr, 13.5 W, 4.75 V, 5 Co, S, 0.5 Mo, bal Fe
For inserted blade cutting tools; high speed steel

ELECTRITE KELVAN.
M-73, 0.88 C, 1.7 W, 3.75 Cr, 1.15 V, 9.6 Mo, 8.4 Co, bal Fe
Hardened: C 63-67 Rock.
For lathe tools and other machine tools, very good red hardness and wear resistance
AISI Type M-33 High speed tool steel

ELECTRITE LACOMO
M-73; 0.8 C, 4 Cr, 5 Co, 1.25 V, 1.5 W, 8.5 Mo, bal Fe.
For hobs, saw teeth, lathe tools, reamers, high speed steel.

ELECTRITE MCH.
M-73; 0.50 C, 6.2 Mo, 1 W, 3.7 Cr, 0.75 V, bal Fe.
For forging dies, punches, shear blades, hot work steel, resists heat checking

ELECTRITE MCL
M-73; 0.30 C, 6.2 Mo, 1 W, 3.7 Cr, 0.75 V, bal Fe.
For forging dies, dummy blocks, extrusion dies; hot work steel, oil hardened.

ELECTRITE MV-1.
M-73; 0.8 C, 4.1 Cr, 4.25 Mo, 1.1 V, bal Fe.
For cutting tools, small taps, thread rolls; low alloy high speed steel.

ELECTRITE MV-2.
M-73; 0.88 C, 4.1 Cr, 4.25 Mo, 2.0 V, bal Fe.
For cutting tools, pipe taps, thread chasers; low alloy high speed steel.

ELECTRITE MV-3.
M-73; 1.18 C, 4.1 Cr, 4.25 Mo, 3.15 V, bal Fe.
For cutting tools; special high speed steel; abrasion resistant.

ELECTRITE MV-4.
M-73; 1.4 C, 4.1 Cr, 4.25 Mo, 4.15 V, bal Fe.
For cutting tools; special high speed steel, abrasion resistant.

ELECTRITE STARK.
M-73; 1.33 C, 5.5 W, 4.5 Cr, 4.0 V, 4.5 Mo, bal Fe.
Hardened: C 64-66 Rock.
For drills, reamers, lathe and planer tools, chisels, plastic core pins, chasers.
Type M-4 Tool steel. Abrasion resistant and tough.
High speed steel.

ELECTRITE SUPER COBALT.
M-73; 0.8 C, 2 V, 9 Co, 18 W, 4 Cr, bal Fe.
For tools, high speed cutting tools; high speed steel.

ELECTRITE SUPER COBALT XL.
M-73; 0.8 C, 2 V, 9 Co, S, 18 W, 4 Cr, bal Fe.
For lathe and planer tools, reamers, broaches, taps; Type T5; high speed steel.

ELECTRITE TATMO.
M-73, 0.8 C, 3.25-4.25 Cr, 1.25-2 W, 0.75-1.5 V, 7.5-9.5 Mo, (Co), bal Fe.
For reamers, lathe tools, drills, broaches, dies, hot work dies, cutting tools; high speed steel; wear resistant

ELECTRITE TATMO V.
M-73, 1.0 C, 1.75 W, 3.75 Cr, 2.05 V, 8.75 Mo, bal Fe.
Hardened: C 65-68 Rock
For cutters, drills, reamers, lathe and planer tools, form tools, broaches
Type M-7 high speed steel. Good red-hardness and edge toughness.

ELECTRITE TATMO XL
M-73; 0.8 C, 3.25-4.25 Cr, 1.2-2.0 W, 0.7-1.5 V, 7.5-9.5 Mo, Co, S, bal Fe
For reamers, drills, lathe and planer tools, hobs; Type M1; high speed steel.

ELECTRITE T.N W
M-73, 0.85 C, 4 Cr, 28 V, 8 Mo, bal Fe
For form cutters, taps, drills; high speed steel.

ELECTRITE TNW-XL.
M-73, 0.85 C, 4 Cr, 2 V, S, 8 Mo, bal Fe.
For form cutters, reamers, taps, drills; high speed steel.

ELECTRITE U
M-73, 0.70 C, 0.30 Mn, 4.0 Cr, 14 W, 0.2 V, bal Fe.
For tools, dies, gages, reamers; high speed steel.

ELECTRITE UB
M-73, 0.75 C, 4 Cr, 5 Co, 2 V, 14 W, bal Fe.
For reamers, blades, cutting tools, high speed steel

ELECTRITE ULTRA COBALT
M-73; 0.8 C, 2.0 V, 12 Co, 18 W, 4 Cr, bal Fe.
For tools, high speed cutting tools; high speed steel.

ELECTRITE ULTRAVAN.
M-73; 1.5 C, 6.3 W, 4.25 Cr, 4.75 V, 5 Mo, 5 Co, bal Fe
For inserted blade cutting tools, high speed steel.

ELECTRITE ULTRAVAN XL.
M-73; 1.5 C, 6.3 W, 4.2 Cr, 4.7 V, 5 Mo, 5 Co, S, bal Fe
For inserted blade cutting tools; high speed steel.

ELECTRITE VANADIUM
M-73, 1.1 C, 18 W, 4 Cr, 3.5 V, bal Fe.
C 67 Brin.
For high speed tools for cutting hard materials; high speed steel.

ELECTRITE VANADIUM XL.
M-73; 1.1 C, 18 W, 4 Cr, S, 3.5 V, bal Fe.
For cutters for hard materials; Type T3; high speed steel.

ELECTRO.
M-388; 0.7 C, 6 W, 6 Mo, bal Fe.
For high speed cutting tools; high speed steel.

ELECTRO-ALLOY H3.
England; Ni, Cr.
For high temperature applications; heat and corrosion resistant.

ELECTRO HIGH SPEED.
Eng.; 0.76 Cu, 0.45 Mn, 2.95 Cr, 13.24 W, 1.51 V, bal Fe.
For tools, cutters, drills; high speed steel.

ELECTROLOY.
M-778; Cu alloy.
For welding equipment.

ELECTROLOY.
M-1523, 15 Cr, 60 Ni, bal Fe.
Wire. 95,000-175,000 TS
For resistors; high electrical resistance.

ELECTROLOY 1.
M-777, M-778; Cu-W.
Bars: 135,000 TS, 130 Brin.
For resistance welding electrode, 35% electrical conductivity, for stainless steel.

ELECTROLOY 10.
M-777, M-778, Cu-W.
Bars. 160,000 TS; 205 Brin.
For resistance welding electrode; 28% electrical conductivity, for inserts and facings.

ELECTROLOY 20.
M-777, M-778, Cu-W.
Bars: 170,000 TS; 228 Brin.
For resistance welding electrode; for heavy projection welding.

ELECTROLOY 100.
M-777, M-778; Cu-W.
Bars: 200,000 TS; Rockwell A76.
For resistance welding electrode; 30% electrical conductivity, for Red Brass.

ELECTROLOY GRADE B.
M-778; Cu alloy.
175,000 TS; 5 El; 365 Brin.
For facing and inserts on projection welding electrodes, electrical conductivity 40-45%.

ELECTROLOY GRADE BX.
M-778; Cu alloy.
95,000 TS; 4-8 El, 210-228 Brin.
For flash and butt welding dies; electrical conductivity 50%.

ELECTROLOY GRADE C.
M-778; Cu alloy.
60,000 TS; 20 El, 150 Brin.
For spot welding tips; electrical conductivity 55-65%.

ELECTROLOY GRADE XX.
M-778; Cu alloy.
70,000 TS; 20 El; 150 Brin.
For spot welding tips; electrical conductivity 90%.

ELECTROLOY MOLIN 2.
M-777, M-778; Cu alloy.
Cast: 65,000-75,000 TS; 12,000-16,000 YS; 10-2 El; 116-165 Brin.
For resistance welding electrode; 10-15% electrical conductivity.

ELECTROLOY TX.
M-777, M-778; Cu alloy.
Bars: 100,000 TS; 50,000 YS; 10 El; 185 Brin.
Cast: 85,000 TS; 45,000 YS; 10 El; 180 Brin.
For resistance welding electrode; for stainless steel.

ELECTROLYTIC IRON.
M-205; 0.006 C, 0.004 S, 0.005 Si, 0.015 Cu, 99.965 Fe.
Forged. 55,000 TS; 48,500 YS; 33 El; 83 RA.
For thin seamless tubing, magnetic cores, electrical instruments; brittle as deposited.

ELECTROLYTIC TOUGH PITCH COPPER.
M-33; 99.9 Cu, 0.04 oxygen.
Annealed: 30,000 TS; 10,000 YS; 45 El; 48 Brin.
Cold drawn· 50,000 TS, 45,000 YS; 6 El; 106 Brin
For electric conductors, anodes, bus bars, radiators, high conductivity

ELECTROLYTIC TOUGH PITCH COPPER 100.
M-8, 99.9 + Cu.
Hard 55,000 TS, 45,000 YS; 5 El
For electric conductors, pipes, tubes; high conductivity.

ELECTROLYTIC TOUGH PITCH COPPER 110.
M-8, 99.9 + Cu
Hard: 48,000 TS; 40,000 YS, 15 El, B 45 Rock
Soft: 32,000 TS, 10,000 YS, 50 El, F 45 Rock
For roofering, flashing, gutters, architectural shapes, fasteners, plating anodes
Elect cond 101.

ELECTROMATIC
United States, 0.75 C, bal Fe
For springs, oil tempered wire.

ELECTROMET CALCIUM-ALUMINUM-SILICON
M-48; 10-14 Ca, 8-12 Al, 50-53 Si
For deoxidizing and degasifying steel.

ELECTROMET CALCIUM-MANGANESE-SILICON
M-48, 16-20 Ca, 14-18 Mn, 53-59 Si, bal Fe
Used as a scavenger for steel, cleanser of oxides and gases.

ELECTROMET CALCIUM-SILICON.
M-48; 30-33 Ca, 60,65 Si, 1.5-3 Fe
For metallurgical applications, deoxidizer and degasifier, graded according to Ca content.

ELECTROMET CHROMIUM CARBIDE
M-48; 86.1-86.6 Cr, 12.8-13.3 total C.
Sintered: Rockwell A88.
For extrusion dies, gage blocks; pressed or slip-cast and sintered

ELECTROMET CHROMIUM-COPPER
M-48; 8-11 Cr, 88-90 Cu, 1 max Fe, 0.5 max Si.
For metallurgical applications.

ELECTROMET CHROMIUM (HIGH CARBON).
M-48; 9-11 C, 87-90 Cr, bal Fe
For production of nonferrous Cr alloys, deoxidized; graded according to carbon content.

ELECTROMET CHROMIUM METAL (LOW C)
M-48; 97 min Cr, 1 max Fe, 0.2 or 0.5 max C.
For Cr bearing alloy production; Cr-additions.

ELECTROMET COLUMBIUM METAL.
M-48, 0.27 C, 0.01 N, 0.04 oxygen, 0.1 Ta, 0.5 ppm B, bal Cb.
Cold drawn: 82,500 TS; 72,000 YS; 17 El; 68 RA.
Annealed: 50,000 TS; 36,000 YS; 49 El; 82 RA.
For atomic reactors, chemical processing equipment, high temperature alloys; high heat and corrosion resistance.

ELECTROMET DISTILLED CALCIUM.
M-48; 99.48 Ca, 0.045 Fe, 0.025 Mn, 0.03 Ni, 0.03 C, 0.004 Cr.
Rolled: 16,700 TS; 12,300 YS; 7 El; 35 RA.
Annealed: 6960 TS; 1990 YS; 51 El; 58 RA.
For alloying agent for Al, Pb, Si, copper deoxidizer; getter for electronic tubes

ELECTROMET FERRO-BORON.
M-48; 17-25 B, 0.5 max Al, 1 max Si, 0.5 max C, bal Fe.
For deoxidizer and degasifier additions to steel; boron, boron additions

ELECTROMET FERRO-CHROME (FOUNDRY).
M-48, 5-7 C, 62-66 Cr, 7-10 Si, bal Fe
For metallurgical applications, ladle additions of Cr to cast iron; dissolves readily.

ELECTROMET FERRO-CHROME (HIGH CARBON).
M-48, 4.5-7 C, 1-3 Si, 65-70 Cr, bal Fe.
For production of Cr steels and cast irons; graded according to carbon content

ELECTROMET FERRO-CHROME (LOW CARBON).
M-48, 67-73 Cr, 0.02-2.0 C, 0.2-1.0 Si, bal Fe.
For stainless steels, graded according to carbon content.

ELECTROMET FERRO-CHROME (NITROGEN)
M-48, approximately 0.75 N, 0.10 max C, 67-71 Cr, 0.3-1 Si, bal Fe
For metallurgical applications for high Cr steels; graded according to N_2 content

ELECTROMET FERROCHROME SILICON
M-48, 33-57 Cr, 23-48 Si, 0.05 max C, bal Fe.
For production of stainless steel, to reduce metal value in slag

ELECTROMET FERRO-COLUMBIUM
M-48, 50-60 Cb, 8.0 max Si, 0.4 max C, bal Fe.
For additions to stainless steel and high temperature alloys of Cb, increases strength at elevated temperatures.

ELECTROMET FERRO-MANGANESE (LOW CARBON)
M-48, 0.07-0.50 C, 85-90 Mn, bal Fe.
For high Mn additions to low C steels, metallurgical applications; graded according to carbon content.

ELECTROMET FERRO-MANGANESE (LOW IRON)
M-48, 85-90 Mn, 2 max Fe, 3 max Si, approx 7.0 C, bal Fe
For metallurgical applications in non-ferrous alloys, where high Mn, low Fe are needed.

ELECTROMET FERRO-MANGANESE (MEDIUM CARBON)
M-48, 1.5 C, 1.5 max Si, 80-85 Mn, bal Fe.
For high Mn additions to medium C steels, metallurgical applications; for low C-Mn steels.

ELECTROMET FERROMANGANESE SILICON.
M-48; 63-66 Mn, 28-32 Si, 0.10 max C, 0.05 max P, bal Fe.
For slag reducing agent and Mn additions to steel.

ELECTROMET FERRO-MANGANESE (STANDARD).
M-48; 74-76 Mn, 1 max Si, 0.3 max P, approx 7 C, bal Fe.
For metallurgical applications, alloy deoxidizer.

ELECTROMET FERRO-SILICON (15%).
M-48; 14-20 Si, 1.0 max C, 74-84 Fe, 0.05 max P, 0.04 max S.
For addition of Si to steel, metallurgical applications; graded according to Si content.

ELECTROMET FERRO-SILICON (50%).
M-48; 47-51 Si, bal Fe.
For metallurgical applications, graphitizer and deoxidizer; graded according to Si content.

ELECTROMET FERROSILICON (50% LOW Al).
M-48; 47-51 Si, 0.4 max Al, bal Fe.
For additions of Si to steel and cast iron; deoxidizer.

ELECTROMET FERROSILICON (65% LOW Al).
M-48, 64.5-69.5 Si, 0.5 max Al, bal Fe.
For production of electrical sheet steel, deoxidizer; Si-additions.

ELECTROMET FERRO-SILICON (75%).
M-48, 73-78 Si, bal Fe.
For metallurgical applications, silicon additions; graded according to Si content

ELECTROMET FERROSILICON (75% LOW Al).
M-48, 73-78 Si, 0.5 max Al, bal Fe
For deoxidizer and alloy for steel, silicon additions; inoculant for cast iron

ELECTROMET FERRO-SILICON (85%)
M-48; 83-88 Si, bal Fe
For high silicon alloys, metallurgical applications; inoculant for cast iron

ELECTROMET FERROSILICON (85% LOW Al).
M-48, 83-88 Si, 0.5 max Al, bal Fe
For deoxidizer and alloy for steel, inoculant for cast iron.

ELECTROMET FERRO-SILICON (90%)
M-48, 92-95 Si, bal Fe.
For high silicon alloys, metallurgical applications; graded according to Si content.

ELECTROMET FERROSILICON (90% LOW Al).
M-48; 92-95 Si, 0.5 max Al, bal Fe.
For deoxidizer and alloy for steel; inoculant for cast iron

ELECTROMET FERROSILICON-CHROME.
M-48, 50-54 Cr, 28-32 Si, 1.25 max C, bal Fe
For ladle additions of Cr and Si to steel, alloying.

ELECTROMET FERRO-TUNGSTEN.
M-48; 70 80 W, 0.6 max C, bal Fe.
For steel alloys, alloying W to steel, graded according to C content.

ELECTROMET FERRO-VANADIUM.
M-48; 55-50 V, 10 max Si, 3 max C, bal Fe
For metallurgical applications, steel alloys, V additions; graded according to C and Si content.

ELECTROMET LOW PHOSPHORUS FERROMANGANESE.
M-48; 90 min Mn, 0.06 max P, 0.07 max C, bal Fe.
For Mn additions to austenitic stainless steels, alloying.

ELECTROMET MANGANESE.
M-48; 2.5 max Fe, 1.5 max Si, 0.2 max C, 96 min Mn.
For metallurgical applications, alloying, deoxidizer; graded according to C and Fe content.

ELECTROMET MANGANESE-BORON.
M-48, 75 Mn, 17.5 min B, 5 max Fe, 1.5 max Si, 3 max C.
For deoxidizer, degasifier and cleanser; for nonferrous alloys.

ELECTROMET MANGANESE-COPPER.
M-48; 28-32 Mn, 65-70 Cu, 4 max Fe, 0.75 max Si.
For non-ferrous metallurgical applications; graded according to Fe content.

ELECTROMET MANGANESE-NICKEL TITANIUM.
M-48; 0.10 max C, 6-8 Mn, 29-31 Ni, 46.5-48.5 Ti, 12.5-14.5 Al, 1 max Fe, 0.2 max Si.
For Ti additions to high temperature alloys.

ELECTROMET NICKEL BORON.
M-48; 15-18 B, 3 max Fe, 0.5 max C, bal Ni.
For addition agent for Ni and Al alloys; for alloying in hard abrasion resistant alloys.

ELECTROMET NICKEL-ZIRCONIUM.
M-48; 43-50 Ni, 25-30 Zr, 2 max Fe, 10 max Si, approx 15 Al.
For deoxidizer and degasifier for Ni and Fe alloys.

ELECTROMET SILICO-MANGANESE.
M-48; 3.0 max C, 65-68 Mn, 12-21 Si, bal Fe.
For metallurgical applications, alloying, and deoxidizing; graded according to carbon content.

ELECTROMET SILICON (REFINED).
M-48; 96 min Si, 2 max Fe.
For metallurgical applications for Cu and Al silicon alloys; graded according to Fe content

ELECTROMET SILICON-SPIEGEL.
M-48; 25-30 Mn, 5-8 Si, 2-4 C, bal Fe.
For metallurgical applications; furnished in standard and special grades.

ELECTROMET SILICON TITANIUM.
M-48; 40-50 Ti, 45-50 Si, 3 max Fe.
For tool and die steels, also nonferrous alloys; titanium additions.

ELECTROMET SPIEGELEISEN.
M-48; 19-28 Mn, 1.0 max Si, bal Fe, C.
For metallurgical applications; graded according to Mn content.

ELECTROMET TANTALUM METAL.
M-48; 0.015 C, 0.001 H, 0.01 Fe, bal Ta.
Cold drawn: 114,200 TS; 104,500 YS, 19 El; 76 RA; 205 Brin.
Recrystallized: 54,900 TS; 37,700 YS; 54 El; 92 RA; 103 Brin.
For heat exchangers, bayonet heaters, pickling tanks; high corrosion resistance.

ELECTROMET TITANIUM CARBIDE.
M-48; 95 min TiC, 19.2 min combined C, 0.2 max Fe, 0.3 max free C.
For additions to tungsten carbide; pressed or slip-cast and sintered.

ELECTROMET VANADIUM METAL.
M-48; 0.10 C, 0.10 H, 0.10 N, 0.10 O, bal V.
Annealed: 60,000-70,000 TS; 49,100 YS; 30-20 El; 80-70 RA; 140 Brin.
For atomic reactor structures.

ELECTROMET ZIRCONIUM (12-15%).
M-48; 12-15 Zr, 39-43 Si, 0.30 max C, bal Fe.
For ferrous metallurgical applications, steel deoxidizer; nitride and sulfide former.

ELECTROMET ZIRCONIUM (35-40%).
M-48; 35-40 Zr, 47-52 Si, 0.5 max C, bal Fe.
For ferrous metallurgical applications, deoxidizer; nitride and sulfide former.

ELECTRON AZ-31.
M-78; 3.3 Al, 0.3-0.5 Mn, 1.25 Zn, bal Mg.
Cast: 36,000-40,000 TS; 25,000-29,000 YS; 12-8 El; 50 Brin.
For light alloy parts, structures; C.S.-49000-52000.

ELECTRON AZ61.
Eng.; 5.5-7.0 Al, 0.1-1.0 Zn, 0.1-0.5 Mn, bal Mg.
Used to hold broken bones together.

ELECTRON AZ-855.
M-106, M-78; 8.5-9.0 Al, 0.2-0.6 Zn, 0.1-0.3 Mn, 0.5 max impurities, bal Mg
Forged: 40,500-49,000 TS; 22,500-31,000 YS; 15-8 El; 15-10 RA; 65-75 Brin.
For forgings, aircraft components; Iz-4-6.

ELECTRON "A.Z.G."
M-78, M-217; 6 Al, 3 Zn, 0.35 Mn, 0.3 Si, bal Mg.
Cast: 23,000-29,000 TS, 14,500-19,000 YS; 6-3 El, 7 RA; 55 Brin.
For automobile and airplane engine crankshafts; high fatigue strength.

ELECTRON "A.Z.M."
M-78, M-217, M-338; 6 Al, 1 Zn, 0.2-0.5 Mn, 0.2 Si, bal Mg
Rolled: 49,000 TS; 31,000 YS; 14 El, 27 RA; 70 Brin.
Forgings 45,000 TS; 29,000 YS, 8 El; 70 Brin.
For extruded and forged light alloy parts, airplane propellers, bus body frames; general structural work.

ELECTRON AZMQ.
M-78, 6.5 Al, 1 Zn, 0.3-0.5 Mn, bal Mg
Cast. 41,000-47,000 TS; 31,000-33,000 YS; 16-10 El, 55 Brin
Extruded: 46,000 TS, 32,000 YS; 13 El; 27 RA; 55 Brin.
For light alloy parts, now obsolete, C.S.-50000-56000.

ELECTRON ZS-32
M-106, M-78; 5 Al, 1 Zn, bal Mg
Forged: 7 El, 15-5 RA; 53 Brin
For forgings, pistons; hardenable.

ELECTROPLATE.
Eng.; 50-70 Cu, 10-20 Ni, 5-30 Zn.
Base for silver plate, tableware.

ELECTRO SHEET COPPER FOIL, Commercial Quality.
M-8, 99.5 + Cu.
Foils in rolls, ½ oz-7 oz/sq ft.
40,000 TS (nominal) 4.5-13 El; 94.3-99.5 elec. conductivity.
For electrical coil windings, transformer windings, flexible cable, electrostatic shielding, die stamped circuits

ELECTROTYPE (STANDARD).
Eng.; 93 Pb, 4 Sb, 3 Sn.
For electrotype.

ELECTRUM.
Eng., 52 Cu, 26 Ni, 23 Zn.
For corrosion resisting parts; nickel silver.

ELECTRUM.
Eng., 55-58 Au, 15-45 Ag.
For jewelry, ornaments; corrosion resistant .

ELECTRUNITE BOILER TUBING.
M-97, M-395; 0.2-0.3 C, bal Fe.
For boiler and heat exchanger tubes; welded tubes (electric).

ELECTRUNITE ENDURO.
M-395; 0.15 C, 18 Cr, 8 Ni, bal Fe.
For welded tubing; corrosion and heat resistant.

ELECTRUNITE STEEL TUBING.
M-395; 0.2 C, 0.8 Ni, 0.4 Cr, bal Fe.
For mechanical tubing; electric welded.

ELEFANT EXTRA ZH.
M-614; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, reamers, hobs, broaches; Type W1; water hardened.

ELEFANT HART.
M-614; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers tools, taps, milling cutters, hobs; Type W1; water hardened.

ELEFANT MH.
M-614; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 60,000 YS; 18 El, 40 RA; 210 Brin.
For drills, taps, reamers, hobs, broaches, Type W1, water hardened.

ELEFANT NR. 3.
M-614; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS, 21 El; 42 RA; 200 Brin.
For drills, taps, reamers, hobs, cutters, punches; Type W1, water hardened.

ELEFANT NR. 4.
M-614, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 190,000 TS, 145,000 YS, 12 El; 35 RA; 400 Brin.
For drills, taps, springs, hobs; Type W1; water hardened.

ELEFANT NR 5
M-614, 0.70 C 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated 175,000 TS, 130,000 YS; 12 El, 36 RA; 360 Brin
For springs, tools, hammers, rails, axes; Type W1, water hardened

ELEFANT ZAH
M-614; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS, 130,000 YS; 12 El; 36 RA, 360 Brin
For springs, tools, rails, axes, hammers; Type W1; water hardened.

ELEFANT ZH
M-614, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 190,000 TS; 145,000 YS, 12 El 35 RA, 400 Brin.
For springs, cutters, drills, taps, reamers; Type W1, water hardened.

ELEKTROBRONZE
M-330; 81 Cu, 10 Al, bal Mn, Fe.
20 El, 160-170 Brin.
For valve gauge fittings; corrosion resistant.

ELEKTRON A5.
M-137; 5 Al, bal Mg.
For light alloy parts.

ELEKTRON A6.
M-338; 6 Al, 1 Zn, 0.2 Mn, bal Mg.
Rolled: 40,000 TS; 23,000 YS; 8 El.
For high strength parts; age-hardenable.

ELEKTRON A8
M-106, M-78; 8 max Al, 0.4 max Zn, 0.4 Mn, bal Mg.
Sand cast: 29,400 TS; 115,000 YS; 4 El; 7 RA; 55 Brin.
Aged: 36,000 TS; 21,000 YS; 13 El; 9 RA; 60 Brin.
For engine components, housings, gear cases; sand and permanent mold castings, age-hardenable.

ELEKTRON A8.
M-137; 7.9-9.0 Al, 0.3-1.0 Zn, 0.15-0.40 Mn, 0.15 max Cu, bal Mg.
Sand cast: 22,800 TS, 11,400 YS; 4 El; 55 Brin.
Permanent mold: 27,000 TS; 10,000 YS; 4.5 El; 60 Brin.
Heat treated: 36,000 TS; 13,000 YS; 12 El; 60 Brin.
For aircraft parts, general purpose castings; age-hardenable.

ELEKTRON A 8.
M-338; 8 Al, 0.5 Zn, 0.3 Mn, bal Mg.
Heat treated: 28,000 TS; 10,000 YS, 5 El; 50 Brin.
Annealed: 39,000-20,000 TS; 12,000-10,000 YS; 2-5 El; 60-50 Brin.
For forgings.

ELEKTRON A8.
M-784, M-1130, 8.0 Al, 0.5 Zn, 0.3 Mn, 0.2 Si, bal Mg.
Cast: 22,000 TS; 11,000 YS; 5 El; 50 Brin.
Heat treated: 38,000 TS; 11,000 YS; 9 El; 60 Brin.
For gear and blower casings for aero engines; sand or die castings.

ELEKTRON A8 HP.
M-106; 7.5-9.0 Al, 0.3-1.0 Zn, 0.15-0.4 Mn, (low residuals) bal Mg.
As sand cast: 18,000-22,400 TS, 10,000-12,400 YS; 0-2 El; 55 Brin; 0.5 Izod.
Chill cast, heat treated: 29,000-36,000 TS, 15,500-18,000 YS, 2-4 El; 75 Brin; 0.6 Izod.
General purpose sand or gravity die magnesium alloy casting
Gen. Eng BS 2970: MAG 2; MAG 7.

ELEKTRON A8HT.
M-106, M-78, 8 Al, 1 Zn, 0.5 Mn, bal Mg.
Heat treated 26,000-32,000 TS; 6-10 El, 50 Brin.
For light alloy parts, sand and permanent mold castings.

ELEKTRON A9V.
M-137; 8.5 Al, 0.5 Zn, 0.3 Mn, bal Mg.
For light alloy parts, heat treatable.

ELEKTRON AM-503.
M-78, M-338; 0.2 Al, 0.2 Zn, 2.5 Mn, 0.2 Cu, 0.4 Si, bal Mg
Cast: 14,000-18,000 TS; 3 El; 30 Brin
Rolled: 40,000 TS; 22,000 YS; 5 El; 20 RA.
For light alloy parts, aircraft pannelling, cowling, fairing, easy to weld, rolled sheets.

ELEKTRON AM503.
M-137, M-1130, 1-2 Mn, bal Mg.
Rolled: 29,000 40,000 TS; 13,500-22,500 YS; 14-5 El, 35-45 Brin
For sheet, shapes, aircraft; for welding.

ELEKTRON AM503
M-784, 1.8 Mn, 0.2 Si, bal Mg.
Cast: 14,000 TS; 40,000 YS; 3 El; 45 Brin
For light alloy parts, corrosion resistant.

ELEKTRON AZ31.
M-137; 2.5-3.5 Al, 0.5-1.5 Zn, 0.2-0.4 Mn, bal Mg.
Cast: 21,000 TS, 11,000 YS; 7 El, 45 Brin.
Chilled: 30,000 TS, 11,000 YS; 15 El; 45 Brin.
For brake shoes, sand or gravity die cast.

ELEKTRON AZ31.
M-338, M-1130, M-784; 3 Al, 1 Zn, 0.3 Mn, bal Mg.
Rolled: 32,000-42,000 TS, 16,000-29,000 YS; 20-4 El; 45-50 Brin.
For aircraft structures, truck bodies, oil tanks; extrusion alloy.

ELEKTRON AZ91.
M-78; 9.5 Al, 0.5 Zn, 0.2 Mn, bal Mg.
Cast: 24,000 TS; 13,500 YS; 2 El; 65 Brin.
For die castings, engine parts; thin sections.

ELEKTRON AZ91.
M-137, M-106; 9.0-10.5 Al, 0.1-1.0 Zn, 0.2-0.4 Mn, bal Mg.
Sand cast: 20,000 TS; 16,000 YS; 2 El; 60 Brin.
Permanent mold: 28,000 TS; 16,000 YS; 5 El; 70 Brin.
For engine casings, aircraft parts; age-hardenable.

ELEKTRON AZ91.
M-784, M-1130; 9.5 Al, 0.5 Zn, 0.3 Mn, 0.2 Si, bal Mg.
Cast: 20,000 TS; 11,000 YS; 3 El; 50 Brin.
Heat treated: 34,000 TS; 18,000 YS; 1 El; 80 Brin.
For aircraft engine parts, crankcases; sand or die castings.

ELEKTRON AZ-855.
M-338; 8.5 Al, 0.4 Zn, 0.2 Mn, bal Mg.
Forged: 45,000-55,000 TS; 22,400-34,000 YS; 14-8 El; 20-18 RA; 70-80 Brin.
For air screw forgings, extruded and forged light alloy parts; age-hardening alloy; corrosion resistant.

ELEKTRON AZ855.
M-784, M-1130; 7.8 Al, 0.4 Zn, 0.3 Mn, 0.1 Si, bal Mg.
Forged: 44,000-49,900 TS; 28,000-32,000 YS; 12-8 El; 65-75 Brin.
For propeller blades, forgings; press forgings.

ELEKTRON AZM.
M-784, M-1130; 6.2 Al, 1.0 Zn, 0.3 Mn, 0.2 Si, bal Mg.
Forged: 40,000 TS; 24,000 YS; 10 El, 70 Brin.
Extruded: 49,000 TS, 31,000 YS; 10 El; 70 Brin
For aircraft wings and fuselage; general construction.

ELEKTRON C.
M-784; 8 Al, 0.4 Zn, 0.3 Mn, bal Mg.
Cast: 24,000 TS; 12,000 YS; 2 El; 60 Brin.
Heat treated: 36,000 TS; 17,000 YS; 2 El; 80 Brin.
For light parts, engine parts; heat treatable.

ELEKTRON C.
M-1130; 7.5-9.5 Al, 0.3-1.5 Zn, 0.15 min Mn, bal Mg.
Cast: 24,100 TS; 11,200 YS; 4 El; 60 Brin.
T4-temper: 35,000 TS; 11,200 YS; 8 El, 60 Brin.
T6-temper: 35,000 TS; 14,000 YS; 2 El; 80 Brin.
For aircraft engine components, rear axle casings; age hardenable.

ELEKTRON M2.
M-338; 1.5 Mn, bal Mg.
Rolled: 34,000 TS; 18,000 YS; 4 El.
For housings, tanks, cold formed parts; corrosion resistant, ductile.

ELEKTRON MCZ.
M-106; 2.5-4.0 Rare Earth, 0.4-1.0 Zr, bal Mg.
Sand cast: 20,000-25,000 TS; 12,200-13,400 YS 3-5 El; 50-60 Brin; 1 Izod.
Sand and gravity die cast magnesium alloy casting; creep resistant.

ELEKTRON MCZ.
M-1130; 0.4-1.0 Zr, 2.5-4.0 Mischmetal, bal Mg.
Annealed: 20,000-25,000 TS; 11,000-13,500 YS; 6-3 El; 45-55 Brin.
For engine components, aircraft structural parts; high creep strength at 500°F.

ELEKTRON MG5.
M-106; 0.15 Cu, 0.6 Si, 0.75 Fe, 1.0 Mn, 0.2 Ti, bal Al.
Extruded: 36,000 TS; 14,000 YS; 22 El; 70 RA; 90 Brin.
¼ H-temper: 42,600 TS; 31,400 YS; 8 El; 90 Brin.
For seaplane propellers, rivets; resists sea water corrosion.

ELEKTRON-MSR.
M-1130; 2 Ag, 0.7-2.5 rare earths, 0.7 Zr, bal Mg.
Heat treated: 78,000-79,000 TS; 50,400-55,000 YS; 4-2 El; 70-90 Brin.
For transmission cases; heat treatable.

ELEKTRON-MTZ.
M-1130; 3.0 Th, 0.7 Zr, bal Mg.
T6 Temper: 26,000-32,000 TS; 11,000-14,000 YS; 5-10 El; 55 Brinell.
For airframes, rockets and missile components.
Good creep resistance and high temperature strength to 700°F.

ELEKTRON RZ5.
M-106, 0.75-1.75 Rare Earth, 3.5-5.0 Zn, 0.4-1.0 Zr, bal Mg.
Sand cast: 24,600-27,000 TS; 12,400-14,500 YS, 3-5 El; 55-65 Brin, 1.5 Izod.
Sand and gravity die cast magnesium alloy casting; weldable, for casting "spidery" castings.
Gen. Eng. BS 2970 MAG 5.

ELEKTRON RZ5.
M-1130, M-137, M-452; 0.75-1.75 rare earths, 3.5-5.0 Zn, 0.4-1.0 Zr, bal Mg
Heat treated: 30,000-32,000 TS, 20,000-22,000 YS; 5-3 El; 65-75 Brin.
For structural and engine parts; age-hardenable, high temperature use to 400°F.

ELEKTRON TZ6.
M-106; 1.5-2.3 Th, 5.0-5.8 Zn, 0.4-1.0 Zr, bal Mg
Sand cast; 38,000-42,500 TS; 21,000-24,600 YS, 5-12 El; 65-75 Brin, 1.5 Izod.
High strength thorium alloy, magnesium base casting; for use up to 150°C.
AIRCRAFT DID 5015 (England)

ELEKTRON TZ6
M-1130; 5.5 Zn, 0.7 Zr, 1.8 Th, bal Mg.
Cast: 38,000 TS; 23,000 YS; 5 El, 65 Brin.
Stabilized: 43,500 TS, 26,500 YS, 15 El; 75 Brin.
For gear casings, engine castings; used to 400°F.

ELEKTRON Z5Z.
M-106; 3.5-5.5 Zn, 0.4-1.0 Zr, bal Mg.
Sand cast: 29,000-33,500 TS; 15,700-17,900 YS; 7-10 El; 55-65 Brin; 3 Izod
Sand and gravity die cast magnesium alloy castings; high yield strength; airframe applications.
Gen. Eng. BS 2970 MAG 4.

ELEKTRON Z5Z.
M-137; 3.5-5.5 Zn, 0.4-1.0 Zr, 0.15 max Mn, bal Mg.
Cast: 33,600 TS; 17,500 YS; 10 El; 55 Brin.
Heat treated: 38,200 TS; 22,000 YS; 7 El; 65 Brin.
For high strength castings; age-hardenable.

ELEKTRON Z5Z.
M-1130; 3.5-4.5 Zn, 0.4-1.0 Zr, bal Mg.
Cast: 37,000 TS; 19,000 YS; 8-15 El; 60 Brin.
Heat treated: 40,000 TS; 25,000 YS; 7 El; 75 Brin.
For structural and engine parts; age-hardenable, for high temperature service.

ELEKTRON ZREO.
M-106; 2.5-4.0 Rare Earth, 0.3-0.7 Zn, 0.4-1.0 Zr, bal Mg.
Sand cast: 20,000-22,400 TS; 12,300-13,400 YS; 3-5 El; 50-60 Brin; 1 Izod.

Sand and gravity die magnesium alloy casting;
improved resistance to sea water; hardenable,
weldable. AIRCRAFT DTD 718 (England).

ELEKTRON ZREO.
M-1130; 0.5 Zn, 0.6 Zr, 2.7 rare earths, bal Mg.
Annealed: 20,000-24,500 TS; 12,000-15,000 YS;
6-3 El; 50-60 Brin.
For jet and turbine parts; creep resistant,
used to 500°F.

ELEKTRON ZRE1.
M-106; 2.5-4.0 Rare Earth, 0.8-3.0 Zn, 0.4-1.0 Zr,
bal Mg.
Sand cast: 20,000-22,400 TS; 12,300-13,400 YS;
3-5 El; 50-60 Brin; 1 Izod.
Sand and gravity die magnesium alloy casting;
pressure tight, heat treatable, weldable,
good creep resistance up to 250°C.
Gen. Eng. BS 2970 MAG 6

ELEKTRON ZRE1
M-137; 2.5-4.0 rare earths, 0.8-3.0 Zn, 0.4-1.0 Zr,
bal Mg.
At 20°C: 24,000 TS; 14,600 YS; 5 El; 50 Brin.
At 200°C: 20,200 TS, 8960 YS; 30 El
For engine and turbine castings,
high creep and heat resistance.

ELEKTRON ZRE1.
M-1130, M-784, M-1045; 2.75 Ce, 0.6 Zr, 2.25 Zn,
bal Mg
Annealed: 22,000 TS; 12,000 YS; 5 El, 55 Brin.
Heat treated: 40,500 TS; 23,500 YS; 5 El, 75 Brin.
For light parts, aircraft engine parts,
heat resistant, operating to 500°F

ELEKTRON ZT1.
M-106, 2.5-4.0 Th, 1.7-2.5 Zn, 0.4-1.0 Zr, bal Mg.
Sand cast 27,000-31,400 TS, 12,300-13,400 YS,
5-8 El, 50-60 Brin; 1.5 Izod
Sand and gravity die cast magnesium alloy casting;
free from porosity; creep resistant to 350°C.
AIRCRAFT DTD 5005 (England).

ELEKTRON ZT1
M-1045, M-1130, 3 Th, 2.3 Zn, 0.7 Zr, bal Mg
Heat treated· 27,000-31,500 TS; 12,500-15,000 YS;
5-10 El, 50-60 Brin
For jet engine and aircraft castings,
age hardenable, used up to 600°F.

ELEKTRON ZTX.
M-1130, 2.5 Th, 1.0 Zn, 0.6 Zr, bal Mg
At 20°C: 33,600 TS, 20,200 YS; 15 El.
At 225°C: 14,600 TS; 9500 YS, 32 El.
For light weight parts, housings, castings.
Extrusion and forging alloy.

ELEKTRON ZTY.
M-1130; 0.7 Th, 0.7 Zr, 0.5 Zn, bal Mg
Rolled 75,000-91,000 TS; 47,000-69,000 YS,
20-10 El; 60-80 Brin.
For aircraft and high temperature components;
creep resistant to 660°F approximately.

ELEKTRON ZW1
M-338; 1.5 Zn, 0.7 Zr, bal Mg.
Extruded· 45,000 TS; 31,500 YS; 5 El.
Rolled: 40,000 TS; 27,000 YS; 8 El.
For aircraft structures; heavy duty.

ELEKTRON ZW1.
M-1130; 0.75-1.50 Zn, 0.5-1.0 Zr, 0.15 max Mn,
0.2 max Al, bal Mg.
Extruded: 36,000-45,000 TS; 24,500-33,500 YS;
10-20 El; 60-75 Brin.
Sheet: 33,500-40,000 TS; 22,500-29,000 YS;
8-18 El; 55-70 Brin.
For airframe structures, cowlings, skins, ribs;
for maximum weldability.

ELEKTRON ZW 2.
M-784; 2 Zn, 0.7 Zr, bal Mg.
Tube: 39,000 TS; 5 El; 75 Brin.
For light parts; non-hardenable.

ELEKTRON ZW 3.
M-338, M-784; 3 Zn, 0.7 Zr, bal Mg.
Rolled: 37,000 TS; 24,000 YS; 18 El; 60 Brin.
Forgings: 49,000 TS, 33,000 YS; 8 El; 80 Brin.
For light parts, aircraft structures; heavy duty.

ELEKTRON ZW3.
M-1130; 2.5-4.0 Zn, 0.5-1.0 Zr, 0.15 max Mn,
bal Mg.
Extruded: 40,000-51,500 TS; 29,000-40,500 YS;
10-25 El; 65-75 Brin.
For airframe construction, skins, cowlings;
free from stress-corrosion cracking.

ELEKTRON ZW6.
M-1130, 5.5 Zn, 0.7 Zr, bal Mg
Extruded· 49,000 TS; 38,000 YS; 10 El.
Heat treated· 51,000 TS; 42,000 YS; 8 El.
For aircraft construction, floor beams;
age hardenable, shock and impact resistant

ELEKTRON ZZ.
M-338; 3 Zn, 0.5 Zr, bal Mg.
For sheets, extrusions, tubes

ELEKTRON ZZ.
M-1130; 0.5-1.0 Zr, 1.0-5.0 Zn, 4 max Cd, bal Mg.
For aircraft extrusions, high temperature use.

ELEPHANT BRAND HARDENING NO 1
M-103; 4 P, 50 Sn, bal Cu.
For hardener for Cu alloys.

ELEPHANT BRAND HARDENING NO 2.
M-103, 7 P, 10 Sn, bal Cu
For hardener for Cu alloys

ELEPHANT BRAND NO. 2 METAL
M-103; 97.85 Cu, 2 Sn, 0.15 P.
For flexible hose, welding rod, line wire,
Phosphor Bronze Grade E

ELEPHANT BRAND NO. 3 METAL.
M-103; 96.95 Cu, 3 Sn, 0.05 P.
For electric contacts, cold heading stock;
Phosphor Bronze Grade E.

ELEPHANT BRAND NO 13 D.
M-103, 4-6 Sn, 4-6 Pb, 0.1 P, bal Cu
55,000 TS, 30,000 YS; 12 El
For hardware; free-cutting

ELEPHANT BRAND NO. 16 METAL
M-103, 95.7 Cu, 4 Sn, 0.3 P.
For springs, knife switches, diaphragms, elec.
contacts, Phosphor Bronze Grade A.

ELEPHANT BRAND NO. 22 METAL.
M-103; 94.7 Cu, 5 Sn, 0.3 P
For diaphragms, welding rods, springs,
Phosphor Bronze Grade A

ELEPHANT BRAND NO. 25 METAL.
M-103; 94.45 Cu, 4 Sn, 0.25 Pb, 0.3 P.
Rods: 55,000-70,000 TS; 5.25 El.
For bolts, nuts, hardware;
Phosphor Bronze Grade B

ELEPHANT BRAND NO 28 METAL.
M-103; 9 Sn, 0.3 Zn, 0.01-0.35 P, bal Cu.
Rolled: 70,000-100,000 TS; 55,000-80,000 YS;
15-20 El.
For diaphragms; P-Bronze Gr. D.

ELEPHANT BRAND NO. 113.
M-103; 90 Cu, 10 Al.
42,500 TS; 19,000 YS; 9 El.
For hardware, corrosion resistant.

ELEPHANT BRAND NO. 126R METAL.
M-103; 97.2 Cu, 2.75 Sn, 0.05 P.
For springs, diaphragms, friction plates; Phosphor Bronze Grade E.

ELEPHANT BRAND NO. 133 METAL.
M-103; 93.75 Cu, 5 Sn, 1 Pb, 0.25 P.
Rods: 55,000-70,000 TS; 5-25 El.
For screw machine parts; Phosphor Bronze Grade B 1.

ELEPHANT BRAND NO. 170 METAL.
M-103; 91.85 Cu, 8 Sn, 0.15 P.
For springs, diaphragms, gears, welding rod; Phosphor Bronze Grade C.

ELEPHANT BRAND NO. 175 METAL.
M-103; 93.8 Cu, 6 Sn, 0.2 P.
For fuse clips, welding rod, wire cloth; Phosphor Bronze Grade F.

ELEPHANT BRAND NO. 192 METAL.
M-103; 98.95 Cu, 1 Sn, 0.05 P.
For springs, hot forgings, signal wire; Phosphor Bronze Grade E.

ELEPHANT BRAND PHOSPHOR BRONZE, GRADE A.
M-103; 95.5 Cu, 3.9 Sn, 0.3 P.
Rolled rod: 45,000-80,000 TS; 50-25 El.
For springs, knife switches, diaphragms; very tough.

ELEPHANT BRAND PHOSPHOR BRONZE, GRADE B.
M-103; 96 Cu, 3.25 Sn, 0.25 Pb, 0.5 P.
Rolled: 45,000-80,000 TS; 40-12 El.
For machine castings, pinions, cog-wheels, propeller screws, piston rods, hardware; corrosion resistant, tough and hard

ELEPHANT BRAND PHOSPHOR BRONZE GRADE B-1.
M-156, M-103; 94 Cu, 5.0 Sn, 1 Pb, 0.5 P.
Rolled rod: 60,000-70,000 TS; 25 Brin.
For rods; rolled or drawn.

ELEPHANT BRAND PHOSPHOR BRONZE, GRADE C.
M-103; 92 Cu, 8 Sn, 0.5 P.
Rolled rod: 75,000-106,000 TS; 52-20 El.
For valves, cocks, cylinder liners; wear and corrosion resistant; hard and durable.

ELEPHANT BRAND PHOSPHOR BRONZE, GRADE D.
M-103; 90 Cu, 10 Sn, 0.5 P.
Rolled rod: 89,000-135,000 TS; 29-16 El.
For gears, valves, pumps, plungers, slides, powder mill tools; hard.

ELEPHANT BRAND PHOSPHOR BRONZE, GRADE E.
M-103; 2 Sn, 0.15 P, bal Cu.
For valves, bearings of heated rolls; very hard.

ELEPHANT BRAND PHOSPHOR BRONZE, GRADE F-2.
M-103; 18.5 Sn, 0.5 P, bal Cu.
Chill cast: 43,000 TS; 0.2 El; 170 Brin.
For slow moving bearings under extreme pressures; hard.

ELEPHANT BRAND PHOSPHOR BRONZE, GRADE G.
M-103; 90 Cu, 5 Sn, 5 Pb, 0.35 P.
For rods, bolts; very tough.

ELEPHANT BRAND PHOSPHOR BRONZE GRADE H.
M-156, M-103; 97.5 Cu, 2.5 Sn, 0.08 P.
For sheets, wire; rolled or drawn.

ELEPHANT BRAND PHOSPHOR BRONZE, GRADE S.
M-103; 0.7-1.0 P, 9-11 Sn, 8-11 Pb, bal Cu.
Cast: 35,000-40,000 TS; 19,000-31,000 YS; 4-3 El; 57-90 Brin.
For bearings for locomotive, marine and stationary engines, roll neck bearings, piston rings; very hard and durable.

ELEPHANT BRAND PHOSPHOR BRONZE GRADE V.
M-156, M-103; 87 Cu, 7 Sn, 6 Pb, 0.5 P.
For rods; rolled or drawn.

ELEPHANT BRAND PHOSPHOR BRONZE NO. 64.
M-103; 79.8 Cu, 10 Sn, 10 Pb, 0.2 P.
For castings; pressure tight.

ELEPHANT BRAND PHOSPHOR BRONZE NO. 130.
M-103; 90 Cu, 5 Sn, 5 Pb, P.
Cast: 55,000 TS; 45,000 YS; 20 El.
For bearings; heavy loads

ELEPHANT BRAND PHOSPHOR BRONZE NO. 146L.
M-103; 88 Cu, 10 Sn, 2 Pb
For castings, hardware; free-cutting.

ELEPHANT BRAND PHOSPHOR BRONZE NO 187.
M-103; 88 Cu, 8 Sn, 4 Pb, P.
For bearings; heavy duty.

ELEPHANT BRAND PHOSPHOR BRONZE NO. 190.
M-450; 10 Sn, 5 Pb, bal Cu.
For bearings; heavy duty.

ELEPHANT BRAND PHOSPHOR BRONZE NO. GK.
M-103; 83 5 Cu, 8 Sn, 8 Pb, 0.5 P.
For castings, hardware; free-cutting

ELEPHANT BRAND PHOSPHOR BRONZE NO. SN 1.
M-103; 78.9 Cu, 10.5 Sn, 9 Pb, 0.75 Ni, 0 85 P.
For bearings; heavy duty.

ELGILOY.
M-1712; 40 Co, 20 Cr, 15 Ni, 7 Mo, 2 Mn, 15 Fe, 0 15 C, 0.05 Be
Heat treated: 380,000 TS, 280,000 YS, 702 Brin.
Available in wire, rod, strip, cable, tubing for springs, watch parts, non-magnetic, corrosion resistant.

ELGINITE.
M-1087, Cr, Ni, Fe, Mo, Mn, bal Co.
For temperature compensating hair springs; constant flexibility from −35 to 122°F.

ELHANCO.
Eng.; 0.7-1.2 C, 0.2 V, bal Fe.
For general tools; water hardening.

ELIANITE I.
Italy; 15 Si, 0.6 Mn, bal Fe.
For pumps, valves, drains, chemical plant equipment; acid resistant, brittle.

ELIANITE II.
Italy; 15 Si, 0.5 Mn, 2.2 Ni, 0.82 C, bal Fe.
For pumps, valves, chemical plant equipment; acid resistant, brittle.

ELINVAR.
M-104, M-373, M-32; 36 Ni, 12 Cr, 1-2 Si, 0.8 C, W, bal Fe.
Rolled: 107,000 TS; 64,500 YS.
For watches, chronometers, hair springs, resistances; slightly magnetic.

ELINVAR EXTRA.
M-68, M-1084; 41-43 Ni, 2.4 Ti, 5.5 Cr, 0.6 max C, 0.5 Mn, 0.4 Si, bal Fe.
Heat treated: 90,000 TS; 35,000 YS; 40 El; 125 Brin.
Aged: 180,000 TS; 115,000 YS; 18 El; 330 Brin.
Cold drawn: 200,000 TS; 180,000 YS; 7 El; 420 Brin.
For springs, diaphragms, bourdon tubes; constant modulus.

ELITE.
M-1294; 1.35 C, W, Co, bal Fe.
For blanking and forming dies, punches; oil hardening, wear resistant.

ELKALOY A.
M-265; 1 Cd, 99 Cu.
Bars: 65,000 TS; 60,000 YS; 15 El; 50 RA; 120 Brin.
For electrodes for resistance welding of steel.
Elect. cond. 90%.

ELKALOY D
M-265; Al, bal Cu.
Cast: 70,000 TS; 30,000 YS; 8 El; 8 RA, 200 Brin.
For welding electrodes; 20% electrical conductivity.

ELKALOY D110
M-265, Al, Fe, bal Cu.
Cast 90,000 TS; 12 El, 176 Brin.
For bearings, gibs, slides, valve seats and stems; 12% conductivity, corrosion resistant

ELKALOY D-120.
M-265; 11.0-12 2 Al, 3 25-4 5 Fe, bal Cu
Cast: 80,000-85,000 TS; 35,000-70,000 YS; 10-2 El; 200-350 RA.
For bushings, bearings, forming and flash welder dies; Al bronze, heat treatable, wear resistant

ELKALOY D130.
M-265; Al, Fe, bal Cu
Cast: 85,000 TS; 0 5 El, 350 Brin
For forming dies and rolls, guide posts; 9% conductivity, Al-bronze.

ELKONITE 1W3.
M-265, 44 Cu, 56 W.
Bars 63,000 TS.
For resistance electrodes for spot welding steel, electrical contacts
Elect. cond 55%.

ELKONITE 3W3.
M-265; 32 Cu, 68 W.
Sintered 75,000 TS, 178 Brin.
For electrical contacts.
50% elect. cond.

ELKONITE 3W53.
M-265; W Cu.
Heat treated: 120,000 TS; Rockwell B105.
For resisting welding electrodes; 30% electrical conductivity

ELKONITE 5-S.
M-265; 88 W, 12 Ag.
Sintered 55,000 TS; 30 Rock C.
Density: 17.53; Elec. cond.: 38%.
For rocket nozzles; elevated temp. erosion resistant material

ELKONITE 5W3.
M-265; 30 Cu, 70 W.
Sintered: 200 Brin.
For resistance welding electrode for steel.
48% electrical conductivity.

ELKONITE 10W3.
M-265; 74 W, 26 Cu.
Sintered: 90,000 TS; 225 Brin.
For resistance welding electrodes, valve seats, switches, bearings.
Sintered powder metallurgy. 46 Elect. cond.

ELKONITE 10-W-53.
M-265; Cu, bal W.
Heat treated: 160,000 TS
For resistance welding dies; heat treatable.

ELKONITE 20S.
M-265; 27.5 Ag, 72.5 W.
Sintered: 70,000 TS; 200 Brin.
For spot welding resistance electrodes for stainless steel. Elect. cond. 49%.

ELKONITE 20W3.
M-265; Cu, W.
For welding electrodes; sintered, 36% cond.

ELKONITE 30W3.
M-265; 20 Cu, 80 W.
Sintered: 98,000 TS; 200 Brin.
For dies, welding dies; difficult to machine.

ELKONITE 35S.
M-265; 35 Ag, 65 W.
Sintered: 55,000 TS; B 85 Rock.
For electrical contacts.
52% elect. cond.

ELKONITE 50S.
M-265, 49 Ag, 51 W.
Sintered: 35,000 TS; B 55 Rock.
For electrical contacts
65% elect cond

ELKONITE 100M.
M-265, Mo
Wrought 80,000 TS
For resistance welding electrodes; 31% cond

ELKONITE 100W
M-265, W.
Wrought: 50,000 TS, 280 Brin
For electrodes for spot welding copper and silver, sintered

ELKONITE 1062
M-265, Ag-WC-Co.
230 Brin
For electrical contacts; elec. cond. 35%.

ELKONITE 2052.
M-265; 48 Ag, 51.75 W, 0.25 C.
Sintered: Rock B 55.
Elec. cond: 65%.
For electrical contacts.

ELKONITE 2110.
M-265, 90 Ag, 10 W.
Wrought: B 41 Rock.
For electrical contacts.
92% elect. cond.

ELKONITE 2125C
M-265, 75 Cu, 25 W
For electrical contacts.
50% elect. cond

ELKONITE 2150.
M-265, 50 Ag, 50 W.
For electrical contacts.
60% elect cond

ELKONITE 2165.
M-265; 35 Ag, 65 W.
Sintered: Rock B 65 (hard); B 55 (annealed).
Elec. cond: 50%.
For electrical contacts.

ELKONITE 2173.
M-265; 27 Ag, 73 W.
Sintered: Rock B 68 (hard); B 58 (annealed).
Elec. cond.: 41%.
For electrical contacts.

ELKONITE 2650.
M-265; 50 W, 50 Ag.
Ann: 33,000 TS; 21,500 YS; 3.5 El; 46 R-30T.
Cold worked: 48,000 TS; 45,000 YS; 1.2 El; 55 R-30T.
Elec. cond.: 68-72%; density 13.41.
For thin strip, formable, electrical contacts.

ELKONITE 2665.
M-265; 65 W, 35 Ag.
Ann: 56,500 TS; 39,500 YS; 1.8 El; 67 R-30 T.
Cold worked; 60,000 TS; 58,000 YS; 0.5 El; 70 R-30 T.
Elec. cond.: 57-59%; density 14 7.
For thin strip, formable, electrical contacts.

ELKONITE 2673.
M-265; 73 W, 27 Ag.
Ann: 55,000 TS; 48,000 YS; 0.6 El; 70 R-30 T.
Cold worked: 64,000 TS; 62,000 YS; 74 R 30 T.
Elect. cond : 53-54%; density 15 49.
For thin strip, formable, electrical contacts.

ELKONITE 3042.
M-265; 58 Ag, 42 WC.
Sintered: 80 Rock B.
Elec. cond.: 52%.
For electrical contacts.

ELKONITE 3135.
M-265, 65 Ag, 35 WC.
Bar: 75 Brin.
For electrical contacts.
55% elect. cond

ELKONITE 3150.
M-265, 50 Ag, 50 WC.
Bar. 105 Brin.
For electrical contacts.
45% elect. cond.

ELKONITE 3165.
M-265; 35 Ag, 65 WC.
Hard: Rock B 85
Annealed: Rock B 62.
Elec. cond.: 35%
For electrical contacts

ELKONITE 3250-C.
M-265, Cu-WC.
190 Brin.
For electrical contacts; elec. cond. 45%

ELKONITE 4050.
M-265, 50 Ag, 50 W.
Sintered B 65 Rock.
For electrical contacts.
Sintered alloy. 62% conductivity.

ELKONITE 4055.
M-265; 46 Ag, 53 W, 1 C.
Sintered: Rock B 85.
Elec. cond.: 55%
For electrical contacts

ELKONITE 7130.
M-265; Ag, Mo.
Sintered: 121 Brin.
For electrical contacts.

ELKONITE 7150.
M-265; 50 Ag, 50 Mo.
Sintered: B 65 Rock.
For electrical contacts.
Sintered alloy. 50% conductivity.

ELKONITE 3160.
M-265; 40 Ag, 60 Mo.
Hard: Rock B 68.
Ann: Rock B 50.
Elec. cond: 45%.
For electrical contacts.

ELKONITE G12.
M-265; 65 Ag, 35 WC.
Sintered: 35,000 TS; B 57 Rock.
For electrical contacts.
57% elect. cond.

ELKONITE G13.
M-265; 50 Ag, 50 WC.
Sintered: 40,000 TS; 110 Brin.
Elec. cond : 47%.
For contactors.

ELKONITE G14.
M-265; 40 Ag, 60 WC.
Sintered: 60,000 TS, B 100 Rock.
For electrical contacts.
37% elect. cond.

ELKONITE G 17.
M-265; 40 Ag, 60 Mo.
Sintered: 73,000 TS; 150 Brin.
For contactors, easy to machine; 47% electrical conductivity.

ELKONITE G18.
M-265, 50 Ag, 50 Mo.
Sintered: 42,000 TS; B 75 Rock.
For electrical contacts
52% elect. cond.

ELKONITE TC5.
M-265, 50 Cu, 50 WC.
Sintered. 75,000 TS; B 94 Rock.
For resistance welding electrodes and dies.
47% elect cond.

ELKONITE TC10
M-265; 44 Cu, 56 WC.
Sintered: 75,000 TS, B 99 Rock
For resistance welding electrodes and dies
43% elect cond

ELKONITE TC-20
M-265; Cu, bal WC
Sintered 80,000 TS
For resistance welding electrodes and dies; 30% cond

ELKONITE TC-53
M-265; Cu, bal WC.
Heat treated 168,000 TS
For resistance welding dies, 18% cond

ELKONIUM 1
M-265, 75 0 Ag, 24 5 Cu, 0.5 Ni
Ann: 45,000 TS, 32 El, 78 R 15T.
Cold worked: 80,000 TS, 4 El; 85 R-15 T.
Elec cond 75% I A C S.; Density 5.27
For electrical contacts

ELKONIUM 12
M-265; Ag-Cu-Ni.
Wrought: 81,000 TS; 3 El
For electrical contacts; elec. cond. 70%.

ELKONIUM 15.
M-265; Ag-Cu
Wrought: 78,000 TS; 2 El.
For electrical contacts, elec. cond. 85%.

ELKONIUM 17.
M-265; 77 Ag, 22.6 Cd, 0.4 Ni.
Annealed: 35,000 TS; 50 El.
Wrought: 76,000 TS; 3 El.
For electrical contacts.
31% elect. cond.

ELKONIUM 18
M-265; 86.8 Ag, 5.5 Cd, 0.2 Ni, 7.5 Cu.
Wrought: 75,000 TS; 50,000 YS; 3 El.
For current carrying reeds and springs, make and break electrical contacts.
43% elect. cond.

ELKONIUM 21.
M-265; Ag-Cu.
Wrought: 77,000 TS; 4 El.
For electrical contacts; elec. cond. 83%.

ELKONIUM 22.
M-265; 72 Ag, 28 Cu.
Annealed: 53,000 TS; 20 El; Rock 15 T-79.
Cold worked: 80,000 TS; 5 El; Rock 15 T-85.
Elect. cond. 84.
For electrical contacts.

ELKONIUM 23.
M-265; Ag-Cu.
Wrought. 53,000 TS; 3 El.
For electrical contacts, 97% cond

ELKONIUM 24.
M-265; Ag, Be
Wrought.
For electrical contacts

ELKONIUM NO. 25
M-265; 93 Ag, 3 Ti.
Wrought: 54,000 TS, 4 El.
For electrical contacts; 60% conductivity

ELKONIUM 26
M-265; Ag-Zn
Wrought. 52,000 TS, 10 El.
For electrical contacts, elec cond. 15%.

ELKONIUM 30.
M-265, 99.9 Pt
Annealed 20,000 TS; 35 El
Wrought 35,000 TS; 5 El
For electrical contacts
15% elect cond

ELKONIUM 31
M-265, 90 Pt, 10 Ir
Annealed. 55,000 TS, 20 El
Wrought 90,000 TS, 5 El
For electrical contacts
7% elect. cond

ELKONIUM 32
M 265, 80 Pt, 20 Ir
Annealed 100,000 TS; 12 El
Wrought· 145,000 TS; 5 El.
For electrical contacts
5.5% elect. cond.

ELKONIUM 33
M-265, 89 Pt, 11 Ru.
Annealed 85,000 TS, 12 El.
Wrought: 150,000 TS; 5 El
For electrical contacts.
4% elect. cond.

ELKONIUM 34.
M-265, 92 Pt, 8 Ru
Annealed· 70,000 TS, 15 El
Wrought: 130,000 TS, 5 El.
For electrical contacts
4% elect. cond

ELKONIUM 35
M-265; 65 Pt, 35 Ir
Annealed· 100,000 TS; 8 El
Wrought· 195,000 TS; 3 El.
For electrical contacts.
5% elect. cond.

ELKONIUM 36.
M-265; 97 Ag, 3 Pt.
For electrical contacts for automotive voltage regulators.
45% elect. cond.

ELKONIUM 37.
M-265; 86 Pt, 14 Ru.
Annealed: 95,000 TS; 10 El.
Wrought: 170,000 TS; 3 El.
For electrical contacts.
4% elect. cond.

ELKONIUM 38.
M-265, 75 Pt, 25 Ir.
Annealed: 125,000 TS, 10 El.
Wrought: 170,000 TS, 5 El.
For electrical contacts.
5 5% elect. cond.

ELKONIUM 39.
M-265; Pt-Ir-Os.
For electrical contacts; elec. cond. 4 5%.

ELKONIUM 40.
M-265, 99.9 Pd.
Wrought· 47,000 TS; 5 El.
Annealed. 28,000 TS, 28 El.
For electrical contacts
16% elect. cond.

ELKONIUM 41.
M-265, 72 Pd, 26 Ag, 2 Ni.
Wrought 100,000 TS, 5 El.
For electrical contacts.
4.5% elect cond

ELKONIUM 42
M-265, 60 Pd, 40 Ag
Annealed 60,000 TS, 30 El; 130 Brin
For electrical contacts.
4% electrical conductivity.

ELKONIUM 43
M-265, 23 Pd, 60 Ag, 12 Cu, 5 Ni.
Wrought. 110,000 TS, 3 El.
For electrical contacts.
11 5% elect cond

ELKONIUM 44
M-265, 90 Ag, 10 Pd.
Wrought 56,000 TS; 3 El.
For electrical contacts.
27% elect cond.

ELKONIUM 45
M-265, 97 Ag, 3 Pd
Annealed· 27,000 TS, 37 El.
Wrought· 48,000 TS, 3 El.
For electrical contacts.

ELKONIUM 46
M-265; 99 Ag, 1 Pd.
Wrought· 47,000 TS; 3 El.
For electrical contacts.
79% elect cond

ELKONIUM 47.
M-265, 95 Pd, 5 Ru
Wrought 75,000 TS; 2 El.
For electrical contacts
8% elect cond.

ELKONIUM 49
M-265; Ag, Pd, Cu, Ni.
Wrought 91,000 TS, 2 El; 185 Brin.
For electrical contacts, 21% electrical conductivity.

ELKONIUM 60
M-265, Ag alloy.
For springs, corrosion resistant; discontinued.

ELKONIUM 63.
M-265; 99 55 Ag, 0 25 Mg, 0.20 Ni.
Wrought: 50,000 TS, 6 El; 100 Brin.
For electrical contacts.
71% elect. cond.

ELKONIUM 70.
M-265; 72 Au, 26.2 Ag, 1.8 Ni.
Wrought: 50,000 TS; 5 El; 81 Rock (15 T).
For electrical contacts.
14% elect. cond.

ELKONIUM 71.
M-265; 90 Ag, 10 Au.
Annealed: 29,000 TS; 28 El.
Wrought: 46,000 TS; 3 El.
For electrical contacts.
40% elect. cond.

ELKONIUM 72.
M-265; 69 Au, 25 Ag, 6 Pt.
Wrought: 55,000 TS; 4 El; 66 Brin.
For electrical contacts.
11% electrical conductivity.

ELKONIUM 73.
M-265; Cu, Cd, Ag, Au.
Annealed: 37,000 TS.
Wrought: 65,000 TS; 40 El; 162 Brin.
For electrical contacts; electrical cond. 91.

ELKONIUM 74.
M-265; 50 Au, 50 Ag.
Elec. cond.: 16%.
For electrical contacts.
Corrosion resistance.

ELKONIUM 75.
M-265; 71 Au, 5 Ag, 9 Pt, 15 Cu.
Annealed: 101,000 TS; Rock 15T-88.5.
Cold worked. 170,000 TS; Rock 15N-75
Elec. cond.: 8%.
For electrical contacts, brush contacts.

ELKONIUM 76.
M-265; 90 Au, 10 Cu.
Annealed: 58,000 TS; 76 Rock 15T.
Cold worked: 102,000 TS, 91 Rock 15T.
Elec. cond.: 16%
For electrical contacts.

ELKONIUM 117.
M-265; Ag-Cu-Cd-Ni.
Wrought: 86,000 TS; 2 El
For electrical contacts; 30% cond

ELKONIUM 217.
M-265; 85 Ag, 15 Cd.
Annealed: 28,000 TS; 55 El.
Wrought: 58,000 TS; 5 El.
For electrical contacts.
35% elect. cond.

ELKONIUM 301.
M-265; 85 Pt, 15 Ir.
Annealed: 75,000 TS; 12 El.
Wrought: 120,000 TS; 5 El.
For electrical contacts.
6% elect. cond.

ELKONIUM 302.
M-265; 73.4 Pt, 18.4 Pd, 8.2 Ru.
Wrought: 125,000 TS; 2 El; 240 Brin.
For electrical contacts
4% electrical conductivity.

ELKONIUM 305.
M-265; 95 Pt, 5 Ru.
Wrought: 115,000 TS; 5 El.
For electrical contacts.
5.5% elect. cond.

ELKONIUM 323.
M-265; Pt, Pd, Ni.
Wrought: 70,000 TS; 5 El; 123 Brin.
For electrical contacts; 10% electrical conductivity.

ELKONIUM 401.
M-265; 35 Pd, 9.5 Pt, 9 Au, 14 Cu, 32.5 Ag.
Wrought: 150,000 TS; 2 El.
For electrical contacts.
5.5% elect. cond.

ELKONIUM 405.
M-265; 89 Pd, 11 Ru.
Wrought: 100,000 TS; 2 El.
For electrical contacts.
6% elect. cond.

ELKONIUM 460.
M-265; 60 Pd, 40 Cu.
Wrought: 103,000 TS; 2 El.
For electrical contacts.
8% elect. cond.

ELKRO.
M-357; 0.5 C, 0.95 Cr, 0.2 V, bal Fe.
For dies, oil hardening.

ELMARID.
Eng; 5.9 C, 83 W, 4.5 Co, 0.4 Fe.
For tips for high speed tools, dies; $W_2C + WC$.

ELMEDUR.
M-1246, W-alloy.
For resistance welding electrodes; sintered alloy.

ELMET.
M-1246; TiC, Co, Cr, Ni.
For electrical contacts; sintered.

ELMET 2H.
M-780, Mo-Ag.
130 Brin.
For electrical contacts, sintered

ELMET 3C.
M-780, W-Cu-Ni
198 Brin.
For electric contacts; sintered.

ELMET 4.
M-780, W-Cu-Ni.
275 Brin
For electrical contacts; sintered.

ELMET 5d
M-780, W-Ag.
180 Brin.
For electric contacts, sintered.

ELMET 5K.
M-780, W-Ag.
110 Brin.
For electric contacts, sintered.

ELMET C.
M-780; Cu alloy.
120 Brin
For welding electrode; 82% conductivity; for welding iron (spot)

ELMET Cu.
M-780; Cu alloy.
350 Brin.
For welding electrodes; 36% conductivity; spot welding of copper.

ELMET H-1.
M-780; Cu alloy.
120 Brin.
For welding electrodes; butt welding, 59% conductivity.

ELMET H-2.
M-780; Cu alloy.
180 Brin.
For butt welding electrodes; 45% conductivity.

ELMET H-3.
M-780; W, bal Cu.
For butt welding electrodes; 36% conductivity.

ELMET H-3.
M-1246; W-alloy.
For resistance welding electrodes; sintered alloy.

ELMET HEAVY METAL.
M-1246; W-alloy.
For flywheel, weights; for protection against radioactivity.

ELMET HR.
M-1246; TiC, Ni, Co, Cr.
Sintered.
For dies, tools, jet engine components; high oxidation resistance.

ELMET-ROTUNG.
M-1246, W, Cu.
Sintered
For electrical contacts.

ELMET S17
M-1246; W, Cu, Ni.
For balancing weights, isotope containers; heavy metal

ELMET S18
M-1246; W, Ni.
For balancing weights, isotope containers; heavy metal.

ELMET-SILVUNG.
M-1246; W, Ag.
For electrical contacts; sintered alloy.

ELMET U.
M-780; Cu alloy
180 Brin
For spot welding electrodes, 68% conductivity.

ELMET-W
M-1246, Cu, Cr.
For resistance welding electrodes, sintered alloy

ELNERS GERMAN SILVER
Eng., 57 4 Cu, 26 6 Zn, 13 Ni, 3 Fe
For ornaments, nickel silver.

ELOXAL
Ger., Al alloy.
For light alloy parts; anodically oxidized.

ELTUN DIE STEEL.
M-357, 0 4 C, 3 Cr, 9 W, 0.2 V, bal Fe
For tools, dies, bolt and rivet dies, hot work steel

ELVERITE A.
M-17, M-447; 3.4-3.7 C, 0.5-1 Si, bal Fe.
Cast: 500 Brin.
For tube mill linings, wheels, jaw crusher sprockets; wear resisting, chilled cast iron.

ELVERITE "B."
M-447; 3.3 C, 2.4 Si, 1.5 Ni, 0.7 Cr, bal Fe.
For wear resisting cast parts in pulverizers, crushers, stamp mills, conveyors; chilled cast iron.

ELVERITE C.
M-447, 1.0 1.8 Cr, 3.5 C, 0.25-1 0 Si, 4.5 Ni, 0.6 Mo, bal Fe.
Sand cast: 40,000-50,000 TS; 650-700 Brin.
For coal and cement pulverizers, crushers, mixers, abrasion resistant

ELVERITE D.
M-447; 3.3 C, 2.2 Si, 0.4 Mo, 0.7 Mn, bal Fe.
For castings; abrasive and wear resistant, cast iron.

EM 15.
M-1; Ni, bal Fe.
For glass to metal seals; controlled expansion.

EM 51.
5-6 Ce, 1.2 Mn, bal Mg.
For aircraft engine parts; heat treatable.

EM-62.
German; 6 Ce, 2 Mn, bal Mg.
For engine cylinder heads; high temperature use.

EMBEEBUSH METAL.
M-179; Cu alloy.
For castings; corrosion resistant.

EME.
M-85; 0.15 C, 19 Cr, 12 Ni, 3 W, 1 Cb, bal Fe.
Rolled: 135,000 TS; 100,000 YS; 20 El; 45 RA.
Forged: 115,000 TS; 80,000 YS; 25 El; 50 RA.
For jet engine and missile components, stainless and heat resistant, creep resistant.

EM IV.
M-459; 0 14 C, 3 Mn, 0.12 Si, bal Fe.
For welding electrode; general purpose.

EMK.
Eng; 71 Fe, 19 Mo, 19 Co, 0.8 Si.
For alloy for sealing in glass; coefficient of expansion 92 × 10^{-7}

EMOCW.
M-459, C, Cr, Mo, bal Fe.
Oil treated: 114,000-143,000 TS; 85,000-114,000 YS; 17-11 El
For gears, shafts, oil hardening, tough.

EMP 300 M
M-1716; 99 + Fe, 0 01 max C, 0.15 Mn, 0.005 P, 0.010 S, 0 02 Si, H_2 loss = 0 12%.
High grade iron powder for sintering.
Particle size: 97% thru 100 mesh screen.
52% thru 250 mesh screen.
To be blended, usually with graphite and zinc stearate, compressed and sintered

EMP 400 MS.
M-1716; 99.3 Fe, 0.02 C, 0.25 Mn, 0 007 P, 0 20 S, 0.02 max Si, 0.10 O_2.
High grade iron powder for sintering.
Particle size· 97% through 100 mesh screen
51% through 250 mesh screen.
To be blended, usually with graphite and zinc stearate, compressed and sintered.
This grade produces free-machining material.

EMP 4600
M-1716, 0 01 max C, 0 20 Mn, 0 008 P, 0 015 S, 0.02 Si, 0 09 O_2, 1.90 Ni, 0.50 Mo, bal Fe.
High grade iron alloy powder for sintering
Particle size 97% through 100 mesh screen.
53% through 250 mesh screen.
To be blended, usually with graphite and zinc stearate, compressed and sintered
This grade permits oil hardenable parts.

EMP 8600.
M-1716, 0 02 C, 0.20 Mn, 0 01 P, 0 015 S, 0.47 Cr, 0 10 Si, 0 62 Ni, 0.40 Mo, 0.24 O_2, bal Fe
High grade iron alloy powder for sintering
Particle size· 97% through 100 mesh screen.
52% through 250 mesh screen.
To be blended, usually with graphite and zinc stearate, compressed and sintered.
This grade produces 8600 alloy steel.

EMP 9400
M-1716; 0 02 C, 0 20 Mn, 0.01 P, 0.015 S, 0.10 Si, 0.27 Cr, 0 28 Ni, 0.21 Mo, 0.15 O_2, bal Fe
High grade iron alloy powder for sintering.
Particle size: 97% through 100 mesh screen.
52% through 250 mesh screen.
To be blended, usually with graphite and zinc stearate, compressed and sintered.
This grade produces 9400 alloy steel.

EMPEDUR.
M-1246; WC, Fe.
Sintered.
For hard facing electrode; sintered.

EMPEROR.
M-107; 0.2 C, 20 Cr, 10 Ni, bal Fe.
For hardening boxes, carburizing pans, furnaces, crucibles, glass molds; heat and corrosion resistant.

EMPEROR.
Ger.; Sn, Sb, Pb.
For bearings; anti-friction.

EMPEROR BRASS.
Eng.; 60 Cu, 20 Al, 20 Zn.
For corrosion resistant parts; corrosion resistant.

EMPEROR CHROME NICKEL ALLOY.
M-107; 0.2 C, 9 Ni, 19 Cr, bal Fe.
For furnace parts; heat resistant, stainless, austenitic.

EMPIRE 12.
M-162; 0.25 C, 2-3 Ni, 1-1.5 Cr, 0.7 Mn, 0.3 Mo, bal Fe.
For castings; tough.

EMPIRE 18.
M-162; 0.25 max C, 4-6 Cr, 0.5 Mn, bal Fe.
For castings; for oil well and refineries.

EMPIRE NO. 18
M-162; 0.2 C, 18 Cr, bal Fe
80,000-100,000 TS; 65,000-75,000 YS; 25-15 El, 40-30 RA, 170-200 Brin.
For corrosion resisting parts; corrosion resistant

EMPIRE NO 18-8
M-162, 0.15 C, 18 Cr, 8 Ni, bal Fe.
80,000-100,000 TS; 35,000-50,000 YS, 15-5 El, 20-10 RA.
For stainless and corrosion resisting parts; stainless, corrosion resistant.

EMPIRE NO. 24-12.
M-162; 0.25 C, 24 Cr, 12 Ni, bal Fe.
70,000-90,000 TS; 30,000-45,000 YS; 15-5 El, 20-10 RA
For heat and corrosion resisting parts; heat and corrosion resisting.

EMPIRE NO. 25-5.
M-162; 0.2 C, 25 Cr, 5 Ni, bal Fe.
For heat and corrosion resisting parts; heat and corrosion resisting.

EMPIRE NO. 30
M-162; 0.3 C, 30 Cr, bal Fe.
40,000-50,000 TS; 30,000-40,000 YS; 1-0 El; 2-0 RA.
For heat and corrosion resisting parts; heat and corrosion resistant.

EMPIRE NO. 35-15.
M-162; 0.35 C, 15 Cr, 35 Ni, bal Fe
60-000-70,000 TS; 8-2 El; 3-1 RA; 180 Brin.
For heat and corrosion resisting parts; heat and corrosion resistant.

EMPIRE NO. 60-20.
M-162, 0.50 C, 20 Cr, 60 Ni, bal Fe.
80,000-90,000 TS, 50,000-60,000 YS; 25-20 El; 50-40 RA.
For heat and corrosion resisting parts; heat and corrosion resistant.

EMPIRE NO. 75-20.
M-162; 75 Ni, 20 Cr, 5 Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

EMPIRE CF-3.
M-162; 0.03 max C, 18-21 Cr, 9-12 Ni, bal Fe.
Cast: 75,000 TS; 36,000 YS; 45 El; 140 Brin.
For welded fabrications, chemical plant equipment; stainless, austenitic; Type 304L.

EMPIRE CF-3M.
M-162; 0.03 max C, 18-21 Cr, 10-13 Ni, 2-3 Mo, bal Fe.
Cast: 78,000 TS; 40,000 YS; 44 El; 150 Brin.
For welded acid resistant castings; stainless, austenitic; Type 316L.

EMPIRE CF-16FA.
M-162; 0.16 max C, 18-21 Cr, 9-12 Ni, 0.2-0.3 Se, 0.15 max Mo, bal Fe.
Cast: 75,000 TS, 35,000 YS; 40 El, 160 Brin.
For chemical, paper, textile and bleaching equipment; stainless, austenitic, free-cutting.

EMPIRE CF-30.
M-162, 0.30 max C, 17-20 Cr, 8-11 Ni, bal Fe.
Cast 80,000 TS, 40,000 YS, 40 El; 160 Brin
For chemical plant and electrical equipment, stainless, austenitic.

EMPIRE "D."
M-162; C, 26 Cr, 4 Mo, 25 Ni, 1 V, bal Fe.
For engineering applications; heat and corrosion resistant

EMPIRE STEEL
M-38, 0.08-0.18 C, bal Fe
For screw machine products; case hardening.

EMRO
M-1432; C, alloy, bal Fe.
For gears, shafts, hooks, chains, chisels, shock and fatigue resistant.

EN12KHG.
Russia, 0.5-0.6 C, 4.5-5.5 Mn, 3.0-4.5 Cr, 11-13 Ni, bal Fe
For instrumental parts; paramagnetic.

EN25.
Russia; 0.3-0.6 C, 2-3 Cr, 22-25 Ni, bal Fe
For instrument parts; paramagnetic.

EN36.
Russia, 0.26 max C, 0.7 max Mn, 0.35 max Si, 35-37 Ni, bal Fe.
For electrical equipment, instruments, low coefficient of expansion

EN42
Russia, 0.3 max C, 0.8 max Mn, 0.4 max Si, 42-44 Ni, bal Fe.
For calibrating instruments; controlled expansion coefficient.

EN60.
Russia; 0.25 max C, 0.7-1.5 Mn, 12-15 Cr, 3.5-5.5 Al, bal Fe.
For electrical resistance and heating elements; applications to 1100°C.

ENDEWRANCE-50.
M-1489; 1.8-5.0 B, 3.0-5.0 Si, 2 max Cr, 3.5 max Fe, bal Ni.
Cast: C 40-62 Rock.
For hard facing electrodes for pump sleeves, steam valves, gauges.
Heat, corrosion and wear resistant.

ENDEWRANCE-51.
M-1489, 1.8-5.0 B, 3.0-5.0 Si, 2 max Cr, 3.5 max Fe, bal Ni.
Cast. C 40-62 Rock
For hard facing electrodes for pump sleeves, steam valves, gauges.
Heat, corrosion and wear resistant.

ENDEWRANCE-52.
M-1489; 1.8-5.0 B, 3.0-5.0 Si, 2 max Cr, 3.5 max Fe, bal Ni.
Cast: C 40-62 Rock.
For hard facing pump sleeves, steam valves, gauges.
Corrosion, heat and wear resistant.

ENDEWRANCE-53.
M-1489; 1.8-5.0 B, 3.0-5.0 Si, 2 max Cr, 3.5 max Fe, bal Ni.
Cast: C 40-62 Rock.
For hardfacing pump sleeves, steam valves, gauges.
Corrosion, heat and wear resistant.

ENDEWRANCE 202.
M-1489; 0.05-0 12 C, 0.18 Ti, 0.6 Cb, 26-30 Cr, 47-52 Co, bal Fe.
Cast: 135,000 TS; 48,000 YS; 10 El; 10 RA; 250 Brin.
Wrought· 132,000 TS; 61,000 YS; 7 El; 6 RA; 350 Brin.
For furnace baffles, burner tips, sintering grates, quench baskets.
Corrosion and heat resistant. Resists thermal shock.

ENDEWRANCE-CM2.
M-1489, 23 Cr, 28 Mo, 10 Co, bal Fe.
Cast 112,000 TS; Rock C 50-54.
For hard facing welding rods, rollers, steel mill guides, pug mill paddles, coal pulverizing hammers.
Heat and corrosion resistant. High wear resistance.

ENDEWRANCE-CM 18
M-1489; 25 Cr, 15 Ni, 8 Mo, 25 Co, bal Fe.
Cast. Rock C 40-42, 62,000 TS
For welding rods, steam valves, punches, pump sleeves, hot trimming dies.
High wear resistance Heat and corrosion resistance.

ENDEWRANCE-CM.40
M-1489, 30 Cr, 10 Ni, 10 Co, 14 W, bal Fe
Cast: 64,000 TS; C 38-42 Rock.
For welding rods, valve and valve seats, gas turbine parts, superchargers.
Heat, corrosion and wear resistant.

ENDURANCE AA.
M-657, 87 Cu, 12 Sn, 1 P.
For aero and motor bronze castings; wear resistant, low coefficient of friction.

ENDURANCE BB.
M-657; 89 Cu, 10.5 Sn, 0.5 P
For bushings, resists abrasive wear.

ENDURANCE CC.
M-657, 89-65 Cu, 10 Sn, 0.35 P.
For pumps, collars, bearings; corrosion resistant.

ENDURANCE DD
M-657; 80 Cu, 10 Sn, 9 75 Pb, 0.25 P.
For railway bearings, connecting rod bearings; heavy duty.

ENDURANCE EE.
M-657, 84 Cu, 9.5 Sn, 6 3 Pb, 0.2 P.
For railway bearings, connecting rod bearings; heavy duty

ENDURO 17-7.
M-97; 0.15 max C, 2 max Mn, 1 max Si, 16-18 Cr, 6-8 Ni, bal Fe.
Annealed· 110,000 TS; 40,000 YS; 60 RA; 165 Brin.
½ H-temper: 150,000 TS; 110,000 YS, 16 El; 320 Brin.
Hard: 185,000 TS; 140,000 YS; 9 El; 410 Brin.
For transportation equipment and aircraft parts; stainless, austenitic; Type 301.

ENDURO 18-8.
M-97; 0.15 max C, 2.0 Mn, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000-90,000 TS; 35,000-40,000 YS; 50-60 El; 65-70 RA; 156-160 Brin.
For evaporators, vessels, chemical engineering equipment, sterilizers, marine parts; stainless; resists scaling to 1450°F; Type 302

ENDURO 18-8 B.
M-97; 0.15 max C, 2 max Mn, 2-3 Si, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 90,000-95,000 TS; 40,000 YS; 55-50 El; 65 RA; 156-160 Brin.
For annealing boxes, furnace parts, pump parts, pre-heaters, stainless, resists oxidation to 1700°F; Type 302B.

ENDURO 18-8 Cb.
M-97; 0.15 C, 17-19 Cr, 7.0-9.5 Ni, Cb = 6-10 × C, bal Fe.
Annealed· 80,000-90,000 TS; 35,000-45,000 YS; 60-55 El; 60-55 RA; 135-185 Brin.
For stainless parts, welded structures, tanks; non-magnetic, austenitic

ENDURO 18-8 F.M
M-97, 0.15 max C, 17-19 Cr, 8-10 Ni, 0.07 P, S or Se, 0 6 max Mo or Zr, bal Fe.
Heat treated· 101,700 TS; 46,900 YS, 55 El, 62 RA; 179 Brin.
Annealed. 90,000 TS, 35,000 YS; 50 El; 55 RA; 160 Brin
For tanks, vessels, chemical engineering equipment, pump shafts, valves; stainless and heat resistant; free machining

ENDURO 18-8 F.S
M-97, 0 12 max C, 17-19 Cr, 10-13 Ni, bal Fe
Annealed 85,000 TS; 38,000 YS, 50 El, 880 Brin
For spinners, stainless parts, stainless, austenitic, Type 305.

ENDURO 18-8 HT.
M-97, 0 08-0.20 C, 17-20 Cr, 7-10 Ni, 1 5 max Mn, bal Fe.
Annealed. 85,000 TS; 35,000 YS, 50 El; 80 Rb.
Hard 185,000 TS; 140,000 YS; 5 El, 40 Rc
For bus bodies, airplanes, trucks, stainless austenitic.

ENDURO 18-8 Mo.
M-97; 0 16 max C, 1.5 Mn, 0.75 max Si, 18-22 Cr, 7-10 5 Ni, 2-4 Mo, bal Fe.
For stainless and corrosion resisting parts, corrosion resistant, stainless; Type 316

ENDURO 18-8 S
M-97, 0 08 max C, 2 max Mn, 18-20 Cr, 8-11 Ni, bal Fe.
Annealed: 85,000 TS, 35,000 YS, 55 El; 70 RA, 150 Brin.
For welded stainless structures where severe acid corrosion and high temperatures are encountered; stainless, corrosion resistant, Type 304.

ENDURO 18-8S-Cb.
M-97; 0.08 max C, 17-19 Cr, 9-12 Ni, 2 max Mn, Cb = 10 × C, bal Fe.
Annealed. 80,000-95,000 TS; 35,000-45,000 YS; 60-55 El; 60-55 RA; 160 Brin.
For airplane exhaust stacks, collector rings, heat resistors; stainless, austenitic, corrosion and heat resistant; Type 347.

ENDURO 18-8 S-Mo.
M-97; 0.10 max C, 2 Mn, 16-18.0 Cr, 10-14 Ni, 2-3 Mo, 0.1 max Si, bal Fe.
Annealed: 80,000-90,000 TS; 30,000-40,000 YS; 50-60 El; 65-70 RA; 150-156 Brin.
For textile and dye equipment, chemical apparatus, paper and pulp mill equipment, stainless, corrosion resistant; Type 316.

ENDURO 18-8 S-Mo-Cb.
M-97; 0.08 max C, 2 max Mn, 1 max Si, 17-19 Cr, 13-15 Ni, 2-3 Mo, Cb(Ta) = 10 × C min, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 40 El; 172 Brin.
For corrosion and heat resistant parts; corrosion resistant, high temperature strength, austenitic.

ENDURO 18-8 S-Ti.
M-97; 0.08 C, 2.0 Mn, 1.0 max Si, 17-19 Cr, 7-9 Ni, Ti = 5 × C, bal Fe.
Annealed: 85,000-90,000 TS, 35,000 YS; 55-50 El; 65 RA; 150-156 Brin.
For welded stainless structures where severe acid corrosion and high temperatures are encountered; stainless, corrosion resistant; Type 321.

ENDURO 18.8 Ti.
M-97; 0.16 max C, 0.6 max Mn, Ti, 0.75 max Si, 16.5-20.0 Cr, 7.0-10.5 Ni, 0.8 Mo, bal Fe.
Annealed: 80,000 TS; 35,000 YS, 65 El; 65 RA; 170 Brin.
For stainless parts, welded structures; stainless and heat resistant.

ENDURO 19-9 S-Mo.
M-97; 0.10 max C, 2 max Mn, 1 max Si, 18-20 Cr, 11-14 Ni, 3-4 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 165 Brin
For corrosion and heat resistant parts; corrosion resistant, high temperature strength, austenitic.

ENDURO 19-9S Ti.
M-97; 0.07 max C, 19 Cr, 9 Ni, Ti, bal Fe
For stainless parts; stainless.

ENDURO 20-10 S.
M-97; 0.08 max C, 19-21 Cr, 10-12 Ni, 0.2 max Mn, bal Fe.
Annealed: 85,000-95,000 TS; 40,000-60,000 YS, 45-50 El; 60 RA; 150 Brin.
For working electrodes and filler rods; heat and corrosion resistant.

ENDURO 20-23
M-97; 0.20 max C, 18-23 Cr, 0.50 max Si, bal Fe.
For stainless parts, still and condenser tubes, pump parts, fittings, valves; stainless, heat and corrosion resistant.

ENDURO 20-25.
M-97; 0.25 max C, 19-21 Cr, 24-26 Ni, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

ENDURO 201.
M-97; 0.15 max C, 5.5-7.5 Mn, 16-8 Cr, 3.5-5.5 Ni, 0.25 N, bal Fe.
Rolled: 115,000 TS, 55,000 YS; 55 El; 185 Brin.
For railroad car bodies; Type 201; stainless, austenitic.

ENDURO 202.
M-97; 0.15 max C, 7.5-10.0 Mn, 17-19 Cr, 4-6 Ni, 0.25 max N, bal Fe.
Rolled: 105,000 TS; 55,000 YS; 55 El; 185 Brin.
For kitchen utensils, storage and pasteurizing equipment; Type 202; stainless, austenitic.

ENDURO "A.A."
M-97; 0.12 max C, 14-18 Cr, 1.0 max Mn, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 60 RA; 163 Brin.
For valves, heat transfer parts, condenser tubes, nitrogen fixation apparatus, pumps; non-hardening, corrosion resistant; Type 430; heat resistant to 1400°F.

ENDURO AA-FM.
M-97; 0.12 max C, 14-18 Cr, 0.60 max Mo, 0.07 min P, S or Se, 0.60 max Mo or Zr, bal Fe.
Annealed: 80,000 TS; 55,000 YS; 25 El; 60 RA; 170 Brin.
Rolled: 90,000 TS; 80,000 YS; 15 El; 55 RA; 190 Brin.
For pump shafts, trim, oil burner parts, hardware, tanks, valves, screw machine parts; free machining, corrosion resistant.

ENDURO AA HIGH CARBON.
M-97; 0.9-1.2 C, 16-18 Cr, bal Fe.
Annealed: 125,000 TS; 90,000 YS; 10 El; 30 RA; 265 Brin.
Hardened: 240,000 TS; 200,000 YS; 5 El; 10 RA; 550 Brin.
For corrosion resistant parts, valves, bearings; corrosion and wear resistant; Type 440 C.

ENDURO AA-Ni.
M-97; 0.20 max C, 1 max Mn, 1 max Si, 15-17 Cr, 1.25-2.50 Ni, bal Fe.
Wire: 135,000 TS; 115,000 YS, 10 El; 50 RA; 290 Brin.
Bars: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For spring temper applications, corrosion resistant, Type 431.

ENDURO "F.C."
M-97, 0.15 max C, 1.25 max Mn, 12-14 Cr, 0.07 max P, 1 S, Se, 0.6 max Mo, Zr, bal Fe
Annealed: 75,000 TS, 40,000 YS, 30 El, 60 RA; 160 Brin
Hardened: 110,000 TS, 85,000 YS; 18 El, 55 RA, 230 Brin.
For turbine blades, valve stems, chemical engineering equipment, pump shafts, bushings, stainless, corrosion and heat resistant; free machining, Type 416

ENDURO "H.C."
M-97, 0.35 max C, 23-27 Cr, 1.0 max Mn, bal Fe.
Annealed: 80,000 TS; 45,000 YS, 25 El; 45 RA; 179 Brin.
For annealing boxes, glass molds, valves, fittings, rabble arms, furnace parts, stainless, corrosion resistant, resists heat to 1900°F; Type 446

ENDURO "H.C.N."
M-97; 0.20 max C, 20 max Mn, 1.0 max Si, 22-24 Cr, 12-15 Ni, bal Fe.
Annealed: 90,000 TS, 45,000 YS, 50 El, 60 RA; 170 Brin.
For furnace parts, oil refining and chemical plant equipment, skid rails; stainless, corrosion and heat resistant; resists heat to 1950°F.

ENDURO H.C.N. LOW CARBON.
M-97; 0.08 max C, 2 max Mn, 1 max Si, 22-24 Cr, 12-15 Ni, bal Fe
Annealed: 90,000 TS; 45,000 YS; 50 El; 60 RA; 170 Brin.
For furnace parts, skid rails, oil refining and chemical equipment; stainless and heat resistant to 1950°F.

ENDURO K.A.-2 F.M.
M-97; 0.1-0.2 C, 0.75-1.25 Mn, 16.5-20.0 Cr, 7.0-10.5 Ni, 0.4-0.6 Mo, bal Fe.
For stainless parts; stainless and heat resistant.

ENDURON.
M-494; 1.9 C, 1.9 Si, 0.06 P, 16 Cr, bal Fe.
Cast: 78,000 TS; 269-321 Brin.
For piston rings, cylinder liners; heat and abrasion resistant.

ENDURO NC-3.
M-97; 0.25 max C, 2.0 Mn, 1.5 Si, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS, 45,000 YS; 45 El; 65 RA; 183 Brin.
For retorts, valves, furnace parts, pump parts, rails, heat and corrosion resistant to 2000°F.

ENDURO S-1.
M-97; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Annealed: 65,000 TS; 35,000 YS; 35 El, 70 RA; 155 Brin.
Heat treated: 110,000 TS; 85,000 YS; 23 El; 65 RA; 225 Brin.
For cutlery, pump shafts, steam turbine parts, valve seats, rifle and revolver barrels; stainless and heat resistant; Type 410.

ENDURO S-1 ALUMINUM.
M-97; 0.08 max C, 11.5-13.5 Cr, 0.10-0.30 Al, bal Fe
Annealed: 65,000 TS; 40,000 YS; 25 El; 170 Brin.
Cold drawn: 85,000 TS; 70,000 YS, 20 El; 60 RA; 185 Brin.
For oil refining equipment; creep and heat resistant.

ENDURO S-1-Ni
M-97; 0.15 max C, 1 max Mn, 1 max Si, 11.5-13.0 Cr, 1.25-2.50 Ni, bal Fe
Heat treated: 210,000 TS, 105,000 YS; 15 El; 228 Brin
For heat treated springs; corrosion resistant, Type 414

ENDURO "S" HIGH CARBON.
M-97, 0.15 min C, 12-14 Cr, bal Fe
Annealed 95,000 TS, 50,000 YS, 25 El, 55 RA, 195 Brin
For corrosion resistant parts, valves, cutlery; corrosion resistant, Type 420

ENDURO "S" TURBINE QUALITY
M-97, 0.15 max C, 11.5-13.0 Cr, bal Fe
Annealed 70,000 TS; 40,000 YS; 30 El; 60 RA; 155 Brin
Hardened 110,000 TS; 85,000 YS; 20 El, 55 RA; 225 Brin
For turbine blades and parts; corrosion and heat resistant, Type 410

ENDWELDUR
M-653, 0.2 C, bal Fe.
Normalized: 55,000 TS
For chains.

ENDWELDUR 85.
M-653; 0.4 C, bal Fe
Normalized: 85,000 TS.
For chains.

ENDWELDUR 125
M-653; 0.4 C, 3.5 Ni, bal Fe.
Heat treated: 125,000 TS.
For chains.

ENEBRA BRONZE.
M-557; Sn, bal Cu.
For high static and dynamic parts, corrosion resistant.

ENEBRA EDELBRONZE NI.
M-557; Sn, bal Cu.
Sand cast: 50,000-65,000 TS; 21,000-36,000 YS; 30-20 El; 110-130 Brin.
For chemical industries; corrosion resistant.

ENEBRA EDELBRONZE TO.
M-557; Sn, bal Cu.
Sand cast: 71,000-85,000 TS; 26,000-36,000 YS; 30-20 El; 120-150 Brin.
For chemical and textile industries; corrosion resistant.

ENEBRA EDELBRONZE TU-I.
M-557; Sn, bal Cu.
Sand cast: 92,000-107,500 TS; 43,000-56,000 YS; 15-8 El; 150-190 Brin.
For chemical and textile industries, corrosion resistant.

ENEBRA EDELBRONZE TU-II.
M-557; Sn, bal Cu.
Sand cast: 78,500-92,000 TS; 28,000-43,000 YS, 30-20 El; 120-150 Brin
For chemical and textile industries; corrosion resistant.

ENEBRA LAGERBRONZE B-33
M-557; Sn, bal Cu.
For machine parts, automobile and diesel engine parts, high strength.

ENEBRA LAGERBRONZE BZ-20.
M-557, Sn, bal Cu.
For machine parts, automobile and diesel engine parts, high strength.

ENEBRA LAGERBRONZE BZ-25.
M-557; Sn, bal Cu.
For machine parts, automobile and diesel engine parts, high strength

ENEBRA LAGERBRONZE PN.
M-557, Sn, bal Cu.
36,000-51,000 TS; 23,000-28,000 YS, 18-10 El, 70-90 Brin
For pump parts, corrosion resistant

ENEBRA SONDERMESSINGE S-IM
M-557, Zn, bal Cu
78,400-93,000 TS; 36,000-43,000 YS, 15-10 El 130-160 Brin.
For general construction

ENEBRA SONDERMESSINGE S-IIM.
M-557, Zn, bal Cu
56,000-72,000 TS, 19,000-25,000 YS; 35-25 El, 90-120 Brin
For general construction

ENEBRA SPEZIALBRONZE EH-I.
M-557; Sn, bal Cu
85,000-100,800 TS, 36,000-50,000 YS; 15-10 El, 150-180 Brin
For electrical industries.

ENEBRA SPEZIALBRONZE EH-II.
M-557; Sn, bal Cu
72,000-85,000 TS, 28,000-36,000 YS; 25-15 El; 130-150 Brin
For electrical industries

ENEBRA SPEZIALBRONZE EH-III.
M-557, Sn, bal Cu.
72,000-78,500 TS, 25,000-31,000 YS, 30-20 El; 110-130 Brin
For electrical industries.

ENGALOY 129
M-686; 60 Pd, 40 Ni.
For brazing electronic components.
M P. 2260°F Eutectic alloy Good wetability.

ENGALOY 135
M-686; 21 Pd, 48 Ni, 31 Mn.
Shear strength: 38,000 at 1250°F and 20,000 at 1500°F and 50,000 At R.T.
For brazing electronic components.
Eutectic alloy. Melting point 2050°F. Good wetability and ductility.

ENGALOY 142.
M-686; 60 Pd, 39.8 Ni, 0.05 B, 0.15 Li.
For brazing electronic components.
M.P. 1630°F. Eutectic alloy.
Good wetability and ductility.

ENGALOY 238.
M-686; 80 Au, 20 Cu.
Annealed: 67,200 TS; 17 El.
For brazing electronic components.
M.P. 1630°F. Eutectic alloy. Good wetability and ductility.

ENGALOY 241.
M-686; 50 Au, 50 Cu.
Annealed wire: 77,800 TS; 32 El.
For brazing filler metal for electronic applications.
M.P. 950-975°C.

ENGALOY 242.
M-686; 37.5 Au, 62 5 Cu.
Annealed. 53,400 TS, 35 El.
For brazing electronic components.
M.P. 1814-1859°F.
Good wetability and ductility.

ENGALOY 243.
M-686; 35 Au, 62 Cu, 3 Ni.
Annealed: 93,700 TS; 9 El
For brazing electronic components.
M P 1787-1886°F. Good wetability and ductility

ENGALOY 255.
M-686, 82 Au, 18 Ni.
Annealed 100,800 TS; 5 El.
For brazing electronic components
M P. 1742°F. Eutectic alloy Good wetability and ductility

ENGALOY 259.
M-686; 94 Au, 6 Cu.
Annealed wire: 39,600 TS; 31 El.
For brazing filler metal for electronic applications
M P. 965-990°C.

ENGALOY 260.
M-686; 35 Au, 65 Cu
Annealed: 53,900 TS; 40 El.
For brazing electronic components.
M P 1832-1870°F. Good wetability.

ENGALOY 261
M-686; 75 Au, 5 Ag, 20 Cu.
Annealed wire: 78,900 TS, 36 El.
Uses: Brazing alloy for electronic components
M.P. 1625-1640°F. Good wetability and ductility.

ENGALOY 265.
M-686, 72 Au, 22 Ni, 6 Cr.
Uses: Brazing alloy for electronic components.
M P. 1785-1835°F.
Good wetability and ductility.

ENGALOY 269.
M-686; 81.5 Au, 15.5 Cu, 3 Ni
Annealed: Wire 90,000 TS; 25 El.
For brazing filler metal for electronic applications.
M.P 900-910°C.

ENGALOY 428.
M-686; 5 Pd, 95 Ag.
Annealed wire. 31,500 TS; 28 El
Uses. Brazing alloy for electronic components.
M.P. 1780-1850°F.
Good wetability and ductility.

ENGALOY 431.
M-686; 10 Pd, 90 Ag.
Annealed wire: 31,600 TS; 44 El
For brazing alloy for electronic components
M.P. 1835-1950°F.
Good wetability and ductility.

ENGALOY 440.
M-686; 20 Pd, 75 Ag, 5 Mn.
Shear strength of 19,000 at 1250°F and 14,000 at 1500°F.
For brazing electronic components.
M.P. 1830-2050°F. Good wetability.

ENGALOY 441.
M-686; 33 Pd, 64 Ag, 3 Mn.
Shear strength of 27,000 at 1250°F and 18,000 at 1500°F
For brazing electronic components.
M.P. 2100-2190°F. Good wetability.

ENGALOY 447
M-686, 20 Pd, 80 Ag.
Annealed wire: 39,000 TS, 34 El
For brazing alloy for electronic components.
M.P. 1960-2150°F.
Good wetability and ductility

ENGALOY 478.
M-686; 5 Pd, 68 Ag, 27 Cu
Annealed wire. 65,100 TS, 23 El.
For brazing alloy for electronic components.
M.P 1480-1490°F
Good wetability and ductility.

ENGALOY 485
M-686, 30 Pd, 70 Ag.
Uses: Brazing alloy for electronic components.
M.P. 2120-2250°F. Good wetability and ductility.

ENGALOY 490
M-686, 15 Pd, 65 Ag, 20 Cu
Annealed wire 68,300 TS, 20 El
Uses. Brazing alloy for electronic components
M P Brazing alloy for electronic components
M.P. 1565-1650°F
Good wetability and ductility.

ENGALOY 491
M-686, 10 Pd, 58 Ag, 32 Cu
Annealed wire 69,500 TS, 22 El
Uses. Brazing alloy for electronic components.
M.P. 1520-1565°F
Good wetability and ductility.

ENGALOY 492.
M-686, 25 Pd, 54 Ag, 21 Cu
Annealed wire 73,000 TS, 15 El.
Uses Brazing alloy for electronic components.
M P 1650-1740°F.
Good wetability and ductility.

ENGALOY 493
M 686, 20 Pd, 52 Ag, 28 Cu
Annealed wire 71,700 TS, 25 El.
Uses Brazing alloy for electronic components.
M P 1615-1650°F Good wetability and ductility

ENGALOY 845.
M-686; 84.6 Ag, 7.5 Cu, 2 2 Pb, 5.5 In, 0 2 Li.
For brazing electronic components.
M P. 1400-1615°F
Good wetability and ductility.

ENGALOY EI 14597.
M-686, 55 Cu, 20 Pd, 15 Ni, 10 Mn.
Shear strength: 27,000 at 1000°F, 21,000 at 1250°F and 18,000 at 1500°F
For brazing electronic components
M.P. 1940-2020°F.
Good wetability and ductility.

ENGELHARD ALLOY NO 18
M-18; 75 Pt, 25 Ir.
For thermocouple wire, magnetos, electrical contacts, thermostats, lab. ware, surgical tools, voltage regulators, potentiometer wire, jewelry.

ENGELHARD ALLOY NO 26.
M-18; 70 Pt, 30 Ir.
For thermocouple wire, magnetos, electrical contacts, thermostats, lab. ware, surgical tools, voltage regulators, potentiometer wire, jewelry.

ENGELHARD ALLOY NO 109.
M-18, 90 Pt, 10 Ir
For thermocouple wire, magnetos, electrical contacts, thermostats, lab ware, surgical tools, voltage regulators, potentiometer wire, jewelry.

ENGELHARD ALLOY NO 141.
M-18; 6 Pt, 69 Au, 25 Ag.
For electrical contacts

ENGELHARD ALLOY NO 158.
M-18, 85 Pt, 15 Ir
For thermocouple wire, magnetos, electrical contacts, thermostats, lab ware, surgical tools, voltage regulators, potentiometer wire, jewelry.

ENGELHARD ALLOY NO 190
M-18, 3 Pt, 97 Ag
For electrical contacts

ENGELHARD ALLOY NO 208
M-18; 80 Pt, 20 Ir
For thermocouple wire, magnetos, electrical contacts, thermostats, lab ware, surgical tools, voltage regulators, potentiometer wire, jewelry.

ENGELHARD ALLOY NO 349
M-18; 75 Pd, 25 Ag
For hydrogen purification

ENGELHARD ALLOY NO 430
M-18, 95 Pt, 5 Ru
For contact material, resistance wire, jewelry

ENGELHARD ALLOY NO 661
M-18, 60 Pd, 40 Cu
For sliding contacts and slip rings

ENGELHARD ALLOY NO 1453
M 18, 50 Pd, 50 Ag
Dental material

ENGELHARD ALLOY NO 1560.
M-18, 10 Pt, 35 Pd, 10 Au, 30 Ag, 14 Cu, 1 Zn
For electrical contacts.

ENGELHARD ALLOY 1751
M 18; 23.2 Co, 76.8 Pt
Bar: C 26 Rock; 9,500,000 (BH) max, 6450 Br, 4300 Hc, 3770 Bo
For permanent magnets in watches, electrical and magnetic instruments
Ductile, high coercive force

ENGELHARD ALLOY NO 1990
M-18, 40 Pd, 60 Au.
For thermocouples, resistance wire.

ENGELHARD ALLOY NO 2006
M-18, 100% Ag
For solder, electrical contacts, chemical processing equipment

ENGELHARD ALLOY NO 2246.
M-18; 90 Pt, 5 Pd, 5 Rh
For nitric acid catalyst.

ENGELHARD ALLOY NO 2576.
M-18, 30 Pt, 70 Au.
For spinnerettes.

ENGELHARD ALLOY NO 3004.
M-18, 100% Au
For chemical equipment.

ENGELHARD ALLOY NO 3947.
M-18; 75 Au, 12 Ag, 13 Cu.
18 K gold jewelry.

ENGELHARD ALLOY NO 4
M-18; 100% Ir.
For crucibles, spark plug electro
temperature apparatus.

ENGELHARD 4556
M-237, M-1036; 1.7 Mg, bal Ag
Annealed: 46,000 TS; 15 El, Rock (30T)
Cold Drawn: 62,000 TS, 5 El; Rock (30T) 6
For secondary emitter in television camera tubes.
Elect. cond. 35 annealed, 32 cold rolled

ENGELHARD ALLOY NO 5009.
M-18, 100% Os
Alloying element for: pen nibs, record player needles, electrical contacts and instrument pivots

ENGELHARD ALLOY NO 5033
M-18, 75 Au, 18.5 Ni, 1 Cu, 5.5 Zn
18 K white gold jewelry

ENGELHARD ALLOY NO 5124
M-18, 4 Pt, 26 Pd, 25 Au, 28 Ag, 16 Cu, 1 Zn.
Dental material.

ENGELHARD ALLOY NO 5330.
M-18, 13.95 Pt, 83 Pd, 3.05 Au
For thermocouple wire

ENGELHARD ALLOY NO 5355
M-18, 31.4 Pt, 55 Pd, 13.6 Au
For thermocouple wire.

ENGELHARD ALLOY NO 6007
M 18, 100% Pd
For telephone relay contacts

ENGELHARD ALLOY NO 6031
M-18, 92 Pt, 8 W.
For spark plug electrodes, electrical contacts, strain gages

ENGELHARD ALLOY NO 6346
M 18, 56.25 Au, 24.96 Cu, 12.64 Ni, 6.15 Zn
14 K jewelry alloy

ENGELHARD ALLOY NO 6361.
M-18; 56.25 Au, 8.75 Ag, 30.63 Cu, 4.37 Zn
14 K jewelry alloy

ENGELHARD ALLOY NO 6395
M-18, 97 Pt, 3 Ru
For contact material, resistance wire, jewelry

ENGELHARD ALLOY NO 6429
M-18, 72.9 Au, 16.1 Ag, 11 Cu
For electrical contacts

ENGELHARD ALLOY NO 6551
M-18, 85 Pt, 15 Ni.
For cathode emitter wire.

ENGELHARD ALLOY NO 7005
M 18, 100% Rh
For plated reflectors, sliding electrical contact plate, jewelry plate

ENGELHARD ALLOY NO 7070
M-18, 95 Pt, 5 Au.
For electrical ribbon, spinnerettes, brazing wire, lab ware

ENGELHARD ALLOY NO 7146.
M-18; 70 Pt, 30 Rh.
For thermocouples, resistance heaters, spinnerettes, glass manufacturing, nitric acid catalyst.

ENGELHARD ALLOY NO 7450
M-18; 95 Pt, 5 Rh
For thermocouples, resistance heaters, spinnerettes, glass manufacturing, nitric acid catalyst.

ENGELHARD ALLOY NO 7500, 7526, 7542.
M-18; 90 Pt, 10 Rh.
For thermocouples, resistance heaters, spinnerettes, glass manufacturing, nitric acid catalyst.

ENGELHARD ALLOY NO 7609; 11,775.
M-18; 80 Pt, 20 Rh.
For thermocouples, resistance heaters, spinnerettes, glass manufacturing, nitric acid catalyst.

ENGELHARD ALLOY NO 7658.
M-18; 91 Pt, 9 W.
For spark plug electrodes, electrical contacts, strain gages.

ENGELHARD ALLOY NO 7674.
M-18; 34.95 Pd, 65.05 Au.
For thermocouple wire.

ENGELHARD ALLOY NO 7872.
M-18; 90 Pt, 10 Ru.
For contact material, resistance wire, jewelry.

ENGELHARD ALLOY NO 8003.
M-18; 100% Ru.
Hardener for Pt and Pd; alloyed with 90% Pt for aircraft magneto contacts.

ENGELHARD ALLOY NO 8227.
M-18; 75 Au, 22 Ag, 3 Ni.
For thermostats

ENGELHARD ALLOY NO 8318.
M-18; 92 Pd, 8 W.
Potentiometer resistor wire

ENGELHARD ALLOY NO 8383.
M-18; 60 Pt, 40 Rh.
For thermocouples, resistance heaters, spinnerettes, glass manufacturing, nitric acid catalyst.

ENGELHARD ALLOY NO 8391.
M-18; 95.5 Pd, 4.5 Ru
For electrical contacts, jewelry

ENGELHARD ALLOY NO 8904.
M-18, 96 Pt, 4 Ru.
For contact material, resistance wire, jewelry.

ENGELHARD ALLOY NO 8938.
M-18; 94 Pt, 6 Ru.
For contact material, resistance wire, jewelry.

ENGELHARD ALLOY NO 8961.
M-18, 87 Pt, 13 Rh.
For thermocouples, resistance heaters, spinnerettes, glass manufacturing, nitric acid catalyst

ENGELHARD ALLOY NO 8987.
M-18; 93.5 Pd, 6.5 Ru.
For resistor wire, white jewelry alloy.

ENGELHARD ALLOY NO 9001.
M-18; 100% Pt.
For electrical contacts, thermocouples, resistance thermometers, metal to glass seals, lab. ware, cathodic protection.

ENGELHARD 15065.
M-237; M-1036; 0.2 Mg, 0.20 Ni, bal Ag.
Annealed: 32,000-38,000 TS; 12-27 El; 75 Knoop Hard.
Hardened: 68,000-74,000 TS; 2-6 El; 169 Knoop Hard.
For springs, switches, relays.
Oxidation hardened. Good spring properties. 75% elec. cond. as hardened.

ENGELHARD 16527.
M-237, M-1036; 0.15 Mg, 0.20 Ni, bal Ag.
Annealed: 28,000-34,000 TS; 20-38 El; 82 Knoop.
Hardened: 58,000-64,000 TS; 9-16 El; 143 Knoop.
For springs, switches.
Oxidation hardened.
75% elec. cond. as hardened.

ENGELHARD ALLOY NO 17632.
M-18; 8.5 Pt, 72.5 Au, 4.75 Ag, 14 Cu, 0.25 Zn.
For electrical contacts.

ENGELHARD ALLOY NO 19182.
M-18; 77.7 Pt, 22.3 Co.
For magnets.

ENGINEERING.
M-472; 0.18-0.25 C, 12-14 Cr, bal Fe.
Heat treated. 100,000-200,000 TS; 8-20 El; 201-460 Brin.
For hydraulic and steam equipment, valves, valve seats, corrosion resistant; Type 420.

ENGLISH-1
Eng.; 61.3 Cu, 19.1 Zn, 19.1 Ni.
For knives, forks, etc for silver plating; nickel silver.

ENGLISH-2.
Eng ; 70.3 Cu, 29.3 Zn, 0.17 Sn, 0.26 Pb.
For hardware; free-cutting.

ENGLISH ALLOY
Eng.; 53 Sn, 33 Pb, 11 Sb, 2.4 Cu, 1 Zn.
For bearings, bushings, Babbitt.

ENGLISH B.M.
England, 80 Zn, 14.5 Sn, 5.5 Cu.
For bearings; will not resist heat or live steam.

ENGLISH BRASS
Eng.; 70 Cu, 29 Zn, 0.3 Pb, 0.2 Sn
For hardware, novelties; free-cutting

ENGLISH GERMAN SILVER
Eng ; 59.4 Cu, 25 Zn, 13 Ni, 3 Fe.
For ornamental parts, corrosion resistant

ENGLISH LINOTYPE.
Eng.; 83 Pb, 5 Sn, 12 Sb.
For type metal for linotype machines

ENGLISH PENNY BRONZE
England; 3 Sn, 1.5 Zn, bal Cu
For springs, corrosion resistant.

ENGLISH PEWTER.
Eng.; 81.2 Sn, 5.7 Sb, 1.6 Cu, 11.5 Pb.
For bearings, ornaments, household utensils; corrosion resistant.

ENGLISH PHOSPHOR BRONZE.
England; 10 Sn, 9.6 Pb, 1 P, bal Cu.
For bearings, gear wheels; heavy duty

ENGLISH SPECULUM.
Eng.; 67 Cu, 33 Zn.
For deep drawing, spinning, stamping; high ductility.

ENGLISH STEREOTYPE (STANDARD).
Eng , 82.5 Pb, 4.5 Sn, 13 Sb.
For type metal.

ENGLISH TYPE METAL (A).
Eng.; 63.2 Pb, 12 Sn, 24 Sb, 0.8 Cu
For type metal.

ENGLISH TYPE METAL (B).
Eng.; 60.5 Pb, 14.5 Sn, 24.2 Sb, 0.8 Cu.
For type metal.

ENGLISH TYPE METAL "D."
Eng.; 58 Pb, 15 Sn, 26 Sb, 1.0 Cu.
For type metal.

ENGLISH TYPE METAL "E."
Eng.; 77.5 Pb, 6.5 Sn, 16 Sb.
For type metal.

ENGLISH TYPE METAL OLD "C."
Eng.; 69.2 Pb, 9.1 Sn, 19.5 Sb, 1.7 Cu.
For type metal.

ENGRAVER PLATE.
M-38; 0.35 C, bal Fe.
For engraver's plates.

ENGRAVER'S BRASS.
U.S.; 66 Cu, 33 Zn, 1 Pb.
For engravings; free-cutting.

ENGRAVER'S BRASS.
M-102; 62.5-64.5 Cu, 1.5-2.5 Pb, bal Zn.
Annealed: 45,000 TS; 50 El.
Hard: 73,000 TS; 7 El.
For gears, watch and clock backs; free cutting.

ENGRAVERS BRASS 63.
M-141; 65.5 Cu, 33.4 Zn, 1.1 Pb.
Hard: 74,000 TS; 60,000 YS; 7 El; 150 Brin.
Soft: 49,000 TS; 17,000 YS; 54 El; 61 Brin.
For engraved items, dials; brass.

"E" NICKEL replaced by **NICKEL 212.**

ENORM S.
M-1339; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, drills, reamers; high speed steel.

ENTECROD 192
M-717; Cd, Ag alloy.
Cast. 11,000 TS
For solder, hard, 650-700°F bonding temperature.

EPCO-OIL HARD
M-781; 1.0 C, 0.5 Cr, 1.0 Mn, 0.5 W, bal Fe.
For dies, gauges, master tools, non-deforming.

EPCO-WATER HARD.
M-781; 1.05 C, 0.25 Mn, bal Fe.
For blanking forming, and trimming dies; water hardened

ERA 59.
M-62, 0.25-0.40 C, 1.3-1.8 Mn, 0.20-0.35 Mo, bal Fe
Bar. 100,000-145,000 TS; 72,000-112,000 YS, 16-22% El; 201-341 Brin.
For gears, crankshafts, fasteners, bolts
Water harden, shock resistant

ERA 60 M
M-62; 0.18 C, 0.05-0.35 Si, 1.1-1.5 Mn, 0.10-0.18 S, 0.05 max P, bal Fe.
Bar: 90,000 TS, 20 El, 52,000 YS; 190 Brin.
Annealed. 62,000 TS; 40,000 YS; 32 El, 121 Brin
Heat treated: 102,000 TS, 74,000 YS, 26 El; 269 Brin.
For gears, bolts, cams, camshafts, bushings, clips, jaws, fasteners.
SAE 1118 case hardening steel. Free-cutting, shock resistant.

ERA 131.
M-62; C, Mo, Cr, Cu, bal Fe.
For tubes for steam turbines; creep resistant.

ERA 156.
M-62, 0.30-0.40 C, 1.3-1.8 Mn, 0.35-0.55 Mo, bal Fe.
Bar: 100,000-145,000 TS; 72,000-112,000 YS; 16-22% El; 201-341 Brin
For gears, shafts, axles, bolts, crankshafts, countershafts
Oil hardening, shock resisting.

ERA 165.
M-62; 0.15-0.25 C, 1.4-1.8 Mn, 0.4-0.7 Ni, 0.15-0.35 Mo, bal Fe.
Bar: 90,000 TS; 60,000 YS; 22% El; 200 Brin.
For gears, bolts, fasteners, shafts.
Oil or water harden.

ERA 171.
M-62; 0.30-0.50 C, 2.5-3.5 Cr, 0.40 max Ni, 0.70-1.20 Mo, 0.10-0.30 V, bal Fe.
Oil hardened: 190,000 TS; 152,000 YS; 10% El.
For gears, bolts, cams, camshafts, rolls.
Nitriding steel, wear and abrasion resistant.

ERA 1414.
M-62; C, 14 Cr, 14 Ni, W, bal Fe.
For exhaust valves; heat resistant.

ERA 7393.
M-62; C, 18 Cr, 8 Ni, Mo, W, Ti, bal Fe.
For gas turbine rotors, blades; heat resistant.

ERA 16356 see **ERA H R 7.**

E.R.A. "A.T.V."
Eng.; 13.4 Cr, 22.6 Ni, 3.3 W, 1.5 Mn, 1.8 Si, bal Fe.
For heat and corrosion resisting parts; stainless and corrosion resistant.

ERA A.T.V
M-62, 0.3 C, 14 Cr, 28 Ni, 4 W, 1.5 Mn, 1.8 Si, bal Fe.
108,000 TS; 60,000 YS; 25 El; 45 RA.
For high duty I.C. engine valves, supercharger rotors; heat resisting.

ERA BORON 1.
M-62; 0.10 C, 0.5 Si, 0.3 Mn, 1.0 B, bal Fe.
For nuclear reactors; for neutron absorption

ERA BORON 2.
M-62, 0.10 C, 0.5 Si, 0.3 Mn, 2.0 B, bal Fe.
For nuclear reactors; for neutron absorption.

ERA BORON 3
M-62, 0.10 C, 0.5 Si, 0.3 Mn, 3.0 B, bal Fe
For nuclear reactors, for neutron absorption.

ERA BORON 4
M-62, 0.10 C, 0.5 Si, 0.3 Mn, 4.0 B, bal Fe.
For nuclear reactors; for neutron absorption.

ERA C R 2.
M-62; C, 20 Cr, 8 Ni, Cu, W, bal Fe.
For impellers, castings; stainless

ERA C R 3
M-62, C, 10 Cr, 20 Ni, Cu, W, bal Fe.
For stainless parts, corrosion resistant.

ERA CR4
M-62, 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed. 95,000 TS, 45,000 YS; 50 El; 60 RA, 190 Brin.
For acid resistant parts, chemical plant equipment; Type 316, stainless, austenitic

ERA CR4S
M-62; 0.10 C, 18 Cr, 9 Ni, 2 Mo, Ti, bal Fe.
Annealed. 95,000 TS; 45,000 YS; 50 El; 60 RA, 190 Brin
For chemical plant equipment; Type 316Ti, stainless, austenitic.

ERA C R BORON.
M-62; 0.08 C, 0.5 Si, 0.3 Mn, 2-4 B, 18 Cr, 10 Ni, bal Fe.
For nuclear reactors; for neutron absorption

ERA C.R I.
M-62, 0.1 C, 18 Cr, 8 Ni, 0.5-1.5 Mn, bal Fe.
88,000-132,000 TS, 66,000-88,000 YS; 75-37 El; 150-230 Brin
For domestic utensils, fittings, chemical plant equipment; corrosion resistant; austenitic

ERA C R.I.L.
M-62; 0.08 C, 18 Cr, 8 Ni, bal Fe.
For chemical equipment; austenitic, stainless.

ERA C.R.I.S.
M-62; 0.1 C, 18 Cr, 8 Ni, 0.1 Ti, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El; 60 RA; 175 Brin.
For chemical equipment, welded structures; Type 321; austenitic, stainless.

ERA C.R.I.S. (Cb).
M-62; C, 18 Cr, 8 Ni, Cb, bal Fe.
For stainless equipment to be welded; stabilized.

ERA H.R.-1.
M-62; 22 Cr, 0.7 Ni, 0.2 Si, 0.4 W, 0.2 C, bal Fe.
At 20°C: 130,000 TS; 85,000 YS; 37 El, 37 RA; 200 Brin.
At 700°C: 69,000 TS, 35 El, 57 RA.
At 1000°C: 45,000 TS; 30 El; 64 RA.
For engine valves, crucibles, furnace conveyors, dredger parts, carburizing boxes,
corrosion resisting, stainless; range of alloys.

ERA HR2.
M-62; 0.25 C, 21 Cr, 7 Ni, 1.5 Si, bal Fe.
Annealed: 85,000 TS; 42,000 YS; 45 El; 60 RA; 180 Brin.
For furnace parts, heat treat boxes,
heat and corrosion resistant.

ERA HR3
M-62; 0.2 max C, 25 Cr, 20 Ni, bal Fe.
Annealed: 95,000 TS, 45,000 YS; 50 El; 65 RA; 180 Brin.
For furnace parts, heat treat boxes,
engine components; Type 310, austenitic,
heat resistant.

ERA H.R 4.
M-62; C, 28 Cr, bal Fe.
For heat resistant castings, resists scaling to 1150°C.

ERA H.R. 5.
M-62, C, 12 Cr, 60 Ni, bal Fe.
For high temperature equipment, heat resistant.

ERA H.R. 6
M-62; C, 25 Cr, 12 Ni, bal Fe.
For furnace parts, heat resistant to 1050°C in S atm.

ERA HR7.
M-62; 0.3 C, 15 Cr, 35 Ni, bal Fe.
Cast: 70,000 TS; 40,000 YP; 10 El, 170 Brin.
At 1600°F; 22,000 TS; 28 El; 36 RA.
For carburizing boxes, trays, furnace parts, grills.
Oxidation and heat resistant

ERA H.R.I.S
M-62; 21 Cr, 7 Ni, 3.5 Si, bal Fe.
For heat resistant castings; heat resistant.

"ERA" MANGANESE STEEL.
M-62; 1.25 C, 11-14 Mn, bal Fe
85,000-100,000 TS; 60-80 El.
For crushers, dredging machines, soldiers helmets; wear resisting; non-magnetic.

ERAYDO.
M-226, M-240; 1-3 Cu, 0.03-0.1 Ag, bal Zn.
Rolled: 30,000-50,000 TS; 12,000-22,000 YS; 40-15 El.
For panels, indoor trim, electrical appliances, drawn cases; rustless, non-magnetic.

ERCO.
M-1425; 0.8 C, bal Fe.
For dies to resist alternate heating and cooling; water hardened.

ERFTAL.
Germany; 0.04 Fe, 99.9 Al.
For reflectors; a high gloss mill aluminum.

ERGAL 55.
M-541; M-1220; M-1283; 5.8 Zn, 2.5 Mg, 1.6 Cu, 0.2 Mn, 0.15 Cr, 0.08 Ti, bal Al.
TA-Temper: 90,000 TS; 80,000 YS; 6 El; 160 Brin.
For cast aircraft components, hardware.
Self-aging, high strength cast alloy.

ERGAL 60.
M-1220, M-1283, 6.8 Zn, 2.5 Mg, 1.6 Cu, 0.1 Ti, 0.2 Mn, 0.15 Cr, bal Al.
Cast.
For aircraft castings; self-aging.

ERGAL 65.
M-541, M-1220, M-1283; 7.8 Zn, 2.5 Mg, 1.6 Cu, 0.2 Mn, 0.15 Cr, 0.1 Ti, bal Al.
TA-Temper: 82,000-96,000 TS; 72,000-85,000 YS; 4-9 El; 150-180 Brin
For cast aircraft components.
Self-aging, high strength cast alloy.

ERGALPLAT 65
M-541; 1.5-1.7 Cu, 2.5 Mg, 0.2 Mn, 8 Zn, bal Al.
R-Temper: 27,000-37,000 TS, 23,000 YS, 8-20 El.
TA-Temper: 80,000-94,000 TS; 71,000-85,000 YS; 4-14 El.
For aircraft constructional parts; self-aging
Heat and corrosion resistant.
High strength and fatigue resistant

ERGES 4.
M-1368; 0.6-1.4 Mg, 0-1.6 Si, 0.6-1.0 Mn, 0-0.3 Cr, bal Al.
For chemical equipment, corrosion resistant

ERGSTE 13
M-1333, 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El, 70 RA; 155 Brin
Cold drawn: 100,000 TS, 85,000 YS, 17 El; 60 RA; 205 Brin
For turbine blades, valve trim, chemical plant equipment, Type 410; corrosion resistant.

ERGSTE 17.
M-1333; 0.8 C, 17 Cr, bal Fe.
Annealed 107,000 TS, 62,000 YS, 18 El, 35 RA, 220 Brin
Heat treated: 280,000 TS; 270,000 YS, 3 El; 15 RA, 555 Brin.
For bearings, valves, surgical instruments;
Type 440B, corrosion resistant, hardenable

ERGSTE 17L.
M-1333; 0.10 C, 17 Cr, 2 Mo, bal Fe
Annealed. 125,000 TS, 95,000 YS; 20 El, 55 RA; 260 Brin.
For chemical plant equipment, corrosion resistant.

ERGSTE 17LT.
M-1333, 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe
Annealed 130,000 TS, 98,000 YS, 20 El; 53 RA, 260 Brin
For chemical plant welded structures;
corrosion resistant, stabilized

ERGSTE 17T.
M-1333; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe
Annealed: 130,000 TS; 98,000 YS; 20 El; 53 RA; 260 Brin
For chemical plant welded equipment;
corrosion resistant, stabilized.

ERGSTE 17U.
M-1333; 0.12 max C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 160 Brin.
For screw machine products, chemical plant equipment; Type 430F; corrosion resistant.

ERGSTE 25L.
M-1333; 0.15 C, 16 Cr, 0.2 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS;
25 El; 50 RA; 160 Brin.
For screw machine products, chemical plant equipment; Type 430F; corrosion resistant.

ERGSTE 80K.
M-1333; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA;
150 Brin.
For chemical plant equipment, tanks;
Type 302; stainless, austenitic.

ERGSTE 80P.
M-1333, 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 60 El; 70 RA;
150 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El;
330 Brin.
For chemical plant equipment, welded tanks, mixers;
Type 304, stainless, austenitic.

ERGSTE 80S.
M-1333; 0.1 max C, 18 Cr, 8.5 Ni, bal Fe
Annealed: 85,000 TS; 35,000 YS, 60 El; 70 RA,
150 Brin.
Cold drawn: 180,000 TS; 125,000 YS, 10 El,
330 Brin
For chemical plant equipment, welded tanks, mixers,
Type 304, stainless, austenitic.

ERGSTE 80T.
M 1333, 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C,
bal Fe.
Annealed 85,000 TS, 35,000 YS; 55 El,
65 RA, 150 Brin.
Cold drawn 95,000 TS; 60,000 YS; 40 El; 60 RA;
185 Brin
For welded structures, chemical plant equipment;
Type 321, stainless, austenitic.

ERGSTE 80U.
M-1333, 0.12 C, 8.5 Ni, 18 Cr, bal Fe
Annealed: 80,000 TS; 35,000 YS; 55 El, 75 RA;
150 Brin.
For chemical plant equipment, fasteners,
Type 302, stainless, austenitic

ERGSTE 80X.
M-1333; 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C,
bal Fe
Annealed 90,000 TS, 35,000 YS, 56 El,
65 RA; 160 Brin.
Cold drawn. 100,000 TS, 65,000 YS; 40 El; 60 RA,
202 Brin
For welded structures, chemical plant equipment;
Type 347, stainless, austenitic

ERGSTE 82P.
M-1333; 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe
Annealed. 80,000 TS; 35,000 YS; 55 El;
70 RA; 150 Brin.
Cold drawn: 140,000 TS, 130,000 YS; 7 El;
280 Brin.
For acid resistant equipment, mixers, agitators;
Type 316L; stainless, austenitic.

ERGSTE 82RT.
M-1333; 0.05 C, 18 Cr, 10 Ni, Cu, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El, 70 RA;
150 Brin.
For chemical plant equipment; stainless, austenitic.

ERGSTE 82S.
M-1333; 0.1 max C, 18 Cr, 9.5 Ni, 2 Mo, bal Fe
Annealed: 85,000 TS; 35,000 YS;
50 El; 65 RA; 160 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El;
300 Brin.
For acid resistant equipment, mixers, agitators;
Type 316; stainless, austenitic.

ERGSTE 82T.
M-1333; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo,
Ti × 4 = C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA;
160 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El;
300 Brin.
For welded acid resistant equipment; Type 316Ti;
stainless, austenitic.

ERGSTE 82X.
M-1333; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo,
Cb = 8 × C, bal Fe
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA;
160 Brin
Cold drawn: 150,000 TS; 135,000 YS, 6 El,
300 Brin.
For welded acid resistant equipment;
Type 316Cb; stainless, austenitic.

ERGSTE 120.
M-1333; 0.10 max C, 12.5 Cr, 13 Ni, bal Fe
For chemical plant equipment, corrosion resistant

ERGSTE 135P.
M 1333; 0.07 C, 17 Cr, 13 Ni, 2 Mo, bal Fe
Annealed: 85,000 TS; 35,000 YS, 50 El,
65 RA; 160 Brin.
Cold drawn: 150,000 TS; 135,000 YS,
6 El; 300 Brin
For acid resistant equipment, mixers, agitators;
Type 316; stainless, austenitic.

ERGSTE 182RT
M-1333; 0.07 max C, 17.5 Cr, 17.5 Ni, 2 Mo, 2 Cu,
Ti = 7 × C, bal Fe.
Annealed 85,000 TS; 35,000 YS; 50 El, 65 RA;
160 Brin
For welded acid resistant, equipment, tanks, mixers,
stainless, austenitic, stabilized.

ERGSTE CN20.
M-1333, 0.13 C, Cr, Mo, bal Fe
For gears, cams, camshafts; case hardening, tough.

ERGSTE CN30.
M-1333; 0.15 C, Ni, Cr, bal Fe.
For gears, bolts, machine tool parts;
case hardening, tough

ERGSTE CN60
M-1333, 0.15 C, Ni, Cr, bal Fe.
For gears, bolts, machine tool parts; case hardened,
shock resistant.

ERGSTE CN80.
M-1333; 0.15 C, Ni, Cr, bal Fe.
For gears, bolts, machine tool parts,
case hardened, shock resistant.

ERGSTE E110S.
M-1333; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS, 58,000 YS; 18 El; 40 RA;
210 Brin.
For springs, tools, drills, taps, reamers;
Type W1; water hardened.

ERGSTE ESCV110.
M-1333, 1.15 C, 0.65 Cr, 0.1 V, 0.3 Mn, bal Fe.
For bearings, bushings, cutters; oil hardened, tough.

ERGSTE ESWV.
M-1333; 1.2 C, 0.20 Cr, 0.1 V, 1.0 W, bal Fe.
For forming dies, shears; oil hardened.

ERGSTE K13.
M-1333; 0.13 C, 0.3-0.5 Si, 0.25-0.50 Mn, bal Fe.
Annealed: 70,000 TS, 40,000 YS; 25 El;
60 RA; 145 Brin.
For gears, bolts, machine tool parts;
case hardening steel.

ERGSTE K20.
M-1333; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For cutlery, valves, turbine blades, surgical instruments; Type 420; stainless.

ERGSTE K20L.
M-1333; 0.2 C, 0.4 Si, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, cutlery, valves; Type 420 Mo; stainless.

ERGSTE K20N.
M-1333; 0.22 C, 0.4 Si, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431; corrosion and heat resistant.

ERGSTE K40.
M-1333; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For cutlery, valves, surgical instruments; Type 420; stainless.

ERGSTE K90.
M-1333; 0.85 C, Cr, V, bal Fe.
For tools, cutters, drills, taps, broaches; water or oil hardened.

ERGSTE K90L.
M-1333; 0.90 C, Cr, Mo, bal Fe.
For bearings, punches, cutters; water or oil hardened.

ERHARD BRONZE.
German; Zn, Cu, Al.
For ornamental fittings.

ERIE.
M-1705; 1.0 C, 0.35 Mn, 0.2 Si, bal Fe.
Water hardening tool steel. AISI W1.

ERIE NO. 5.
M-1425; 0.7 C, alloy, bal Fe.
For shear blades, punches, blacksmith tools; water hardened.

ERIE AA.
M-1425; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel.

ERIE EXTRA.
M-1705; 1.0 C, 0.35 Mn, 0.2 Si, bal Fe.
Water hardening tool steel. AISI W1.

ERIE RA.
M-1425; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For tools, drills, lathe and planer cutters; high speed steel.

ERIE SPECIAL.
M-1705; 1.0 C, 0.35 Mn, 0.2 Si, bal Fe.
Water hardening tool steel. AISI W1.

ERK ADG.
M-1336; 2.1 C, 11.5 Cr, 0.3 Mn, bal Fe.
For blanking and forming dies, gauges; oil hardened, non-deforming.

ERKENZWEIG BRA.
M-1336; 0.20 C, 0.40 Si, 0.3 Mn, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For turbine blades, valves, cutlery, dental instruments; Type 420; stainless.

ERKENZWEIG EX.
M-1336; 1.4 C, 0.30 Cr, 0.10 V, 0.30 Mn, bal Fe.
For forming dies, engraving tools, cutters; water hardened, wear resistant.

ERKENZWEIG EXTRA BEST MH.
M-1336; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 20 El; 40 RA; 210 Brin.
For springs, tools, cutters, drills, broaches; Type W1; water hardened.

ERKENZWEIG EXTRA BEST Z.
M-1336; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For punches, drills, taps, reamers, cutters; Type W1; water hardened.

ERKENZWEIG EXTRA BEST ZH.
M-1336; 1.0 C, 0.25 max Mn, 0.25 max Si, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, drills, cutters; Type W1; water hardened.

ERKENZWEIG HB.
M-1336; 1.4 C, 0.30 Cr, 0.1 V, bal Fe.
For header dies, cutters, bearings, oil hardened, tough.

ERKENZWEIG KM45.
M-1336; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, pinions, crankshafts, forging dies; oil hardened, shock resistant.

ERKENZWEIG KWB.
M-1336; 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For cutters, shears, header dies; oil hardened, tough.

ERKENZWEIG NH.
M-1336; 0.95 C, W, Mo, Cr, bal Fe.
For lathe and planer tools, drills; high speed steel.

ERKENZWEIG NHA.
M-1336, 1.35 C, W, Co, Cr, V, bal Fe.
For engravers' tools, forming and blanking dies; high speed steel.

ERKENZWEIG NHB.
M-1336; 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, broaches, reamers, drills; high speed steel.

ERKENZWEIG NHC.
M-1336, 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel

ERKENZWEIG NHE.
M-1336; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For engravers' tools, blanking and forming dies; high speed steel.

ERKENZWEIG NHH.
M-1336; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

ERKENZWEIG NHPC.
M-1336; 0.86 C, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

ERKENZWEIG NHUC.
M-1336; 0.86 C, 0.85 Mo, 2.5 V, 12 W, 4.1 Cr, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel.

ERKENZWEIG PKU.
M-1336; 1.0 C, 0.1 V, 0.25 Mn, bal Fe.
Heat treated: 200,000 TS; 130,000 YS; 8 El; 25 RA; 400 Brin.
For reamers, drills, drawing and forming dies; oil or water hardened, wear resistant.

ERKENZWEIG PLDI.
M-1336; 0.55 C, 0.18 V, 1.85 W, 0.9 Si, 1.05 Cr, bal Fe
For heading and forging dies, upsetters, punches; oil hardened, tough.

ERKENZWEIG PLD III.
M-1336; 0.35 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For heading and forging dies, upsetters, punches; oil hardened, tough.

ERKENZWEIG PSA.
M-1336; 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For blanking and forming dies, cutters, punches; oil hardened, wear resistant

ERKENZWEIG PSX.
M-1336; 1.4 C, 0.30 Cr, 0.10 V, 0.30 Mn, bal Fe.
For blanking and forming dies, bearings, oil or water hardened.

ERKENZWEIG SPEZIAL K.
M-1336, 2.1 C, 11.5 Cr, 0.30 Mn, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

ERKENZWEIG SPWC.
M-1336; 0.30 C, 2.0 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion rams, dies, liners; oil hardened, hot work steel.

ERKENZWEIG SWK III.
M-1336, 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For springs, shear blades, punches, oil hardened, shock resistant.

ERKENZWEIG SWK V.
M-1336 0.45 C, Cr, Ni, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant

ERKENZWEIG SWK VI
M-1336, 2.1 C, 11.5 Cr, 0.70 W, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

ERKENZWEIG SWK VII
M-1336, 0.45 C, W, Cr, V, bal Fe
For shear blades, forging and heading dies; oil hardened, tough.

ERKENZWEIG SWK VIII.
M-1336; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams, dies and liners; hot work steel, oil hardened.

ERKENZWEIG WCR.
M-1336; 1.42 C, W, V, bal Fe.
For blanking and heading dies; oil hardened, wear resistant.

ERKENZWEIG WNC 40.
M-1336; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

ERM 3A.
M-1083; 0.9-1.1 Ni, 0.18-0.25 P, 0.1-0.15 S, bal Cu
Bar: 62,000-78,000 TS; 18-25 El; 150-175 Brin.
For electrical switchgear and resistance welding equipment, electrical contacts.
55-60% electrical conductivity.

ERMAL.
M-51; 2.2-2.4 C, 0.9-1.0 Si, 0.7-0.8 Mn, bal Fe.
Cast: 62,000-67,000 TS; 46,000-48,000 YS; 5-3 El; 5-4 RA; 179-225 Brin.
For brake drums, wrench handles, break levers, bolts, gears; wear and corrosion resisting

ERMALITE.
M-51; 2.4-2.6 total C, 1.6-2.0 graphitic C, 0.6-0.8 combined C, 1.9-2.0 Si, 0.4-0.45 Si, 0.35-0.45 Ni, or Mo, bal Fe.
Cast. 60,000-65,000 TS; 60,000-65,000 YS, 1-2 El; 240-250 Brin.
For brake drums, wear and shock resisting.

ERM ALW.
M-1083; 0.5-0.7 Te, 0.08-0.12 Ni, bal Cu.
Bar: 38,000-45,000 TS; 15-18 El; 95-110 Brin.
For spot and seam welding of aluminum alloys.
High conductivity resistance welding electrode.

ERMANN METAL.
50 Bi, 25 Sn, 25 Pb.
For low fusion parts; M.P. 93°C

ERM CCS
M-1083; 0.5-0.8 Cr, bal Cu
Bar: 66,000-78,000 TS; 20-30 El; 135-160 Brin
For switchgear and resistance welding equipment, rotor bars.
High electrical conductivity both at room and elevated temperatures

ERM HSM
M-1083; 0.5-0.8 Te, 0.02-0.05 oxygen, bal Cu.
Bar. 37,000-41,000 TS; 14-25 El; 90 Brin
For commutator bars, gas welding nozzles.
95-98% electrical conductivity.

ERM NS.
M-1083; 0.3-0.5 Be, 2.0-2.5 Co, bal Cu.
Bar· 112,000-123,000 TS; 10 El; 240-310 Brinell
For machine parts and resistance welding equipment.
High strength and hardness. Age-hardenable.

ERM SC65
M-1083, 5.5-6.5 Ag, 0.02-0.04 oxygen, bal Cu.
Forged. 63,000-67,000 TS; 12.5 El; 125-150 Brin.
For high duty seam welding electrode.
82-86% conductivity.

ERODUR E 2.
M-1290; 2.0 C, 2.1 Cr, bal Fe
Hardenable to 500-600 Brin.
Castings for wear resistant parts or tools
DIN GS-200CrMn8, Werkstoff Nr 1.2129.

ERODUR E 16 SR
M-1290; 1.6 C, 12.0 Cr, 0.75 Mo, 0.25 V, bal Fe.
Hardenable to 500-600 Brin
Castings for wear resistant parts or tools
DIN G-X160CrMoV12.

ERODUR E 28.
M-1290, 2.7 C, 28.0 Cr, bal Fe
Hardenable to 500-600 Brin.
Castings for wear resistant parts or tools.
DIN G-X270Cr29.

ERODUR E-C1 H.
M-1290; 0.80 C, 1.8 Cr, bal Fe
Hardenable to 400 Brin.
Castings for wear resisting parts or tools.
DIN GS-80Cr7.

ERODUR E-CM 1H.
M-1290; 0.42 C, 1.0 Cr, 0.20 Mo, bal Fe
Cast, heat treated: 118,000-184,000 TS; 100,000-145,000 YS; 9-4 El.
Castings for wear resistant parts or tools.
DIN GS-42CrMo4; Werkstoff Nr. 1.7225.

ERODUR E-VMS.
M-1290; 0.30 C, 1.25 Mn, bal Fe.
Heat treated: 106,000-128,000 TS; 78,000 min YS; 12 min El.
Castings for small wear resisting parts or tools.
DIN GS-30Mn5; Werkstoff Nr. 1.5066.

ERODUR MNA 1.
M-1290; 1.2 C, 13.0 Cr, bal Fe.
Sol. ann. & age: 84,000 min TS; 42,500 min YS; 25 min El.
Austenitic manganese steel casting; work hardens to hard, wear resistant martensite.
DIN G-X120Mn12; Werkstoff 1.3401.

ERODUR MNA 1 U.
M-1290; 1.05 C, 12.0 Mn, bal Fe.
Sol. ann. & age: 84,000 min TS; 42,500 min YS; 25 min El.
Austenitic manganese steel casting; work-hardens to hard, wear resistant martensite.
DIN G-X100Mn12.

ERODUR MNA 2.
M-1290; 1.4 C, 17.0 Mn, 2.25 Cr, bal Fe.
Sol. ann. & age: 100,000 min TS; 57,000 min YS; 15 min El.
Austenitic wear resistant casting.
DIN G-X140MnCr162.

ERZBERG WEICH.
M-1314; 0.35 C, 0.25-0.50 Si, 0.20-0.80 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS, 30 El; 53 RA; 185 Brin.
For gears, bolts, shafts, machine tool parts, water hardened.

ERZBERG ZAH.
M-1314, 0.45 C, 0.25-0.50 Si, 0.20-0.80 Mn, bal Fe
Hot rolled: 98,000 TS; 60,000 YS; 24 El; 45 RA, 215 Brin.
For gears, bolts, shafts, machine tool parts; water hardened.

ERZBERG ZAHHART.
M-1314; 0.60 C, 0.25-0.50 Si, 0.20-0.80 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS, 12 El; 40 RA; 325 Brin.
For gears, axles, rails, shafts, punches; water hardened.

ES3.
M-459; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed. 110,000 TS; 58,000 YS; 18 El; 40 RA; 210 Brin.
For drills, taps, reamers, broaches, Type W1; water hardened.

ES4.
M-459; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, hobs, reamers, springs; Type W1; water hardened.

ES5.
M-459; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, drills, taps, reamers; Type W1; water hardened.

ES6.
M-459; 0.8-1.2 C, 0.25 Si, 0.25 Mn, bal Fe.
Water hardened: 166,000-216,000 TS; 100,000-150,000 YS; 11-15 El; 32-37 RA; 330-600 Brin.
For taps, drills, reamers, punches, stamps, knurls, mandrels.
Type W1 water hardening.

ES-12.
M-1014; 0.15 max C, 11-14 Cr, 0.25-0.45 Mn, bal Fe.
Annealed: 75,000 TS; 48,000 YS; 20 El; 180 Brin.
For corrosion resistant parts, turbine blades; Type 410; magnetic, corrosion resistant.

ES-15-35.
M-1014; 0.15 max C, 17-20 Ni, 34-37 Cr, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 40 El, 150 Brin.
For salt pots, furnace equipment, heat treating boxes; heat resistant, austenitic; Type 330.

ES 17-7.
M-1014; 0.09-0.15 C, 6-8 Ni, 2 max Mn, 16-18 Cr, bal Fe.
Annealed: 100,000 TS; 40,000 YS, 55 El, 80 Rb.
Worked: 185,000 TS; 140,000 YS; 16 El; 43 Rc
For refrigerator and kitchen equipment trim; Type 301; corrosion resistant, non-magnetic.

ES-18-8.
M-1014; 0.09-0.20 C, 2 max Mn, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed. 90,000 TS, 40,000 YS, 55 El, 180 Brin.
For stainless parts, chemical plant equipment, Type 302, austenitic, non-magnetic

ES-18-8 LC.
M-1014, 0.08 max C, 2 max Mn, 18-20 Cr, 8-10 Ni, bal Fe
Annealed: 85,000 TS, 35,000 YS; 60 El, 180 Brin
For stainless parts, chemical plant equipment; austenitic, non-magnetic; Type 304.

ES 18 8Si
M-1014, 0.08-0.15 C, 2-3 Si, 17-19 Cr, 8-10 Ni, bal Fe
Annealed: 95,000 TS; 50,000 YS; 45 El, B90 Brin
For heat resistant parts, furnace equipment, stainless, non-magnetic

ES-18-10 CB
M-1014; 0.10 max C, 2 max Mn, 17-19 Cr, 9-13 Ni, Cb = 8 × C, bal Fe
Annealed. 90,000 TS; 45,000 YS, 45 El, 180 Brin
For welded tanks, manifolds, stainless parts, Type 347; heat and corrosion resistant

ES-18-10Cb-LO-Ta.
M-1014, 0.08 max C, 17-19 Cr, 9-13 Ni, Cb = 8 × C, 0.10 max Ta, bal Fe
Annealed: 88,000 TS; 45,000 YS, 45 El; 160 Brin
For chemical plant equipment, welded structures, stainless, austenitic, Type 348

ES-18-10 TI
M-1014; 0.10 max C, 2 max Mn, 17-19 Cr, 9-12 Ni, Ti = 5 × C, bal Fe
Annealed. 85,000 TS, 40,000 YS, 50 El, 180 Brin.
For exhaust manifolds, welded tanks, stainless parts; Type 321; heat and corrosion resistant.

ES-19-9DL
M-1014; 0.28-0.35 C, 18-21 Cr, 8-11 Ni, 1.0-1.7 Mo, 1.0-1.7 W, 0.25-0.60 Cb, 0.1-0.35 Ti, bal Fe.
Annealed: 110,000 TS, 55,000 YS, 35 El, 185 Brin.
For jet engine and turbine components; high oxidation resistance.

ES-19-9L.
M-1014, 0.03 max C, 18-20 Cr, 8-12 Ni, bal Fe.
Annealed: 78,000 TS; 35,000 YS; 52 El, 144 Brin.
For chemical plant equipment; stainless, austenitic; Type 304L.

ES 19-12 MoL.
M-1014; 0.03 max C, 2.0 max Mn, 1.0 max Si, 18-20 Cr, 11-15 Ni, 3.0-4.0 Mo, bal Fe.
Stainless sheet, plate, strip, coil
Ann: 80,000-90,000 TS; 30,000-50,000 YS; 45-52 El; Rb 77-83.

Excellent corrosion resistance; resistant to scaling up to 1600°F.
For food processing equipment, paper pulp, chemical plant equipment, fountain pens.
AISI 317L.

ES-25-12.
M-1014; 0.20 max C, 2 max Mn, 1.25 max Si, 22-24 Cr, 12-15 Ni, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 45 El; 185 Brin.
For furnace parts, heat resistant parts, heat treating boxes; heat and corrosion resistant; Type 309.

ES-25-20.
M-1014; 0.08 max C, 2 max Mn, 1.5 max Si, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 85,000 TS; 45,000 YS, 45 El; 185 Brin.
For furnace parts, carburizing and annealing boxes; Type 310; heat and corrosion resistant.

"E.S.A."
M-73; 1.4 C, 4 W, 0.5 Cr, 0.3 V, bal Fe.
For finishing tools, reamers; abrasion resistant.

E.S.C. Alloys see B.S.C. Alloys.

ESCO NO. 1B.
M-438, 0.30 C, 1.0 Mn, 0.40-0.60 Si, bal Fe.
Cast. 79,000 TS; 46,000 YS; 30 El, 47 RA; 163 Brin
For housings, gears, shafts, machine tool parts, water hardened.

ESCO 5
M-438; 0.05 C, 16.05 Cr, 4.02 Ni, 2.82 Cu, 0.56 Mn, 0.61 Si, bal Fe.
Annealed 138,000 TS, 113,000 YS; 14% El; 315 Brin.
Heat Treated 180,000 TS, 156,000 YS; 3% El; 6% RA, 418 Brin
Uses Pump impellers, valves.
Precipitation hardening stainless steel

ESCO NO 5T
M-438, 0.20 max C, 8-10 Cr, 0.9-1.2 Mo, bal Fe
Cast 90,000-105,000 TS, 65,000-85,000 YS, 18-22 El, 40-55 RA; 200-240 Brin.
For oil refinery equipment, Type HA; corrosion resistant.

ESCO NO. 5W
M-438, 0.20 max C, 4.0-6.5 Cr, 0.45-0.65 Mo, bal Fe
Cast 90,000-100,000 TS; 75,000-80,000 YS; 18-24 El, 45-60 RA, 190-248 Brin.
For oil refinery equipment, Type 501, corrosion resistant

ESCO NO 5X.
M-438, 0.20 max C, 4.0-6.5 Cr, 0.45-0.65 Mo, bal Fe
For oil refinery equipment; Type 502, corrosion resistant

ESCO NO. 6-T
M-438, 0.15 max C, 3-4 Ni, 0.6 Mn, 0.5 Si, bal Fe.

ESCO NO 12M.
M-438, 0.25-0.35 C, 0.2-0.3 Mo, 0.03-0.07 V, 1.0-1.3 Mn, 0.5 Si, bal Fe.
Cast 102,000 TS; 81,000 YS; 21 El; 225 Brin.
Heat treated 257,000 TS; 91,000 YS, 5 El; 495 Brin.
For earth moving equipment, dredging and cement equipment; wear, shock and abrasion resistant.

ESCO NO. 14.
M-438; 1.15-1.25 C, 12-14 Mn, 0.4-1.0 Si, bal Fe.
Cast: 120,000 TS; 55,000 YS, 20 El, 200 Brin.
For rock and ore crushers, earth moving equipment; impact, shock and abrasion resistant.

ESCO NO. 16-N.
M-438; 0.25 C, 2.5-3.0 Cr, 0.40-0.65 Mo, 1 Mn, bal Fe.
For oil refinery equipment; creep resistant.

ESCO NO. 16W.
M-438; 0.20 max C, 1.0-1.5 Cr, 0.45-0.65 Mo, 0.5-0.8 Mn, bal Fe.
Cast: 80,000-90,000 TS; 50,000-70,000 YS; 22 El; 210-220 Brin
For structural and steam turbine components; high temperature use.

ESCO NO. 16Z.
M-438; 0.18 max C, 2.0-2.7 Cr, 0.9-1.2 Mo, bal Fe.
Cast: 70,000-100,000 TS; 40,000-75,000 YS; 21-20 El; 200-220 Brin
For structural and steam turbine components; high temperature use.

ESCO NO. 18CW.
M-438; 0.65-0.75 C, 1.9-2.4 Cr, 0.4-0.6 Ni, 0.25 max Mo, bal Fe.
Cast: 135,000-180,000 TS; 118,000-130,000 YS; 12-4 El; 290-390 Brin
For liners for abrasion slurries, wear resistant.

ESCO NO 20
M-438; 0.07 max C, 19-22 Cr, 27.5-31 Ni, 1.8-2.5 Mo, 3.0-3.5 Cu, bal Fe.
Cast: 68,000 TS; 30,000 YS; 47 El; 60 RA; 125 Brin.
For acid resistant equipment; Type CN-7M, austenitic, corrosion resistant.

ESCO NO 20.
M-748, 0.07 C, 29 Ni, 20 Cr, 2-3 Mo, 4 Cu, bal Fe.
Cast: 65,000-75,000 TS; 28,000-38,000 YS; 50-35 El, 50-40 RA; 120-150 Brin.
For chemical plant equipment, valves, resists mixed acids, austenitic.

ESCO NO. 21.
M-438, 0.70 max C, 96.5 min Ni, 2 max Si, 0.75 max Mn, bal Fe.
Cast: 60,000 TS; 25,000 YS; 25 El; 30 RA; 120 Brin.
For corrosion and heat resistant castings, cast nickel, corrosion and heat resistant.

ESCO NO 22.
M-438; 0.30 max C, 62-68 Ni, 3 max Fe, bal Cu.
Cast 75,000 TS, 32,000 YS, 50 El, 50 RA; 120 Brin
For corrosion resistant parts, cast Monel, corrosion resistant

ESCO NO. 22H.
M-438, 0.35 max C, 0.5-1.5 Mn, 2.5 max Fe, 1 Si, 62-68 Ni, bal Cu.
Cast. 85,000-120,000 TS; 50,000-80,000 YS; 20-10 El, 175-250 Brin.
For chemical plant equipment, cast H-Monel, corrosion resistant

ESCO NO. 22S.
M-438, 0.35 max C, 0.5-1.5 Mn, 2.5 max Fe, 1.0-2.2 Si, 62-68 Ni, bal Cu
Cast 120,000-145,000 TS; 80,000-130,000 YS; 4-1 El, 275-350 Brin
For chemical plant equipment, age-hardenable, cast S Monel, corrosion resistant.

ESCO NO. 23
M-438; 0.20 max C, 12-15 Cr, 76-79 Ni, 6 max Fe.
Cast. 80,000 TS; 37,000 YS; 16 El; 5 RA; 150 Brin.
At 1200°F: 63,000 TS; 25,000 YS; 39 El.
At 1800°F: 72,000 TS; 3800 YS; 118 El.
For nitriding containers; cast Inconel, corrosion and heat resistant.

ESCO NO. 26.
M-438; 0.12 max C, 26-30 Mo, 4-7 Fe, bal Ni:
Cast: 78,000 TS; 56,000 YS; 12 El; 12 RA; 196 Brin.
For corrosion resistant equipment; Hastelloy B; corrosion resistant.

ESCO NO. 27.
M-438; 0.15 max C, 15.5-17.5 Cr, 16-18 Mo, 3.7-4.7 W, 4.0-7.0 Fe, bal Ni.
Cast: 70,000 TS; 50,000 YS; 15 El; 22 RA; 200 Brin.
For corrosion resistant equipment; Hastelloy C.

ESCO NO. 28.
M-438; 11 max Si, 4 max Cu, 1 Mn, 1 Al, bal Ni.
Cast: 36,000-40,000 TS; 35,000-40,000 YS, 0 El; 0 RA; 484-545 Brin.
For pump valves; Hastelloy D; resists HCl and H_2SO_4.

ESCO NO. 32.
M-438; 0.20-0.40 C, 12 Cr, 1 max Ni, bal Fe.
Heat treated: 200,000 TS; 150,000 YS; 5 El; 7 RA; 450 Brin.
For cutlery, valves, furnace parts; Type CA40; corrosion resistant.

ESCO NO. 32B.
M-438; 0.06-0.15 C, 11.5-13.5 Cr, 0.25 max Ni, bal Fe.
Heat treated: 160,000 TS; 145,000 YS; 12 El, 25 RA; 360 Brin.
For turbine blades, valves, cutlery; Type 403; corrosion and heat resistant.

ESCO NO. 32C.
M-438; 0.06-0.15 C, 11.5-14 Cr, 1 max Ni, 0.5 max Mo, bal Fe.
Heat treated: 200,000-135,000 TS; 150,000-115,000 YS; 7-17 El; 6-43 RA; 390-260 Brin.
Cast: 115,000-100,000 TS; 100,000-75,000 YS; 20-30 El; 52 RA; 225-185 Brin.
For cutlery, valves, pump parts; Type CA15; corrosion resistant.

ESCO NO. 33-A.
M-438; 0.60-0.75 C, 1 Mn, 16-18 Cr, 0.75 Mo, bal Fe.
Heat treated. 400 Brin.
For bearings, races, pivots, valves, cutlery; Type 440A; stainless, hardenable.

ESCO NO. 33-B.
M-438, 0.75-0.95 C, 16-18 Cr, 0.75 max Mo, 1 Mn, 1 Si, bal Fe.
Annealed: 107,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin.
For bearings, cutlery, valves; Type 440 B; stainless, hardenable.

ESCO NO. 33C.
M-438; 0.95-1.2 C, 16-18 Cr, 0.75 max Mo, bal Fe.
For bearings, valves; Type 440C; corrosion resistant.

ESCO NO. 35AW.
M-438; 2.3-2.8 C, 1.25 Mn, 24-28 Cr, bal Fe.
Cast: 630 Brin.
Annealed· 370 Brin.
For roasters, impellers; high abrasion resistance.

ESCO NO. 35C.
M-438; 0.50 C, 28 Cr, 3 max Ni, bal Fe.
For furnace parts, heat resistant parts; Type CC-50.

ESCO NO. 35H.
M-438; 0.50 max C, 26-30 Cr, 4 max Ni, bal Fe.
At 1400°F: 10,500 TS; 8700 YS; 65 El.
At 1800°F: 2500 TS; 2100 YS, 110 El.
At 70°F: 75,000 TS; 66,000 YS.
For furnace rabble arms, sintering bars, grates, dampers; heat resistant to 2000°F in S atmosphere.

ESCO NO. 35-T.
M-438; 0.50 C, 26-30 Cr, 4-7 Ni, 0.5 max Mo, bal Fe.
Cast: 97,000 TS; 65,000 YS; 18 El; 212 Brin.
For cylinder liners, valves, furnace parts; Type CC50; corrosion and heat resistant.

ESCO NO. 36.
M-438; 0.20 max C, 26-30 Cr, 3-4 Ni, 1.5 Mo, bal Fe.
For corrosion and heat resisting parts; acid resistant.

ESCO NO. 36PH.
M-438; 0.07 C, 16 Cr, 4 Ni, 2.5 Cu, bal Fe.
Heat treated: 160,000 TS; 145,000 YS; 12 El; 25 RA; 360 Brin.
For corrosion resistant castings; age-hardenable, high strength.

ESCO NO. 37 PH
M-438; 0.04 C, 1 Mn, 1 Si, 25-27 Cr, 4.75-6.0 Ni, 1.75-2.25 Mo, 2.75-3.25 Cu, bal Fe.
Heat treated: 130,000-144,000 TS; 95,000-105,000 YS; 10-22 El; 15-41 RA; 285-321 Brin
For chemical plant equipment, digesters, autoclaves; high corrosion resistance.

ESCO NO. 40
M-438, 0.16 C, 20 Cr, 9 Ni, bal Fe
Cast: 80,000 TS, 35,000 YS; 15 El; 150 Brin.
For chemical and plastic plant equipment; Type CF-8; stainless, austenitic.

ESCO NO. 40F
M-438, 0.16 max C, 18-21 Cr, 9-12 Ni, 1.5 max Mo, 0.20-0.35 Se, bal Fe
Cast: 72,000 TS, 35,000 YS; 58 El, 60 RA, 140 Brin
For chemical plant equipment, Type CF-16F; corrosion resistant, free-cutting

ESCO NO 40H.
M-438; 0.20-0.40 C, 18-23 Cr, 9-12 Ni, 0.5 max Mo, bal Fe
At 1200°F 57,000 TS; 16 El
At 1600°F· 22,000 TS, 22 El.
At 70°F. 90,000 TS, 50,000 YS; 25 El.
For furnace dampers, oil still supports, annealing furnaces; strength and scale resistant to 1600°F, Type HF

ESCO NO 40L.
M-438, 0.03 max C, 18-21 Cr, 8-11 Ni, bal Fe
Cast. 65,000 TS, 28,000 YS, 55 El, 60 RA; 140 Brin.
For chemical plant equipment, tanks, mixers; Type 304L, austenitic, stainless

ESCO NO 40S
M-438, 0.08 max C, 18-21 Cr, 8-11 Ni, bal Fe.
Cast 72,000 TS; 32,000 YS; 60 El, 65 RA, 140 Brin.
For chemical plant equipment; Type CF-8; austenitic, corrosion resistant

ESCO NO 40T.
M-438, 0.08 max C, 17-20 Cr, 9-12 Ni, bal Fe.
Cast 65,000 TS; 28,000 YS; 45 El; 50 RA; 125 Brin.
For chemical plant equipment; Type 305; austenitic, stainless.

ESCO NO. 41.
M-438, 0.08 max C, 18-21 Cr, 9-12 Ni, Cb = 8 × C, bal Fe.
Cast: 72,000 TS; 36,000 YS; 35 El; 35 RA; 145 Brin

For welded chemical plant equipment; Type CF8C; austenitic, stainless.

ESCO NO. 41W.
M-438; 0.08 max C, 18-21 Cr, 9-12 Ni, Cb + Ti = 10 × C, bal Fe.
Cast: 72,000 TS; 36,000 YS; 35 El; 35 RA; 145 Brin.
For welded chemical plant equipment; Type CF-8C; austenitic, stainless.

ESCO NO. 43.
M-438; 0.20 max C, 22-26 Cr, 10-13 Ni, bal Fe.
For corrosion and heat resisting parts; heat and corrosion resistant.

ESCO NO. 43C.
M-438; 0.20 max C, 22-26 Cr, 12-15 Ni, bal Fe.
Cast: 70,000 TS; 30,000 YS; 35 El; 60 RA; 150 Brin.
For furnace parts, heat treat boxes; Type CH-20; austenitic, heat resistant.

ESCO NO. 43H.
M-438; 0.20-0.50 C, 24-28 Cr, 11-14 Ni, 1.5 max Mo, 0.2 N, bal Fe.
At 1400°F: 35,000 TS; 18,000 YS; 12 El.
At 1800°F: 11,000 TS, 7000 YS; 30 El.
At 70°F. 85,000 TS, 45,000 YS, 15 El.
For furnace shafts, beams and rollers, tube supports; Type HH; scale resistant to 2000°F.

ESCO NO. 44.
M-438; 0.03 max C, 17.5-18.5 Cr, 12.0-13.0 Ni, 2.0-3.0 Mo, 0.2-0.3 Cb, 0.5-1.0 Mn, bal Fe.
Cast. 71,500-76,500 TS; 42,750-48,250 YS; 39-47 El, 45-50 RA; 170 Brin
For heat exchanger tubes; corrosion and heat resistant

ESCO NO 45
M-438, 0.20 max C, 18-22 Cr, 7-9 Ni, bal Fe.
For turbine castings, chemical plant equipment; Type CF-20, stainless, austenitic

ESCO NO 45L
M-438, 0.03 max C, 18-21 Cr, 10-13 Ni, 2-3 Mo, bal Fe
Cast: 70,000 TS; 35,000 YS, 40 El; 55 RA; 170 Brin
For acid resistant chemical plant equipment; Type 316L; austenitic, stainless

ESCO NO. 45S.
M-438, 0.08 max C, 18-21 Cr, 9-12 Ni, 2-3 Mo, bal Fe.
Cast: 80,000 TS, 42,000 YS; 45 El; 65 RA, 170 Brin
For acid resistant equipment, Type CF-8M, stainless

ESCO NO 45T
M-438; 0.08 max C, 16-19 Cr, 13-15 Ni, 2-3 Mo, bal Fe.
Cast 70,000 TS, 30,000 YS, 50 El; 62 RA; 125 Brin
For acid resistant equipment; Type 316; stainless, austenitic.

ESCO NO 46.
M-438; 0.2-0.5 C, 26-30 Cr, 14-18 Ni, bal Fe.
For heat resistant parts, furnace equipment; stainless and heat resistant, austenitic.

ESCO NO 48.
M-438; 0.2-0.6 C, 28-32 Cr, 18-22 Ni, bal Fe
Cast: 85,000 TS; 50,000 YS; 10 El, 190 Brin.
For furnace parts and equipment, salt pots; Type HL, heat resistant

ESCO NO. 50.
M-438; 0.12 max C, 2.5-3.0 Si, 20-23 Cr, 25-28 Ni, 2.5 Mo, 1.5 Cu, bal Fe.
Cast: 70,000 TS; 35,000 YS; 50 El; 60 RA; 140 Brin.
For salt pots, heat and corrosion resistant parts; Type CN-M-Cu; austenitic, corrosion resistant.

ESCO NO. 51.
M-438; 0.30 max C, 26-30 Cr, 8-11 Ni, 0.5 max Mo, bal Fe.
Cast: 90,000 TS; 57,000 YS; 25 El; 34 RA; 200 Brin.
For furnace parts, heat treat boxes; Type CE-30 austenitic, stainless.

ESCO NO. 52-C.
M-438; 0.10 C, 14-17 Cr, 33-37 Ni, bal Fe.
Cast: 70,000 TS; 40,000 YS; 10 El, 12 RA; 170 Brin.
For salt pots, furnace pots, heat treat boxes; Type HT; heat resistant.

ESCO NO. 52H.
M-438; 0.35-0.75 C, 13-17 Cr, 33-37 Ni, 0.5 max Mo, bal Fe.
At 1200°F: 42,000 TS; 28,000 YS; 5 El.
At 1800°F: 11,000 TS; 8000 YS; 28 El.
At 70°F: 67,000 TS, 40,000 YS; 10 El.
For retorts, radiant tubes, salt pots, hearth plates, carburizing boxes, resists oxidation and thermal cycling.

ESCO NO. 53C.
M-438; 0.20 max C, 23-27 Cr, 19-22 Ni, bal Fe.
Cast 75,000 TS, 35,000 YS; 35 El; 42 RA; 140 Brin.
For furnace parts, salt pots, heat treat boxes; Type CK-20; austenitic, heat resistant.

ESCO NO. 53H.
M-438; 0.20-0.60 C, 24-28 Cr, 18-22 Ni, 0.5 max Mo, bal Fe.
At 1600°F 23,000 TS; 21 El.
At 70°F: 75,000 TS; 40,000 YS; 18 El.
For gas dissociation equipment, fixtures, baskets, calcining tubes; good strength and oxidation resistance to 2100°F; Type HK.

ESCO NO 54.
M-438, 0.2-0.5 C, 19-23 Cr, 23-27 Ni, bal Fe.
For heat treating boxes, furnace parts; Type HN, heat resistant.

ESCO NO. 55
M-438, 0.3-0.5 C, 17-21 Cr, 37-41 Ni, bal Fe.
For salt pots, heat treat boxes, furnace parts; Type HU; heat resistant.

ESCO NO. 56.
M-438, 0.35-0.75 C, 10-14 Cr, 58-62 Ni, bal Fe.
At 1400°F. 32,000 TS, 23,000 YS.
At 1800°F: 10,000 TS, 8000 YS, 40 El.
At 70°F: 70,000 TS, 40,000 YS, 6 El.
For carburizing and hardening fixtures, retorts; Type HW, resists thermal cycling.

ESCO NO 57.
M-438, 0.3-0.7 C, 15-19 Cr, 64-68 Ni, bal Fe.
For heat treat boxes, furnace equipment; heat and corrosion resistant

ESCO NO. 61A.
M-438, 3 max C, 1.7-2.5 Cr, 13.5-17.5 Ni, 5.5-7.5 Cu, bal Fe.
Cast: 25,000 TS; 135 Brin.
For corrosion and wear resistant parts; Ni-Resist Type 1; corrosion resistant cast iron.

ESCO NO. 62A.
M-438, 3.0 max C, 1.7-2.5 Cr, 18-22 Ni, bal Fe.
Cast: 25,000 TS; 135 Brin.
For corrosion and wear resistant parts; Ni-Resist Type 2; corrosion resistant cast iron.

ESCO NO. 63.
M-438; 3 max C, 2 Cr, 20 Ni, bal Fe.
For corrosion and wear resistant parts; Ni-Resist Type 2B; corrosion resistant cast iron.

ESCO NO. 70.
M-438; 0.08-0.16 C, 1-2 Mn, 20.0-22.5 Cr, 19-21 Ni, 2.5-3.5 Mo, 18.5-21.0 Co, 2-3 W, 0.75-1.25 Cb, 0.15 N, bal Fe.
For high temperature applications; Multimet N-155.

ESCO 72.
M-438; 0.1 C, 0.18 Ti, 0.6 Cb, 26-30 Cr, 47-52 Co, bal Fe.
Cast: 135,000 TS; 48,000 YS; 10 El; 10 RA; 250 Brin.
For furnace baffles, burner tips, sintering grates, quench baskets.
Corrosion, heat and thermal shock resistant.

ESCO STAINLESS NO. 33.
M-438; 0.25 max C, 12-15 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

ESCO STAINLESS NO. 34.
M-438; 0.25 max C, 16-20 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

ESCO STAINLESS NO. 35.
M-438; 0.25 max C, 24-30 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

ES EXTRA.
M-459; 0.9-1.2 C, bal Fe.
For tools, water hardening.

ES PRIMA.
M-27; 0.12 C, 2.5 Ni, 0.8 Cr, bal Fe.
Hardened: 130,000-160,000 TS; 100,000 YS; 13 El; 40 RA, 270-330 Brin.
For gears, shafts, pinions; case-hardening.

ESSHETE 316.
M-1724; 0.04-0.09 C, 0.8 max Si, 1.0-2.0 Mn, 11.0-14.0 Ni, 16.0-18.0 Cr, 2.0-2.75 Mo, B, bal Fe.
Sol. tr.: 74,000 min TS; 30,000 min YS, 30 El.
For superheater tubes, power plant components.
B.S. 3605-855 (1963); ASTM 213-64T TP316H.

ESSHETE 321.
M-1724; 0.04-0.09 C, 1.0 max Si, 2.0 max Mn, 9.0-11.0 Ni, 17.0-19.0 Cr, 0.70 max Ti, bal Fe.
Sol. tr.: 74,000 min TS; 30,000 min YS; 30 El.
For superheater tubes, power plant components.
B.S. 970-En58B; ASTM 213-64T TP321H; AISI 321.

ESSHETE 347.
M-1724; 0.04-0.09 C, 0.8 max Si, 0.5-2.0 Mn, 9.0-13.0 Ni, 17.0-19.0 Cr, Nb = 10 × %C min, bal Fe.
Sol. tr.: 74,000 min TS; 32,600 min YS; 30 El.
For superheater tubes, power plant components.
B-S. 3605-822 Nb(1963): AISI 347; ASTM 213-64T TP347H.

ESSHETE 1250.
M-1724; 0.15 max C, 0.2-1.0 Si, 5.5-7.0 Mn, 9.0-11.0 Ni, 14.0-16.0 Cr, 0.8-1.2 Mo, 0.15-0.4 V, 0.75-1.25 Nb, 0.003-0.009 B, bal Fe.
Sol. tr.: 72,000 min TS; 25,800 min YS; 30 El.
For superheater tubes, pressure vessels, steam piping, parts operating up to 650°C.

ESSHETE CML.
M-1724: 0.12 max C, 0.4-0.7 Mo, 0.75-1.25 Cr. bal Fe.
Normalized: 62,000-78,000 TS; 22,000-25,000 YS; 45-41 El; 70-63 RA.
For superheater tubes, steam piping; resists heat to 1000°F; creep resistant.
BS 1507, 1508; ASTM A199-64T-Gr T11.

ESSHETE CRM2.
M-1724; 0.15 max C, 2.0-2.5 Cr, 0.9-1.1 Mo, bal Fe.
Normalized: 93,000 TS; 80,000 YS; 30 El.
Annealed: 72,500 TS; 34,500 YS; 40 El.
For steam piping, super heater tubes; creep resistance to 1100°F.
B.S. 1503, 1508; ASTM A200-62T GrT22.

ESSHETE CRM5.
M-1724; 0.12 max C, 4.0-6.0 Cr, 0.45-0.65 Mo, bal Fe.
Annealed: 67,000 TS; 30,000 YS; 40 El.
For heat exchangers, valves, superheaters, steam and oil tubes; resists scaling to 1100°F.

ESSHETE CRM9.
M-1724; 0.15 max C, 0.25-1.0 Si, 0.3-0.6 Mn, 8.0-10.0 Cr, 0.90-1.10 Mo, bal Fe.
.2% proof stress at 540°C: 32,500-39,000 psi.
B.S. 1607-GrP17; ASTM 199 Gr T9;
DIN X9CrMo91, Werkstoff Spec 213.

ESSHETE D4C.
M-1724, 0.15 C, 0.5 Mo, bal Fe.
Normalized: 56,000-68,000 TS.
For superheater tubes, steam piping; resists heat to 950°F: creep resistant

ESSHETE MV.
M-1724; 0.08-0.15 C, 0.4-0.7 Mn, 0.25-0.50 Cr, 0.5-0.7 Mo, 0.22-0.30 V, bal Fe.
Nor. & Temp 67,000 min TS, 42,200 min YS; 17 El
For steam piping.
B S 3604 CD 660(1963).

ESTHONIA 5 MARK.
Eng., 70 Cu, 20 Zn, 10 Ni.
For coinage, corrosion resistant.

"e.t.d." 150.
M-699, 0.40 min C, 0.75-1.0 Mn, 0.20-0.35 Si, 0.80-1.10 Cr, 0.15-0.25 Mo, 0.04-0.05 Te, bal Fe.
Bar: 150,000 min TS; 130,000 min YS; 10 El, 32 min Rc; 75% machinability.
For shafts, studs, bolts, gears; high strength without heat treatment.

"e.t.d." 180.
M-669; 0.40 min C, 0.75-1.0 Mn, 0.20-0.35 Si, 0.80-1.10 Cr, 0.15-0.25 Mo, bal Fe.
Bar. 180,000 min TS; 165,000 min YS; 5-10 El; 38 min Rc; 56% machinability.
For shafts, gears, studs, bolts, high strength without heat treatment.

ETERNOS 10.
M-1339; 0.15 C, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin
For chemical plant equipment, tanks, mixers, filters, Type 302; stainless, austenitic.

ETERNOS 11.
M-1339; 0.15 C, 24 Cr, 19 Ni, bal Fe.
Annealed: 100,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin.
For furnace parts, valves, turbine and jet engine parts; Type 310; stainless, austenitic.

ETERNOS 23.
M-1339, 0.15 max C, 24 Cr, 1.5 Al, 1.4 Si, bal Fe.
For oil refinery equipment; heat and creep resistant.

ETIRAL.
M-104; C, 10 Cr, bal Fe.
For wire drawing dies; tough and hard.

EUGENE VADERS.
Eng.; 57.5 Cu, 0.3 Fe, 2.5 Mn, 1.5 Al, 0.5 Si, bal Zn.
For propellers, gears, high strength castings; corrosion resistant.

EUREKA.
U.S.; 60 Cu, 40 Ni.
Hot rolled: 60,500-65,000 TS; 20,000-22,400 YS; 51-45 El; 67-65 RA.
For resistance materials and thermocouples; similar to "Constantan" and "Ferry Metals."

EUREKA.
Pb, Sb, bal Sn.
For Babbitt bearings; Babbitt metal.

EUREKA.
M-35; C, bal Fe.
For machinery parts; water hardened.

EUREKA 1 ELECTRODE.
M-765; 2.50 C, Cr, W, high cobalt.
For surfacing parts subject to severe wear, heat and abrasion.

EUREKA NO. 1 HARD FACING RODS-BARE.
M-765; 2.50 C, Cr, W, high cobalt.
For surfacing parts subject to severe wear, heat and abrasion.

EUREKA 2 HIGH SPEED BARE ROD
M-765; 0.75 C, 4.0 Cr, 4.0 Mo, W, plus high cobalt.
For welding high speed cutting tools all types by G.T A. method

EUREKA 4 HIGH SPEED BARE ROD.
M-765; 1.55 C, 12.0 W, 4.85 V, Cr, Co, bal Fe
For welding high speed tool where a 63-65 Rock C hardness is required

EUREKA 6 ELECTRODE.
M-765, 1.45 C, 28.5 Cr, 3.9 W, Ni, Si, high cobalt.
For surfacing punches, dies, shear blades subject to severe heat and impact.

EUREKA NO 6 HARD FACING ROD-BARE.
M-765; 1.45 C, 28.5 Cr, 3.9 W, Ni, Si, high cobalt.
For surfacing punches, dies, shear blades subject to severe heat and impact.

EUREKA 12 ELECTRODE.
M-765; 1.40-1.45 C, Cr, Ni, W, Mo and high cobalt.
For surfacing parts subject to severe wear, heat and abrasion.

EUREKA NO. 12 HARD FACING ROD-BARE.
M-765; 1.40 C, Ni, W, Mo, high cobalt.
For surfacing parts subject to severe wear, heat and abrasion.

EUREKA 35 H. W. ELECTRODE.
M-765; 0.07 C, 4.35 Cr, 0.85 Ni, Mo, Mn, bal Fe.
For welding hot work die units, forging and upsetter dies.

EUREKA 40-A A. H. BARE ROD.
M-765; 0.70 C, 1.0 Cr, Mn, Mo, bal Fe.
For welding the low air hardening and graphitic tool steels by G.T.A. method.

EUREKA 45 H. W. ELECTRODE.
M-765; 0.10 C, 4.25 Cr, 2.0 W, Mn, Mo, Ni, V, bal Fe.
For welding hot work die units, forging and upsetter dies.

EUREKA 45-A H. W. BARE ROD.
M-765; 0.08 C, Cr, Ni, Mo, Si, bal Fe.
Very low carbon hot work for welding hot work units that must be machinable, forging and die cast dies.

EUREKA 52 ELECTRODE.
M-765; Pure deoxidized copper.

EUREKA 70-A O. H. BARE ROD.
M-765; 0.90 C, Cr, V, W, Mo, Mn, bal Fe.
For welding oil hard tool steel by G.T.A. process.

EUREKA 70-W O. H. ELECTRODE.
M-765; 0.65-0.75 C, 1.4 Cr, 2.15 W, Mn, V, Si, bal Fe.
For welding "W" type oil hardening tool steels.

EUREKA 71-M O. H. ELECTRODE.
M-765; 0.65-0.75 C, 1.4 Cr, 1.15 Mo, Mn, V, bal Fe.
For welding oil hardening tool and die steels.

EUREKA 72 H. W ELECTRODE.
M-765; 0.25-0.30 C, 5.0 Cr, 2.75 W, 2.25 Mo, Mn, V, bal Fe.
For welding hot work die steels.

EUREKA 72-A H. W. BARE ROD.
M-765; 0.36 C, 5.0 Cr, W, Mo, Si, bal Fe.
For welding hot work tool steel punches, shear blades, etc.

EUREKA 73 H. W. ELECTRODE.
M-765; 0.40-0.50 C, 4.25 Cr, 9.5 W, 1.4 Mo, bal Fe.
For welding extreme hot work die steels.

EUREKA 73-A H. W BARE ROD.
M-765, 0.50 C, 7.5 Cr, 1.48 V, Mo, Si, bal Fe.
For welding hot work shear blades and punches subject to high heat.

EUREKA 75-X H. W. ELECTRODE.
M-765; 0.75-1.0 C, 0.80 Cr, 0.40 V, Mo, Mn, bal Fe.
For welding water hardening tools and dies.

EUREKA 75-XA W. H. BARE ROD.
M-765; 1.15 C, Si, Mn, V, bal Fe.
For welding water hard tool steel by G.T.A. process.

EUREKA 78-A H. W BARE ROD
M-765; 0.50 C; 7.5 Cr, 1.48 V, Mo, Si, bal Fe.
For welding high C, high Cr and similar alloys where a high Rockwell C hardness is required.

EUREKA 88 H W. ELECTRODE.
M-765, 0.40-0.50 C, 5.0 Cr, 5.0 W, 3.50 Co, Mn, Mo, V, bal Fe.
For welding extreme hot work die steels.

EUREKA 88-A H. W. BARE ROD.
M-765; 0.39 C, 4.25 Cr, 4.1 W, V, Co, bal Fe.
For welding hot work dies where extreme heat and impact is a problem

EUREKA 99 ELECTRODE
M-765; 97.0 Ni, bal Fe.

EUREKA 100 ELECTRODE.
M-765; 99 Ni, bal Fe.

EUREKA NO 100-A PURE NICKEL BARE ROD.
M-765; 99.0 Ni.

EUREKA 130 ALLOY ELECTRODE.
M-765; 0.25-0.35 C, 1.15 Cr, Mo, Mn, bal Fe.
For welding SAE 4130 and flame hardening units.

EUREKA 130-A BARE ROD.
M-765; 0.32 C, Mo, Cr, Mn, Si, bal Fe.
Low alloy for welding flame hardened dies and SAE 4130 steel.

EUREKA 145 ALLOY ELECTRODE.
M-765; 0.40-0.50 C, 1.0 Cr, Mn, Mo, V, bal Fe.
For welding SAE 6145 and also flame hardening dies.

EUREKA 145-A BARE ROD.
M-765; 0.45-0.50 C, Cr, Mo, Mn, Si, bal Fe.
Medium alloy for welding flame hardened dies and 6145 steel.

EUREKA 200 HARD SURFACING ELECTRODE.
M-765; 0.06-0.12 C, Cr, Ni, Mo, Mn, Cb, bal Fe.
Work hardening; 200 BHN + for surfacing parts subject to wear, heat and impact; austenitic.

EUREKA 240 HARD SURFACING ELECTRODE.
M-765; 0.10-0.20 C, Cr, Ni, Mo, Mn, bal Fe.
Work hardening, 240 BHN + for surfacing parts subject to wear, heat, and impact; austenitic.

EUREKA 340 HARD SURFACING ELECTRODE.
M-765; 0.60-0.75 C, Mn, Cr, W, Mo, Cb, bal Fe.
Work hardening; 340 BHN +, for surfacing parts subject to wear, heat, and impact; austenitic.

EUREKA 350-A ALLOY BARE ROD.
M-765; 0.06 C, 12.5 Cr, 1.85 Ni, bal Fe.
For joining or repairing cracked die sections.

EUREKA 400 BUILD UP ELECTRODE.
M-765; 0.55-0.65 C, Mn, Cr, Si, bal Fe.
For build up on water hardening tool and die steels.

EUREKA 440 HARD SURFACING ELECTRODE.
M-765; 0.75-1.0 C, Mn, Cr, Ni, W, Mo, Cb, bal Fe.
Work hardening; 440 BHN + for surfacing parts subject to wear, heat and impact; austenitic.

EUREKA 500-and 580 HIGH ALLOY ELECTRODES.
M-765; Low C, Cr, Ni, Mn, Mo, Si, bal Fe.
For joining and repairing high alloys and tool steel.

EUREKA 1000-A H. W. BARE ROD.
M-765; 0.40 C, 5.0 Cr, Mo, V, Si, bal Fe.
Tungsten free rod for welding die cast dies made from H-11 or H-13.

EUREKA 1215 A. H. ELECTRODE.
M-765; 0.75-1.0 C, 4.75 Cr, 1.05 W, 1.85 Mo, V, Mn, bal Fe.
For welding air hardening tool and die steels.

EUREKA 1215-A A. H. BARE ROD.
M-765; 1.0 C, 5.0 Cr, Mo, W, Mn, bal Fe.
For welding air hard tool steel by G. T. A. process.

EUREKA 1216 H. S. ELECTRODE.
M-765; 0.60-0.75 C, 4.60 Cr, 8.75 Mo, W, V, Mn, bal Fe.
For welding high speed steel and other hot work units.

EUREKA 1216-A HIGH SPEED BARE ROD.
M-765; 0.93 C, 8.5 Mo, 3.5 Cr, V, W, bal Fe.
High Mo high speed for welding tools of the M1-M2 type.

EUREKA 1220-A A. H. BARE ROD.
M-765; 2.15 C, 11.5 Cr, Mo, V, Mn, bal Fe.
For welding high carbon, high chromium tool steel by G. T. A. method.

EUREKA 5545 ELECTRODE.
M-765; 45 Ni, 55 Cu.

EUREKA NO. 5545-A CUPRO-NICKEL BARE ROD.
M-765; 45 Ni, 55 Cu.
For repairing cast iron patterns.

EUREKA 8510 W. H. ELECTRODE.
M-765; 0.50-0.75 C, 1.15 Cr, 0.45 Mo, V, Mn, bal Fe.
For welding water hardening tools and dies.

EUREKA EUREKALLOY "C" ELECTRODE.
M-765; 0.05-0.10 C, 55.0 Ni, 16.25 Cr, 17.5 Mo, W, Mn, V, bal Fe.
For surfacing parts subject to heat, impact, oxidation and certain chemicals.

EUREKA EUREKALLOY "X" ELECTRODE.
M-765; 0.30-0.35 C, Ni, Mo, high cobalt.
For surfacing units subject to pressure, impact, heat and galling, hot extrusion and forge dies.

EUREKA EXP-10 and EXP-20 SURFACING ELECTRODE.
M-765; Low C, Cr, Ni, Mo, Si, Mn, bal Fe.
For welding cast iron and alloy drawing and forming dies.

EUREKA "FORGEWELD" LOW ALLOY ELECTRODE.
M-765; Low C, Mo, Si, Mn, bal Fe.
For repairing forge shop components, rams and sow blocks.

EUREKA "HAMMERWELD" ELECTRODE.
M-765; Low C, Cr, Ni, Mo, Si, Mn, bal Fe.
For welding and repairing forging dies.

EUREKA MARWELD BARE ROD.
M-765; Maraging steel for repairing dies of maraging steel or overlaying hot work dies.

EUREMATIC NO. 2 FLUX CORED WIRE.
M-765, Low C, med. alloy, bal Fe.
For repairing rams and sow blocks.

EUREKAMATIC NO. 5 FLUX CORED WIRE.
M-765; Low C, med. alloy, bal Fe.
For forge die impressions and shanks.

EUREKAMATIC NO 45 FLUX CORED WIRE.
M-765, Low C, Cr, Ni, Mn, Mo, W, bal Fe.
For filling forge die impressions.

EUREKAMATIC NO. 45 SOLID WIRE.
M-765; 0 08 C, med Cr, Mo, bal Fe.
Semi hot work grade, for repairing upsetter and forge dies

EUREKAMATIC NO. 72 SOLID WIRE.
M-765; Low C, Cr, Mo, W, bal Fe.
For repairing shear blades, forge dies, and building composite units, hot work.

EUREKAMATIC NO. 73 SOLID WIRE.
M-765; Low C, med Cr, high W, bal Fe.
For repairing, shear blades and other hot work steel subject to severe heat.

EUREKAMATIC NO. 78 SOLID WIRE.
M-765; Med C, high Cr, (W free) bal Fe.
Hot work grade for repairing hot or cold die units.

EUREKAMATIC NO. 130 SOLID WIRE.
M-765, 0.32 C, Cr, Mo, Mn, Si, bal Fe.
For overlay with mild alloy; meets SAE 4130 Spec

EUREKAMATIC NO. 145 SOLID WIRE.
M-765; 0.45-0 50 C, Cr, V, bal Fe.
Medium carbon, meets SAE 6145 Spec

EUREKAMATIC NO. 350 ALLOY SOLID WIRE.
M-765, 0.06 C, Mn, Mo, high Cr, bal Fe.
For joining tool steel, repairing crane wheels and forge dies.

EUREKAMATIC NO. 1216 SOLID WIRE.
M-765; C, Cr, high Mo, bal Fe.
Type M1 and M2.

EUREKAMATIC "BUILD-UP" SOLID WIRE.
M-765; Low C, alloy, bal Fe.
For preliminary build up on die sections before facing with harder material.

EUREKAMOLD BARE ROD.
M-765; Low C, Cr, Ni, Si, bal Fe.
For mold repair—P6 type.

EUREKA T G.A. LOW AIR ELECTRODE.
M-765; 0.70-0 75 C, 0.75 Cr, 1.70 Ni, 1.65 Mo, 1.15 Mn, bal Fe.
For welding low air tool steels.

EUROPEAN "REAMUR."
Eng.; 2.8-3.5 C, graphite, 0.6-0.8 Si, bal Fe.
For castings; malleable cast iron.

EUTALLITE—6.
M-717; 29 Cr, 1.1 C, 4 W, bal Co; As cast: Rock. C45.
For hard facing overlay on engine valves, tractor treads, fuel pump shafts, forging dies. Alloy powders deposited by oxy-acetylene. Wear resistant.

EUTALLITE UNIVERSAL 10092.
M-717; Cobalt base alloy powder for overlays.

EUTECBOR 9.
M-717; For hard facing overlays using torch. Operates at 1800°-1900°F; wear and corrosion resistant.

EUTEC CHROM 2.
M-717; C, alloy, bal Fe.
Cast: 675 Brin.
For welding electrodes, hard overlay.

EUTEC ROD 14.
M-717; 3 C, 2 Si, bal Fe.
For gas welding rod; for cast iron

EUTECROD 14 FC.
M-717, Electrode for torch brazing or building up cast iron, as machine bases, motor and gear housings
Bonding temperature 1400°-1600°F, Hard: 200 Brin.

EUTECROD 15
M-717; Electrode for low temperature torch build up and sealing of cast iron, malleable, steel, copper and nickel alloys, such as crankcases, water jackets
Bonding temperature 450°-600°F, pressure strength 1500 psi.

EUTECROD 16
M-717, Copper base with high nickel content.
Rod for torch brazing ferrous and non-ferrous metals
Bonding temperature 1400°-1600°F, 100,000 TS

EUTECROD 16 FC
M-717; Flux coated modification of EUTECROD 16

EUTEC ROD 18.
M-717; Zn, bal Cu
For gas welding rod, for bronze and brass.

EUTECROD 18 FC.
M-717, Flux coated grade of EUTECROD 18

EUTECROD 19.
M-717, Zn base with Al
For surface build up on aluminum

EUTECROD 21-FC-E.
M-717;
For torch joining of aluminum; Melts 1090°F; 33,000 TS

EUTECROD 80.
M-717, Copper base with nickel.
Rod for torch brazing steel as bicylces, ladders, steel furniture.
Bonding temperature 1400°-1600°F; 80,000 TS.

EUTECROD 80 FC.
M-717;
Flux coated modification of EUTECROD 80.

EUTECROD 91.
M-717; Cobalt—Chromium—Tungsten.
Hard facing alloy for torch or TIG for build up on check valves, exhaust valves, hot punches.

EUTECROD 146.
M-717;
Electrode for torch brazing of cast iron, steels and copper base alloys at low heat; Bonding temperature 1400°-1600°F; Strength 65,000 psi.

EUTECROD 146 FC.
M-717; Flux coated modification of EUTECROD 146.

EUTECROD 155.
M-717, Rod for joining most ferrous and non-ferrous metals at low temperature.
Bonding temperature 725°F; 16,000 TS.

EUTECROD 157.
M-717; 95.5 Sn, 3.46 Ag.
Solder type alloy free from lead, zinc, antimony and cadium. Melts 425°F; 15,000 TS.

EUTECROD 157-B.
M-717;
Flux cored solder type alloy free from lead, zinc, antimony and cadium; Melts 425°F; 15,000 TS.

EUTECROD 158-B.
M-717,
Flux-cored solder; Melts 361°F, 7,000 TS.

EUTECROD 180
M-717;
Electrode for torch brazing copper base alloys;
Melts 1290°F, 42,000 TS.

EUTECROD 185 FC
M-717,
Machinable overlays on cast iron, steel, copper and nickel alloys
Flux coated, for torch, bonding temperature 1400°1600°F, hardness 200 Brin

EUTECROD 186 FC
M-717,
For machinable overlays on ferrous and non-ferrous parts; bonding temperature 1400°-1600°F, using torch, hardness 200-300 Brin.

EUTECROD 190.
M-717,
For torch welding aluminum; Melts 1070°F; 34,000 TS.

EUTECROD 196.
M-717,
For torch build-up and joining zinc die castings;
M P 700°F; 28,000 TS

EUTECROD 800.
M-717;
For torch brazing copper base alloys,
Melts 1305°F; 40,000 TS

EUTECROD 1601
M-717;
Rod for torch, furnace or induction brazing ferrous and non-ferrous.
Temperature 1225°F; 60,000 TS

EUTEC ROD 1700
M-717; Ag, bal Cu.
For silver brazing.

EUTECROD 1702
M-717;
Electrode for torch brazing steel, stainless steel, carbide tips; Melts 1200°F; 85,000 TS.

EUTEC ROD 1800.
M-717; Ag, bal Cu.
For gas welding rod; for steel and copper alloys.

EUTECROD 1801.
M-717, 51 Ag, 22 Cu, 21 Zn, 5 Cd, 1 Sn.
For brazing ferrous and non-ferrous;
M.P. 1120°F; 90,000 TS.

EUTECROD 1803.
M-717;
For torch brazing copper and copper alloys;
Melts 1185°F; 55,000 TS.

EUTECROD 1804.
M-717;
For torch brazing copper and copper alloys;
Melts 1185°F; 50,000 TS.

EUTEC ROD 1850FC.
M-717; Cu alloy.
Cast: 90,000 TS; 180 Brin.
For torch welding rod for copper; discontinued.

EUTECROD 1900.
M-717;
For torch welding magnesium; M.P. 1100°F; 30,000 TS.

EUTECROD 1909.
M-717;
For soldering aluminum and magnesium;
M.P. 315°F; 10,000 TS.

EUTECSIL 1020 FC.
M-717;
Flux coated alloy for torch brazing of ferrous and non-ferrous alloys; Melts 1050°F; 85,000 TS.

EUTECSIL 1030 FC.
M-717;
Flux coated rod, silver braze type, for joining ferrous and non-ferrous metals; Temperature 1150°F; 60,000 TS.

EUTEC-SILWELD 1618.
M-717;
For ferrous and non-ferrous joining; M.P. 1125°F, 85,000 TS.

EUTECTAL.
M-620; 1.5 Cu, 0.8 Mn, 1.58 MgSi, 0.35 Ti, 0.25 Si, bal Al.
Heat treated: 38,000 TS; 4 El; 98 Brin.
For light alloy parts; age hardenable.

EUTECTIC ALLOY-1.
U.S.; 50 Bi, Pb, 13 Sn, 10 Cd
For fusible alloys, fuses.

EUTECTIC ALLOY-2.
U.S.; 52 Bi, 40 Pb, 8 Cd.
For fusible alloys, fuses.

EUTECTIC ALLOY-3.
U.S.; 53 Bi, 32 Pb, 15 Sn.
For fusible alloys, fuses.

EUTECTIC ALLOY-4.
U.S.; 54 Bi, 26 Sn, 20 Cd.
For fusible alloys, fuses.

EUTECTIC ALLOY-5.
50 Sn, 18 Cd, 32 Pb.

EUTEC-TINWELD 1.
M-717;
For soldering iron, nickel, copper base alloys;
M.P. 450°F; 7,000 TS.

EUTEC-TINWELD II.
M-717;
For lead free soldering; M.P. 450°F; 15,000 TS.

EUTEC-TINWELD III.
M-717;
For soldering electronic and radio components;
M.P. 360°F; 8,000 TS.

EUTEC-TINWELD IV.
M-717;
For soldering copper base alloys M.P. 452°F; 10,000 TS.

EUTEC TRODE 24.
M-717; Ni alloy.
For arc welding rod; machinable welds on cast iron.

EUTECTRODE 27.
M-717;
For repair welding cast iron; AC-DC; for machine bases, frames, supports. Strength 60,000 psi.

EUTECTRODE 65.
M-717; Cr, Ni, Mo steel, coated.
Electrode for DC-Rev. welding and overlaying to give harder and stronger weld metal. 140,000 TS; 320 Brin.

EUTECTRODE 66.
M-717;
Electrode for AC-DC welding of mild steel, beams, channel iron, pipes; 80,000 TS; machinable.

EUTECTRODE 280.
M-717;
Electrode for reverse DC welding copper alloys to ferrous metals, 60,000 TS.

EUTECTRODE 300
M-717;
For DC reverse welding copper; 35,000 TS.

EUTECTRODE 670.
M-717; Cr, Ni steel.
Electrode for AC-DC welding of low alloy steel and some stainless steel; 95,000 TS.

EUTECTRODE 680.
M-717;
Electrode for AC-DC welding of alloy steels, leaf and coil springs, some stainless grades, 120,000 TS.

EUTECTRODE 691
M-717;
Electrode for AC-DC welding of miscellaneous steels, 105,000 TS.

EUTECTRODE 1850 (AC).

EUTECTRODE 1851 (DC).
M-717,
For arc welding copper base alloys.

EUTEC TRODE 2100.
M-717; Al alloy.
For welding rod (gas or electric); for Al sheet and castings.

EUTECTRODE 2101.
M-717;
For DC reverse welding of aluminum alloys; 34,000 TS.

EUTECTRODE N 2.
M-717;
For hard, wear resistant overlays on steels and cast iron, AC-DC; for plow shares, cement grinder rings, mixers, excavator teeth, hardness C 50-55 Rock.

EUTECTRODE N 4.
M-717;
Hard overlays on manganese steels; AC-DC; for railroad, construction equipment, rails and frogs Hardness as deposited Rb 98, work hardens to C 45 Rock.

EUTECTRODE N 40.
M-717;
For hard facing or joining austenitic manganese steels; AC-DC; for bucket teeth and lips, crushers, hammer mills and similar parts subject to severe impact; work hardenable.

EUTECTRODE N 61.
M-717;
For heavy build-ups of hard and abrasion resistant overlays on steel and cast iron; AC-DC; Hardness C 50-55 Rock

EUTECTRODE N 90.
M-717;
Hard overlay for ferrous metals; AC-DC, deposits retain high strength and hardness at elevated temperatures; for ash remover impellers, exhaust valves, hot punches

EUTECTRODE N 6800
M-717;
Electrode for AC-DC overlays on steel as forging dies, rams, piercing tools, tongs
85,000 TS; 210 Brin

EUTECTRODE Super 110.
M-717,
Electrode for AC-DC welding steel, angle iron, I-beams, channel iron, 110,000 TS.

EUTHERM A11.
M-1340, 0.15 C, 19.5 Cr, 9.5 Ni, bal Fe
Annealed 80,000 TS; 35,000 YS, 55 El, 75 RA; 150 Brin
For chemical plant equipment, tanks, mixers, filters, Type 302, stainless, austenitic.

EUTHERM A22
M-1340, 0.15 C, 24 Cr, 19 Ni, bal Fe
Annealed 100,000 TS, 45,000 YS, 50 El, 65 RA; 185 Brin
For furnace parts pumps, valves, turbine parts; Type 310, stainless, austenitic

EUTHERM F8
M-1340, 0.12 max C, 2.3 Si, 6 Cr, bal Fe
Annealed 70,000 TS, 30,000 YS, 28 El, 65 RA, 160 Brin
For oil refinery equipment, heat and creep resistant

EUTHERM F10
M-1340, 0.12 max C, 2 Si, 18 Cr, bal Fe.
Annealed· 80,000 TS, 50,000 YS, 25 El; 50 RA; 150 Brin
For shafts, gears, chemical plant equipment, sinks; Type 430, stainless

EUTHERM F30
M-1340, 0.12 max C, 1.5 Al, 24 Cr, bal Fe.
Annealed 85,000 TS, 50,000 YS; 30 El, 55 RA; 180 Brin.
For oil refinery and chemical plant equipment; heat resistant

EUTHERM FA25
M-1340, 0.2 C, 25 Cr, 4 Ni, bal Fe.
Cast· 80,000 TS, 55,000 YS, 200 Brin
For furnace parts, heat treating boxes, valves, pumps, Type CC, corrosion and heat resistant.

EUZONIT.
M-1335; 55 Ni, 20 Mo, 20 Fe.
For corrosion and heat resistant equipment; corrosion and heat resistant

EUZONIT 60
M 1335; 0.10 C, 17 Cr, 60 Ni, 20 Mo, bal Fe
For corrosion and heat resistant parts; corrosion and heat resistant. Resists sulphuric acid

EUZONIT 70.
M-1335; 67 Ni, 30 Mo, bal Fe.
For high temperature applications; corrosion and heat resistant. Resists sulphuric acid.

EUZONIT 85.
M-1335; 85 Ni, 9 Si, 4 Cu.
For high temperature applications; corrosion and heat resistant.

EV4Co.
M-Germany; 1.3 C, 5 Co, 1 Mo, 4 V, 12 W, 4 Cr, bal Fe.
Hardened: C 64-66 Rock.
For cast cutting tools, reamers, drills, broaches, engravers tools.
High speed steel, Type T15, high hot-hardness and wear resistance.

EV5.
Russia; 0.7-0.8 C, 0.4 max Mn, 0.3-0.5 Cr, 5.0-6.5 W, bal Fe.
For permanent magnet; heat treated.

E.V 300.
M-752, 30% Cr cast iron (no nickel).
For corrosion resistance at room temp. and at elevated temp.

E.V. ALLOY
M-752, C, 10-12 Ni, 22-24 Cr, bal Fe.
Annealed 65,000-75,000 TS, 5 El.
For carburizing boxes, furnace parts, resists heat to 1175°C

EVANOHM
M-61, 20 Cr, 75 Ni, 2.75 Al, 2.75 Cu
Annealed· 150,000 TS, 117,000 YS; 20 El.
For precision resistors; high electrical resistance, low resistance change with temperature

EVANOHM
M-897; 20 Cr, 3 Al, 2 Cu, bal Ni
Annealed· 90,000 TS, 65,000 YS, 40 El.
For precision resistors; heat resistant to 300°C

EVANS PEERLESS
M-259, 0.9-1.2 C, bal Fe.
For tools, dies, jigs, water hardened.

EVANSTEEL GRADE I.
M-146; 1.5-2.0 Ni, 0.75-1.0 Cr, 0.3 C, bal Fe.
Annealed· 95,000-100,000 TS, 50,000-60,000 YS, 27-22 El; 40-30 RA, 200 Brin.
For sprockets, gears, high pressure valves; resists abrasion and wear; resists temperature to 1000°F.

EVANSTEEL, GRADE II
M-146, 0.3 C, 1.5-2.0 Ni, 0.75-1.00 Cr, bal Fe.
Annealed· 115,000-125,000 TS, 65,000-75,000 YS; 20-15 El, 30-25 RA, 275 Brin
For tractor shoes, bucket lips, dipper teeth, sheaves, abrasion resistant; heat resistant to 1000°F

EVANSTEEL, GRADE III.
M-146, 0.3 C, 1.5-2.0 Ni, 0.75-1.00 Cr, bal Fe
Annealed· 145,000-160,000 TS, 120,000 YS; 12 El; 10 RA, 400-500 Brin
For dipper teeth, liner plates, guard rails, pulverizer hammers; abrasion resistant; heat resistant to 1000°F.

EVERARD.
M-589, 1.0-1.2 C, bal Fe.
For dies, tools; water hardening.

EVERBRITE.
M-642, 29.5-31.5 Ni, 59-65 Cu, 5-8 Fe, 0.6 max Mn, 0.25 max C, 0.6 max Si.
Cast: 75,000 TS, 50,000 YS; 14 El; 20 RA; 200 Brin.
For valve disks, valve seat rings, steam turbine nozzle blocks and valves; machinable; resists action of steam.

EVERBRITE.
M-129; 60 Cu, 30 Ni, 3 Fe, 3 Si, 3 Cr.
Cast: 75,000 TS; 45,000 YS; 14 El; 170 Brin.
For valves, chemical plants; corrosion resistant.

EVERBRITE NO. 82.
M-154; 30.5 Ni, 62 Cu, 7 Fe, 0.5 Mn.
For steam applications; high corrosion resistance.

EVERDUR 637.
M-8; 2 Si, 7.25 Al, bal Cu.
Annealed: 88,000 TS; 44,000 YS; 25 El; Rock B 85.
For screw machine products and forgings, studs, bolts, switchgear, electrical hardware, valve stems.
Corrosion resistant, nonmagnetic.

EVERDUR 651.
M-8; 1.5 Si, 0.25 Mn, bal Cu.
Soft: 40,000 TS; 15,000 YS, 50 El; Rock F 55.
Hard: 70,000 TS; 55,000 YS; 15 El; Rock B 80.
For cold headed and roll threaded bolts, hardware marine fittings, pole line hardware, rigid conduit, welding rod. Corrosion resistant.
Good for severe cold working.

EVERDUR 655.
M-8; 95.8 Cu, 3.1 Si, 1.1 Mn.
Annealed Rods: 55,000 TS; 20,000 YS; 65 El; B 35 Rock.
Hard: 90,000 TS; 55,000 YS, 18 El; B 90 Rock.
For bearing plates, bolts, screws, forgings, hardware, springs, tanks, marine fittings, oil storage tanks.
High corrosion resistance and strength.

EVERDUR 656.
M-8; 95.8 Cu, 3.1 Si, 1.1 Mn.
For welding rods to weld copper and copper alloys, also plain and galvanized steel.
Good for carbon-arc and acetylene welding and inert gas welding.

EVERDUR 661.
M-8; 3 Si, 1 Mn, 0.40 Pb, bal Cu.
Soft. 58,000 TS, 22,000 YS; 70 El
Hard: 90,000 TS; 60,000 YS; 18 El.
For screw machine parts; free cutting, wear and corrosion resistant.

EVERDUR 1000 see EVERDUR 6552.

EVERDUR 1010 see EVERDUR 655.

EVERDUR 1012 see EVERDUR 661.

EVERDUR 1014 see EVERDUR 637.

EVERDUR 1015 see EVERDUR 651.

EVERDUR 6552.
M-8; 4 Si, 1.1 Mn, bal Cu.
Cast: 50,000 TS; 20,000 YS; 25 El.
For castings, pipe fittings, valves; M.P. 1000°C.

EVERDUR A see EVERDUR 655.

EVERSHYNE.
M-233; 0.2 C, 18 Cr, 8 Ni, bal Fe.
For stainless parts; stainless.

E.V.M.
M-115; 0.82 C, 0.35 Si, 0.25 Mn, 18.5 W, 4.3 Cr, 2.1 V, 0.65 Mo, bal Fe.
For drills, chasers, lathe tools, forming tools; high speed steel.

E.V. STEEL.
M-752; Ni-Cr heat resisting steel.
Six alloys ranging from 12 to 60% Ni.
For heat resistant parts as furnace parts, heat treat boxes, retorts and trays, burner nozzles.

EW.
M-459; C, bal Fe.
Water treated: 72,000-85,000 TS; 42,000-56,000 YS; 29-22 El.

EWP.
M-1114; C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe.
For hot dies; hot work steel.

EX-2.
0.65-0.75 C, 0.25-0.45 Mn, 0.20-0.35 Si, 0.70-1.0 Ni, 0.15-0.30 Cr, 0.08-0.15 Mo, bal Fe.
Hardened: Rock C 60 min.
Annealed: 200 Brin max.
For spindles, rolls, bearings, plungers, valves, meters, pins, cylinders. Wear resistant, deep hardening.

EX. "B" METAL.
Eng; 77 Cu, 15 Pb, 8 Sn, P.
For bearings, bushings, heavy duty

EXCELITE.
M-965, 32 Cr, 18 W, 45 Co, 2 C, 0.2 B, bal Fe.
For cutting tools; cast.

EXCELSIOR
M-248; 55 Cu, 45 Ni, 0.3 Fe
For resistance alloy; heat resistant.

EXCELSIOR.
M-98, 45 Ni, bal Cu.
Annealed: 70,000 TS, 25,000 YS; 35 El.
For resistors, rheostats, heating elements; low electrical resistance, for service up to 1000°F

EXELLOY
M-748, 0.10 C, 12 Cr, bal Fe
Heat treated. 115,000 TS, 90,000 YS, 22 El, 65 RA, 250 Brin.
For valves, valve stems; corrosion resistant.

EX. "K" METAL
Eng, 77 Cu, 12.5 Pb, 10.5 Sn, P.
For bearings, bushings, heavy duty.

EXL-DIE.
M-35; 0.90 C, 1.15 Mn, 0.5 Cr, 0.5 W, 0.1 V, bal Fe
Oil hardening cold work tool steel.
For taps, reamers, broaches, extrusion and engraving dies, form tools; non-deforming.
AISI 01.

EXL-DIE SMOOTHCUT
M-35; 0.9 C, 1 Mn, 0.5 W, 0.5 Cr, bal Fe.
For tools, dies, chisels, shear blades, drills, vise jaws; non-deforming, oil hardened.

EXLO.
M-394, 0.025 max C, Cr, Si, bal Fe.
Used as addition for stainless steel melting.

EXOCUT.
M-1; 1.09 C, 3.75 Cr, 8.0 Co, 9.5 Mo, 1.6 W, 1.15 V, 0.2 Mn, 0.3 Si, bal Fe.
Hardened: Rock C 68-70.
For cutters to machine heat treated superalloys.
Super high speed steel. Not shock resistant.

EXOHARD.
M-1; 1.1 C, 0.2 Mn, 0.3 Si, 3.75 Cr, 5.0 Co, 9.5 Mo, 1.6 W, 0.015 P, 0.020 S, 1.25 V, bal Fe.
Hardened: Rock C 64-68.
For cutting tools for hard metals, lathe and planer tools, broaches. Super high speed steel. Not shock resistant.

EXP. 99.
M-106; Same as RR 250.

EXPANDED METAL.
U.S.; 0.15-0.25 C, bal Fe.
For reinforced concrete or plaster walls; low carbon steel mesh.

EXPANDING ALLOY.
Eng.; 67 Pb, 25 Sn, 8.3 Bi.
For type metal, mounting purposes.

EXPANSIVE METAL.
M-216; 75 Pb, 16.7 Sb, 8.3 Bi.
For plugging castings; expands on freezing.

EXPORT.
M-1260, M-1261; 92 Sn, 3.9 Sb, 3.9 Cu, 0.2 Ni.
Cast: 7000 TS; 19 Brin.
For engine bearings and bushings; M.P. 440-600°F; shock resistant.

EXPRESS.
M-1408, 0 7 C, 14 W, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, reamers, drills, broaches; high speed steel.

EXPRESS COBALT FIVE.
M-1408; 0.7 C, 4 Cr, 18 W, 1 V, 5 Co, bal Fe
For lathe and planer tools, reamers, broaches; high speed steel.

EXPRESS COBALT TEN.
M-1408; 0.7 C, W, 4 Cr, Mo, V, 10-12 Co, bal Fe.
For cutters for heat treated steels; high speed steel

EXPRESS E.Z.
M-1546, 0 72 C, 10.5 W, 1.3 V, 0.5 Mo, 0.25 Co, bal Fe.
Hardened: C 64-66 Rock.
For lathe and planer tools, hobs, broaches, end mills, form cutters.
High-speed steel, oil hardening, high red-hardness

EX-TEN 42.
M-604, 0 21 max C, 0 02 min V, 0 01 Cb, 1.35 max Mn, 0.30 max Si, bal Fe.
Plate· 42,000 min YS, 63,000 min TS; 24 El; 42,000 CYS.
For structural applications, automotive and truck parts, storage tanks, pipe lines, cargo containers and construction machinery.
Good formability and weldability Tough.

EX-TEN 45.
M-604; 0.22 max C, 1.25 max Mn, 0.10 Si, 0.02 Cb, 0 02 min V, bal Fe
Rolled 60,000 TS; 45,000 YS; 25 El.
For railroad car and bus bodies, cargo containers.
High strength low alloy construction steel.

EX-TEN 50.
M-604, 0 26 max C, 1.35 max Mn, 0.01 min Cb, 0 02 min V, 0 10 Si, bal Fe.
Rolled: 65,000 TS; 50,000 YS, 22 El.
For railroad car and bus bodies, cargo containers.
High strength low alloy construction steel.

EX-TEN 55.
M-604; 0.20 max C, 1.35 max Mn, 0.10 Si, 0.02 Cb, 0.02 min V, bal Fe.
Rolled: 70,000 TS; 55,000 YS; 20 El.
For automotive and truck bodies, cargo containers, tote boxes. High strength low alloy steel.

EX-TEN 60.
M-604; 0.26 max C, 1.35 max Mn, 0.02 min Cb, 0.02 min V, 0.012 max N, bal Fe.
Bar: 75,000 min TS, 60,000 min YP; 18 El.
For automotive and truck parts, cargo containers, tote boxes, gas cylinders, construction machinery.
Low-alloy, high strength steel.

EX-TEN 65.
M-604; 0.26 max C, 1.35 max Mn, 0.01 min Cb, 0.02 min V, 0.012 max N, bal Fe.
Bar: 80,000 min TS; 65,000 min YP; 16 El.
For automotive and truck parts, cargo containers, tote boxes, gas cylinders, construction machinery.
Low-alloy, high strength steel.

EXTRA.
M-32; 0.6-1.2 C, bal Fe.
For taps, reamers, drills, dies, cold heading dies; water hardening.

EXTRA.
M-140; 0.8-1.20 C, 0.25 Mn, 0.25 Si, bal Fe.
Water hardening tool steel; AISI W1.

EXTRA.
M-783; 1.15 C, 0.3 Mn, 0.5 V, 0.35 Si, bal Fe.
For drills, taps, water hardened.

EXTRA NO. 5.
M-360; 0.7-0.9 C, bal Fe.
For tools, drills, taps, water hardened.

EXTRA 214.
M-27; C, 19 W, 4 Cr, 2.25 V, bal Fe.
For tools, dies, cutters; high speed steel.

EXTRA BEST.
M-364; 1 C, bal Fe.
For tools, taps, reamers; water hardening.

EXTRA BEST MH.
M-1340; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed. 110,000 TS, 57,000 YS; 18 El; 40 RA; 210 Brin.
For drills, taps, springs, hobs, reamers; Type W1; water hardened.

EXTRA BEST VZH.
M-1340, 1.0 C, 0 25 Mn, 0.1 V, bal Fe.
For springs, taps, reamers, broaches; Type W2; water hardened.

EXTRA BEST Z.
M-1340; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated· 190,000 TS; 145,000 YS; 10 El; 30 RA, 400 Brin.
For springs, taps, drills, reamers, punches; Type W1; water hardened.

EXTRA BEST ZH.
M-1340; 1.0 C, 0.25 max Si, 0 25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS, 21 El; 42 RA; 200 Brin.
For springs, taps, drills, hobs, reamers; Type W1; water hardened.

EXTRA BEST ZW
M-1340; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated· 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin
For springs, rails, punches, axes, crimpers; Type W1; water hardened.

EXTRA CARBON.
M-114, 0.7-1 4 C, bal Fe.
For tools, dies, punches; water hardened.

EXTRA CARBON.
M-73; 1 0 C, 0.25 Mn, 0.25 Si, bal Fe.
For engraving tools, shear blades, taps, drills; water hardened.

EXTRA CHROME.
M-275; 0.5 C, 4 Cr, bal Fe.
For hot work dies and tools; hot work steel.

EXTRA COST.
M-618; 1.05-1.15 C, bal Fe.
For tools, drills; water hardened.

EXTRA (DISSTON).
M-357; 1.0 C, bal Fe.
For tools, drills, cutters; water hardened.

EXTRA D.R.
M-73; 1.2 C, bal Fe.
For drills, taps, cutters; drill rod, water hardening.

EXTRA DRACO.
M-114; 0.7-1.2 C, 0.2 V, bal Fe.
For tools, cold header dies; water hardened.

EXTRA DRACO DV.
M-114; 1.0 C, 0.50 V, bal Fe.
For tools, dies, taps, drills, cutters; Type W2; water hardened.

EXTRA DURO MX4.
M-616; C, alloy, bal Fe.
For tools; oil hardened.

EXTRA EXTRA.
M-459; 1.2-1.3 C, bal Fe.
For tools, water hardened.

EXTRA G.
M-782; 0.7-1.1 C, bal Fe
For tools, drills, taps; water hardened.

EXTRA H.
M-73; 1.0 C, 0.25 Mn, 0.25 Si, bal Fe.
For general tools, cutters, drills, hobs, taps; Type W1; water hardened.

EXTRA H.
M-1182; 1.0 C, 0.50 V, bal Fe.
For taps, cutters, drills, tools; Type W2, water hardened.

EXTRA HEADER DIE.
M-35; 0.95 C, 0.35 Mn, 0.25 Si, bal Fe.
For header dies; water hardened.

EXTRA HIGH LEADED BRASS 356.
M-8; 62.5 Cu, 35 Zn, 2.5 Pb.
Hard Sheet: 73,000 TS, 60,000 YS, 7 El; B 80 Rock.
Soft Sheet 45,000 TS, 17,000 YS; 50 El, B 15 Rock.
For clocks, instruments, screw machine parts, fasteners
Elect. cond 26 Hard and strong, good machinability

EXTRA L.
M-115, 0.6-1.25 C, bal Fe.
For tools, taps, punches; varying tempers

EXTRA LION.
M-1415; 0.70 C, 18 W, 4 Cr, 1 V, bal Fe.
For drills, cutters, hobs, broaches, reamers, high speed steel.

EXTRA M.G.
M-363, M-27; 1.05 C, 1.1 Mn, 0.5 Cr, 0.25 Si, bal Fe.
For tools and dies, long taps, reamers, screw dies, calipers; non-deforming.

EXTRA MH.
M-1340, 1.1 C, 0.25 max Si, 0.25 max Mn. bal Fe.
Annealed: 110,000 TS; 58,000 YS; 18 El, 40 RA, 210 Brin.
For springs, taps, reamers, cutters; Type W1; water hardened.

EXTRA PUNCH.
M-73; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For punches, dies; oil hardening.

EXTRA QUALITY.
M-363; 0.7-1.2 C, bal Fe.
For punches, dies, general tools; water hardening.

EXTRA RAPID 300.
M-27; 1.3 C, 4 Cr, 12 W, 1 Mo, 4 V, bal Fe.
For cutting tools, engraver's tools; high speed steel.

EXTRA RAPID 300A
M-27; 1.2 C, 10.5 W, 4.3 Cr, 3.8 V, bal Fe.
For tools, dies, cutters; high speed steel.

EXTRARD.
M-85; 0.35 C, 5 Cr, 1.4 Mo, 1.25 W, 0.2 V, 1 Si, bal Fe.
For heat resistant parts, hot work tools; Type H12; air or oil hardened.

EXTRA S.
M-1182, 0.60-1.4 C, 0.25 V, bal Fe.
For tools, taps, cutters, reamers; Type W2; water hardened.

EXTRA SO
M-616; 1.05 C, bal Fe.
For tools, drills, taps; water hardened

EXTRA SPECIAL
M-74, 1.50-1.30 C, 0.20-0.40 Mn, 0.15-0.40 Cr, 3.5-4.5 W, 0.35 V, bal Fe
For tools, form cutters, reamers; fast finishing steel.

EXTRA SPECIAL.
M-260, M-38, 1.25 C, 0.5 Cr, bal Fe.
Water hardened
For tools, punches, cold trimming dies, blanking dies, water hardening

EXTRA SPECIAL.
M-364, 1.2 C, bal Fe
For tools, finishing tools, drills, water hardening.

EXTRA SPECIAL ALLOY.
M-73, C, W, bal Fe
For tools, drills, taps, water hardened

EXTRA SPECIAL POWER TRANSFORMER 52-58
M-806, 0.03 C, 4.5 Si, bal Fe
Annealed. 75,000 TS, 68,000 YS, 2 El.
For power and radio transformers; high permeability.

EXTRA SUPERDURALUMIN
Japan, Al-Cu-Zn-Mn-Mg
For light alloy parts.

EXTRA SUPER INCOMPARABLE.
M-1409, 0.8 C, 22 W, 4.5 Cr, 1.8 V, 10 Co, 0.7 Mo, bal Fe
For lathe and planer tools, cutters; high speed steel.

EXTRA TENAZ DURO
M-27, 0.9-1.0 C, bal Fe.
For tools, drills, taps, water hardened.

EXTRA TENAZ DURO.
M-616, 0.95 C, bal Fe
For tools, drills, taps; water hardened

EXTRA TOOL
M-38; M-85, 0.7-1.2 C, bal Fe.
For cutters, dies, general tools; water hardened.

EXTRA TOOL
M-355, 1.1 C, bal Fe.
For tools, fixtures, water hardened.

EXTRA TOUGH AND HARD.
M-27; 1.1 C, bal Fe
For general purpose tools and dies; water hardening.

EXTRA TOUGH NO. 4.
M-69; 0.7 C, 1.5 Ni, 0.5 Cr, 0.2 Mo, bal Fe.
For punches, shear blades; tough.

EXTRA TOUGH NO. 6.
M-69, 0.50 C, 0.8 Mn, 0.95 Cr, 0.2 V, bal Fe.
For gears, bolts, springs, crankshafts; oil hardened, tough.

EXTRA TOUGH NO. 7.

M-69; 0.70 C, 0.7 Mn, 0.3 Mo, bal Fe.

For rails, hammers, axles, springs; oil or water hardened.

EXTRA TOUGH NO. 7 H.C.

M-69; 0.83 C, 0.83 Mn, 0.25 Mo, bal Fe.

For rails, hammers, axles; oil or water hardened.

EXTRA TRIPLE CONQUEROR.

M-1406; 1.6 C, 0.6 Cr, 6 W, 0.15 Si, 0.4 Mn, bal Fe.

For turning tools, drawing dies; finishing steel, wear resistant.

EXTRA TRIPLE GRIFFIN.

M-1112; 1.5 C, 0.35 Cr, 6 W, 0.35 Mn, bal Fe.

For drawing dies, cutters; water hardened, hard case and tough core.

EXTRA V.

M-57; 0.90-1.0 C, 0.2 V, bal Fe.

For tools, drills, taps, cutters, reamers, Type W2; water hardened.

EXTRA VALTOOL.

M-357, 0.60-1.4 C, 0.25 V, bal Fe.

For tools, drills, taps, cutters; Type W2, water hardened

EXTRA WARRANTED.

M-260; 1.0-1.2 C, bal Fe.

For taps, dies, reamers, drills, knives; Type W1, water hardened

EXTRA ZH.

M-1340; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe

Annealed: 100,000 TS; 53,000 YS, 21 El, 42 RA, 200 Brin

For springs, taps, drills, hobs; Type W1, water hardened.

EXTRA ZW

M-1340, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe

Annealed 100,000 TS, 53,000 YS; 21 El, 42 RA, 200 Brin

For springs, taps, drills, hobs, reamers; Type W1; water hardened.

EXTRUDAL

M-249, 0.4-0.8 Si, 0.4-0.8 Mg, bal Al

Forged: 36,000-43,000 TS, 29,000-36,000 YS, 18-10 El, 75-90 Brin.

For light alloy parts, good formability

EXTRUDAL 12

M-541; 0.8-1.3 Cu, 11-13 Si, 0.8-1.2 Mg, 0.8 max Fe, 0.6-1.2 Ni, bal Al.

TA Temper: 55,000-60,000 TS; 42,000-48,000 YS, 5-12 El, 110-135 Brin

For forged pistons High corrosion resistant

EXTRUSION DIE

M-73, 0.8 C, 3.5 W, bal Fe.

For extrusion dies, tools, oil hardening.

EYA-1 CAST IRON

Russia, 1.3-3.2 C, 17.8-19.2 Cr, 8.5-9.2 Ni, 1.7-2.6 Si, bal Fe.

For furnace parts and equipment; corrosion resistant, cast iron.

EYELET BRASS.

U.S.; 65-68 Cu, 32-35 Zn.

Hard: 85,000 TS; 60,000 YS; 4 El, 156 Brin.

Soft: 46,000 TS, 20,000 YS, 58 El; 53 Brin.

For eyelets, drawn shells; high ductility.

EZ 9W.

M-336; 0.7 C, 9.5 W, 3.5 Cr, 0.2 V, bal Fe.

For gripper and hot forming dies, punches, piercers; hot work steel.

E.Z. 14 W.

M-336; 0.7 C, 14 W, 3 Cr, 0.2 V, bal Fe.

240 Brin.

For hot dies, tools, extrusion and hot forging dies; high speed steel.

EZ 33A.

Various foundries; 2.7 Zn, 3.0 Re (Ce, etc.), 0-7 Zr, bal Mg.

T5-temper: 20,000-23,000 TS, 14,000-15,000 YS; 2-3 El.

At 600°F: 12,000 TS; 8000 YS; 50 El.

Magnesium sand and permanent mold casting with good pressure tightness and weldability.

For parts operating at 350-500°F.

ASTM B80-69, B199-68, AMS 4442, QQ-M-55, QQ-M-56; SAE 506.

E-Z-CUT 20.

M-240; 0.15 C, S, Mn, bal Fe.

Free machining; for screw machine products, and case hardened parts.

EZ-DIE.

M-35; 1 C, 5.2 Cr, 1.15 Mo, 0.25 V, bal Fe.

For blanking, coining and forming dies; air hardened, Type A2; non-deforming.

E-Z-DIE SMOOTHCUT.

M-35; 1.0 C, 0.8 Mn, 5 Cr, 1 Mo, 0.25 V, S, bal Fe.

For forming and blanking dies, extrusion equipment, air hardenable; tough and wear resistant; AISI A2.

E-Z DIE V.

M-35; 2.15-2.30 C, 1.0-1.3 W, 0.95-1.2 Mo, 5.0-5.5 Cr, 4.6-5.0 V, bal Fe

Hardened. C 60-66 Rock

For lamination and forming dies, burnishing rolls, blanking and drawing dies, powder metal dies.

High wear and abrasion resistance Cold work tool steel, Type A7. Air harden.

EZ HEAD

M-12, 0.08 max C, 16-18 Cr, 17.5-19.0 Ni, bal Fe.

For cold headed parts; stainless

E-Z STAINLESS STEEL

M-73, 0.3-0.4 C, 13-14 Cr, bal Fe

For cutlery, table-ware; stainless, free machining

E-Z-TEM.

M 1684, 0.35 C, 0.8 Mn, 0.45 Si, 1.0 Cr, 0.4 Mo, 0.5 Cu, bal Fe

Shock resisting tool steel

F-17 TRIMETAL

M-739, 8-12 Pb, 8-12 Sn, bal Cu, overlay 3-5 Cu, 7-8 Sb, bal Sn

For heavy duty bearings, with steel backing

F-23

M-739, 0.90-1.25 Sn, 14.75-15.50 Sb, 0.8-1.1 As, 0.6 max Cu, bal Pb

For bearings, SAE-15

F-95

M-339, 3.2 T.C., 1.6 Si, 0.7 Mn, 1 Ni, 0.25 Cr, bal Fe.

Cast: 108,800 TS, 330 Brin.

For piston rings, wear and fatigue resistant

FA-3

M-1699, Sintered carbide tool material

For heavy roughing cuts and interrupted cuts on cast iron, non-ferrous and non-metallic materials.

FA-4.

M-1699; Sintered carbide tool material

For roughing cuts and light interrupted cuts on cast iron, non-ferrous and non-metallic materials.

FA-5.
M-1699; Sintered carbide tool material.
For general purpose machining of cast iron, non-ferrous and non-metallic materials, and for wear resisting applications.

FA-6.
M-1699; Sintered carbide tool material.
For general purpose machining of cast iron, non-ferrous metals and non-metallics.

FA-7.
M-1699; Sintered carbide tool materials.
For finish cuts on cast iron, non-ferrous metals and non-metallics.

FA-8.
M-1699; Sintered carbide tool material.
For fine finishing cuts on cast iron, non-ferrous metals and non-metallics.

FA-9.
M-1699; Sintered carbide tool material.
For finish cutting cast iron, non-ferrous metals and non-metallics.

FA-62.
M-1699; Sintered carbide tool material.
For light roughing and finishing high temperature alloys and non-ferrous metals.

FABRIALLOY.
M-1171; 0.5-0.6 C, bal Fe.
For welding electrodes; shielded.

FACEWELD 1.
M-578; 4.2 C, 5.4 Mn, 0.71 Si, 0.25 Mo, 22.5 Cr, 0.12 V, bal Fe.
Hard surfacing arc welding electrodes for resistance to severe abrasion.

FACEWELD 12.
M-578; 4.5 C, 1.0 Mn, 1.0 Si, 6.0 Mo, 18.5 Cr, 0.7 V, bal Fe.
Hardsurfacing arc welding electrodes for resistance to severe abrasion.

FAGERSTA-16.
M-52; 0.80 C, 0.20 Si, 0.30 Mn, bal Fe.
Heat treated: 188,000 TS; 143,000 YS; 12 El; 35 RA; 388 Brin.
For clutch discs, girders, rails, tie rods, drills; Type W1; water hardened.

FAGERSTA-20.
M-52; 1.0 C, 0.20 Si, 0.30 Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, reamers, hobs, taps; Type W1; water hardened.

FAGERSTA-24.
M-52, 1.2 C, 0.20 Si, 0.30 Mn, bal Fe.
Heat treated: 20,000 TS; 125,000 YS; 8 El; 28 RA; 400 Brin.
For drills, cutters, reamers, broaches; Type W1; water hardened.

FAGERSTA "30" HOLLOW DRILL.
M-385, M-52; 0.8 C, 0.9 Cr, 0.3 Mo, bal Fe.
For drills for mining and quarrying; oil hardening.

FAGERSTA A540.
M-52; 0.80 C, 0.20 Si, 0.30 Mn, 0.10 V, bal Fe.
For chisels, axles, shafts, drills; Type W1; water hardened.

FAGERSTA AD 95.
M-785; 0.70 C, 0.25 Cr, 0.15 V, 1.0 W, bal Fe.
For coining dies; oil hardened.

FAGERSTA ALLOY "30" DRILL.
M-608; 1.0 C, 1.1 Cr, 0.30 Mn, 0.35 Mo, bal Fe.
For tools, drills; water hardened.

FAGERSTA ALLOY CHISEL.
M-385, M-52; Cr, W, Mo, C, bal Fe.
For punches, chisels, rivet sets and busters; shock resistant.

FAGERSTA ALLOY SHOE DIE.
M-52, M-385; 0.55 C, 0.65 Cr, 0.35 Mo, bal Fe.
For shoe dies, cutting dies for leather and paper and rubber; oil hardened.

FAGERSTA ALLOY SHOE DIE.
M-608; 0.50 C, 0.60 Cr, 0.60 Mn, 0.40 Mo, bal Fe.
For tools, dies; oil hardened.

FAGERSTA B85.
M-52; 0.40 C, 1.25 Mn, bal Fe.
For gears, machinery parts; tough.

FAGERSTA B 103.
M-52; 0.45 C, 0.25 Si, 0.8 Mn, bal Fe.
Normalized: 85,500-107,000 TS; 46,000 min YS; 18 El; 180-230 Brin.
For surface hardened gears, levers, shifter forks, shafts. Water hardening.

FAGERSTA B 805.
M-52; 0.40 C, 0.25 Si, 1.3 Mn, bal Fe.
Hardened: 100,000-118,000 TS; 65,000 min YS; 17 min El; 50 min RA; 210-250 Brin.
For surface hardened gears and shafts.
Oil or water hardening.

FAGERSTA BRILLIANT H.H.
M-608; 0.70 C, 3.5 Cr, 14 W, bal Fe.
For tools, cutters, drills; high speed steel.

FAGERSTA BRILLIANT WKE EXTRA
M-608; 0.70 C, 4.5 Cr, 9 Co, 1.5 V, 19 W, bal Fe.
For tools, cutters, drills; high speed steel.

FAGERSTA BRILLIANT WW.
M-608; 0 70 C, 4.5 Cr, 1.5 V, 18 W, bal Fe.
For tools, cutters, reamers; high speed steel.

FAGERSTA BROACH.
M-608, 1.15 C, 0.40 Cr, 1.25 Mn, bal Fe.
For tools, broaches, reamers; tough.

FAGERSTA BROACH.
M-52, M-385; 0 7 C, 18 W, 4 Cr, 1 V, bal Fe.
For broaches, cuttters, drills, taps; high speed steel.

FAGERSTA C46.
M-52; 1.3 C, 0.50 Cr, bal Fe
For files, razors, water hardened.

FAGERSTA C50.
M-52; 1.8 C, 12 Cr, 0 60 Mo, 3.25 Co, bal Fe.
For cold work tools, cutters; oil or air hardened, non-deforming.

FAGERSTA C71.
M-52; 0.95 C, 1.5 Si, 0.75 Mn, 1.0 Cr, bal Fe.
For drawing and forming dies; oil hardened

FAGERSTA C143.
M-52; 0 5 C, 0.85 Mn, 1.05 Cr, 0.3 Mo, 0 15 V, bal Fe.
For gears, machinery parts; oil hardened, tough.

FAGERSTA C182.
M-52; 0.90 C, 0.50 Cr, bal Fe.
For wood working tools; water hardened.

FAGERSTA C265.
M-52; 1.5 C, 12 Cr, 0.8 Mo, 0 2 V, bal Fe.
For drawing and blanking dies, punches; air hardened, non-deforming.

FAGERSTA C 345.
M-52; 0.42 C, 0.25 Si, 0.8 Mn, 1.1 Cr, 0.2 Mo, bal Fe.
Hardened: 112,000-117,000 TS; 72,000 min YS; 10 min El; 40 min RA; 210-370 Brin.
For gears, shafts, power transmission components.
Oil hardening.

FAGERSTA C424.
M-52; 0.50 C, 1.05 Cr, 0.15 V, 0.85 Mn, bal Fe.
For gears, shafts, springs; shock resistant.

FAGERSTA C550.
M-52; 1.0 C, 5.2 Cr, 1.1 Mo, 0.2 V, bal Fe.
For finishing tools, blanking dies; non-deforming, air hardened.

FAGERSTA C 642.
M-52; 0.25 C, 0.65 Mn, 1.05 Cr, 0.2 Mo, 0.3 max Ni, bal Fe.
Hardened: 156,000-185,000 TS; 128,000 min YS; 8 min El; 330 390 Brin.
For shafts, gears, machinery parts; oil or water hardenable.

FAGERSTA C 643.
M-52; 0.34 C, 0.25 Si, 0.7 Mn, 1 Cr, 0.2 Mo, bal Fe.
Hardened: 128,000-150,000 TS; 98,000 min YS; 12 min El; 50 min RA; 270-310 Brin.
For gears, shafts, power transmission components. Oil hardening.

FAGERSTA CARBON.
M-385, M-52; C, bal Fe.
For general tools; water hardening.

FAGERSTA CIRCULAR PLATES.
M-385, M-52; C, Cr, Ni, bal Fe.
For saws; oil hardening.

FAGERSTA COLD HEADER.
M-385, M-52; C, V, bal Fe.
For cold heading and swedging dies, tough.

FAGERSTA CUTLERY STEEL.
M-385, M-52; C, bal Fe.
For knives, saws; water hardening.

FAGERSTA D61.
M-52; 0.90 C, 1.2 Mn, 0.5 Cr, 0.5 W, 0.1 V, bal Fe.
For drawing and forming dies, punches; oil hardened, non-deforming.

FAGERSTA D65
M-52; 2 C, 13 Cr, 1.2 W, 0.75 Mn, bal Fe.
For forming and drawing dies, cold work tools; oil or air hardened, non-deforming.

FAGERSTA D66.
M-52, 0.3 C, 3.25 Cr, 9 W, 0.25 V, bal Fe.
For die casting dies, hot work tools; hot work steel, oil hardened.

FAGERSTA D110.
M-52, 0.35 C, 1.25 Si, 5 Cr, 5 W, 0.65 Co, bal Fe.
For Al die casting dies, hot work tools; hot work steel, oil hardened

FAGERSTA D249.
M-52; 0.45 C, 1.2 Cr, 0.25 Mo, 2.2 W, 0.15 V, 0.9 Si, bal Fe.
For pneumatic tools, chisels, shears; hot work steel, oil hardened.

FAGERSTA D366.
M-52; 0.3 C, 0.3 Mn, 3 Cr, 1.7 Ni, 9 W, 0.3 V, bal Fe.
For die casting dies, hot work tools; hot work steel, oil hardened.

FAGERSTA DIE CASTING.
M-608; 0.50 C, 3 Cr, 0.35 Mn, 0.25 V, bal Fe.
For die casting dies, tools; oil hardened.

FAGERSTA DRAWING DIE STEEL.
M-385, M-52; C, Mn, Cr, W, bal Fe.
For wire drawing dies; oil hardening.

FAGERSTA ENGRAVER PLATES.
M-608; 0.35 C, 0.30 Mn, 0.10 Si, bal Fe.
For engraver plates; water hardened.

FAGERSTA ENGRAVERS PLATE.
M-52, M-385; 0.35 C, bal Fe.
For engravers plates.

FAGERSTA FAST FINISHING.
M-385, M-52; 1.2 C, 2 W, bal Fe.
For finishing tools; water hardening.

FAGERSTA FB-A-2.
M-52; 1.0 C, 0.7 Mn, 5.2 Cr, 0.2 V, 1.1 Mo, bal Fe.
Ht. Tr.: 250,000 TS; 195,000 YS; 5 El; C 50 Rock.
For blanking and trimming dies, gages, shear knives, punches, forming dies, thread rolling dies Air hardening tool steel.
AISI Type A2 nondeforming

FAGERSTA FB-A-4.
M-52, 0.95 C, 2 Mn, 2.2 Cr, 1.1 Mo, bal Fe.
Ht. Tr.: C 62-65 Rock.
For punches, forming and blanking tools, shear blades, broaches, drills, reamers.
Air hardening tool steel. AISI Type A4 nondeforming.

FAGERSTA FB-A-6.
M-52; 0.7 C, 2.2 Mn, 1.0 Cr, 1.4 Mo, bal Fe
Ht. Tr.: 290,000 TS, 264,000 YS, 1 El; C 55 Rock.
For blanking and forming dies, shear blades, mandrels, master hobs
Air hardening tool steel. Type AISI-A6 non-deforming.

FAGERSTA FB-BRILLIANT DIE.
M-52; 0.50 C, 1.0 Mn, 0.3 Si, 1.1 Cr, 0.25 Mo, bal Fe
Prehardened low alloy steel for molds.

FAGERSTA FB-D2.
M-52, 1.5 C, 11.5 Cr, 0.2 V, 0.8 Mo, bal Fe.
Ht. Tr.: 278,000 TS, 214,000 YS, 1 El, C 57 Rock.
For blanking and drawing dies, gauges, burnishing tools, thread rolling dies.
Air hardening tool steel AISI Type D2 nondeforming.

FAGERSTA FB-D2 HIGH PRODUCTION.
M-52; 1.55-1.7 C, 0.25-0.35 Mn, 0.25-0.35 Si, 11.5-12.5 Cr, 0.7-1.0 V, 0.7-0.9 Mo, bal Fe
Air or oil hardening cold work tool steel, chromium type; AISI D2.

FAGERSTA FB-D3 HIGH PRODUCTION "H."
M-52, 2.05 C, 0.4 Mn, 11.5 Cr, 0.6 V, bal Fe.
Air or oil hardening cold work tool steel, chromium type; AISI D3.

FAGERSTA FB-D6.
M-52, 2.1 C, 0.7 Mn, 0.3 Si, 13 Cr, 1.3 W, bal Fe.
Hardened: Rock C 62-64
For punching and drawing dies, shear blades, knives, rotary slitters, gages, wear plates and cams, impact extrusion dies. Abrasion and wear resistant, non-deforming.
AISI Type D6 Air or oil hardening

FAGERSTA FB-H11
M-52, 0.40 C, 0.4 Mn, 1.05 Si, 5.0 Cr, 0.5 V, 1.35 Mo, bal Fe
Air or oil hardening hot work tool steel, chromium type, for forging dies and hot forming dies; AISI H11

FAGERSTA FB-H12
M-52, 0.35 C, 1 Si, 1.5 W, 1.6 Mo, 5 Cr, bal Fe.
Ht. Tr.: 216,000 TS; 185,000 YS, 14 El; 53 RA.
For trimmer dies, die casting dies, forging and bolt heading dies.
Hot work tool steel. AISI Type H12. Tough, shock resistant.

FAGERSTA FB-H13.
M-52; 0.35 C, 5 Cr, 1 V, 1.5 Mo, bal Fe.
Ht. Tr.: 290,000 TS; 228,000 YS; 3 El; C 55 Rock.
For forging and heading dies, bulldozer dies,
piercing and forming punches.
Hot work, air hardening tool steel.
AISI type H13, shock resisting.

FAGERSTA FB-M1.
M-52; 0.78 C, 3.8 Cr, 1.15 V, 1.5 W, 8.75 Mo,
bal Fe.
High speed steel for lathe tools, milling cutters,
drills, broaches; AISI M1.
Molybdenum type.

FAGERSTA FB-M2.
M-52, 0.83 C, 4.15 Cr, 1.9 V, 6.5 W, 0.5 Mo, bal Fe.
High speed steel, molybdenum-tungsten type,
for general purpose cutting tools, as drills,
lathe tools, milling cutters; AISI M2.

FAGERSTA FB-M3 (Class 2).
M-52; 1.20 C, 4.0 Cr, 3.0 V, 6.0 W, 6.0 Mo, bal Fe.
High speed steel for cutting tools, molybdenum-tungsten type; for lathe tools, gun drills, reamers,
thread chasers; high hardness.
AISI M3 Class 2.

FAGERSTA FB-M7.
M-52; 1.0 C, 3.75 Cr, 2.05 V, 1.75 W, 8.75 Mo,
bal Fe
High speed steel for cutting tools; AISI M7.

FAGERSTA FB-M10.
M-52; 0.90 C, 4.0 Cr, 2.0 V, 8.0 Mo, bal Fe
High speed steel for cutting tools, AISI M10.

FAGERSTA FB-O1
M-52; 0.95 C, 0.5 Cr, 0.5 W, bal Fe .
Ht Tr. 250,000 TS; 225,000 YS; 8 El; C 50 Rock.
For blanking and forming dies, punches, reamers,
plug and ring gauges, taps
Oil hardening tool steel. AISI Type O1,
shock resisting

FAGERSTA FB-06 GRAPHITIC.
M-52; 1.45 C, 0.8 Mn, 1.15 Si, 0.25 Mo, bal Fe.
AISI Type O6 oil hardening tool steel.

FAGERSTA FB-S1.
M-52; 0.55 C, 2 W, 1.7 Cr, 0.25 V, bal Fe
Ht. Tr.: 295,000 TS; 258,000 YS; 4 El; C 54 Rock
For chisels, punches, shear blades,
bolt heading dies, die casting dies.
Shock resisting tool steel.
AISI type S1, tough.

FAGERSTA FB-S1 MIRYCAL
M-52; 0.45-0.50 C, 0.2-0.5 Mn, 0.75-1.0 Si,
1.15-1.25 Cr, 0.15-0.25 V, 2.25-2.60 W, bal Fe.
AISI Type S1 shock resisting tool steel.

FAGERSTA FB-S4.
M-52, 0.55 C, 0.8 Mn, 2.0 Si, bal Fe.
AISI Type S4 shock resisting tool steel.

FAGERSTA FB-S5 TUFCUT.
M-52; 0.5-0.55 C, 0.6-0.8 Mn, 1.3-1.6 Si, 0.3-0.4 Mo,
bal Fe.
AISI Type S5 shock resisting tool steel.

FAGERSTA FB-S7 TUF DIE AIR HARDENING
Shock Resisting.
M-52; 0.5 C, 0.7 Mn, 0.25 Si, 3.25 Cr, 1.4 Mo,
bal Fe.
Air or oil hardening shock resisting tool steel;
AISI S7.

FAGERSTA FB-T1.
M-52; 0.70-0.75 C, 3.75-4.25 Cr, 1.05 V,
18.0 W, bal Fe.
High speed steel for general purpose machining;
AISI T1.

FAGERSTA FB-T4.
M-52; 0.68-0.75 C, 4.0 Cr, 1.05 V, 17.25 W,
0.5 Mo, 4.5 Co, bal Fe.
High speed steel for cutting tools
for machining tough metals; AISI T4.

FAGERSTA FB-W1.
M-52; 1.05 C, 0.25 Mn, 0.25 Si, bal Fe.
Ht. Tr.: 208,000 TS; 146,000 YS; 12 El; 460 Brin.
For cold working tools, dies, blanking and coining
dies, knurling and threading dies,
punches, stamps, taps, reamers.
AISI Type W1, water hardening.

FAGERSTA FB-W1 COLD HEADER DIE STEEL.
M-52; Composition by arrangement.
AISI Type W1 water hardening tool steel.

FAGERSTA FB-W1 EXTRA CARBON.
M-52; 1.0-1.1 C, 0.25-0.35 Mn, 0.25-0.35 Si, bal Fe.
AISI Type W1 water hardening tool steel.

FAGERSTA FB-W1 SPECIAL.
M-52; 1.0-1.2 C, 0.25-0.35 Mn, 0.2-0.3 Si, bal Fe.
AISI Type W1 water hardening tool steel.

FAGERSTA FB-W1 SPECIAL CARBON.
M-52; 1.0-1.2 C, 0.25-0.35 Mn, 0.2-0.3 Si, bal Fe.
AISI Type W1 water hardening tool steel.

FAGERSTA FB-W2
M-52; 1.05 C, 0.25 Mn, 0.25 Si, 0.20 V, bal Fe
Ht. Tr.: 210,000 TS, 148,000 YS; 10 El; 470 Brin
For cold working tools, dies,
blanking and coining dies, knurling and
threading dies, punches, stamps, taps, reamers
AISI Type W2, water hardening.

FAGERSTA HACK SAW
M-385, M-52, C, W, bal Fe
For hack saws, water hardening

FAGERSTA HIGH PRODUCTION
M-385, M-52, C, Cr, Mo, V, bal Fe
For production dies and tools, non-deforming.

FAGERSTA HOLLOW DRILL
M-385, M-52; 0.8 C, 0.3 Mn, bal Fe
For drills for mining and quarrying,
water hardening

FAGERSTA HOLLOW DRILL
M-608; 0.8 C, 0.3 Mn, bal Fe
For hollow drills, water hardened

FAGERSTA HOT DIE
M-385, M-52, C, Cr, W, bal Fe.
For hot work dies, hot work steel

FAGERSTA K291.
M-52; 0.12 C, 0.75 Cr, 3 Ni, bal Fe
For gears, camshafts, crankshafts,
case hardened, shock resistant

FAGERSTA K333
M-52; 0.15 C, 0.65 Cr, 1.25 Ni, bal Fe
For gears, camshafts, crankshafts,
case hardened, shock resistant

FAGERSTA K336
M-52, 0.18 C, 0.75 Cr, 3 Ni, bal Fe.
For gears, camshafts, crankshafts;
case hardened, heavy duty

FAGERSTA K669.
M-52; 0.30 C, 1.25 Cr, 4.25 Ni, bal Fe.
For gears, shafts; oil hardened, tough.

FAGERSTA K825.
M-52, 0.4 C, 1.4 Cr, 1.25 Ni, 0.2 Mo, bal Fe.
Ht. Tr.: 165,000 TS; 145,000 YS; 14 El; 350 Brin.
For gears, shafts, connecting rods, bolts,
fasteners, hardware.
Shock resistant, oil hardening.

FAGERSTA K845.
M-52; 0.35 C, 1.15 Cr, 2.6 Ni, bal Fe.
For gears, shafts, crankshafts; oil hardened, tough.

FAGERSTA L97.
M-52; 0.55 C, 3 Ni, 0.3 Mo, 0.4 Mn, 1 Cr, bal Fe.
For drop forgings dies, cold work tools; oil hardened, shock resistant.

FAGERSTA L441.
M-52; 0.20 C, 0.55 Mn, 1.8 Ni, 0.25 Mo, bal Fe.
For gears, shafts; case hardened.

FAGERSTA L536.
M-52; 0.30 C, 1.05 Cr, 3.25 Ni, 0.25 Mo, bal Fe.
Hardened: 213,000 min TS; 170,000 min YS; 8 min El, 25 min RA; 440-510 Brin.
Oil hardening steel for gears, shafts, machinery parts..

FAGERSTA NON-DEFORMING.
M-608, 0.95 C, 0.45 Cr, 1.05 Mn, 0.45 W, bal Fe.
For tools, dies; non-deforming

FAGERSTA OIL HARDENING.
M-385, M-52, C, Cr, W, bal Fe.
For blanking, stamping and forming dies and tools; non-deforming.

FAGERSTA OVERCOAT AXE
M-385, M-52; 1.0 C, 0.25 Mn, bal Fe.
For axes; water hardening

FAGERSTA OVERCOAT AXE.
M-608, 1.0 C, 0.25 Mn, bal Fe.
For axes, tools, water hardened

FAGERSTA P10
M-52; 0.70 C, 4.5 Cr, 18.5 W, 1.2 V, 0.6 max Co, bal Fe
For twist drills, hobs, cutters, reamers, high speed steel

FAGERSTA P15.
M-52, 0.8 C, 4.5 Cr, 18.5 W, 2.5 Co, 1.6 V, bal Fe
For planing and shaping tools, cutters, reamers; high speed steel

FAGERSTA PAVEMENT BREAKER
M-385, M-52; 0.65 C, 0.3 Mn, bal Fe
For spades, moil points for concrete breaking, water hardening

FAGERSTA PAVEMENT BREAKER.
M-608, 0.65 C, 0.30 Mn, bal Fe
For pavement breaking tools, water hardened

FAGERSTA POLHEIM WIRE
M-385; 1.8 C, 2 Cr, 2 Mn, 13 W, bal Fe
For wire drawing dies, oil hardened.

FAGERSTA POLHEM WIRE DRAWING.
M-608, 1.8 C, 2.0 Cr, 2.0 Mn, 13 W, bal Fe.
For wire drawing dies; oil hardened

FAGERSTA Q5.
M-52, 0.80 C, 1.2 Mo, 4.5 Cr, 18.5 W, 5.5 Co, 1.6 V, bal Fe.
For milling cutters, lathe and planer tools; high speed steel.

FAGERSTA Q10.
M-52; 0.80 C, 1 Mo, 4.5 Cr, 18.5 W, 10 Co, 1.6 V, bal Fe.
For lathe and planer tools, reamers, broaches, hobs, high speed steel.

FAGERSTA QRO-45 HOT WORK.
M-52; 0.30 C, 2.8 Cr, 0.5 V, 2.8 Mo, 2.8 Co, bal Fe.
Air or oil hardening tool and die steel for hot working operations.

FAGERSTA R140.
M-52; 0.10 C, 13.5 Cr, 1.1 Mo, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 30 El; B 80 Rock.
Cold Drawn: 95,000 TS; 80,000 YS, 15 El; B 92 Rock.
For oil refinery and chemical plant equipment, valve trim, shafts. Corrosion resistant

FAGERSTA R320.
M-52; 0.09 max C, 17.2-18.7 Cr, 8.5-10.0 Ni, bal Fe.
Annealed: 78,000 min TS; 28,000 min YS; 40 min El; 55 min RA; B 90 Rock
80% Reduction. 259,000 TS; 228,000 YS; 5 El
For welded equipment in the food and chemical industries, washing machines, fittings, kitchen sinks.
Type 302 Stainless, austenitic.

FAGERSTA R350
M-52; 0.06 max C, 18.0-19.5 Cr, 8.5-10.0 Ni, 0.8-1.5 Mn, 0.25-0.75 Si, bal Fe
Annealed 80,000 TS, 35,000 YS, 60 El, B 80 Rock
Cold Drawn: 240,000 TS, 212,000 YS, 5 El.
For food, chemical, textile and plastic industries, storage tanks, vats, containers. Austenitic, stainless, oxidation resistant Type 304.

FAGERSTA R740.
M-52, 0.30 C, 14 Cr, 0.6 Mo, 0.4 Ni, bal Fe.
Annealed 95,000 TS, 50,000 YS, 25 El, B 92 Rock
Ht. Tr. 250,000 TS; 215,000 YS, 8 El; C 52 Rock
For cutlery, surgical instruments, gauges, shafts, hardware, gages, needle valves
Corrosion resistant, hardenable

FAGERSTA REGULAR.
M-608; 1.0 C, 0.35 Mn, bal Fe
For tools, drills, taps, water hardened

FAGERSTA RO 8155 HOT WORK
M-52, 0.40 C, 3.0 Cr, 0.5 Mo. bal Fe.
Air or oil hardening tool and die steel for hot working operations.

FAGERSTA ROLLED AUGER
M-608, 0.85 C, 0.30 Mn, bal Fe
For augers, drills, punches, water hardened.

FAGERSTA RRJ10
M-52; 0.08 max C, 11.5-13 Cr, 0.1-0.3 Al, bal Fe.
Annealed 71,000 TS, 42,600 YS, 22 El, 70 RA, 150 Brin.
Heat treated 175,000 TS, 145,000 YS, 21 El; 64 RA, 352 Brin.
For oil refinery and chemical plant equipment, Type 405, corrosion resistant

FAGERSTA RRJ11
M-52, 0.09-0.12 C, 13 Cr, 0.5 max Si, bal Fe
Annealed 75,000 TS, 40,000 YS, 35 El; 70 RA; 155 Brin
For turbine blades, valves, cutlery, surgical instruments, Type 403 and 410; corrosion resistant

FAGERSTA RRJ11
M-572, 0.15 max C, 11.5-13.5 Cr, 1 max Mn, 1 max Si, bal Fe
Annealed 80,000 TS, 40,000 YS, 35 El, 70 RA; 155 Brin.
Cold drawn 100,000 TS, 85,000 YS, 17 El, 60 RA, 205 Brin.
For valve parts, turbine blades, cutlery, knives, Type 410; corrosion resistant.

FAGERSTA RRJ14
M-52, 0.08 C, 13 Cr, 2 Ni, 1 Mo, bal Fe.
For oil refinery equipment; corrosion resistant.

FAGERSTA RRM20.
M-52; 0.07-0.12 C, 17 Cr, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, oil burners and heaters; Type 430; corrosion resistant.

FAGERSTA RRM22.
M-52; 0.2 C, 15-17 Cr, 1.25-2.5 Ni, bal Fe.
Heat treated: 100,000-135,000 TS; 78,000-112,000 YS; 25-15 El; 60-45 RA; 240-280 Brin.
For pump spindles, propeller shafts, aircraft structures; Type 431; stainless, hardenable.

FAGERSTA RRM23.
M-52; 0.10 C, 17 Cr, 8 Ni, Mo, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 60 El; B 80 Rock.
For chemical plant equipment, evaporators, digesters, acid tanks.
Stainless steel, acid resistant, austenitic.

FAGERSTA RRM24.
M-52; 0.10 max C, 17 Cr, 1.5 Mo, bal Fe .
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA, 150 Brin.
For oil refinery equipment, oil burners and heaters; Type 430Mo; corrosion resistant.

FAGERSTA RRM28.
M-52; 0.12 max C, 17 Cr, S, Se, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For screw machine products, shafts; Type 430F; corrosion resistant, free-cutting.

FAGERSTA RRNJ30.
M-52; 0.06 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS, 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 304; austenitic, stainless.

FAGERSTA RRNJ30.32.
M-52; 0.08-0.20 C, 2 max Mn, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 60 El; 70 RA; 150 Brin.
Cold drawn: 125,000 TS; 95,000 YS; 22 El; 55 RA, 277 Brin.
For oil refinery and chemical plant equipment; Type 302; stainless, austenitic.

FAGERSTA RRNJ31.
M-52; 0.05 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El, 75 RA; 150 Brin.
For chemical plant equipment, tanks, filters, mixers; Type 304; stainless, austenitic.

FAGERSTA RRNJ32.
M-52; 0.06 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks; Type 304; stainless.

FAGERSTA RRNJ33.
M-52; 0.10 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 302; stainless, austenitic.

FAGERSTA RRNJ35.
M-52; 0.05 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 304; stainless, austenitic.

FAGERSTA RRNJ36.
M-52; 0.03 max C, 19 Cr, 10 Ni, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El; B 76 Rock.
For welded structures, chemical plant equipment, tanks, evaporators, digesters, agitators.
Type 304L stainless steel, austenitic.

FAGERSTA RRNJ38.
M-52; 0.08-0.15 C, 18 Cr, 9 Ni, P, S, Se, Zr, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For screw machine products, shafts; Type 303; stainless, austenitic.

FAGERSTA RRNJ40.
M-52; 0.08 max C, 18 Cr, 10 Ni, 1.5 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin
For acid resistant chemical plant equipment, tanks; Type 316; stainless, austenitic.

FAGERSTA RRNJ41.
M-52; 0.06 max C, 18 Cr, 9 Ni, 1.5 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks; Type 316; stainless, austenitic.

FAGERSTA RRNJ42
M-52; 0.08 max C, 17 Cr, 12 Ni, bal Fe.
Annealed: 80,000 TS; 32,000 YS; 55 El; B 80 Rock.
For chemical plant equipment, evaporators, digesters, acid tanks.
Stainless steel; austenitic.

FAGERSTA RRNJ44.
M-52, 0.12 max C, 18 Cr, 10 Ni, 2.5 Mo, bal Fe.
Annealed 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks; Type 316; stainless, austenitic.

FAGERSTA RRNJ45.
M-52; 0.06 max C, 18 Cr, 9 Ni, 1.5 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks; Type 316; stainless, austenitic.

FAGERSTA RRNJ46.
M-52; 0.03 C, 17 Cr, 12 Ni, bal Fe.
Annealed: 78,000 TS, 30,000 YS; 60 El, B 78 Rock.
For chemical plant equipment, tanks, evaporators, digesters, mixers
Stainless steel, austenitic.

FAGERSTA RRNJ47
M-52; 0.10 C, 18 Cr, 15 Ni, bal Fe.
Annealed: 85,000 TS, 36,000 YS; 55 El; B 84 Rock.
For chemical and textile plant equipment, evaporators.
Stainless steel, austenitic. Heat and corrosion resistant.

FAGERSTA RRNJ50.
M-52; 0.06 C, 18 Cr, 12 Ni, 0.6 Cb, bal Fe.
Annealed: 88,000 TS; 38,000 YS; 55 El; B 82 Rock.
For welded structures, chemical plant equipment, evaporators, mixers, digesters.
Type 347 stainless steel, austenitic, stabilized, welding grade.

FAGERSTA RRNJ51.
M-52; 0.08 max C, 18 Cr, 8 Ni, Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, tanks; Type 321; stainless, austenitic.

FAGERSTA RRNJ52.
M-52; 0.12 C, 18 Cr, 5 Ni, 9 Mn, bal Fe.
Annealed: 100,000 TS; 50,000 YS; 60 El; B 90 Rock.
For pumps, valves, valves bodies, food processing equipment, digesters, hardware, spray nozzles.
Type 202 and 204 stainless steel non-hardenable.

FAGERSTA RRNJ59.
M-52; 0.08-0.16 C, 12 Cr, 12 Ni, bal Fe.
For valves; corrosion resistant.

FAGERSTA RRO4.
M-52; 0.10 max C, 5 Cr, bal Fe
Annealed: 70,000 TS; 30,000 YS; 28 El; 65 RA; 160 Brin.
For oil refinery equipment; Type 501; creep and heat resistant

FAGERSTA RRO6
M-52; 0.10 max C, 5 Cr, bal Fe.
Annealed. 70,000 TS, 30,000 YS; 28 El; 65 RA; 160 Brin.
For oil refinery equipment; Type 501; creep and heat resistant.

FAGERSTA RRS70.
M-52, 0 13-0 18 C, 13 Cr, bal Fe.
Annealed: 80,000 TS, 42,000 YS; 33 El; 65 RA, 165 Brin.
For turbine blades, valves, cutlery, surgical instruments; Type 410; corrosion resistant.

FAGERSTA RRS70(72).
M-52, 0.15 min C, 12-14 Cr, bal Fe.
Annealed· 88,000 TS, 40,000 YS; 32 El, 68 RA; 170 Brin.
For cutlery, valve trim, turbine blades; Type 420; stainless, hardenable

FAGERSTA RRS71(73)
M-52, 0 15 min C, 12-14 Cr, bal Fe
Annealed: 88,000 TS; 40,000 YS, 32 El, 68 RA; 170 Brin.
For cutlery, valve trim, turbine blades, Type 420; stainless, hardenable.

FAGERSTA RRS72.
M-52, 0 26-0 37 C, 13 Cr, bal Fe.
Annealed· 95,000 TS, 50,000 YS, 25 El; 55 RA, 195 Brin.
For valves, cutlery, surgical and dental instruments, Type 420; corrosion resistant.

FAGERSTA RRS73.
M-52; 0.38-0.45 C, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 50 RA, 210 Brin.
For valves, cutlery, surgical and dental instruments; Type 420, corrosion resistant.

FAGERSTA RRS74.
M-52; 0.20 C, 13 Cr, 1 Mo, bal Fe.
For oil refinery and chemical plant equipment, corrosion resistant

FAGERSTA RRT80.
M-52; 0-12 max C, 20 Cr, 20 Ni, bal Fe.
For valves; corrosion and heat resistant.

FAGERSTA RRT83.
M-52; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin.
At 1200°F: 57,000 TS; 22,000 YS; 32 El; 45 RA.
For furnace parts, valves, pumps, heat treating boxes; Type 310; austenitic, heat resistant.

FAGERSTA RRT85.
M-52; 0.15 C, 23 Cr, 14 Ni, S, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; B 83 Rock.
For heat treating boxes, furnaces, gas and oil heater baffles, salt pots. Free-machining.
Type 309S stainless steel, austenitic, heat and corrosion resistant.

FAGERSTA RRV60.
M-52; 0.35 C, 25 Cr, bal Fe.
Annealed: 85,000 TS; 50,000 YS; 30 El; 55 RA; 180 Brin.
For furnace parts and equipment; Type 446; heat resistant.

FAGERSTA RRV61.
M-52; 0.15 max C, 25 Cr, 2.5 Mo, 1.8 Ti, bal Fe.
For welded furnace parts and equipment; corrosion and heat resistant.

FAGERSTA RRV61.
M-52; 0 35 C, 23-27 Cr, bal Fe.
Annealed: 90,000 TS; 60,000 YS, 20 El; 45 RA, 180 Brin.
For furnace parts, heat treating boxes; Type 446; heat resistant.

FAGERSTA RRV62.
M-52; 0.12 max C, 26 Cr, 4 Ni, bal Fe.
Cast· 90,000 TS; 65,000 YS; 2 El; 212 Brin.
For furnace parts and equipment, heat treating boxes; Type CC-50; corrosion and heat resistant

FAGERSTA RRV62
M-52; 0 25 C, 23-30 Cr, 3-5 Ni, bal Fe.
Normalized: 93,000 TS; 71,000 YS, 20 El; 48 RA; 210 Brin
For valves, pumps, furnace parts; Type 327; heat resistant.

FAGERSTA RRV64.
M-52, 0.10 max C, 26 Cr, 5 Ni, 1.5 Mo, bal Fe.
For furnace parts and equipment, salt pots; Type 329, heat resistant.

FAGERSTA RRV64.
M-52; 0.20 C, 23-28 Cr, 2.5-5.0 Ni, 1-2 Mo, bal Fe.
Normalized. 103,000 TS; 78,000 YS, 18 El; 45 RA; 235 Brin.
Annealed: 95,000 TS; 41,000 YS; 29 El; 60 RA, 225 Brin.
For valves, pumps, furnace parts; Type 327, heat resistant

FAGERSTA RRV66.
M-52, 0.35 max C, 20 Cr, bal Fe.
For cutlery, valves, surgical instruments; Type 442; corrosion resistant.

FAGERSTA S310.
M-52; 0.55 C, 1.75 Si, 0.75 Mn, bal Fe.
For springs; oil hardened.

FAGERSTA SHOE DIE.
M-385; 0.55 C, 0 65 Cr, 0.35 Mo, bal Fe.
For cutting dies for leather, paper and rubber; water hardened.

FAGERSTA SOLID DRILL.
M-385; 1.0 C, 0.3 Si, 0.3 Mn, bal Fe.
For drills, chisels, taps; water hardened.

FAGERSTA SPECIAL.
M-608; 1.0 C, 0.35 Mn, bal Fe.
For tools, drills, taps; water hardened.

FAGERSTA SSL.
M-52; 0.8 C, 18.5 W, 1.2 Mo, 2.5 Co, 4.5 Cr, 1.6 V, bal Fe.
For cutting and planing tools, milling cutters; high speed steel.

FAGERSTA TWISTED AUGER.
M-385; 0.7 C, 0.3 Si, 0.35 Mn, bal Fe.
For augers for coal and ore mining; water hardened.

FAGERSTA W221.
M-52; 1.2 C, 0.55 W, 0.1 V, 0.3 Mn, bal Fe.
For twist drills, hobs, taps, reamers;
water hardened.

FAGERSTA W401.
M-52; 1.1 C, 0.3 Cr, 1 W, 0.1 V, bal Fe.
For twist drills, reamers, taps; water hardened.

FAGERSTA W406.
M-52; 1.4 C, 0.4 Cr, 5.5 W, 0.5 V, bal Fe.
For finishing cutters; water hardened.

FAGERSTA WKE-4.
M-52; 1.25 C, 4.1 Cr, 3.1 V, 9.0 W, 3.1 Mo, 9.0 Co, bal Fe.
Heat treated: Rock C 68.
For cutters, thread tools, lathe and planer tools.
Super high speed steel.

FAGERSTA WKE-45.
M-52; 1.40 C, 4.2 Cr, 3.9 V, 9.0 W, 3.5 Mo, 12.5 Co, bal Fe.
High speed steel for finish machining steel;
high hardness, good wear resistance,
good red hardness.

FAHLUN BRILLIANTS (FALUNER DIAMENTEN).
German; 60 Sn, 40 Pb.
For ornaments.

FAHR.
Fe-Ni-Cr.
For heat resistant parts, heat resistant.

FAHRALLOY C.
M-994; 56 Ni, 14 Cr, 17 Mo, 5 W, bal Fe.
For pumps, valves, plastic and
chemical plant equipment.
Heat and corrosion resistant.

FAHRALLOY CD.
M-994; 0.25 C, 1 0 Si, 27-30 Cr, 3-6 Ni, bal Fe.
Cast: 85,000 TS; 48,000 YS; 16 El; 190 Brin.
At 1600°F: 23,000 TS; 18 El.
For salt pots, furnaces, sintering bars,
cracking equipment, recuperators. High oxidation
resistance in S-atm. Corrosion
resistant casting alloy.
Type HD.

FAHRALLOY CF-4.
M-994; 0.04 C, 1.5 Si, 17-20 Cr, 9-12 Ni, bal Fe.
Annealed: 79,000 TS; 34,000 YS; 71 El.
For computer parts, engine mountings, filter press
plates, hardware, oil burner parts, spray nozzles
Stainless casting alloy, austenitic, non-hardenable.

FAHRALLOY CG-12.
M-994; 0.12 C, 1.5 Si, 20-23 Cr, 10-13 Ni, bal Fe.
Annealed: 77,000 TS; 36,000 YS; 50 El;
163 Brin.
For oil refinery and chemical processing
equipment, power plants, pumps, valve bodies.
Heat and corrosion resistant casting alloy,
austenitic, non-hardenable.

FAHRALLOY Cr-W.
M-994; 2.25 C, 11 Cr, 1 max Si, 1 W, bal Fe.
For heat resistant castings;
corrosion and heat resistant.

FAHRALLOY D-1.
M-994; 2.5-3 C, 10-12 Cr, 4-5 Mo, 1 max Si,
1 max Mn, bal Fe.
For heat resistant castings; corrosion and
heat resistant.

FAHRALLOY F-1.
M-994; 0.35-0.75 C, 37-41 Ni, 17-21 Cr, bal Fe.
For heat resistant castings; heat resistant, Type HU.

FAHRALLOY F-2.
M-994; 0.5 C, 21-24 Cr, 3-6 Ni, 1.75 max Si,
2 max Mn, bal Fe.
For heat resistant castings;
corrosion and heat resistant.

FAHRALLOY F-2-B.
M-994; C, 22 Cr, 9 Ni, bal Fe.
For castings; heat resistant.

FAHRALLOY F-2-B.
M-994; 0.8 min C, 16-23 Cr, 7-11 Ni, Si, Al,
bal Fe.
For heat and corrosion resistant parts;
heat and corrosion resistant.

FAHRALLOY F-3.
M-994; 0.5 C, 26-30 Cr, 4 Ni, 1.5 Si, 1 Mn, bal Fe.
For castings; heat resistant.

FAHRALLOY F3X.
M-994, 3.1-3.5 C, 26.5-28.5 Cr, 2.5-4 Ni,
1.25 max Si, 0.5 max Mn, bal Fe.
For heat resistant castings; corrosion and
heat resistant, cast iron.

FAHRALLOY F-5.
M-994; 0.35-0 75 C, 15-19 Cr, 64-68 Ni, 2 5 max Si,
2 max Mn.
For heat resistant castings,
corrosion and heat resistant; Type HX.

FAHRALLOY F-5-B.
M-994; 0.51-0 80 C, 49-57 Ni, 16-23 Cr, Mn Si,
bal Fe.
For heat and corrosion resistant parts;
heat and corrosion resistant.

FAHRALLOY F-10.
M-994, 0.2-0.5 C, 23-27 Cr, 11-14 Ni, bal Fe.
For heat resistant castings; heat resistant, Type HH

FAHRALLOY F-10LC.
M-994, 0 2 C, 22-26 Cr, 12-15 Ni, 2 Si, 1.5 Mn,
bal Fe.
Annealed: 88,000 TS; 50,000 YS, 38 El; 190 Brin
For chemical plant equipment, valves, pumps,
digester fittings; Type CH-20, stainless, austenitic.

FAHRALLOY F-11
M-994; C, 14-16 Cr, 49-51 Ni, 19-21 Mo and W,
bal Fe.
For heat resistant castings,
corrosion and heat resistant.

FAHRALLOY F-12.
M-994; 1.0 C, 28 Cr, 10 Ni, bal Fe.
For furnace parts; heat resistant

FAHRALLOY F-35.
M-994; 1 C, 33-36 Cr, bal Fe.
For heat resistant castings; heat resistant

FAHRALLOY F-35 N.
M-994; 2 C, 33-36 Cr, 9-11 Ni, 2 max Si,
2 max Mn, bal Fe.
For heat resistant castings; corrosion
and heat resistant

FAHRALLOY F-0726.
M-994; 0.5 C, 6-8 Cr, 25-27 Ni, 1 max Si,
1.25 max Mn, bal Fe.
For heat resistant castings; corrosion and
heat resistant.

FAHRALLOY F-0821.
M-994; 0.5 C, 7-10 Cr, 21-23 Ni, 1.5 max Si,
1 max Mn, bal Fe.
For heat resistant castings;
corrosion and heat resistant.

FAHRALLOY F-1260.
M-994; 0.35-0.75 C, 10-14 Cr, 58-62 Ni, 2.5 max Si, 2 max Mn.
For heat resistant castings; corrosion and heat resistant; Type HW.

FAHRALLOY F-1400.
M-994; 0.15 max C, 12-14 Cr, 1.5 max Ni, bal Fe.
Heat treated: 100,000-216,000 TS; 75,000-173,000 YS; 28-6 El, 62-9 RA; 185-415 Brin.
For chemical plant equipment, heat treating boxes; corrosion resistant; Type CA-15.

FAHRALLOY F-1535.
M-994; 0.35-0.75 C, 13-17 Cr, 33-37 Ni, 2.5 max Si, bal Fe .
Cast: 60,000 TS; 38,000 YS; 20 El; 21 RA; 156 Brin.
Annealed: 84,000 TS, 50,000 YS; 10 El; 18 RA; 200 Brin.
For furnace parts, muffles, heat treat boxes, pots; Type HT; heat and corrosion resistant.

FAHRALLOY F-1800.
M-994; 0.3 max C, 18-22 Cr, 2 Ni, 1.5 Si, 1 Mn, bal Fe.
For castings; stainless; Type CB-30.

FAHRALLOY F-1808.
M-994, 0.2 max C, 18-21 Cr, 8-11 Ni, 2 Si, 1.5 Mn, bal Fe
For castings; stainless, austenitic, Type CF-20

FAHRALLOY F 1808Cb
M 994, 0.08 max C, 18-21 Cr, 9-12 Ni, Cb = 8 × C, bal Fe
Annealed. 85,000 TS; 45,000 YS, 45 El; 165 Brin
For welded construction, chemical plant equipment, Type 347, stainless, stabilized.

FAHRALLOY F-1808LC
M-994, 0.08 max C, 18-21 Cr, 8-11 Ni, 2 Si, 1.5 Mn, bal Fe.
Annealed· 78,000-85,000 TS, 42,000-45,000 YS; 50-45 El, 155-165 Brin
For valves, pumps, mixers, spray nozzles, evaporators, Type CF-8, stainless, austenitic.

FAHRALLOY F-1808Mo
M-994, 0.08 max C, 18-21 Cr, 9-12 Ni, 2 Si, 1.5 Mn, 2-3 Mo, bal Fe.
Annealed· 80,000 88,000 TS, 45,000-48,000 YS; 48-42 El, 160-170 Brin.
For valves, pumps, mixers, spray nozzles, evaporators; Type CF-8M, stainless, austenitic.

FAHRALLOY F-1824.
M-994; 0.08 C, 16-19 Cr, 21-25 Ni, 2 Si, 1.5 Mn, 2-3 Mo, bal Fe
For heat resistant castings; corrosion and heat resistant, Type CN-7.

FAHRALLOY F-2210
M-994; C, 20-23 Cr, 9-11 Ni, Al, bal Fe.
For heat resistant castings; corrosion and heat resistant.

FAHRALLOY F-2520.
M-994, 0.25 C, 23-27 Cr, 19-22 Ni, 2 Si, 2 Mn, bal Fe.
For heat resistant castings; corrosion and heat resistant; Type CK-25.

FAHRALLOY F-2520-HK.
M-994; 0.2-0.6 C, 24-28 Cr, 18-22 Ni, 3 max Si, 2 max Mn, bal Fe.
For heat resistant castings; corrosion and heat resistant; Type HK.

FAHRALLOY F-2802.
M-994; 0.5 C, 26-30 Cr, 4 max Ni, 2 max Si, bal Fe.
Cast: 70,000-110,000 TS; 65,000-75,000 YS; 2-19 El; 190-223 Brin.
For ore roasting furnaces, rabble arms, dampers; Type HC; heat resistant.

FAHRALLOY F-2808.
M-994; 0.3 max C, 26-30 Cr, 8-11 Ni, 2 Si, 1.5 Mn, bal Fe.
Cast: 95,000 TS; 55,000 YS; 16 El; 18 RA; 212 Brin.
Annealed: 90,000 TS, 50,000 YS, 18 El; 20 RA; 197 Brin.
For valves, pumps, fittings, Type CE-30; corrosion resistant.

FAHRALLOY F-2810.
M-994; 0.2-0.5 C, 26-30 Cr, 8-11 Ni, 2 max Si, 2 max Mn, bal Fe.
For heat resistant castings; corrosion and heat resistant; Type HE.

FAHRALLOY F-2817.
M-994, 0.25 C, 27-30 Cr, 16-18 Ni, 1.5 Si, 1.5 Mn, bal Fe.
For heat resistant castings; corrosion and heat resistant.

FAHRALLOY F-2817-HI.
M-994, 0.2-0.5 C, 26-30 Cr, 14-18 Ni, 2 max Si, bal Fe.
Cast: 80,000 TS; 45,000 YS; 12 El, 180 Brin.
Aged· 90,000 TS, 65,000 YS, 6 El, 200 Brin.
For valves, fittings, pumps, furnace parts; Type HI; corrosion and heat resistant

FAHRALLOY F-3020
M-994, 0.2-0.6 C, 28-32 Cr, 18-22 Ni, 0.3 max Si, 2.0 max Mn, bal Fe.
For heat resistant castings, corrosion and heat resistant; Type HL

FAHRALLOY-HB.
M-994; 0.40 C, 1.5 Si, 18-22 Cr, 2 max Ni, bal Fe.
Annealed: 95,000 TS, 60,000 YS, 15 El, 195 Brin.
For furnace brackets and hangers, rabble arms, valve parts and bodies Heat and corrosion resistant casting alloy. Type CB-30.

FAHRALLOY-HT75
M-994, 0.75 C, 1.75 Si, 13-17 Cr, 33-37 Ni, bal Fe.
Cast: 70,000 TS; 40,000 YS; 10 El; 180 Brin.
At 1400°F, 35,000 TS; 26,000 YS; 10 El.
For air ducts, brazing trays, cyanide pots, fan blades, glass molds.
Heat and abrasion resistant casting alloy.
Type HT. High fatigue strength.

FAHRALLOY-HTCb.
M-994; 0.50 C, 1.75 Si, 13-17 Cr, 33-37 Ni, 1.0 Cb, bal Fe
Cast. 68,000 TS, 39,000 YS, 12 El; 175 Brin.
For glass molds, gear spacers, heat treating fixtures, muffles Heat and corrosion resistant casting alloy.
Type HT. High fatigue strength

FAHRALLOY-HU Cb.
M-994, 0.50 C, 1.75 Si, 17-21 Cr, 37-41 Ni, 1.0 Cb, bal Fe.
Cast. 70,000 TS; 40,000 YS; 9 El; 170 Brin.
For carburizing retorts, lead pots, resistor guides, muffles, pouring spouts, conveyor screws.
Heat and corrosion resistant casting alloy.
Type HU.

FAHRENWALD RESISTING GOLD ALLOY.
Eng.; 90-60 Au, 10-40 Pd.
For chemical equipment; white gold, high acid resistance.

FAHRIG ANTIFRICTION METAL .
Eng.; 90 Sn, 10 Cu.
For bearings; antifriction.

FAHRITE alloys see OHIOLOY alloys.

FAIRLEYS.
M-491; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed tools and cutters; high speed steel.

FAKIR FAS2.
M-1312; 0.53 C, 0.90 Si, 0.9 Mn, bal Fe.
For gears, bolts, punches, crimpers; water hardened.

FAKIR FC1.
M-1312; 1.05 C, 1.0 Cr, 0.3 Mn, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant.

FAKIR FGS.
M-1312; 1.05 C, 1.0 Cr, 1.15 W, 0.9 Mn, bal Fe.
For bearings, cutters, punches; water hardened, wear resistant.

FAKIR FJS.
M-1312; 0.9 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, upsetters, blanking dies; oil hardened, nondeforming.

FAKIR FKL.
M-1312; 0.55 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For cold header and upsetter dies, crimpers; oil hardened, tough.

FAKIR FKO-10.
M-1312; 0.78 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, form cutters, hobs; high speed steel, heavy duty.

FAKIR FKP.
M-1312; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

FAKIR FP.
M-1312; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

FAKIR FRS27MO.
M-1312; 0.95 C, 4 Cr, W, Mo, V, bal Fe
For form and milling cutters, reamers, hobs; high speed steel.

FAKIR FSC.
M-1312; 2.1 C, 11.5 Cr, 0.70 W, bal Fe.
For blanking and forming dies, punches; oil hardened, nondeforming.

FAKIR FSD.
M-1312; 0.35 C, 0.18 V, 1.05 Cr, 1.85 W, bal Fe.
For header dies, upsetters, punches, crimpers; oil hardened, tough.

FAKIR FSM.
M-1312; 0.35 C, 0.18 V, 1.05 Cr, 1.85 W, bal Fe.
For header dies, shears, punches, upsetters; oil hardened, tough.

FAKIR FSP.
M-1312; 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For upsetters, punches, rivet sets; hot work steel, oil hardened.

FAKIR FSS.
M-1312; 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For bearings, cutters, bushings; water hardened, wear resistant.

FAKIR FSZ.
M-1312; 1.4 C, 0.3 Cr, 0.1 V, 0.3 Mn, bal Fe.
For engravers tools, milling cutters, reamers; water hardened.

FAKIR FW2.
M-1312; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For cutters, drills; Type W1; water hardened.

FAKIR FW3.
M-1312; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For cutters, drills, hobs; Type W1; water hardened.

FAKIR FW4.
M-1312; C, bal Fe.
For tools, cutters; water hardened.

FAKIR FW5.
M-1312, C, bal Fe.
For tools, cutters; water hardened.

FAKIR FW6.
M-1312; C, bal Fe.
For tools, cutters; water hardened.

FAKIR FWM.
M-1312; C, bal Fe
For tools, cutters; water hardened.

FAKIR FWN.
M-1312, 0.55 C, Ni, Cr, Mo, V, bal Fe.
For punches, crimpers, upsetters; oil hardened, shock resistant.

FAKTUM.
M-912; 0.26-0.34 C, 2.2-2.5 Cr, 0.13-0.18 V, bal Fe.
For tools, dies, hot work steel.

FALCON 4.
M-435; 0.45 C, 2.25 W, 1.5 Cr, 0.25 V, bal Fe.
For chisels, pneumatic tools; shock resistant.

FALCON 6.
M-435; 0.55 C, 2.25 W, 1.25 Cr, 0.25 V, bal Fe.
For punches, shear blades, dies; shock resistant.

FALCON EXTRA.
M-253; high C, bal Fe.
For chisels, punches, see Seminole.

"F" ALLOY.
M 331; 2.5 Cu, 20 Zn, 0.5 Mg, 0.5 Mn, 0.75 Si, bal Al.
Heat treated. 8100 TS; 57,000 YS, 19 El.
For aircraft parts, structures; die casting.

FALLS 4-11-44.
M-92; 30 Ni, 30 Cr, bal Fe.
For strengthening high Si iron.

FALLS NO 11.
M-92; Cu alloy.
For high conductivity Cu castings, deoxidizers, degasifier

FALLS NO. 12 ALUMINUM.
M-92; 7.0-8.5 Cu, bal Al.
Cast: 19,000-22,000 TS; 14,000 YS; 1.5-2.0 El, 50 Brin.
For crankcases, vacuum cleaners; not heat treatable.

FALLS NO. 14.
M-92; Cu alloy.
For pressure tight castings; for Cu base alloys.

FALLS NO. 21.
M-92; Mn-Cu.
For Mn bronze hardener; hardener.

FALLS NO. 31 Al BRONZE HARDENER.
M-92; Fe-Al-Cu.
For producing Al bronze; 89 Cu, 10 Al, 1 Fe.

FALLS NO. 34 Al BRONZE HARDENER.
M-92; Fe-Al-Cu.
For producing Al bronze; 4 Fe, 10 Al, 86 Cu.

FALLS NO. 43 ALUMINUM.
M-92; 5 Si, bal Fe.
Cast: 17,000-19,000 TS; 9000 YS; 6-3 El.
For castings; corrosion resistant.

FALLS NO. 108 ALUMINUM.
M-92; 3 Si, 4 Cu, bal Al.
Cast: 19,000 TS; 14,000 YS; 1.5 El.
For castings of intricate design; pressure tight.

FALLS NO. 154 ALLOY.
M-92; 45 Ni, 15 Cr, bal Fe.
For ladle additions to iron.

FALLS NO. 195 ALUMINUM.
M-92; 4.5 Cu, bal Al.
Cast: 21,000 TS; 14,000 YS; 2.0 El.
For castings of high strength; heat treatable.

FALLS NO. 214 ALUMINUM.
M-92; 4 Mg, bal Al.
Cast: 22,000-25,000 TS, 12,000 YS; 9-6 El.
For castings; corrosion resistant.

FALLS BORON ALUMINUM.
M-92; 1 B, bal Al.
For introducing boron in Al alloys; grain refiner.

FALLS BORON COPPER 2%.
M-92; 2 B, bal Cu.
For master alloy for bronzes; grain refiner.

FALLS COPPER ALUMINUM.
M-92; 50 Cu, bal Al.
For Cu addition to Al alloys; alloying

FALLS COPPER-NICKEL.
M-92; 50 Ni, bal Cu.
For alloying for nickel bronzes.

FALLS FERRO ZINC. 5%.
M-92; 5 Fe, bal Zn.
For adding Fe to brasses and bronzes; imparts hardness and creep resistance.

FALLS LITHIUM ALUMINUM 5%.
M-92; 5 Li, bal Al.
For Li additions to Al alloys; diminishes porosity.

FALLS LITHIUM COPPER 2%.
M-92; 2 Li, bal Cu.
For degasifier and deoxidizer for Cu alloys; for dense, non-porous castings.

FALLS MAGNESIUM ZINC. 4%.
M-92; 4 Mg, bal Zn
For adding Mg to Zn base alloys; imparts hardness and creep resistance.

FALLS MANGANESE COPPER.
M-92, 30 Mn, bal Cu.
For Mn additions to Cu base alloys.

FALLS MANGANESE ZINC 4%.
M-92; 4 Mn, bal Zn.
For adding Mn to Zn base alloys, imparts hardness and creep resistance.

FALLS NICKEL COPPER.
M-92; 65 Ni, bal Cu.
For ladle additions to iron and steel.

FALLS PHOSPHOR COPPER.
M-92; 15 P, bal Cu.
For deoxidizing Cu base alloys.

FALLS SILICON ALUMINUM.
M-92; 50 Si, bal Al.
For Si addition to Al alloys; alloying.

FALLS SILICON COPPER.
M-92; 10-30 Si, bal Cu.
For Si additions to Cu base alloys.

FALLS SPECIAL PATTERN ALUMINUM.
M-92; Si, Ti, bal Al.
For patterns, match plates; small top shrinkage.

FALLS TITANIUM ALUMINUM.
M-92; 2.5-5.0 Ti, bal Al
For Ti addition to Al alloys; alloying.

FALLS TITANIUM ALUMINUM.
M-92; 5 Ti, bal Al.
For addition of Ti to aluminum alloys; increases fluidity and ductility.

FALLS V-25.
M-92; 25 Ni, bal Cu.
For Ni additions to bronze; hardener.

FAMA 100.
M-Sweden, 24 Ni, 13 Al, 4 Cu, bal Fe.
For permanent magnets, electrical and magnetic equipment High permeability.

FAMA 600
M-Sweden; 24 Ni, 13 Al, 4 Cu, bal Fe.
For permanent magnets, electrical and magnetic equipment. High permeability.

FAMA 700.
M-Sweden; 21 Ni, 12 Co, 10 Al, 6 Cu, bal Fe
For permanent magnets, electrical and magnetic equipment High permeability

FAN BLADES
Eng ; 61. Cu, 37.0 Zn, 1.5 Pb.
For fan blades; free-cutting.

FANITE.
M-53, 55 Zn, bal Cu. For brazing metal.

FANSTEEL NO. 1.
M-53, Cu alloy
For soldering tips; for low P M. solders.

FANSTEEL NO. 2.
M-53, Cu alloy
For soldering tips, for heavy duty service.

FANSTEEL 17
M-53, 6 Ni, 4 Cu, bal W
Sintered: 90,000 TS, 1 El, 230-255 Brin.
For rotors, flywheels, governors, radiation shields. Machinable Powder metallurgy.

FANSTEEL 21
M-53; 85-90 W, 10-15 Ag
Sintered: 75,000 TS
For high temperature rocket hardware.
Silver infiltrated tungsten High density 33% elect. cond.

FANSTEEL 42.
M-53; 0.5 Ti, 0.08 Zr, bal Mo
Sheet. 120,000-145,000 TS, 105,000-135,000 YS; 7-16 El.
At 2400°F. 50,000 TS.
For high temperature applications, aircraft skins and structural parts.
High recrystallization temperature, good hot strength.

FANSTEEL 60.
M-53; 10 W, 90 TA.
Sheet: 165,000 TS; 165,000 YS; 3 El, Rock B 97.
At 1500°F: 104,000 TS; 96,000 YS; 3 El.
For chemical equipment to resist corrosion and high temperatures, missile nozzles, electronic components.
High corrosion resistance. Work hardens.

FANSTEEL 77.
M-53; W base alloy.
High density alloy; 90,000 TS; 1 El; 230-255 Brin.
For rotors, flywheels, governor weights, radiation shields; machinable.

FANSTEEL 80.
M-53; 1 Zr, bal Cb.
At 1500°F: 32,000 TS; 28,000 YS; 15 El.
At 2500°F: 8000 TS; 6000 YS; 50 El.
At Rt; 50,000 TS; 37,000 YS; 15 El; B 67 Rock.
For missile and rocket components.
High heat and corrosion resistance.

FANSTEEL 82.
M-53; 32 Ta, 1.0 Zr, 0.005 C, bal Cb.
At 2000°F: 30,000 TS.
At 2400°F: 12,000 TS.
For missile and other high temperature applications; heat and oxidation resistant.

FANSTEEL 85.
M-53; 0.6-1.1 Zr, 26-29 Ta, 10-12 W, bal Cb.
At 70°F: 109,000 TS; 92,000 YS; 14 El.
At 2000°F 55,000 TS; 43,000 YS; 20 El.
For space vehicles, nuclear reactors.
Good combination of density, strength, and oxidation resistance at high temperatures.

FANSTEEL 99.
M-53; 1 Ni, bal W.
Sintered: 100,000 TS; 80,000 YS, 6 El.
For missile hardware, rotors, shields, counterweights.
Heavy metal, heat resistant.

FANSTEEL 222.
M-53; 8.5-9.5 W, 2.0-2.8 Hf, 0.0135 max C, 0.06 max Cb, bal Ta.
Stress Relieved (90% cold worked): 220,000 TS; 190,000 YS.
Recrystallized: 180,000 TS; 170,000 YS; 28 El
For aerospace equipment supersonic air and space craft, missile hardware, liquid metal reactors.
Low transition temperature, good creep properties.
Resists extreme environmental conditions

FANSTEEL 601.
M-53; Cu alloy.
Heat treated: 65,000 TS; 55,000 YS; 20 El; 125 Brin.
For soldering iron tips; elec. cond. 85.

FANSTEEL 602.
M-53, Cu alloy
Heat treated: 75,000 TS; 70,000 YS; 15 El; 150 Brin.
For collector rings, circuit breaker parts, torch tips, commutator segments; heat treatable, elec. cond. 80.

FANSTEEL 603.
M-53; Cu alloy.
Heat treated: 120,000 TS; 100,000 YS; 8 El; 190 Brin.
For springs, slip rings, circuit breakers, switch blades; heat treatable, elec. cond. 50.

FANSTEEL 606.
M-53; Cu alloy.
Heat treated: 95,000-115,000 TS; 95,000 YS; 10-15 El; 240 Brin.
For springs, vibrators, circuit breakers, switch blades; heat treatable, corrosion resistant, elec. cond. 53.

FANSTEEL 607.
M-53; Cu alloy.
Heat treated: 175,000-195,000 TS; 170,000 YS; 2-5 El; 420 Brin.
For springs, virbrator arms, contact brushes, fuse clips; heat treatable, elec. cond. 24.

FANSTEEL BL2.
M-53; 1 Ni, bal W.
For counterweights, gyros; high density.

FANSTEEL SCB-291.
M-53; 10 W, 10 Ta, bal Cb.
At 70°F: 75,000 TS; 60,000 YS; 25 El; Rock B 87.
At 1500°F: 46,000 TS; 36,000 YS; 21 El.
At 2500°F: 17,000 TS; 13,000 YS; 24 El.
For high temperature applications, space craft.
Readily workable. Good creep resistance.
Excellent high temperature strength.

FANWELD.
M-53, W, Cr, Co, TaC, CbC.
Cast: 530 Brin.
For hard facing welding rod, hot work dies; wear resistant, high red hardness.

FARCO.
M-253.
For solder for Al, stainless steel, Monel; corrosion resistant.

FARM-ALLOY.
M-507, 2 C, 12 Cr, 4 Mo, 1 V, 3 Ni, 2 Mn, 0.5 B, bal Fe.
Welded: 70,000 TS; 580 Brin
For hard facing electrodes; wear resistant.

FARMFACE
M-9; 4.5 C, 6.0 Mn, 2.0 Si, 30.0 Cr, bal Fe.
Welded. 600 Brin
For hard facing rod, austenitic, wear resistant.

FARRELL-CHEEK F-85.
M-220; 0.25-0.35 C, 1.2-1.4 Mn, 0.35-0.60 Si, 0.2-0.3 Mo, bal Fe.
Annealed: 85,000 TS, 53,000 YS; 22 El, 35 RA, 195 Brin.
Heat treated 105,000-150,000 TS; 85,000-125,000 YS, 17-10 El, 35-25 RA; 240-325 Brin
For gears, shafts, housings; wear and abrasion resistant.

FARRELL-CHEEK F-85-ACM.
M-220, 0.33-0.43 C, 0.65-1.0 Mn, 0.15-0.30 Mo, 0.8-1.1 Cr, bal Fe.
Normalized 100,000 TS, 75,000 YS; 18 El, 35 RA, 225 Brin.
For gears, shafts, housings; fatigue and abrasion resistant

FARRELL-CHEEK F-85-AKN.
M-220; 0.33-0.43 C, 1.5-2.0 Ni, 0.6-0.9 Cr, 0.2-0.3 Mo, bal Fe.
Normalized: 100,000 TS, 75,000 YS, 18 El, 35 RA, 225 Brin.
For gears, shafts, housings, fatigue and abrasion resistant.

FARRELL-CHEEK FC-1020.
M-220; 0.15-0.25 C, 0.65-0.85 Mn, 0.35-0.60 Si, bal Fe.
Annealed: 60,000 TS, 30,000 YS; 26 El; 38 RA; 120-170 Brin.
For machine tool castings, gears, shafts, housings; SAE1020, water hardened.

FARRELL-CHEEK FC-1025.
M-220, 0.20-0.30 C, 0.65-0.85 Mn, 0.35-0.60 Si, bal Fe
Annealed: 78,000 TS; 38,000 YS; 24 El; 36 RA; 150 Brin.
Heat treated: 80,000 TS; 55,000 YS; 22 El; 35 RA; 200 Brin
For machine tool castings, gears, housings, shafts; SAE1025, water hardened.

FARRELL-CHEEK FC-1030.
M-220; 0.25-0.35 C, 0.65-0.85 Mn, 0.35-0.60 Si, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 24 El; 35 RA; 170 Brin.
Heat treated: 90,000 TS; 60,000 YS; 20 El; 40 RA; 210 Brin.
For machine tools castings, gears, shafts, housings; SAE1030, water hardened.

FARRELL-CHEEK FC-1045.
M-220, 0.40-0.50 C, 0.65-0.85 Mn, 0.35-0.60 Si, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 18 El, 30 RA; 175 Brin.
Normalized: 85,000 TS, 50,000 YS, 18 El; 26 RA, 195 Brin.
For machine tool castings, gears, shafts,; SAE 1045, water hardened

FARRELL F-85-B.
M-220, 0.25-0.35 C, 1.2-1.4 Mn, 0.35-0.60 Si, 0.2-0.3 Mo, bal Fe
Hardened: 120,000 TS; 100,000 YS; 14 El, 30 RA, 240-310 Brin.
For gears, pinions, shafts, crankshafts, wear and abrasion resistant

FARRELL-F-85-BKN.
M-220; 0.33-0.43 C, 0.60-0.80 Mn, 0.35-0.60 Si, 0.2-0.3 Mo, 1.5-2.0 Ni, 0.6-0.9 Cr, bal Fe.
Hardened 175,000 TS; 150,000 YS; 6 El, 12 RA; 350-400 Brin
For gears, pinions, shafts, crankshafts; air or oil hardening, tough, fatigue resistant.

FARRELL F 85-HCM.
M-220, 0.33-0.43 C, 0.65-1.0 Mn, 0.35-0.60 Si, 0.15-0.30 Mo, 0.80-1.0 Cr, bal Fe
Normalized 120,000 TS, 100,000 YS, 16 El; 30 RA, 250-300 Brin
For gears, pinions, shafts, crankshafts; high hardenability, fatigue and abrasion resistant

FARRELL F 85 L
M-220, 0.25-0.35 C, 1.2-1.4 Mn, 0.35-0.60 Si, 0.2-0.3 Mo, bal Fe
Normalized 100,000 TS, 65,000 YS, 18 El, 30 RA, 160-240 Brin
For gears, pinions, shafts, housings, wear and abrasion resistant

FARRELLOY
M-252. For solder, corrosion resistant

FARRELL'S "85" ALLOY (A)
M-220, 0.4 C, 0.2 Mo, 0.8 Cr, 0.7 Mn, 1.5 Ni, bal Fe
100,000-170,000 TS, 60,000-140,000 YS; 21-7 El, 36-15 RA, 200-400 Brin
For chains, shovels, crusher rolls, gears, car wheels, sprockets, coal cutters, resists wear, shock, and abrasion.

FARRELL'S HARD EDGE
M-220; 0.6 C, 1.5 Ni, 0.8 Cr, bal Fe.
Heat treated: 650-750 Brin.
For crane wheels, rollers, sheaves, sprockets, gears, abrasion resistant.

FASALOY.
M-53; Ag, Cu, Co.
For electrical contacts.

FASALOY NO. 3.
M-53; Ag, Cu.
For electrical contacts.

FASALOY NO. 4.
M-53; Ag, Cu.
For electrical contacts.

FASALOY NO. 5.
M-53; Ag, Cu, Ni.
For electrical contacts.

FASALOY NO 6.
M-53; Ag, Cu.
For contact parts, electrical contacts; high electrical conductivity.

FASALOY NO. 7.
M-53; Ag, Cd.
For electrical contacts.

FASALOY NO. 12
M-53, Pt, Ru
For electrical contacts

FASALOY NO. 14
M-53; Pt, Ir
For electrical contacts.

FASALOY NO. 24
M-53, Ag, Au.
For electrical contacts.

FASALOY 72
M-53; 72 Au, 26.2 Ag, 1.8 Ni.
For brazing tantalum to steel
Melting range 1904-1940°F.

FASALOY 99
M 53, Ag alloy
For contacts

FASALOY NO 106
M-53, Ag, Cu
B 82 Rockwell
For electrical contacts, springs

FASALOY NO 136
M-53, Ag, Ni.
For electrical contacts

FASALOY NO 138
M-53, Ag, Ni
For electrical contacts

FASALOY NO 139.
M-53, Ag, Ni
For electrical contacts

F A S STEEL
M-56, M-521, 0.4 C, 11.5 Cr, bal Fe
Oil treated 112,000-123,000 TS; 78,500-90,000 YS; 22-18 El, 43-35 RA, 210-260 Brin
For aircraft and automobile valves, heat and corrosion resistant, Firth Brown J-180

FASTBOR HOLLOW DRILL.
M-1067, 0.8 C, bal Fe
For hollow drills; tough.

FASTBOR HOLLOW DRILL
M-908, 0.8 C, bal Fe.
For hollow drill, water hardening

FASTELL NO. 31
M-53; Pd, Ru.
For electrical contacts; formerly No. 928.

FASTELL NO. 35.
M-53, Pd, Ag, Ni.
B85 Rockwell.
For electrical contacts; formerly No. 2.

FASTELL NO. 41.
M-53, Ag, Pd.
B80 Rockwell.
For electrical contacts; formerly No. 1.

FASTELL NO. 42.
M-53; Ag, Pd.
For electrical contacts; formerly No. 1090.

FASTELL NO. 51.
M-53; Ag, Pt.
For electrical contacts; formerly No. 10.

FASTELL NO. 72.
M-53; 72 Au, 26.2 Ag, 1.8 Ni.
For electrical contacts; formerly No. 11.

FASTELL NO. 130.
M-53; Ag, Cd.
For electrical contacts; formerly No. 3653.

FASTELL NO. 142.
M-53; Ag, Ni.
For electrical contacts; formerly No. 2647.

FASTELL 2900.
M-53; Cu.
Sintered: 28,000 TS; 8000 YS; 34 El; 15 Rock F.
Coined: 37,000 TS; 30,000 YS, 15 El; 75 Rock F.
For electrical parts, contacts, terminals, connectors, conductors, welding electrodes.
High conductivity, optimum density. Sintered electrical copper material.

FASTELL BH.
M-53; Mo-Ag.
For electric contacts; sintered

FASTELL E.
M-53; Ag, Mo.
For electrical contacts, sintered.

FASTELL N
M-53; W-Cu.
For electric contacts; sintered.

FASTELL NL.
M-53; Cu, W.
For electrical contacts; sintered; formerly X.

FASTELL UM.
M-53; Ag, W.
For electrical contacts; sintered.

FASTELL UP.
M-53; Ag, W.
For electrical contacts, circuit breakers; sintered.

FASTELL UR.
M-53; W-Ag.
For electric contacts; sintered.

FAST FINISHING.
M-365; 1.25-1.35 C, 3.5-5.0 W, bal Fe.
For tools, reamers, arbors; oil hardened.

FAST FINISHING (DISSTON).
M-357; 1.2 C, 2 W, bal Fe.
For tools, cutters, water hardened.

FATIGUE-PROOF.
M-669; 0.40-0.48 C, 1.35-1.65 Mn, 0.04 max P, 0.24-0.33 S, 0.15-0.30 Si, bal Fe.
Cold finished: 140,000 min TS; 125,000 min YS; 8 El; 30 min Rc; 80% machinability.
For studs, bolts, shafts, axles, machined parts.

FATIGUE-PROOF.
M-1124; 0.40-0.48 C, 1.35-1.65 Mn, 0.04 max P, 0.24-0.33 S, 0.15-0.30 Si, bal Fe.
Cold finished: 140,000 min TS; 125,000 min YS; 8 El; 30 min Rc; 80% machinability
For studs, shafts, bolts, axles, machined parts.

FAULTLESS-A BABBITT.
M-88; Sn, Sb, Pb, Cu.
Cast: 21.8 Brin.
For bearings for saw mills and wood working equipment; Babbitt, resists sudden strain.

FAVORIT.
M-1308; 0.9 C, 1.9 Mn, 0.1 V, bal Fe.
For shears, punches, cutters, dies, crimpers; non-deforming, oil hardened.

FAVORITO SC1.
M-616; 0.95 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies, cutters; non-deforming.

FB-3.
M-1699; Sintered carbide tool materials.
For blanking dies and punches for heavy shock in punching operations.

FB-4.
M-1699; Sintered carbide tool material.
For general purposes blanking dies and punches.

FB-5.
M-1699; Sintered carbide tool materials.
For blanking dies and punches, slitter knives for thicker material.

FB-6.
M-1699; Sintered carbide tool material.
For blanking dies and punches, for punching thin material.

FB-A2. (and other "FB" alloys)
SEE FAGERSTA FB-A2.

F.B.D.
German; 0.15 C, 1 Mn, 1.2 Si, 17.5 Cr, 16 Ni, 1.75 Mo, 2 Cb, 0.12 V, bal Fe.
For supercharger parts, gas engines; high heat resistant.

FC NO. 1.
M-439, M-1, 0.5 C, 0.7 Cr, 1.6 Ni, 0.5 Mn, 0.5 Si, bal Fe.
For stripper dies, backing blocks, die blocks; shock resistant, oil hardened.

FC NO 2
M-439, M-1, 0.18-0.23 C, 1.5 Cr, 0.5 Mo, bal Fe.
For upset insert dies; oil hardened, shock resistant.

FC NO. 5.
M-439, M-1; 1.9-2.2 C, 11.5-12.5 Cr, 0.6-0.9 Mo, bal Fe.
For draw dies, forming and blanking dies, non-deforming, oil hardened.

FC NO. 5XI.
M-439, M-1, 0.3 C, 5 Cr, 1.2 Si, 1.4 Mo, 0.3 V, 1.3 W, bal Fe.
For tools, dies, mandrels, extrusion rams, hot work steel, oil hardened.

FC-5X1 SPEC.
M-439; 0.30-0.35 C, 2.5-3.0 Cr, 9-10.5 W, 0.25 V, 0.25 Mo, 1.7 Ni, bal Fe.
For cast hot work tools; hot work steel, oil hardened.

FC-5XIV.
M-1, M-439; 0.37-0.42 C, 5 Cr, 1.2 Mo, 1.0 V, 1.2 Si, bal Fe
For die casting dies, hot work dies; oil or air hardened.

FC NO. 10.
M-439, M-1, 1.0-1.2 C, 1.1-1.3 Cr, 0.3-0.5 Mo, bal Fe.
For cold rolling dies; oil hardened.

FC NO. 14.
M-439, M-1; 0.35 C, 4.0-5.5 Cr, 0.25 V, 3.25-4.25 W, 1.25-1.75 Si, bal Fe.
For hot die inserts, dummy blocks, press forging dies; oil or air hardened, non-deforming.

FC NO. 19.
M-439, M-1; 0.35 C, 5 Cr, 1.5 Si, 0.3 V, 4 W, bal Fe.
For upset form punches, press forging dies, container liners; hot work steel, oil hardened.

FC NO. 20.
M-439, M-1; 1.4 C, 0.6 Si, 3.5 W, 0.2 V, bal Fe.
For cold drawing dies; water hardened.

FC NO. 23.
M-439, M-1; 0.35-0.42 C, 1.0-1.5 Cr, 0.8 Si, 3.75-4.25 W, 0.25 V, bal Fe.
For extrusion liners and rams; oil hardened, hot work steel.

FC NO. 38M.
M-439, M-1; 0.9 C, 0.25 Mn, 0.15-0.25 V, bal Fe.
For special purpose tools; water hardened.

FC NO. 55.
M-439, M-1; 1.5 C, 11.5-13 Cr, 0.95 Mo, 0.5 V, 2 Co, 0.4 Ni, bal Fe.
For cold work rolls, tools, dies; air hardened, non-deforming.

FC NO. 66.
M-439, M-1, 1.4-1.6 C, 11.5-12.5 Cr, 1.0 Mo, 0.6 V, 3.5 Co, 0.4 Ni, bal Fe.
For forming and blanking dies, punches; air hardened, non-deforming.

FC-85A.
M-220; 0.25-0.35 C, 1.2-1.4 Mn, 0.4 Si, 0.3 Mo, bal Fe
Normalized: 90,000 TS, 60,000 YS, 20 El; 40 RA, 193 Brin.
For gears, shafts, machine tool housings; tough and wear resistant.

FC-85AC.
M-220; 0.25-0.35 C, 1.2-1.4 Mn, 0.4 Si, 0.3 Mo, 1.2 Cu, bal Fe.
Normalized: 90,000 TS; 60,000 YS, 22 El; 42 RA; 193 Brin
For gears, cases, machine tool castings; tough and wear resistant.

FC-85-AKN.
M-220; 0.33-0.40 C, 0.8 Mn, 0.4 Si, 0.2-0.3 Mo, 1.5-2.0 Ni, 0.45-0.90 Cr, bal Fe
Normalized 100,000 TS; 75,000 YS; 18 El; 35 RA; 220 Brin
For gears, shafts, machine tool castings, air hardened, immune to temper brittleness.

FC-85-AN.
M-220; 0.16-0.23 C, 0.8 Mn, 0.4 Si, 1.75-2.50 Ni, bal Fe.
Normalized. 80,000 TS; 50,000 YS; 26 El; 55 RA; 160 Brin.
For gears, cases, machine tool castings, shock and fatigue resistant.

FC-85-AV
M-220; 0.25-0.35 C, 1.3 Mn, 0.4 Si, 0.25 Mo, 0.15 V, bal Fe.
Normalized. 90,000 TS, 60,000 YS; 22 El, 42 RA; 193 Brin.
For gears, cases, machine tool castings, shock resistant castings.

FC-85-BN
M-220; 0.25-0.30 C, 0.8 Mn, 0.4 Si, 0.2-0.3 Mo, 1.75-2.50 Ni, bal Fe.
Heat treated: 125,000 TS; 110,000 YS; 14 El; 32 RA; 275 Brin.
For gears, cases, machine tool castings; low temp applications, tough.

FC-85-HN.
M-220; 0.25-0.30 C, 0.7 Mn, 0.4 Si, 1.75-2.50 Ni, bal Fe.
Normalized: 90,000 TS; 60,000 YS; 25 El, 50 RA, 190 Brin.
For gears, casings, machine tool castings; immune to temper brittleness.

FC-85 T.
M-220; 0.2-0.3 C, 0.7 Mn, 0.4 Si, 0.5 S and P. bal Fe.
Heat treated: 82,000 TS; 46,000 YS, 21 El; 32 RA; 180 Brin.
For gears, shafts, machine tool housings; heat treated castings.

FC-440C.
M-1, M-439; 0.95-1.2 C, 16-18 Cr, 0.40-0.65 Mo, bal Fe.
For surgical instruments, ball bearings, liners; Type 440C; corrosion resistant.

FC-1025.
M-220; 0.2-0.3 C, 0.7 Mn, 0.4 Si, 0.5 S and P, bal Fe.
Annealed: 70,000 TS; 38,000 YS; 24 El; 36 RA; 143 Brin.
For gears, shafts, machine tool housings; SAE 1020 to 1027 steel castings.

FC-1025V.
M-220; 0.2-0.3 C, 0.7 Mn, 0.4 Si, 0.10-0.20 V, bal Fe.
Normalized: 75,000 TS; 48,000 YS, 25 El; 40 RA; 153 Brin.
For gears, cases, machine tool castings; shock resistant castings.

FC-1040
M-220, 0.4-0.5 C, 0.7 Mn, 0.5 Si, 0.05 S and P, bal Fe.
Annealed 80,000 TS; 45,000 YS; 17 El; 25 RA; 187 Brin
For gears, shafts, machine tool housings; SAE 1040 to 1046 steel castings.

FC-1040 N.
M-220; 0.4-0.5 C, 0.7 Mn, 0.5 Si, 0.5 S and P, bal Fe.
Normalized· 85,000 TS; 50,000 YS, 18 El; 26 RA; 170 Brin.
For gears, shafts, machine tool housings; SAE 1040 to 1046 steel castings.

FC-1040 Q
M-220, 0.4-0.5 C, 0.7 Mn, 0.5 Si, 0.05 S and P, bal Fe.
Heat treated· 95,000 TS, 65,000 YS; 19 El, 35 RA, 200 Brin.
For gears, shafts, machine tool housings, SAE 1040 and 1046 steel castings

FC-1084.
M-1, M-439, 0.25-0.35 C, 0.4 Mn, 1.0-1.5 Si, 8-10 Cr, 1.0-1.25 Mo, bal Fe.
For oil refinery equipment, stills; resists oil corrosion.

FC-8740.
M-439, 0.38-0.43 C, 0.5 Cr, 0.3 Mo, 0.5 Ni, bal Fe.
For cast gears, shafts, machine tools, oil hardened.

FC-AH
M-439, M-1; 1.45-1.60 C, 11.5-12.5 Cr, 0.8 Mo, 0.5 V, 0.2 Ni, bal Fe.
For forming and blanking dies; air hardened, non-deforming.

FC AIR HARDENING CAST TO SHAPE.
M-1; 1.5 C, 0.4 Mn, 0.4 Si, 12.0 Cr, 0.25 Ni, 0.5 V, 0.9 Mo, 0.75 Co, bal Fe.
AISI Type D2 cold work tool steel.

FC AIR HARDENING FORGING.
M-1; 1.5 C, 0.4 Mn, 0.4 Si, 12.0 Cr, 0.25 Ni, 0.5 V, 0.9 Mo, 0.75 Co.
AISI Type D2 cold work tool steel.

FC-ALX.
M-1, M-439; 1.75-2.0 C, 32-34 Cr, 16-17 W, 0.7 Mo, 0.5 Mn, bal Co.
For tools, dies; corrosion and abrasion resistant.

FC-ALX NO. 6.
M-439; 1.0 C, 33.5 Cr, 6 W, bal Co.
For high temperature applications; heat resistant.

FCB(T).
Eng.; 0.12 C, 17.5 Cr, 12 Ni, 1 Cb, bal Fe.
For gas turbine parts; stainless, austenitic, stabilized.

FCC 16B CAST-TO-SHAPE.
M-1, M-439; 0.65 C, 0.55 Mn, 0.9 Cr, 0.8 Mo, 0.1 V, 0.3 Si, 1.8 Ni, bal Fe.
For hot forming dies; hot work steel.

FCC 168.
M-1, M-439; 0.65 C, 0.9 Cr, 0.8 Mo, 0.1 V, 1.8 Ni, bal Fe.
For hot forming dies; oil or air hardened, hot work steel.

F.C.C. AIR HARDENING.
M-1, M-439; 1.45-1.60 C, 0.4-0.5 Mn, 0.7 Co, 11.5-12.5 Cr, 0.8 Mo, 0.5 V, bal Fe.
For blanking, forming, drawing, embossing dies, punches, hot press work, rotary shears; air hardening; non-deforming; cast to shape; resists abrasion.

FC CAST TOOL STEEL.
M-1; 0.9 C, 0.35 Mn, 0.3 Si, bal Fe.
AISI Type W1 water hardening tool steel.

FC-CMS.
M-439, M-1; 0.55-0.65 C, 0.8-1.2 Cr, 0.7 Mn, 0.4 Mo, 0.5 Ni, 0.15 V, bal Fe.
For forming dies; tough, oil hardened.

FC-CNS.
M-439; 1.6 C, 11-13 Cr, 0.5 V, 0.9 Mo, 0.6 max Co, bal Fe.
For blanking and forming dies, castings; air hardened, non-deforming.

FC-CTS.
M-1, M-439; 0.8-1.1 C, bal Fe.
For cold work dies, inserts, machinery parts; water hardened.

FC-CV.
M-1, M-439; 0.45 C, 1.0 Cr, 0.7 Mn, 0.2 V, bal Fe.
For machinery parts, dies; oil or water hardened.

FC-EZ.
M-439; 1.4 C, 0.25 Cr, 0.25 Mo, 1.3 Si, 1 Mn, bal Fe.
For cutters; oil or water hardened.

FC-FH.
M-1, M-439; 0.5 C, 1.1 Mn, 1.2 Cr, 0.4 Mo, 0.1 V, bal Fe.
For machinery parts, cold work dies; oil hardened.

FC-FLAMHARD.
M-1; 0.50 C, 1.15 Mn, 0.50 Si, 1.20 Cr, 0.12 V, 0.40 Mo, bal Fe.
Prehardened: 300-325 Brinell.
For die casting dies, die holder blocks, frames.
Hot work die steel.

FCF SPECIAL.
M-459; C, Cr, bal Fe.
For files; water hardening.

FCHD.
M-1132; 0.14 max C, 17-19 Mn, 10-13 Cr, 0.5-2.0 Si, 0.3-0.8 Ti or 0.1-0.3 N, bal Fe.
For turbine blades; high heat resistant.

FC-HE.
M-220; 0.25-0.35 C, 1.2 Mn, 0.4 Si, 0.2-0.3 Mo, bal Fe.
Normalized: 110,000 TS; 90,000 YS; 20 El; 45 RA.
For hard edge tools, gears; wear and abrasion resistant.

FCI STAINLESS IRON.
M-521; 0.12 C, 0.6 Si, 1.2 Mn, 13.5 Cr, 0.28 Mo, 0.23 S, bal Fe.
Heat treated: 85,000 TS, 58,000 YS; 28 El; 62 RA; 180 Brin.
For hardware, screw machine products; free-cutting, corrosion resistant.

FC-NCI.
M-439; M-1; 2.75 C, 1.2 Cr, 0.25 Mo, 1 Al, 2.6 Si, bal Fe.
For liners, sleeves, machinery parts; nitriding cast iron.

FC-ROLOY.
M-1, M-439; 1.5 C, 12 Cr, 1.1 Mo, 0.5 V, 0.7 Co, 0.25 Ni, bal Fe.
For cold working rolls, dies, blanking and forming dies; air hardened, non-deforming.

FC-ROLOY NO 2.
M-1, M-439; 1.0 C, 5.25 Cr, 1.15 Mo, 0.5 V, bal Fe.
For blanking and forming dies, cold work dies; air hardened.

FC SPEZIAL.
M-459; C, Cr, bal Fe.
For files; water hardening.

F.C.S. STAINLESS STEEL.
M-521; 0.18 C, 0.6 Si, 1.2 Mn, 0.23 S, 0.25 Mo, 13.5 Cr, bal Fe.
Heat treated: 92,000 TS; 65,000 YS; 25 El; 54 RA, 220 Brin.
For hardware, screw machine products, bolts, shafts, free cutting, corrosion resistant.

FCW SPECIAL.
M-459, C, Cr, W, bal Fe.
For files; water hardening

FD-3.
M-1699; Sintered carbide tool material.
For draw dies, for drawing wire, tube and bar stock

FD-4.
M-1699; Sintered carbide tool material.
For draw dies, for drawing wire, tube and bar stock.

FD-5.
M-1699; Sintered carbide tool material.
For draw dies, for drawing wire, tube and bar stock

"FD65" STEEL.
English; 0.25 C, 0.5 Mn, 3 Ni, 1.2 Cr, 0.45 Mo, 0.2 V, bal Fe.
Hardened: 150,000 TS; 20 El; 65 RA; 320 Brin.
For aircraft engine parts; case hardened.

FEAL.
M-France; 25 Al, bal Fe.
For atomic reactors.
Outstanding resistance to oxidation and excellent strength at high temperatures. It is particularly transparent to neutrons.

FECHRAL.
Russia; 0.06-0.15 C, 17-25 Cr, 4-7 Al, bal Fe.
For resistance wire; heat resistant.

FECRALOY.
M-61; 0.2 C, 13 Cr, 4 Al, bal Fe.
Rolled: 128,000 TS; 104,000 YS; 5 El.
For rheostats, heating elements; high heat resistance.

FEDERAL HIGH SPEED.
M-377; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed cutting tools; high speed steel.

FEDERAL-MOGUL F-2.
M-709; 80 Cu, 10 Sn, 10 Zn.
Cast: 40,000 TS; 29 El; 27 RA; 64 Brin.
For bushings, bearings; S.A.E. 64.

FEDERAL-MOGUL F-8.
M-709; 83 Cu, 7 Sn, 7 Pb, 3 Zn.
Cast: 34,000 TS; 23 El; 24 RA; 53 Brin.
For bearings, bushings.

FEDERAL-MOGUL F-15.
M-709; 70 Cu, 10 Sn, 20 Pb.
Cast: 31,300 TS; 16 El; 14.6 RA; 59 Brin.
For bearings.

FEDERAL-MOGUL F-22.
M-709; 5-12 Al, Fe, Ni, Mn, Zn, Sn, bal Cu.
Cast: 70,000 TS; 25 El; 130 Brin.
For marine propellers; resists sea water corrosion.

FEDERALOY AF-6.
M-709; Sn, bal Al.
Cast.
For journal and crankpin bearings; heavy duty.

FEDERALOY AT-7.
M-709; 5.5-7.0 Sn, 0.7-1.3 Cu, 0.7-1 3 Ni, bal Al.
Cast: 21,000 TS; 10,500 YS, 11 El; 44 Brin.
For journal and crankpin bearings; Alcoa 750 TS; heavy duty

FEDERALOY B-30.
M-709; 25-32 Pb, 1.5 max Ag, bal Cu.
Cast: 8000-9000 TS, 6 8 El; 22-32 Brin.
For journal and crankpin bearings; SAE 48; heavy duty

FEDERALOY B-35
M-709, 32-37 Pb, 1 5 max Ag, bal Cu.
Cast: 7750-8750, 6-8 El; 20-30 Brin
For journal and crankpin bearings; SAE 480, heavy duty

FEDERALOY B-40
M-709, 37-42 Pb, 2 max Ag, bal Cu.
Cast: 75,000 85,000 TS; 6-8 El; 20-30 Brin
For bearings, bushings; superior to Babbitt.

FEDERALOY B-100.
M-709, 3-5 Cu, 7-8 Sb, bal Sn.
At 70°F: 105,000 TS, 11 El; 24 Brin
At 300°F 42,000 TS, 22 El, 8 Brin.
For reciprocating engine bearings, pump bearings; Babbitt.

FEDERALOY F-12.
M-709; 6-8 Sn, 18-20 Pb, bal Cu.
Cast: 25,000 TS, 16 El, 14 RA; 47 Brin.
For bearings, bushings; resists adverse lubrication

FEDERALOY H-24.
M-709, 21-27 Pb, 4 min Sn, bal Cu.
Cast.
For journal and crankpin bearings, SAE 49; heavy duty.

FEDERALOY H-35.
M-709; 32-37 Pb, 4 min Sn, bal Cu.
Cast.
For journal and crankpin bearings; SAE 480; heavy duty.

FEDERALOY HF-2.
M-709; 9-11 Sn, 9-11 Pb, 0.75 max Zn, 0.5 max Ni, bal Cu.
Cast.
For heavy duty bushings, bearings; SAE-797.

FEDERALOY HF-3.
M-709; 4 Sn, 4 Zn, 8 Pb, 0.5 max Sb, 0.5 max P, bal Cu.
Cast.
For thrust washers, bearings, bushings; SAE-798.

FEDERALOY HF-16.
M-709; 3-4 Sn, 3 max Zn, 21-25 Pb, bal Cu.
Cast.
For heavy duty bushings, bearings; SAE 799.

FEDERALOY HF-24.
M-709; 76 Cu, 24 Pb.
Cast.
For bearings, liners, bushings; plastic bronze.

FEDERALOY L-200
M-709; 14-16 Sb, 0.75-1.25 Sn, 0.6 max Cu, 1.0 As, bal Pb.
At 70°F: 8800 TS; 2 El; 21 Brin
For bearings for engines, compressors, pumps and turbines; Babbitt.

FEDERALOY L-300.
M-709; 9.25-10 75 Sn, 14-16 Sb, 0.5 max Cu, bal Pb.
For bearings, bushings; Babbitt.

FEDERALOY L-301.
M-709; 2-4 Sn, 0.3-1.0 Hg, 0.05-1 0 Ca, 0.15 max Al, bal Pb.
At 70°F: 10,300 TS; 13 El; 23 Brin.
For bearings; Babbitt.

FEDERALOY RS-11.
M-709, 0.25-0.75 Sn, 0.10 max Fe, 88-92 Cu, bal Zn.
For architectural trim, commercial bronze, SAE 795

FEDERALOY RS-13
M-709, 66 Cu, 34 Zn.
For ornaments, fixtures, hardware, SAE 70C; yellow brass.

FEDERALOY RS-21.
M-709, 3.5-4 5 Sn, 1.5-4.0 Zn, 3.5-4.5 Pb, bal Cu.
Cast.
For piston pins, bushings, thrust washers; SAE 791, leaded bronze.

FEDERALOY RS-25.
M-709; 0 5 Sn, 8 Zn, 1 5 Pb, bal Cu.
Cast
For hardware; free-cutting

FEDERALOY RS-27.
M-709; 36 Zn, 1 5 Pb, bal Cu
Cast.
For hardware, free-cutting; SAE-72

FEDERALOY RS-29
M-709; 99.0 min Al
Cast.
For electrical machinery conductors

FEDERATED NO 2
M-815; 7.5 Sb, 3 5 Cu, 89 Sn
Cast. 10,900 TS, 8 El, 24 Brin
For bearings; M.P 466°F.

FEDERATED NO. 3.
M-815, 83.3 Sn, 8.3 Sb, 8.3 Cu.
Cast: 12,300 TS; 2 El; 26 Brin
For bearings; antifriction, Babbitt.

FEDERATED NO. 7.
M-815; 75 Pb, 10 Sn, 15 Sb.
Cast: 10,500 TS; 5 El, 20 Brin.
For bearings; antifriction, Babbitt.

FEDERATED NO. 8.
M-815, 80 Pb, 5 Sn, 15 Sb.
Cast: 10,000 TS; 5 El; 20 Brin.
For bearings; antifriction, Babbitt.

FEDERATED NO. 14.
M-815; 83.75 Pb, 0.75 Sn, 12.5 Sb, 3 As.
Cast: 9800 TS; 1.5 El; 22 Brin.
For bearings; antifriction, Babbitt.

FEDERATED NO. 15.
M-815; 83 Pb, 1 Sn, 1 As, 15 Sb.
Cast: 10,350 TS; 2 El; 20 Brin.
For bearings; antifriction, Babbitt.

FEDERATED F004.
M-815; 4 Mg, bal Al.
Sand Cast: 22,000-26,000 TS; 12,000-14,000 YS; 6-10% El; 50-60 Brin.
For corrosion resistant castings. Tough. Aluminum 214 alloy. Not heat treatable.

FEDERATED F004Zn.
M-815; 4 Mg, 2 Zn, bal Al.
Cast: 24,000-29,000 TS; 16,000-19,000 YS; 3-7 El; 70 Brin.
For cookware, food handling equipment, fittings, marine hardware.
Pressure tight, similar to Aluminum A214.

FEDERATED F008.
M-815; 8 Mg, bal Al.
Cast: 45,000 TS; 28,000 YS; 5 El; 75 Brin.
For general purpose die castings, brake shoes, propellers, cylinder blocks, motor brackets.
Tough, strong, high corrosion resistance. Similar to Aluminum 218.

FEDERATED F024.
M-815; 2 Si, 4 Mg, bal Al.
Cast: 20,000-24,000 TS; 13,000-16,000 YS; 1-2 El; 60 Brin.
For pressure tight castings, cooking utensils, marine fittings.
Aluminum B 214, excellent corrosion resistance.

FEDERATED F050.
M-815; 5 Si, bal Al.
Cast: 22,000 TS; 10,000 YS; 4 El; 50 Brin.
For pressure tight castings, marine hardware, architectural parts.
Aluminum 43 alloy, tough and corrosion resistant.

FEDERATED F070.3.
M-815; 7 Si, 0.3 Mg, bal Al.
Ht. Tr.: 33,000 TS; 24,000 YS; 3 El; 70 Brin.
Sand Cast: 23,000 TS; 12,000 YS; 3 El; 55 Brin.
For complex pressure tight castings.
Aluminum 356. Age hardenable, corrosion resistant.

FEDERATED F090.5.
M-815; 9.5 Si, 0.5 Mg, bal Al.
Cast: 46,000 TS; 24,000 YS; 4 El; 80 Brin.
For general purpose castings, cover plates, instrument housings, casings. Corrosion resistant die castings. Similar to Aluminum 360.

FEDERATED F100.4.
M-815; 0.8 Cu, 8 Zn, 0.4 Mn, bal Al.
Cast: 29,000 TS; 16,000 YS, 6-7 El; 60 Brin.
For permanent mold castings.

FEDERATED F0120.
M-815; 12 Si, bal Al.
Sand Cast: 27,000 TS; 12,000 YS; 8 El; 55 Brin.
Permanent Mold: 26,000 TS; 12,000 YS; 3 El.
For meter cases, switch boxes, thin walled castings.
Similar to Aluminum 13, not heat treatable, pressure tight, high fluidity.

FEDERATED F150.5.
M-815; 1 Cu, 5 Si, 0.5 Mg, bal Al.
Ht. Tr.: 44,000 TS; 42,000 YS; 1 El; 95 Brin.
Cast: 26,000 TS; 17,000 YS; 2 El; 75 Brin.
For complex pressure tight castings, cylinders, housings, hardware.
Age-hardenable, good castability, pressure tight.

FEDERATED F-250.
M-815; 2 Cu, 5 Si, bal Al.
For light alloy castings; age-hardenable.

FEDERATED F360.
M-815; 3 Cu, 6 Si, bal Al.
Ht. Tr.: 35,000 TS; 20,000 YS; 3 El; 80 Brin.
Sand Cast: 28,000 TS; 15,000 YS; 4 El; 60 Brin.
For housings, oil pans, casings.
Heat treatable, high strength.

FEDERATED F391 Ni.
M-815; 3.5 Cu, 9 Si, 1 Mg, 1 Ni, bal Al.
Cast: 32,000 TS; 26,000 YS; 2 El; 85 Brin.
For pistons.
Aluminum D 132 alloy.

FEDERATED F401.5 Ni.
M-815; 4 Cu, 1.5 Mg, 2 Ni, bal Al.
Ht. Tr.: 45,000 TS; 42,000 YS; 1 El; 100 Brin.
Cast: 34,000 TS; 32,000 YS; 1 El; 86 Brin.
For cylinder heads, pistons.
Aluminum 142 alloy, wear and heat resistant. Age-hardenable.

FEDERATED F410.
M-815; 4 Cu, 1 Si, bal Al.
Ht. Tr.: 47,000 TS; 42,000 YS; 1 El; 110 Brin.
Cast: 25,000 TS; 11,000 YS; 4 El; 65 Brin.
For high strength castings, housings, hardware, gear cases, oil pans.
Age-hardenable. Aluminum 195 alloy.

FEDERATED F 430
M-815; 3.5-4.5 Cu, 3 Si, 0.05 Mg, 0.5 Mn, 1 Fe, 0.3 Ni, 0.3 Zn, bal Al.
Cast: 25,000 TS, 12,000 YS; 3 El; 57 Brin.
Aged: 28,000 TS; 21,000 YS, 2 El; 74 Brin.
For light alloy castings; general purpose alloy.

FEDERATED F450.
M-815; 4 Cu, 5 Si, bal Al.
Ht. Tr.: 45,000 TS; 40,000 YS; 1 El; 105 Brin.
Cast: 25,000 TS; 15,000 YS; 2 El; 70 Brin.
For general purpose castings
Aluminum A108, heat treatable. Good castability.

FEDERATED F460.
M-815; 3-4 Cu, 5.5-6.5 Si, bal Al.
Ht Tr.: 45,000 TS; 40,000 YS; 1 El; 105 Brin.
Cast: 25,000 TS, 15,000 YS; 2 El; 70 Brin.
For general purpose castings, grills, reflectors, housings, casings.
Heat treatable, Aluminum 319 alloy.

FEDERATED F-480.
M-815; 4 Cu, 8 Si, bal Al.
For die castings; high strength.

FEDERATED F-720.
M-815, 7 Cu, 2 Si, bal Al.
For castings; general use.

FEDERATED F750.3
M-815; 6.5 Cu, 5.5 Si, 0.3 Mg, bal Al.
Ht. Tr.. 50,000 TS; 48,000 YS; 0.5 El; 130 Brin.
For pistons.
Aluminum 152 alloy, age-hardenable, high strength.

FEDERATED F1000.3.
M-815; 10 Cu, 0.3 Mg, bal Al.
Ht. Tr.: 44,000 TS; 40,000 YS; 0.5 El; 120 Brin.
For cylinder heads, pistons.
Aluminum 122 alloy. Heat treatable, good high temperature strength.

FEDERATED F1040.3.
M-815; 10 Cu, 4 Si, 0.4 Mg, bal Al.
Ht. Tr.: 46,000 TS; 44,000 YS; 125 Brin.
For cylinder heads, pistons.
Aluminum 138 alloy, age-hardenable.
Good high temperature strength.

FEDERATED F1121 Ni.
M-815; 1 Cu, 12 Si, 1 Mg, 2.5 Ni, bal Al.
Stress-Relieved: 32,000-36,000 TS; 28,000-30,000 YS; 0.5% El; 105 Brin.
For general purpose castings.
Aluminum A 132 Alloy. Not heat treatable.

FEDERATED F4110.
M-815; Si, bal Al.
For die castings; high fluidity.

FEDERATED STEEL MILL ALUMINUM GR. 4.
M-815; 85-90 Al, bal Cu, Fe, Mn, etc.
For deoxidizer in steel mills.

FEDERATED XXXX NICKEL.
M-815; Sn alloy.
For bearings, Babbitt.

FEDOL.
M-375; 1.2 C, 0.2 V, bal Fe.
For tools, dies; water hardening.

FENICOLOY.
M-1523; 29 Ni, 17 Co, 0.2 Mn, bal Fe.
Resistance wire: 294 ohms per cir.mil.ft.
Ann.: 75,000 psi.; hard drawn; 150,000 psi.
For resistors; max oper. range; 450°C.

FENTON'S ALLOY.
Eng.; 80 Zn, 14 Sn, 6 Cu.
For bearings; Babbitt.

FENTON'S ALLOY.
Eng ; 80 Zn, 8.5 Cu, 11.5 Sb.
For bearings; Babbitt.

FER.
M-365; 0.7-1.2 C, bal Fe.
For tools, dies, punches; water hardened.

FERAL.
Germany; 0.06 C, 0.6 Mn, bal Fe, clad with Al alloy.
For aircraft fire walls; aluminum-clad steel.

FERALITE
M-145; 3 C, Si, Mn, bal Fe.
For housings, fittings, gears, shafts, malleable iron.

FERALLOY.
M-104; 14 Al, Mn, Si, bal Fe.
For corrosion and heat resistant parts; corrosion and heat resistant.

FERALSI.
M-745; Fe-Al-Si.
For magnetic applications; high magnetic permeability.

FERALUN.
M-250; Special iron base + abrasive grains imbedded.
For stairs, platforms; castings; wear resistant.

FERAN.
M-798, Fe-Al.
For bi-metals in the canning industry.

FERAN.
Eng.; sheet Iron coated with Al and rolled together.
For engineering construction; corrosion resistance of Al and strength of Fe.

FERCHROMIT.
M-651; 22-30 Cr, 0.5-2.5 Si, 0.1-1.5 C, bal Fe.
Resists oxidation at high temperatures.

FEREX.
U.S.; 0.2 C, bal Fe.
For welding rod for armor; coated.

FERIMPHY.
M-771; iron alloy.
For armatures, transformers; soft magnet for strong or moderate field.

FERINOX.
M-101; 0.09 C, 1.2 Si, 1.3 Mn, 17 Cr, 8 Ni, 0.7 Mo, bal Fe.
Rolled: 299,000 TS; 250,000 YS; 8 El.
For watch mainsprings.
Stainless, austenitic, high fatigue strength

FERMET.
Eng.; 4 Cr, 18 Ni, 2.2 Mn, 1 W, 0.3 Cu, 0.35 C, bal Fe.
For corrosion resisting parts; stainless and corrosion resistant.

FERNITE 5C.
M-439; 0.45-0.55 C, 1.2 Mo, 4 Co, 19-21 Cr, 11-13 Ni, 0.2 Se, bal Fe.
For heat resistant parts; heat and corrosion resistant.

FERNITE 17A.
M-439; 0.30-0.50 C, 8-9 Cr, 18.7-19.7 Ni, bal Fe.
For high temperature applications; heat resistant

FERNITE 17B.
M-439; 0.20-0.30 C, 6.7-7.7 Cr, 18.7-19.7 Ni, bal Fe.
For high temperature applications; heat resistant.

FERNITE 24.
M-439; 2.3 C, 24 Cr, 0.3 Mn, 0.2 Si, 5.3 W, 0.3 V, 0.3 Ni, 0.9 B, bal Fe.
For forming and sizing dies; cast iron, corrosion resistant.

FERNO
M-688, 0.70 C, 3.75 Cr, 0.55 V, 0.7 Mo, bal Fe.
For hot work dies, punches, shear blades; good red hardeners.

FERNO EXTRA.
M-688; 0.45 C, 3.75 Cr, 0.4 Mn, 0.7 V, 12 W, bal Fe.
For hot work dies, punches, shear blades; tough and abrasion resistant.

FEROBA-III.
M-210, BaO, 6 Fe_2O_3.
3500 Br, 2500 Hc, 2,800,000 BH max.
For permanent magnets in electrical and magnetic equipment. High permeability.

FERRAL.
Russia, 0.25 max C, 12-15 Cr, 3.5-5.5 Al, bal Fe.
For electrical and heat resistance elements; applications to 1100°C.

FERRIMAG I.
M-38, BaO, 6 Fe_2O_3. (Sintered)
1,050,000 BH max; 2300 Br. 1850 Hc; 1150 Bd.
For permanent magnets, high coercive force.

FERRIMAG 5.
M-38, BaO, 6 Fe_2O_3.
Bar. 3950 Br, 2400 Hc, 2,500,000 BH max.
For electrical and magnetic equipment.
Permanent magnet, high permeability.

FERRO BRONZE.
U.S.; 8 Fe, 0.7 Cr, bal Cu.
For hardware; corrosion resistant.

FERROCAL.
M-302; Al alloy
Chill cast: 23,000-28,000 TS, 4-2 El.
For permanent mold castings; general machinery parts, automobile and motorcycle parts.

FERROCHRONIN 15-60.
M-303; 15 Cr, 60 Ni, bal Fe.
For electrical equipment, heating elements, resistors, high heat and electrical resistance.

FERROCHRONIN 20-30.
M-303; 20 Cr, 30 Ni, bal Fe.
For electrical equipment, heating elements, resistors; high heat and electrical resistance.

FERROCHRONIN 75-15.
M-303; 14-16 Cr, 72 Ni, 6-9 Fe.
For heaters, combustion liners, manifolds, regenerators; high heat and corrosion resistance.

FERROCITE.
M-799; 0.5 C, bal Fe.
For valves, guides; powder metals.

FERRODUR.
M-508; 3 C, 0.5 Mo, 1.2 Ni, 0.9 Mn, 2 Si, 0.2 Cr, bal Fe.
Heat treated: 50,000 TS; 0 El; 500 Brin.
For pump liners, shaft sleeves; centrifugal casting.

FERROLUM.
M-1193; lead clad steel.
For chemical plant equipment; acid resistant.

FERROMET.
M-1246; Fe alloy.
For machine parts, bearings, magnets; sintered alloy.

FERRO MOLYBDENUM (LOW CARBON).
M-640; 0.50 max C, 60-70 Mo.
For metallurgical applications in steel making; Mo-additions.

FERRO MOLYBDENUM (STANDARD).
M-640; 1.60-2.25 C, 58-65 Mo, bal Fe.
For metallurgical applications in steel making; Mo-additions.

FERRON.
M-329; 50 Fe, 35 Ni, 15 Cr.
For heating elements, heat and corrosion resisting parts; heat and corrosion resistant.

FERROPYR-I.
England; 86 Fe, 7 Cr, 7 Al, 1 Mn + Si.
For electrical resistances; used in high temperature range of 2100-2460°F.

FERRO SILICON.
M-394; 15-95 Si, bal Fe. For use in manufacture of steel; Vancoram Six Grades.

FERRO-SILICON CAST IRON NO. 8.
M-243; 3 C, 25 Si, bal Fe.
Welded: 26,000 TS.
For welding rods for cast iron; cast iron.

FERROSILID.
Russia; 0.5-0.7 C, 12-18 Si, bal Fe.
For cast pumps and conduits; acid resistant, cast.

FERROSTEEL.
M-748; 3 C, 1.8 Si, bal Fe.
Cast: 35,000 TS.
For valves, fittings; Tr.S. 3600; Tr. def. 0.14.

FERROTHERM FF 6.
M-72; 0.15 C, 6 Cr, bal Fe.
Heat treated: 78,000 TS; 50,000 YS; 18 El; 50 RA.
For furnace parts, crucibles, autoclaves, recuperators; heat and corrosion resistant to 800°C.

FERROTHERM FF 18.
M-72; 0.15 C, 18 Cr, bal Fe.
Annealed: 78,000 TS; 50,000 YS; 12 El; 12 RA.
For furnace parts, crucibles, autoclaves, recuperators; heat and corrosion resistant to 1000°C.

FERROTHERM FF 30.
M-72; 0.15 C, 30 Cr, bal Fe.
Annealed: 78,000 TS; 58,000 YS; 12 El; 8 RA.
For furnace parts, crucibles, autoclaves, recuperators; heat and corrosion resistant to 1200°C.

FERROTHERM FF 112.
M-72; 1.0 C, 12 Cr, bal Fe.
For furnace parts, crucibles, autoclaves, recuperators; heat and corrosion resistant to 850°C.

FERROTHERM FF 118.
M-72; 1.0 C, 18 Cr, bal Fe.
For furnace parts, crucibles, autoclaves, recuperators, heat and corrosion resistant to 1000°C.

FERROTHERM FF 128.
M-72; 1.0 C, 28 Cr, bal Fe.
For furnace parts, crucibles, autoclaves, recuperators; heat and corrosion resistant to 1100°C.

FERROTHERM FF 228.
M-72; 2.0 C, 28 Cr, bal Fe.
For furnace parts, crucibles, autoclaves, recuperators; heat and corrosion resistant to 1100°C.

FERRO-TIC GR.A.
M-1469; 26 Ti, 7 C, 2 Cr, 2 Mo, bal Fe.
Annealed: 400 Brin.
Heat treated: 700 Brin.
For drawing and forming dies, rolls, cutters; sintered carbide, heat treatable.

FERRO-TIC Gr. C.
M-1469, 26 Ti, 7 C, 2 Cr, 2 Mo, bal Fe (45% carbide by volume).
Ann: 40 Rock C.
Ht. Tr.: 300,000 Tr.S.; 70 Rock C.
For tools, dies, rolling and blanking dies, valves, wear parts.
Sintered carbides with alloy steel matrix, wear resistant; max operating temp 400°F.

FERRO-TIC Gr CM.
M-1469; 56.5 Fe, 27.6 Ti, 6.6 Cr, 2.0 Mo, 7.4 C. (45% carbide by volume).
Ann 45 Rock C.
Ht. Tr : 310,000 Tr.S; 66-70 Rock C.
For tools, dies, valves, forming dies
Steel bonded carbide; max. operating temp: 1000°F.

FERRO-TIC Gr CN 5.
M-1469; 45% WC by volume, age-hardenable copper-nickel alloy matrix.
For tools and dies, and for wear resistant parts exposed to sea water, corrosion resistant, excellent resistance to sea water.

FERRO-TIC Gr. CS-40
M-1469; 45% TiC by volume, Martensitic stainless steel matrix.
Ann: 50 Rock C
Hardened: 225,000 Tr.S; 68-70 Rock C.
Good wear and corrosion resistance; for can closing tools, chemical plant valve seats and wear parts

FERRO-TIC Gr. DN-1.
M-1469; 45% TiC by volume, age-hardenable nickel-aluminum alloy matrix.
Ann: 40-41 Rock C.
Age-hardened: 52-53 Rock C.
Good corrosion resistance toward strong chlorides.

FERRO-TIC Gr. HT-2.
M-1469; 45% TiC by volume, Ni-Fe-Cr age hardenable alloy matrix.
Ann: 44 Rock C.
Aged: 54 Rock C; 250,000 Tr.S.

FERRO-TIC Gr. HT-6.
M-1469; 45% TiC by volume, Ni-Cr age hardenable steel matrix.

Solutionized: 46 Rock C.
Aged (1st step): 51 Rock C.
Aged (fully): 54 Rock C; 310,000 Tr.S.
Excellent oxidation and corrosion resistance and high temperature strength.

FERRO-TIC Gr. J.
M-1469; 40% W TiC_2 by volume, high speed steel matrix.
Annealed: 48 Rock C.
Hardened and tempered: 70 Rock C; 250,000 TrS.
For tools for hot working applications as piercing, forming, machining of non-ferrous materials.

FERRO-TIC Gr. M-6
M-1469; 45% TiC by volume; maraging steel matrix.
Solutionized: 51 Rock C.
Aged: 65 Rock C; 280,000 TrS.
Can be nitrided for 75 Rock C surface.

FERRO-TIC Gr. M-6A.
M-1469; 50% TiC by volume, maraging steel matrix.
Solutionized: 54 Rock C.
Aged: 67 Rock C; 375,000 TrS.
Very good abrasion resistance; can be nitrided to surface hardness of 74 Rock C.

FERRO-TIC Gr. M-6B.
M-1469; 55% TiC by volume; maraging steel matrix.
Ann: 58 Rock C.
Hardened: 68 Rock C; 400,000 TrS.
Excellent wear resistance.

FERRO-TIC Gr. MS-5
M-1469; 45% TiC by volume; age-hardenable martensitic stainless steel matrix.
Solutionized: 51 Rock C.
Aged: 63-64 Rock C; 280,000 TrS
Good corrosion resistance, can be nitrided for high surface hardness, for abrasion resistance parts in the food, chemical and aerospace industries.

FERRO-TiC Gr. S-45.
M-1469, 39 TiC, 11 Cr, 7 3 Ni, 42 7 Fe.
450 Brin.
For valve parts, seal rings, knives, molds; oxidation and heat resistant

FERRO-TiC GR. S-55.
M-1469; 52 TiC, 8.6 Cr, 5.7 Ni, 33.7 Fe
550 Brin.
For valve parts, seal rings, knives, molds; oxidation and heat resistant.

FERRO-TITANIUM 18-2.5.
M-394, 2 5 C, 18 Ti, bal Fe.
For metallurgical applications in steel making

FERRO TITANIUM LOW CARBON.
M-394; 0.10 max C, 27-40 Ti, 8 max Al, 1-11 Si, bal Fe.
For metallurgical applications in making stainless steel.

FERROTITE.
M-192; 0.2 C, bal Fe.
For welding rod.

FERROTRODE N2B.
M-717;
For machinable overlays, and mild abrasion on ferrous metals; AC DC; for hammers, sprockets, rollers, excavator equipment.
Hardness C 28-31 Rock.

FERRO TUNGSTEN. (A.S.T.M.).
M-640; 0.60-0.70 C, 70-80 W, 1.0 max Si, bal Fe
For metallurgical applications in steel making; sum H_2S metals less than 0.25%.

FERRO TUNGSTEN (LOW MELTING).
M-640; 2.5 C, 65-75 W, 1.5 max Si, bal Fe.
For metallurgical applications in steel making; sum H_2S metals less than 0.25%.

FERRO TUNGSTEN (STANDARD).
M-640; 0.60-0.70 C, 76-80 W, 0.75 max Si, bal Fe.
For metallurgical applications in steel making; sum H_2S metals less than 0.25%.

FERROVAC 1020.
M-1214; 0.20 C, 0.01 Ni, 0.003 Mn, 0.005 P, 0.01 Si, bal Fe.
For poles pieces for magnetrons, klystron components; vacuum melted.

FERROVAC 4340.
M-1214, M-38, 0.4 C, 0.8 Cr, 1.8 Ni, 0.25 Mo, bal Fe.
Heat treated: 185,000-285,000 TS; 166,000-215,000 YS; 16-12 El; 60-41 RA; 410-540 Brin.
For bolts, gears, shafts, crankshafts; vacuum melted, shock resistant.

FERROVAC 52100.
M-1214, M-38, 0 95-1.1 C, 1.3-1 6 Cr, bal Fe.
Annealed: 95,000 TS, 65,000 YS; 27 El; 62 RA; 180 Brin.
Heat treated: 200,000 TS, 185,000 YS; 3 El; 30 RA; 400 Brin.
For plug and ring gages, jet engine bearings; vacuum melted, wear resistant.

FERROVAC E.
M-38, 99.9% Fe.
Gas free, high purity iron.
High maximum permeability.
For relays, solenoid plungers, armatures, pole pieces, magnetic core devices.

FERROVAC HALMO
M-38; 0.58 C, 4.75 Cr, 1.15 Si, 5.25 Mo, 0.55 V, bal Fe.
For high temperature bearings, shears, punches; vacuum melted hot work steel.

FERROWELD
M-192; 0 1 C, bal Fe.
For welding rods for cast iron, coated

FERROWELD
M-578, 0 15 C, 0 03 Si, 0.30 Mn, 0.04 P, 0.04 S, bal Fe.
Low carbon steel arc welding electrode.
AWS Class ESt.

FERROXDURE.
Dutch; BaO + 6 Fe_2O_3.
For permanent magnets.

FERROXDURE I.
M-1401, $BaFe_{12}O_{19}$.
For magnets for motors and oil filters; magnetic ceramic.

FERROXDURE II.
M-1401; $BaFe_{12}O_{19}$.
For magnets for motors and oil filters; magnetic ceramic.

FERROZOID.
M-121; 33-35 Ni, 3.5 Cr, bal Fe.
For electrical resistances, resistance alloy; now known as "Dullray"

FERRUL.
Eng; 54.6 Cu, 40 Zn, 5 Pb, 0.4 Al.
For bearings, intricate castings, free-cutting.

FERRY.
Eng.; 2 Ba, 1 Ca, 0.25 Hg, bal Pb.
For bearings, solder.

FERRY.
M-86, M-121; 55-56 Cu, 44-45 Ni.
Annealed: 73,000 TS; 34,000 YS; 45 El; 77 RA; 160 Brin.
For electrical resistances, thermocouples.
Max. operating temperature 440°C.
Corrosion resistant.

FERRYDUR.
M-1717; 13 Cr, C, others, bal Fe.
Up to 48-65 Rock C hardness.
Excellent wear resistance.
For castings to resist wear.
AFNOR: Z 200 C 13 (approx.).

FERRYNOX 8.
M-1717; 0.18-0.25 C, 17-19 Cr, 7-9 Ni, bal Fe.
Corrosion resistant, good resistance to scaling; austenitic.
For ventilator fans, heat exchangers.
AFNOR: Z 20 CN 18.08.

FERRYNOX 8M.
M-1717; 0.18-0.25 C, 16-20 Cr, 8-10 Ni, 3 Mn, bal Fe.
Good corrosion and heat resistance; Austenitic.
For pumps for chemical plants.
AFNOR: Z 20 CNM 18.10.

FERRYNOX 8S.
M-1717; 0.18-0.25 C, 16-20 Cr, 8-10 Ni, 2-3 Mo, bal Fe.
Excellent corrosion resistance, good resistance to scaling at elevated temperatures; austenitic.
For pump rotors, compressors.
AFNOR: Z 20 CND 18.10.

FERRYNOX 10.
M-1717; 0.05-0.10 C, 16-20 Cr, 8-10 Ni, Ti, bal Fe.
Corrosion resistant; temperature resistant.
Austenitic.
For food equipment, sugar refineries.
AFNOR: Z 6 CN 18 10.

FERRYNOX 12.
M-1717, 0.18-0.25 C, 22-27 Cr, 11-13 Ni, bal Fe
Good high temperature properties, Austenitic, corrosion resistant.
For furnace and heat treat equipment.
AFNOR: Z 20 CN 25.13.

FERRYNOX 15.
M-1717; 0.18-0.25 C, 23-27 Cr, 13-16 Ni, bal Fe.
Good high temperature properties.
Furnace equipment, jet engine parts.
AFNOR: Z 20 CN 25.15.

FERRYNOX 20.
M-1717, 0.18-0.25 C, 24-26 Cr, 19-22 Ni, bal Fe.
Good high temperature properties
For jet engine, gas turbines, heat exchangers.
AFNOR: Z 20 CN 25.20
US-AISI 310 Stainless.

FERRYNOX 35.
M-1717; 0.18-0.25 C, 14-16 Cr, 34-36 Ni, bal Fe.
Good high temperature properties in carburizing atmospheres.
For heat treat equipment, petroleum industry.
AFNOR: Z 20 NC 35.15.

FERRYNOX 65.
M-1717; 0 18-0.25 C, 14-16 Cr, 62-66 Ni, bal Fe.
Good high temperature properties, good corrosion resistance. For chemical plant equipment.
AFNOR· NC 15 Fe

FERRYNOX Co 50.
M-1717; 50 Co, 28 Cr, bal Fe.
Room temp: 60-70 Kg/mm²; 2-4 El.
1000°C: 11-13 Kg/mm²; 15-17 El.
Good strength at high temperatures.
Resistant to oxidation and many chemicals.
For furnace equipment.

F EXTRA.
M-459; C, bal Fe.
For files; water hardening.

F & G 1.
M-1548; 3.0-5.5 Cu, 0.3-0.9 Si, 0.3-1.0 Mn, 0.5 1.5 Mg, bal Al.
Soft: 23,000-31,000 TS; 15-20 El; 50-60 Brin.
Heat treated: 68,000 TS; 48,000 YS; 10 El; 140 Brin.
For rivets, hydraulic fittings, hardware, bridges, heavy duty structures.
Age-hardenable, high strength.

F & G 3.
M-1548; 5.0-6.0 Cu, 1.0 Si, 0.5 Mn, bal Al.
Soft: 28,000 TS; 15-25 El; 50-60 Brin.
Heat Treated: 71,000 TS; 57,000 YS; 2 El; 140 Brin.
For hydraulic fittings, hardware, aircraft and engine components.
Age-hardenable, high strength and endurance limit.

F & G 4.
M-1548; 0.5-1.0 Si, 0.8-1.5 Mn, 0.5-1.0 Mg, bal Al.
Heat treated: 50,000 TS, 36,000 YS; 12 El, 95 Brin.
For hardware, structures, tanks, aircraft components.
Age-hardenable, corrosion resistant.

F & G 5.
M-1548; 1.5 Mn, 5.0-9.0 Mg, bal Al.
Soft: 32,000 TS; 12,800 YS; 25 El; 55 Brin
Hard 68,000 TS, 48,000 YS, 10 El; 120 Brin.
For heat exchangers, fixtures, tanks.
Non-hardenable, corrosion resistant

F & G 8
M-1548, 1.0-2.0 Mn, bal Al.
Half hard. 26,000 TS; 21,000 YS; 5 El; 45 Brin.
Hard: 35,000 TS; 28,000 YS; 2 El; 60 Brin
For commercial roofing, heat exchangers, ducts, fixtures, tanks
Non-heat treatable, good weldability.

FH-2
M-1699; Sintered carbide tool material.
For heading dies and punches

FH-3
M-1699; Sintered carbide material.
For heading dies and punches.

FH-4.
M-1699; Sintered carbide material.
For heading dies and punches.

FH-5.
M-1699; Sintered carbide tool material
For heading dies and punches.

FH-6.
M-1699, Sintered carbide tool material.
For heading dies and punches.

F.I. 20 STEEL.
M-521, 0.06 C, 0.3 Si, 0.7 Mn, 21 Cr, bal Fe.
Heat treated: 72,000 TS; 55,000 YS; 34 El; 60 RA; 175 Brin.
For corrosion resistant parts; corrosion resistant.

FIELD.
Eng.; 10 Si, 3 Cu, 1.5-2 Al, bal Ni.
For corrosion resisting parts; stainless and corrosion resistant.

FIELD ROLLED.
Eng.; 60 Ni, 29 Fe, 20 Mo.
Stainless and corrosion resistant.

FIFTEEN PER CENT.
Eng.; 56.66 Cu, 28.33 Zn, 15 Ni.
For ornamental parts; corrosion resistant.

FIFTY-FIVE.
M-800; 2.9-3.1 C, 1.2-1.5 Ni, 0.4-0.6 Mo, 1.4-1.6 Si, bal Fe.
Cast: 55,000-62,000 TS.
For hydraulic press and diesel engine parts; cast iron.

FILBRITE.
Eng.; C, 17 Cr, 35 Ni, bal Fe.
For heat and corrosion resisting parts; stainless and corrosion resistant.

FILE BRONZE.
U.S.; 18-31 Sn, 7-8.5 Pb, 0-10 Zn, bal Cu.
For plumbing, hardware; free-cutting.

FILE METAL (GENFER).
64.6-62.0 Cu, 18-20 Sn, 10 Zn, 7.6-8.0 Pb.
For nail file; free-cutting.

FILE METAL (VOGEL).
51-73 Cu, 19-28.5 Sn, 0-7 Zn, 7.0-8.5 Pb.
For nail file; free-cutting.

FILIPOFF LEAD-CALCIUM.
1.37 Cu, 1.9 Ca, 1.0 Sr, 1.1 Ba, 0.1 Na, bal Pb.
For bearings; anti-friction.

FILNIC K.
M-44; Al-Ni.
For filaments; heat resistant.

FILNIC M.
M-44; 45 Co, 55 Ni.
For filaments, heat resistant.

FIL-SODER.
M-66, Sn-Pb
For solder for Al, no flux required

FINE SILVER
M-63, 99.9 Ag
Hard 41,000 TS; 30,000 YS; 3 El.
Annealed: 23,000 TS; 10,000 YS, 35 El, 38 RA
For jewelry, alloys; M.P. 1761°F.

FINIS
M-485; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed tools and cutters; high speed steel.

FINISHING SPECIAL.
M-85; C, Cr, W, bal Fe.
For tools

FINKL COLD-HOT.
M-55, 0.9 C, 0.7 Cr, 0.2 Mo, 0.5 Ni, bal Fe.
For cold and hot trimming dies; heat resistant; tough.

FINKL CUPRODIE.
M-55, 0.55 C, 0.8 Mn, 1.55 Ni, 0.95 Cr, 0.3 Mo, 0.75 Cu, bal Fe.
Pre hardened (as required) from 37-50 Rc
Mech. prop. depend on hardness.
For hammer dies, forging press dies, drop hammer dies. Resists heat checking.

FINKL DC
M-55; 0.37 C, 0.4 Mn, 1.0 Si, 5.2 Cr, 1.4 Mo, 0.95 V, bal Fe. Vacuum electric furnace degassed.
As Ann: 229 Brin.
For die casting dies for Al, Mg, Zn, lead and tin base alloys; for plastic mold dies.
AISI Type H 13 Hotwork steel.

FINKL FS.
M-55, 0.55 C, 0.75 Mn, 0.27 Si, 1.0 Ni, 1.0 Cr, 0.3 Mo, bal Fe. Vacuum degassed.
FS is the annealed condition, see Finkl FX for prehardened condition.
For forging dies and other hotworking tools.

FINKL FX.
M-55; 0.55 C, 0.75 Mn, 0.27 Si, 1.0 Ni, 1.0 Cr, 0.3 Mo, bal Fe. Vacuum degassed.
FX is prehardened condition of Finkl FS. Hardness as ordered.
Mech. prop. vary with hardness.
Good high temperature properties.
For hammer dies, press dies, sow blocks, punchers, headers, and other hot work tools.

FINKL HB.
M-55; 0.52 C, 1.2 Mn, 0.27 Si, 0.65 Cr, 0.09 S, 0.20 Mo, bal Fe.
Prehardened: C 28-34 Rock (or as required).
For holder blocks, forging and extrusion dies, die casting and plastic molding dies.
Prehardened. Good machinability.

FINKL MD.
M-55; 0.32 C, 0.80 Mn, 0.52 Si, 1.7 Cr, 0.4 Mo, bal Fe.
Prehardened. C 28-34 Rock. Vacuum degassed.
For zinc die casting dies, plastic molds.
Prehardened; Type P20 Tool steel.

FINKL W4X.
M-55; 0.37 C, 0.45 Mn, 1.0 Si, 5.0 Cr, 1.45 Mo, 0.35 V, 1.25 W. Vacuum degassed.
Annealed or hardened as required, 37 to 46 Rc.
For forging press dies, inserts, extrusion press rams, liners, forging machine headers
AISI Type H-12 Hot work steel.

FINKL WF.
M-55, 0.35 C, 0.55 Mn, 0.5 Si, 0.65 Ni, 2.40 Cr, 0.72 Mo, bal Fe.
Prehardened, as required, from 28 to 50 Rc
Mech prop depend on hardness.
For hammer dies, press dies, punches, headers, gripper dies, insert dies, sow blocks.

FIREARMOR "A."
M-184, 65 Ni, 15 Cr, 1.75 Mn, 0.5 C, 1.0 Si, bal Fe.
Cast: 60,000 TS; 46,000 YS; 2.9 El; 1.2 RA; 190 Brin.
For carburizing boxes; heat and abrasion resisting.

FIREARMOR B.
M-184; 15 Cr, 60 Ni, 0.5 C, 1.7 Mn, 1.2 Si, bal Fe.
Cast. 62,000 TS, 33,000 YS, 1.5 El; 3.0 RA; 200 Brin.
For furnace parts, grates, heat resistant.

FIREDIE.
M-35; 0.35 C, 5 Cr, 0.45 Mn, 0.45 V, 1.4 Mo, 1.0 Si, bal Fe
For hot work dies, die casting dies; hot work die steel.

FIREDIE 13.
M-35; 0.38 C, 1.4 Mo, 5.2 Cr, 1.05 V, 1 Si, bal Fe.
Ht. Tr.: 285,000 TS, 225,000 YS, 4 El, C 54 Rock.
For hot extrusion tools and die casting dies for Al, Mg and Zn alloys.
Hot work tool steel type H13, tough, shock resistant.

FIREDIE 13 SMOOTHCUT.
M-35; 0.38 C, 1 Si, 1.4 Mo, 5.2 Cr, 1.05 V, sulphides, bal Fe
Ht. Tr.. 286,000 TS; 226,000 YS; 3 El; C 54 Rock.
For hot sizing dies for forming titanium alloys, hot extrusion and die casting dies, scroll shear dies.
Free machining, oil hardening.
Hot work steel type H13.

FIREX.
M-40; 0.40 C, 4.5 Ni, 1.10 Cr, 0.3 Si, 0.6 Mn, bal Fe.
For cutting tools, hot shears, shock resisting tools, chisels; air or oil hardening.

FIREX SPECIAL.
M-40; 0.40-0.55 C, 0.4-1.0 Cr, 2.75-4.0 Ni, 0.4-0.9 Mn, 0.15-0.20 V, 0.4-0.7 Mo, bal Fe.
For tools, dies, punches; shock resistant, tough.

FIRINIT.
M-381.
For welding and soldering rods.

FIRMINY A.C.M.
M-1043; 0.55 C, 1.4 Ni, 0.6 Cr, 0.4 Mo, 0.1 V, bal Fe.
For forging dies; oil hardened.

FIRMINY A.D.F.
M-1043; 0.28 C, 3.5 Ni, 1.1 Cr, bal Fe.
For gears, bolts, crankshafts, machine tool parts; oil hardened, tough.

FIRMINY A.D.F.M.
M-1043; 0.30 C, 1.3 Cr, 3.5 Ni, 0.4 Mo, bal Fe.
For forging dies, crankshafts; oil hardened, tough.

FIRMINY A.L.S.
M-1043; 1.45 C, 5.5 W, 0.55 Cr, 0.5 V, bal Fe.
For header dies, engraving tools; oil hardened.

FIRMINY A.M.3.
M-1043; 0.35 C, 1.1 Mn, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

FIRMINY B.L.N.
M-1043; 0.28 C, 10 W, 3 Cr, 0.3 Mo, 0.6 V, bal Fe.
For hot work tools and dies, extrusion rams, punches; hot work tool steel; Z28WCDW10.

FIRMINY B.O.L.
M-1043; 0.38 C, 4.2 W, 3.4 Cr, 0.6 Mo, 1.0 V, bal Fe.
For hot work tools and dies, punches, extrusion rams; hot work tool steel, 38WCDV42.

FIRMINY B.T.R.
M-1043; 0.35 C, 4.7 Ni, 0.35 Cr, 1.15 Mo, bal Fe.
For forging and plastic mold dies, oil hardened.

FIRMINY C.L.D.
M-1043; 0.9 C, 1.5 Cr, bal Fe.
For bearings, dies; oil hardened, wear resistant.

FIRMINY C.M.Y.1.
M-1043; 0.50 C, 1 Cr, 0.25 Mo, bal Fe.
For bolts, gears, crankshafts; oil hardened, tough.

FIRMINY C.M.Y.2.
M-1043; 0.35 C, 1 Cr, 0.25 Mo, bal Fe.
For bolts, gears, crankshafts, oil hardened, tough.

FIRMINY C.M.Y.4.
M-1043; 0.25 C, 1 Cr, 0.25 Mo, bal Fe.
For bolts, gears, crankshafts, machine tool parts; oil hardened, tough.

FIRMINY C.M.Y.5.
M-1043; 0.20 C, 1 Cr, 0.25 Mo, bal Fe.
For crankshafts, machine tool parts; case hardened, tough.

FIRMINY C.M.Y.6.
M-1043; 0.12 C, 0.5 Cr, 0.5 Mo, bal Fe.
For machine tool parts, cams; case hardened, tough.

FIRMINY C.M.Y.7.
M-1043; 0.08 C, 1 Cr, 0.25 Mo, bal Fe.
For machine tool parts, cams, camshafts; case hardened, tough.

FIRMINY C.M.Y.16.
M-1043; 0.13 C, 5.5 Cr, 0.6 Mo, bal Fe.
For oil refinery equipment; creep resistant.

FIRMINY C.N.W.
M-1043; 0.38 C, 3 W, 2.5 Cr, 0.7 Mo, 0.25 V, bal Fe.
For pneumatic tools, chisels, upsetting dies; oil hardened.

FIRMINY C.R.V.
M-1043; 1.5 C, 1.8 Cr, 0.25 V, bal Fe.
For bearings, dies; oil hardened, wear resistant.

FIRMINY C.T.
M-1043; C, alloy, bal Fe.
For machine tool parts; oil hardened.

FIRMINY C.T.N.2.
M-1043; 0.10 C, 2 Ni, bal Fe.
For camshafts, cams, fasteners; case hardened, tough.

FIRMINY C.T.N.6.
M-1043; 0.10 C, 6 Ni, bal Fe.
For hobbing dies.

FIRMINY C.T.N.C.4
M-1043; 0.16 C, 1.8 Cr, 1 Ni, 0.1 Mo, bal Fe.
For cams, camshafts; case hardened, tough.

FIRMINY C.T.N.C.5.
M-1043; 0.10 C, 1 Ni, 1.4 Cr, 0.1 Mo, bal Fe.
For machine tool parts; case hardened, tough.

FIRMINY C.T.N.M.
M-1043; 0.10 C, 1.2 Ni, 0.12 Mo, 0.10 Cr, bal Fe
For gears, bolts, fasteners, cams; case hardened, tough

FIRMINY C.T.N.V.
M-1043, 0.10 C, 3 Ni, 0.3 Cr, bal Fe.
For camshafts, cams, gears, fasteners; case hardened, shock resistant.

FIRMINY C.V.A.1.
M-1043; 0.50 C, 1 Cr, 0.15 V, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

FIRMINY C.V.A.2.
M-1043; 0.4 C, 1 Cr, 0.15 V, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

FIRMINY C.V.A.3.
M-1043; 0.30 C, 2.5 Cr, 0.2 V, bal Fe
For oil refinery equipment; creep resistant.

FIRMINY C.V.A.4.
M-1043; 0.3 C, 1 Cr, 0.15 V, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

FIRMINY C.V.A.6.
M-1043; 0.18 C, 1 Cr, 0.1 V, bal Fe.
For gears, bolts, camshafts; case hardened, shock resistant

FIRMINY C.V.A.7.
M-1043; 0.12 C, 1 Cr, 0.1 V, bal Fe.
For gears, bolts, camshafts; case hardened, shock resistant.

FIRMINY C.W.2.
M-1043; 0.55 C, 1.8 W, 1 Cr, 0.9 Si, bal Fe.
For header dies; oil or water hardened.

FIRMINY C.W.3.
M-1043; 0.45 C, 1.8 W, 1 Cr, 0.8 Si, bal Fe.
For header dies; water or oil hardened.

FIRMINY F.C.K.
M-1043; 1.9 C, 13 Cr, bal Fe.
For blanking and forming dies; oil or air hardened.

FIRMINY F.G.O.
M-1043; 2 C, 3.75 W, bal Fe.

FIRMINY G.R.N.
M-1043; 0.42 C, 2 Si, bal Fe.
For machine tool parts; heat resistant.

FIRMINY ICN001.
M-1043; 0.11-0.16 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 35 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

FIRMINY ICN164.
M-1043; 0.12 C, 18-19 Cr, 10-12 Ni, 2.5-3.5 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, mixers; Type 316 and 317; stainless, austenitic.

FIRMINY ICN164T.
M-1043; 0.12 max C, 18 Cr, 10 Ni, 2.5 Mo, Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, mixers; Type 316; stainless, austenitic.

FIRMINY ICN472.
M-1043; 0.08 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 304; stainless, austenitic.

FIRMINY ICN472T.
M-1043; 0.08 max C, 18 Cr, 8 Ni, Ti, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, tanks mixers; Type 321; stainless, austenitic.

FIRMINY ICN583.
M-1043; 0.05 max C, 18 Cr, 8 Ni, bal Fe.
Annealed 85,000 TS; 35,000 YS; 60 El, 70 RA; 150 Brin
For chemical plant equipment, tanks, mixers; Type 304, stainless, austenitic.

FIRMINY L.F.
M-1043, 1.15 C, 0.7 Cr, bal Fe
For bearings, cutters, dies; oil or water hardened, wear resistant.

FIRMINY M.12A.F.Y.
M-1043; 1 C, 12 Mn, bal Fe.
For wear resistant parts; wear and abrasion resistant

FIRMINY M.14A.F.Y.
M-1043, 1.2 C, 14 Mn, 1.5 Cr, bal Fe.
For wear resistant parts; wear and abrasion resistant

FIRMINY M.A.S.
M-1043, 0.38 C, 1.2 Mn, 1.2 Si, bal Fe.
For machine tool parts; tough.

FIRMINY M.C.R.1.
M-1043; 0.45 C, 0.9 Cr, 0.7 Mn, bal Fe.
For machine tool parts, gears; oil or water hardened.

FIRMINY M.C.R.2.
M-1043; 0.35 C, 0.9 Cr, 0.7 Mn, bal Fe.
For machine tool parts, gears; oil or water hardened.

FIRMINY M.C.R.3.
M-1043; 0.15 C, 0.9 Cr, 1.2 Mn, bal Fe.
For camshafts, cams, bolts; case hardened, tough.

FIRMINY M.C.R.4.
M-1043; 0.17 C, 0.8 Cr, 0.7 Mn, bal Fe.
For camshafts, cams, gears; case hardened, tough.

FIRMINY M.C.R.5.
M-1043; 0.10 C, 0.8 Cr, 0.7 Mn, bal Fe.
For camshafts, cams, machine tool parts; case hardened, tough.

FIRMINY M.L.
M-1043; 0.92 C, 1.3 Mn, 0.5 Cr, bal Fe.
For punches, blanking and forming dies; oil hardened, non-deforming

FIRMINY N.2.
M-1043; 0.28 C, 2 Ni, bal Fe.
For gears, bolts, fasteners, oil hardened, tough.

FIRMINY N.3.
M-1043; 0.28 C, 3 Ni, bal Fe.
For gears, bolts, fasteners; oil hardened, tough.

FIRMINY N.5.
M-1043; 0.28 C, 5 Ni, bal Fe.
For gears, bolts, fasteners, machine tool parts; oil hardened, tough.

FIRMINY N.C.1.
M-1043, 0.4 C, 2.8 Ni, 0.7 Cr, bal Fe
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

FIRMINY N.C.2.
M-1043; 0.3 C, 2.8 Ni, 0.5 Cr, bal Fe
For machine tool parts, bolts, gears; oil hardened, shock resistant.

FIRMINY N.C.3.
M-1043, 0.25 C, 2.8 Ni, 0.5 Cr, bal Fe.
For machine tool parts, bolts, gears, oil hardened, shock resistant

FIRMINY N.C.4
M-1043; 0.18 C, 2.8 Ni, 0.5 Cr, bal Fe.
For camshafts, cams, gears, case hardened, tough.

FIRMINY N.C.M.2.
M-1043, 0.32 C, 2.6 Ni, 0.7 Cr, 0.6 Mo, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

FIRMINY N.C.M.4
M-1043; 0.16 C, 2.9 Ni, 0.45 Cr, 0.3 Mo, bal Fe.
For machine tool parts, cams, case hardened, shock resistant

FIRMINY P.F
M-1043, 0.14 C, 4 Ni, 0.9 Cr, bal Fe
For camshafts, cams, gears, fasteners, case hardened, shock resistant .

FIRMINY P.F.3
M-1043; 0.10 C, 3.5 Ni, 0.6 Cr, bal Fe
For camshafts, machine tool parts, gears; case hardened, shock resistant.

FIRMINY S.A.M.
M-1043; 1.15 C, 1.9 W, 0.45 Cr, bal Fe.
For heading dies; oil hardened.

FIRMINY T.R.D.
M-1043, 1.3 C, 0.8 W, 0.5 Cr, bal Fe.
For cutters, dies; oil hardened.

FIRMINY T.S.W.
M-1043; 0.42 C, 2 Si, 0.4 W, bal Fe.
For machine tool parts; heat resistant.

FIRMINY V.D.L.
M-1043; 0.14 C, 5.5 Ni, 1.5 Cr, bal Fe.
For camshafts, cams, gears, bolts; case hardened, shock resistant.

FIRMINY V.D.L.D.
M-1043; 0.35 C, 3.8 Ni, 1.5 Cr, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

FIRST QUALITY.
M-363; 0.8-1.2 C, bal Fe.
For tools, punches, dies; water hardening.

FIRTH.
M-56; 1.05 C, 0.22 Mn, bal Fe.
For tools, dies, taps, drills; water hardened.

FIRTH 16-25-6.
M-57; 0.08 C, 17 Cr, 25 Ni, 6 Mo, 0.15 N, bal Fe.
Rolled: 115,000 TS; 60,000 YS; 35 El; 50 RA; 201 Brin.
Cold drawn: 150,000 TS; 120,000 YS; 19 El; 40 RA; 300 Brin.
For jet engine components, fasteners, bolts; ductile, high temperature uses to 1300°F.

FIRTH 19-9DL.
M-57; 0.28-0.35 C, 18-21 Cr, 8-11 Ni, 1.5 Mo, 1.4 W, 0.50 Cb, 0.4 Ti, 1.2 Mn, bal Fe.
Hot rolled: 118,000 TS; 69,000 YS; 58 El; 55 RA; 216 Brin.
At 1000°F: 89,000 TS; 42,000 YS; 43 El; 52 RA.
For turbine wheels, bolts, turbo superchargers; high temperature uses to 1200°F.

FIRTH 19-9DX.
M-57; 0.3 C, 19 Cr, 9 Ni, 1.5 Mo, 1.2 W, 0.55 Ti, bal Fe.
Hot rolled: 118,000 TS; 69,000 YS; 58 El; 55 RA; 216 Brin.
At 1000°F: 89,000 TS; 42,000 YS; 43 El; 52 RA.
For jet engine fasteners; high temperature uses to 1200°F.

FIRTH A-286.
M-57; 0.05 C, 1.35 Mn, 15 Cr, 26 Ni, 1.2 Mo, 2 Ti, 0.3 V, bal Fe.
Rolled: 135,000-160,000 TS; 85,000-115,000 YS, 20-30 El; 30-55 RA.
For gas turbine discs, jet engine components; austenitic, heat treatable.

FIRTHAG.
M-56; 0.45 C, 0.90 Mn, 0.95 Cr, 0.25 Si, bal Fe
For punches, gears, bolts; Brit, EN18.

FIRTH A.H.G.
M-56; 0.25-0.32 C, 0.3-0.6 Mn, 4-4.5 Ni, 1-1.5 Cr, bal Fe.
Air-hardened: 224,000-280,000 TS; 190,000-238,000 YS; 17 El; 20 RA; 444 Brin.
For gears, driving pinions, timing wheels; shock resisting "Firth-Brown E-84", "Atlas AHNC."

FIRTHALOY.
M-54; W.C.
For wire drawing and extrusion dies; cemented tungsten carbide.

FIRTH "A.W."
M-56; 1.20 C, 0.25 Mn, bal Fe.
For tools, cutters; water hardening.

FIRTH-BROWN 20CF.
M-56; 0.20 C, 0.35 Si, 0.9 Mn, bal Fe
For gears, shafts; case hardening.

FIRTH-BROWN 30CF.
M-56; 0.3 C, 0.35 Si, 0.9 Mn, bal Fe.
For gears, shafts; water hardening.

FIRTH-BROWN 40CF.
M-56; 0.42 C, 0.4 Si, 0.8 Mn, bal Fe.
For gears, shafts; water hardening.

FIRTH-BROWN 50CF.
M-56; 0.52 C, 0.4 Si, 0.8 Mn, bal Fe.
For gears, shafts; water hardening.

FIRTH BROWN 50CT.
M-56; 0.48 C, 0.25 Si, 0.70 Mn, bal Fe.
For streetcar and railway wheel tires; water hardened.

FIRTH BROWN 60CT.
M-56; 0.60 C, 0.25 Si, 0.70 Mn, bal Fe.
For streetcar and railway wheel tires; water hardened.

FIRTH BROWN 65CF.
M-56, 0.65 C, 0.35 Si, 0.70 Mn, bal Fe.
For machine tool parts, springs; water hardened.

FIRTH BROWN 65CT.
M-56; 0.65 C, 0.25 Si, 0.70 Mn, bal Fe.
For streetcar and railway wheel tires; water hardened.

FIRTH BROWN A-1.
M-56; 0.12-0.15 C, bal Fe.
54,000-63,000 TS.
For case-hardened railway and general forgings; case-hardening steel.

FIRTH BROWN A-2.
M-56; 0.22-0.26 C, bal Fe.
63,000-72,000 TS.
For marine shafting, boiler drums, crank axles, high pressure reaction chambers; water hardened.

FIRTH BROWN A-3.
M-56; 0.28-0.32 C, bal Fe.
69,500-78,500 TS.
For boiler drums, locomotive piston rods, marine shafting, gears, rotors, shafts; water hardened.

FIRTH BROWN A-4.
M-56; 0.32-0.40 C, bal Fe.
78,500-89,600 TS.
For mine shafting, locomotive crank pins, shafts, rotors; water hardened.

FIRTH BROWN A-5.
M-56, 0.40-0 50 C, bal Fe.
89,000-112,000 TS.
For turbo-electric disks, shafts, rotors, locomotive crank pins; oil hardened.

FIRTH BROWN A-6.
M-56; 0.55-0 65 C, bal Fe.
100,800-123,000 TS.
For die blocks; oil hardened.

FIRTH BROWN A 7
M-56; 0.60-0.70 C, bal Fe.
134,000-157,000 TS.
For diesel engine cylinder liners, forged rings for ball mills, oil hardened.

FIRTH-BROWN ANC1.
M-56; 0.3 C, 0.45 Mn, 4 25 Ni, 1.25 Cr, bal Fe.
For shafts, gears, formerly "Brown ATG."

FIRTH-BROWN ANC2.
M-56, 0.4 C, 0.5 Mn, 3.5 Ni, 1.6 Cr, bal Fe.
For shafts, gears; formerly "Brown ATG."

FIRTH-BROWN ANCM.
M-56; 0 3 C, 0 45 Mn, 4.25 Ni, 1.25 Cr, 0.25 Mo, bal Fe.
For shafts, gears; formerly "Atlas AHNC."

FIRTH BROWN B-20.
M-56; C, 1.4 Mn, bal Fe.
78,400-112,000 TS.
For medium tensile shafts and gears.

FIRTH BROWN B-21.
M-56; high C, 1.0 Ni, bal Fe.
196-255 Zrin.
For die blocks; oil hardened.

FIRTH BROWN B-22.
M-56; C, 3.5 Ni, bal Fe.
89,600-123,000 TS.
For alternator rotors, and marine gear wheel rims, shafts in electrical and turbine equipment; tough.

FIRTH BROWN B-23.
M-56; high C, 1.5 Ni, Cr, bal Fe.
207-285 Brin.
For die blocks; shock resistant.

FIRTH BROWN B-24.
M-56; C, 3.5 Ni, Cr, bal Fe.
112,000-140,000 TS.
For die blocks, shafts; shock resistant.

FIRTH BROWN B-25 (ATLAS S.P. STEEL).
M-56 C, 3.5 Ni, Mo, bal Fe.
123,000-145,000 TS.
For heavy road vehicle axles; tough.

FIRTH BROWN B-26.
M-56; 0.4-0.5 C, Ni, Cr, Mo, bal Fe.
123,000-145,000 TS.
For high pressure steam and air vessels, shafts, axles; tough.

FIRTH BROWN B 27.
M-56, high C, Ni, Cr, Mo, bal Fe.
269-364 Brin.
For die blocks; tough.

FIRTH BROWN B-28 (FIRTH ROLL STEEL) (ATLAS DIE RING STEEL).
M-56; C, Cr, bal Fe.
321-402 Brin.
For rolls, die rings; water hardened.

FIRTH BROWN B-29 (FIRTH SHOE & DIE STEEL).
M-56; 0.55 C, 0.65 Cr, bal Fe.
For shoes and dies for ore reduction stamp batteries; oil hardened.

FIRTH BROWN B-30 (FIRTH S.H.B.) (ATLAS BALL RACE STEEL).
M-56, 1.0 C, 1.2 Cr, bal Fe.
For ball races, balls, rollers; water hardening.

FIRTH BROWN B45CH
M-56; 0.15 C, 0.60 Ni, 0.65 Cr, 0.12 Mo, bal Fe.
For gears, cams, camshafts, fasteners; case hardened, EN361

FIRTH BROWN B55CH.
M-56; 0.20 C, 0.65 Cr, 0.60 Ni, 0.12 Mo, bal Fe.
For gears, cams, camshafts, machinery parts; case hardened, EN362.

FIRTH BROWN B65CH.
M-56; 0.24 C, 0.60 Ni, 0.65 Cr, 0.12 Mo, bal Fe.
For gears, cams, camshafts, case hardened, EN363.

FIRTH-BROWN BEST C. S.
M-56; 0.7-1.4 C, bal Fe.
Hardened: 500-700 Brin.
For hammers, tools, drills, chisels; cheap tool steel "Firth Brown L-222."

FIRTH-BROWN BRB.
M-56; 1.4 C, 0.35 Si, 0.4 Mn, 0.75 Cr, 5 W, bal Fe
For tools, dies, drawing dies; oil hardening.

FIRTH BROWN C-40 (ATLAS A.T.C. 20).
M-56; 0.20 C, bal Fe.
56,000-78,000 TS.
For wire, tubes, parts for automobiles and airplanes; high ductility.

FIRTH BROWN C-42 (ATLAS A.T.C. 40).
M-56; 0.40 C, bal Fe.
78,000-98,000 TS.
For airplane and automobile parts, wire, tubes; tough.

FIRTH BROWN C-44 (FIRTH F.T. 50) (ATLAS A.T.C. 55).
M-56; 0.5-0.6 C, bal Fe.
100,000-123,000 TS.
For aircraft cylinders.

FIRTH BROWN C-45 (ATLAS A.T.C. 75).
M-56; 017-0.8 C, bal Fe.
196-255 Brin.
For clutch plates; wear resistant.

FIRTH-BROWN CAST STEEL.
M-56; 0.7-1.4 C, bal Fe.
Hardened: 500-700 Brin.
For turning, planning and slotting dies, shaping tools, wood saws, axes, scythes, drills; tool steel intermediate quality "Firth Brown L-221."

FIRTH BROWN CAST STEEL WARRANTED.
M-56; 0.70-1.4 C, 0.15 Si, 0.30 Mn, bal Fe.
For drills, reamers, broaches, hobs; Type W1; water hardened.

FIRTH-BROWN CCR 1.
M-56; 0.85 C, 0.3 Mn, 1.8 Cr, bal Fe.
For tools, dies; oil hardening.

FIRTH-BROWN CCR 2
M-56; 1.0 C, 0.45 Mn, 1.4 Cr, bal Fe.
For tools, dies; oil or water hardening.

FIRTH-BROWN CCRF.
M-56; 0.42 C, 0.3 Si, 0.7 Mn, 0.9 Cr, bal Fe.
For gears, shafts, bolts; water hardening.

FIRTH-BROWN CCW.
M-56; 0.52 C, 0.7 Si, 0.55 Mn, 1.2 Cr, 2.3 W, bal Fe.
For tools, dies; hot work steel.

FIRTH-BROWN CDD.
M-56; 1.9 C, 0.15 Si, 0.25 Mn, 0.6 Cr, 6 W, bal Fe.
For tools, dies, drawing dies; oil hardening

FIRTH BROWN CHROMVA-W.
M-56; 0.17 C, 0.30 Si, 0.30 Mn, 2.75 Cr, 0.60 Mo, 0.70 V, 0.50 W, bal Fe.
For elevated temperature applications.

FIRTH-BROWN CMCR.
M-56, 0.85 C, 0.8 Mn, 0.8 Cr, bal Fe.
For tools, dies; oil hardened.

FIRTH-BROWN CMN1.
M-56; 0.25 C, 1.5 Mn, bal Fe.
For gears, shafts; water hardening.

FIRTH-BROWN CMN 2.
M-56; 0.35 C, 1.5 Mn, bal Fe.
For gears, shafts; water hardening.

FIRTH-BROWN CR1T.
M-56; 0.52 C, 0.25 Si, 0.7 Mn, 0.45 Cr, bal Fe
For railway tires, wheels.

FIRTH-BROWN CR2T.
M-56; 0.6 C, 0.25 Si, 0.7 Mn, 0.45 Cr, bal Fe.
For railway tires, wheels.

FIRTH-BROWN CR3T.
M-56; 0.65 C, 0.25 Si, 0.7 Mn, 0.45 Cr, bal Fe.
For railway tires, wheels.

FIRTH-BROWN CR4T.
M-56; 0.72 C, 0.25 Si, 0.7 Mn, 0.45 Cr, bal Fe.
For railway tires, wheels.

FIRTH-BROWN CRM1.
M-56; 0.4 C, 0.65 Mn, 1.2 Cr, 0.25 Mo, bal Fe.
For gears, shafts, bolts; oil hardening.

FIRTH-BROWN CRM2.
M-56; 0.4 C, 0.6 Mn, 1.3 Cr, 0.85 Mo, bal Fe.
For gears, shafts, bolts; tough, oil hardening.

FIRTH-BROWN CRM3.
M-56; 0.27 C, 0.6 Mn, 3.25 Cr, 0.6 Mo, bal Fe.
For gears, shafts, machinery parts; oil hardened, tough.

FIRTH-BROWN CRM4.
M-56; 0.3 C, 0.6 Mn, 2.75 Ni, 0.6 Mo, bal Fe.
For gears, shafts; tough.

FIRTH BROWN CRM5.
M-56; 0.13 C, 0.25 Si, 0.40 Mn, 5.25 Cr, 0.55 Mo, bal Fe.
For oil refinery equipment; creep and corrosion resistant, high temperature use.

FIRTH BROWN CRM6.
M-56; 0.12 C, 2.25 Cr, 1.0 Mo, 0.45 Mn, 0.20 Si, bal Fe.
For oil refinery equipment; creep and corrosion resistant.

FIRTH BROWN CRMO.
M-56; 0.10 C, 0.40 Si, 0.50 Mn, 0.85 Cr, 0.50 Mo, bal Fe.
For oil refinery equipment; creep resistant, high temperature use.

FIRTH-BROWN CRV1.
M-56; 0.47 C, 0.25 Si, 0.65 Mn, 0.85 Cr, 0.2 V, bal Fe.
For laminated springs; oil hardening.

FIRTH-BROWN CRV2.
M-56; 0.45 C, 0.25 Si, 0.65 Mn, 1.25 Cr, 0.2 V, bal Fe.
For laminated springs; oil hardening.

FIRTH-BROWN CRV3.
M-56; 0.35 C, 1.25 Cr, 0.2 V, bal Fe
For forgings; formerly Atlas ATCV.

FIRTH-BROWN CRWC.
M-56; 0.34 C, 0.9 Si, 0.25 Mn, 5.5 Cr, 4.7 W, 0.5 Co, bal Fe.
For tools, dies; hot work steel.

FIRTH-BROWN CVW3.
M-56; 1.35 C, 0.15 Si, 0.30 Mn, 0.5 V, 3.75 W, bal Fe.
For tools, dies, drawing dies; oil hardening.

FIRTH BROWN D-60 (ATLAS A.T.M.N.).
M-56; 0.4 C, 1.4 Mn, bal Fe.
89,000-112,000 TS.
For automobile crankshafts, front axles, swivel axles, spindles; oil hardening.

FIRTH BROWN D-62 (FIRTH F.N. 3.5). (ATLAS A.T.N.X.).
M-56; 0.4 C, 3.5 Ni, bal Fe.
123,000-145,500 TS.
For aircraft and automobile connecting rods and axles; shock resistant.

FIRTH BROWN D-63 (FIRTH F.N. 5).
M-56; 0.4 C, 5 Ni, bal Fe.
90,000-123,000 TS.
For turbine blading and shrouding strip; tough

FIRTH BROWN D-65 (ATLAS A.T.C.V.).
M-56; C, Cr, V, bal Fe.
112,000 TS.
For machine parts, flat valves; oil hardening.

FIRTH BROWN DICROME.
M-56; 0.60 C, 0.60 Cr, 0.60 Mn, 0.25 Si, bal Fe.
For machine tool parts; oil hardened.

FIRTH BROWN E-80 (DURATLAS).
M-56; 0.4 C, 2.5 Ni, Cr, Mo, bal Fe.
134,000-224,000 TS.
For automobile crankshafts, axles, gears; oil hardening.

FIRTH BROWN E-82 (FIRTH BOLT STEEL).
M-56; C, 3.5 Ni, Cr, Mo, bal Fe.
145,000-168,000 TS.
For bolts, flanges; tough.

FIRTH BROWN E-83 (ATLAS N.C. 100).
M-56; 0.4 C, Ni, Cr, bal Fe.
224,000 TS.
For gears; oil hardening.

FIRTH-BROWN EXTRA CS.
M-56; 0.7-1.4 C, bal Fe.
Hardened: 500-700 Brin.
For finishing tools, drills, milling cutters, reamers, razors, punches, surgical instruments, taps, needles; tool steel "Firth Brown L-220."

FIRTH BROWN F10C.
M-56, 0.10 C, 0.25 Si, 0.65 Mn, bal Fe.
Annealed: 64,000 TS; 40,000 YS; 28 El; 65 RA; 130 Brin.
For nails, rivets, fan blades, case hardened parts; case hardened.

FIRTH BROWN F15C.
M-56; 0.15 C, 0.25 Si, 0.65 Mn, bal Fe.
Annealed: 70,000 TS; 45,000 YS; 25 El; 60 RA, 145 Brin.
For screws, bolts, case hardened parts; case hardened.

FIRTH BROWN F20C.
M-56, 0.20 C, 0.25 Si, 0.65 Mn, bal Fe.
Annealed: 73,000 TS; 45,000 YS; 22 El; 58 RA; 150 Brin.
For screws, bolts, gears, case hardened parts, case hardened.

FIRTH BROWN F25C
M 56; 0.25 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 70,000 TS; 45,000 YS; 31 El; 58 RA; 145 Brin
For crankshafts, gears, bolts, fasteners; water hardened.

FIRTH-BROWN F30C.
M-56; 0.32 C, 0.25 Si, 0.65 Mn, bal Fe
For axles

FIRTH BROWN F35C.
M-56; 0.35 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS, 30 El; 53 RA, 183 Brin.
For gears, shafts, axles, bolts; water hardened.

FIRTH BROWN F40C.
M-56, 0.40 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 91,000 TS; 58,000 YS; 27 El; 50 RA; 200 Brin
For gears, shafts, axles, bolts, crankshafts; water hardened.

FIRTH BROWN F45C.
M-56, 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For gears, shafts, bolts, axles, crankshafts; water hardened.

FIRTH BROWN F45CH.
M-56; 0.15 C, 0.25 Si, 0.70 Mn, 0.80 Ni, 0.60 Cr, bal Fe.
For gears, pinions, shafts, cams, camshafts; case hardened; Brit EN351; shock resistant.

FIRTH BROWN F50C.
M-56; 0.50 C, 0.25 Si, 0.65 Mn, bal Fe.
Annealed: 96,000 TS; 52,000 YS; 16 El; 23 RA; 170 Brin.
For gears, shafts, bolts, axles, crankshafts; water hardened.

FIRTH-BROWN F55C.
M-56; 0.55 C, 0.7 Mo, bal Fe.
For springs; water hardening.

FIRTH BROWN F55CH.
M-56; 0.18 C, 0.25 Si, 0.70 Mn, 1.0 Ni, 0.80 Cr, bal Fe.
For gears, pinions, cams, camshafts, machine tool parts; case hardened; Brit. EN352; shock resistant.

FIRTH BROWN F60C.
M-56; 0.60 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 320 Brin.
For die blocks, girders, clutch discs; water hardened

FIRTH BROWN F65C.
M-56; 0.65 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated. 170,000 TS; 116,000 YS, 10 El; 38 RA, 350 Brin.
For die blocks, girders, clutch discs, water hardened

FIRTH BROWN F65CH.
M-56; 0.18 C, 0.25 Si, 0.70 Mn, 1.3 Ni, 1.0 Cr, 0.10 Mo, bal Fe.
For gears, pinions, camshafts, cams, machinery parts, case hardened; Brit EN353, shock resistant.

FIRTH BROWN F70C.
M-56, 0.70 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated: 174,000 TS; 128,000 YS; 12 El, 37 RA; 352 Brin.
For springs, rails, die blocks, girders; water hardened.

FIRTH-BROWN F75C.
M-56; 0.75 C, 0.65 Mn, bal Fe.
For springs; water hardening.

FIRTH BROWN F75CH.
M-56; 0.18 C, 0.25 Si, 0.70 Mn, 1.75 Ni, 1.0 Cr, 0.15 Mo, bal Fe.
For gears, cams, camshafts, machine tool parts, case hardened, Brit EN354, shock resistant.

FIRTH BROWN F85C.
M-56, 0.85 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated. 190,000 TS, 145,000 YS, 12 El; 35 RA; 390 Brin.
For drills, punches, springs, reamers, hobs, Type W1; water hardened.

FIRTH BROWN F85CH
M-56, 0.18 C, 0.25 Si, 0.70 Mn, 2 Ni, 1.6 Cr, 0.2 Mo, bal Fe.
For gears, cams, machine tool parts; case hardened; Brit. EN355; shock resistant.

FIRTH-BROWN F95C.
M-56; 0.95 C, 0.6 Mn, bal Fe.
For springs; water hardening.

FIRTH BROWN F-103 (ATLAS N.C.C.H.).
M-56; C, 3 Ni, Cr, bal Fe.
123,000 TS.
For automobile camshafts, overhead valve gear, timing wheels; tough.

FIRTH-BROWN F543.
M-56; 0.09 C, 0.6 Si, 0.6 Mn, 4.8 Ni, 3.9 Cr, 3 Mo, bal Fe.
For tools, dies.

FIRTH-BROWN FCCH.
M-56; 0.14 C, 0.6 Mn, bal Fe.
For shafts, gears; formerly "Atlas CCH;" case hardening.

FIRTH BROWN FCCR.
M-56; 0.45 C, 0.25 Si, 0.90 Mn, 0.95 Cr, bal Fe.
For gears, bolts, crankshafts; water hardened.

FIRTH-BROWN FCMO.
M-56; 0.3 C, 0.75 Mn, 0.6 Mo, bal Fe.
For gears, shafts; water hardening.

FIRTH-BROWN FCVA.
M-56; 1.08 C, 0.1 Si, 0.2 Mn, 0.15 V, bal Fe.
For tools, dies, drills, taps; water hardening.

FIRTH-BROWN FCW5.
M-56; 1.35 C, 0.15 Si, 0.35 Mn, 5 W, bal Fe.
For tools, dies, drawing dies; oil hardening.

FIRTH-BROWN FN15.
M-56; 0.6 C, 0.65 Mn, 1.25 Ni, bal Fe.
For shafts; formerly "Atlas ND."

FIRTH-BROWN FN30.
M-56; 0.3 C, 0.65 Mn, 3 Ni, bal Fe.
For gears, shafts; tough.

FIRTH-BROWN FN35.
M-56, 0.3 C, 0.6 Mn, 3.6 Ni, bal Fe.
For gears shafts; oil hardening, tough.

FIRTH-BROWN FN50.
M-56, 0.2 C, 0.5 Mn, 5 Ni, bal Fe.
For gears, bolts, shafts; case hardening.

FIRTH-BROWN FNCF
M-56; 0.35 C, 0.35 Si, 0.8 Mn, 1.75 Ni, 0.75 Cr, bal Fe.
For gears, punches, shafts; oil hardening.

FIRTH BROWN FNCR.
M-56, 0.35 C, 1.25 Ni, 0.60 Cr, bal Fe.
For gears, pinions, bolts, machinery parts; Brit EN111; oil hardened, tough.

FIRTH BROWN FNMC
M-56; 0.65 C, 0.3 Si, 5.2 Mn, 12 Ni, 3.7 Cr, bal Fe.
For heat and corrosion resistant parts; non-magnetic, austenitic.

FIRTH-BROWN FPRF.
M-56; 1.1 C, 0.4 Si, 1 Mn, 0.9 Ni, 3.25 Cr, 0.35 Mo, bal Fe.
For tools, dies, oil hardening

FIRTH BROWN G-120 (NITRALLOY GRADE 1).
M-56; 0.45-0.55 C, Cr, Al, bal Fe.
156,000-202,000 TS.
For nitrided rolls, die blocks; nitriding steel

FIRTH BROWN G-121.
M-56; 0.35-0.45 C, 1.1 Al, 0.2 Mo, 1.5 Cr, bal Fe.
Rolled: 123,000-145,000 TS.
For nitrided rolls, brick press plates, crankshafts, camshafts.
Nitriding steel. Wear resistant.

FIRTH-BROWN G-122.
M-56; 0.26-0.35 C, Cr, Al, bal Fe.
89,000-123,000 TS.
For pump rods, crankshafts, camshafts; nitriding steel.

FIRTH BROWN G-123 (NITRALLOY GRADE 7).
M-56; 0.20-0.26 C, Cr, Al, bal Fe.
78,000-100,000 TS.
For elevator parts, low stressed nitrided parts; nitriding steel.

FIRTH BROWN GK3.
M-56, 0.35 C, 0.30 Si, 0.50 Mn, 2.0 Cr, 0.25 Mo, 0.15 V, bal Fe
For crankshafts, oil refinery equipment; oil hardened, creep resistant.

FIRTH BROWN GK5.
M-56; 0.25 C, 0.30 Si, 0.50 Mn, 2.0 Cr, 0.25 Mo, 0.15 V, bal Fe.
For crankshafts, oil refinery equipment; oil hardened, creep resistant.

FIRTH BROWN GK7.
M-56; 0.18 C, 0.30 Si, 0.50 Mn, 2.0 Cr, 0.25 Mo, 0.15 V, bal Fe
For oil refinery equipment; creep resistant, high temperature use.

FIRTH BROWN H-140.
M56; C, bal Fe.
For laminated springs.

FIRTH BROWN H-141.
M-56; C, bal Fe.
For helical springs; oil hardening.

FIRTH BROWN H-142.
M-56; C, Cr, bal Fe.
For springs; oil hardening.

FIRTH BROWN H-143.
M-56; C, Cr, bal Fe.
For helical springs; oil hardening.

FIRTH BROWN H-144.
M-56; C, Cr, V, bal Fe.
For springs; oil hardening.

FIRTH BROWN H-145.
M-56; C, Si, Mn, bal Fe.
67,000-83,000 TS.
For springs; hardened by heat treatment.

FIRTH BROWN HACKSAW.
M-56; 1 2 C, 1.25 W, 0.25 Mn, 0.25 Si, bal Fe.
For hacksaws, cutters; water hardened.

FIRTH BROWN HCM3.
M-56; 0.40 C, 3 Cr, 1.0 Mo, 0.25 V, bal Fe.
For oil refinery equipment; Brit. EN40C; creep resistant.

FIRTH BROWN HCM5.
M-56; 0 30 C, 3 Cr, 0.4 Mo, bal Fe
For oil refinery equipment; Brit. EN40B; creep resistant.

FIRTH BROWN HCM7.
M-56; 0.20 C, 3 Cr, 0.4 Mo, bal Fe.
For oil refinery equipment; Brit. EN40A; creep resistant.

FIRTH-BROWN HDBS.
M-56; 0.36 C, 0.35 Si, 0.3 Mn, 3 6 Cr, 0.25 V, 3 W, bal Fe.
For tools, dies; hot work steel.

FIRTH BROWN I-163 (SAITIE).
M-56, M-521; C, 18 Cr, 2 Ni, bal Fe.
112,000-134,000 TS.
For pump spindles, propeller shafts, bolts, nuts, seaplane fittings; magnetic, stainless.

FIRTH BROWN L-223 (FIRTH "T" BRAND).
M-56; 0.5-0.7 C, bal Fe.
For smiths tools, set screws, keys; electric steel.

FIRTH BROWN L-225 (FIRTH TEXTILE SPINDLE).
M-56; C, bal Fe.
For textile spindles; crucible steel.

FIRTH BROWN LCMO.
M-56; 0.17 C, 0.25 Si, 0.45 Mn, 0.50 Mo, bal Fe.
For gears, bolts, camshafts, cams; case hardened, tough.

FIRTH-BROWN M13F.
M-56; 1.1 C, 0.7 Si, 13 Mn, 1 Cr, bal Fe.
For wear resistant parts; wear resistant, austenitic.

FIRTH BROWN M-241 (FIRTH T.M.S.).
M-56; C, alloy, bal Fe.
For taps and dies, punches, jigs; non-shrinking electric steel.

FIRTH BROWN M-242 (FIRTH M.C.T.).
M-56; C, alloy, bal Fe.
For taps and dies, punches, jigs; non-shrinking crucible steel.

FIRTH BROWN M-243 (TRUTAP).
M-56; C, alloy, bal Fe.
For taps and dies, punches, tools; non-shrinking electric steel.

FIRTH BROWN M-244 (ATLAS SELF-HARDENING CHISEL).
M-56; C, Ni, Cr, bal Fe.
For hand and pneumatic chisels; shock resistant.

FIRTH BROWN M-245 (FIRTH EXTRA W.C.S.).
M-56; C, 1.0 W, bal Fe.
For hand and pneumatic tools; crucible steel.

FIRTH BROWN M-246 (FIRTH W.C.S.).
M-56; C, 1.0 W, bal Fe.
For hand and pneumatic tools; crucible steel.

FIRTH BROWN M-247 (FIRTH T.D C.) (BROWN'S SPECIAL X PUNCH).
M-56; C, 1.0 W, bal Fe.
For hand and pneumatic tools; electric steel.

FIRTH BROWN M-248 (FIRTH HACKSAW STEEL)
M-56 C, W, bal Fe.
For hacksaws; water hardening

FIRTH BROWN M-249 (FIRTH EXTRA SUPERIOR).
M-56; C, 3 5 W, bal Fe.
For special roll turning tools, tools for rifling gun barrels, boring cylinders and expanding tubes; crucible steel.

FIRTH BROWN M-250 (WOLFRAM C S.).
M-56, C, 3 5 W, bal Fe.
For special roll turning tools, tools for rifling gun barrels, boring cylinders, expanding tubes, crucible steel.

FIRTH BROWN M-251 (LASCUT)
M-56, C, 3.5 W, bal Fe.
For special roll turning tools, tools for rifling gun barrels, boring cylinders, expanding tubes; electric steel.

FIRTH BROWN M-252 (FIRTH 5 C S).
M-56; C, 5 W, bal Fe.
For cold drawing dies for wire and for roll turning tools; crucible steel.

FIRTH BROWN M-253 (FIRTH C Y.W.).
M-56; C, 3.5 Cr, bal Fe.
For hot working dies and coal cutters; tough.

FIRTH BROWN M-255 (FIRTH EXTRA HARD SHEET)
M-56; C, Cr, W, bal Fe.
For cold metal saws, crucible steel.

FIRTH BROWN M-256 (FIRTH C.C.W.).
M-56, C, low W, Cr, bal Fe
For hand and pneumatic chisels, rivet snaps, punches, coal picks, caulking tools; crucible steel.

FIRTH BROWN M-258 (STANSLOG).
M-56, C, low W, Cr, bal Fe.
For hand and pneumatic chisels, rivet snaps, punches, coal picks, caulking tools; electric steel.

FIRTH BROWN M-259 (FIRTH B.R.B.).
M-56; C, medium W, Cr, bal Fe.
For heavy duty barrel boring tools, rifling tools; crucible steel.

FIRTH BROWN M-260 (C.D.D.).
M-56; C, medium W, Cr, bal Fe.
For dies for working of brass and copper; crucible steel.

FIRTH BROWN M-262 (DYLASTA).
M-56; C, high W, Cr, bal Fe.
For hot and cold stamping dies for brass and copper, hot rivet unit and bolt dies, extruding dies; electric steel.

FIRTH-BROWN MCMT.
M-56; 0.36 C, 0.25 Si, 1.25 Mn, 0.7 Cr, 0.45 Mo, bal Fe.
For railway tires, wheels.

FIRTH-BROWN MCT.
M-56; 0.95 C, 0.25 Si, 1.1 Mn, 0.5 W, 0.5 Cr, bal Fe .
For bearings, punches, dies, crimpers, cutters; oil hardened, non-deforming.

FIRTH-BROWN MMO1.
M-56; 0.32 C, 1.6 Mn, 0.27 Mo, bal Fe.
For gears, shafts; oil hardening.

FIRTH-BROWN MMO2.
M-56; 0.33 C, 1.6 Mn, 0.4 Mo, bal Fe.
For gears, shafts; oil hardening.

FIRTH-BROWN MMOF.
M-56; 0.26 C, 0.35 Si, 1.5 Mn, 0.35 Mo, bal Fe.
For gears, shafts; water hardening.

FIRTH-BROWN MN1F.
M-56; 0.26 C, 0 35 Si, 1.5 Mn, bal Fe.
For gears, shafts

FIRTH-BROWN MN3F
M-56, 0.42 C, 0 35 Si, 1.4 Mn, bal Fe.
For gears, shafts, punches; oil hardening.

FIRTH-BROWN MO1F.
M-56, 0 2 C, 0 35 Si, 0 8 Mn, 0.65 Mo, bal Fe.
For gears, shafts, case hardening.

FIRTH BROWN MOVA(1).
M-56; 0 10 C, 0.25 Si, 0.50 Mn, 0 70 Mo, 0.25 V, bal Fe
For oil refinery equipment; elevated temperature use

FIRTH BROWN MOVA(2).
M-56, 0 20 C, 0 25 Si, 0.50 Mn, 0.70 Mo, 0.25 V, bal Fe.
For high temperature applications.

FIRTH-BROWN NIMCH.
M-56; 0.10 C, 0.5 Ni, 0.2 Mo, 0.3 Mn, bal Fe.
For gears, shafts; formerly "Fibratlas"; case hardening.

FIRTH-BROWN N2MCH.
M-56, 0 17 C, 0 5 Mn, 1.8 Ni, 0 25 Mo, bal Fe.
For gears, shafts; case-hardening.

FIRTH-BROWN N3CCH.
M-56; 0.12 C, 0.4 Mn, 3.3 Ni, 0 8 Cr, bal Fe.
For gears, shafts; case-hardening, tough.

FIRTH-BROWN N3CH.
M-56, 0.14 C, 0.25 Si, 0.4 Mn, 3.1 Ni, bal Fe.
For gears, shafts; case hardening.

FIRTH BROWN N3CMCH
M-56; 0.12 C, 3.3 Ni, 0.80 Cr, 0.20 Mo, bal Fe
For gears, shafts, machinery parts, cams; case hardened, shock resistant.

FIRTH-BROWN N4CCH.
M-56; 0.14 C, 0.4 Mn, 4 25 Ni, 1.25 Cr, bal Fe.
For gears, shafts; case-hardening, tough.

FIRTH BROWN N4CMCH.
M-56; 0.14 C, 4.25 Ni, 1.25 Cr, 0.25 Mo, bal Fe.
For gears, shafts, camshafts, cams, bolts; case hardened, shock resistant.

FIRTH-BROWN N5CH.
M-56; 0.10 C, 0.3 Mn, 5 Ni, bal Fe.
For gears, shafts; case-hardening, tough.

FIRTH-BROWN N5MCH.
M-56; 0.12 C, 0.4 Mn, 5.1 Ni, 0.2 Mo, bal Fe.
For gears, shafts; case-hardening, shock resistant.

FIRTH-BROWN NCM1.
M-56; 0.4 C, 0.6 Mn, 1.6 Ni, 1.0 Cr, 0.5 Mo, bal Fe.
For gears, shafts, bolts; shock resistant, heavy duty.

FIRTH-BROWN NCM2.
M-56; 0.6 C, 0.65 Mn, 1.5 Ni, 0.7 Cr, 0.25 Mo, bal Fe.
For gears, shafts; heavy duty.

FIRTH-BROWN NCM3.
M-56; 0.3 C, 0.6 Mn, 2.4 Ni, 0.6 Cr, 0.45 Mo, bal Fe.
For gears, shafts; shock resistant.

FIRTH-BROWN NCM4.
M-56; 0.4 C, 0.6 Mn, 0.65 Cr, 0.6 Mo, 0.3 Ni, bal Fe.
For gears, shafts, bolts, machinery parts; oil hardened, shock resistant.

FIRTH-BROWN NCM5.
M-56; 0.3 C, 0 6 Mn, 3.25 Ni, 0.6 Cr, 0.6 Mo, bal Fe.
For gears, shafts, bolts; shock resistant.

FIRTH-BROWN NCM6.
M-56; 0.3 C, 0.6 Mn, 3.25 Ni, 0.8 Cr, 0.3 Mo, bal Fe.
For bolts, gears, shafts; tough, shock resistant.

FIRTH-BROWN NCM7.
M-56; 0 3 C, 0.6 Mn, 3.5 Ni, 1.25 Cr, 0.6 Mo, bal Fe.
For bolts, gears, shafts; tough, shock resistant.

FIRTH-BROWN NCMCH.
M-56; 0 14 C, 0 4 Mn, 4.25 Ni, 1.25 Cr, 0.25 Mo, bal Fe
For gears, shafts; case-hardening, tough.

FIRTH-BROWN NCMF.
M-56; 0 35 C, 0.35 Si, 0.8 Mn, 1.75 Ni, 0.75 Cr, 0.35 Mo, bal Fe.
For gears, shafts, dies; oil hardening.

FIRTH BROWN NCMO.
M-56; 0.38 C, 0 25 Si, 0.65 Mn, 1.4 Ni, 1.2 Cr, 0.15 Mo, bal Fe.
For gears, bolts, machine tool parts; Brit EN110; oil hardened, tough.

FIRTH-BROWN NCMV.
M-56, 0.25 C, 0 55 Mn, 3 Ni, 1.2 Cr, 0.45 Mo, 0.2 V, bal Fe.
For bolts, gears, shafts; tough, shock resistant.

FIRTH-BROWN NCR1.
M-56, 0 55 C, 0 65 Mn, 1.5 Ni, 0.65 Cr, bal Fe.
For gears, shafts; formerly "Atlas NCD."

FIRTH-BROWN NCR2.
M-56, 0.3 C, 0 6 Mn, 3.25 Ni, 0.75 Cr, bal Fe.
For gears, shafts, tough.

FIRTH-BROWN NCR3
M-56; 0.65 C, 0.15 Mn, 1.95 Ni, 1.9 Cr, bal Fe.
For gears, shafts; tough,

FIRTH BROWN NMCM.
M-56; 0.40 C, 0.75 Ni, 0.45 Cr, 0.20 Mo, 1.35 Mn, 0.25 Si, bal Fe.
For gears, bolts, machine tool parts, fasteners; Brit. EN100; oil hardened, tough.

FIRTH-BROWN NMCW.
M-56; 0.7 C, 0.3 Si, 9.2 Mn, 7.7 Ni, 3.3 Cr, 0.6 W, bal Fe.
For heat and corrosion resistant parts; non-magnetic, austenitic.

FIRTH-BROWN NMM1.
M-56; 0.18 C, 1.4 Mn, 0.5 Ni, 0.3 Mo, bal Fe.
For axles; tough.

FIRTH-BROWN NMM2.
M-56; 0.28 C, 1.2 Mn, 0.5 Ni, 0.25 Mo, bal Fe.
For axles; tough.

FIRTH-BROWN O5CF.
M-56; 0.07 C, 0.35 Si, 0.07 Mn, bal Fe.
For hubbing dies; case hardening.

FIRTH BROWN O-275 (FIRTH N.M.C.).
M-56; 0.5 C, 12 Ni, 5 Mn, 4 Cr, bal Fe.
Annealed: 67,000-123,000 TS.
For cylinder liners, alternator rotor caps and wedges, piston skirts; non-magnetic, coef of expansion 0.000021 per °C.

FIRTH BROWN P-280 (FOUNDRY AA).
M-56; C, bal Fe.
For crane magnets, cast steel magnet yokes; magnet steel; high permeability.

FIRTH BROWN P-281 (TUNGSTEN MAGNET). (ATLAS TUNGSTEN MAGNET).
M-56; C, 6 W, bal Fe.
For aircraft and automobile magnetos, telephone, telegraph and radio apparatus; magnet steel; high remanence and coercive force.

FIRTH BROWN P-282 (TUNGSTEN CHROME MAGNET).
M-56; C, Cr, 6 W, bal Fe.
For aircraft and automobile magnetos, telephone, telegraph and radio apparatus, magnet steel, high remanence and coercive force.

FIRTH BROWN P-283 (COBALT MAGNET)
M-56; C, Co, bal Fe.
For aircraft and automobile magnetos, telephone, telegraph and radio apparatus; high coercive force.

FIRTH BROWN Q-300.
M-56; 0.45-0.50 C, bal Fe.
94,000-98,000 TS.
For railway tires.

FIRTH BROWN Q-301.
M-56; 0.55-0.60 C, bal Fe.
112,000-123,000 TS.
For railway tires.

FIRTH BROWN Q-302.
M-56; 0.65-0.70 C, bal Fe.
125,000-141,000 TS.
For railway tires.

FIRTH BROWN Q-303.
M-56; C, Mn, Mo, bal Fe.
100,000-138,000 TS.
For railway tires.

FIRTH BROWN Q-304.
M-56; 0.50-0.55 C, Cr, bal Fe.
112,000-123,000 TS.
For railway tires.

FIRTH BROWN Q-305.
M-56; 0.55-0.65 C, Cr, bal Fe.
125,000-159,000 TS.
For railway tires.

FIRTH BROWN Q-306.
M-56; 0.60-0.70 C, Cr, bal Fe.
141,000-155,000 TS.
For railway tires.

FIRTH BROWN Q-307.
M-56; 0.65-0.75 C, Cr, bal Fe.
145,000-180,000 TS.
For railway tires.

FIRTH BROWN Q-308.
M-56; 0.65-0.75 C, 1.25 Ni, Cr, bal Fe.
159,000-TS.
For railway tires; tough.

FIRTH BROWN R-320.
M-56; C, bal Fe.
78,000-90,000 TS.
For railway axles; water hardening.

FIRTH BROWN R-321.
M-56; C, bal Fe.
90,000-101,000 TS.
For railway axles; water hardening.

FIRTH BROWN R-322.
M-56; C, 3.5 Ni, bal Fe.
101,000-112,000 TS.
For railway axles; oil hardening, tough.

FIRTH BROWN R-323.
M-56; C, alloy, bal Fe.
101,000-112,000 TS.
For railway axles; oil hardening.

FIRTH-BROWN RBD.
M-56; 0.4 C, 0.15 Si, 0.25 Mn, 3 Cr, 0.5 V, 10 W, bal Fe.
For tools, dies; hot work steel.

FIRTH-BROWN RBD-E.
M-56; 0.22 C, 0.25 Si, 0.25 Mn, 2.25 Ni, 2.25 Cr, 0.45 Mo, 0.2 V, 10 W, bal Fe.
For tools, dies; hot work steel.

FIRTH BROWN S-340 (FOUNDRY A).
M-56; 0.20 C, bal Fe
58,000-67,000 TS
For locomotive gear centers, railway and marine castings for low strength; water hardening

FIRTH BROWN S-341 (FOUNDRY B MILD)
M-56, 0.28 C, bal Fe.
63,000-72,000 TS
For marine and automobile castings for medium strength; water hardening.

FIRTH BROWN S-342 (FOUNDRY B).
M-56; 0.32 C, bal Fe.
67,000-78,500 TS.
For railway gear centers, marine and general castings for medium strength; water hardening.

FIRTH BROWN S-343 (FOUNDRY C)
M-56, 0.40 C, bal Fe.
78,500-89,500 TS
For high tensile castings for railway, marine and general purposes, water hardening.

FIRTH BROWN S-344 (FOUNDRY D).
M-56; 0.60 C, bal Fe.
89,500-101,000 TS.
For cast steel die blocks; water hardening.

FIRTH BROWN S-345 (FOUNDRY E).
M-56; 0.75 C, bal Fe.
112,000-123,000 TS.
For cast steel die blocks; water hardening.

FIRTH-BROWN SHC1.
M-56; 0.44 C, 1 Si, 0.65 Mn, 3 Ni, 0.65 Cr, bal Fe.
For tools, dies, gears, shafts; tough.

FIRTH-BROWN SIMN.
M-56; 0.55 C, 1.85 Si, 0.8 Mn, bal Fe.
For springs; oil hardening.

FIRTH-BROWN SP.
M-56; 1.1 C, 0.15 Si, 0.25 Mn, 0.6 Cr, 0.35 W, bal Fe.
For tools, dies; water hardening.

FIRTH BROWN STANDARD.
M-56; 1.5 C, 12 Cr, 0.9 Mo, 0.9 V, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

FIRTH BROWN T-360 (FOUNDRY "A, Mn").
M-56; 0.25 C, Mn, bal Fe.
78,000-89,500 TS.
For transmission gears; resists shock and abrasion.

FIRTH BROWN T-361 (FOUNDRY "C-M").
M-56; 0.45 C, Mn, bal Fe.
89,500-112,000 TS.
For transmission gears; resists shock and abrasion.

FIRTH BROWN T-362 (FOUNDRY N.C.).
M-56; C, Ni, Cr, bal Fe.
101,000-112,000 TS.
For transmission gears; resists shock and abrasion.

FIRTH BROWN T-363 (FOUNDRY N.C. Mo).
M-56; C, Ni, Cr, Mo, bal Fe.
112,000-134,000 TS.
For transmission gears; resists shock and abrasion.

FIRTH BROWN T-364 (FOUNDRY C-Cr).
M-56; C, Cr, bal Fe.
101,000-123,000 TS.
For transmission gears; resists shock and abrasion.

FIRTH BROWN T-365 (FOUNDRY A-Mo).
M-56; 0.20 C, Mo, bal Fe.
72,000-85,000 TS
For cast steel mooring cables; ductile.

FIRTH BROWN T-366 (FOUNDRY B, Mo).
M-56; 0.30 C, Mo, bal Fe.
80,000-98,000 TS
For cast steel turbine casings, high pressure steam chests.

FIRTH BROWN T-367 (FOUNDRY A, Mn, Mo).
M-56; C, Mn, Mo, bal Fe.
90,000-112,000 TS.
For piling work; shock resistant.

FIRTH BROWN T-368 (ADAMANT T.M.).
M-56, 0.50 C, 1 Cr, 0.9 Mn, bal Fe.
For crusher plates, lining plates for pulverizers and grinders; water hardening

FIRTH BROWN T-369 (ADAMANT A).
M-56, 0.70 C, 1.9 Mn, 1 Cr, bal Fe.
For crusher plates, lining plates for pulverizers and grinders; oil or water hardening.

FIRTH BROWN T-370 (ADAMANT G-R).
M-56; 0.75 C, 1.9 Cr, 0.9 Mn, bal Fe.
Cast steel crusher plates, liners for pulverizers and grinders; oil hardening.

FIRTH BROWN T-371 (ADAMANT H.P.).
M-56, 0.90 C, 1.25 Ni, 1.9 Cr, 0.2 Mo, bal Fe
For crusher plates, liners for pulverizers and grinders; oil hardening.

FIRTH BROWN T-372 (ADAMANT EXTRA).
M-56; 0.75 C, 0.9 Ni, 1.9 Cr, 0.9 Mn, 0.35 Mo, bal Fe.
For crusher plates, liners for pulverizers and grinders; oil hardening.

FIRTH BROWN T-373 (FOUNDRY PILGER ROLL).
M-56; 1.0 C, Cr, Mo, bal Fe.
300-320 Brin.
For cast steel pilger rolls; oil hardening.

FIRTH BROWN T-374 (FOUNDRY Mn 12).
M-56; C, 12 Mn, bal Fe.
200-240 Brin.
For tramway crossings, crushing and grinding machinery; tough, wear resistant.

FIRTH-BROWN TDC.
M-56; 1.2 C, 0.25 Si, 0.25 Mn, 1.25 W, bal Fe.
For tools, dies, hacksaws; water hardening.

FIRTH-BROWN TMS.
M-56; 0.92 C, 0.3 Si, 1.75 Mn, bal Fe.
For tools, dies; oil hardening, non-deforming.

FIRTH BROWN TREBLE EXTRA.
M-56; 0.70-1.4 C, 0.15 Si, 0.30 Mn, bal Fe.
For drills, reamers, taps, broaches; Type W1; water hardened.

FIRTH BROWN "U" BRAND.
M-56; 0.7-1.4 C, bal Fe.
For hot working and battering tools, bolt and rivet headers, hot drop forging dies, rivet sets; electric steel.

FIRTH-CHQ.
M-57; C, alloy, bal Fe.
For cold heading dies; cold work steel.

FIRTH "DIEHARD."
M-56; 1.5 C, 13 Cr, bal Fe.
Hardened: 550-660 Brin.
For forging, blanking and drawing dies, cold trimming and punching dies; abrasion resisting "Firth Brown M-254" Air-hardening.

FIRTH DISCALOY.
M-57; 0.04 C, 13 Cr, 25 Ni, 3 Mo, 1.8 Ti, 0.2 Al, bal Fe.
At 70°F. 145,000 TS; 116,000 YS; 19 El; 23 RA.
At 1000°F: 125,000 TS, 98,000 YS; 16 El; 34 RA.
For gas turbine blades, rotors, jet engine parts; age hardenable, high temperature applications.

FIRTH "F-65."
M-56; 0.2-0.3 C, 2.75-3.50 Ni, 1.0-1.4 Cr, 0.25 max V, 0.65 Mo, bal Fe
Oil treated. 146,000-168,000 TS; 127,000-135,000 YS; 17 El, 40 RA.
For crank shafts, propeller shafts, rear axles, gear box shafts, connecting rods; "Firth Brown E-81;" for high duty work.

FIRTH FCN-5 STEEL.
M-56; 0.08-0.15 C, 4.75-5.25 Ni, bal Fe.
Heat treated: 101,000 TS, 65,700 YS; 20 El; 50 RA.
For motor car gears; case-hardening "Firth Brown F-102", "Atlas NCH 5."

FIRTH FCNC STEEL.
M-56, 0.12-0.18 C, 4-4.5 Ni, 1.0-1.4 Cr, bal Fe.
Heat treated: 180,000 TS; 144,000 YS; 12 El; 35 RA.
For gears for aero-engines, racing car gears; case-hardening "Firth Brown F-104", "Browns Atecor."

FIRTH FN-3 STEEL.
M-56; 0.25-0.40 C, 2.75-3.25 Ni, bal Fe.
Oil hardened: 101,000-123,000 TS; 65,700-80,000 YS; 22 El; 50 RA.
For valves, propeller shafts, rear axles, gear box shafts, connecting rods; "Firth Brown D-61", "Atlas ATN."

FIRTH FNC-3.
M-56; 0.08-0.15 C, 2.75-3.5 Ni, bal Fe.
Heat treated: 94,100 TS; 56,500 YS; 18 El; 45 RA; 140 Brin.
For gears, camshafts, steering gear parts; for case hardening "Firth Brown F-101", "Atlas NCH-3."

FIRTH FNC STEEL.
M-56; 0.28-0.34 C, 3.0-3.75 Ni, 0.5-1.0 Cr, bal Fe.
Oil hardened: 123,000-146,000 TS; 92,000-110,000 YS; 20 El; 50 RA.
For crank shafts, propeller shafts, rear axles, connecting rods, motor cars; "Firth Brown D-64", "Atlas NC-45."

FIRTH FS-2.
M-57; 63 TiC, 29.6 Ni, 7.4 Cr.
Sintered: Rockwell A87.
For jet engine components; super refractory, sintered carbides.

FIRTH FS-5.
M-57; 63 TiC, 25.9 Co, 11.1 Cr.
Sintered: Rockwell A90.
For jet engine parts; sintered carbides.

FIRTH FS-8.
M-57; 63 TiC, 22.2 Ni, 7.4 Co, 7.4 Cr.
At 75°F: 26,200 TS; 0 El.
At 800°F: 43,000 TS; 1.3 El.
At 1800°F: 37,800 TS; 2.4 El.
For jet engine components, cutting tools; oxidation, corrosion and heat resistant.

FIRTH FS-9.
M-57; 50 TiC, 30 Ni, 10 Co, 10 Cr.
At 75°F: 30,500 TS; 0 El.
For jet engine components, nozzles, dies; oxidation, corrosion and heat resistant.

FIRTH FS-26.
M-57; 54.3 TiC, 40 Ni, 5.7 Cr_3C_2.
At 80°F: 33,000 TS; 0 El.
At 1200°F: 48,000 TS; 0 El.
At 1800°F: 41,000 TS; 0.8 El.
For jet engine components, nozzles, dies; oxidation, corrosion and heat resistant.

FIRTH FS-27.
M-57; 42.9 TiC, 50 Ni, 7.1 Cr_3C_2.
At 80°F: 75,000 TS; 0 El.
At 800°F: 76,500 TS; 0 El.
At 1800°F: 35,000 TS; 1.7 El.
For jet engine components, cutting tools, oxidation, corrosion and heat resistant.

FIRTH F.S M-10.
M-57; 0.7 C, 8 Mo, 2 V, bal Fe.
For cutting tools, drills, hobs, reamers; high speed steel.

FIRTH F.S.M-10 MOD.
M-57; 0.65 C, 4 Cr, 8.2 Mo, 2 V, bal Fe.
For hot work tools and dies, punches, shears; hot work steel, oil hardened.

FIRTH FT-30 STEEL.
M-56; 0.28-0.40 C, 0.30 Si, 0.45-0.80 Mn, bal Fe.
Normalized: 67,000-90,000 TS; 35,500-45,000 YS; 25 El; 45 RA.
For general engineering use; "Firth Brown C-41"; "Atlas ATC-30."

FIRTH FT-40 STEEL.
M-56; 0.45-0.55 C, 0.30 Si, 0.5-0.7 Mn, bal Fe.
Normalized: 90,000-112,000 TS; 45,000-56,000 YS; 20 El; 40 RA.
For general engineering use; "Firth Brown C-43"; "Atlas ATC-50."

FIRTH GREEK ASCOLOY.
M-57; 0.15 C, 0.3 Si, 0.3 Mn, 13 Cr, 2 Ni, 3 W, 0.12 Al, bal Fe.
Heat treated: 137,000-195,000 TS; 108,000-160,000 YS; 23-14 El; 63-51 RA; 290-400 Brin.
For compressor wheels and blades, bolts, fasteners; heat resistant to 1000°F.

FIRTH HEAVY METAL.
M-57; 95 W, bal Ni + Cu.
Sintered: 120,000 TS; 2 El; 300 Brin.
For counterweights, x-ray tube screens; density 17.5-18.2.

FIRTH H.W.D. MOD.
M-57; 0.55 C, 1 Si, 1.4 W, 5.25 Cr, bal Fe.
For dies; air hardened, non-deforming.

FIRTHITE.
M-57; 97-87 Tungsten carbide, 5-13 Co.
For tipped cutting tools; cemented tungsten carbide.

FIRTHITE GR. TXL.
M-57; 81 WC; 12.5 TiC, 6.5 Co.
Sintered: 790 Brin.
For cutting tools; carbide cermet.

FIRTHITE H.
M-57; 6.0 Co, 94 WC.
78 Rockwell-C.
For cutters on cast iron, nonferrous metals and nonmetallics; cemented WC.

FIRTHITE H-23
M-57; WC, Co
Sintered· 240,000 TrS; A 91.8 Rock.
Density: 14.8
Cutting tools for roughing cuts; for machining superalloys.

FIRTHITE HA.
M-57; 6 Co, 3 TaC, 91 WC.
79 Rockell-C.
For tool bits, cutters; for semi-finishing hard irons.

FIRTHITE HB.
M-57; 8 Co, 92 WC.
77-Rockwell-C.
For tool bits, cutters; for roughing cast iron.

FIRTHITE HE.
M-57; 95.5 WC, 4.5 Co.
Sintered: Rockwell A92.
For cutting tools; sintered carbide.

FIRTHITE HF.
M-57; WC, 3 Co.
81 Rockwell-C.
For tools, cutters, finishing cuts.

FIRTHITE NHA.
M-57; WC.
For cutters for machining cast iron; cemented carbide.

FIRTHITE NTA.
M-57; WC, Co.
Sintered: 250,000 TrS; A 91 0 Rock.
Density: 12.9.
Cutting tools for rough machining steel.

FIRTHITE T-04.
M-57; 85 WC, 10 Co, 1 TaC, 4 TiC.
For tipped tools for rough cuts; cemented.

FIRTHITE T-22.
M-57; WC, Co.
Sintered: 240,000 TrS; A 92.2 Rock.
Density: 12.8.
Cutting tool for general purpose machining steel.

FIRTHITE T-25.
M-57; WC, Co.
Sintered: 190,000 TrS; A 92.8 Rock.
Density: 12.1.
For semi-finish cuts on ferrous and non-ferrous metals; crater-resistant grade.

FIRTHITE T-31.
M-57; 68.5 WC, 6.5 Co, 25 TiC.
For bits for cutting tools; hardest and most wear resistant, sintered.

FIRTHITE T-41.
M-57; WC, 8 Co.
79 Rockwell-C.
For tools, dies, cutters; cemented WC.

FIRTHITE T-66.
M-57; 60 WC, 12 Co, 28 Ta.
For heavy duty cutters and tools; sintered.

FIRTHITE T-89.
M-57; 12 Co, 59 WC, 22 TaC, 7 TiC.
77 Rockwell-C.
For rough and semi-finish cuts, tipped tools; cemented.

FIRTHITE TXH.
M-57; 83 WC, 8 Co, 9 TiC.
Sintered: Rockwell A91.5.
For cutting tools; sintered carbide.

FIRTHITE TXL.
M-57; 81 WC, 6.5 Co, 12.5 TiC.
Sintered: Rockwell A92
For cutting tools; sintered carbide.

FIRTHITE-WF.
M-57, 70 TiC, 18 MoC, 12 Ni
Sintered: A 92 Rock; 125,000 TrS.
Sintered carbide tool inserts for cutting steel; high speed fine finishing.

FIRTHITE WL
M-57; 73 WC, 6 Co, 21 TaC.
Sintered: Rockwell A91
For cutting tools; sintered carbide.

FIRTH "NONVAR" CAST STEEL
M-56, C, bal Fe, high Mn.
Hardened: 444-600 Brin
For taps, boiler stay bolts, punches, dies, jigs, gages; "Firth Brown M-240."

FIRTHOB
M-56; 0.09 C, 0.5 Mn, 1.25 Ni, 0.5 Cr, bal Fe.
For gears, shafts, cams, machinery parts; case hardened, shock resistant

FIRTH PNUSNAP.
M-56; 0.35 C, 0.5 Si, 0.25 Mn, 1.0 Cr, 1.8 W, bal Fe.
Heat treated. 512-555 Brin.
For pneumatic snaps, for hot riveting chisels, punches, tough, shock resistant.

FIRTH "RBD" STEEL
M-56; C, high W, Cr, bal Fe.
Hardened: 286-418 Brin
For hot rivet dies, die blocks, shear blades, hot iron punches; air hardening "Firth Brown M-261"

FIRTH RT.
M-56, 1.2 C, 0.28 Mn, 3 W, bal Fe.
For draw dies, punches, burnishing tools; fast finishing tool steel.

FIRTH VC.
M-57; 1.1 C, 4 Cr, 2.6 Mo, 2.5 W, 4 V, bal Fe.
For twist drills, reamers, broaches; abrasion resistant.

FIRTH-VICKERS 21/4N STEEL.
M-521; 0.48-0.58 C, 0.25 max Si, 8.0-10.0 Mn, 20.0-22.0 Cr, 3.25-4.5 Ni, 0.38-0.5 N, bal Fe.
Non-magnetic, precipitation hardenable stainless steel.
Ht. Tr. tested at 800°C: 53,000 TS; 35,800 YS.
Good oxidation resistance up to 850°C.
For valves in internal combustion engines.

FIRTH-VICKERS 309.
M-521; 0.15 max C, 1.0 max Si, 2.0 max Mn, 22.0-24.0 Cr, 13.0-15.0 Ni, bal Fe.
At room temp: 90,000 TS; 35,000 YS; 50 El.
At 800°C: 26,800 TS; 13,800 YS (0.2% proof).
Good resistance to corrosion and to scaling at elevated temperature; for superheater supports, furnace parts, heat treat boxes and annealing racks. Weldable. AISI 309.

FIRTH-VICKERS 448 STEEL.
M-521; 0.10-0.13 C, 0.50 Si, 1.0 Mn, 11.0 Cr, 0.75 Ni, 0.65 Mo, 0.15-0.30 V, 0.40 Nb, bal Fe.
Air or oil harden; temper 650-700°C.
At Room Temp: 150,000 TS, 127,000 YS; 20 El.
At 700°C: 51,500 TS; 44,000 YS; 28 El.
For aircraft gas turbine discs and similar stressed parts at elevated temperatures.

FIRTH-VICKERS 467.
M-521; 0.2 C, 9.5 Ni, 14 Cr, 2 Mo, 2.5 Cu, 0.7 Ti, bal Fe.
Annealed: 98,000 TS, 43,500 YS; 52 El; 56 RA.
At 500°F: 80,000 TS; 33,600 YS; 31 El; 36 RA.
At 750°F 61,000 TS; 33,000 YS; 24 El, 27 RA.
For jet engine components; heat and creep resistant, austenitic.

FIRTH-VICKERS 507.
M-521, 0.12 C, 0.4 Cb, 10.5 Cr, 0.75 Mo, 0.15 V, bal Fe
Annealed: 75,000 TS; 35,000 YS; 30 El; B 82 Rock.
Cold Drawn 95,000 TS; 80,000 YS; 15 El, B 92 Rock.
For springs, table flatware, knives, oil refinery equipment Corrosion resistant.

FIRTH-VICKERS 535 STEEL.
M-521, 0.07 C, 0.40 Si, 0.85 Mn, 10.5 Cr, 0.30 Ni, 6.0 Co, 0.75 Mo, 0.20 V, 0.45 Nb, bal Fe.
Air or oil harden, temper 600-650°C:
At Room Temp: 160,000 TS, 142,000 YS, 22 El.
At 550°C. 118,000 TS, 103,000 YS, 22 El.
For aircraft turbine and compressor disc forgings and wrought rings

FIRTH-VICKERS 548 STEEL.
M-521; 0.06 C, 0.40 Si, 1.0 Mn, 16.5 Cr, 11.5 Ni, 1.5 Mo, 1.0 Nb, bal Fe
Austenitic stainless steel, weldable
Room Temp. 80,000 TS; 33,000 YS; 55 El
At 700°C: 53,000 TS; 18,000 YS. 41 El
For structural parts and welded assemblies operating at elevated temperatures.

FIRTH-VICKERS 555 STEEL
M-521, 0.05 C, 0.40 Si, 1.5 Mn, 16.5 Cr, 10.5 Ni, 2.4 Mo, bal Fe
Austenitic stainless, weldable.
At 700°C. 45,600 TS; 13,800 YS.
For steam pipe, chemical plant equipment.

FIRTH-VICKERS 566.
M-521, 0.12 C, 0.4 Si, 0.8 Mn, 11.5 Cr, 2.3 Ni, 1.4 Mo, 0.15 V, 0.3 Nb, bal Fe.
Air hardened, tempered 630-650°C.
Room Temp. 147,000 TS; 124,000 YS; 22 El.
At 600°C: 80,000 TS; 66,000 YS; 28 El.
For turbine blading for use up to 450°C.

FIRTH-VICKERS 607 STEEL
M-521; 0.15 C, 0.30 Si, 0.80 Mn, 11.0 Cr, 0.60 Ni, 0.80 Mo, 0.25 V, bal Fe.
Air or oil hardenable, corrosion resistant steel, primarily for sheet production.
For stamped or formed parts stressed at temperatures up to about 600°C.

FIRTH-VICKERS F 17.
M-521; 0.10 C, 14-18 Cr, bal Fe.
Annealed: 80,000 TS; 45,000 YS; 28 El; 145 Brin.
For automotive trim, kitchen sinks, oil burners, fasteners, furnace parts.
Type 430 stainless steel, nonhardenable, ferritic, heat resistant.

FIRTH-VICKERS F.A.L.
M-521; 0.12 max C, 0.8 max Si, 1.0 max Mn, 12.0-14.0 Cr, 3.8-4.8 Al, bal Fe.
Heat treated: 90,000 TS; 67,000 YS; 25 El.
Corrosion resistant steel with high electrical resistivity; for resistances and rheostats.

FIRTH-VICKERS F.A.S.
M-521; 0.43 C, 0.3 Si, 0.5 Mn, 11.5 Cr, bal Fe.
Annealed: 110,000 TS; 79,000 YP; 20 El; 240 Brin.
For stainless ball bearings.
Corrosion resistant.

FIRTH-VICKERS F.C.I.
M-521; 0.12 max C, 0.8 max Si, 1.0-2.0 Mn, 0.15-0.30 S, 11.5-13.5 Cr, 0.3-0.6 Mn, bal Fe.
Martensitic, free-machining, hardenable corrosion resistant steel.
Air or oil hardenable to about 28-38 Rock C.
For shafts, hardware, fasteners, cap screws.
BS: EN.56AM; AISI 416.

FIRTH-VICKERS F.C.S.
M-521; 0.20-0.28 C, 0.8 max Si, 1.0-2.0 Mn, 0.15-0.30 S, 12.0-14.0 Cr, 0.3-0.6 Mo, bal Fe.
Martensitic, free-machining, hardenable corrosion resistant steel.
Air or oil hardenable to about 44-52 Rock C.
For spline shafts, gears, studs, hardware.
BS: EN.56 CM, 2S.124; AISI 420 F.

FIRTH-VICKERS F.G.
M-521; 0.20-0.28 C, 0.8 max Si, 1.0 max Mn, 12.0-14.0 Cr, bal Fe.
Martensitic corrosion resistant steel.
Ht. tr. & temp. 400°C: 218,000 TS; 196,000 YS; 18 El; 480 VDH hardness.
For cutlery, surgical instruments, dental tools, turbine equipment, valves.
B.S.: 3S.62, EN56C; AISI 420.

FIRTH-VICKERS F.G.(L).
M-521; 0.12-0.20 C, 0.8 max Si, 1.0 max Mn, 11.5-13.5 Cr, bal Fe.
Martensitic corrosion resistant steel; hardenable to about 42-48 Rock C.
For intricate cutlery and surgical instruments where hot forging may be difficult.
(AISI 420-low carbon range).

FIRTH-VICKERS F.H.
M-521; 0.28-0.36 C, 0.8 max Si, 1.0 max Mn, 12.0-14.0 Cr, bal Fe.
Martensitic corrosion resistant steel.
Air or oil hardenable to 240,000 psi TS and hardness of 598 VDH.
For knives, cutlery, surgical and dental instruments.

FIRTH-VICKERS F.H.M.
M-521; 0.70-0.90 C, 0.8 max Si, 1.0 max Mn, 15.5-17.5 Cr, 0.3-0.7 Mo, bal Fe.
Martensitic corrosion resistant steel.
Air or oil hardenable to about 50-56 Rock C.
For cutlery, dental and surgical instruments, valves, stainless ball and roller bearings.
AISI 440B.

FIRTH VICKERS F.I.
M-521; 0.08 max C, 11.5-13 Cr, 0.1-0.3 Al, bal Fe.
Normalized: 71,000 TS; 42,600 YS; 22 El; 70 RA; 150 Brin.
Heat treated: 175,000 TS; 145,000 YS; 21 El; 64 RA; 352 Brin.
For oil refinery and chemical plant equipment; Type 405; corrosion resistant.

FIRTH-VICKERS F.I.17.
M-521; 0.07 C, 17 Cr, 0.80 Mn, bal Fe.
Annealed: 78,400 TS; 49,300 YS; 32 El; 50 RA; 160 Brin.
For auto trim, window frames, grills; corrosion resistant; Type 430.

FIRTH-VICKERS F.I. 17 Mo STEEL.
M-521; 0.07 C, 0.40 Si, 0.60 Mn, 16.3 Cr, 0.40 Ni, 1.0 Mo, bal Fe.
Ferritic stainless steel; for motor car hub caps and trim, domestic flatware and holloware.

FIRTH-VICKERS F.I. (Al).
M-521; 0.08 max C, 11.5-14.5 Cr, 0.1-0.3 Al, bal Fe.
Annealed: 65,000 TS; 38,000 YS; 36 El; 145 Brin.
Cold Drawn: 85,000 TS; 70,000 YS; 20 El; 185 Brin.
For heat treating boxes, quenching racks, oil refining and chemical plant equipment. Heat and corrosion resistant. AISI Type 405.

FIRTH-VICKERS F.I. (Ti) STEEL.
M-521; 0.06 max C, 0.8 max Si, 1.5 max Mn, 10.5-12.0 Cr, 1.0 Ni, 0.2-0.8 Ti, bal Fe.
Soft: 63,000 TS; 34,000 YS; 32 El.
Hard: 72,000 TS, 52,000 YS; 25 El.
For lightly loaded parts to resist scaling up to 700-750°C.
Similar to AISI 405.

FIRTH-VICKERS F.L.
M-521; 0.08 max C, 11.5-14.5 Cr, 0.1-0.3 Al, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 30 El; 60 RA; 160 Brin.
For heat treating boxes, quenching racks, high temperature units
Type 405 stainless steel.

FIRTH VICKERS F.M.B.
M-521; 0.08 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 60-50 El; 75-60 RA; 150-190 Brin.
For chemical plant equipment, mixers, agitators, filters, Type 316; stainless, austenitic.

FIRTH-VICKERS F.S.M.1.
M-521, 0.05 C, 17.2 Cr, 7.15 Mn, 4.5 Ni, 0.12 N, bal Fe.
Annealed: 104,000 TS; 56,000 YS; 51 El; B 90 Rock.
For aeronautical applications, kitchen equipment, fasteners.
Type 204, corrosion and heat resistant. Stainless, austenitic, high strength

FIRTH-VICKERS F.V. 507.
M-521; 0.12 C, 11.0 Cr, 0.8 Mo, 0.15 V, 0.4 Nb, bal Fe.
Martensitic corrosion resistant steel casting.
Air or oil hardenable to about 35-44 Rock C.
In harden conditions has good strength and corrosion resistance at room temperature and is used to about 700°C; for housings, brackets.

FIRTH-VICKERS F.V. 520 (B) STEEL.
M-521; 0.07 max C, 0.7 max Si, 1.0 max Mn, 13.2-14.7 Cr, 5.0-6.0 Ni, 1.2-2.0 Cu, 1.2-2.0 Mo, 0.2-0.7 Nb, bal Fe.
Corrosion resistant maraging type steel.
Aged: 122,000-212,000 TS; 78,000-150,000 YS; 10-20 El; 270-450 VDH. (varying treatment).

Weldable; for blading, bolts, fasteners, valves, pumps, water impellers, assemblies.

FIRTH-VICKERS F.V. 520 (S) STEEL.

M-521; 0.04-0.07 C, 0.6 max Si, 0.8-1.8 Mn, 15.3-16.0 Cr, 5.0-5.8 Ni, 1.4-2.1 Cu, 1.2-2.0 Mo, 0.5-0.15 Ti, bal Fe.

Corrosion resistant maraging type steel.

Aged: 142,000-196,000 TS; 116,000-142,000 YS; 6 min El; 320-400 VDH. (varying treatment).

Weldable; for bolts, fasteners, valves, pump parts, water impellers, assemblies.

FIRTH-VICKERS F.V. 702.

M-521; 0.03 C, 0.5 Si, 0.6 Mn, 15.7 Cr, 2.5 Ni, 1.0 Mo, 0.5 Nb, bal Fe.

Good resistance to corrosion and stress corrosion, equipment for chemical plants.

FIRTH-VICKERS H.R.CROWN 1 STEEL.

M-521; 0.20 C, 0.8 Si, 0.9 Mn, 22.5 Cr, 11.0 Ni, 0.5 W, bal Fe.

Austenitic stainless steel casting.

For room temperature and elevated temperature parts subject to corrosive conditions; good high temperature strength.

AISI 309; BS; 1648-E.

FIRTH-VICKERS H.R.CROWN MAX STEEL.

M-521; 0.20 C, 1 0 Si, 0.8 Mn, 23.0 Cr, 11.5 Ni, 3.0 W, bal Fe.

Austenitic stainless steel casting.

For room temperature and elevated temperature parts subject to corrosive conditions; good high temperature strength.

AISI 309; BS; 1648-E.

FIRTH-VICKERS MOLYBDENUM STAINLESS STEEL.

M-521, 0 10 C, 0.30 Si, 0 30 Mn, 12.5 Cr, 0 75 Mo, bal Fe.

Air or oil hardenable; good resistance to scaling and creep at elevated temperatures, for turbine blades and similar applications.

FIRTH-VICKERS MOLYBDENUM VANADIUM STAINLESS STEEL.

M 521, 0 12 C, 0 30 Si, 0.60 Mn, 12.25 Cr, 0 80 Ni, 0.60 Mo, 0 18 V, bal Fe.

Air or oil hardenable, tempered 675/700°C;

At Room temp· 115,000 TS, 100,000 YS; 29 El.

At 650°C· 48,000 TS; 40,000 YS (0.2% proof).

For stressed parts operating up to 650°C.

FIRTH-VICKERS S.80.

M-521; 0.16 C, 16 5 Cr, 2.5 Ni, bal Fe.

Oil treated 100,000-135,000 TS; 78,000-112,000 YS; 25-15 El; 60-45 RA; 240-280 Brin

For pump spindles, propeller shafts, seaplane and aircraft construction; magnetic, stainless and rust resistant AISI 431.

FIRTH-VICKERS S L.V.

M-521, 0.40-0 50 C, 3.0-3.75 Si, 0.3-0.6 Mn, 7.5-9.5 Cr, bal Fe.

Ht. Tr Temp.: 650°C: 134,000-154,000 TS; 100,000-112,000 YS; 20-10 El.

Good mechanical properties and scale resistance at elevated temperatures.

For valves in internal combustion engines.

BS.EN.52.

FIRTH-VICKERS "VIKRO."

M-50, M-521; 60-65 Ni, 15-25 Cr, 1.0-0.10 C, 0.5-1.0 Si, 1.0 max Mn, bal Fe.

Normalized: 102,000-134,000 TS; 65,000-78,000 YS, 25-15 El; 35-25 RA; 180-240 Brin.

At 1000°C: 17,600 TS.

For case hardening boxes, gas or oil burners, furnace muffles, boiler stay bolts; heat resisting; stainless.

FIRTH VICKERS XB.

M-521; 0.78 C, 2.0 Si, 0.45 Mn, 19.5 Cr, 1.35 Ni, bal Fe.

Hardened: 140,000 TS; 127,000 YS; 16 El; 21 RA.

At 400°C: 110,000 TS; 78,000 YS; 15 El; 28 RA.

For valves. Stainless, heat and corrosion resistant.

FIRTH W.C.R.

M-57; 0.5 C, 7.5 W, 7.5 Cr, bal Fe.

For hot work tools and dies; hot work steel, oil hardened.

FIRTH XDL.

M-57; 0.4 C, 15 W, 3.5 Cr, 0.5 V, bal Fe.

For hot work dies, extrusion rams and liners; hot work steel, oil hardened.

FISCHER VIS-11.

M-1659; 0.25 C, 10.8 Cr, 1.1 Mo, 0.6 Ni, 0.4 V, 0.4 W, bal Fe.

Annealed: 95,000 TS; 45,000 YS; 25 El; B 92 Rock.

Hardened. 245,000 TS; 210,000 YS; 8 El; C 50 Rock.

For valves, gears, cutlery, shafts, bearings, surgical instruments.

Corrosion resistant, hardenable. Cast only.

FISCO NO. 1.

M-627; 0.15 C, 0.5 Mn, 1.8 Ni, 0.25 Mo, bal Fe.

For arbors, gears, pinions; carburizing steel.

FISCO NO. 2.

M-627, 0.3-0 4 C, 0.9-1.2 Mn, bal Fe.

Rolled 90,000 TS; 65,000 YS, 18 El; 45 RA; 212 Brin.

For gears, shafts, bolts, gears, lead screws, spindles; excellent machining qualities.

FISCO NO. 3.

M-627; C, Mo, Cr, bal Fe.

For axles, bolts, gears, keys, pinions; oil hardening

FISCO NO 4.

M-627; 0 45-0.55 C, 0.6-0.9 Mn, 0.8-1.1 Cr, 0 15-0.25 Mo, bal Fe

Oil quenched. 150,000-130,000 TS; 130,000-100,000 YS; 17-18 El, 55-50 RA; 300-230 Brin.

For shafts, gears, axles, high impact and creep strength, pre-heat treated.

FISCO 66.

M-627; 0.8 C, 4 Cr, 5.5 W, 1.5 V, 5 Mo, bal Fe.

For tools, cutters; high speed steel.

FISCO AIRDIE

M-627; 0 6 C, 5 Cr, bal Fe.

For tools, cutters; oil hardening.

FISCO AIRQUENCH.

M-627; 0.95 C, 2.04 Mn, 1.9 Cr, 1 Mo, bal Fe.

For dies, rolls, gauges; air hardening.

FISCO CARBON.

M-627; 1.0 C, bal Fe.

For tools, dies, cutters, water hardening.

FISCO CHROMDIE

M-627; 1.6 C, 12 Cr, 0.75 Mo, 0.25 V, bal Fe.

For dies, gauges, mandrels, shear blades; air hardening, abrasion resistant.

FISCO COBALT.

M-627; 0.74 C, 4 5 Cr, 1.4 V, 18.8 W, 0.6 Mo, 5 Co, bal Fe.

For tools, cutters, dies; high speed steel.

FISCO DUPLEX.

M-627; 0.8 C, bal Fe.

For tools; water hardening..

FISCO EXCELL.
M-627; 0.8 C, 18 W, 4 Cr, 2 V, 0.7 Mo, bal Fe.
For tools, cutters; high speed steel.

FISCO HIGH SPEED.
M-627; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, cutters; high speed steel.

FISCO HOT WORK.
M-627; 0.6 C, 8.5 Mo, 1.7 V, 3.6 Cr, bal Fe.
For hot work tools and dies; hot work steel.

FISCO MOLY.
M-627; 0.7 C, 1.5 W, 9.5 Mo, 4 Cr, 1 V, bal Fe.
For tools, cutters; high speed steel.

FISCO-Mo NO. 1 .
M-627; 0.1-0.2 C, 0.4-0.7 Mn, 1.65-2.0 Ni, 0.2-0.3 Mo, bal Fe.
Oil quenched: 120,000 TS; 90,000 YS; 22 El; 60 RA; 248 Brin.
For carburized parts, arbors, gears, pinions, cams, clutches; minimum distortion.

FISCO-Mo NO. 3.
M-627; 0.45-0.55 C, 0.6-0.9 Mn, 0.9-1.1 Cr, 0.15-0.25 Mo, bal Fe.
Annealed: 100,000 TS, 68,000 YS; 25 El, 55 RA; 183 Brin.
Heat treated: 240,000 TS; 225,000 YS; 12 El; 30 RA; 460 Brin.
For heavy duty shafts, gears, clutches; good machining qualities.

FISCO OILDIE.
M-627; C, bal Fe.
For tools, dies; oil hardening.

FISCO OILHARD.
M-627; 0.9 C, 1.1 Mn, 0.5 Cr, 0.25 V, 0.4 W, bal Fe.
For tools, cutters, dies, gauges, non-deforming

FISCO OMEGA.
M-627; 0.55 C, 0.8 Mn, 0.5 Mo, 0.25 V, 2.3 Si, bal Fe.
For impact tools; shock resistant, water hardened.

FISCO PNEUMATIC.
M-627; C, bal Fe
For tools; oil hardening.

FISCO PRECISION.
M-627; C, bal Fe
For tools; water hardening.

FISCO SEVEN
M-627; C, bal Fe.

FISCO SPECIAL.
M-627; 1.0 C, bal Fe
For tools, dies, cutters, water hardening.

FISCO STAR TUNG.
M-627; C, W, bal Fe.
For tools, cutters; oil hardening.

FISCO SUPERIOR.
M-627; 0.8 C, 12 Co, 20 W, 4 Cr, 1 V, 0.6 Mo, bal Fe.
For tools, cutters; high speed steel.

FISCO TIGER.
M-627, 1.0 C, 18 W, 4 Cr, 2 V, bal Fe.
For tools, cutters; high speed steel.

FISCO VANADIUM.
M-627; 0.9 C, 0.16 V, bal Fe.
For tools, dies, cutters, water hardening.

FIVE POINT DEEP HARD.
M-804; 0.4 C, 1.5 Ni, 0.8 Cr, 0.2 Mo, bal Fe.
For gears, axles, wrist pins, wheels, valves; oil hardening.

FIXAMPER.
M-771; Ni-Fe.
For heating elements, electrical resistances; good to 600°C.

FIXINVAR.
M-104; 36 Ni, bal Fe.
For clocks.

F.J.A.B. EXTRA.
M-365; 0.9-1.4 C, bal Fe.
For general tools and dies; water hardening.

F.J.A.B HOLLOW DRILL.
M-365; 1-1.2 C, bal Fe.
For mining, quarrying and construction tools; water hardening.

F.J.A.B REGULAR.
M-365, 0.9-1.2 C, bal Fe.
For general tools and dies; water hardening.

F.J.A.B ROOLED AUGER.
M-365; 0.7-0.9 C, bal Fe.
For tools for mining soft ores, coal, etc.; water hardening.

F.J.A.B. SOLID DRILL
M-365; 1.1-1.2 C, bal Fe For mining, quarrying, construction work tools; water hardened

F.J.A.B. SPECIAL.
M-365; 0.9-1.2 C, bal Fe
For special die work tools.

FK(D)M-10.
Germ., 0.25 C, 3 Cr, 0.4 W, 0.4 Mo, 0.2 V, bal Fe.
For turbine blades for jet engines; oil hardened

FLAMALOY
M-157; C, alloy, bal Fe
For castings; castings, wear resistant

FLAME HARD
M-1482; 0.55 C, 1.2 Mn, 1.25 Cr, 0.4 Mo, 0.1 V, bal Fe
For trim dies, oil or flame hardened.

FLAME RESISTING ALLOY.
Eng.; 14 Cr, 9.7 Ni, 0.8 Mn, 0.2 Si, 0.2 C, bal Fe.
For heat resisting alloy parts, corrosion and heat resistant

FLANGE METAL, FRENCH
French, 94 Cu, 5.6 Sn, 0.05 Pb
For bushings, fittings, flanges; tough.

FLANGE METAL, GERMAN.
German, 92 Cu, 5 Zn, 2.5 Sn.
For pipes, fittings, flanges, corrosion resistant.

FLASH ALLOY
M-915, 0.17-0.22 C, 1.65-2.0 Ni, 0.2-0.3 Mo, bal Fe.
For sling chains.

FLECTO IRON
M-94, 2.4-2.6 C, 0.45 Mn, 1.1 Si, bal Fe.
Cast: 52,000 TS, 35,000 YS; 14 El; 135 Brin.
For castings to be hot galvanized; specially annealed malleable cast iron.

FLEETWELD 5.
M-578; C, bal Fe
Steel arc welding electrode
AWS Class E6010

FLEETWELD 5P.
M-578; C, bal Fe.
Steel arc welding electrode.
AWS Class E6010.

FLEETWELD 7.
M-578; C, bal Fe.
Steel arc welding electrode.
AWS Class E6012.

FLEETWELD 35.
M-578; C, bal Fe.
Steel arc welding electrodes.
AWS Class E6011.

FLEETWELD 35LS.
M-578; C, bal Fe.
Steel arc welding electrode.
AWS Class E6011.

FLEETWELD 37.
M-578; C, bal Fe.
Steel arc welding electrode.
AWS Class E6013.

FLEETWELD 47.
M-578, C, bal Fe.
Steel arc welding electrode.
AWS Class E7014.

FLEETWELD 57.
M-578; C, bal Fe.
Steel arc welding electrode.
AWS Class E6013.

FLEETWELD 180.
M-578, C, bal Fe
Steel arc welding electrode.
AWS Class E6011.

FLETCHER & EMPERER BEARING.
Eng.; 92 Al, 7.5 Cu, 0.3 Sn
For bearings, non-hardenable.

FLETCHER'S ALLOY.
Eng; 96 Al, 3 Cu, 1 Sn, 0.5 Sb, P.
For aircraft and light weight parts; non-hardenable.

FLETCHERS BEARING METAL.
90 Al, 7 Cu, 1 Zn
For bearings.

FLEX
M-1291, 0.50 C, Mn, bal Fe.
For gears, shafts, machine tool parts, water hardened

FLEXALOY.
M-1128, C, Cr, Mn, Ni, bal Fe.
550 Brin.
For hard surfacing electrodes, wear resistant against earth

FLEXARC ACP-MO.
M-118, C, bal Fe
For welding electrodes for steel.

FLEXARC AP.
M-118; 0.1 C, bal Fe.
Welded 62,000 TS; 52,000 YS, 22 El
For welding electrodes, for low carbon steel, E6012.

FLEXARC AP-Mo.
M-118; C, alloy, bal Fe.
For welding electrodes; E-7010.

FLEXARC DH.
M-118; 0.2 C, bal Fe.
Welded: 62,000 TS; 55,000 YS; 25 El.
For welding electrodes; coated, for medium carbon steel, E6020.

FLEXARC DH-MO.
M-118; C, alloy, bal Fe.
Welded: 70,000 TS, 57,000 YS; 25 El.
For welding electrodes; high tensile, E-7020.

FLEXARC FP.
M-118; 0.3 C, bal Fe.
Welded. 68,000 TS; 55,000 YS; 17 El.
For welding electrodes; coated; for medium carbon steel, E6012.

FLEXARC FP-2.
M-118; C, bal Fe.
Welded: 68,000 TS; 55,000 YS; 17 El.
For arc welding electrodes; AWS-E-6012.

FLEXARC GRADE 18.
M-118; C, bal Fe.
For welding rods; Sulcoat E-4510.

FLEXARC LOH-2.
M-118; C, alloy, bal Fe.
Welded: 70,000 TS; 57,000 YS; 22 El.
H_2 coated electrode for alloy steel; E-7016.

FLEXARC SW-2.
M-118; Fe alloy.
Welded: 68,000 TS; 55,000 YS; 17 El.
For welding electrodes; E-6013.

FLEXIBLE HACK BAND.
M-357; 1.3 C, 0.15 Cr, bal Fe.
For tools, dies; water hardening.

FLEXITE.
M-1684; 0.45 C, 1.1 Mn, 1.1 Cr, 1.75 Ni, 0.2 V, 0.35 Mo, bal Fe.
Oil hardening, low alloy tool steel.

FLEXOGRAIN PHOSPHOR BRONZE.
M-98; Sn, P, bal Cu.
For springs, contacts, clips; high fatigue life.

FLEX-O-LOY.
M-1579, 68.5-71.5 Cu, 0.03 Pb, 0.05 Fe, 30 Zn.
Hard 76,000 TS; 63,000 YS; 8 El; Rock B 82.
Spring: 95,000 TS, 65,000 YS; 3 El; Rock B 91.
For electrical, electronic, and wiring device components Good formability.

FLEXOR.
M-1433, 0.34 C, 0.85 Cr, 0.50 Mo, 0.45 W, bal Fe.
Heat treated: 160,000-250,000 TS; 125,000-200,000 YS; 14-9 El; 44-37 RA; 300-495 Brin.
For chuck jaws, arbors, motor shafts, gears, racks, arbors; pre-treated machinery steel.

FLEXO STEEL
M-32; 0.60 C, 0.75 Mn, 2.0 Si, bal Fe.
Heat treated 325,000-135,000 TS; 300,000-100,000 YS, 4-20 El; 10-50 RA, 600-250 Brin.
For leaf springs, recoil springs, shuttle springs; great toughness for high service stresses.

FLINSO
M-805; Pb, bal Sn
For solder for Al.

FLINT ALLOY.
Eng., 83 Fe, 12.5 Cr, 0.5 Si, 0.3 C.
For cutlery, stainless parts, corrosion resisting parts; corrosion resistant

FLINTCAST.
M-192; 3.3 T. C, 2.4 Si, 1 Cr, bal Fe.
For abrasion resisting iron castings, abrasion resisting.

FLINTMETAL
M-1250; 3.0-3.6 C, 4.0-4.75 Ni, 1.4-3.5 Cr, 0.4-0.7 Si, bal Fe.
Sand cast: 45,000 TS; 600 Brin.
Permanent mold: 50,000 TS; 675 Brin.
For cams, dies, rollers, bearing races; white cast iron, hard, corrosion resistant.

FLINTUFF.
M-95; 3.0 C, Ni, bal Fe.
For rolls; hard alloy.

FLINTYPE.
M-507; 0.90 C, 1.0 Si, 0.3 Mn, 9.5 Cr, 0.6 Mo, 3.2 Ni, bal Fe.
Hardfacing electrode.
As arc welded: 55,000 psi, 560 BHN.
For overlay or buildup on plow points, heavy earth moving machinery; abrasion resistant, not designed for edge impact.

FLOCKTON 4% TUNGSTEN.
M-1409; 1.3 C, 4-5 W, 1.0-1.2 Cr, 0.25 V, bal Fe.
For reamers; oil hardened.

FLOCKTON C.T.
M-1409; 0.3 C, 9 W, 2.5 Cr, 0.4 V, bal Fe.
For heading and piercing dies, punches; hot work steel, oil hardened.

FLOCKTON H.C.C.
M-1409; C, Co, bal Fe.
For shear blades, nibblers; air hardened.

FLOCKTON H.D.M.
M-1409; 0.35 C, 5 Cr, 1.5 Mo, 1 Si, 0.4 Mn, 0.4 V, bal Fe.
For extrusion dies, die casting dies; hot work steel, oil hardened.

FLOCKTON I.E.-P.
M-1409; 1.0 C, bal Fe.
Annealed. 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For tools, dies, drills, taps; water hardened; Type W1.

FLOCKTON N.T.C.
M-1409; C, alloy, bal Fe.
For chisels; non-tempering steel, air hardened.

FLOCTON P.B.7.
M-1409; C, alloy, bal Fe.
For taps, dies, drills, reamers; resists severe compression and abrasion.

FLOCTON P-NI.
M-1409, 0.8 C, 1.8 Ni, 1 Cr, 0.35 Mn, bal Fe.
For machinery parts, cold heading dies; oil hardened, shock resistant.

FLOCKTON R.H.D.
M-1409; 0.38 C, 5 Cr, 1.5 Mo, 1.5 W, 1 Si, 0.3 Mn, bal Fe.
For extrusion and heading dies, rams, mandrels; oil or air hardened, hot work steel.

FLOCKTON T.C.
M-1409; 1.5 C, 3.2 W, 0.15 Cr, bal Fe.

FLO-KOTE.
M-374; 0.2 C, 11-13 Mn, Ni, bal Fe.
For welding electrode; tough, wear resistant.

FLOTECTIC SILVER #2.
M-717.
Silver solder type alloy for torch, furnace or induction brazing, ferrous and non-ferrous alloys.
Melts 1295°F; 58,000 TS.

FLUGINOX 51.
M-1120; 0.05 C, 0.2 Al, 12.5 Cr, 0.5 Mo, bal Fe
Annealed: 70,000 TS; 35,000 YS; 40 El; 80 RA; 145 Brin.
Cold Drawn: 90,000 TS; 80,000 YS; 20 El; 65 RA; 200 Brin.
For oil refinery and chemical plant equipment, table flatware, hardware. Corrosion resistant.

FLUGINOX 60.
M-1120; 0.05 max C, 13 Cr, 0.5 Mo, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 40 El; 80 RA; 145 Brin.
Cold Drawn: 90,000 TS; 80,000 YS; 20 El; 65 RA; 200 Brin.
For oil refinery and chemical plant equipment, table flatware, hardware. Corrosion resistant.

FLUGINOX 62.
M-1120; 0.20 C, 12 Cr, 1 Mo, 0.8 Ni, 0.25 V, 1.0 W, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 30 El; 70 RA; B 82 Rock.
Heat treated: 230,000 TS; 195,000 YS; 8 El, 30 RA; C 50 Rock.
For cutlery, surgical instruments, valves, bearings, shafts. Corrosion resistant, hardenable.

FLUGINOX 65.
M-1120; 0.22 C, 11 Cr, 1 Mo, V, Cb, bal Fe.
Annealed: 75,000 TS, 35,000 YS; 30 El; 70 RA, B 82 Rock
Cold Drawn: 90,000 TS, 80,000 YS; 15 El; 60 RA; B 92 Rock.
For knives, cutlery, valves, bearings, shafts, gears, surgical instruments
Corrosion resistant, hardenable

FLUKS
M-1260, 55 Sn, 10 Sb, 2.5 Cu, 32.5 Pb.
Cast: 11,400 TS; 22 Brin.
For refrigerator and electric motor bearings; M.P 355-620°F; good castability

FLUSH PLATE
Eng.; 65.75 Cu, 32.75 Zn, 1.50 Pb.
For hardware, free-cutting

FLUXCOR ½ Mo
M-663, 0.08 C, 0.8 Mn, 0.5 Si, 0.5 Mo, bal Fe.
Wire for welding and build-up of low alloy steel using Co_2 shielded gas.
Welded, stress ann· 92,000 TS; 81,000 YS, 26 El

FLUXCOR 1.
M-663; 0.11 C, 1.6 Mn, 0.84 Si, bal Fe.
Wire for welding or build-up on mild steel.
As welded· 101,700 TS, 89,200 YS; 24 El
AWS E 70T-2

FLUXCOR 2
M-663
For welding steel having residual oil from machining and forming
AWS E 70T-1.

FLUXCOR Cr-Mo 1.
M-663, 0.07 C, 0.84 Mn, 0.46 Si, 1.23 Cr, 0.51 Mo, bal Fe
Wire to join or repair Cr-Mo steel castings and similar Cr-Mo steels
Welded, stress ann: 103,000 TS, 93,000 YS; 25 El.

FLUXCOR Cr-Mo 2.
M-663, 0.04 C, 0.83 Mn, 0.48 Si, 2.23 Cr, 1.08 Mo, bal Fe.
Wire for welding or build-up of Cr-Mo castings and wrought steel of similar composition
Welded, stress ann 110,000 TS; 100,000 YS; 20 El.
Usually used with Co_2 shielded gas

FLUXRITE.
M-88; Sn, bal Pb.
For solder; soft

FLYLITE NO. 4.
M-1045; 8.3-9.7 Al, 1.7-2.3 Zn, 0.1 max Mn, bal Mg.
Cast: 20,000 TS; 10,000 YS; 1 El; 65 Brin.
T-Temper: 34,000 TS; 18,000 YS; 1 El; 84 Brin.
For sand castings; heat treatable.

FLYLIGHT NO. 5.
M-1045; 7.5-8.5 Al, 0.2-0.6 Zn, 0.3 Mn, 0.2 Si, bal Mg.

Cast: 20,000 TS; 11,000 YS; 3 El; 50 Brin.
Heat treated: 32,000 TS; 11,000 YS; 9 El; 60 Brin.
For gear and blower casing for aero engines; heat treatable.

FLYLITE NO. 8.
M-1045; 5.3-6.7 Al, 2.5-3.5 Zn, 0.15 max Mn, bal Mg.
Cast: 24,000 TS; 10,000 YS; 4 El; 50 Brin.
T-Temper: 34,000 TS; 16,000 YS; 3 El; 73 Brin.
For sand castings; heat treatable.

FLYLITE NO. 9.
M-1045; 9.2-9.8 Al, 0.2-0.6 Zn, 0.2-0.4 Mn, bal Mg.
Cast: 18,000 TS; 11,000 YS; 1 El; 55 Brin.
T-Temper: 34,000 TS; 17,000 YS; 1 El; 75 Brin.
For sand castings; heat treatable.

FM-2.
M-1699, Sintered carbide tool material.
For percussion type mining tools.

FM-3.
M-1699; Sintered carbide tool material.
For percussion and rotary drilling type mining tools

FM-5
M-1699; Sintered carbide tool material.
For coal mining tools, percussion, rotary drilling, auger bits

FM-6.
M-1699, Sintered carbide tool material.
For percussion and rotary drilling type mining tools.

FM-100.
M-1531, 1.25 T.C., 0.92 C.C., 3 Cu, 0.2 Si, 0.5 Mn, 0.9 Mo, bal Fe.
Sintered. 100,000 TS; Rockwell B95.
For piston rings; wear resistant.

F-NICKEL.
M-68, 5-6 Si, 1-2 Fe, 0.2 Cu, 0.025 S, 90-92 Ni.
For alloying cast iron; Ni additions

FO 25-12.
M-1487.
Stainless steel, similar to AISI 309

FO 25-20.
M-1487.
Stainless steel; similar to AISI 310

FO 36-18.
M-1487.
Stainless steel, similar to AISI 330.

FOBES METAL.
Eng.; 54 Zn, 46 Cu.
For ornamental castings, low strength.

FOB METAL.
Eng., 87.50 Cu, 12.0 Zn, 0.50 Sn
For fobs, ornaments; red brass.

FOC 0 POINTS.
M-1546; 1.25 C, bal Fe
Hardened: Rock C 65-66.
For files, cutting tools, drills.
Water hardening, wear resistant.

FOC 3 POINTS.
M-1546; 0.90 C, bal Fe.
Annealed: 100,000 TS; 53,000 YP; 21 El; 197 Brin.
Hardened: 216,000 TS; 152,000 YP; 11 El; 600 Brin.
For chisels, bolts, cutting tools, springs, punches, drills. Water hardening, wear resistant

FOC 4 POINTS.
M-1546; 0.80 C, bal Fe.
Annealed: 120,000 TS; 65,000 YS; 15 El; 223 Brin.
Hardened: 190,000 TS; 142,000 YS; 12 El; 390 Brin.
For chisels, bolts, springs, bearings, liners.
Water hardening, wear resistant.

FONTAINMOREAU BRONZE.
England; 0-8 Cu, 0-1 Fe, 0-1 Pb, bal Zn.
For ornaments, fittings; die castings.

FONTE R.A.
M-700; 0.2 C, bal Fe.
For structural parts; carburizing steel.

FOOL-PROOF.
M-80; 0.7 C, 4 W, 2 Cr, bal Fe.
For hand and pneumatic chisels, oil hardening.

FOREZ 2AS.
M-1487; 0.85 C, 6 W, 2 V, 6 Mo, 4.5 Cr, bal Fe.
For lathe and planer tools, drills, reamers, hobs; high speed steel (Z85WD06-06).

FOREZ 3AS.
M-1487; 0.80 C, 18 W, 5 Cr, 1 Mo, 1.5 V, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel (Z80W18).

FOREZ 3ASR.
M-1487; 0.70 C, 12 W, 2.5 Mo, 2 V, 5 Cr, bal Fe.
For lathe and planer tools, reamers, milling cutters; high speed steel (Z70WD12).

FOREZ 4AS.
M-1487, 0.85 C, 18 W, 5 Cr, 1.5 V, 1 Mn, 5 Co, bal Fe.
For lathe and planer tools, milling cutters, hobs; high speed steel (Z85WK-18-05).

FOREZ 444.
M-1487; 1.25 C, 20 W, 4 Cr, V, Co, bal Fe.
For lathe and planer tools, reams, taps, drills; high speed steel, oil hardened (Z125WK20-15).

FOREZ CH1.
M-1487; 1.0 C, 0.3 Mn, 0.3 Si, bal Fe.
For cutters, water hardened (100C2).

FOREZ CH3
M-1487, 0.90 C, 0.3 Mn, 0.3 Si, bal Fe.
For milling cutters, reamers, drills, punches, files; water hardened (90C2).

FOREZ CH4.
M-1487, 1.2 C, 0.3 Mn, 0.3 Si, bal Fe.
For nail dies, hot snaps, punches, shears, hard and tough (120C2).

FOREZ CH5
M-1487, 0.80 C, 1.2-1.5 Mn, 0.40 Si, bal Fe.
For reamers, taps, gauges, special dies; oil hardened, non-deforming (80M5).

FOREZ CX50.
M-1487; 0.50 C, bal Fe.
Annealed. 96,000 TS, 52,000 YS; 16 El, 23 RA, 170 Brin.
For impact and shear tools, pneumatic chisels; water hardened

FOREZ CX75.
M-1487, 0.75 C, bal Fe.
Heat treated: 180,000 TS, 132,000 YS, 11 El; 36 RA; 360 Brin
For wire drawing dies, reamers, punches; water hardened.

FOREZ CX100.
M-1487; 1.00 C, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For reamers, taps, drills, punches; water hardened.

FOREZ CX125.
M-1487; 1.25 C, bal Fe.
For drills, reamers, milling cutters; water hardened.

FOREZ DT.
M-1487; 2 C, 12 Cr, bal Fe.
For shear blades, wire drawing and piercing dies; non-deforming, oil hardened (Z200 C12).

FOREZ E3.
M-1487; 1.25 C, 11 W, 3 V, 0.6 Mo, 4.5 Cr, bal Fe.
For lathe and planer tools, reams, taps, drills; high speed steel, oil hardened (Z125WV15-03).

FOREZ MO6.
M-1487; 0.35 C, alloy, bal Fe.
For injection nozzles, molds, die casting dies; hot work steel, tough (35D06-04).

FOREZ MT18.
M-1487; 0.50 C, 4 Cr, 18 W, 1 Mo, 1 V, bal Fe.
For cold work tools, punches, crimpers; cold impact steel (Z50WV18-01).

FOREZ NI5.
M-1487; 0.35 C, 3 Ni, 0.8 Cr, bal Fe.
Annealed: 92,000 TS; 20 El; 50 RA.
Heat treated: 165,000 TS; 10 El, 40 RA.
For arbors, gears, machine tool parts, shafts; oil hardened (35NC11).

FOREZ NID.
M-1487; 0.40 C, 3 Ni, 0.8 Cr, bal Fe.
Annealed: 103,000 TS; 15 El; 50 RA.
Heat treated: 235,000 TS; 3 El; 20 RA.
For gears, machine tool parts, shafts, axles; oil hardened (40NC11).

FOREZ NVM.
M-1487; 0.4 C, Ni, Cr, bal Fe.
Annealed: 128,000 TS; 18 El; 40 RA.
Heat treated: 275,000 TS; 6 El; 20 RA.
For hot work punches and dies; tough and hard (40NW5).

FOREZ SM.
M-1487; C, Si, Mn, bal Fe.
For crankshafts, propeller shafts, axles, gears; oil hardened.

FOREZ SMX.
M-1487; 0.45 C, 1.9 Si, 0.6 Mn, bal Fe.
For springs, washers, looms, machine tool parts; oil or water hardened (45S8).

FOREZ SUPRA EXTRA 4AS.
M-1487; 0.85 C, 18 W, 5 Cr, 1.5 V, 1 Mo, 10 Co, bal Fe.
For lathe and planer tools, broaches, reamers, hobs; high speed steel (Z85WK-18-10).

FOREZ TE.
M-1487; 0.3 C, 3 Cr, 9 W, bal Fe.
For punches, dies, bolt and nail dies; hot work steel (Z30WC09)

FOREZ TES.
M-1487; 0.30 C, W, Cr, V, bal Fe.
For punches, dies, wire drawing dies; cold work steel (Z30WCV10).

FOREZ TFR.
M-1487; 0.85 C, 6 W, 2 V, 1 Mo, 4.5 Cr, bal Fe.
For lathe and planer tools, reamers, hobs; taps; high speed steel (Z85WD06-02).

FOREZ TM.
M-1487; 0.40 C, alloy, bal Fe.
For hot and cold stamping tools, pneumatic chisels; shock resistant (40WNCD).

FORGE-DIE.
M-115; 0.25 C, 13.5-14.5 W, 3.5 Cr, 0.5 V, bal Fe.
For upsetter heads and dies, piercing punches, extrusion dies; resists heat checking, hot work steel.

FORGE-WELL.
M-1684; 0.27 C, 1.0 Mn, 1.2 Cr, 0.25 V, 0.3 Mo, bal Fe.
Oil hardening, low alloy tool steel, for molds.

FORGING BRASS.
Eng.; 60-57 Cu, 40-43 Zn.
For corrosion resisting forgings; high strength.

FORGING BRASS-377.
M-8; 60 Cu, 38 Zn, 2 Pb.
Soft Rod: 54,000 TS; 20,000 YS; 45 El; B 45 Rock.
For hardware, gears, fasteners, bolts.
Free-machining leaded brass.

FORGING BRASS, NO 377.
M-33; 60 0 Cu, 38.0 Zn, 2.0 Pb.
As extruded. 52,000 TS; 20,000 YS; 45 El; 32,000 shear, 78 Rock F.
For forgings, tire valve stems.
ASTM B 124, Alloy 2, B 283

FORGINGS, RUSSIAN.
Russia, 53.5 Cu, 42 Zn, 4.5 Mn.
For corrosion resisting forgings; corrosion resistant.

FORMA-1.
M-111; 0.05 C, 0.05 Si, 0.10 Mn, bal Fe.
For bakelite molding dies; deep hobbing, case hardened.

FORMA 2.
M-111; 0 08 C, 0.1 Si, 0.15 Mn, bal Fe.
For deep drawn parts; deep drawing steel.

FORMALOY.
M-336; C, Mn, Ni, Cr, Mo, bal Fe
For dies, shearing tools; oil hardening.

FORMALOY
M-815; 3 Cu, 0 4 Mg, bal Zn.
Aged· 40,300 TS; 33,100 YS, 2.8 El; 103 Brin.
Cast· 32,300 TS; 4.7 El; 90 Brin
Chilled. 36,000 TS; 2.7 El; 93 Brin
For dies for forming aluminum sheets, drop hammer punches and dies; die casting alloy, high strength

FORMBRITE.
M-8, Zn, bal Cu.
For deep drawn parts; good formability.

FORMDIE.
M-35; 0 51 C, 0 45 Mn, 1 0 Si, 5.2 Cr, 1.5 Ni, 1 05 V, 1.4 Mo, bal Fe.
For shear blades, extrusion dies, inserts, heavy punches
Type A9 air hardening tool steel.

FORMDIE SMOOTHCUT.
M-35; 0.48-0.54 C, 0.9-1 1 Si, 1.25-1.50 Mo, S, 5.0-5 4 Cr, 0.9-1.1 V, 1.35-1.65 Ni, bal Fe.
For shear blades, hot upsetting and gripper dies, drop forging and hot heading dies, punches. air hardening.
Cold work tool steel, Type A9.

FORMITE NO. 1.
M-35; 0 35 C, 13 5 W, 3.7 Cr, 0.4 Si, 0.4 V, 0 3 Mn, bal Fe.
For hot punches, dies, shear blades; heat resistant, oil hardened; "Durite V-40."

FORMITE NO. 2.
M-35; 0.30 C, 3.25 Cr, 9.25 W, 0.5 V, bal Fe.
For forming, extrusion and die casting dies; hot work steel, oil hardened. AISI H21.

FORMITE NO. 3.
M-35; 0.51 C, 15 W, 3 Cr, 0.5 V, bal Fe.
Hardened: C 52-56 Rock.
For hot shear blades and punches, hot forming and extrusion rolls and dies.

Hot work tool steel Type H24;
High temperature hardness.

FORMITE NO. 21.
M-35; 0.33 C, 9.25 W, 3.3 Cr, 0.5 V, bal Fe.
For hot temperature springs, forging dies, forming dies, gripper dies.
Type H21 hot work tool steel.

FORMITE NO. 24.
M-35; 0.51 C, 15.0 W, 3.0 Cr, 0.5 V, bal Fe.
For die casting dies, punches, piercing tools, blanking dies.
Type H24 hot work tool steel

FORMOLD.
M-38; 0.07 max C, 0.55 Ni, 1.35 Cr, 0.2 Mo, bal Fe.
For plastic mold dies, cold hubbed; oil hardened, high core strength.

FORNANC SPECIAL.
M-1724; 0.15-0.25 C, 1.4-1.8 Mn, 0.4-0.7 Ni, 0.15-0.35 Mo, bal Fe.
Hardened: 90,000-107,000 TS; 67,000-80,000 YS; 30-22 El; 70-50 Brin.
For gears, shafts, axles; oil hardened.

FORTAL.
M-807; 94.3 Al, 4.0 Cu, 0.5 Mg, 0.5 Mn, 0.7 Si.
For light alloy parts, age-hardenable.

FORTISSIMUS.
M-615; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutters, tools, high speed steel.

FORTIWELD
M-1724; 0.10-0.16 C, 0.4-0.6 Mo, 0.6 max Mn, 0.4 max Si, 0.005 max B, bal Fe
Normalized. 97,500-88,000 TS, 75,000-69,000 YS, 26-17 El, 64 RA.
For bridge cranes, railroad cars, material handling equipment, good formability and weldability

FORT PITT VANADIUM
M-275, 1.0 C, 0.2 V, bal Fe.
For tools, drills, taps, water hardened

FORTUNA 12M
M-1307, 1.2 C, 12 Mn, bal Fe
For crusher jaws, impact tools, liners, grab-teeth, wear resistant, work hardened

FORTUNA A12
M-1332, M-1307, 0.10 max C, 12.5 Cr, 12 Ni, bal Fe
Annealed: 72,000-92,000 TS; 30,000 YS; 60 El, 115-150 Brin.
For clock cases, chemical plant equipment; EN58D Special; stainless, good cold workability

FORTUNA A18.
M-1332, M-1307, 0.15 max C, 18 Cr, 9 Ni, bal Fe.
Annealed 78,000-108,000 TS, 36,000 YS; 55 El; 130-180 Brin
For chemical plant equipment, vessels, tanks, agitators; Type 302; stainless, austenitic.

FORTUNA A18Z
M-1322, M-1307; 0.10 max C, 18 Cr, 10 Ni, Ti, bal Fe.
Annealed: 78,000-108,000 TS; 38,000 YS; 50 El; 140-190 Brin.
For welded chemical plant equipment, tanks, vessels; Type 321; stainless, austenitic.

FORTUNA A18ZN.
M-1332, M-1307; 0.10 max C, 18 Cr, 10 Ni, Cb + Ta, bal Fe.
Annealed: 78,000-108,000 TS; 38,000 YS; 45-50 El, 140-190 Brin.
For acid resistant welded chemical plant equipment; Type 347; stainless, austentic.

FORTUNA A182Z.
M-1332, M-1307; 0.10 max C, 18 Cr, 11 Ni, 2.3 Mo, Ti, bal Fe.
Annealed: 78,000-108,000 TS; 38,000 YS; 50 El; 140-190 Brin.
For acid resistant chemical plant equipment. mixers; Type 316 + Ti; stainless, austenitic.

FORTUNA A182ZN.
M-1332, M-1307, 0.10 max C, 18 Cr, 11 Ni, 2.3 Ti, Cb + Ta, bal Fe.
Annealed 78,000-108,000 TS; 38,000 YS; 45 El; 140-190 Brin.
For acid resistant chemical plant equipment; Type 316 + Cb; stainless, austenitic.

FORTUNA A183Z.
M-1332, M-1307; 0.10 max C, 18 Cr, 12 Ni, 2.8 Mo, Ti, bal Fe.
Annealed: 78,000-108,000 TS; 38,000 YS; 50 El; 140-190 Brin.
For chemical and pharmaceutical equipment, EN58J Special; stainless, austenitic.

FORTUNA A183ZN.
M-1332, M-1307; 0.10 max C, 18 Cr, 12 Ni, 2.8 Mo, Ta + Cb, bal Fe
Annealed 78,000-108,000 TS; 38,000 YS; 45 El; 140-190 Brin
For pharmaceutical and chemical equipment, resists sulfide lye; Type 318; stainless, austenitic.

FORTUNA A2182ZN
M-1332, M-1307, 0.06 max C, 18 Cr, 18 Ni, 2.3 Mo, Cu, Ta, Cb, bal Fe
Annealed 78,000-108,000 TS, 34,000 YS; 45 El; 140-190 Brin.
For equipment for pickling and sulfuric acid plants; acid resistant, austenitic.

FORTUNA AS18
M-1332, M-1307, 0.06 max C, 18 Cr, 10 Ni, bal Fe.
Annealed. 72,000-101,000 TS; 32,000 YS; 55 El, 130-180 Brin
For chemical plant equipment, tanks, breweries; Type 304, stainless, austenitic.

FORTUNA AS175.
M-1332, M-1307, 0.06 max C, 17 Cr, 14 Ni, 4.5 Mo, bal Fe
Annealed 78,000-108,000 TS, 34,000 YS; 50 El, 140-190 Brin.
For equipment for salt works and soda plants, cooling coils, Type 317, stainless, austenitic.

FORTUNA AS182
M-1332, M-1307, 0.06 max C, 18 Cr, 11 Ni, 2.3 Mo, bal Fe
Annealed 78,000-108,000 TS, 32,000 YS; 45 El, 140-180 Brin
For chemical plant equipment, agitators, mixers; tanks, Type 316, stainless, austenitic

FORTUNA AS183
M-1332, M-1307, 0.06 max C, 18 Cr, 12 Ni, 2.8 Mo, bal Fe
Annealed: 78,000-108,000 TS, 32,000 YS, 50 El, 140-180 Brin.
For acid resistant chemical and textile plant equipment; Type 316; stainless, austenitic.

FORTUNA BS 45.
M 1307, 0.4 C, 1.4 Cr, 4 Ni, 0.5 W, bal Fe.
Annealed. 225 Brin.
For plastic mold dies; oil or air hardened.

FORTUNA BS50.
M-1307; 0.50 C, 1.1 Cr, 3.5 Ni, bal Fe.
For cutlery, blanking dies, hobbing dies, punches, air or oil hardened, shock resistant.

FORTUNA C 1215.
M-1307; 1.65 C, 12 Cr, 0.1 V, bal Fe.
For blanking and drawing dies, piercing punches; air hardened, non-deforming.

FORTUNA C 1215 SUPRA.
M-1307; 1.65 C, 12.5 Cr, 1.4 Co, 1.2 Mo, bal Fe.
For blanking and forming dies, die casting dies; air hardened, non-deforming.

FORTUNA C 1220.
M-1307; 2.1 C, 12 Cr, bal Fe.
For drawing and blanking dies, thread rolling dies; oil hardened, non-deforming.

FORTUNA CA 1215.
M-1307; 1.65 C, 12 Cr, 0.8 Mo, 0.5 W, bal Fe.
For blanking and forming dies, die casting dies; air hardened, non-deforming.

FORTUNA CA 1220.
M-1307; 2.1 C, 12 Cr, 0.1 W, bal Fe.
For blanking and forming dies, punches, shears; oil hardened, non-deforming.

FORTUNA CA 1220 SUPRA.
M-1307; 2.1 C, 12 Cr, 0.1 W, Co, Mo, bal Fe.
For blanking and forming dies, shearing knives; oil hardened, non-deforming.

FORTUNA Co300.
M-1307; 0.8 C, 3 Co, 12 W, 4.2 Cr, 0.5 Mo, 1.8 V, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

FORTUNA Co500.
M-1307; 0.8 C, 5 Co, 18 W, 4.2 Cr, 0.7 Mo, 1.5 V, bal Fe.
For lathe and planer tools, drills, taps, reamers; high speed steel.

FORTUNA Co1000.
M-1307; 0.75 C, 10 Co, 18 W, 4.2 Cr, 0.7 Mo, 1.5 V, bal Fe.
For cutting tools, broaches, reamers; high speed steel.

FORTUNA CSV 4.
M-1307; 0.30 C, 1.5 Si, 1.5 Cr, 0.1 V, bal Fe.
For shear blades, dies, stamps, piercers; hot work steel, water hardened.

FORTUNA CSV5.
M-1307; 0.45 C, 1.5 Si, 1.5 Cr, 0.1 V, bal Fe.
Annealed: 225 Brin.
For chisels, shear blades, punches, pneumatic tools; oil hardened, shock resistant.

FORTUNA CSV6.
M-1307; 0.60 C, 1.0 Si, 1.2 Cr, 0.10 V, bal Fe.
Annealed: 235 Brin.
For punches, blanking dies, cold shear blades; oil hardened, shock resistant.

FORTUNA DMo10.
M-1307, M-1332; 0.24 C, 0.25 Si, 0.60 Mn, 1.2 Cr, 0.25 Mo, bal Fe.
Heat treated: 85,000-115,000 TS; 65,000-72,000 YS; 19-21 El.
For bolts and nuts, oil refinery and chemical plant equipment; creep resistant to 500°C.

FORTUNA DMo11
M-1307, M-1332; 0.16 C, 0.25 Si, 0.60 Mn, 0.30 Mo, bal Fe.
Heat treated: 62,000-78,000 TS; 38,000 YS; 24 El.
For flanges, welded collars, oil refinery equipment; creep resistant to 500°C.

FORTUNA DMo14.
M-1307, M-1332; 0.13 C, 0.25 Si, 0.60 Mn, 1.0 Cr, 0.45 Mo, bal Fe.
Heat treated: 62,000-78,000 TS; 41,000 YS; 24 El.
For flanges, welded collars, oil refinery equipment; creep resistant to 500°C.

FORTUNA DMo20.
M-1307, M-1332; 0.24 C, 0.25 Si, 0.45 Mn, 1.4 Cr, 0.55 Mo, 0.2 V, bal Fe.
Heat treated: 100,000-135,000 TS; 78,000-85,000 YS; 15-19 El.
For bolts, nuts, oil refinery and chemical plant equipment; creep resistant to 500°C.

FORTUNA DMo22.
M-1307, M-1332; 0.21 C, 0.47 Si, 0.40 Mn, 1.35 Cr, 1.1 Mo, 0.3 V, bal Fe.
Heat treated: 101,000-121,000 TS; 78,500 YS; 19 El.
For bolts and nuts, oil refinery and chemical plant equipment; creep resistant to 500°C.

FORTUNA EC3.
M-1307, M-1332, 0.15 C, 0.25 Si, 0.50 Mn, 0.60 Cr, bal Fe.
Heat treated. 85,000-120,000 TS; 58,000 YS; 16 El; 45 RA.
For gears, pinions, camshafts; case hardened.

FORTUNA ECMo2H.
M-1307, M-1332; 0.20 C, 0.35 max Si, 0.70 Mn, 0.60 Cr, 0.35 Mo, bal Fe
Heat treated: 128,000-170,000 TS; 92,000 YS, 12 El; 45 RA.
For gears, pinions, camshafts, cams; case hardened.

FORTUNA ECMo4.
M-1307, M-1332, 0.15 C, 0.35 max Si, 0.95 Mn, 1.15 Cr, 0.25 Mo, bal Fe.
Heat treated: 121,000-157,000 TS; 92,000 YS; 12 El; 40 RA.
For gears, pinions, camshafts; case hardened.

FORTUNA ECMo5
M-1307, M-1332, 0.20 C, 0.35 max Si, 1.0 Mn, 1.2 Cr, 0.25 Mo, bal Fe.
Heat treated. 156,000-192,000 TS; 107,000 YS; 9 El; 30 RA.
For gears, cams, camshafts, bolts, fasteners; case hardened, tough.

FORTUNA EMC5.
M-1307, M-1332, 0.16 C, 0.25 Si, 1.2 Mn, 1.0 Cr, bal Fe.
Heat treated: 114,000-157,000 TS; 85,000 YS; 12 El; 40 RA.
For gears, cams, camshafts, crankshafts; case hardened, tough.

FORTUNA EMC5H.
M-1307, M-1332; 0.20 C, 0.25 Si, 1.3 Mn, 1.2 Cr, bal Fe.
Heat treated: 144,000-186,000 TS; 101,000 YS; 10 El; 35 RA.
For gears, bolts, crankshafts; case hardened, tough.

FORTUNA ENC6.
M 1307, M-1332; 0.13 C, 0.35 max Si, 0.50 max Mn, 0.20 max Cr, 1.5 Ni, bal Fe.
Heat treated: 85,000-115,000 TS; 58,000 YS; 12 El; 50 RA.
For gears, pinions, camshafts, cams, bolts; case hardened, shock resistant.

FORTUNA ENC10.
M-1307, M-1332; 0.13 C, 0.35 max Si, 0.50 max Mn, 0.75 Cr, 2.5 Ni, bal Fe.
Heat treated: 114,000-144,000 TS, 78,000 YS; 17 El; 50 RA.
For gears, pinions, camshafts, cams, fasteners; case hardened, shock resistant

FORTUNA ENC14.
M-1307, M-1332; 0.13 C, 0.35 max Si, 0.50 max Mn, 0.75 Cr, 3.5 Ni, bal Fe.
Heat treated: 128,000-170,000 TS; 92,000 YS; 11 El; 45 RA.
For gears, pinions, camshafts, cams; case hardened, tough.

FORTUNA ENC18.
M-1307, M-1332; 0.13 C, 0.35 max Si, 0.50 max Mn, 1.1 Cr, 4.5 Ni, bal Fe.
Heat treated: 177,000-200,000 TS; 128,000 YS, 9 El; 40 RA.
For gears, shafts, camshafts, cams; case hardened, tough.

FORTUNA EW 5H
M-1307, 0.20 C, 1.3 Mn, 1.2 Cr, bal Fe
Annealed 217 Brin
For plastic mold dies, case hardened

FORTUNA EW 15 SPECIAL.
M-1307; 0.19 C, 1.3 Cr, 0.20 Mo, 4 Ni, bal Fe.
Annealed: 245 Brin.
For plastic mold dies, case hardened.

FORTUNA EW 52H
M-1307, 0.20 C, 1 Mn, 1.2 Cr, 0.25 Mo, bal Fe.
Annealed 217 Brin
For plastic mold dies; case hardened

FORTUNA EWX 50
M-1307, 0.07 max C, 5 Cr, 1 Mo, 0.2 V, bal Fe
Annealed. 140 Brin
For plastic mold dies, case hardened

FORTUNA EX8H
M-1307, M-1332, 0.20 C, 0.25 Si, 0.80 Mn, 0.5 Cr, 0.6 Ni, 0.2 Mo, bal Fe
Heat treated 135,000-177,000 TS, 92,000 YS; 11 El; 40 RA
For gears, fasteners, camshafts, cams, case hardened

FORTUNA EX15
M-1307, M-1332, 0.15 C, 0.25 Si, 0.50 Mn, 1.5 Cr, 1.5 Ni, bal Fe
Heat treated 128,000-170,000 TS; 92,000 YS, 11 El, 40 RA.
For gears, fasteners, camshafts, cams, bolts, case hardened

FORTUNA EX17.
M-1307, M-1332; 0.15 C, 0.25 Si, 0.50 Mn, 1.7 Cr, 1.5 Ni, 0.3 Mo, bal Fe.
Heat treated: 156,000-192,000 TS; 107,000 YS, 10 El; 40 RA
For gears, axles, shafts, cams, camshafts; case hardened, tough

FORTUNA EX20.
M-1307, M-1332; 0.18 C, 0.25 Si, 0.50 Mn, 2.0 Cr, 2.0 Ni, bal Fe.
Heat treated: 170,000-206,000 TS; 114,000 YS; 9 El; 35 RA.
For machine tool parts, gears, crankshafts, camshafts; case hardened, tough.

FORTUNA F13.
M-1332, M-1307; 0.10 max C, 13 Cr, bal Fe.
Heat treated: 85,000-107,000 TS; 63,000 YS; 26 RA; 170-210 Brin.
For cutlery, fittings, appliances, pump and valve parts; corrosion resistant; Type 410.

FORTUNA F17.
M-1332, M-1307; 0.08 C, 17 Cr, bal Fe.
Annealed: 62,000-85,000 TS; 43,000 YS; 24 El; 140-180 Brin.
For cutlery, fittings, kitchen appliances and sinks; Type 430; corrosion resistant.

FORTUNA F17A.
M-1332, M-1307; 0.15 max C, 17 Cr, 0.25 Mo, S, bal Fe.
Heat treated: 100,000-123,000 TS; 63,000 YS; 16 El; 190-240 Brin.
For screw machine products, screws, bolts, gears; free-cutting, corrosion resistant.

FORTUNA F17Z.
M-1332, M-1307; 0.08 C, 17 Cr, Ti, bal Fe.
Annealed: 68,000-85,000 TS; 43,000 YS; 24 El; 130-170 Brin.
For welded acid resistance and chemical plant equipment; stabilized, welding grade, corrosion resistant.

FORTUNA FU.
M-1307, 1.3 C, 0.25 Mn, bal Fe.
For files, rasps; water hardened.

FORTUNA FU33.
M-1307, 0.37 C, 0.50 Mn, bal Fe.
Hot rolled. 85,000 TS; 54,000 YS, 30 El; 53 RA; 185 Brin
For files, rasps; case hardened tools.

FORTUNA FU43.
M-1307, 0.47 C, 0.67 Mn, bal Fe.
Hot rolled· 98,000 TS; 60,000 YS; 24 El; 54 RA, 212 Brin
For files, rasps, water hardened

FORTUNA GB0.
M-1307, M-1332, 0.10 C, 0.25 Si, 0.40 Mn, 0.035 max S and P, bal Fe.
Heat treated: 60,000-74,000 TS; 36,000 YS; 22 El; 55 RA.
For machine and construction parts, fasteners, case hardened.

FORTUNA GB1
M-1307, M-1332, 0.15 C, 0.25 Si, 0.40 Mn, 0.035 max S and P, bal Fe.
Heat treated 72,000-94,000 TS; 42,000 YS; 19 El; 50 RA.
For bolts, levers, journals, gears, case hardened.

FORTUNA GB2.
M-1307, M-1332, 0.22 C, 0.25 Si, 0.45 Mn, 0.035 max S and P, bal Fe.
Heat treated. 72,000-92,000 TS; 42,000-52,000 YS; 24-25 El; 45-50 RA.
For machine tool parts, gears, shafts, bolts; water hardened.

FORTUNA GB3.
M-1307, M-1332; 0.35 C, 0.25 Si, 0.55 Mn, 0.035 max S and P, bal Fe.
Heat treated: 78,000-115,000 TS; 47,000-61,000 YS; 19-24 El; 40-50 RA.
For machine tool parts, gears, fasteners; water hardened.

FORTUNA GB4
M-1307, M-1332; 0.45 C, 0.25 Si, 0.65 Mn, 0.035 max S and P, bal Fe.
Heat treated: 85,000-128,000 TS; 52,000-67,000 YS; 17-21 El; 35-45 RA.
For pinions, bolts, transmission gears, shafts; for surface hardening.

FORTUNA GB5H.
M-1307, M-1332; 0.56 C, 0.30 Si, 0.55 Mn, bal Fe.
Heat treated: 92,000-135,000 TS; 58,000-76,000 YS; 16-19 El; 35-40 RA.
For pistons, machine tool parts; for surface hardening.

FORTUNA GB6.
M-1307, M-1332; 0.60 C, 0.25 Si, 0.65 Mn, 0.035 max S and P, bal Fe.
Heat treated: 100,000-150,000 TS; 60,000-80,000 YS; 15-18 El; 30-40 RA.
For clutch levers, gears, axles, shafts; water hardened.

FORTUNA GB6H.
M-1307, M-1332; 0.68 C, 0.32 Si, 0.7 Mn, 0.040 max S and P, bal Fe.
Annealed: 98,000 TS
For shafts, piston rods, valve stems; wear resistant, oil or water hardened.

FORTUNA GB9.
M-1307, M-1332, 0.90 C, 0.32 Si, 1.1 Mn, 0.040 max S and P, bal Fe.
Annealed: 145,000 TS; 85,000 YS; 12 El.
Heat treated: 242,000 TS; 199,000 YS, 7 El.
For molds for briquette presses; wear resistant, oil hardened.

FORTUNA GB10.
M-1307, M-1332; 0.10 C, 0.25 Si, 0.40 Mn, 0.045 max S and P, bal Fe.
Heat treated: 60,000-74,000 TS; 36,000 YS; 22 El, 55 RA.
For bushings, bolts, levers, gears; case hardened.

FORTUNA GB11.
M-1307, M-1332; 0.15 C, 0.25 Si, 0.40 Mn, 0.045 max S and P, bal Fe.
Heat treated: 72,000-94,000 TS; 42,000 YS; 19 El; 50 RA.
For machine and construction parts, gears, bolts; case hardened.

FORTUNA GB12.
M-1307, M-1332; 0.22 C, 0.25 Si, 0.45 Mn, 0.045 max S and P, bal Fe.
Heat treated: 60,000-92,000 TS, 33,000-56,000 YS; 24-30 El; 40-45 RA.
For machine tool parts, gears, bolts, shafts; water hardened.

FORTUNA GB13.
M-1307, M-1332, 0.35 C, 0.25 Si, 0.55 Mn, 0.045 max S and P, bal Fe.
Heat treated: 72,000-114,000 TS; 40,000-62,000 YS; 19-25 El; 35-45 RA.
For shafts, gears, axles, machine tool parts; oil or water hardened.

FORTUNA GB14.
M-1307, M-1332; 0.45 C, 0.25 Si, 0.65 Mn, 0.045 max S and P, bal Fe.
Heat treated: 85,000-128,000 TS; 49,000-70,000 YS; 17-21 El; 30-40 RA
For shafts, axles, gears, bolts; oil or water hardened.

FORTUNA GB16.
M-1307, M-1332; 0.60 C, 0.25 Si, 0.65 Mn, 0.045 max S and P, bal Fe.
Heat treated: 100,000-150,000 TS; 56,000-80,000 YS; 15-18 El; 25-35 RA.
For axles, shafts, spindles, bolts, gears; oil or water hardened.

FORTUNA GFD2.
M-1307, M-1332; 0.38 C, 1.5 Si, 0.65 Mn, bal Fe.
Heat treated: 170,000-200,000 TS; 150,000 YS; 7-10 El; 30 RA; 350-400 Brin.
For railway and auto springs; water hardened.

FORTUNA GFD3.
M-1307, M-1332; 0.48 C, 0.25 Si, 1.75 Mn, 0.050 max S and P, bal Fe.
Heat treated: 186,000-213,000 TS; 157,000 YS; 7-10 El; 30 RA; 380-435 Brin.
For railway and auto springs; oil hardened.

FORTUNA GFD4.
M-1307, M-1332; 0.46 C, 1.65 Si, 0.65 Mn, 0.050 max S and P, bal Fe.
Heat treated. 186,000-213,000 TS; 157,000 YS; 7-10 El; 30 RA; 380-435 Brin.
For railway and auto springs; water hardened.

FORTUNA GFD5.
M-1307, M-1332; 0.66 C, 1.65 Si, 0.70 Mn, 0.050 max S and P, bal Fe
Heat treated 186,000-213,000 TS; 157,000 YS; 7-10 El, 30 RA, 380-435 Brin
For railway and auto springs, oil hardened.

FORTUNA GFD5W.
M-1307, M-1332; 0.56 C, 1.65 Si, 0.70 Mn, 0.050 max S and P, bal Fe.
Heat treated. 186,000-213,000 TS; 157,000 YS; 7-10 El; 30 RA, 380-435 Brin.
For railway and auto springs; oil hardened.

FORTUNA GFD7.
M-1307, M-1332; 0.65 C, 1.10 Si, 1.0 Mn, 0.050 max S and P, bal Fe.
Heat treated 190,000-225,000 TS, 157,000 YS; 7-10 El; 30 RA, 390-450 Brin
For railway and auto springs, oil hardened.

FORTUNA GFD8
M-1307, M-1332, 0.67 C, 1.3 Si, 0.50 Mn, 0.50 Cr, bal Fe.
Annealed 112,000 TS, 65,000 YS, 16 El.
Heat treated 232,000 TS, 190,000 YS, 8 El
For highly stressed springs, wear resistant, heavy duty

FORTUNA GFD8R
M-1307, M-1332, 0.60 C, 1.1 Si, 1.0 Mn, 0.50 Cr, bal Fe
Heat treated· 200,000-238,000 TS, 177,000 YS, 7-10 El, 30 RA, 410-435 Brin.
For highly stressed springs, oil hardened.

FORTUNA GFD530
M-1307, M-1332, 0.30 C, 0.22 Si, 0.30 Mn, 2.35 Cr, 0.6 V, 4.35 W, bal Fe.
Heat treated 202,000-248,000 TS; 177,000 YS, 6-9 El, 30 RA.
For high temperature springs; oil hardened, heat resistant.

FORTUNA GK.
M-1307, M-1332, 1.05 C, 0.25 Si, 0.32 Mn, 0.50 Cr, bal Fe.
Annealed. 215 Brin
For ball bearings, roller and needle bearings; oil or water hardened.

FORTUNA GKL.
M-1307, M-1332, 1.0 C, 0.25 Si, 0.32 Mn, 1.5 Cr, bal Fe.
Annealed· 215 Brin.
For ball bearings, ball races and discs; oil hardened.

FORTUNA GKL0.
M-1307, M-1332, 1.0 C, 0.25 Si, 0.32 Mn, 1.5 Cr, bal Fe.
Annealed: 207 Brin.
Heat treated: 600 Brin.
For ball and roller bearings; wear resistant, heavy duty.

FORTUNA GMKL.
M-1307, M-1332; 1.0 C, 0.60 Si, 1.1 Mn, 1.5 Cr, bal Fe.
Annealed: 226 Brin.
For ball bearing races; oil or water hardened.

FORTUNA GRL.
M-1307, M-1332; 1.05 C, 0.25 Si, 0.32 Mn, 1.0 Cr, bal Fe.
Annealed: 215 Brin.
For ball bearings, balls and rollers, races; oil or water hardened.

FORTUNA GSB7.
M-1307; 0.70 C, 0.30 Mn, bal Fe.
Heat treated: 174,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For stone working tools; water hardened.

FORTUNA GSB8.
M-1307; 0.85 C, 0.30 Mn, bal Fe.
Heat treated: 185,000 TS; 142,000 YS; 12 El; 32 RA; 390 Brin.
For stone working tools; water hardened.

FORTUNA GSB10.
M-1307, 1.0 C, 0.25 Mn, bal Fe.
Annealed: 100,000 TS, 53,000 YS; 21 El; 42 RA; 200 Brin.
For stone working tools; water hardened.

FORTUNA GSB11.
M-1307; 1.1 C, 0.25 Mn, bal Fe.
Annealed: 110,000 TS; 56,000 YS; 19 El; 40 RA; 210 Brin.
For stone working tools; water hardened.

FORTUNA GSB63
M-1307; 0.62 C, 0.70 Mn, bal Fe.
Heat treated. 160,000 TS, 113,000 YS; 12 El; 40 RA, 325 Brin
For stone working tools; water hardened.

FORTUNA GSP5.
M-1307, 0.53 C, 1 Si, 1 Mn, bal Fe
Rolled 235-290 Brin.
For hammer and press saddles, trimming tools, hot work steel, oil hardened.

FORTUNA GSP6
M-1307, 0.65 C, 1.0 Si, 1.0 Mn, bal Fe
For spring collets, screw drivers, clamping jaws; oil hardened.

FORTUNA GSP8
M-1307, 0.67 C, 1.3 Si, 0.50 Cr, bal Fe.
For spring collets, screw drivers, clamping jaws; oil hardened.

FORTUNA HSB1.
M-1307, 0.85 C, bal Fe.
For mechanical and hard wood saws; water hardened; Type W1.

FORTUNA HSB2.
M-1307; 0.75 C, 0.70 Mn, bal Fe.
Heat treated: 180,000 TS, 140,000 YS; 14 El; 38 RA; 375 Brin.
For agricultural equipment, saws, cement scrapers; oil or water hardened.

FORTUNA HSB4.
M-1307; 0.80 C, 0.50 Cr, 0.4 V, bal Fe.
For wood working tools, circular saws; oil or water hardened.

FORTUNA M13.
M-1332, M-1307; 0.40 C, 13 Cr, bal Fe.
Heat treated: 540-560 Brin.
For cutlery, knives, springs, dies, instruments; corrosion resistant, hardenable.

FORTUNA M-131.
M-1332, M-1307; 0.50 C, 14 Cr, 0.5 Mo, bal Fe.
Heat treated: 550-570 Brin.
For cutlery, knives, surgical instruments; corrosion resistant, hardenable.

FORTUNA M171.
M-1332, M-1307; 0.90 C, 18 Cr, 1.2 Mo, V, bal Fe.
Heat treated: 560-580 Brin.
For gears, bearings, cutters; Type 440B; hardenable, corrosion resistant.

FORTUNA M171H.
M-1332, M-1307; 1.1 C, 17 Cr, 1 Mo, V, bal Fe.
Heat treated: 590-620 Brin.
For bearing rolls and rings, cutters; Type 440C; hardenable, corrosion resistant.

FORTUNA M-2171.
M-1332, M-1307; 0.90 C, 17 Cr, 0.5 Mo, V, Co, bal Fe.
Heat treated: 580-600 Brin.
For bearing rolls and races, cutters; hardenable, corrosion resistant.

FORTUNA Mo 500.
M-1307; 0.85 C, 5 Mo, 1.8 V, 6.5 W, 4 Cr, bal Fe.
For planing and turning tools, milling cutters, saws, high speed steel.

FORTUNA Mo 503.
M-1307; 1.2 C, 5 Mo, 3.3 V, 6.5 W, 4.5 Cr, bal Fe.
For drills, reamers, broaches, saw teeth; high speed steel.

FORTUNA Mo 550.
M-1307; 0.8 C, 5 Co, 5 Mo, 1.8 V, 6.5 W, 4.25 Cr, bal Fe.
For heavy milling and planing cutters; high speed steel.

FORTUNA MoG 110.
M-1307; 0.45 C, 1.5 Cr, 0.7 Mo, 0.3 V, bal Fe.
For die casting dies, forging tools; hot work steel, oil hardened.

FORTUNA MoG 111.
M-1307; 0.45 C, 1.5 Cr, 0.5 Mo, 0.8 V, 0.5 W, bal Fe.
For shear blades, forging tools, gripper dies; hot work steel, oil hardened.

FORTUNA MoG 330.
M-1307; 0.30 C, 3 Cr, 3 Mo, 0.6 V, bal Fe.
For piercing mandrels, die inserts, heading dies; hot work steel, oil hardened.

FORTUNA MoG 510.
M-1307, 0.4 C, 1 Si, 5 Cr, 1.5 Mo, 0.6 V, bal Fe.
For forging dies, die inserts, gripping dies; hot work steel, oil or air hardened.

FORTUNA MoG 511.
M-1307; 0.35 C, 1 Si, 5 Cr, 1.5 Mo, 0.3 V, 1.5 W, bal Fe.
For forging dies, die inserts, shear blades; hot work steel, air or oil hardened.

FORTUNA NC6.
M-1307, M-1332; 0.27 C, 1.5 Cr, 1.0 Al, bal Fe.
Heat treated. 92,000-114,000 TS; 65,000 YS; 19 El; 55 RA.
For gears, shafts, camshafts, cams; nitriding steel.

FORTUNA NC6H.
M-1307; M-1332; 0.34 C, 1.5 Cr, 1.0 Al, bal Fe.
Heat treated: 114,000-144,000 TS; 85,000 YS; 15 El; 50 RA.
For gears, shafts, camshafts, cams; nitriding steel.

FORTUNA NC7 EXTRA.
M-1307, M-1332; 0.33 C, 1.7 Cr, 1.0 Ni, 1.0 Al, bal Fe.
Heat treated: 114,000-144,000 TS; 85,000 YS; 17 El; 50 RA.
For gears, shafts, camshafts, cams, piston rods; nitriding steel.

FORTUNA NCMo4.
M-1307, M-1332; 0.32 C, 1.0 Cr, 0.2 Mo, 1.0 Al, bal Fe.
Heat treated: 114,000-135,000 TS; 85,000 YS; 15 El; 50 RA.
For gears, shafts, camshafts, cams; nitriding steel.

FORTUNA NCS5.
M-1307, M-1332; 0.30 C, 1.2 Cr, 0.9 Al, 0.1 S, bal Fe.
Heat treated: 85,000-115,000 TS; 65,000 YS; 15 El; 50 RA.
For gears, shafts, camshafts; nitriding steel.

FORTUNA NCS5.
M-1307, M-1332; 0.30 C, 1.2 Cr, 0.9 Al, 0.1 S, bal Fe.
Heat treated: 85,000-115,000 TS; 65,000 YS; 15 El; 50 RA.
For gears, shafts, camshafts; nitriding steel.

FORTUNA NCV9 SPEC.
M-1307, M-1332; 0.30 C, 2.5 Cr, 0.12 Mo, 0.15 V, bal Fe.
Heat treated: 128,000-164,000 TS; 100,000-114,000 YS; 13-16 El; 45-50 RA.
For gears, shafts, cams, valve spindles, camshafts; nitriding steel.

FORTUNA NG.
M-1307; 0.55 C, 0.7 Cr, 0.2 Mo, 1.7 Ni, 0.1 V, bal Fe.
For forging dies, crankshafts, camshafts; hot work steel, oil hardened.

FORTUNA NG2 SUPRA
M-1307; 0.55 C, 1 Cr, 0.5 Mo, 1.7 Ni, 0.1 V, bal Fe.
For forging and gripping dies, die inserts, hot work steel, oil or air hardened.

FORTUNA NG3 SUPRA.
M-1307; 0.55 C, 1 Cr, 0.7 Mo, 2.2 Ni, bal Fe.
For drop forging dies, hot mandrels, hot work steel, oil or air hardened.

FORTUNA OB7.
M-1307, M-1332, 0.71 C, 0.20 Si, 0.22 Mn, bal Fe.
Heat treated: 107,000-144,000 TS; 58,000-80,000 YS; 11-15 El; 30-35 RA.
For machine tool parts, springs, hammers, axes, for surface hardening.

FORTUNA PH5B.
M-1307, M-1332; 0.10 C, 2.85 Cr, bal Fe.
Heat treated: 65,000-76,000 TS, 32,000 YS, 25 El
For pipes for oil refineries and high pressure washers; creep and heat resistant

FORTUNA PH5C.
M-1307, M-1332; 0.15 C, 2.35 Cr, 0.40 Mn, 0.25 Si, bal Fe.
Heat treated: 72,000-85,000 TS; 43,000 YS, 22 El.
For parts for core pipes for high pressure windings, creep and heat resistant.

FORTUNA PH8N.
M-1307, M-1332; 0.17 C, 2.65 Cr, 0.25 Mo, 0.15 V, bal Fe.
Heat treated: 92,000-115,000 TS; 65,000 YS; 19 El.
For parts resistant to 400°C; creep and heat resistant.

FORTUNA PH9.
M-1307, M-1332; 0.20 C, 3.15 Cr, 0.55 Mo, 0.5 V, bal Fe.
Heat treated: 114,000-135,000 TS; 78,000 YS; 17 El.
For parts resistant to 480°C; creep and heat resistant.

FORTUNA PH10.
M-1307, M-1332; 0.21 C, 2.35 Cr, 0.40 Mo, 0.8 V, 0.37 W, bal Fe.
Heat treated: 114,000-135,000 TS; 78,000 YS; 17 El.
For parts resistant to 520°C; creep and heat resistant.

FORTUNA PH20.
M-1307, M-1332; 0.15 max C, 5.0 Cr, 0.55 Mo, bal Fe.
Heat treated: 65,000-107,000 TS; 36,000-58,000 YS; 20-23 El.
For pipes for oil refinery plants; creep and heat resistant.

FORTUNA R3
M-1307, 1.42 C, 0.3 Cr, 0.25 V, 3.0 W, bal Fe.
For thread cutters, scrapers, chisels; water hardened.

FORTUNA R5.
M-1307; 1.3 C, 0.2 Cr, 5 W, bal Fe.
For thread cutters, scrapers, chisels, engraving needles; water hardened

FORTUNA SC 150
M-1307; 1.45 C, 1.4 Cr, bal Fe.
For taps, milling cutters, reamers, broaches; oil hardened, wear resistant

FORTUNA SICV
M-1307, 1.15 C, 0.70 Cr, 0.1 V, bal Fe.
For drills, taps, cutters, files, punches; oil or water hardened

FORTUNA SIW
M-1307; 1.2 C, 0.1 V, 1.0 W, bal Fe
For drills, taps, cutters, files, punches; oil or water hardened

FORTUNA SMV 200
M-1307; 0.90 C, 2 Mn, 0.1 V, bal Fe
For blanking tools, punches, tap drills, chasers; oil hardened, cold work steel

FORTUNA SW 55
M-1307; 0.95 C, 1.3 Mn, 0.5 Cr, 0.6 W, bal Fe.
For milling cutters, blanking dies, oil hardened, cold work steel

FORTUNA SW 100.
M-1307; 1.2 C, 1.0 W, bal Fe.
For drills, taps, cutters, files, punches; oil or water hardened

FORTUNA SW 111.
M-1307, 1.05 C, 1 Mn, 1 Cr, 1.2 W, bal Fe
For milling cutters, swages, blanking tools, reamers; oil hardened, cold work steel

FORTUNA T13
M-1332, M-1307; 0.20 C, 13 Cr, bal Fe
Heat treated: 107,000-130,000 TS; 78,000 YS; 18 El; 210-250 Brin.
For pumps, valves, piston rods, cutlery; Type 420; corrosion resistant, hardenable

FORTUNA T17.
M-1332, M-1307, 0.20 C, 17 Cr, 2 Ni, bal Fe.
Heat treated: 114,000-137,000 TS; 85,000 YS; 18 El; 225-280 Brin.
For shafts, axles, valves, pump parts; Type 431; corrosion resistant to sea water.

FORTUNA T131.
M-1332, M-1307; 0.20 C, 13 Cr, 1.2 Mo, bal Fe.
Heat treated: 107,000-130,000 TS; 78,000 YS; 18 El; 220-260 Brin.
For steam turbine blades, molds; corrosion resistant, hardenable.

FORTUNA T171.
M-1332, M-1307; 0.35 C, 17 Cr, 1.2 Mo, bal Fe.
Heat treated: 114,000-137,000 TS; 85,000 YS; 18 El; 225-265 Brin.
For axles, spindles, valve seats and cones; corrosion resistant.

FORTUNA TC4.
M-1307, M-1332; 0.34 C, 0.25 Si, 0.70 Mn, 1.0 Cr, bal Fe.
Heat treated: 114,000-170,000 TS; 78,000-114,000 YS; 13-17 El; 40-50 RA.
For aircraft and auto engine parts; oil hardened, tough.

FORTUNA TC4B
M-1307, M-1332; 0.37 C, 0.25 Si, 0.65 Mn, 1.0 Cr, bal Fe.
Heat treated: 114,000-170,000 TS; 78,000-114,000 YS, 13-17 El; 40-50 RA.
For gears, shafts, machinery parts; for surface hardening.

FORTUNA TC4 SPEC.
M-1307, M-1332; 0.41 C, 0.25 Si, 0.70 Mn, 1.0 Cr, bal Fe.
Heat treated: 219,000-250,000 TS; 185,000 YS; 9 El; 30 RA.
For gears, shafts, crankshafts; oil hardened, shock resistant

FORTUNA TC6.
M-1307, M-1332; 0.36 C, 0.25 Si, 0.50 Mn, 1.5 Cr, bal Fe.
Heat treated: 100,000-135,000 TS, 65,000-78,000 YS; 17-18 El; 55-60 RA.
For levers, axles, steering parts, gears, shafts; oil hardened, tough

FORTUNA TCMo4.
M-1307, M-1332; 0.34 C, 0.25 Si, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
Heat treated: 100,000-176,000 TS; 65,000-114,000 YS; 13-18 El; 45-60 RA.
For crankshafts, axles, gears, connecting rods; for surface hardening.

FORTUNA TCMo4H.
M-1307, M-1332; 0.42 C, 0.25 Si, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
Heat treated: 107,000-186,000 TS; 78,000 YS; 17 El, 55 RA.
For axle swivels, connecting rods, gears, shafts; oil hardened, shock resistant.

FORTUNA TCMo4W.
M-1307, M-1332; 0.25 C, 0.25 Si, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
Heat treated: 92,000-150,000 TS; 60,000-92,000 YS; 15-19 El; 50-65 RA.
For axles, shafts, steering parts; oil hardened, tough.

FORTUNA TCMo5.
M-1307, M-1332; 0.50 C, 1.0 Cr, 0.2 Mo, bal Fe.
Heat treated: 114,000-185,000 TS; 85,000-128,000 YS; 12-16 El; 40-50 RA.
For gears, shafts, crankshafts; for surface hardening.

FORTUNA TCV4.
M-1307, M-1332, 0.50 C, 0.25 Si, 0.90 Mn, 1.0 Cr, 0.1 V, bal Fe.
Heat treated: 212,000-250,000 TS; 185,000 YS; 10 El; 35 RA.
For axles, levers, gears, shafts; oil hardened, shock resistant.

FORTUNA TCV5.
M-1307, M-1332; 0.59 C, 0.25 Si, 1.0 Mn, 1.1 Cr, 0.10 V, bal Fe.
Heat treated: 212,000-242,000 TS; 190,000 YS; 7-10 El; 30 RA; 435-495 Brin.
For highly stressed springs; oil hardened.

FORTUNA TCV6.
M-1307, M-1332; 0.42 C, 0.25 Si, 0.60 Mn, 1.5 Cr, 0.1 V, bal Fe.
Heat treated: 107,000-128,000 TS; 78,000 YS; 17 El; 55 RA.
For gears, shafts, crankshafts, axles; oil hardened, shock resistant.

FORTUNA TCV9 SPEC.
M-1307, M-1332; 0.30 C, 0.25 Si, 0.55 Mn, 2.5 Cr, 0.2 Mo, 0.15 V, bal Fe.
Heat treated: 175,000-208,000 TS; 145,000-157,000 YS; 11 El; 35-40 RA.
For crankshafts, bolts, gears, screws; oil hardened, shock resistant.

FORTUNA TM4.
M-1307, M-1332; 0.40 C, 0.35 Si, 1.0 Mn, bal Fe.
Heat treated: 100,000-150,000 TS; 65,000-92,000 YS; 15-18 El; 40-50 RA.
For bolts, spindles, shafts; oil or water hardened.

FORTUNA TM5.
M-1307, M-1332; 0.30 C, 0.25 Si, 1.4 Mn, bal Fe.
Heat treated 92,000-135,000 TS; 60,000-75,000 YS; 17-19 El; 45-55 RA.
For forgings, axles, shafts, gears; water hardened.

FORTUNA TMCV4
M-1307, M-1332; 0.27 C, 0.25 Si, 1.1 Mn, 0.7 Cr, 0.1 V, bal Fe
Heat treated. 92,000-150,000 TS; 60,000-92,000 YS; 15-19 El, 50-65 RA
For crankshafts, axles, levers, gears; oil hardened, tough.

FORTUNA TMS4.
M-1307, M-1332; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
Heat treated: 100,000-170,000 TS; 65,000-114,000 YS, 13-18 El; 35-50 RA.
For gears, pinions, camshafts, connecting rods; for surface hardening.

FORTUNA TMS5
M-1307, M-1332; 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
Heat treated. 100,000-170,000 TS; 65,000-114,000 YS; 13-18 El, 35-50 RA.
For shafts, gears; tough and abrasion resistant.

FORTUNA TMV7.
M-1307, M-1332; 0.42 C, 0.25 Si, 1.8 Mn, 0.1 V, bal Fe.
Heat treated 127,000-186,000 TS, 100,000-128,000 YS; 12-15 El; 30-40 RA.
For axles, shafts, gears, bolts, connecting rods; oil hardened, tough.

FORTUNA TNC6H.
M-1307, M-1332; 0.35 C, 0.30 Si, 0.50 Mn, 0.50 Cr, 1.5 Ni, bal Fe.
Heat treated: 108,000-121,000 TS; 74,000 YS; 18 El; 50 RA.
For axle swivels, axles, shafts, gears; oil hardened, shock resistant.

FORTUNA TNC6W.
M-1307, M-1332; 0.30 C, 0.30 Si, 0.50 Mn, 0.50 Cr, 1.5 Ni, bal Fe.
Heat treated: 92,000-108,000 TS; 61,000 YS; 21 El; 50 RA.
For construction and machine parts, shafts, gears; oil hardened, shock resistant.

FORTUNA TNC10H.
M-1307, M-1332; 0.35 C, 0.30 Si, 0.50 Mn, 0.75 Cr, 2.5 Ni, bal Fe.
Heat treated: 114,000-135,000 TS; 78,000 YS; 12 El; 50 RA.
For wheels, hubs, axles, swivels, gears; oil hardened, tough.

FORTUNA TNC10W.
M-1307, M-1332; 0.30 C, 0.30 Si, 0.50 Mn, 0.75 Cr, 2.5 Ni, bal Fe.
Heat treated: 101,000-121,000 TS; 72,000 YS; 17 El; 50 RA.
For wheel hubs, axle swivels, gears, shafts; oil hardened, shock resistant.

FORTUNA TNC14H.
M-1307, M-1332; 0.30 C, 0.30 Si, 0.50 Mn, 0.75 Cr, 3.5 Ni, bal Fe.
Heat treated: 128,000-150,000 TS; 101,000 YS; 12 El; 50 RA.
For axles, shafts, levers, gears, connecting rods; oil hardened, shock resistant.

FORTUNA TNC14W.
M-1307, M-1332; 0.25 C, 0.30 Si, 0.50 Mn, 0.75 Cr, 3.5 Ni, bal Fe.
Heat treated: 108,000-128,000 TS; 78,000 YS; 17 El; 50 RA.
For axles, shafts, levers, gears, connecting rods; oil hardened, shock resistant.

FORTUNA TNC18.
M-1307, M-1332; 0.35 C, 0.30 Si, 0.50 Mn, 1.3 Cr, 4.5 Ni, bal Fe.
Heat treated: 144,000-166,000 TS; 114,000 YS; 11 El; 50 RA.
For shafts, axles, axle tubes; oil hardened, shock resistant.

FORTUNA TT13.
M-1332, M-1307; 0.15 C, 13 Cr, bal Fe.
Heat treated: 100,000-123,000 TS; 72,000 YS; 20 El; 190-420 Brin.
For turbine blades, cutlery; Type 420; corrosion resistant, hardenable.

FORTUNA TX10.
M-1307, M-1332; 0.36 C, 0.25 Si, 0.65 Mn, 1.0 Cr, 1.0 Ni, 0.2 Mo, bal Fe.
For airplane and auto parts, axles, shafts, gears, countershafts; oil hardened, tough.

FORTUNA TX15.
M-1307, M-1332; 0.34 C, 0.25 Si, 0.55 Mn, 1.5 Cr, 1.5 Ni, 0.2 Mo, bal Fe.
Heat treated: 152,000-186,000 TS; 123,000-135,000 YS; 12 El; 40-45 RA.
For gears, shafts, aircraft and auto parts, machine tool components, oil hardened, tough

FORTUNA TX20.
M-1307, M-1332; 0.30 C, 0.25 Si, 0.45 Mn, 2.0 Cr, 0.3 Mo, 2.0 Ni, bal Fe.
Heat treated: 175,000-208,000 TS; 145,000-157,000 YS; 11 El; 35-40 RA.
For aircraft and auto parts, machine tool parts, gears, shafts; subjected to high stresses, oil hardened.

FORTUNA V 300.
M-1307; 0.85 C, 12 W, 2.5 V, 4 Cr, 0.8 Mo, bal Fe.
For milling cutters, lathe and planer tools, saws; high speed steel.

FORTUNA V400.
M-1307; 1.25 C, 12 W, 4 V, 4.2 Cr, 0.8 Mo, bal Fe.
For milling cutters, lathe and planer tools, drills; high speed steel.

FORTUNA V450.
M-1307; 1.35 C, 5 Co, 12 W, 4 V, 4.2 Cr, 0.8 Mo, bal Fe.
For cutters for abrasive material; high speed.

FORTUNA VC12.
M-1307, M-1332; 2.1 C, 0.3 Si, 0.3 Mn, 11.5 Cr, bal Fe.
Heat treated: 114,000-135,000 TS; 72,000 YS; 9 El; 10 RA.
For valve seats; heat and corrosion resistant.

FORTUNA VCN 18-8.
M-1307, M-1332; 0.42 C, 2.25 Si, 18 Cr, 9 Ni, 1 W, bal Fe.
Heat treated: 114,000-144,000 TS; 58,000 YS; 27 El; 35 RA.
For exhaust valves; high oxidation and heat resistance.

FORTUNA VCN 235.
M-1307, M-1332; 0.45 C, 1.15 Si, 1.05 Mn, 23 Cr, 2.7 Mo, 5 Ni, bal Fe.
Heat treated: 107,000-135,000 TS; 85,000 YS; 16 El; 25 RA.
For exhaust valves; for service up to 700°C.

FORTUNA VCS2
M-1307, M-1332; 0.45 C, 4.0 Si, 0.45 Mn, 2.65 Cr, bal Fe
Heat treated: 128,000-151,000 TS, 101,000 YS; 16 El; 40 RA
For exhaust and inlet valves, oil hardened.

FORTUNA VCS9
M-1307, M-1332, 0.45 C, 3.05 Si, 0.45 Mn, 9.0 Cr, bal Fe
Heat treated 128,000-151,000 TS; 101,000 YS; 16 El, 40 RA.
For exhaust valves, high stressed, oil hardened.

FORTUNA VCS 20.
M-1307, M-1332; 0.80 C, 2.15 Si, 0.4 Mn, 20 Cr, 1.37 Ni, bal Fe
Heat treated. 127,000-150,000 TS, 101,000 YS; 7 El.
For exhaust valves; good strength, oxidation resistant.

FORTUNA W3
M-1307; 0.45 C, 0.70 Mn, bal Fe
Hot rolled. 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For hammers, axes, pliers, shears, anvils, stamps; water hardened

FORTUNA W7 EXTRA.
M-1307; 0.70 C, bal Fe
Heat treated 174,000 TS, 128,000 YS; 12 El; 37 RA, 352 Brin.
For cold shears, rivet snaps, blanking tools; water hardened.

FORTUNA W7 PRIMA.
M-1307; 0.70 C, bal Fe.
Heat treated: 174,000 TS; 128,000 YS; 12 El; 37 RA; 350 Brin.
For hot and cold work tools, knives, hammers; water hardened.

FORTUNA W8 EXTRA.
M-1307; 0.85 C, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For cold punches, leather stampers, gauge tools; water hardened.

FORTUNA W8N.
M-1307; 0.85 C, 0.60 Ni, 0.10 V, bal Fe.
For coining, gripping and heading dies; water hardened.

FORTUNA W8 PRIMA.
M-1307; 0.85 C, bal Fe.
Annealed: 190 Brin.
For shear blades, knives, hammer tools; Type W1; water hardened.

FORTUNA W10 EXTRA.
M-1307; 1.0 C, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 23 El; 45 RA; 200 Brin.
For jaws, shear blades, snaps, cold headers; water hardened.

FORTUNA W10 PRIMA.
M-1307; 1.0 C, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For cold forging dies, knives, milling cutters, reamers; water hardened.

FORTUNA W10V.
M-1307; 1.0 C, 0.1 V, bal Fe.
For cold forging dies, shear blades, punches; water hardened, Type W2.

FORTUNA W11 EXTRA.
M-1307, 1.1 C, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 210 Brin.
For jaws, shear blades, cold heading dies; water hardened, wear resistant.

FORTUNA W11 PRIMA.
M-1307; 1.15 C, bal Fe.
Annealed: 110,000 TS; 56,000 YS; 19 El; 39 RA, 210 Brin.
For wood and leather tools, files, saws, drills; water hardened.

FORTUNA W13 PRIMA.
M-1307, 1.3 C, bal Fe.
Annealed: 210 Brin
For lathe and planer tools, taps, draw punches; water hardened

FORTUNA W18
M-1307, 0.75 C, 18 W, 4 Cr, 1 V, bal Fe
For lathe and planer tools, reamers, hobs, drills; high speed steel.

FORTUNA W23.
M-1307, 0.15 C, 0.40 Mn, bal Fe.
Annealed: 70,000 TS, 40,000 YS; 25 El; 60 RA; 130 Brin
For plastic mold dies, rollers, water hardened

FORTUNA W33.
M-1307; 0.35 C, 0.50 Mn, bal Fe.
Hot rolled: 85,000 TS, 54,000 YS, 30 El, 53 RA; 185 Brin
For pliers, screw drivers, augers, forks; water hardened.

FORTUNA W63.
M-1307, 0.60 C, 0.70 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El, 40 RA; 325 Brin
For hammers, hatchets, knives, vise-jaws, tool holders; water hardened.

FORTUNA W63K.
M-1307; 0.65 C, 1.0 Mn, bal Fe.
For shackles, bolts, liners, hammers; oil hardened, wear resistant.

FORTUNA W73.
M-1307; 0.70 C. 0.70 Mn, bal Fe.
Heat treated. 180,000 TS; 140,000 YS; 14 El; 38 RA; 375 Brin.
For axes, wood working tools, knives; water hardened.

FORTUNA W83K.
M-1307; 0.80 C, 1.0 Mn, bal Fe.
For shackles, bolts, liners, hammers; oil hardened, wear resistant.

FORTUNA W93.
M-1307; 0.90 C, 0.5 Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For cement crushers, knives, pressure plates; oil or water hardened.

FORTUNA W93K.
M-1307; 0.90 C, 1.0 Mn, bal Fe.
For shackles, bolts, liners, drag rails, hammers; oil hardened, wear resistant.

FORTUNA WA 235.
M-1307; 0.35 C, 1 Si, 1 Cr, 0.2 V, 2 W, bal Fe.
For hand chisels, cold shears, rivet snaps; hot work steel, water hardened.

FORTUNA WA 245.
M-1307; 0.45 C, 1 Si, 0.3 Mn, 1 Cr, 0.2 V, 2 W, bal Fe.
For hot piercing and trimming tools, cutters, hot work steel, oil hardened.

FORTUNA WA255.
M-1307, 0.55 C, 1.0 Si, 1.0 Cr, 0.2 V, 2.0 W, bal Fe.
For blanking dies, shear blades, punches, knives; oil hardened, tough

FORTUNA WA 430.
M-1307, 0.30 C, 1 Si, 1 Cr, 0.2 V, 4 W, bal Fe
For shear blades, gripping dies, mandrels, hot work steel, oil hardened.

FORTUNA WA 530
M-1307; 0.30 C, 2.5 Cr, 0.6 V, 4.5 W, bal Fe.
For extrusion and tube press tools, liners, hot work steel, oil hardened.

FORTUNA WA 930.
M-1307; 0.30 C, 2.5 Cr, 0.4 V, 9 W, bal Fe
For extrusion dies, liners and rams, die casting dies, hot work steel, oil or air hardened

FORTUNA WA 2930
M-1307, 0.30 C, 2 Co, 2.5 Cr, 0.3 V, 9 W, bal Fe.
For extrusion dies, liners, rams; hot work steel, oil hardened

FORTUNA WC 6H.
M-1307, 0.34 C, 1 Al, 1.5 Cr, bal Fe
Annealed: 110 Brin
For plastic mold dies, nitrided.

FORTUNA WF8.
M-1307, 0.67 C, 1.3 Si, 0.5 Cr, bal Fe
For crusher parts, hammer mills, brick molds; wear resistant, tough

FORTUNA WGKL.
M-1307, 1.0 C, 1.5 Cr, bal Fe.
For blanking tools, punches, thread cutting tools; oil hardened, wear resistant.

FORTUNA WM 13.
M-1307; 0.40 C, 13 Cr, bal Fe
Annealed. 225 Brin.
For plastic mold dies; corrosion resistant.

FORTUNA WO 3
M-1307, 0.10 C, 0.40 Mn, bal Fe.
Annealed: 140 Brin
For plastic mold dies; case hardened.

FORTUNA WRL.
M-1307; 0.90 C, 0.80 Cr, bal Fe.
For stamping and coining dies, cold rolls; water hardened.

FORTUNA WSB EXTRA.
M-1307; 1.15 C, 2 W, bal Fe.
For saws; oil hardened.

FORTUNA WT 131.
M-1307; 0.30 C, 13 Cr, 0.4 Mo, bal Fe.
For dies, casting dies, piercing mandrels; hot work steel, corrosion resistant.

FORTUNA ZW.
M-1307; 1.4 C, 0.3 Cr, 0.1 V, bal Fe.
For drawing dies; water hardened, abrasion and wear resistant.

FOURDRINIER BRASS.
M-33; 83 Cu, 17 Zn.
Annealed: 43,000 TS; 14,000 YS; 49 El.
Cold drawn: 95,000 TS; 6 El.
For Fourdrinier cloth; red brass, wire.

FOURDRINIER WIRE.
Eng.; 85-80 Cu, 15-20 Zn, 0-0.4 Sn, 0.01 Pb.
For wire for Fourdinier screens used in paper manufacture.

FOURTEEN PER CENT.
Eng.; 60-58 Cu, 26-28 Zn, 14 Ni.
For ornamental flatware; corrosion resistant.

FOX NO. 031 (531).
M-430; 0.2 C, 0.9 Cr, 1.5 Ni, bal Fe.
Hardened: 130,000-170,000 TS; 110,000-150,000 YS; 20-14 El; 60-50 RA.
For gears, pinions, axles; case hardening steel.

FOX NO. 040 (540).
M-430; 0.12-0.18 C, 3.8-4.5 Ni, 1.0-1.4 Cr, bal Fe.
Hardened: 170,000-200,000 TS; 130,000-160,000 YS; 18-13 El; 60-45 RA.
For gears, pinions, shafts; case hardening steel

FOX NO. 120.
M-430; 0.30-0.40 C, 1.3-1.7 Mn, bal Fe.
Normalized: 80,000-90,000 TS; 48,000-60,000 YS; 30-27 El; 60-50 RA.
For automotive parts, nuts, bolts; oil hardening.

FOX NO. 130.
M-430; 0.25-0.40 C, 1.3-1.8 Mn, 0.20-0.35 Mo, bal Fe.
Normalized: 90,000-110,000 TS, 50,000-90,000 YS; 25-20 El; 60-50 RA.
For crankshafts, axles, bolts, connecting rods; tough.

FOX NO. 131.
M-430; 0.3-0.4 C, 1.3-1.8 Mn, 0.35-0.55 Mo, bal Fe.
Hardened: 90,000-160,000 TS; 80,000-140,000 YS; 22-12 El; 60-40 RA.
For crankshafts, axles, bolts; tough.

FOX NO. 135.
M-430; 0.15-0.25 C, 1.4-1.8 Mn, 0.4-0.7 Ni, 0.15-0.35 Mo, bal Fe.
Hardened: 80,000-100,000 TS; 60,000-80,000 YS; 30-22 El; 70-50 RA.
For gears, shafts, axles; oil hardening.

FOX NO. 525.
M-430; 0.2 C, 5 Ni, bal Fe.
Hardened: 100,000 TS; 70,000 YS; 20 El; 45 RA.
For gears, shafts, axles; case hardening steel.

FOX NO. 540.
M-430; 0.14-0.18 C, 4-4.5 Ni, 1-1.5 Cr, 0.35 max Mo, bal Fe.
Hardened: 170,000-200,000 TS; 130,000 YS; 13 El; 45 RA.
For gears, shafts, axles; case hardening steel.

FOX NO. 671.
M-430; 0.35-0.45 C, 1.25-1.75 Ni, 0.8-1.4 Cr, bal Fe.
Hardened: 150,000 TS; 14 El; 45 RA.
For gears, axles, shafts; oil hardening.

FOX NO. 1038.
M-430; 0.50 C, 3.2 Si, 8 Cr, bal Fe.
Hardened: 134,000 TS; 98,000 YS; 27 El; 59 RA; 262 Brin.
For exhaust valves; heat resistant.

FOX SF6
M-430, M-1724; 0.06 C, 13 Cr, 0.2 Al, bal Fe.
Annealed: 65,000 TS; 38,000 YS; 30 El; 160 Brin.
For annealing boxes, furnace parts, oil refinery equipment.
Type 405 stainless steel, heat and corrosion resistant.

FOX SF10.
M-430, M-1724; 0 12 C, 12-14 Cr, bal Fe.
Annealed· 75,000 TS; 40,000 YS; 35 El; 155 Brin.
For flat springs, knives, table flatware, cutlery, oil refinery equipment.
Type 410 stainless steel, heat and corrosion resistant.

FOX SF11.
M-430, M-1724, 0.20 C, 12-14 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El; B 92 Rock.
Ht Tr.. 250,000 TS; 215,000 YS, 8 El, C 52 Rock
For cutlery, surgical instruments, gauges, needle valves, cams Type 420 stainless steel, heat treatable.

FOX SF12
M-430, M-1724; 0.20 C, 12-14 Cr, bal Fe.
Annealed· 95,000 TS, 40,000 YS; 25 El; B 92 Rock.
Ht. Tr 240,000 TS, 210,000 YS; 10 El; C 50 Rock.
For cutlery, surgical instruments, valves, bearings, gears, shafts
Type 420 stainless steel, corrosion and heat resistant. Hardenable

FOX SF13.
M-430, M-1724, 0 22 C, 13 Cr, bal Fe.
Ht Tr : 220,000 TS, 195,000 YS; 12 El, C 48 Rock.
For cutlery, valves, ball bearings, surgical instruments, gears.
Type 420 stainless steel, hardenable

FOX SF17.
M-420, M-1724, 0 10 C, 14-18 Cr, bal Fe.
Annealed. 75,000 TS; 45,000 YS, 28 El, 145 Brin
For oil burner and heater parts, oil refinery and chemical plant equipment.
Type 430 stainless steel, ferritic, non-hardenable.

FOX SF20.
M-430, M-1724, 0.12 C, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed. 90,000 TS, 40,000 YS, 50 El, B 80 Rock
For chemical and pharmaceutical plant equipment, evaporators, digesters
Type 302 stainless steel, austenitic, non-hardenable.

FOX SF22.
M-430, M-1724; 0.06 C, 18 Cr, 11 Ni, 0.4 Ti, bal Fe.
Annealed: 85,000 TS; 30,000 YS; 55 El; B 80 Rock.
For welded structures, chemical plant equipment, tanks, digesters, mixers, agitators.
Type 321 stainless steel, austenitic, stabilized; welding grade.

FOX SF23.
M-430, M-1724; 0.05 C, 17-19 Cr, 9-12 Ni, 0.3 Ti, bal Fe.
Annealed: 85,000 TS; 30,000 YS; 55 El; B 80 Rock.
For welded structures, vessels, digesters, evaporators, tanks.
Type 321 stainless steel, stabilized, austenitic, welding grade.

FOX SF25.
M-430, M-1724; 0.06 C, 18 Cr, 10 Ni, Mo, Ti, bal Fe.
Annealed: 86,000 TS; 32,000 YS; 54 El; B 82 Rock.
For acid tanks, welded structures, evaporators, digesters, mixers.
Type 18-10 Mo Ti stainless steel, austenitic, stabilized

FOX SF35.
M-430, M-1724; 0.06 C, 17 Cr, 12 Ni, 2-3 Mo, bal Fe
Annealed: 80,000 TS; 35,000 YS; 60 El; B 82 Rock.
For acid tanks, chemical plant equipment, evaporators, mixers.
Type 316 stainless steel, austenitic, non-hardenable.

FOX SF80T.
M-430, M-1724; 0.06 C, 4 Ni, 16 Cr, 2 Mo, 2 Co, bal Fe.
Annealed 130,000 TS; 100,000 YS; 16 El; C 26 Rock.
For marine hardware, pump shafts, valve parts, aircraft structures High strength, stainless

FOX SF301.
M-430, M-1724; 0.12 C, 16-18 Cr, 6-8 Ni, bal Fe.
Annealed· 110,000 TS; 40,000 YS; 60 El, B 85 Rock
For aircraft structural members, diaphragms, household utensils, trailer bodies, springs.
Type 301 stainless steel, austenitic.

FOX SF304 ELC
M-430, M-1724, 0 06 C, 18-20 Cr, 8-12 Ni, bal Fe.
Annealed. 85,000 TS, 35,000 YS, 60 El, 150 Brin.
For processing and chemical plant equipment, welded structures, evaporators
Type 304 stainless steel, austenitic, non-hardenable.

FOX SF316 Ti
M-430, M-1724; 0.06 C, 18 Cr, 11 Ni, 0.4 Ti, bal Fe
Annealed 85,000 TS; 30,000 YS; 55 El; B 82 Rock.
For welded structures, tanks, evaporators, digesters. Type 321 stainless steel, austenitic, stabilized

FOX SF318.
M-430, M-1724; 0.1 C, 17 Cr, 13 Ni, 3 Mo, 0 6 Cb, bal Fe
Annealed· 85,000 TS, 40,000 YS; 50 El; B 83 Rock.
For chemical plant equipment, welded structures and tanks, mixers, agitators
Type 318 stainless steel, austenitic, welding grade.

FOX SF320.
M-430, M-1724; 0 03 C, 18-20 Cr, 8-12 Ni, bal Fe
Annealed: 77,000 TS; 30,000 YS, 60 El; 140 Brin
For welded structures, evaporators, digesters, mixers, chemical plant equipment.
Type 304L stainless steel, austenitic, non-hardenable

FOX SF321.
M-430, M-1724; 0.06 C, 17-19 Cr, 9-12 Ni, 0.3 Ti, bal Fe.
Annealed· 85,000 TS; 30,000 YS; 55 El; B 80 Rock.
For welded structures, mixers, evaporators, digesters, chemical plant equipment.
Type 321 stainless steel, austenitic, stabilized, welding grade.

FOX SF620.
M-430, M-1724; 0.07 C, 18-20 Cr, 8-12 Ni, bal Fe.
Annealed: 83,000 TS; 32,000 YS; 62 El; 150 Brin.
For chemical plant equipment, welded structures, evaporators, digesters.
Type 304 stainless steel, austenitic, non-hardenable.

FOX SF835.
M-430, M-1724; 0.08 C, 18.5 Cr, 11 Ni, 0.4 Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; B 82 Rock.
For welded structures, chemical plant equipment, evaporators, tanks, digesters.
Type 321 stainless steel, stabilized, austenitic, welding grade.

FOX SF920.
M-430, M-1724; 0.10 C, 17-19 Cr, 9-10 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 40 El; B 85 Rock.
For chemical plant and food processing equipment, tanks, mixers.
Type 302 stainless steel, austenitic.

FPC NONTEMPERING.
M-365; 0.3-0 4 C, 0.7-0.9 Cr, 0.7 Mn, 0.3-0.6 Mo, bal Fe.
For chisels, punches, caulking tools; water hardened

"F" QUALITY.
M-179; 58 Cu, 1 5-2 Pb, bal Zn.
Extruded: 56,000 TS, 30-35 El; 25-30 RA; 95-110 Brin
Drawn: 64,000 TS; 25-30 El; 20-25 RA, 110-125 Brin.
For hot stampings, free-cutting.

FRAMDIE.
M-35, 1.1 C, 1 4 Cr, 0.4 Mo, 0.35 Mn, bal Fe.
For drive shafts, spindles, arbors, oil hardenable cold work tool steel, AISI L7.

FRANCO.
M-492; 0 7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed tools and cutters; high speed steel.

FRANKITE
M-571; 3.5 C, 2.5 Si, alloy, bal Fe.
For castings, alloyed gray iron

FRANKITE E-212.
M-571; C, bal Fe.
For hydraulic bodies, compressor cylinders.

FRANKITE E-450.
M-571; 1.1 min C, 12-15 Ni, Cr, 5-7 Cu, bal Fe.
25,000-35,000 TS; 145-170 Brin.
For heat and corrosion resistant parts; heat and corrosion resistant

FRANKITE E-604.
M-571; C, 4.5 Ni, 1.5 Cr, bal Fe.
For mixer blades, ash chutes, scrapers; "Ni-Hard"; abrasion resistant.

FRANKITE E-821.
M-571; 0.70-1 10 C, 22-25 Cr, bal Fe.
42,000-50,000 TS; 200-230 Brin.
For heat and corrosion resistant parts; heat and corrosion resistant.

FRANKITE E-822.
M-571; 1.75-2.0 C, 22-25 Cr, bal Fe.
80,000-90,000 TS; 320-350 Brin.
For heat and corrosion resistant parts; heat and corrosion resistant.

FRANKITE E-830N.
M-571; C, 30 Cr, 3 Ni, bal Fe.
For furnace supports, kilns; corrosion and heat resistant.

FRANKITE E-831.
M-571; 0.80-1.10 C, 30-34 Cr, bal Fe.
45,000-55,000 TS; 280-300 Brin.
For heat and corrosion resistant parts; heat and corrosion resistant.

FRANKITE E-832.
M-571; 1.10 min C, 31-39 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

FRANXA 9.
M-678; 0.58-0.63 C, 1.5-1.9 Si, 0.5-0.9 Mn, bal Fe.
Annealed: 120,000 TS, 78,000 YS; 12 El.
Hardened: 225,000 TS; 141,000 YS; 6 El.
For tools, dies, springs; shock resistant

FRANZ MAYER NO. 2.
M-27; 0.55 C, 0.10-0.40 Si, 0.5-0.7 Mn, bal Fe.
Heat treated: 160,000 TS; 115,000 YS; 13 El; 42 RA; 320 Brin.
For gears, bolts, machine tool parts; water hardened.

FRAPPANT.
M-1340; 0.9 C, 1.9 Mn, 0.1 V, bal Fe.
For blanking and forming dies, punches; non-deforming, oil hardened.

FRASSE GRADE A.
M-360; 1.1-1.2 C, 0.15-0.25 Mn, bal Fe.
For augers, broaches, cutters, tools; water hardened.

FRASSE GRADE B.
M-360; 1.0-1.1 C, 0.15-0.25 Mn, bal Fe.
For cold chisels, drills, knives, reamers; water hardened.

FRASSE GRADE C.
M-360; 0.90-1.1 C, 0.15-0.25 Mn, bal Fe.
For chisels, drills, hammers, picks, punches; water hardened.

FRASSE GRADE H.
M-360; 1.0-1.1 C, 1.25-1.79 W, bal Fe.
For cutters, tools; oil hardened.

FREECUT 15
M-341, 0.20 C, 1.25 Mn, 0.05 Si, 0.25 S, 0.02 P, bal Fe
Free machining steel plate stock.

FREECUT 45.
M-341; 0.45 C, 1.25 Mn, 0.05 Si, 0.25 S, 0.02 P, bal Fe.
Free machining, flame hardenable plate stock.

FREE CUTTING BRASS-360.
M-8; 61.5 Cu, 35.25 Zn, 3.25 Pb.
Hard: 58,000 TS; 42,000 YS; 20 El; B 70 Rock.
Soft: 47,000 TS; 18,000 YS; 55 El; B 20 Rock.
For hardware, gears, pinions, screw machine products, fasteners.
Free-machining leaded brass.

FREE CUTTING BRASS, Copper Alloy No. 360.
M-33; 62 Cu, 34.75 Zn, 3.25 Pb.
Half hard 1.0 inch; 58,000 TS; 45,000 YS; 25 El; 34,000 shear; 78 Rock B.
Excellent machinability; for automatic machine parts as studs, bolts, nuts, shafts.
ASTM B16; CDA 360.

FREE CUTTING BRASS, SCOVILL 276.
M-102; 60-63 Cu, 2.5-3.7 Pb, bal Zn.
Annealed: 49,000 TS; 53 El; 58 RA.
¼ Hard: 58,000 TS; 25 El; 50 RA; 144 Brin.
For screw machine products; free cutting.

FREE CUTTING BRONZE.
U.S.; 89 Cu, 10 Zn, 1.5 Pb.
For screw stock, bolts, automobile radiators; free-cutting.

FREE CUTTING MUNTZ METAL-293.
M-8; 60 Cu, 39 Zn, 1 Pb.
Soft: 54,000 TS; 20,000 YS; 40 El.
Hard: 80,000 TS, 60,000 YS, 6 El.
For screw machine parts; free cutting.

FREE CUTTING MUNTZ METAL-3711.
M-8; 60.0 Cu, 36.75 Zn, 3.25 Pb
Hard: 60,000 TS; 45,000 YS; 18 El; B 72 Rock.
Soft: 48,000 TS; 20,000 YS; 54 El; B 20 Rock.
For butt hinges, lock bodies, mechanical devices, screw machine products, forging rods; Free-cutting, extrudable.

FREE CUTTING PHOSPHOR BRONZE 610.
M-8; 4 Sn, 4 Zn, 4 Pb, bal Cu.
Hard: 60,000 TS; 50,000 YS, 20 El.
For bearings, bushings, valve and pump parts, gears, pinions; free cutting, wear resistant.

FREE-CUTTING TUBE BRASS-282.
M-8; 66.5 Cu, 31.9 Zn, 1.6 Pb.
Soft 45,000 TS; 17,000 YS
Hard. 73,000 TS, 60,000 YS.
For screw machine products, free-cutting.

FREE CUTTING TUBE BRASS-332
M-8; 66.5 Cu, 31.9 Zn, 1.6 Pb
Hard Tube 73,000 TS; 60,000 YS; 10 El; B 80 Rock
Soft Tube: 45,000 TS, 17,000 YS; 50 El; B 15 Rock.
For screw machine products, ball point pens, plumbing fixtures, musical instruments. Free machining tubes.

FREE-CUTTING YELLOW BRASS 271
M-8, 3.25 Pb, 35.25 Zn, bal Cu
Soft. 47,000 TS; 32,000 YS, 60 El, 60 Brin
Hard: 62,000 TS, 50,000 YS, 20 El; 140 Brin.
For machined parts, hardware; free-cutting.

FREEMACHINEWELD.
M-118, Ni
For welding electrodes for cast iron; machinable welds.

FRENCH
French, 50 Cu, 31 Zn, 18 Ni
For ornamental parts, fittings; corrosion resistant.

FRENCH ALLOY.
France; 58-50 Cu, 25-30 Zn, 17-20 Ni
For electrical resistors, ornamental parts, nickel silver

FRENCH AUTO
Eng., 75 Pb, 10 Sn, 15 Sb
For automobile bearings, Babbitt.

FRENCH NAVY ANTIFRICTION METAL.
French; 7 Cu, 7.5 Sn, 78.5 Zn
For bearings, bushings; Babbitt

FRENCH SILVER SOLDER.
France; 66 Ag, 24 Cu, 10 Zn.
For silver solder.

FRENCH TYPE METAL "A."
France; 55 Pb, 22 Sn, 23 Sb.
For type metal.

FRENCH TYPE METAL "B."
France; 55 Pb, 15 Sn, 30 Sb.
For type metal.

FREUND STEEL.
German; 0.7-1.3 Si, 0.3-0.6 Mn, 0.1-0.15 C, Cr, bal Fe.
For highly stressed structural members; high elastic steel.

FRICKE'S HARDER.
69 Cu, 30 Zn, 10 Ni.
For strong corrosion resistant parts; corrosion resistant.

FRICKE'S SILVERY.
50 Cu, 18.8 Zn, 31.2 Ni.
For ornamental and decorative parts; corrosion resistant.

FRICKS ALLOY.
Eng.; 69-50 Cu, 18-39 Zn, 5.5-31 Ni.
For ornamental, base for plated ware; nickel silver.

FRICKS ALLOY.
Eng.; 55-50 Cu, 31-30 Zn, 19-17 Ni.
For resistances, decorative parts; corrosion resistant.

FRICKS BLUISH YELLOW, HARD.
55.5 Cu, 39 Zn, 5 5 Ni.
For hardware, decorative parts; corrosion resistant.

FRICKS PALE YELLOW, DUCTILE.
62 5 Cu, 31.2 Zn, 6.3 Ni.
For hardware, decorative parts, corrosion resistant.

FRICTION ALLOY (STANDARD).
Eng.; 50 Pb, 40 Sn, 10 Sb.
For antifriction metal; Babbitt.

FRICTIONLESS.
M-815, Pb alloy.
For bearings, linings; Babbitt.

FRIGIDAL.
M-303; 35 Ni, low Cr, bal Fe
86,000 TS, 32 El
For electric resistances; coefficient of expansion (0-40°C.) 0 0000014.

FRILOLIT CrMo.
M-1311, 0 9 C, 18 Cr, 0 1 V, 1.1 Mo, bal Fe.
For bearings, liners, valves, corrosion resistant.

FRILOLIT RF.
M-1311, 0.4 C, 0 4 Si, 13 Cr, bal Fe
Annealed· 95,000 TS, 50,000 YS, 25 El, 55 RA; 195 Brin
Cold drawn 105,000 TS, 85,000 YS, 17 El; 50 RA, 215 Brin.
For valves, cutlery, surgical instruments; Type 420; corrosion resistant.

FRILOLIT RFOO
M-1311; 0 12 max C, 13 Cr, 0 4 Si, bal Fe.
Annealed. 75,000 TS; 40,000 YS, 35 El, 70 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS, 17 El; 60 RA; 205 Brin.
For turbine blades, surgical instruments; Type 410; corrosion resistant.

FRILOLIT RF SPEZIAL.
M-1311; 0.85 C, Cr, V, bal Fe.
For cutters, tools; oil or water hardened

FRILOLIT RFW.
M-1311; 0.2 C, 0 4 Si, 13 Cr, bal Fe.
Annealed. 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For turbine blades, surgical instruments; Type 420; corrosion resistant.

FRISMUTH ALUMINUM SOLDER.
Eng.; 67 Sn, 27 Pb, 3 Al.
For aluminum solder.

FROGALLOY C.
M-849; 0.4-0.6 C, 4 Mn, 18-21 Cr, 9.0-10.5 Ni, 1.2 Mo, bal Fe.
Welded: 117,000 TS; 91,000 YS; 14.5 El; 550 Brin.
For hard surfacing electrodes; work hardenable; wear resistant.

FROGALLOY M.
M-849; 0.5-0.6 C, 4 min Mn, 18-21 Cr, 9.0-10.5 Ni, bal Fe.
Welded: 117,000 TS; 90,000 YS; 16 El; 550 Brin.
For welding electrodes, hard surfacing; stainless, work hardens, shielded arc.

FRONTIER NO. 3.
M-58; 88.5 Cu, 11 Sn, 0.25 Pb, 0 25 P.
35,000-40,000 TS; 20,000-25,000 YS; 6-10 El; 67-85 Brin.
For worm gears, bearings; Iz-2-10.

FRONTIER NO. 5.
M-58; 10 Al, 89 Cu, 1 Fe, traces Ti.
Untreated: 60,000-80,000 TS; 22,000-28,000 YS; 30-15 El, 120-130 Brin.
Heat treated· 80,000-95,000 TS, 50,000-65,000 YS; 10-4 El, 180-200 Brin
For housing nuts, worm gears, spur gears, bearings, spacer boxes; resists wear and shock; heat resisting.

FRONTIER NO. 6.
M-58, 86 Cu, 9 5 Sn, 2.5 Pb, 2 Zn.
30,000-45,000 TS, 18,000-20,000 YS; 15-20 El; 55-70 Brin.
For general utility bearing bronze, Iz-8-10.

FRONTIER NO 7.
M-58; 79.5 Cu, 11 Al, 6 Fe, 3.5 Mn.
70,000-80,000 TS; 35,000-45,000 YS; 3-5 El, 150-170 Brin.
For paper mill machinery and valve seats; Iz-3-5.

FRONTIER NO. 8
M-58, 83.5 Cu, 10 Sn, 2.5 Pb, 3 5 Ni, 0 5 P.
35,000-45,000 TS, 25,000-28,000 YS; 10-15 El; 80-93 Brin
For heavy duty bearings, worm gears, lead screws; high strength bearing, Iz-3-5

FRONTIER NO 9.
M-58, 90 Cu, 10 Sn.
30,000-35,000 TS; 15,000-20,000 YS; 10-15 El; 63-70 Brin.
For acid resisting work; Iz-3-10.

FRONTIER NO 10.
M-58, 8 Sn, 4 Zn, bal Cu.
Cast: 30,000-45,000 TS; 18,000-23,000 YS; 15-30 El, 65-74 Brin.
For bearings, screw down nuts, worm gears, hydraulic castings; gun metal bronze.

FRONTIER NO. 11.
M-58, 88 Cu, 5 Ni, 5 Sn, 2 Zn.
Cast: 70,000 TS; 50,000 YS; 15 El; 160 Brin.
For bearings, gears, screws, bolts, age-hardenable, tough

FRONTIER NO. 14.
M-58; 10 Sn, 5 Pb, 0.25 P, bal Cu.
Cast: 30,000-40,000 TS; 19,000-22,000 YS; 15-5 El; 50-61 Brin.
For bearings against soft steel; for moderate speeds.

FRONTIER NO. 15Y.
M-58; 79.75 Cu, 10 Sn, 10 Pb, 0.25 P.
28,000-35,000 TS; 19,000-22,000 TS; 5-10 El; 52-70 Brin.
For small machine tool bearings; Iz-3-8.

FRONTIER NO. 18.
M-58; 85 Cu, 5 Sn, 5 Pb, 5 Zn.
27,000-33,000 TS; 15,000-20,000 YS; 15-20 El; 50-70 Brin.
For general utility bronze; not recommended for bearings; Iz-13-18.

FRONTIER NO. 20.
M-58; 77.75 Cu, 7 Sn, 15 Pb, 0.25 P.
27,000-31,000 TS; 17,000-18,000 YS; 12-18 El; 43-63 Brin.
For bearings, acid resisting alloy in mining machinery; for high speeds; Iz-6-8.

FRONTIER NO. 28.
M-58; 99.6-99.9 Cu.
17,000-20,000 TS; 6000-9000 YS; 40-50 El; 40-50 Brin.
For high electrical conductivity bearings.

FRONTIER NO. 29.
M-58; 0.5 Sn, 41 Zn, 1 Fe, 1 Al, 0.5 Mn, bal Cu.
Cast: 65,000-85,000 TS; 25,000-35,000 YS; 35-20 El; 104-119 Brin.
For propeller blades and hubs, valves; manganese bronze.

FRONTIER NO. 30.
M-58; 20 Zn, 2.5 Fe, 6.5 Al, 2.5 Mn, bal Cu.
Cast: 90,000-110,000 TS; 50,000-65,000 YS; 15-10 El, 196-220 Brin
For propeller blades, gears; manganese bronze, high strength.

FRONTIER NO. 38.
M-58; 67 Cu, 8 Sn, 24 Pb, 1 Zn.
Cast: 22,500-27,500 TS; 14,500-19,000 YS; 10-15 El; 45-55 Brin.
For castings, bearings; heavy duty.

FRONTIER 40E.
M-58, 5.5 Zn, 0.55 Mg, 0.5 Cr, 0.2 Ti, bal Al
Aged: 32,000-38,000 TS, 22,000-26,000 YS; 3-10 El, 75-90 Brin.
For aircraft parts, pressure tight castings; age-hardenable at room temperature.

FRONTIER BRONZE.
M-106; 0.5-0.75 Mg, 0.1 Ni, 4.8-5.7 Zn, 0.1 Pb, 0.05 Sn, 0.15-0.25 Ti, 0.4-0.6 Cr, bal Al.
Sand cast: 31,200-35,800 TS; 22,400-24,700 YS; 4-6 El; 60-70 Brin, 3 Izod.
Medium strength, reasonable shock resistant sand or gravity die cast aluminum alloy. Ages 21-30 days at room temperature. Somewhat hot short; for simple castings only.

FS see FINKL FS.

FS M-10
M-57; 0.85 C, 4.25 Cr, 8.25 Mo, 2 V, bal Fe.
For drills, taps, dies, chasers, broaches; high speed steel.

F SPEZIAL.
M-459; C, bal Fe.
For files; water hardening.

FT-2.
M-1699; Sintered carbide tool material.
For heavy roughing and interrupted cuts on carbon and alloy steel.

FT-3.
M-1699; Sintered carbide tool materials.
For heavy roughing or interrupted cuts on carbon and alloy steels.

FT-4.
M-1699; Sintered carbide tool materials.
For general machine shop cutting of carbon and alloy steels.

FT-5.
M-1699; Sintered carbide tool material.
For general purpose machining of carbon and alloy steels including heavy duty, interrupted cuts and elevated temperatures.

FT-6.
M-1699; Sintered carbide tool material.
For finish cutting carbon and alloy steel.

FT-7.
M-1699; Sintered carbide tool material.
For light finishing and precision boring of carbon and alloy steels.

FT-8.
M-1699; Sintered carbide tool material.
For cutting hot flash trim, special purpose wire drawing.

FT-9.
M-1699; Sintered carbide tool material.
For heavy duty machining at elevated temperatures.

FT-21
M-1699; Sintered carbide tool material.
For heavy roughing and interrupted cuts on carbon and alloy steels; for gage blocks.

FT-35.
M-1699, Sintered carbide tool material
For heavy duty milling and interrupted cuts on carbon and alloy steels.

FT-42.
M-1699; Sintered carbide tool material.
For general purpose milling of carbon and alloy steels.

FT-62
M-1699, Sintered carbide tool material
For general purpose cutting of carbon and alloy steels, wide range.

FUCHS ACID RESISTING ALLOY.
Eng ; 73-80 Ag, 13-15 Ni, 13.5-15 Au
For chemical equipment, corrosion resisting parts, acid resistant

FUCHS ACID RESISTING GOLD ALLOY
Eng , 75 Au, 10-15 Ni, 10-15 W.
For chemical equipment, acid resistant.

FUCHSAL
M-1361; 0.6-1.4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, 0.3 max Cr, bal Al.
Annealed: 21,000 TS, 8000 YS, 24 El
For window frames, gutters, fan blades, boats; good forming and welding properties.

FUCHSDUR
M-1361; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al
Annealed: 27,000 TS, 11,000 YS; 22 El, 47 Brin.
Heat treated: 72,000 TS, 57,000 YS; 130 Brin
For aircraft structures and fittings, fasteners; age-hardenable.

FUCHSMAN.
M-1361; 1.0-1.5 Mn, 0.3 max Cr, bal Al.
Soft: 16,000 TS, 6000 YS; 40 El.
Hard: 29,000 TS; 27,000 YS; 10 El.
For cooking utensils, heat exchangers, tanks, furniture; good forming and welding characteristics.

FUEGO.
M-344; 0.5 C, 0.9 Si, 0.5 Mn, Cr, V, bal Fe.
For punches, shears, chisels; water hardened.

F.U.G. 1.
M-1360; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
Annealed: 27,000 TS; 11,000 YS; 22 El; 47 Brin.
Heat treated: 72,000 TS; 57,000 YS; 130 Brin.

For aircraft structures and fittings, fasteners; age-hardenable.

F.U.G. 4.
M-1360; 0.6-1.4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, 0.3 Cr, bal Al.
Annealed: 21,000 TS; 8000 YS; 24 El.
For window frames, fan blades, gutters, boats; good forming and welding properties.

F.U.G. 6.
M-1360; 2-4 Mg, 0.4 max Mn, 0.3 max Cr, bal Al.
Soft: 28,000 TS; 13,000 YS; 30 El; 47 Brin.
Hard. 40,000 TS; 35,000 YS; 10 El; 73 Brin.
For aircraft tanks and fittings, fuel lines, marine parts; resists sea water corrosion

F.U.G. 8.
M-1360, 1.0-1.5 Mn, 0.3 max Cr, bal Al.
Soft: 16,000 TS; 6000 YS; 40 El.
Hard· 29,000 TS; 27,000 YS; 10 El.
For cooking utensils, heat exchangers, tanks, furniture; good forming and welding properties.

FUJI-FTW 42.
M-1538, 0 18 C, 1.5 max Mn, 0 55 max Si, bal Fe.
Rolled: 74,000-88,000 TS; 50,000 min YP; 20 min El.
For building structures, derricks, booms, bridges.
Structural low carbon steel.

FUJI-FTW 58.
M-1538; 0.18 C, 1.5 max Mn, 0.55 max Si, bal Fe.
Ht Tr · 82,000-97,000 TS; 65,000 min YP; 16 min El.
For mine cars, bus bodies, booms, derricks, bridges.
Structural low carbon steel.

FUGI-HiZ.
M-1538, 0 10-0.18 C, 0 6-1 0 Mn, 0.15-0.50 Cu, 0 7-1 0 Ni, 0 4-0 8 Cr, 0 4-0.6 Mo, 0.03-0.10 V, 0 002-0 006 B, bal Fe.
Heat Treated 114,000-135,000 TS; 100,000 min YP, 20% min El.
For car and railroad bodies, agricultural equipment
High strength-low alloy constructional steel.

FULLER ALLOY.
M-808, 6 Zn, 1.2 Mg, 2 Fe, bal Al.
Heat treated· 43,000-48,000 TS; 0-2 El; 110-115 Brin.
For light alloy castings; heat treatable

FULTON NO 110-A.
M-1101, 5 Ag, 88.5 Cu, 6 5 P.
For silver solder, self-fluxing, M P. 1185-1300°F.

FULTON NO. 111.
M-1101; 9 Ag, 51 Cu, 40 Zn.
For silver solder; M.P. 1510°F.

FULTON NO. 111A.
M-1101; 15 Ag, 80 Cu, 5 P
For silver solder; M P. 1185°F.

FULTON NO 112
M-1101; 20 Ag, 45 Cu, 30 Zn, 5 Cd.
For silver solder, brazing; M.P. 1140-1410°F.

FULTON NO. 112-A.
M-1101; 25 Ag, 52.5 Cu, 22.5 Zn.
For silver solder, M P. 1500-1575°F.

FULTON NO. 113.
M-1101; 30 Ag, 38 Cu, 32 Zn.
For silver solder; M.P. 1370°F.

FULTON NO. 113-A.
M-1101; 35 Ag, 26 Cu, 21 Zn, 18 Cd.
For silver solder, brazing; M P. 1125-1295°F

FULTON NO. 114.
M-1101; 40 Ag, 30 Cu, 28 Zn, 2 Ni.
For silver solder, brazing; M.P. 1240°F.

FULTON NO. 114-A.
M-1101; 45 Ag, 30 Cu, 25 Zn.
For silver solder; M.P. 1250°F.

FULTON NO. 114-AN.
M-1101; 45 Ag, 15 Cu, 16 Zn, 24 Cd.
For silver solder; M.P. 1120°F.

FULTON NO. 114-B.
M-1101; 40 Ag, 35 Cu, 25 Zn, 5 Ni
For silver solder; M.P. 1240-1560°F.

FULTON NO. 114-N.
M-1101; 40 Ag, 18 Cu, 15 Zn, 27 Cd.
For silver solder; M.P. 1076°F.

FULTON NO. 115.
M-1101; 50 Ag, 15.5 Cu, 16.5 Zn, 18 Cd.
For silver solder; M.P. 1160°F.

FULTON NO. 115-4.
M-1101; 54 Ag, 40 Cu, 5 Zn, 1 Ni.
For silver solder, M P. 1325-1575°F.

FULTON NO. 117-2.
M-1101; 72 Ag, 28 Cu.
For silver solder; M.P. 1435-1435°F.

FULTON NO. 118-A.
M-1101; 85 Ag, 15 Mn.
For silver solder; M.P. 1760-1778°F.

FULTON NO. 216
M-1101; 60 Ag, 25 Cu, 15 Zn.
For silver solder; M.P. 1260°F.

FULTON NO 216-A.
M-1101; 65 Ag, 20 Cu, 15 Zn.
For silver solder; M.P. 1280-1325°F.

FULTON NO 217.
M-1101; 70 Ag, 20 Cu, 10 Zn.
For silver solder; M.P 1335°F.

FULTON NO 218.
M-1101, 80 Ag, 16 Cu, 4 Zn.
For silver solder, M P 1360°F.

FULTON NO A-114.
M-1101; 40 Ag, 36 Cu, 24 Zn.
For silver solder; M.P. 1330°F.

FULTON NO. A-115
M-1101; 50 Ag, 34 Cu, 16 Zn.
For silver solder, M P 1275°F.

FULTON EGR.
M-1101; 56 Ag, 22 Cu, 18 Zn, 4 Sn.
For silver solder, brazing; M P 1145-1205°F.

FULTON NO. G4-115.
M-1101; 50 Ag, 15.5 Cu, 16.5 Zn, 18 Cd.
For silver solder; M.P. 1160-1175°F.

FULTON NO. G5-115.
M-1101; 50 Ag, 15.5 Cu, 15 5 Zn, 16 Cd, 3 Ni.
For silver solder; M P. 1195-1270°F.

FULTON NO. G-112
M-1101; 20 Ag, 45 Cu, 35 Zn.
For silver solder; M.P. 1430-1500°F.

FULTON NO. LA-115.
M-1101, 50 Ag, 28 Cu, 22 Zn.
For silver solder; M.P. 1250-1340°F.

FURBALOI.
Eng ; 0.45 Cu, 0.05 Mn, 0.13 C, 13.35 Cr, 0.08 Ni, bal Fe.
77,000 TS; 38 El; 75 RA.
For corrosion resisting parts; corrosion resistant.

FURIOUS.
M-1411; 1.25 C, 4.5 W, 1.2 Cr, 0.25 V, bal Fe.
For blanking and heading dies, punches, oil hardened, abrasion resistant.

FURODIT 7G.
M-912; M-501; 0.3 C, 2.2 Si, 6 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

FURODIT NO. 8.
M-501; 0.2 C, 6 Cr, 2 Al, bal Fe.
49,800-57,000 TS; 35-27 El; 70 RA.
For heat resisting parts; heat resistant to 1470°F.

FURODIT 8G.
M-501, M-912; 0.3 C, 2.3 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For oil refinery equipment, valves; creep and heat resistant.

FURODIT 9G.
M-501, M-912; 0.5 C, 1.5 Si, 17 Cr, bal Fe.
For furnace parts, conveyors, heat treating boxes, retorts; corrosion and heat resistant.

FURODIT 10.
M-501, M-912; 0.12 C, 2 Si, 18 Cr, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery and food processing equipment, sinks, bolts, burners; corrosion and heat resistant; Type 430.

FURODIT 10G.
M-501, M-912; 0.6 C, 1.5 Si, 22 Cr, bal Fe.
For oil refinery equipment, furnace parts, burners; heat resistant.

FURODIT 12G.
M-501, M-912; 0.6 C, 1.5 Si, 29 Cr, bal Fe.
For oil refinery and chemical plant equipment, furnace parts; Type CC-60; heat resistant

FURODIT 25.
M-501, M-912; 0.20 C, 6 Ni, 25 Cr, bal Fe.
Cast: 85,000 TS; 48,000 YS; 16 El; 190 Brin.
For salt pots, furnace parts, grate bars, dampers, rabble arms and blades; Type HD; heat resistant.

FURODIT 30.
M-501, M-912; 0.12 max C, 1.5 Si, 1.5 Al, 24 Cr, bal Fe.
Annealed: 85,000 TS; 50,000 YS; 30 El; 55 RA; 180 Brin.
For oil refinery equipment, heat exchangers; heat and creep resistant.

FURODIT N6.
M-501, M-912; 0.15 C, 1.5 Si, 19 Cr, 2 Mo, 5 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA, 170 Brin.
For acid resistant, chemical plant equipment, stainless.

FURODIT NH11.
M-501, M-912; 0.15 C, 2 Si, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

FURODIT NH12.
M-912, M-501; 0.15 C, 2 Si, 24 Cr, 19 Ni, bal Fe.
Annealed: 100,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin.
For furnaces, valves, pumps, turbine and jet components; Type 310; stainless, austenitic.

FURODIT "S."
M-501; 0.2 C, 27 Cr, 1 Mo, bal Fe.
52,700-64,000 TS; 30-18 El; 60-50 RA.
For heat and corrosion resisting parts; heat and corrosion resistant.

FURODIT "SS."
M-501; 0.2 C, 29 Cr, 2 Mo, 1-2 Ta, bal Fe.
57,000-71,000 TS; 30-16 El; 60-50 RA.
For heat and corrosion resisting parts; heat and corrosion resistant.

FURODIT "Z."
M-501; 0.2 C, 25 Cr, bal Fe.
52,700-64,000 TS; 30-18 El; 60-50 RA.
For heat resisting parts; heat resistant to 2010°F.

FURODIT Z SPECIAL.
M-501; 0.2 C, 25 Cr, 2 Ta, bal Fe.
Annealed: 57,000-68,500 TS; 25-15 El; 60-50 RA.
For furnace parts, heat treating boxes, pots; heat resistant to 2100°F.

FUSE-WELL NO. 28.
M-810; 3.2 C, 2 Si, bal Fe.
For welding rod for cast iron; flux coated, gas welding.

FUSIBLE.
Eng.; 45 Bi, 17 Sn, 30 Pb, 10 HgS.
For solders, binding plugs; M.P. 85°C.

FUSIBLE ALLOY-1.
U S.; 50 Bi, 34 Sn, 17 Cd.
For fusible alloy, M.P. 65°C.

FUSIBLE ALLOY-2.
U S.; 15 Bi, 42 Sn, 43 Pb.
For fusible alloy; low melting point

FUSIBLE ALLOY-3
U S.; 33.3 Bi, 33.3 Sn, 33.3 Pb.
For fusible alloy; low melting point.

FUSIBLE METAL "D."
33.3 Bi, 66.7 Sn.
For fusible alloy; M.P 166°C.

FUSIBLE METAL "E"
13 Bi, 40 Sn, bal Pb.
For fuses, fire extinguishers; M.P 172°C.

FUSIBLE METAL "F."
12.5 Bi, 39.5 Sn, bal Pb.
For fuses, fire extinguishers; M.P. 178°C.

FUSIBLE METAL "G."
20 Bi, 80 Sn
For fuses, fire extinguishers; M.P. 200°C.

FULTALLOY.
M-809, C, 0.5 Mo, bal Fe.
For castings.

F.V.S. STEEL.
M-521; 0 42 C, 1 5 Si, 0.7 Mn, 14 Cr, 14 Ni, 2 5 W, bal Fe.
Heat treated: 130,000 TS; 74,000 YS; 23 El; 24 RA.
For stainless parts; austenitic, stainless.

G-97.
M-249, 0.5 Si, 0.85 Fe, 1.4 Mn, 0.25 Mg, 12.75 Cu, bal Al.
Cast· 24,000-32,000 TS; 21,000-26,000 YS; 1.0-0.5 El.
For pistons; cast alloy.

G97.
M-1548; 12.0 Cu, 1.4 Mn, 0.25 Mg, 0.8 Fe, bal Al.
Cast: 24,000-32,000 TS; 21,000-26,000 YS; 0.5-1.0 El.
For pistons. Cast alloy.

G-192 ALLOY.
0.60 C, 22 Cr, 8.5 Mn, 0.35 N, bal Fe.
For high temperature valves, gas turbine parts, nozzles, afterburners; super strength, high temperature alloy.

GALAHAD A.
M-62; 13 Cr, 0.1 C, bal Fe.
For corrosion resisting parts; cutlery; rustless and wear resistant.

GALAHAD A.C.
M-62; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Heat treated: 120,000-135,000 TS; 110,000-117,000 YS; 16-15 El; 63-58 RA; 220-240 Brin.
For cutlery, valves, turbine blades; Type 410; corrosion resistant.

GALAHAD A.F.C.
M-62; 0.12 C, 12-14 Cr, 0.75 max S, 1 max Ni, 0.6 max Mo, bal Fe.
Bar: 78,000-112,000 TS; 12-20 El; 280 Brin.
For cutlery, turbine blades, gears, oil refinery equipment.
Type 416 F stainless, free-cutting.

GALAHAD B.
M-62; 0 15 C, 13 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant, hardenable.

GALAHAD B.F.C.
M-62; 0 12-0 18 C, 0 75 max S, 12 0-14 0 Cr, 1.0 max Ni, 0.60 max Mo, bal Fe.
Bar 78,000-112,000 TS; 12-20% El, 150-277 Brin.
For cutlery, tableware, turbine blades, structural parts. Free machining.
Type 416F stainless steel. Hardenable

GALAHAD C.
M-62, 0.20 C, 13 Cr, bal Fe.
For corrosion resistant parts; stainless, hardenable.

GALAHAD C F.C
M-62, 0.18 0 25 C, 0.75 max S, 12 0-14 0 Cr, 1 0 max Ni, 0 60 max Mo, bal Fe.
Bar· 78,000-120,000 TS; 12 20% El; 150-277 Brin
For cutlery, tableware, turbine blades, structural parts
Type 420F stainless steel Hardenable Free machining

GALAHAD D
M-62; 0.25 C, 13 Cr, bal Fe.
Heat treated 250,000 TS; 185,000 YS, 9 El; 15 RA, 500 Brin.
For cutlery, knives, surgical instruments; Type 420, corrosion resistant

GALAHAD D F.C.
M-62; 0 25-0 35 C, 0 75 max S, 12.0-14 0 Cr, 1 0 max Ni, 0 60 max Mo, bal Fe
Bar: 78,000-112,000 TS; 12-20% El; 150-277 Brin.
For cutlery, tableware, valves, knives, turbine blades Free machining.
Type 420 F stainless steel. Hardenable

GALAHAD E.
M-62, 0.3 C, 17 Cr, 2 Ni, bal Fe.
Heat treated· 135,000 TS, 112,000 YS; 15 El, 45 RA; 280 Brin
For propeller shafts, marine hardware; Type 431; corrosion resistant.

GALAHAD F.
M-62; 0.12 max C, 16-18 Cr, 0.5 max Ni, bal Fe.
Annealed: 75,000 TS; 40,000 YS; B 80 Rock.
For nitric acid storage tanks, heat treatment equipment, furnace parts.
Heat resisting Type 442.

GALICAR.
M-405; Pb, Sb, bal Sn.
For antifriction alloy; Babbitt.

GALLIMORE METAL.
M-409; 45 Ni, 28 Cu, 25 Zn, 2 Fe, Si, Mn.
Hard rolled: 156,000 TS; 2.5 El.
Soft rolled: 98,000 TS; 42 El.
For airplane parts, non-corrosive stampings; non-corrosive in sea water.

G-ALLOY.
M-311; 18 Zn, 2.5 Cu, 0.35 Mg, 0.35 Mn, 0.20 Fe, 0.75 Si, bal Al.
Hot rolled: 72,000-78,000 TS; 58,000-69,500 YS; 19-17 El.
For cast parts for trucks, airplanes and boats; light weight.

G-ALLOY.
M-314; Pb alloy.
10,000 TS; 22 Brin.
For bearings.

GALVALLOY.
M-813; Zn-Pb-Sn.
For Al solder; no flux required.

GALVAMATT.
M-814; 0.2 C, bal Fe.
For stoves. metal signs; galvanized sheets

GALVOBRITE.
M-815; Zn alloy.
For galvanizing industry; improves fluidity of Zn

GALV-WELD.
M-1104, Pb, Zn, Sn, Bi.
For solder for regalvanizing, Zn-base alloy.

GAMA
English, 12 Cu, 2 Ni, 0.5 Fe, 0.5 Si, bal Al.
For pistons; low friction.

GAMAN H.
M-38; 0 45 C, 12 Mn, 23 Cr, 0.45 N, bal Fe

GAMAN L.
M-38; 0.40 C, 13 Mn, 12 Cr, 0.2 N, bal Fe.

GAMAN R.
M-38, 0 18 C, 12 Mn, 18 Cr, 0.40 N, bal Fe

GAMMA COLUMBIUM.
M-1, M-114, 0 4 C, 1 Mn, 1 Si, 15 Cr, 25 Ni, 2-4 Mo, 4 Cb, bal Fe.
Annealed: 108,000 TS; 32,000 YS; 37 El.
For superchargers, wheels, aircraft engine components; high heat resistance.

GAMMA NICKEL STEEL.
M-85; 36 Ni, bal Fe
Annealed: 70,000 TS; 24,000 YS; 36 El; 68 RA; 143 Brin.
Cold drawn: 90,000 TS; 70,000 YS; 20 El; 60 RA; 185 Brin
For instruments, chronometers; low thermal expansion.

GANNALOY.
U S.; 0 03 C, 5 Cr, 25 Ni, 2.25 Ti, 0 5 Al, bal Fe.
For corrosion and heat resistant parts, corrosion and heat resistant.

G.A. PERCIT EXTRA.
M-72, 1 2-1.4 C, 2-3 Si, 26-28 Cr, 57-63 Fe.
For hard surfacing electrodes; wear and corrosion resistant

GARANT DOMO.
M-1318; 0.85 C, 4 Cr, W, Mo, V, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel.

GARANT DOMO Co.
M-1318, 0.85 C, 4 Cr, Co, Mo, W, V, bal Fe.
For lathe and planer tools, hobs, reamers, taps, drills; high speed steel.

GARANT DOMO V.
M-1318; 0.85 C, 4 Cr, W, Mo, V, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

GARANT EXTRA.
M-1318; 0.74 C, 4 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, hobs, drills, taps; high speed steel.

GARANT EXTRA 333.
M-1318; 0.95 C, 4 Cr, W, Mo, bal Fe.
For lathe and planer tools, reamers, hobs, drills; high speed steel.

GARANT PRIMA.
M-1318; 0.82 C, 4 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, hobs, taps; high speed steel.

GARANT REKORD 3.
M-1318; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, hobs, taps, broaches; high speed steel.

GARANT REKORD 5.
M-1318; 0.79 C, 4.7 Co, 4.2 Cr, 0.8 Mo, 1.6 V, 18 W, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel.

GARANT REKORD 10.
M-1318; 0.76 C, 10 Co, 4 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, hobs, broaches; high speed steel.

GARANT SONDERKLASSE 500.
M-1318; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For engravers' tools, form cutters, reamers; high speed steel.

GARANT SONDERKLASSE Co.
M-1318; 1.35 C, Co, 4.2 Cr, Mo, W, V, bal Fe.
For engravers' tools, form cutters, reamers; high speed steel.

GARANT SPEZIAL 275.
M-1318; 0.86 C, 4 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, broaches, reamers, taps; high speed steel.

GARBA.
M-359; 1.0 C, bal Fe.
For drills, taps; drill rod, water hardening.

GARFIELD.
M-1705; 1.0 C, 0.3 Mn, 0.25 Si, 0.5 Cr, 0.2 V, bal Fe.
Water hardening tool steel, AISI W7.

GASID NO. 12.
M-481; 9 Sn, 3 Zn, bal Cu.
30,000 TS; 22 El; 20 RA; 125 Brin.
For high pressure acid pumps in oil refineries; corrosion resistant to hot HCl.

GASID NO. 15.
M-481; 7 Al, 2.5 Fe, bal Cu.
42,000 TS; 20-30 El; 32 RA; 193 Brin.
For chemical apparatus and equipment; corrosion and acid resistant.

GASITE.
M-1251; 3.0-3.6 C 4.0-4.75 Ni, 1.4-3.5 Cr, 0.4-0.7 Si, bal Fe.
Sand cast: 45,000 TS; 600 Brin.
Permanent mold: 55,000 TS; 675 Brin.
For heavy cams, dies, roller bearing races; white cast iron, corrosion resistant.

GAUSSIT 180.
M-Germany; 50 Co, 14 V, bal Fe.
8000 Br, 1.4 BH max.
For electromechanical devices, hysteresis motors, digital computers.
Precipitation hardening permanent magnet.

G-B NO. 35.
M-1108; 40 Ag, 18 Cu, 15 Zn, 27 Cd.
For silver solder, brazing; M.P. 1120-1205°F.

G-B NO. 40.
M-1108; 40 Ag, 20 Cu, 16 Zn, 24 Cd.
For silver solder, brazing; M.P. 1125-1235°F.

G-B NO 45.
M-1108; 45 Ag, 15 Cu, 16 Zn, 24 Cd.
For silver solder, brazing; M.P. 1125-1145°F.

G-B NO. 50.
M-1108, 50 Ag, 17.5 Cu, 11.5 Zn, 21 Cd.
For silver solder, brazing; M P. 1170-1220°F.

G-B NO 1300.
M-1108; 30 Ag, 29 Cu, 25 Zn, 16 Cd.
For silver solder, brazing; M.P. 1125-1320°F.

G-B NO 1445.
M-1108; 40 Ag, 18 Cu, 15 Zn, 27 Cd.
For silver solder, brazing; M.P 1120-1205°F.

G. BABBITT
M-815, M-314; 12.5 Sb, 3 As, 0.75 Sn, bal Pb.
At 70°F; 9800 TS; 1.5 El; 22 Brin.
At 392°F: 1900 TS, 70 El
For Babbitts, bearings, M.P. 486-549°F; heavy duty

G-B SH 7.
M-926; Ag, bal Cu.
For silver solder.

GBZ 10 BRONZE.
Ger., 90 Cu, 10 Sn.
Cast: 45,500 TS; 20,000 YS; 45 El; 62 Brin
For castings

GBZ 14 BRONZE
Ger.; 86 Cu-14 Sn.
Cast 32,000 TS; 27,000 YS, 7 El, 79 Brin.
For castings.

GBZ 20
Ger , 80 Cu, 20 Sn.
Cast: 27,000 TS, 0 El; 120 Brin.
For castings.

G.C C NO. 112.
M-1111, Ce alloy.
Addition agent to stainless steels.

G.C.C. CERIUM METAL.
M-1111; 0.70 Fe, 0.03 C, 0.02 Si, 0.70 other rare earth metals, bal Ce.
For alloying, flints, pyrophoric

G.C.C DIDYMIUM METAL.
M-1111; 2.3 Ce, 44.7 La, 37.4 Nd, 10.5 Pr, 3.4 Sm, 0.7 Fe.

G.C.C. MISCHMETAL.
M-1111; 50-55 Ce, 24-26 La, 15-16 Nd, 5-6 Pr, 2-3 Sm
For desulfurizer and deoxidizer in alloying; pyrophoric.

G.C.C. PURE CERIUM METAL.
M-1111; 0.7 Fe, 0.70 other rare earths, 0.03 C, 0.02 Si, bal Ce.
For desulfurizer and deoxidizer in alloying; pyrophoric.

GCX.
M-766; 0.08 C, 0.45 Mn, 0.05 Si, 0.04 Cb, bal Fe.
For parts to be carbonitrided, as cams, ratchets, transmission levers.

GDH-3.
M-816; 2.15 C, 0.25 Mn, 0.25 Si, 12.0 Cr, 0.8 V, bal Fe.
Air or oil hardening tool steel for cold working dies, punches; AISI D3.

GDH-3SP.
M-816; 2.10 C, 12.5 Cr, 0.5 Ni, bal Fe.
Air or oil hardening cold work tool steel for dies, punches, gages; AISI D3.

GDH-10.
M-816, 0.40 C, 0.55 Mn, 1.0 Si, 3.25 Cr, 0.35 V, 2.5 Mo, bal Fe.
Air or oil hardening hot work tool and die steel for forging dies, hot forming tools; AISI H10.

GDH-11.
M-816; 0.40 C, 0.4 Mn, 1.0 Si, 5.0 Cr, 0.5 V, 1.35 Mo, bal Fe.
Air or oil hardening hot work tool and die steel for forging dies, hot forming tools, AISI H11.

GDH-12.
M-816, 0.35 C, 0.35 Mn, 1.05 Si, 5.0 Cr, 0.35 V, 1.25 W. 1.35 Mo, bal Fe
Air or oil hardening hot work tool and die steel for forging dies, hot forming tools; AISI H12.

GDH-13
M-816, 0.40 C, 0.4 Mn, 1.1 Si, 5.0 Cr, 1.1 V, 1.35 Mo, bal Fe
Air or oil hardening hot work tool steel, chromium type; AISI H13

G.D.H NO 33
M-816, 0.35 C, 0.8-1.0 Si, 4.5-5.0 Cr, 1.0-1.2 W, 1.3-1.5 Mo, bal Fe
For forging dies, hot piercing and punching dies; hot work steel

G.D.H NO. 212.
M 816, 0.45-0.50 C, 0.85-1.05 Cr, 0.9-1.2 W, 0.15-0.25 Mo, bal Fe
For chisels, shear blades, die blocks, tough.

G.D.H NO. 280
M-816, 0.5 C, 1.3-1.6 Si, 0.3-0.4 Mo, bal Fe
For tools, punches, shear blades, tough.

G.D.H NO 350.
M-816; 1.25-1.35 C, 3.5-3.7 W, bal Fe
For drills, dies, gear cutters, taps, keen cutting edge

GDH-A2.
M-816; 1.0 C, 0.7 Mn, 0.3 Si, 5.25 Cr, 0.3 V, 1.15 Mo, bal Fe.
Air hardening, medium alloy, cold work tool steel, AISI A2.

GDH-A4
M-816, 0.95 C, 2.0 Mn, 2.2 Cr, 1.1 Mo (lead added) bal Fe.
Air hardening, medium alloy, cold work tool steel; AISI A4.

G.D.H. BLUE LABEL.
M-816; 1.55-1.70 C, 11.5-12.5 Cr, 0.15-0.25 V, 0.7-0.9 Mo, bal Fe
For tools, gauges, punches, dies; oil hardened.

GDH BRAKE DIE.
M-816; 0.50 C, 0.9 Mn, 1.0 Cr, 0.20 Mo, bal Fe.
Oil hardening tool steel for shafts, arbors, lathe centers, forming tools.

G.D.H. BRONZE LABEL
M-816; 0.90-0.95 C, 1.0-1.1 Mn, 0.4-0.5 Cr, 0.4-0.5 W, bal Fe.
Heat treated: 640 Brin.
For tools, gauges, broaches, taps; oil hardened.

GDH-CHW.
M-816; 0.23 C, 0.6 Mn, 1.25 Si, 10.0 Cr, 0.75 Ni, 1.0 V, 0.45 W, 1.2 Mo, 0.10 N, bal Fe.
Air or oil hardening hot work tool steel, chromium type.

GDH-D2.
M-816; 1.55 C, 0.35 Mn, 0.45 Si, 11.5 Cr, 0.9 V, 0.8 Mo, bal Fe.
Air or oil hardening cold work tool steel, chromium type; for lamination dies, punches, thread forming tools; AISI D2.

GDH-D2 FM
M-816; 1.55 C, 0.35 Mn, 0.45 Si, 11.5 Cr, 0.9 V, 0.8 Mo, S, bal Fe.
Air or oil hardening cold work tool steel, chromium type; free machining grade. AISI D2

GDH-D4.
M-816, 2.25 C, 0.35 Mn, 0.5 Si, 11.5 Cr, 0.2 V, 0.8 Mo, bal Fe
Oil or air hardening cold work tool steel, chromium type; AISI D4.

GDH-D5
M-816, 1.50 C, 0.4 Mn, 0.4 Si, 12.0 Cr, 0.35 Ni, 0.5 V, 0.9 Mo, 3.25 Co, bal Fe.
Air or oil hardening cold work tool steel, high carbon, high chromium type; AISI D5.

GDH GRAPH-AIR.
M-816; 1.35 C, 1.8 Mn, 1.2 Si, 1.85 Ni, 1.50 Mo, bal Fe
Air or oil hardening, medium alloy, cold work tool steel; AISI A10

GDH GRAPH-TUNG.
M-816, 1.50 C, 1.0 Mn, 0.9 Si, 0.5 Ni, 2.75 W, bal Fe.
Water or oil hardening tool steel; good wear resistance and high hardness.

GDH-H24.
M-816; 0.45 C, 0.3 Mn, 0.3 Si, 3.5 Cr, 0.7 V, 14.0 W, bal Fe.
Air or oil hardening hot work tool steel, tungsten type, AISI H24.

GDH-L2
M-816, 0.50 C, 0.8 Mn, 0.3 Si, 1.0 Cr, 0.2 V, bal Fe.
Oil hardening tool steel for shafts, arbors, lathe centers; AISI L2; similar to AISI 4150.

GDH-L6.
M-816; 0.75 C, 0.75 Mn, 0.9 Cr, 1.75 Ni, 0.35 Mo, bal Fe.
Oil hardening tool steel for shafts, arbors, lathe centers, drill bushings; AISI L6.

GDH LUSTRE DIE
M-816; 0.50 C, 0.9 Mn, 1.0 Cr, bal Fe.
Oil hardening tool steel for shafts, arbors.

GDH-M2.
M-816; 0.85 C, 4.15 Cr, 1.95 V, 6.4 W, 5.0 Mo, bal Fe.
High speed tool steel, molybdenum-tungsten type; for lathe tools, milling cutters, drills, broaches; AISI M2.

GDH-M41.
M-816, 1.1 C, 0.45 Mn, 0.3 Si, 4.25 Cr, 2.0 V, 6.75 W, 3.75 Mo, 5.0 Co, bal Fe.
High speed steel, molybdenum-tungsten-cobalt type; AISI M41.

GDH NON TEMPERING.
M-816; 0.35 C, 0.7 Mn, 0.45 Si, 0.8 Cr, 0.3 Mo, 0.3 Cu, bal Fe.
Oil hardening tool, shock resisting type.

GDH-O1.
M-816; 0.90 C, 1.2 Mn, 0.5 Cr, 0.2 V, 0.5 W, bal Fe
Oil hardening tool steel; AISI O1.

GDH-O2.
M-816; 0.90 C, 1.5 Mn, 0.25 Si, 0.3 Mo, bal Fe.
Oil hardening tool steel; AISI O2.

GDH-O7.
M-816; 1.25 C, 0.3 Mn, 0.35 Si, 0.4 Cr, 0.2 V, 1.4 W, bal Fe.
Oil hardening tool steel,
high hardness and wear resistant; AISI O7.

G.D.H. RED LABEL.
M-816; 0.65-0.75 C, 3-4 Cr, 1.0-1.5 V, 18-20 W, bal Fe.
For tools, cutters; high speed steel.

GDH-S1.
M-816; 0.45-0.50 C, 0.2-0.5 Mn, 0.75-1.0 Si, 1.15-1.25 Cr, 0.15-0.25 V, 2.25-2.6 W, bal Fe.
Oil hardening tool, shock resisting type; AISI S1.

GDH-S5.
M-816; 0.6 C, 0.8 Mn, 2.0 Si, 0.25 Cr, 0.2 V, 0.25 Mo, bal Fe.
Water or oil hardening tool steel,
shock resisting type; AISI S5.

GDH-S7.
M-816; 0.5 C, 0.7 Mn, 3.25 Cr, 1.4 Mo, bal Fe.
Oil hardening tool steel;
shock resisting type; AISI S7.

G.D.H. SILVER LABEL.
M-816; 1.0 C, bal Fe.
Heat treated: 660 Brn.
For tools, punches, shears, dies; water hardened

GDH-T1.
M-816; 0.75 C, 0.3 Mn, 0.3 Si, 4.0 Cr, 1.15 V, 18.25 W, bal Fe.
High speed steel, tungsten type,
general purpose cutting tool; AISI T1.

GDH-W1.
M-816; 1.1 C, 0.3 Mn, 0.25 Si, bal Fe
Water hardening tool steel; AISI W1.

GDH-W2.
M-816; 1.05 C, 0.25 Mn, 0.25 Si, 0.2 V, bal Fe.
Water hardening tool steel; AISI W2.

GEANT 3.
M-1118; 0.7 C, 18 W, 5 Co, 4 Cr, 1.3 V, bal Fe.
For tools, dies, cutters, hobs, drills,
high speed steel.

GEANT 22.
M-1421; 0.8 C, 10 W, 4 Cr, 1.7 V, 0.9 Mo, bal Fe.
For lathe an dplaner tools, hobs, reamers;
high speed steel.

GEANT 50.
M-1421; 0.75 C, 18 W, 4 Cr, 1 V, 0.7 Mo, bal Fe
For lathe and planer tools, reamers, broaches,
taps; high speed steel.

GEANT 55.
M-1421; 0.85 C, 12 W, 4 Cr 2 V, 0.9 Mo, 2.8 Co, bal Fe.
For lathe and planer tools, drills, reamers;
high speed steel.

GEANT 60.
M-1421; 0.80 C, 18 W, 4 Cr, 1.5 V, 0.75 Mo, bal Fe
For lathe and planer tools, drills, reamers,
hobs; high speed steel.

GEANT 66.
M-1421; 1.3 C, 4 Cr, 12 W, 4.5 V, 0.90 Mo, 4.5 Co, bal Fe.
For blanking and forming dies, engravers tools;
high speed steel.

GEANT 77.
M-1421, 0.85 C, 18 W, 4 Cr, 1.5 V, 0.70 Mo, 5 Co, bal Fe.
For lathe and planer tools, milling cutters,
drills; high speed steel.

GEANT 88.
M-1421; 0.85 C, 18 W, 4 Cr, 1.5 V, 0.7 Mo, 10 Co, bal Fe.
For lathe and planer tools, cutters, broaches;
high speed steel.

GEANT M5.
M-1421; 0.85 C, 6 W, 4 Cr, 2.4 V, 5 Mo, bal Fe.
For lathe and planer tools, reamers;
high speed steel.

GEAR BRONZE-1.
U. S.; 78-91 Cu, 10-12 Sn, 0-3 Zn, 0.2 Pb, 0.1-0.3 P.
Cast: 38,000 TS; 20,000 YS; 10 El, 80 Brin.
For gears, worm wheels; tough.

GEAR BRONZE-2
U S; 88 Cu, 10 Sn, 2 Pb.
For gears; free-cutting

GEAR BRONZE-3.
U. S.; 85 Cu, 13 Sn, 2 Zn
For gears; tough.

GEARING BRONZE
Eng.; 91.3 Cu, 8.7 Sn.
For gears, tough.

GEARS BRONZE
Eng.; 85 Cu, 10 Sn, 3 Zn, 2 Pb.
For gears; free-cutting.

GEAR STEEL
Eng., 3.5 Ni, 1.5 Cr, 0.45-0.50 C, bal Fe.
For gears and pinions, oil-hardening

GEAR STEEL HIGH DUTY
Eng.; C, alloy, bal Fe
For gears; oil-hardening

GEAR-WHEEL BRONZE.
M-452, 11-12 Sn, 0-1.5 Zn, 0.1-0.3 P, bal Cu
Cast: 30,000-37,000 TS; 20,000-23,000 YS;
4-1 El, 90-125 Brn
For high duty worm wheels;
working with hardened steel worms

G.E.C HEAVY ALLOY
M-978, 90 W, 7.5 Ni, 2.5 Cu
Sintered: 90,000 TS; 83,000 YS; 4 El; 290 Brin.
For screens in X-ray tubes; sintered.

GECOR.
M-60, Cobalt rare earth compounds (Co_5 Sm)
Anisotropic permanent magnet material.
Highest energy product and coercive force.

GEDGE'S METAL.
Eng; 60 Cu, 38.2 Zn, 1.8 Fe.
For ship sheathing, cylinders for hydraulic presses,
malleable at red heat.

GEMCO.
M-1493; 87.75 Cu, 12 Ge, 0.25 Ni.
M.P. 1508-1769°F
For high temperature brazing.

GEMMA.
M-771; 35 Ni, bal Fe.
For magnets; high permeability.

GEMPCO.
M-1063; Sn-Pb-graphite, bal Cu.
For friction material, clutch discs, motor,
brushes; sintered, self lubricating.

GENALLOY.
M-59; 37-40 Ni, 17-21 Cr, C, Si, bal Fe.
Cast: 67,000 TS; 38,000 YS; 6 El; 207 Brin.
For furnace parts; high resistance
to heat and corrosion.

GENALLOY B.
M-59; 0.36-0.50 C, 31-39 Ni, 12-15 Cr, bal Fe.
For heat and corrosion resistant parts;
heat and corrosion resistant.

GENCALLOY.
U.S.; Pb alloy.
For cable sheathing; corrosion resistant.

GENCALOY.
U.S.; Pb alloy.
For cable sheath.

GENELITE.
M-306 70-73 Cu, 12-14 Sn, 9-10 Pb, 4.5-5.5 graphite.
For bearings for aero engines;
synthetic bronze, self-lubricating.

GENERAL ALLOYS CN-1-H.
M-59; 0.20-0.50 C, 26.0-30.0 Cr, 8.0-11.0 Ni, bal Fe
Cast: 95,000 TS; 45,000 YS; 20 El; 200 Brin
For oil burner parts, rabble arms, tube supports
Heat resistant, stainless.

GENERAL ALLOYS Q-10.
M-59, 0.20 max C, 18-21 Cr, 8-11 Ni, bal Fe.
Annealed· 77,000 TS; 36,000 YS; 50 El; 163 Brin
For pumps, rolls, valve bodies in
chemical plant equipment; stainless, austenitic,
ACI CF 20

GENERAL ALLOYS Q-11.
M-59, 0 08 max C, 18-21 Cr, 8-11 Ni, bal Fe.
Annealed. 77,000 TS; 37,000 YS; 55 El; 140 Brin
For spray nozzles, sanitary fittings and chemical
plant equipment; stainless, austenitic;
ACI CF-8

GENERAL ALLOYS Q-12
M-59; 0 08 max C, 18-21 Cr, 9-12 Ni, 2-3 Mo,
bal Fe.
Annealed: 80,000 TS; 42,000 YS, 50 El; 168 Brin
For mixing propellers;
fittings in chemical plant equipment;
stainless, austenitic; ACI CF-8C.

GENERAL ALLOYS Q-13.
M-59; 0.08 max C, 19 Cr, 11 Ni, 3-4 Mo, bal Fe
Annealed 80,000 TS, 42,000 YS, 50 El, 168 Brin
For acid resistant castings; Type 317,
corrosion resistant. Fittings, mixing propellers

GENERAL ALLOYS Q-14.
M-59; 0 08 max C, 18-21 Cr, 9-12 Ni, Cb, bal Fe
Annealed: 77,000 TS; 38,000 YS, 39 El, 149 Brin
For pump parts, valve bodies
in chemical plant equipment;
stainless, austenitic; ACI CF-8C

GENERAL ALLOYS Q-15.
M-59, 0.16 max C, 18-21 Cr, 9-12 Ni, 0 2-0 35 Se,
bal Fe
Annealed: 77,000 TS; 40,000 YS, 52 El, 150 Brin
For pumps, castings, valves in
chemical plant equipment;
free-machining austenitic stainless,
ACI CF-16F.

GENERAL ALLOYS Q-16.
M-59; 0.20 max C, 19 Cr, 9 Ni, 3 Mo, bal Fe.
Annealed: 70,000 TS; 30,000 YS; 35 El, 40 RA;
160 Brin.
For chemical plant equipment; ACI-CH20.

GENERAL ALLOYS Q-21.
M-59; 0.20 max C, 22-26 Cr, 12-15 Ni, bal Fe.
Annealed: 83,000 TS; 50,000 YS; 38 El; 190 Brin.
For pumps, roasting equipment, furnace parts, heat
treating boxes; heat resistant. ACI CH-20.

GENERAL ALLOYS Q-22.
M-59; 0.10 max C, 22-26 Cr, 12-15 Ni, bal Fe.
Annealed. 86,000 TS; 40,000 YS; 40 El; 170 Brin.
For furnace parts, heat treating boxes, chemical
plant equipment; heat resistant; ACI CH-10.

GENERAL ALLOYS Q-23.
M-59; 0.10 max C, 24 Cr, 12 Ni, 3 Mo, bal Fe.
Annealed: 70,000 TS; 30,000 YS; 45 El; 55 RA;
150 Brin.
For chemical plant equipment;
ACI-CH10M, heat and corrosion resistant.

GENERAL ALLOYS Q-30.
M-59; 0.20 max C, 23-27 Cr, 19-22 Ni, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 20 El; 180 Brin.
For valves, digesters, jet engine parts,
furnace parts, heat treating boxes;
heat resistant; ACI CK-20.

GENERAL ALLOYS Q-35.
M-59; 0 20 C, 23-27 Cr, 19-22 Ni, bal Fe.
Annealed· 65,000 TS; 30,000 YS, 30 El; 165 Brin.
For furnace parts, heat treating boxes,
chemical plant parts. ACI CK-20.

GENERAL ALLOYS Q-41.
M-59; 0.07 max C, 16 Cr, 35 Ni, Mo, Cu, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 45 El; 45 RA;
150 Brin.
For chemical plant equipment, furnace fixtures;
corrosion and heat resistant

GENERAL ALLOYS Q-50.
M-59; 0.08-0 15 C, 12 Cr, 1 max Ni, bal Fe.
Normalized. 100,000-200,000 TS; 75,000-150,000 YS;
30-7 El; 40 RA; 185-390 Brin
For chemical plant equipment, ACI-CA15,
corrosion resistant

GENERAL ALLOYS Q-51.
M-59, 0.2-0 4 C, 12 Cr, 1 max Ni, bal Fe.
Heat treated 110,000-220,000 TS,
67,000-165,000 YS, 16-1 El, 7 RA, 212-470 Brin.
For chemical plant equipment,
ACI-CA40, corrosion resistant

GENERAL ALLOYS Q-56
M-59, 0 60-0.75 C, 17 Cr, 1 max Ni, bal Fe.
Heat treated 400 Brin
AISI-440A, corrosion resistant.

GENERAL ALLOYS Q-57.
M-59, 0 95-1.2 C, 17 Cr, 1 max Ni, bal Fe.
Heat treated· 550 Brin.
AISI 440C, corrosion resistant

GENERAL ALLOYS Q-58
M-59; 0 12 max C, 16 Cr, 1 max Ni, bal Fe
Annealed· 80,000 TS; 45,000 YS, 10 El; 10 RA;
200 Brin
For chemical plant equipment,
AISI 430, corrosion resistant.

GENERAL ALLOYS Q-60.
M-59, 0.30 max C, 20 Cr, 2 max Ni, bal Fe.
Annealed: 95,000 TS; 60,000 YS, 15 El; 10 RA;
200 Brin.
For chemical plant equipment,
ACI-CB20, corrosion resistant

GENERAL ALLOYS Q-65
M-59; 0.30-0.50 C, 28 Cr, 4 max Ni, bal Fe.
Annealed. 97,000 TS; 65,000 YS; 18 El; 212 Brin.
For furnace parts, heat treating boxes;
ACI-CC50, corrosion and heat resistant.

GENERAL ALLOYS Q-66.
M-59; 0.20 max C, 28 Cr, 3 max Ni, bal Fe.
Annealed: 55,000 TS; 45,000 YS.
For furnace parts, heat treating boxes, chemical plant equipment; ACI-CC20, heat and corrosion resistant.

GENERAL ALLOYS Q-67.
M-59; 0.35 max C, 25 Cr, 1 max Ni, bal Fe.
Annealed: 55,000 TS; 40,000 YS.
For chemical plant equipment; AISI 446, corrosion resistant.

GENERAL ALLOYS Q-80.
M-59; 0.10 max C, 26-30 Cr, 3-6 Ni, Mo, bal Fe.
Annealed: 60,000 TS; 40,000 YS.
For chemical plant equipment; resists high temperature and high temperature corrosion; AISI 329.

GENERAL ALLOYS Q81.
M-59; 0.07 max C, 20 Cr, 25 Ni, 3 Mo, 1 Cu, bal Fe.
Cast.
For chemical plant equipment; corrosion resistant.

GENERAL ALLOYS Q-82.
M-59; 0.30 max C, 29 Cr, 9 Ni, bal Fe.
Cast: 80,000 TS; 40,000 YS; 20 El; 20 RA
For furnace parts, chemical plant equipment; ACI-CE30, corrosion and heat resistant.

GENERAL ALLOYS Q-85.
M-59; 0.07 C, 19-22 Cr, 27-31 Ni, 1.75-2 5 Mo, 3 min Cu, bal Fe.
Annealed: 65,000-75,000 TS; 28,000-38,000 YS; 50-35 El; 120-150 Brin.
For towers, pickling hooks in chemical plant equipment; resists sulphuric acid

GENERAL ALLOYS Q-86.
M-59; 0.12 max C, 1 max Cr, 64 Ni, 28 Mo, bal Fe.
Annealed: 80,000 TS; 57,000 YS; 8 El; 179-235 Brin.
For castings, corrosion and heat resistant, Hastelloy B. Chemical plant parts.

GENERAL ALLOYS Q-87.
M-59; 0.12 max C, 1 max Cr, 55 Ni, 21 Mo, bal Fe.
Annealed: 71,000 TS; 47,000 YS; 12 El; 149-187 Brin.
For castings; corrosion and heat resistant; Hastelloy A.

GENERAL ALLOYS Q-88.
M-59; 0.15 max C, 16 Cr, 56 Ni, 4 W, 17 Mo, bal Fe.
Annealed: 78,000 TS, 57,000 YS, 10 El; 187-248 Brin.
For castings, corrosion and heat resistant;
Hastelloy C Resistant to chlorine.

GENERAL ALLOYS Q-89.
M-59; 0 12 max C, 1 max Cr, 84 Ni, 9 Si, 4 Cu, bal Fe.
Annealed· 118,000 TS; 118,000 YS; 0-2 El.
Acid resistant casting; maximum resistance to sulphuric acid
Reference: Hastelloy D.

GENERAL ALLOYS Q-90.
M-59; 0.20 max C, 22 Cr, 45 Ni, Mo, Co, W, bal Fe.
Annealed: 7[illegible],000 TS; 48,000 YS; 11 El; 170 Brin.
For castings; corrosion and heat resistant; Hastelloy X. Oxidation resistant to 2200°F

GENERAL ALLOYS-Q91.
M-59; 0.04 max C, 26 Cr, 5 Ni, 2 Mo, 3 Cu, bal Fe.
Aged: 140,000 TS; 115,000 YS; 18 El, 310 Brin.
Cast: 120,000 TS; 83,000 YS; 27 El; 260 Brin.
For acid resistant and chemical plant equipment, pump, valves, fittings.
ACI-CD4MCu. Corrosion resistant.

GENERAL ALLOYS X-3.
M-59; 0.20-0.60 C, 28.0-32.0 Cr, 18.0-22.0 Ni, bal Fe.
Cast: 82,000 TS; 52,000 YS; 19 El; 192 Brin.
For carrier fingers, enameling fixtures, stack dampers. Heat resistant, stainless.

GENERAL ALLOYS X-4.
M-59; 0.20-0.60 C, 24.0-28.0 Cr, 18.0-22.0 Ni, bal Fe.
Cast: 75,000 TS; 50,000 YS; 19 El; 192 Brin.
For cement kiln segments, pier caps, skid rails.
Heat resistant, stainless.

GENERAL ALLOYS X-5.
M-59; 0.50 max C, 26.0-30.0 Cr, 4.0-7.0 Ni, bal Fe.
Cast: 85,000 TS, 48,000 YS; 16 El; 190 Brin.
For brazing furnace parts, cracking equipment, rabble shoes. Heat resistant.

GENERAL ALLOYS X-6.
M-59; 0.20-0.50 C, 19.0-23.0 Cr, 23.0-27.0 Ni, bal Fe.
Cast: 68,000 TS; 38,000 YS; 17 El; 160 Brin
For chains, furnace beams, tube supports.
Heat resistant. Stainless.

GENERAL ALLOYS X-7
M-59; 0.20-0.50 C, 24.0-28.0 Cr, 11.0-14.0 Ni, bal Fe
Cast: 80,000 TS, 50,000 YS; 25 El, 185 Brin.
For exhaust manifolds, rabble arms, tube hangers.
Heat resistant, stainless.

GENERAL ALLOYS X-8
M-59; 0.20-0 40 C, 19 0-23 0 Cr, 9 0-12 0 Ni, bal Fe.
Cast. 85,000 TS, 45,000 YS, 35 El, 165 Brinell.
For burner tips, fan housings, wear plates.
Heat resistant, stainless.

GENERAL ALLOYS X-9.
M-59, 0.20-0.30 C, 26 0-30 0 Cr, 14 0-18.0 Ni, bal Fe
Cast· 80,000 TS, 45,000 YS, 12 El; 180 Brin.
For furnace rails, lead pots, tube spacers
Heat resistant, stainless

GENERAL ALLOYS X-B
M-59; 33-37 Ni, 13-17 Cr, 0 35-0 75 C, bal Fe
Cast· 70,000 TS, 40,000 YS; 10 El, 180 Brin
For furnace parts, brazing trays, heat treating trays and baskets
Heat and corrosion resistant.

GENERAL ALLOYS X-B Cb
M-59; 0 35-0.75 C, 35 Ni, 15 Cr, Cb, bal Fe
Cast. 70,000 TS, 40,000 YS, 10 El; 180 Brin
For furnace parts, heat treating boxes, salt pots.
Heat and corrosion resistant.

GENERAL PLATE 154.
M-926; 45 Ag, 17 Cu, 16 5 Zn, 20 5 Cd, 0.5 Ni.
For silver brazing; M.P 1135-1150°F

GENERAL PLATE 715.
M-926, 15 Mn, 15 Ni, bal Cu.
Hardened: 100,000-133,000 TS; 40,000-77,000 YS, 12-20 El; 100-320 Brin.
For springs, diaphragms, watch cases; age-hardening, non-magnetic, corrosion resistant.

GENERAL PLATE 720.
M-926; 20 Mn, 20 Ni, bal Cu.
Wrought: 88,000-130,000 TS; 41,000-113,000 YS; 37-0.5 El; 150-300 Brin.
For springs, diaphragms, watch cases, age-hardening, non-magnetic, corrosion resistant.

GENERAL PLATE BH-1.
M-926; 10 Ag, 50 Cu, 40 Zn.
For silver brazing; M.P. 1495-1590°F.

GENERAL PLATE BH-2.
M-926; 10 Ag, 52 Cu, 38 Zn.
For silver brazing

GENERAL PLATE CH-1.
M-926; 40 Ag, 36 Cu, 24 Zn.
For silver brazing; M.P. 1340-1405°F.

GENERAL PLATE CK-4.
M-926; 45 Ag, 30 Cu, 25 Zn.
For silver brazing.

GENERAL PLATE KA-1.
M-916, 52.5 Ag, 20 Cu, 14 Zn, 11.5 Cd, 2 Ni.
For brazing carbide tips; M.P 1115-1195°F

GENERAL PLATE KC-4
M-926, 54 Ag, 40 Cu, 5 Zn, 1 Ni
For silver brazing; M.P 1430-1470°F

GENERAL PLATE KH-2
M-926, 50 Ag, 34 Cu, 16 Zn
For silver brazing

GENERAL PLATE KH-4
M-926, 50 Ag, 15.5 Cu, 15.5 Zn, 16 Cd, 3 Ni
For brazing carbide tips, M.P. 1195-1270°F

GENERAL PLATE KH-7
M-926; 50 Ag, 15.5 Cu, 16.5 Zn, 18 Cd
For brazing; M P 1160-1175°F.

GENERAL PLATE KH-105.
M-926, 50 Ag, 15.5 Cu, 25 Zn, 10 Cd
For silver brazing

GENERAL PLATE KK-5.
M-926, 55 Ag, 31.5 Cu, 11.7 Zn, 1.8 Ni
For furnace brazing of steel parts,
M P 1300-1355°F

GENERAL PLATE LH-1
M-926, 20 Ag, 45 Cu, 30 Zn, 5 Cd
For silver brazing, M P 1430-1500°F.

GENERAL PLATE LH-3
M-926, 19.45 Ag, 47.75 Cu, 32.8 Zn.
For silver brazing, M P. 1440-1500°F

GENERAL PLATE LH-4.
M-926, 20 Ag, 45 Cu, 35 Zn
For silver brazing

GENERAL PLATE LM-1.
M-926, 27 Ag, 40.15 Cu, 38.25 Zn
For silver brazing, M P. 1350-1430°F

GENERAL PLATE MA-1.
M-926; 72.15 Ag, 22.8 Cu, 5.05 Zn
For silver brazing; M P 1345-1400°F

GENERAL PLATE MH-4
M-926, 70 Ag, 20 Cu, 10 Zn
For silver brazing

GENERAL PLATE ML.
M-926; 72 Ag, 28 Cu
For silver brazing, M P. 1435°F; eutectic alloy

GENERAL PLATE SB-2.
M-926; 60.5 Ag, 22.5 Cu, 7 Zn, 10 Cd.
For silver brazing; M.P. 1285-1335°F.

GENERAL PLATE SH-7
M-926; 60 Ag, 20 Cu, 7 Zn, 3 Sn.
For silver brazing; M.P. 1270-1300°F.

GENERAL PLATE SI-1.
M-926; 68 Ag, 27 Cu, 5 Sn.
For silver brazing; M.P 1370-1400°F

GENERAL PLATE SK-4.
M-926; 65 Ag, 20 Cu, 15 Zn.
For silver brazing; M.P. 1285-1325°F.

GENERAL PLATE SM-1.
M-926; 66.7 Ag, 28.25 Cu, 5.05 Zn.
For silver brazing; M.P. 1360-1395°F.

GENESEE 100.
M-500; 0.4 C, Cr, Mo, bal Fe.
Heat treated: 105,000-135,000 TS;
85,000-115,000 YS; 15-11 El; 30-25 RA.
For gears, shafts, oil hardened

GENESEE 180.
M-500, 0.3 C, Mn, bal Fe.
Normalized: 80,000 TS; 45,000 YS; 24 El; 45 RA
For structures; water hardened.

GENESEE 185
M-500, 0.27 C, Mn, Mo, bal Fe.
Normalized. 85,000 TS, 53,000 YS; 22 El; 35 RA
For structures; water hardened.

GENESEE 191
M-500, 0.3 C, Mn, Cr, Mo, bal Fe.
Rolled 90,000 TS; 60,000 YS; 22 El, 45 RA.
For abrasion resisting parts; shock resisting.

GENESEE 194.
M-500, 0.20 C, Mo, bal Fe.
Normalized· 65,000 TS, 35,000 YS, 24 El, 35 RA
For structures; case hardened

GENESEE 194B.
M-500; 0.25 C, Mo, bal Fe.
Normalized 70,000 TS, 45,000 YS, 22 El; 35 RA.
For structures, water hardened

GENESEE 195
M-500, 0.27 C, Mn, Mo, Cr, bal Fe
Normalized 100,000 TS, 65,000 YS, 17 El; 30 RA
For structures; water hardened.

GENESEE 212
M-500, 0.2 max C, 12-16 Cr, bal Fe
For chemical engineering equipment;
corrosion resistant

GENESEE 255
M-500, C, 4-6 Cr, 0.5 Mo, bal Fe.
For chemical engineering equipment,
corrosion resistant.

GENESEE 280
M-500, C, 28 Cr, 10 Ni, bal Fe
For corrosion and heat resisting parts,
heat and corrosion resistant

GENESEE 303
M-500; 0.2 C, 25 Cr, 20 Ni, bal Fe.
75,000 TS, 150 Brin
For corrosion and heat resistant parts,
heat and corrosion rsistant to S fuels.

GENESEE 304.
M-500; 35 C, 17 Cr, 35 Ni, 0.65 Mn, bal Fe
For hearth supports, heat treating baskets,
valves, salt pots, heat and corrosion resistant

GENESEE 305.
M-500, 0.15 C, 17 Cr, 65 Ni, 0.60 Mn, bal Fe.
For hearth supports, heat treating baskets,
valves, salt pots, heat and corrosion resistant.

GENESEE 315.
M-500, 2.8 C, Mo, Si, bal Fe.
Cast: 40,000 TS, 250 Brin
For chemical engineering equipment, stoves, grates;
alloy gray iron.

GENESEE 405.
M-500; 0.45 C, 1 Cr, 0.75 Ni, 1.5 Mn, 0.3 Mo, bal Fe.
For chemical engineering equipment; oil hardening.

GENESEE 412.
M-500; C, 11-14 Mn, Cr, bal Fe.
200 Brin.
For chemical engineering equipment, crusher plates; wear and abrasion resistant.

GENESEE 460.
M-500; 0.6 C, 1 Cr, 3 Ni, 0.3 Mo, bal Fe.
For chemical engineering equipment; oil hardening.

GENESEE 500.
M-500; 3.1 C, 2 Cr, 4.5 Ni, bal Fe.
550 Brin.
For castings, pulverizers; corrosion and abrasion resisting.

GENESEE KA-2.
M-500; 0.2 C, 18 Cr, 8 Ni, bal Fe.
For chemical engineering equipment, pump parts; stainless.

GENESEE KA4.
M-500; 0.2 max C, Cr, Ni, Mo, bal Fe.
Annealed: 75,000 TS; 160 Brin.
For paper mill equipment; resists sulfites; austenitic, corrosion resistant.

GENESEE NICKEL Ni-RESIST.
M-500; C, 2 Cr, 16 Ni, bal Fe.
For castings; corrosion resisting.

GENESEE NI-HARD.
M-500; 3.2 C, 2 Cr, 4.5 Ni, bal Fe.
550 Brin.
For chemical engineering equipment; wear resistant.

GENESEE NI-RESIST
M-500; C, 2 Cr, 13 Ni, 6 Cu, bal Fe.
For chemical engineering equipment; heat resistant.

GEORO.
M-1493; 88 Au, 12 Ge.
M.P.; 673°F. For brazing. Eutectic alloy.

GENSTEEL.
M-1478; C, alloy, bal Fe.
For castings.

GENUINE "A" BABBITT METAL.
M-317; Sn, Sb, Pb.
At 70°F.; 28.6 Brin.; At 212°F.; 12.8 Brin.
For bearings, bushings; M.P 437°F.; Babbitt.

GENUINE SILVERINE.
M-586; Pb, Sb, bal Sn.
For bearings; Babbitt.

GENUINE SOVEREIGN BABBITT.
M-586; 86-90 Sn, bal Cu, Sb.
Cast: 28.4 Brin.
For internal combustion engine bearings; upper freezing point 306°C.

GENUINE WROUGHT IRON.
M-292; 0.05 max. C, 0.05 max. Mn, 0.10-0.15 P, 0.03 max. S, 0.10-0.15 Si, bal Fe.
45,000-50,000 TS; 25,000-30,000 YS; 35 El.
For staybolts, rivets, roofing sheets, water and steam pipes, boiler tubes; ductile, easily welded.

GERMAN ALUMINUM ALLOY.
Germ.; 93 Al, 7 Mg.
For pistons; heat treatable.

GERMANIA B. BRONZE.
England; 80.4 Zn, 9.6 Sn, 4.4 Cu, 4.7 Pb, 0.8 Fe.
For bearings; will not resist heat or live steam.

GERMAN NAVY ANTIFRICTION METAL.
German; 7.5 Cu, 85 Sn, 7.5 Sb.
For bearings, bushings; Babbitt.

GERMAN SILVER, AUSTRIAN.
Aus.: 60-50 Cu, 20-25 Zn, 20-25 Ni.
For ornamental purposes, electrical resistances; corrosion resistant.

GERMAN SILVER, AUSTRIAN.
Aust.; 50 Zn, 44 Cu, 3.3 Sn, 1.2 Pb.
For solder, brazing; nearly white.

GERMAN SILVER, BERLIN.
Germ.: 54 Cu, 28 Zn, 18 Ni.
For ornamental purposes, electrical resistances; corrosion resistant.

GERMAN SILVER, BEST.
Germ.; 46-50 Cu, 20-31 Ni, 29-34 Zn.
For springs and contact points in electrical work; German Silver.

GERMAN SILVER, BIRMINGHAM.
Eng.: 62-50 Cu, 32-20 Zn, 12-30 Ni.
For ornamental purposes, electrical resistances; corrosion resistant

GERMAN SILVER, COMMON FORMULA.
Germ.: 55 Cu, 25 Zn, 20 Ni.
For ornamental purposes, electrical resistances; corrosion resistant

GERMAN SILVER EXTRA WHITE.
M-102; 30 Ni. 50 Cu, 20 Zn.
For corrosion resistant parts, German Silver.

GERMAN SILVER, FIFTHS.
M-102; 7 Ni, 57 Cu, 36 Zn.
Soft: 55,000 TS; 20,000 YS; 50 El.
For ornamental parts, German Silver.

GERMAN SILVER, FIRSTS "A-1" BEST.
M-102, 16 Ni, 56 Cu, 28 Zn.
Soft. 60,000 TS; 50 El.
For cheap flat work, German Silver.

GERMAN SILVER, FIRSTS "A" SPECIAL.
M-102; 17 Ni, 56 Cu, 27 Zn.
For electrical resistances, flat work; German Silver.

GERMAN SILVER FOUNDRY ALLOY.
M-102, 35 Ni, 45 Cu, 20 Zn.
For white metal castings; German Silver.

GERMAN SILVER, FOURTHS.
M-102, 10 Ni, 55 Cu, 35 Zn.
For ornamental parts, German Silver.

GERMAN SILVER, FRENCH (ARCET).
Fren : 50 Cu, 30-31.3 Zn, 20-18.7 Ni.
For ornamental purposes, electrical resistances; corrosion resistant.

GERMAN SILVER, FRENCH (CHAVAL).
Fren.: 58.3 Cu, 25 Zn, 16.7 Ni.
For ornamental purposes, electrical resistances; corrosion resistant.

GERMAN SILVER, RUSSIAN.
Russ.: 45-56 Cu, 18-23.5 Zn, 20-36 Ni.
For ornamental purposes, electrical resistances; corrosion resistant.

GERMAN SILVER, SECONDS.
M-102; 14 Ni, 62 Cu, 24 Zn.
Hard: 120,000 TS; 2 El.
For ornamental and decorative parts; German Silver.

GERMAN SILVER, SHEFFIELD.
Eng.; 59.3 Cu, 25.9 Zn, 14.8 Ni.
For ornamental purposes, electrical resistances; Common Yellow.

GERMAN SILVER, SHEFFIELD.
Eng.; 55.2 Cu, 24.1 Zn, 20.7 Ni.
For ornamental purposes, electrical resistances; Silver White.

GERMAN SILVER, SHEFFIELD.
Eng.; 51.6 Cu, 22.6 Zn, 25.8 Ni.
For ornamental purposes, electrical resistances; Electrum, Bluish.

GERMAN SILVER, SHEFFIELD.
Eng.; 45.7 Cu, 20 Zn, 31.3 Ni.
For ornamental purposes, electrical resistances; Hard Alloy.

GERMAN SILVER SOLDER-1.
Germ., 20 Ag, 30 Cu, 30 Zn, 20 Cd.
For silver solder

GERMAN SILVER SOLDER-2
Germ.; 10 Ag, 40 Cu, 30 Zn, 20 Cd
For silver solder.

GERMAN SILVER SOLDER-3.
Germ.; 10 Ag, 3 Cu, 2 Zn, 75 Sn.
For silver solder, corrosion resistant.

GERMAN SILVER, SPECIAL THIRDS.
M-102; 11 Ni, 56.5 Cu, 32.5 Zn
For white metal trim; German Silver.

GERMAN SILVER, THIRDS
M-102, 12 Ni, 56 Cu, 32 Zn.
For white metal trim, German Silver

GERMAN SILVER WHITE
M-102, 24 Ni, 54 Cu, 22 Zn
For corrosion resistant parts, German Silver.

GERMAN TYPE METAL "A."
Germ., 75 Pb, 2 Sn, 23 Sb.
For type metal

GERMAN TYPE METAL "B"
Germ., 60 Pb, 35 Sn, 5 Sb.
For type metal.

GERMAN TYPE METAL "C"
Germ., 60 Pb, 34.6 Sn, 5.4 Sb.
For type metal

GERMAN TYPE METAL "D."
Germ., 60 Pb, 15 Sn, 25 Sb.
For type metal

GEROWAL I.
M-1374; 5.5-7.0 Si, 2-4 Cu, 0.4-0.6 Mn, 2 max Zn, 1 max Fe, bal Al.
Heat treated: 36,000 TS; 24,000 YS, 2 El, 80 Brin.
For light alloy parts; age hardenable

GEROWAL II
M-1374, 4-7 Cu, 2-4 Si, 2.5 max Zn, 1.1 max Fe, bal Al.
For light alloy parts, age hardenable.

GEROWI SILBERIT.
M-1374; 1.5-3.5 Mg, 1.3 max Si, 0.6 max Mn, 0.2 Cr, 0.2 Ti, bal Al.
Soft: 28,000 TS; 13,000 YS; 30 El; 47 Brin.
For aircraft tanks and fittings, fuel lines, marine parts; resists sea water corrosion.

GEROWI SILBERIT-K.
M-1374; 2-4 Mg, 0.4 max Mn, 0.3 max Cr, bal Al.
Soft: 28,000 TS; 13,000 YS; 30 El; 47 Brin.
Hard: 40,000 TS; 35,000 YS; 10 El; 73 Brin.
For aircraft tanks and fittings, fuel lines, marine parts; resists sea water corrosion.

GEWA 235.
M-1307, 0.35 C, 0.9 Si, 0.3 Mn, 1 Cr, 0.2 V, 1.8 W, bal Fe.
For cold work tools, upsetters, crimpers; tough, shock resistant.

GEWA 250
M-1307; 0.45 C, 0.9 Si, 0.3 Mn, 2 W, 1 Cr, 0.4 V, bal Fe.
For punches, chisels, riveters, crimpers, upsetters, tough, shock resistant.

GEWA 255.
M-1307, 0.55 C, 0.9 Si, 0.3 Mn, 1 Cr, 0.2 V, 1.8 W, bal Fe.
For punches, chisels, riveters, crimpers, upsetters, tough, shock resistant

GEWA 430.
M-1307; 0.3 C, 1 Si, 0.4 Mn, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For punches, chisels, riveters, crimpers, upsetters; tough, shock resistant.

GEWA 530
M-1307, 0.3 C, 0.3 Mn, 2.3 Cr, 0.6 V, 4.2 W, bal Fe.
For punches, upsetters, riveters, shears, crimpers; hot work steel, oil hardened.

GEWA 930.
M-1307; 0.30 C, 0.2 Si, 0.3 Mn, 2.6 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams and liners, punches, upsetters; hot work steel, oil hardened.

GEWA 960
M-1307; 0.65 C, 3.7 Cr, 0.85 Mo, 0.7 V, 8.5 W, bal Fe
For drills, reamers, taps, hobs, broaches; high speed steel, oil hardened

GEWA 2930.
M-1307, 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion rams and liners, punches, shears; hot work steel, oil hardened.

G.F.A. NICKEL.
England, 99.0 min Ni + Co
For anode support wires, valve components; corrosion and heat resistant.

GIANT SPECIAL
M-1683; 0.35 C, 0.9 Cr, 0.3 Mo, bal Fe.
Oil or water hardening steel designed for plastic molds.

GIBRALTER
M-345, 1.05 C, bal Fe
For tools, drills, taps; water hardening.

GIBRALTAR
M-345, 0.95-1.05 C, 0.3 Si, 0.25 Mn, bal Fe.
For cutters, reamers, drills, punches, broaches, taps; Type W1, water hardened

GIBSILOY A-1.
M-650, 95 Ag, 5 Ni
For contact rivets, discs, screws; low contact resistance, high ductility.

GIBSILOY A 3
M-650, 50-95 Ag, 5-50 Ni.
For electric contacts, sintered powders, ductile.

GIBSILOY A-4.
M-650, Ag, Ni.
For electrical contacts; circuit breakers.

GIBSILOY A-6.
M-650; Ag, Ni.
For electrical contacts; circuit breakers.

GIBSILOY A8.
M-650; Ag-Ni.
Sintered: 36,000-58,000 TS
For electrical contacts;
disconnecting switch contacts.

GIBSILOY C-1.
M-650; 99 Ag, 1 graphite.
For contact discs; non-sticking.

GIBSILOY C-2.
M-650; Ag, C.
For electrical contacts, disconnecting switches.

GIBSILOY C 4.
M-650; 93-99 Ag, 1-7 graphite.
For electric contacts, sliding;
mechanically processed.

GIBSILOY C5.
M-650; Ag-C.
Sintered.
For electrical contacts, circuit breakers; non-welding.

GIBSILOY C-7
M-650; 93 Ag, 7 graphite.
For contact discs; non-sticking.

GIBSILOY CW-42.
M-650; Ag, W, C.
For electrical contacts, circuit breakers.

GIBSILOY CW-52.
M-650; Ag, W, C.
For electrical contacts, air circuit breakers.

GIBSILOY M 10.
M-650; 30-90 Ag, 10-70 Mo.
For electrical contacts; arcing.

GIBSILOY M-12.
M-650, Ag-Mo.
Sintered: 55,000 TS; 165 Brin.
For electrical contacts for air circuit
breakers; arcing.

GIBSILOY NC 22.
M-650; Ag, Ni, graphite.
For electrical contacts, rheostat contacts.

GIBSILOY NC-43.
M-650; Ag, Ni, C.
For electrical contacts, rheostats, contactors.

GIBSILOY ND.
M-650, 5-25 Ni, 1-10 Cd, bal Ag.
For electrical contacts.

GIBSILOY NM.
M-650; 1-35 Ni, 1-30 Mo, bal Ag
For electrical contacts; for high current densities.

GIBSILOY NW.
M-650; 1-35 Ni, 1-30 W, bal Ag.
For electrical contacts; for high current densities

GIBSILOY NW-54.
M-650, Ag, Ni, W.
For electrical contacts; D.C. service.

GIBSILOY NW-55.
M-650, Ag, Ni, W.
For electrical contacts; circuit breakers.

GIBSILOY UC-5.
M-650, Ag, Cu, C.
For electrical contacts, rheostats, contactors.

GIBSILOY UT-6.
M-650, Cu-WC.
Rockwell B100.
For electrical contacts, switches;
density 12.3; sintered.

GIBSILOY UT8.
M-650; Cu-WC.
Sintered: 230 Brin.
For electrical contacts and facings for resistance
welding electrodes; sintered.

GIBSILOY UT-10.
M-650, Cu-WC.
Rockwell B95.
For electrical contacts, switches; density
11.1; sintered

GIBSILOY UW4
M-650, Cu-W.
For electric contacts and facings for resistance
welding electrodes; sintered.

GIBSILOY UW-5.
M-650, Cu-W
Rockwell B100
For electrical contacts, switches; density
14.3; sintered.

GIBSILOY UW6.
M-650, Cu-W.
B90 Rockwell
For electric contacts, switches; sintered 50%
elec. cond.

GIBSILOY UW-8
M-650, Cu-W.
Rockwell B85.
For electrical contacts, switches,
density 12.6; sintered.

GIBSILOY W 2.
M-650, 30-90 Ag, 10-70 W.
For electrical contacts

GIBSILOY W-4
M-650, Ag-W
For electrical contacts, contactor contacts.

GIBSILOY W 10
M-650, Ag-W.
For electric contacts, sintered powders.

GIBSILOY W12
M-650, Ag, W.
For electrical contacts, air circuit breakers.

GIBSILOY W-13.
M-650, Ag-W.
Sintered 43,000 TS; 150 Brin.
For electrical contacts for air circuit
breakers, arcing

GIBSILOY W-15
M-650; Ag-W.
Sintered: 63,000 TS; 200 Brin.
For electrical contacts for
air circuit breakers; arcing.

GIBSILOY WC-10
M-650; Ag, WC
For electrical contacts for air circuit breakers.

GIBSILOY WID.
M-650; Ag, W
For electrical contacts; air circuit breakers.

GIBSON S-5
M-650; Ag-Zn.
For thermostats, contactors, switches, relays;
electrical contacts.

GIBSON S-10.
M-650, Ag-Cd.
For thermostats, contactors, switches, relays;
electrical contacts.

GIBSON S-15.
M-650; Ag-Pd.
For thermostats, contactors, switches,
relays; electrical contacts.

GIBSON S-16.
M-650; Ag, Pd.
For electrical contacts, thermostats, switches, relays.

GIBSON S-20.
M-650; Ag-Pt
For thermostats, contactors, switches, relays, electrical contacts.

GIBSON S-25.
M-650; Ag-Cu.
For electrical contacts.

GIBSON S-26.
M-650; Ag, Cu, Ni.
For electrical contacts, relays, switches.

GIESCHE Z13.
M-1134; 4 Al, 0.5-1 0 Cu, 0.03 Mg, bal Zn.
Rolled: 44,000-71,000 TS, 75-140 Brin.
For die castings, instrument cases, housings; rolled or cast.

GIESCHE Z14
M-1134; 0.8-1.0 Al, 0.3-0.4 Cu, bal Zn.
Rolled· 31,000-42,500 TS; 40-70 Brin
For die castings, housings, gears; rolled or cast.

GIESCHE ZL 2.
Ger , 4 Al, 1.0-1 5 Cu, bal Zn
For die or sand castings

GIESCHE ZL 3
Ger ; 4 Al, 0.5 Cu, bal Zn.
For pressed or drawn parts.

GIESCHE ZL7.
M-1134, 4 Cu, 0 2 Al, bal Zn.
Rolled· 28,000-59,600 TS, 45 100 Brin
For die castings, housings, gears, rolled or cast.

GIESCHE ZO4
M-1134, 4 Cu, bal Zn.
For die castings; rolled or cast

GIGANT
M-617, 0 7 C, 18 W, 4 Cr, 1 V, bal Fe
For cutters, tools, high speed steel

GIGANT
M-912, 1 05-1 15 C, 4.5 Cr, 11-12 W, 0.6 Mo, 2 5 V, bal Fe
For tools, dies, cutters, high speed steel.

GIGANT 5
M-501; 0 9 C, 4 Cr, 18 W, 5 Co, 1 3 V, bal Fe.
For tools, dies, cutters; high speed steel

GIGANT 10
M-501; C, 18 W, 9 Co, 1 Mo, 4 Cr, 2 V, bal Fe
For tools, dies, cutters; high speed steel

GIGANT 11
M-912, 0 92-0 98 C, 4 Cr, 1 2-1 5 W, 2 2-2.5 Mo, 2 2-2 5 V, bal Fe
For tools, dies, cutters, high speed steel

GIGANT 22
M-912, 0.78-0.85 C, 3 5-4 0 Cr, 7.3-8 0 W, 1.8-2.0 V, bal Fe
For tools, dies, cutters, high speed steel.

GIGANT 33
M-912, 0.85-0 95 C, 4 5 Cr, 13 W, 0.7 Mo, 2 V, 2.4 Co, bal Fe
For tools, dies, cutters; high speed steel.

GIGANT 44.
M-912; 1.3-1 4 C, 4-4.5 Cr, 9-10 W, 3.5-4 V, bal Fe.
For tools, dies, cutters; high speed steel.

GIGANT 50
M-501, M-912, 0.75 C, 4 Cr, 1 V, 18 W, bal Fe.
For lathe and planer tools, drills, taps, hobs, high speed steel.

GIGANT 55.
M-501, M-912; 0.86 C, 2.8 Co, 4.3 Cr, 8.5 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

GIGANT 60.
M-501, M-912; 0.7 C, 18 W, 1 Mo, 1.5 V, bal Fe
For lathe and planer tools, drills, taps, reamers; high speed steel.

GIGANT 66
M-912; 1.4-1.5 C, 4-4.5 Cr, 12-13 W, 0.4-0.7 Mo, 4.2-5.0 V, 4.2-5 Co, bal Fe.
For tools, dies, cutters; high speed steel.

GIGANT 70
M-501, M-912; 0.80 C, W, Co, Mo, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, drills, taps, reamers; high speed steel.

GIGANT 77
M-501, M-912, 0.8 C, 4.7 Co, 4 Cr, 0.7 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, reamers, taps, hobs; high speed steel.

GIGANT 88.
M-501, M-912; 0 76 C, 10 Co, 4 Cr, 0 8 Mo, 1 8 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

GIGANT BST
M-501, M-912, 0 85 C, 4 Cr, W, Mo.
For lathe and planer tools, reamers, hobs, taps, high speed steel

GIGANT DUPLO.
M-501, M-912, 1 35 C, W, Co, Cr, bal Fe.
For fast finishing tools, engraving cutters; high speed steel, keen edge.

GIGANT M5.
M-501, M-912, 0 85 C, W, Mo, 4 Cr, bal Fe
For lathe and planer tools, drills, taps, hobs, high speed steel.

GIGANT N
M-912, 0 72-0 8 C, 4 5 Cr, 13 W, 0 7 Mo, 1 7 V, 2 4 Co, bal Fe
For tools, dies, cutters, high speed steel.

GIGANT UNO
M-912, 0 72-0 80 C, 13 W, 0 7 Mo, 1 7 V, 5 Co, 4 Cr, bal Fe
For tools, dies, cutters, high speed steel

GILDING 4
M-8, 95 Cu, 5 Zn
Soft· 35,000 TS, 11,000 YS, 38 El.
Hard 55,000 TS, 44,000 YS, 5 El.
For jewelry and bullet jackets; fuse caps, primers, gilding metal.

GILDING, 95%
M-33, 95 Cu, 5 Zn.
Annealed 35,000 TS, 11,000 YS; 45 El.
Hard rolled. 56,000 TS, 50,000 YS; 5 El
For angles, channels, red brass

GILDING 210.
M-8, 95 Cu, 5 Zn.
Hard Sheet: 56,000 TS; 46,000 YS; 5 El; B 64 Rock.
Soft Sheet: 36,000 TS, 11,000 YS, 42 El; F 50 Rock
For coins, costume jewelry, medallions, ornamental trim. 56% elect cond , malleable

GILDING FOIL
U S., 98 Sn, 2 2 Cu, 0 1 Fe.
For cheap jewelry; corrosion resistant.

GILDING METAL.
Eng.; 72-64 Cu, 23-34 Zn, 0.3-2.5 Sn, 0.3 P.
For cheap jewelry, bullet jackets; corrosion resistant.

GILDING METAL.
M-33; 95-97 Cu, 5-3 Zn.
35,000-60,000 TS; 10,000-30,000 YS; 40-5 El.
For cheap jewelry; corrosion resistant.

GILDING METAL 26.
M-141; 95 Cu, 5 Zn.
Hard: 56,000 TS; 50,000 YS; 5 El; 114 Brin.
Soft: 35,000 TS; 11,000 YS; 45 El; 50 Brin.
For jewelry; gilding metal.

GILDING METAL 210.
M-279; 95 Cu, 5 Zn.
Ann: 34,000-38,000 TS; 5000-11,000 YS; 45-48 El.
Cold rolled: 37,000-69,000 TS; 14,000-59,000 YS; 2-45 El.
For coins, medallions, bullet jackets, terminals; red color, easily formed, good corrosion resistance.

GILDING METAL, SCOVILL ALLOY 110.
M-102; 94-96 Cu, bal Zn.
Annealed: 35,000 TS; 45 El.
Hard: 55,000 TS; 5 El; 114 Brin.
For drawn and spun parts; corrosion resistant.

GILGRID 10.
M-897; 45 Ni, 45 Fe, 10 Mo.
Annealed: 90,000 TS; 72,000 YS; 33 El.
For grid wires, electronic tubes; corrosion and heat resistant.

GILGRID 30.
M-897, 67 Ni, 30 Mo, 1 Cr, 1 Si, 1 Mn.
Annealed: 90,000 TS; 63,000 YS; 15 El; 18 RA.
For grid wires, electronic tubes; corrosion and heat resistant

GILMORE NICKEL ALLOY.
M-817; Cu, bal Ni.
For setting diamond tools, holders

GILMORE TOOL.
M-334; 0.85 C, 3.5 Cr, 1 W, bal Fe.
For tools and dies, hot or cold work steel.

GILSON BM12C20.
M-1298; 0 2 max C, 22-24 Cr, 12-15 Ni, 2 max Mn, 3.5 max Si, bal Fe.
Annealed 85,000-95,000 TS; 40,000-50,000 YS; 45-55 El; 150-185 Brin.
For heat treat boxes, furnace parts and equipment; Type 309, austenitic, heat resistant.

GILSON UC-BC14.
M-1298; 0 15 max C, 11 5-13.5 Cr, bal Fe
Heat treated· 120,000-135,000 TS; 110,000-117,000 YS, 16-15 El; 63-58 RA; 220-240 Brin.
For cutlery, valves, turbine blades, Type 410; corrosion resistant.

GILSON UG.
M-1298; 0.2 max C, 22-24 Cr, 12-15 Ni, 2 max Mn, 3.5 max Si, bal Fe
Annealed· 85,000-95,000 TS, 40,000-50,000 YS; 45-55 El; 150-185 Brin.
For heat treat boxes, furnace parts, refinery equipment; Type 309; austenitic, heat resistant.

GILSON-UGAC14.
M-1298; 0.08 C, 11.5-13 Cr, 0.1-0 3 Al, bal Fe.
Normalized: 71,000 TS; 42,600 YS; 22 El; 150 Brin.
Ht. Tr.: 175,000 TS; 145,000 YS; 21 El; 352 Brin.
For injectors, table flatware, valves, pumps, oil refinery equipment .
Type 405, stainless.

GILSON UG-AM.
M-1298; 0.10 max C, 16-18 Cr, 10-14 Ni, 1.7-2.7 Mo, Cb = 10 × C, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 60-50 El; 75-60 RA; 150-190 Brin.
For acid resistant chemical plant equipment; Type 316 Cb; stainless, austenitic.

GILSON UG-AM, 8C, 18MO.
M-1298; 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe.
Normalized: 93,000 TS; 36,000 YS; 45 El; 60 RA; 165 Brin.
Annealed: 87,000 TS; 33,000 YS, 57 El; 73 RA; 155 Brin.
For chemical plant equipment, muffles, cowls; Type 321; stainless, austenitic.

GILSON UG-CC14.
M-1298; 0 15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS; 40,000 YS; 32 El, 68 RA; 170 Brin
Heat treated. 256,000 TS; 190,000 YS, 6 El; 10 RA; 540 Brin
For cutlery, valve trim, springs, turbine blades; Type 420, stainless, hardenable

G-IRON
M-1001, 4 2 C, 2.4 Si, 0 6 Mn, bal Fe.
For making gray iron castings, graphitized pig iron.

GITTERMETALL
German, 0 2 graphite, 10 Sn, 15 Sb, 1.75 Cu, bal Pb
For bearings, graphitic.

GLACIER PRECISION FINISH LEAD BRONZE
M-818; Sn, Pb, bal Cu
For machinery parts; free cuttings.

GLASS MOLD ALLOY
Eng; 65-55 Cu, 12-18 Ni, 11-17 Zn, 8-12 Fe, 0-5-1 0 Si.
For blass molds, U S. Pat 1360773.

GLASS SEALING "42"
M-32, 0 15 max C, 1 0 Mn, 41 5 Ni, bal Fe.
For sealing into glass, low expansion.

GLASS SEALING "49."
M-32, 0.10 C, 49 Ni, bal Fe
For glass sealing, same coefficient of expansion as glass

GLIDDEN 304L.
M-1728; 0 02 C, 18 Cr, 10 Ni, bal Fe
Pre-alloyed metal powders; stainless.
Typical sintered properties: 50,000-62,000 TS; 3 5-12 4 El, 52-62 Rock B.

GLIDDEN 316L.
M-1728; 0 03 C, 17 Cr, 13 Ni, 2 5 Mo, bal Fe.
Pre-alloyed metal powders; stainless.
Typical sintered properties· 49,000-69,000 TS; 3-14 El, 50-60 Rock B.

GLIDDEN 410L (Annealed).
M-1728, 0 02 C, 12 Cr, bal Fe
Pre-alloyed metal powders; stainless.
Typical sintered properties· 58,000-95,000 TS; 2-3 El; 90-96 Rock B.

GLIDDEN 4600.
M-1728, 0 04 C, 0.6 Mn, 1.9 Ni, 0 25 Mo, bal Fe.
Pre-alloyed metal powders; low alloy steel.
Sintered properties depend on carbon pick-up from graphite and zinc stearate and on heat treatment.

GLIDDEN J-8100.
M-1728; 19 Cr, 10 Si, bal Ni. (Boron-free).
Vacuum melted brazing material; brazing temperature 2125-2175°F.

Oxidation resistance to 1900°F; for general purpose and nuclear brazing applications.

GLIDDEN J-8102.
M-1728; 15.2 Cr, 8 Si, bal Ni.
Vacuum melted brazing material; brazing temperature 2150-2200°F.
Boron free for thin gauge (0.005") honeycomb assemblies; good filleting and low erosion tendencies.

GLIDDEN J-8103.
M-1728; 17.1 Cr, 9.2 Si, 0.1 B, bal Ni.
Vacuum melted brazing material; brazing temperature 2100-2150°F.
Low boron grade, good flow, less fillet and more erosion than J-8102.

GLIDDEN J-8104.
M-1728; 11.4 Cr, 6.8 Si, 0 3 B, bal Ni.
Vacuum melted brazing material; brazing temperature 2125-2150°F.
For bridging gaps up to 0.060 inch, and for two or more brazing operations.

GLIDDEN J-8202.
M-1728; 2.2 Cr, 2 6 Si, 1 5 B, bal Ni
Vacuum melted brazing material, brazing temperature 2000-2110°F.
For bridging wide gaps, service temperature up to 1700°F.

GLIDDEN J-8207
M-1728; 5.6 Cr, 3 2 Si, 2 4 B, bal Ni.
Vacuum melted brazing material; brazing temperature 2050-2120°F.
For general wide gap brazing.

GLIDDEN J-8300.
M-1728; 19 Cr, 10 Si, 10 Mn, bal Ni
Vacuum melted brazing material, brazing temperature 2100-2150°F in hydrogen (not vacuum)
For brazing stainless steel honeycombs

GLIDDEN J-8400
M-1728; 19 Cr, 16 5 Ni, 8 Si, 4 W, 0.8 B, bal Co
Vacuum melted brazing material; brazing temperature 2150-2200°F
For brazing L-605, J-1570 and other cobalt base materials.

GLIDDEN J-8600
M-1728, 33 Cr, 4 Si, 24 Pd, bal Ni.
Vacuum melted brazing material; brazing temperature 2140-2170°F.
For joining René 41 and similar superalloys.

GLIDDEN J-8950.
M-1728, 32 Cr, 18 Pd, 4.8 Si, 2 8 Ti, 1.8 Al, bal Ni.
Vacuum melted brazing material; brazing temperature 2125-2175°F.
Braze joint has exceptional high temperature mechanical properties.

GLIDDEN CN-1.
M-1728; 70 Ni, 30 Cu.
Pre-alloyed metal powders; Ni-Cu alloy.
Typical sintered properties; 39,000-44,000 TS; 12 5-17.1 El; 34-38 Rock B.
For parts requiring corrosion resistance

GLIDDEN NF-1.
M-1728; 50 Ni, 50 Fe.
Pre-alloyed metal powders.
Typical sintered properties; 32,000-38,000 TS; 8.4-12 1 El; 26-29 Rock B.
For soft magnetic and electrical applications.

GLIDDEN SF-9.
M-1728; 9 Si, bal Fe.
Pre-alloyed metal powders.
Master alloy for soft magnetic parts.

GLIEVOR BEARING.
Eng.; 74 Zn, 9 Sb, 6 7 Sn, 5 Pb, 4.4 Cu, 1.4 Cd.
For bearings; anti-friction.

GLIEVOR BEARING.
Eng.; 14 Sb, 8 Sn, 77 Pb, 1.5 Fe.
For bearings; anti-friction.

GLIXEY NO. 1.
M-819; Pb, Sb, bal Sn.
For transmission bearings, pump bearings; anti-friction metal.

GLIXEY NO. 2.
M-819; Pb, Sb, bal Sn.
For bearings; antifriction metal.

GLIXEY NO. 2A.
M-819; Pb, Sb, bal Sn.
For bearings; antifriction metal.

GLIXEY NO. 3.
M-819, Pb, Sb, bal Sn.
For bearings; antifriction metal.

GLOBLE DRILL STEEL.
M-57; 1 25 C, 0 10 Cr, 0.30 Mn, bal Fe.
For drills, reamers, cutters; water hardened.

GLUHFEST alloys see JUNKER.

GLX-45W.
M-766; 0.22 C, 1.20 Mn, 0.10 max Si, 0 01-0 04 Cb, bal Fe.
Rolled (min): 60,000 TS; 45,000 YS; 22 El.
For structural parts; weldable.

GLX-50W.
M-766, 0 22 C, 1 2 Mn, 0.10 max Si, 0 01-0 04 Cb, bal Fe
Rolled (min): 65,000 TS; 50,000 YS; 22 El
For structural parts; weldable.

GLX-55W.
M-766; 0.22 C, 1.20 Mn, 0 10 max Si, 0.01-0 04 Cb, bal Fe
Rolled (min.): 70,000 TS; 55,000 YS; 20 El.
For structural parts, weldable.

GLX-60W.
M-766, 0.22 C, 1.20 Mn, 0 10 max Si, 0.01-0 04 Cb, bal Fe.
Rolled (min): 75,000 TS; 60,000 YS; 18 El.
For structural parts; weldable.

GLX-65W.
M-766, 0 22 C, 1.20 Mn, 0.10 max Si, 0.01-0.04 Cb, bal Fe
Rolled (min.) 80,000 TS; 65,000 YS; 16 El.
For structural parts; weldable.

GLYCO.
M-240; 15 Sb, 4.5 Sn, 0.5 As, bal Pb.
For bearings, bushings; anti-friction, Babbitt.

GLYCO METAL.
85.5 Zn, 5 Sn, 4 7 Pb, 0.4 Cu, 2 Al
For bearings, bushings; Babbitt.

GLYCO TURBO.
Eng., 70 Pb, 22 Sb, 8 Sn
For turbine bearings; Babbitt.

GM-O2 DIE.
M-35; 0.90 C, 1.6 Mn, bal Fe.
For dies, punches, crimpers, upsetters; Type O2; oil hardened.

GMOODIE.
M-165; 4 Al, 3.25 Cu, 0.80 Ni, 0.20 Ti, 0.15 Mg, bal Zn.
For dies for sheet forming.

GMR-235.
M-1286, M-1214; 0.15 C, 8-12 Fe, 14-17 Cr, 4.5-6.0 Mo, 2 Ti, 2.5-3.5 Al, 0.1 B, bal Ni.
At 70°F: 147,000 TS; 43 El.
At 1500°F: 90,000 TS, 5 El.
At 1800°F: 21,800 TS; 38 El.
For jet engine components, gas turbine parts; high heat resistant to 1500°F.

GMR236.
M-1286; 0.15 C, 15.5 Cr, 5 Mo, 2.2 Ti, 3.25 Al, 25 Fe, 0.06 B, bal Ni.
For heat resistant parts; corrosion and heat resistant.

GMS 58
Ger.; Zn, bal Cu.
For castings; brass.

GMS 63.
Ger., Zn, bal Cu.
For castings, brass.

GMS 67
Ger., Zn, bal Cu.
For castings; brass.

GOHI IRON
M-191, 0.02 C, 0.25 Cu, 0.025 Mn, 0.003 Si, bal Fe
45,000-50,000 TS; 40-50 El.
For sheet metal construction work, roofing, culverts, pipe, ventilators, skylights, rust resisting.

GOLD-1.
M-1344, 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, drills, taps; high speed steel.

GOLD-2.
M-1344, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For engravers' tools, milling cutters, taps, reamers, high speed steel.

GOLD, 8 CARAT.
47 Cu, 33 Au, 20 Ag.
For jewelry, corrosion resistant.

GOLD, 10 CARAT.
38-46 Cu, 42 Au, 12-20 Ag.
For jewelry, corrosion resistant.

GOLD, 14 CARAT
12 Cu, 58 Au, 30 Ag.
For dental fillings and crowns; corrosion resistant.

GOLD, 14 CARAT
14-28 Cu, 58 Au, 4-28 Ag.
For jewelry, corrosion resistant.

GOLD, 15 CARAT.
13 Cu, 62 Au, 11 Ag.
For jewelry; corrosion resistant.

GOLD, 16 CARAT.
8-27 Cu, 67 Au, 6.6-26 Ag. For jewelry.

GOLD, 18 CARAT.
15-5 Cu, 75 Au, 10-20 Ag.
For jewelry.

GOLD, 20 CARAT.
6-8.3 Cu, 84 Au, 8.3-11 Ag.
For jewelry.

GOLD, 22 CARAT.
4.2 Cu, 92 Au, 4.2 Ag.
For jewelry.

GOLD, 22 CARAT.
3.4 Cu, 92 Au, 4.9 Ag.
For dental crowns and fillings; corrosion resistant.

GOLDAL.
Eng.; Au alloy.
For gold solder, dental alloy; corrosion resistant.

GOLD ANCHOR.
M-342, M-115, 0.68-0.73 C, 17.5-18.5 W, 3.75-4.25 Cr, 0.95-1.15 V, bal Fe.
For chasers, dies, punches, special tools; high speed steel.

GOLD ANCHOR DRILL ROD.
M-342; 0.68-0.73 C, 17.5-18.5 W, 3.75-4.25 Cr, 0.95-1.15 V, bal Fe.
For twist drills, reamers, punches, small tools; high speed steel

GOLD BRONZE.
U.S., 6.5 Sn, 3 Zn, bal Cu
For jewelry, ornaments; corrosion resistant.

GOLD BUTTONS
England; 33 Zn, 5 Sn, 3 Pb, bal Cu.
For buttons, jewelry; free-cutting

GOLD IMITATION
Eng., 97.8 Cu, 2.0 Al, 0.2 Au.
For gold solder, corrosion resistant

GOLD LABEL.
M-344, M-343; 0.60-0.7 C, 3-4 Cr, 18-20 W, 2-3 Co, 1.25-1.5 V, bal Fe.
For cutting tools, high speed steel, "Hellers Peerless."

GOLD LABEL (H & R.)
M-363, 1.2 C, 2.5 W, bal Fe
For finishing tools, cutters; water or oil hardened

GOLD LEAF.
Eng., 66-80 Cu, 34-20 Zn
For gold lead substitute, signs

GOLD LEAF, AIX
Eng., 64.8 Cu, 32.8 Zn, 2.0 Sn, 0.4 Pb
For gold lead substitute, signs.

GOLD LEAF, JEMMAPES.
Eng., 64.6 Cu, 33.7 Zn, 1.4 Sn, 0.2 Pb
For gold lead substitute, signs

GOLD LEAF METAL
Eng., 84 Cu, 16 Zn
For gold leaf substitute, signs.

GOLD METAL LEAF
Eng.; 84-66 Cu, 16-34 Zn, 0-0.4 Pb
For gold solder; corrosion resistant.

GOLDPUNKT.
M 1331, 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, drills, taps, hobs, high speed steel.

GOLDSMITH GB-02.
M-1108, 2 Ag, 91 Cu, 7 P.
For Silver solder; M.P. 1180-1270°F; self-fluxing.

GOLDSMITH GB-05.
M-1108; 5 Ag, 58 Cu, 37 Zn.
For Silver solder; M.P. 1575-1600°F.

GOLDSMITH GB-06.
M-1108; 6 Ag, 86.5 Cu, 7.5 P.
For Silver solder; M.P. 1175-1350°F, self-fluxing.

GOLDSMITH GB-07.
M-1108; 7 Ag, 85 Cu, 8 Sn.
For Silver solder; M.P. 1450-1565°F.

GOLDSMITH GB09.
M-1108; 9 Ag, 53 Cu, 38 Zn.
Melting range: 1450-1565°F.
Brazing alloy.

GOLDSMITH GB15.
M-1180; 15 Ag, 80 Cu, 5 P.
For brazing; M.P. 1185-1300°F, silver solder.

GOLDSMITH GB20.
M-1108; 20 Ag, 45 Cu, 30 Zn, 5 Cd.
For brazing; M P. 1140-1500°F, silver solder.

GOLDSMITH GB25.
M-1108; 25 Ag, 32½ Cu, 22½ Zn.
Melting range. 1300-1575°F.
Brazing alloy.

GOLDSMITH GB30.
M-1108, 30 Ag, 38 Cu, 32 Zn.
For Silver solder; M.P. 1370-1410°F.

GOLDSMITH GB31.
M-1108, 31½ Ag, 34 Cu, 15½ Zn, 19 Cd.
Melting range: 1165-1390°F.
Brazing alloy.

GOLDSMITH GB35
M-1108, 35 Ag, 26 Cu, 21 Zn, 18 Cd.
For brazing, M.P 1125-1295°F, silver solder

GOLDSMITH GB41
M-1108; 41 Ag, 17 Cu, 18 Zn, 24 Cd.
For brazing, M P 1125-1160°F, silver solder.

GOLDSMITH GB45
M-1108, 45 Ag, 15 Cu, 16 Zn, 24 Cd
For brazing; M P 1125-1145°F, silver solder.

GOLDSMITH GB50
M-1108, 50 Ag, 15 5 Cu, 16 5 Zn, 18 Cd
For brazing, M P. 1160-1175°F, silver solder.

GOLDSMITH GB54.
M-1108, 54 Ag, 40 Cu, 5 Zn, 1 Ni.
Melting range 1375-1575°F
Brazing alloy, AMS 4772.

GOLDSMITH GB56.
M-1108, 56 Ag, 22 Cu, 17 Zn, 5 Sn
For Silver solder, M.P 1152-1203°F.

GOLDSMITH GB57
M-1108, 57 Ag, 33 Cu, 3 Mn, 7 Sn
Melting range: 1120 1345°F
Brazing alloy.

GOLDSMITH GB60
M-1108, 60 Ag, 25 Cu, 15 Zn.
For brazing, M.P 1260-1325°F, silver solder

GOLDSMITH GB65
M-1108; 65 Ag, 20 Cu, 15 Zn
For Silver solder, M P. 1280-1325°F.

GOLDSMITH GB70
M-1108, 70 Ag, 20 Cu, 10 Zn
For Silver solder; M.P. 1335-1390°F.

GOLDSMITH GB72.
M-1108; 72 Ag, 28 Cu.
For Silver solder; M P. 1335-1435°F.

GOLDSMITH GB75.
M-1108, 75 Ag, 0 22 Cu, 3 Zn
For silver solder; M.P. 1365-1490°F.

GOLDSMITH GB80.
M-1108; 80 Ag, 16 Cu, 4 Zn.
For brazing; M.P 1360-1490°F, silver solder.

GOLDSMITH GB85.
M-1108; 85 Ag, 15 Mn.
For Silver solder; M.P. 1760-1778°F.

GOLDSMITH GB95-5.
M-1108; 5 Ag, 95 Cd.
Melting range: 620-750°F.
Solder type alloy.

GOLDSMITH GB110.
M-1108, 10 Ag, 52 Cu, 38 Zn.
For Silver solder; M P. 1450-1565°F.

GOLDSMITH GB120.
M-1108; 20 Ag, 45 Cu, 35 Zn
For Silver solder, M P. 1430-1500°F.

GOLDSMITH GB131.
M-1108; 31.5 Ag, 34 Cu, 15.5 Zn, 19 Cd.
For Silver solder, M.P. 1165-1390°F.

GOLDSMITH GB140.
M-1108, 40 Ag, 18 Cu, 15 Zn, 27 Cd.
For Silver solder, M.P. 1135-1205°F.

GOLDSMITH GB145.
M-1108; 45 Ag, 30 Cu, 25 Zn.
For Silver solder; M P. 1250-1370°F.

GOLDSMITH GB150
M-1108, 50 Ag, 15 Cu, 25 Zn, 10 Cd
For Silver solder; M.P. 1166-1190°F.

GOLDSMITH GB160
M-1108, 60 Ag, 30 Cu, 10 Sn
Melting range 1095-1325°F.
Brazing alloy, AMS 4773.

GOLDSMITH GB165
M-1108, 65 Ag, 28 Cu, 5 Mn, 2 Ni.
Melting range· 1385-1445°F.
Brazing alloy.

GOLDSMITH GB175
M-1108, 75 Ag, 20 Cu, 5 Zn
For Silver solder, M.P. 1350-1425°F.

GOLDSMITH GB240
M-1108, 40 Ag, 30 Cu, 28 Zn, 2 Ni.
For Silver solder, M P 1240-1435°F.

GOLDSMITH GB245
M-1108, 45 Ag, 18 Cu, 21 Zn, 16 Cd.
For Silver solder, M P 1140-1185°F

GOLDSMITH GB250.
M-1108, 50 Ag, 34 Cu, 16 Zn
For brazing, M P 1260-1410°F, silver solder

GOLDSMITH GB260
M-1108, 60 Ag, 27 Cu, 13 In.
Melting range 1125-1310°F
Brazing alloy.

GOLDSMITH GB275
M-1108. 75 Ag, 25 Zn
For Silver solder, M.P 1300-1325°F.

GOLDSMITH GB340
M-1108, 40 Ag, 36 Cu, 24 Zn.
For Silver solder, M P. 1330-1445°F.

GOLDSMITH GB350.
M-1108, 50 Ag, 15.5 Cu, 15 5 Zn, 16 Cd, 3 Ni.
For brazing; M P. 1195-1275°F, silver solder.

GOLDSMITH GB440.
M-1108, 40 Ag, 30½ Cu, 29½ Zn.
Melting range. 1150-1350°F
Brazing alloy.

GOLDSMITH GB540.
M-1108; 40 Ag, 30 Cu, 25 Zn, 5 Ni.
For brazing, M.P. 1260-1550°F, silver solder.

GOLDSMITH GB650.
M-1108; 50 Ag, 28 Cu, 22 Zn.
For Silver solder; M.P. 1250-1340°F.

GOLDSMITH GB1270.
M-1108; 91 Ag, 7 P.
Melting range: 1185-1450°F.
For brazing copper and copper alloys.

GOLD SOLDER.
Eng.; Ag, Au, Cu, Zn.
For gold solder; corrosion resistant.

GOLD SOLDER, 8 CARAT.
40 Au, 37 Ag, 23 Cu.
For gold solder.

GOLD SOLDER 8 KT. CADMIUM NO. 1.
M-926; Au alloy.
For gold soldering; easy running, yellow.

GOLD SOLDER 8 KT. NO. 10.
M-926; Au alloy.
For gold soldering; hard running, yellow.

GOLD SOLDER 8 KT. WHITE NO. 5.
M-926; Au alloy.
For gold soldering; medium running, white.

GOLD SOLDER 9½ KT. CADMIUM NO. 1.
M-926; Au alloy.
For gold soldering; easy running, yellow.

GOLD SOLDER 9½ KT. NO. 10.
M-926; Au alloy.
For gold soldering; hard running, yellow.

GOLD SOLDER 9½ KT. WHITE NO. 5.
M-926; Au alloy.
For gold soldering; medium running, white.

GOLD SOLDER, 10 CARAT.
41 Au, 37 Ag, 21 Cu, 0.6 brass.
For gold solder.

GOLD SOLDER 10 KT. CADMIUM NO. 1.
M-926; Au alloy.
For gold soldering; easy flowing, yellow.

GOLD SOLDER 10 KT. NO. 10.
M-926; Au alloy.
For gold soldering; hard flowing, yellow.

GOLD SOLDER 10 KT. WHITE NO. 5.
M-926; Au alloy.
For gold soldering; medium flowing, white.

GOLD SOLDER, 12 CARAT.
50 Au, 35 Cu, 15 Ag.
For gold solder; corrosion resistant.

GOLD SOLDER, 14 CARAT.
50 Au, 33 Ag, 17 Cu.
For gold solder.

GOLD SOLDER, 16 CARAT.
75 Au, 17 Ag, 8.3 Cu.
For gold solder.

GOLD SOLDER, 18 CARAT.
75-63 Au, 13-31 Ag, 6.3-12 Cu.
For gold solder.

GOLD SOLDER, BEST.
63 Au, 23 Ag, 15 Cu.
For gold solder.

GOLD SOLDER, EASY MELT.
55 Au, 32 Ag, 14 Cu.
For gold solder.

GOLD SOLDER, VERY EASY MELT.
55 Ag, 29 Cu, 12 Au, 5.5 Zn.
For gold solder.

GOLD SPEZIAL.
M-1344; 1.35 C, 2 Co, 4.3 Cr, V, W, bal Fe.
For engravers' tools, milling and form cutters, taps; high speed steel.

GOLD STAR.
M-32; 0.77 C, 13.7 W, 5.0 Co, 3.75 Cr, 2.0 V, bal Fe.
For high speed cutting tools; high speed steel for heavy duty service.

GOLD SUPER.
M-1344; 0.79 C, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

GOLD SUPER KOBALT 10.
M-1344; 0.76 C, 10 Co, 4 2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel.

GOLIATH.
M-459; 1.5 C, 11.5 Cr, 0 7 Mo, bal Fe.
For drawing dies; non-deforming.

GOLIATH G.
M-459; C, alloy, bal Fe.
For dies; oil hardened.

GOLIATH GNV.
M-459; 0.55 C, 0.7 Cr, 0.2 Mo, 1.5 Ni, 0.1 V, bal Fe.
For die blocks, gears, mandrels, oil hardened, tough.

GOLIATH SPECIAL M.
M-459; C, alloy, bal Fe
For dies; oil hardened

GOLIATH SPEZIAL.
M-459; 2 2 C, 13 Cr, bal Fe
For drawing dies, oil or air hardened.

GOLIATH SPEZIAL M.
M-459; C, Cr, Ni, Mo, bal Fe
For swaging dies; oil hardened.

GOLIATH V.
M-459; C, alloy, bal Fe.
For dies; oil hardened.

GOMAK 2
France; 3.5-5.0 Al, 2 5-3 5 Cu, 0.02-0 10 Mg. bal Zn.
Die cast: 46,000-53,000 TS; 5-14 El; 80-100 Brin.
For motor frames, gear housings, hardware; similar to Zamak 2.

GOMAK 3
France; 3 5-4 3 Al, 0 03-0 08 Mg, bal Zn.
Die cast· 35,000-43,000 TS, 4-11 El, 60-85 Brin
For gear housings, motor frames, fuel pumps; similar to Zamak 3.

GOMAK 5
France, 3 5-4.3 Al, 0 75-1.25 Cu, 0 03-0.06 Mg, bal Zn.
Die cast: 42,000-50,000 TS; 13-3 El; 70-95 Brin.
For motor frames, gear housings, hardware; similar to Zamak 5

GONG METAL.
Eng; 78 Cu, 22 Zn. For gongs

GORHAM M-40-U12.
M-820; 0.7 C, 4 Cr, Mo, B, Co, bal Fe.
For tools, dies, cutters; high speed steel, abrasion resistant.

GOST-0Ch18N9.
M-Russia; 0 06 C, 18 Cr, 9 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS, B 80 Rock.
For tanks, evaporators, agitators, mixers, chemical plant equipment.
Type 304 stainless steel, austenitic.

GOST-0X18H9.
M-Russia; 0.06 C, 19 Cr, 10 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 150 Brin.

For chemical plant equipment, evaporators, tanks, mixers.
Type 304 stainless steel, austenitic.

GOST-1Ch18N.
M-Russia; 0.05 C, 18 Cr, 12 Ni, 2 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; B 80 Rock.
For chemical plant equipment, acid tanks, evaporators, digesters
Type 316 stainless steel, austenitic, acid resistant.

GOST-1Ch18N9.
M-Russia; 0.10 C, 18 Cr, 9 Ni, bal Fe.
Annealed. 80,000 TS; 35,000 YS; B 80 Rock.
For chemical and pharmaceutical plant equipment, evaporators, trim, molding, digesters.
Type 302 stainless steel, austenitic.

GOST-1Ch18N9T.
M-Russia; 0.06 C, 18 Cr, 10 Ni, 0.3 Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 185 Brin.
For welded structures, and tanks, mixers, evaporators, agitators.
Type 321 stainless steel, austenitic, stabilized, welding grade.

GOST-1X18H.
M-Russia; 0.06 C, 17 Cr, 12 Ni, 2 Mo, bal Fe.
Annealed: 80,000 TS, 30,000 YS, B 80 Rock.
For chemical plant equipment, valve trim, digesters, evaporators.
Type 316 stainless steel, austenitic, corrosion resistant

GOST-1X18H9
M-Russia, 0.12 C, 18 Cr, 9 Ni, bal Fe.
Annealed 90,000 TS; 40,000 YS, B 85 Rock.
For tanks, chemical and pharmaceutical plant equipment, evaporators.
Type 302 stainless steel, austenitic.

GOST-1X18H9T
M-Russia, 0.06 C, 18 Cr, 11 Ni, 0.3 Cb, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 55 Fl; 150 Brin
For welded structures and tanks, mixers, agitators, digesters.
Type 321 stainless steel, stabilized, austenitic, welding grade.

GOST-2Ch13
M-Russia, 0.2 C, 13 Cr, bal Fe
Annealed 95,000 TS, 50,000 YS, B 92 Rock.
For cutlery, surgical instruments, gears, shafts, ball bearings
Type 420 stainless steel, heat treatable.

GOST-2X13
M-Russia; 0.20 C, 12-14 Cr, bal Fe
Annealed 95,000 TS, 50,000 YS; B 92 Rock.
For gears, shafts, cutlery, surgical instruments.
Type 420 stainless steel, hardenable.

GOST-CH17
M-Russia; 0.10 C, 17 Cr, bal Fe
Annealed: 70,000 TS; 40,000 YS; 140 Brin.
For dairy and chemical plant equipment, oil refinery accessories, automobile trim, oil burners, fasteners
Type 430 stainless steel. Non-hardenable.

GOST-Ch18N11B.
M-Russia; 0.06 C, 18 Cr, 12 Ni, 0.6 Cb, bal Fe.
Annealed: 90,000 TS, 35,000 YS; B 85 Rock.
For welded structures and tanks, chemical plant equipment, agitators, mixers, evaporators.
Type 348 stainless steel, austenitic, heat and corrosion resistant.

GOST-Ch18N12M2T
M-Russia; 0.08 C, 18 Cr, 10 Ni, 2 Mo, bal Fe.
For chemical plant equipment, evaporators, agitators, tanks.
Type 18-10 Mo stainless steel. Acid resistant, austenitic.

GOST-Ch20N14S2.
M-Russia; 0.16 C, 24 Cr, 14 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; B 84 Rock.
For salt pots, furnace parts, heat treating fixtures.
Type 309B stainless steel, austenitic, heat and corrosion resistant.

GOST-Ch23N13.
M-Russia; 0.15 C, 23 Cr, 14 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; B 83 Rock.
For heat treating boxes, combustion chambers, salt pots, kilns.
Type 309S stainless steel, heat and corrosion resistant.

GOST-Ch23N18.
M-Russia, 0.20 C, 25 Cr, 21 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; B 90 Rock.
For salt pots, furnace parts, heat treating equipment.
Type 310S stainless steel, heat and corrosion resistant.

GOST-Ch25.
M-Russia; 0.20 C, 25 Cr, bal Fe.
Annealed. 85,000 TS; 50,000 YS; 180 Brin.
For salt pots, furnace parts, heat treating equipment and fixtures.
Type 446 stainless steel, heat and corrosion resistant.

GOST-Ch25N20S2.
M-Russia, 0.20 C, 25 Cr, 20 Ni, bal Fe
Annealed 100,000 TS; 50,000 YS, B 90 Rock.
For furnace parts, salt pots, heat treating fixtures.
Type 314 stainless steel, austenitic, heat and corrosion resistant.

GOST-X17.
M-Russia; 0.10 C, 14-18 Cr, bal Fe.
Cold Rolled 100,000 TS; 70,000 YS, 190 Brin
For automotive trim, hardware, oil burners, fasteners, soot blowers
Type 430 stainless steel, corrosion resistant

GOST-X18H12M2T.
M-Russia, 0.06 C, 17 Cr, 12 Ni, 2 Mo, bal Fe.
Annealed 85,000 TS; 35,000 YS, B 82 Rock
For chemical plant equipment, fixtures, mixers, agitators
Type 18-10 Mo stainless steel, acid resistant, austenitic.

GOST-X18H11S.
M-Russia; 0.06 C, 18 Cr, 12 Ni, 0.8 Cb, bal Fe.
Annealed: 90,000 TS, 40,000 YS; B 82 Rock
For exhaust manifolds, storage containers, welded structures, chemical plant equipment.
Type 347 stainless steel, heat and corrosion resistant, austenitic

GOST-X20H14C2.
M-Russia; 0.15 C, 18 Cr, 10 Ni, 3 Si, bal Fe.
Annealed: 90,000 TS; 40,000 YS, B 85 Rock.
Heat treating fixtures and equipment, furnace parts, tube supports.
Type 302B stainless steel, heat and corrosion resistant.

GOST X23H13
M-Russia; 0.18 C, 23 Cr, 14 Ni, bal Fe.
Annealed. 90,000 TS; 40,000 YS; B 84 Rock.
For heat treating fixtures, furnace parts, salt pots, oil burners.
Type 309S stainless steel, heat and corrosion resistant.

GOST-X23H18.
M-Russia; 0.20 C, 25 Cr, 21 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; B 89 Rock.
For furnace parts and equipment, heat treating boxes and fixtures.
Type 310S stainless steel, heat and corrosion resistant.

GOST-X25.
M-Russia; 0.25 C, 24-30 Cr, bal Fe.
Annealed: 80,000 TS; 48,000 YS; B 85 Rock.
For heat treating boxes, furnace parts, fittings, hardware, valves.
Type 446 stainless steel, heat and corrosion resistant.

GOST-X25H20C2.
M-Russia; 0.20 C, 24 Cr, 20 Ni, bal Fe.
Annealed: 100,000 TS; 50,000 YS; B 90 Rock.
For furnace parts, radiant tubes, heat treating boxes, fixtures.
Type 314 Stainless steel, heat and corrosion resistant.

GOTTINGEN AGG2.
M-1363; 99.5 Al.
Soft: 13,000 TS; 5000 YS; 45 El; 23 Brin.
Hard: 24,000 TS; 22,000 YS; 15 El; 44 Brin
For roofing, culverts, architectural trim, corrosion resistant.

GOTTINGEN AGG3.
M-1363; 1.0-1.5 Mn, 0.3 max Cr, bal Al.
Soft: 16,000 TS; 6000 YS; 40 El.
Hard. 29,000 TS, 27,000 YS; 10 El.
For cooking utensils, heat exchangers, tanks, furniture; good forming and welding properties.

GOTTINGEN AGG4.
M-1363, 1.5-3.0 Mg, 0.5-1.5 Mn, 0.3 max Cr, bal Al.
Soft: 26,000 TS; 10,000 YS, 20 El; 45 Brin.
Hard: 41,000 TS, 36,000 YS, 5 El; 77 Brin.
For roofing, hydraulic tubing, architectural trim, good forming and welding properties.

GOTTINGEN AGG51
M-1363; 0.6-1.4 Mg, 0.6-1.6 Si, 0.3 max Cr, 0.6-1.0 Mn, bal Al.
Annealed: 21,000 TS; 8000 YS; 24 El
For window frames, fan blades, gutters, boats, good formability and weldability.

GOTTINGEN AGG57.
M-1363; 2-4 Mg, 0.4 max Mn, 0.3 max Cr, bal Al.
Soft. 28,000 TS, 13,000 YS; 30 El; 47 Brin
Hard: 40,000 TS, 35,000 YS, 10 El; 73 Brin.
For aircraft tanks and fittings, fuel lines, marine parts, resists sea water corrosion

GOVERNMENT BRONZE
M-102; 86-89 Cu, 7.5-11 Sn, 1.5-4.5 Zn, 0.75 Ni, 0.3 Pb.
35,000 TS; 17,000 YS; 14-16 El.
For valves, gears, fittings, steam valves; composition "G."

GOVERNMENT BRONZE (SCOVILL NO. 99 ALLOY). 510.
M-102; 95 Cu, 5 Sn.
Soft: 50,000 TS; 22,000 YS; 58 El.
Hard: 95,000 TS; 94,000 YS; 5 El.
For springs, switches; Rockwell "B"-32-93

GOVERNMENT BRONZE-H.
U.S.; 82-84 Cu, 12.5-14.5 Sn, 4.5-2.5 Zn, 0.8-1.0 Pb, 0.1 Fe.
For journals, bushings, bearings; high strength.

GOVERNMENT BRONZE SUBSTITUTE.
90 Cu, 6.5 Sn, 3 Zn, 0.5 Pb.
For structural and marine fittings; corrosion resistant.

GRAC.
M-821; 10 Sn, Sb, As, Cd, Ni, graphite, bal Pb. 27 Brin.
For bearings; M.P. 453-576°F.

GRACITE.
M-1009; 0.9 C, 1.25 Mn, 0.5 Cr, 0.5 W, bal Fe.
For punches, forming and beading dies, upsetters; oil hardened, non-deforming.

GRADE "A" (Grade 1).
M-822; 0.95 C, 0.3 Mn, 0.2 Si, bal Fe.
Water hardening tool steel, AISI W1.

GRADE S.
M-788; C, Ni, bal Fe.
For sucker rods in oil wells, resists H_2S in water.

GRADE X.
M-85; 1.2 C, bal Fe.
For drills, taps, cutters; drill rod, water hardening; obsolete.

GRAINAL NO 79.
M-394; 20 Ti, 13 Al, 4 Zr, 8 Mn, 5 max Si, bal Fe
Used in steel manufacturing; increases hardenability.

GRAINLOY.
M-136; 3 C, 1.3 Si, Mn, bal Fe.
For rolls; cast iron.

GRALUR
M-358, C, bal Fe
For drills

GRAMIX.
M-245, Cu-Sn-graphite.
For light machine bearings, bushings, finely powdered mixture, self-lubricating

GRANADA TOOL
M-38, 1.0 C, bal Fe
For mining sledges, tools, dies; water hardened

GRANADA VANADIUM.
M-38, 1 C, 0.3 Mn, 0.2 V, bal Fe
For blacksmith tools, shears, punches, forming dies, water hardening.

GRANALEC.
M-633, Si, bal Fe
For laminations; high magnetic permeability.

GRANATOR
M-633, Si, bal Fe.
For laminations; high magnetic permeability

GRANATURE.
M-633, Si, bal Fe.
For laminations; high magnetic permeability

GRANDIOS
M-1314, 0.8 C, 4.7 Co, 4.3 Cr, 0.7 Mo, 1.5 V, 18 W, bal Fe
For lathe and planer tools, taps, reamers, drills, high speed steel.

GRANDIOS 3VN
M-1314, 0.86 C, 2.8 C, 4.3 Cr, 0.8 Mo, 2 V, 12 W, bal Fe.
For lathe and planer tools, drills, hobs, reamers; high speed steel.

GRANDIOS 5V.
M-1314; 1.35 C, 2 Co, 4.3 Cr, 2 V, 12 W, bal Fe.
For lathe tools, form cutters, broaches; high speed steel.

GRANDIOS 5VN.
M-1314; 0.80 C, Co, 4.3 Cr, Mo, V, W, bal Fe.
For lathe and planer tools, broaches; high speed steel.

GRANDIOS EXTRA.
M-1314; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, milling cutters; high speed steel.

GRANE 1.
M-111; 0.55 C, 1 Cr, 3 Ni, 0.3 Mo, bal Fe.
For drop forging dies; tough.

GRANE 2.
M-111, 0.55 C, 1.5 Cr, 3 Ni, bal Fe.
For drop forging dies; tough.

GRANFIN CAST IRON
Eng ; 2.2-2.6 C, 1.7-2.1 graphite; 2.3-2.5 Si, 0.7-1.0 Mn, bal Fe
For frames, housings, general castings; cast iron.

GRANFORMER.
M-633, Si, bal Fe.
For laminations, high magnetic permeability.

GRANFORMER 52
M-633, 4.7 Si, bal Fe
For transformers, high permeability

GRANFORMER 58
M-633; 4.0-4.4 Si, bal Fe
For transformers, high permeability.

GRANFORMER 65
M-633, 4.0-4.5 Si, bal Fe
For rtansformers, low core loss

GRANFORMER 72
M-633, 3.0-3.4 Si, bal Fe.
For transformers for radios, high permeability

GRANIMO
M-633, Si, bal Fe
For laminations, high magnetic permeability.

GRANISIL
M-633, Si, bal Fe
For laminations, high magnetic permeability

GRANIT
M-1318, 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies, oil hardening, nondeforming

GRANIT 0
M-1319, 0.55 C, 0.70 Cr, 0.18 Mo,, 1.65 Ni, 0.1 V, bal Fe
For gears, pinions, shafts, crankshafts, oil hardened, shock resistant.

GRANIT 1
M-1319, 0.10 C, 0.37 Mn, bal Fe.
For plastic mold dies, hubbable, case hardening

GRANIT 2
M-1319; 1.65 C, 0.35 Si, 11.5 Cr, 0.10 V, bal Fe.
For blanking and forming dies; air hardening, nondeforming.

GRANIT 3.
M-1319; 0.56 C, Ni, Cr, Mo, bal Fe
For gears, crankshafts; oil hardened, shock resistant.

GRANIT IV.
M-1319; 0.40 C, 13 Cr, bal Fe.
Annealed 90,000 TS, 45,000 YS; 40 El, 50 RA; 190 Brin.
For cutlery, surgical instruments; corrosion resistant; Type 420.

GRANIT V.
M-1319; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For bearings, liners; case hardening steel, water or oil hardening.

GRANIT 30.
M-1319, 1.05 C, 0.9 Mn, 1 Cr, 1.15 W, bal Fe.
For cold work tools, dies, bearings, water hardened.

GRANIT Co.
M-1318, 0.65 C, Cr, Co, bal Fe.
For tools, dies, oil hardening.

GRANITE CITY HIGH-YIELD NO. 1.
M-633; C, 0.7-0.9 Mn, 0.01 max P, 0.035 S, 0.15-0.20 Si, 0.20 min Cu, 0.15 min Cr, bal Fe.
Annealed. 70,000 TS, 55,000 YS, 25 El.
For transportation equipment, cars, buses, trucks; corrosion resistant.

GRANITE CITY HIGH-YIELD NO 2
M-633; C, 1.2-1.6 Mn, 0.01 max P, 0.035 S, 0.15-0.20 Si, 0.2 min Cu, 0.15 min Cr, bal Fe.
Annealed: 85,000 TS, 70,000 YS, 18 El.
For bridges, transportation equipment, cars, buses, trucks, corrosion resistant.

GRANIT W.
M-1318; 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For thread rolling dies, blanking and forming dies; oil hardened, non-deforming.

GRANT.
M-1705, 0.45 C, 0.55 Mn, 0.2 Si, 0.95 Cr, 0.20 V, bal Fe
Tool steel for miscellaneous applications as hammers, hatchets. AISI L2.

GRAPH-AIR.
M-376, M-341, 1.35 C, 1.85 Mn, 1.20 Si, 1.85 Ni, 1.50 Mo, bal Fe
Air hardening tool steel, minimal distortion

GRAPHALLOY BABBITT
M-247, graphite impregnated with Pb-base Babbitt.
Sintered: 5000 TS
For self-lubricating bearings, seal rings, contacts, shoes, C.S 19000.

GRAPHALLOY BRONZE
M-247, graphite impregnated with bronze
Sintered 5500 TS
For self-lubricating bearings, seal rings, contact shoes, C S. 24000

GRAPHALLOY CADMIUM.
M-247; graphite impregnated with Cd.
Sintered 5000 TS
For bearings, contacts for controllers, switches, seal rings, maximum temperature 250°F; self lubricating.

GRAPHALLOY COPPER
M-247, graphite impregnated with Cu.
Sintered 6000 TS.
For slip ring brushes, contacts on controllers, relays, bearings; self lubricating, maximum temperature 700°F; C.S. 25000

GRAPHALLOY GRADE A.
M-247; 55 graphite, bal Pb Babbitt.
For bearings of light service; Babbitt soft grade.

GRAPHALLOY GRADE N.
M-247; 55 graphite, bal Pb Babbitt.
For bearings of medium service; Babbitt medium grade.

GRAPHALLOY GRADE O.
M-247; 55 graphite, bal Pb Babbitt.
For bearings; Babbitt hard grade.

GRAPHALLOY GRADE S
M-247; 55 graphite, bal Pb Babbitt.
For bearings; medium hardness.

GRAPHALLOY IRON.
M-247; graphite impregnated with Fe.
Sintered: 6000 TS.
For self-lubricating bearings, submerged bearings; C.S. 25000.

GRAPHALLOY SILVER
M-247; graphite impregnated with Ag.
Sintered: 5500 TS.
For contacts on relays, circuit breakers, bearings, brushes, maximum temperature 700°F; self lubricating; C.S. 24000.

GRAPHEX.
M-824; 87-92 Cu, 9-11 Sn, 4 graphite.
13,000 TS; 11,000 YS; 1 El; 30 Brin.
For bearings, bushings; self lubricating.

GRAPHIDOX NO. 4.
M-394; 10 Ti, 48 Si, 6 Ca, bal Fe
Used in iron manufacturing, for graphitization, reduces chill.

GRAPHITE METAL-1.
Eng ; 80 Pb, 20 Sb
For crucibles, lubricants, lead pencils

GRAPHITE METAL-2
Eng ; 68 Pb, 17 Sb, 15 Sn.
For foundry facings, electric brush carbons.

GRAPHITE NITRALLOY.
M-24, M-386; 1.25-1 5 C, 1.25-1 5 Si, 0.4-0.6 Mn, 1-1.5 Al, 0.2-0.4 Cr, 0 3 Mo, bal Fe
Heat treated: 85,000 TS; 70,000 YS; 19 El, 24 RA
For wear resistant parts; wear resistant after nitriding

GRAPH-Mo.
M-376, M-341; 1.5 C, 0.25 Mo, 0 8 Si, 0.4 Mn, bal Fe.
Annealed· 85,000 TS; 50,000 YS, 25 El; 40 RA, 197 Brin
Heat treated: 218,000 TS, 170,000 YS; 9 El; 14 RA; 388 Brin.
For plug and ring gauge dies, taps, spindles, rolls; wear and abrasion resistant graphitic steel, non-seizing.

GRAPHO BABBITT METAL NO 1.
M-300, graphite and Babbitt.
19 Brin
For Babbitt, graphite bearings, transmission and railroad axle bearings, engine bearings; low bearing temperature, reduced friction losses

GRAPHO BABBITT METAL NO. 2.
M-300; 0.3 graphite, Sn, Pb, Sb
26 Brin.
For bearings for electrica motors, blowers, high speed transmissions; high velocity and high pressures.

GRAPHO BABBITT METAL NO. 3
M-300; 0.3 graphite, Sn, Pb, Sb.
29 Brin.
For bearings for crankshafts in internal combustion engines, mining machinery, machine tools, reciprocating pumps; high pressure and high velocity with alternating load.

GRAPHO BABBITT METAL NO. 4.
M-300; 0.4 graphite, Sn, Pb, Sb.
34 Brin.
For bearings for diesel engines, heavy duty compressors; heavy duty; all kinds of shocks and velocities.

GRAPH-TUNG.
M-376; 1.5 C, 0.5 Mn, 0.65 Si, 0.5 Mo, 2.8 W, bal Fe.
For blanking and drawing dies, coining dies, shear blades; abrasion resistant graphitic steel, non-seizing.

GRAY CUT COBALT.
M-115; 0 8 C, 1.6 V, 20.5 W, 4.25 Cr, 12.25 Co, 0.6 Mo, bal Fe.
For cutting tools, shapers, planers; high speed steel.

GRAYDAC.
M-712; 0.08 C, 0.31 Mn, 0 29 Si, bal Fe.
Welded: 64,000-72,000 TS; 55,000-62,000 YS; 26-19 El; 45-30 RA.
For welding electrodes; low spatter; E-6013.

GRAY DEVIL
M-712, 0 09 C, bal Fe.
Welded 77,000 TS; 65,000 YS, 19 El, 30 RA.
For welding rods for steel, E-6012

GRAY GOLD.
Eng , 86 Au, 5 7-17 0 Fe, 0-8 6 Ag
For jewelry, corrosion resistant

GRAY LABEL
M-341, 0 95 C, bal Fe
For cold heading dies, water hardening

GRAY LABEL STYRIAN
M-651, 0 88 C, 0 19 Mn, bal Fe
For tools, drills, taps; water hardening

GREAT WESTERN GW.
M-1067, 0 85 C, 1 Mn, 0 35 Si, 0 5 Cr, 0 5 W, bal Fe
For milling cutters, drills, dies, punches, mandrels; oil hardened, non deforming

GREEK ASCOLOY
M-57, 0 12 max C, 12 14 Cr, 1 8-2 2 Ni, 2.5-3 5 W, 0 5 max Mo, 0 5 max Cu, bal Fe.
Heat treated 137,000-195,000 TS, 108,000-160,000 YS, 23-14 El; 63-51 RA, 290-400 Brin.
For compressor blades and vanes, fasteners, jet engine components, heat resistant to 1000°F.

GREEN GOLD.
Eng , 75 Au, 11-25 Ag, 13-0 Cd
For jewelry, corrosion resistant.

GREEN LABEL.
M-343, 0 8-1 1 C, bal Fe
For tools depending on temper, "Hellers Extra Tool"

GREEN LABEL.
M-343, 0.8-0 9 C, 1 2-1.4 Mn, 0.4-0.6 W, 0 4-0 6 Cr, bal Fe
For precision tools and files, taps, reamers, chasters, gages, non-deforming; "Stayput" Oil Hardening

GREEN LABEL.
M-261, 0 7-1.2 C, bal Fe.
For tools, dies, shear blades, punches, taps; shock resistant

GREEN LABEL.
M-373, 0.7-1 4 C, bal Fe.
For tools, drills, cutters; water hardening.

GREEN LABEL.
M-341, 0.5 C, 1.0 Cr, 0.75 Mn, 0.18 V, bal Fe.
For gears, crankshafts, springs; oil hardening; shock resisting.

GREEN LABEL.
M-365; 0.7-0.8 C, bal Fe.
For tools.

GREEN LABEL.
M-694; 0.9 C, 1.15 Mn, 0.5 Cr, 0.5 W, 0.2 V, bal Fe.
For tools, dies, punches; nondeforming, oil hardening.

GREEN LABEL DRILL ROD.
M-32; 1.2 C, 0.2 Mn, 0.2 Si, bal Fe.
AISI Type W1 water hardening tool steel.

GREEN LABEL EXTRA.
M-343; 0.8-1.1 C, bal Fe.
For tools, dies; water hardening.

GREENLEAF S-6.
M-1194; WC + Co.
For tipped cutting tools; cemented carbides.

GRIDALOY M.
M-1523; 94 Ni, 5 Mn.
Resistance wire: 105 ohms per cir. mil. ft.
Wire ann: 50,000 psi.; hard drawn: 140,000 psi.
For electrical resistors; max.op.temp.: 500°C.

GRIDALOY P.
M-1523; 98 Ni, plus additives.
Resistance wire: 100 ohms per cir. mil. ft.
Wire ann: 90,000 psi; hard drawn 140,000 psi.
For electrical resistors; max.op.temp.: 500°C.

GRIDNIC E.
M-44; 4.5 Mn, bal Ni.
For radio sets and tube parts, heat resistant.

GRIDNIC T.
M-44; 0.4 max C, 0.2-0.6 Mn, 0.2-0.5 Mg, bal Ni.
For grid wire, heat resistant.

GRIDUR C25.
M-380; 2.6 C, 27.0 Cr, bal Fe.
Weld: Rock C 50-52.
For worm conveyors, guide bars, slides, drawing dies
Hard facing electrode. Wear and corrosion resistant

GRIDUR C35
M-380, 3.5 C, 1.0 Si, 35.0 Cr, bal Fe.
Weld: Rock C 60-62.
For machine parts and tools subject to abrasion by sand, gravel, coal, cement. Corrosion and wear resistant. Hard facing electrode.

GRIDUR G5.
M-380; Granular WC in steel tubes
For tools and machine parts, rotary borers, rock drills, dredger teeth
Hard facing electrode. Wear resistant.

GRIDUR G10.
M-380, Granular WC in steel tubes.
For tools and machine parts, rotary borers, rock drills, dredger teeth.
Hard facing electrode Wear resistant

GRIDUR G15.
M-380; Granular WC in steel tubes
For tool and machine parts, rotary borers, rock drills, dredger teeth, cushing jaws.
Hard facing electrode. Wear resistant.

GRIDUR K40.
M-380; 1.2 C, 1.5 Si, 65.0 Co, 27.0 Cr, 5.5 W, bal Fe.
Weld: Rock C 40-45.
For steam valves, exhaust valves, bearings, trimming dies.
Hard facing electrode. Corrosion, heat and wear resistant.

GRIDUR K50.
M-380; 2.2 C, 55.0 Co, 27.0 Cr, 14.0 W, bal Fe.
Weld: Rock C 50-54.
For steam valves, exhaust valves, bearings, trimming dies.
Corrosion, heat and wear resistant. Hard facing electrode.

GRIDUR K60.
M-380; 2.7 C, 53.0 Co, 25.0 Cr, 19.0 W, bal Fe.
Weld: Rock C 56-60.
For needle valves, impeller parts.
Hard facing electrode. Wear and corrosion resistant.

GRIDUR SA1.
M-380; 1.0 C, 4.2 Cr, 2.8 Mo, 2.5 V, 3.0 W, bal Fe.
Weld: Rock C 48.
For hot working tools, air cooling systems.
Hard facing electrode. High speed steel.

GRIDUR SA2.
M-380; 0.85 C, 4.2 Cr, 1.2 V, 18 W, bal Fe.
Weld: Rock C 58-62.
For tough and impact resistant cutting tools.
Hard facing electrode. High speed steel.

GRIDUR SA3.
M-380; 1.0 C, 4.2 Cr, 9.0 Mo, 1.2 V, 1.8 W, bal Fe.
Weld: Rock C 58-62.
For turning tools, milling cutters, reamers, drills, hot shear blades.
Hard facing electrode. High speed steel.

GRIDUR SA4.
M-380; 1.5 C, 8.0 Co, 4.5 Cr, 6.0 Mo, 3.2 V, 8.0 W, bal Fe.
Weld Rock C 62-65
For cutting tools with highest wear resistance and hardness at elevated temperatures.
Hard facing electrode. High speed steel

GRIDUR-SCS.
M-380; 2.0 C, 0.3 Si, 0.3 Mn, 12.0 Cr, 0.8 W, bal Fe.
Weld: 450 Brin
For welding cutting and blanking dies, punches, shears, broaches, drawing tools.
Hard facing electrode.

GRIDUR SCS-E.
M-380, 2.0 C, 12 Cr, bal Fe.
Weld: Rock C 63-65.
For hard facing cutting and blanking dies, punches, shears, broaches.
Hard facing electrode.

GRIDUR WA1.
M-380, 0.5 C, 2.3 Cr, 0.8 Mo, 1.7 Ni, 0.1 V, bal Fe
Weld: 300-400 Brin.
For welding on tools requiring high toughness and impact resistance, die blocks, upsetters, piercers to 450°C.
Hard facing electrode. Hot work steel.

GRIDUR WA2.
M-380; 0.3 C, 2.3 Cr, 0.5 Mo, 0.6 V, 4.5 W, bal Fe.
Weld: Rock C 45.
For welding on hot working tools, forging dies, mandrels, punches, bushings.
Hard facing electrode. Hot work steel.

GRIDUR WA3.
M-380; 0.3 C, 2.3 Co, 2.7 Cr, 0.4 V, 9.0 W, bal Fe.
Weld: Rock C 48.
For hot working tools, air cooling systems.
Hard facing electrode. Hot work steel.

GRIESHEIM-EA2.
M-380; 0.5 C, 0.4 Si, 5.0 Mn, bal Fe.
Weld: 500 Brin.
For welding skid rails, crusher jaws, baffle plates, dredger parts.
Hard facing electrode.

GRIESHEIM-EA3.
M-380; 0.45 C, 0.45 Si, 0.4 Mn, 5.8 Cr, bal Fe.
Weld: 600 Brin.
For welding crushing jaws, dies, cams, worms, breakers, chain wheels.
Hard facing electrode.

GRIESHEIM-EA600.
M-380; 0.5 C, 2.4 Si, 0.4 Mn, 9.0 Cr, bal Fe.
Welded: 560-600 Brin.
For welding crushing jaws, dies, cams, worms, breakers, chain wheels.
Hard facing electrode.

GRIESHEIM-EA600W.
M-380; 0.5 C, 0.5 Mn, 2.5 Si, 8.0 Cr, bal Fe.
Weld: 560 Brin.
For welding crusher jaws, dies, breakers, cams, worms, chain wheels.
Hard facing electrode.

GRIESHEIM EA-Braun.
M-380, 0.22 C, 1.2 Si, 0.8 Mn, bal Fe.
Weld: 250 Brin.
For welding for rails, switch tongues, wheel tires, worms, axes, cams.
Welding electrode, hard surfacing.

GRIESHEIM-EA-Violet.
M-380; 0.3 C, 1.2 Si, 1.2 Mn, 1.0 Cr, bal Fe.
Weld: 350 Brin.
For welding rails, switch tongues, wheel tires, worms, axes, shafts, cams
Welding electrode, hard facing.

GRIESHEIM Nima.
M-380; 0.7 C, 0.6 Si, 13 Mn, 3.5 Ni, bal Fe.
Weld: 200 Brin.
For welding crusher jaws, mill beaters, dredger teeth, rolling mill parts.
Hard facing electrode. Austenitic Work hardens to 450 Brinell.

GRIESHEIM "RAUCHLOS"
M-380; 0.2 C, bal Fe.
For welding rods.

GRIESHEIM "SINI."
M-380; Alloy, bal Cu.
For welding rods for copper welding.

GRIESHEIM Stama.
M-380; 1.0 C, 0.4 Si, 13 Mn, bal Fe.
Weld: 200 Brin.
For welding mill beaters, crushing jaws, dredger teeth, rolling mill parts.
Austenitic hard facing electrode. Work hardens to 450 Brinell.

GRIFFIN.
M-350, C, Cr, Mn, bal Fe.
For dies, punches, thread rolling tools, non-deforming.

GRILLO 2105.
M-1134, 5 Al, 1 Cu, 0.02 Ga, bal Zn.
For die castings.

GRILLO 31010.
M-1134; 10 Al, 1 Cu, 0.02 Ga, bal Zn.
For castings.

GRIMM 4S4-ZH.
M-1316; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 150,000 YS; 10 El; 30 RA; 390 Brin.
For springs, taps, drills, hobs, reamers; Type W1; water hardened.

GRIMM BRF.
M-1316; 0.20 C, 13 Cr, 0.3 Mn, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For turbine blades, valves, cutlery, surgical instruments; Type 420; stainless.

GRIMM CWL.
M-1316; 2.1 C, 11.5 Cr, 0.70 W, 0.30 Mn, bal Fe.
For blanking and forming dies, punches; oil hardened, non deforming.

GRIMM DSA.
M-1316; 0.38 C, Cr, V, Si, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

GRIMM DSW.
M-1316; 0.45 C, W, Cr, V, bal Fe.
For header dies, upsetters, crimpers; oil hardened.

GRIMM G4.
M-1316; 0.75 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated: 185,000 TS; 140,000 YS; 15 El; 40 RA; 375 Brin.
For rails, springs, tools, axes, hammers; water hardened.

GRIMM GC15.
M-1316; 1.05 C, 1.0 Cr, bal Fe.
For bearings, liners, bushings, water hardened, wear and abrasion resistant.

GRIMM GC120
M-1316, 2.1 C, 11.5 Cr, 0.3 Mn, bal Fe
For blanking and forming dies, oil hardened, non-deforming

GRIMM GCK
M-1316, 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant

GRIMM GCM
M-1316, 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, dies, shears, crimpers; oil hardened, non-deforming

GRIMM GCS
M-1316; 0.90 C, Cr, Si, bal Fe.
For bearings, bushings, liners, water hardened, wear resistant.

GRIMM GCZ
M-1316, 0.90 C, 0.80 Cr, 0.3 Mn, 0.25 Si, bal Fe.
For bearings, cutters, liners, bushings, water hardened, wear resistant.

GRIMM GEE.
M-1316, 0.15 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Annealed: 70,000 TS, 40,000 YS; 25 El, 60 RA, 145 Brin
For gears, bolts, machine tool parts; case hardening steel.

GRIMM GH4.
M-1316; 0.75 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Heat treated 180,000 TS, 132,000 YS; 10 El; 34 RA, 375 Brin
For springs, rails, hammers, tools, cutters, Type W1; water hardened.

GRIMM GH5.
M-1316; 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated. 160,000 TS, 113,000 YS; 12 El; 40 RA, 325 Brin.
For gears, springs, fasteners; water hardened

GRIMM GHM.
M-1316, 0.56 C, Ni, Cr, Mo, V, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

GRIMM GK3.
M-1316 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

GRIMM GK5.
M-1316; 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.55 V, 18 W, bal Fe.
For lathe and planer tools, reamers; high speed steel.

GRIMM GK10.
M-1316; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, reamers, milling cutters; high speed steel.

GRIMM GKS.
M-1316; 1.0 C, 0.1 V, 0.25 Si, 0.25 Mn, bal Fe.
For drills, taps, reamers, broaches; Type W2; water hardened.

GRIMM GLS
M-1316; 0.55 C, W, Cr, V, bal Fe.
For upsetters, shears, punches; oil hardened, tough

GRIMM GM.
M-1316; 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant

GRIMM GME.
M-1316, 0.40 C, Cr, Mo, Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

GRIMM GR
M-1316, 0.50 C, 1.05 Cr, 0.95 Mn, 0.1 V, bal Fe.
For springs, bolts, gears, studs, oil hardened, shock resistant.

GRIMM GSM
M-1316, 0.53 C, 0.90 Si, 0.90 Mn, bal Fe
For springs, bolts, crankshafts; water or oil hardened

GRIMM GWP
M-1316, 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe
For gears, pinions, countershafts, axles, oil hardened, shock resistant

GRIMM GWV112B
M-1316, 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe
For lathe and planer tools, reamers, drills, taps, high speed steel.

GRIMM GWV122 SPEZIAL.
M-1316, 0.82 C, 4 Cr, 0.8 Mo, 1.6 V, 8.7 W, bal Fe
For lathe and planer tools, reamers, broaches, high speed steel

GRIMM GWV132 RAPID
M-1316, 0.86 C, 0.4 Cr, 0.8 Mo, 2.5 V, 12 W, bal Fe
For lathe and planer tools, reamers, broaches, high speed steel.

GRIMM GWV145 RECORD.
M-1316; 1.3 C, 4.3 Cr, 0.8 Mo, 3.8 V, 12 W, bal Fe
For form cutters, broaches, reamers; high speed steel.

GRIMM HPM.
M-1316, 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion press dies, rams and liners; oil hardened, tough.

GRIMM HWP
M-1316; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion press liners and rams, punches, shears; oil hardened, tough.

GRIMM KSA.
M-1316; 0.45 C, Si, Cr, V, bal Fe.
For dies, bolts, crankshafts, gears, shears; oil hardened, tough.

GRIMM NS12.
M-1316; 0.34 C, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment; creep resistant.

GRIMM NS13.
M-1316; 0.32 C, 1.1 Al, 1.1 Cr, 0.18 Mo, bal Fe.
For oil refinery equipment; creep resistant.

GRIMM NS15.
M-1316; 0.27 C, 1.1 Al, 1.4 Cr, bal Fe
For oil refinery equipment; creep resistant.

GRIMM NS23.
M-1316; 0.33 C, 1.1 Al, 1.7 Cr, 1.0 Ni, bal Fe.
For oil refinery equipment; creep resistant.

GRIMM NS48.
M-1316; 0.30 C, 1.1 Cr, 0.2 V, bal Fe.
For gears, pinions, bolts, fasteners; oil hardened, shock resistant.

GRIMM NS54
M-1316; 0.31 C, 2.5 Cr, 0.18 Mo, 0.13 V, bal Fe
For gears, pinions, bolts, fasteners, shafts, oil hardened, shock resistant.

GRIMM RSA.
M-1316, 1.42 C, W, V, bal Fe.
For forming and heading dies, oil or water hardened.

GRIMM'S ALUMINUM SOLDER-1.
Eng., 69.1 Sn, 28.8 Pb, 1.44 Zn, 0.72 Ag.
For aluminum solder

GRIMM'S ALUMINUM SOLDER-2.
Eng.; 50 Sn, 25 Pb, 25 Zn
For aluminum solder

GRIMM SB.
M-1316; 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For forming and blanking dies, punches; oil hardened, tough

GRIMM SE
M-1316, 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe
For gears, bolts, camshafts, cams, case hardened

GRIMM SH4-ZH
M-1316, 0.75 C, 0.4 Si, 0.6 Mn, bal Fe.
Heat treated 180,000 TS; 130,000 YS, 10 El, 35 RA, 360 Brin.
For springs, rails, clutch discs, Type W1, water hardened

GRIMM SH5-ZAH
M-1316, 0.60 C, 0.4 Si, 0.6 Mn, bal Fe
Heat treated 160,000 TS, 114,000 YS, 12 El, 40 RA, 325 Brin
For wheels, die blocks, rails, axles, bolts, water hardened.

GRIMM SH6-ZW.
M-1316; 0.45 C, 0.4 Si, 0.6 Mn, bal Fe
Hot rolled: 98,000 TS; 58,000 YS, 24 El; 45 RA, 212 Brin.
For axles, gears, bolts, bushings, water hardened.

GRIMM SSA.
M-1316; 0.95 C, W, Mo, bal Fe.
For tools, dies, cutters; oil hardened.

GRIMM SSCV
M-1316, 1.35 C, W, Co, bal Fe.
For engravers tools, blanking dies; oil hardened, wear resistant.

GRIMM WAS.
M-1316; 0.55 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Heat treated: 155,000 TS; 110,000 YS, 14 El; 42 RA; 315 Brin.
For axles, tie rods, bushings, bolts, shafts; water hardened.

GRIMM WE2 HARD.
M-1316; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers tools, reamers, blanking dies; Type W1; water hardened.

GRIMM WE3-MH.
M-1316; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 200,000 TS; 125,000 YS; 8 El; 27 RA; 400 Brin.
For springs, taps, reamers, drills, cutters; Type W1; water hardened.

GRIMM WE4-ZH.
M-1316; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 140,000 YS; 10 El; 30 RA; 390 Brin.
For springs, taps, drills, hobs, reamers; Type W1; water hardened.

GRIMM WE5-ZAH.
M-1316; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 174,000 TS; 128,000 YS; 12 El; 37 RA; 350 Brin.
For springs, clutch disks, rails; Type W1; water hardened.

GRIMM WPN.
M-1316; 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For extrusion rams and liners, punches, upsetters; hot work steel, oil hardened.

GRIMM WPN EXTRA.
M-1316; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For shears, punches, upsetters, dies; hot work steel, oil hardened.

GRIMM WS2.
M-1316; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 19 El; 40 RA; 210 Brin.
For springs, taps, drills, hobs, reamers; Type W1; water hardened.

GRIMM WS3-MH.
M-1316; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 200,000 TS; 125,000 YS; 10 El; 30 RA; 400 Brin.
For springs, taps, drills, hobs, reamers; Type W1; water hardened.

GRIMM WS5-ZAH.
M-1316; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 350 Brin.
For wheels, springs, die blocks, girders, rails; Type W1, water hardened

GRIMM ZR SPEZIAL.
M-1316; 1.4 C, 0.30 Cr, 0.10 V, bal Fe.
For bearings, cutters, liners, oil hardened, wear resistant.

GRIPMORE.
M-334; 0.35 C, 4 Cr, 0.25 V, 0.5 Mo, bal Fe
For hot blanking and forming dies, gripper dies; non-deforming, oil hardened.

GRIPMORE NO. 1.
M-334; 0.35 C, 1 Mo, 0.4 V, 1 Si, bal Fe.
For hot blanking and forming dies, gripper dies; oil hardened, hot work steel.

GRIPMORE NO. 1.
M-24; 0.35 C, 5 Cr, 1 Mo, 0.4 V, bal Fe.
For dies, punches, shears, extrusion rams; hot work steel, oil hardened.

GRIPMORE NO. 1-V.
M-334; 0.35 C, 5 Cr, 1 Mo, 1.1 V, 1 Si, bal Fe.
For hot forming and blanking dies, punches; air hardened, hot work steel.

GRIPMORE NO. 2.
M-334; 0.35 C, 1.35 W, 1.75 Mo, 1 Si, 5 Cr, bal Fe.
For punches, gripping dies, hot work tools; air hardened, hot work steel.

GRITALLOY 10011.
M-717;
Tungsten carbide and nickel base alloy powder, for hard build up.

GRM 235D.
M-114, M-167, M-1491; 0.15 C, 15.5 Cr, 5.2 Mo, 3.6 Al, 2.5 Ti, 4.2 Fe, 0.075 B, bal Ni.
For high temperature cast components in jet engines; high heat and stress-rupture properties.

GROMMET BRASS.
U.S.; 70 Cu, 30 Zn.
For grommets; high ductility.

GROSSMAN.
Al alloy.
For light alloy parts.

GS.
M-459; 1.6 C, 12 Cr, bal Fe
For valves for internal combustion engines; heat resistant.

GSC.
M-459; C, Cr, Mo, Co, bal Fe
For valves for internal combustion engines; heat resistant

GSE.
M-459, 0 52 C, 1.5 Si, 13 Ni, 13 5 Cr, 1.2 W, 1.2 V, bal Fe.
For valves, heavy extrusion dies
Resists thermal shock. Good hot hardness

GSM.
M-459; 0 4 C, 2.25 Si, 15 5 Mn, 12.5 Cr, bal Fe.
For valves, corrosion and heat resistant.

G S.N.
M-73; 2 2 C, 13 Cr, bal Fe.
For stamping and forming dies; non-deforming.

G S N SPECIAL.
M-73, 1 5 C, 12 Cr, 0 8 Mo, 1 V, bal Fe.
For stamping and forming dies, non-deforming

GT2A METAL.
France; C, Cr, Ni, bal Fe
For chemical equipment, corrosion resistant.

GT4A METAL
France, C, Cr, Ni, bal Fe.
For chemical equipment; corrosion resistant.

GT-45.
M-100; 0.08 C, 16 7 Cr, 14 Ni, 2.7 Mo, 3 Cu, 0 25 Ti, 0.35 Cb, 0.5 Si, 1.25 Mn, bal Fe.
For high temperature applications, jet engines and turbo superchargers, heat and corrosion resistant.

GUETTIERES BUTTON.
Eng.; 56 Cu, 44 Zn.
For buttons.

GUETTIERES BUTTON.
Eng ; 61.5 Cu, 29-32 Zn, 6.5-9.7 Sn.
For buttons.

GUILLAUME'S METAL.
Eng.; 64.3 Cu, 35.7 Ni.
For tape, chemical equipment; name also applied to "Invar" tape.

GUINEA GOLD.
Eng.; 88 Cu, 12 Zn.
For ornamental parts, cheap jewelry; red brass.

GUISHIBUICHI.
Jap.; 67-51 Cu, 32-49 Ag, Au, Fe.
For jewelry, ornaments; v. Shibu-ichi.

GULF AIR.
M-1431; 1.0 C, 5 Cr, 1.0 Mo, bal Fe.
For tools and dies; Type A2; air hardened, non-deforming.

GULF GH9.
M-1431; C, alloy, bal Fe.
For machine tool parts; oil hardened.

GULF GH14.
M-1431; C, alloy, bal Fe.
For machine tool parts; oil hardened.

GULF GH-VAN.
M-1431; C, alloy, bal Fe
For machine tool parts, oil hardened.

GULF GHW.
M-1431; C, alloy, bal Fe.
For machine tool parts; oil hardened.

GULF H.S.
M-1431, 0.70 C, 4 Cr, 1 V, 18 W, bal Fe.
For lathe and planer tools, drills, hobs, reamers, Type T-1, high speed steel.

GULF H.S 5
M-1431; 0.80 C, 4 Cr, 2 V, 18 W, 8 Co, bal Fe.
For lathe and planer tools, reamers, broaches; Type T-5, high speed steel

GULF M.2.
M-1431, 0.80 C, 4 Cr, 2 V, 6 W, 5 Mo, bal Fe.
For thread rolling dies, broaches, reamers, cutters; Type M2, high speed steel

GULF O.H.
M-1431, 0.90 C, 1 Mn, 0.5 Cr, 0.5 W, bal Fe.
For dies, punches, rollers, mandrels; Type O1, oil hardening, non-deforming

GUN IRON
M-664, 3.0 T.C., 1.5 Si, 0.85 Mn, 1.9 Ni, 0.40 Cr, 0.65 Mo, 0.075 S, 0.180 P, bal Fe.
Cast 35,000-48,000 TS, 200-600 Brin
For cylinder liners, castings, Tr.S. 2700, Tr.D 0.265.

GUNITE A.
M-223, 0.8 C.C., 2.2 G.C., 2 Si, 0.25 Mo, bal Fe.
Cast 40,000 TS; 223 Brin
For cylinder sleeves, camshafts, Tr.S 3200, Tr.D 32, to be hardened.

GUNITE B-1.
M-223, 0.8 C.C., 2.2 G.C., 2 Si, 0.75 Mo, 0.65 Cr, 0.9 Ni, bal Fe.
Cast. 55,000 TS, 269 Brin.
For heavy forming dies, Tr.S. 3400, Tr.D. 30; wear resistant.

GUNITE C.
M-223; 0.8 C.C., 2.2 G.C., 2 Si, bal Fe.
Cast. 35,000 TS; 212 Brin.
For automotive brake drums, cams, rolls, gears, worms, wear resistant under friction Tr.S.-3,000.

GUNITE D
M-223; 0.8 C.C., 2.2 G.C., 2 Si, 0.55 Cr, 1.2 Ni, bal Fe
Cast: 45,000 TS; 235 Brin.
For pump bodies; Tr.S. 3300; Tr.D. 32; abrasion resistant.

GUNITE E.
M-223; 0.8 C.C., 2.2 G.C., 0.4 Mo, 0.4 Cu, bal Fe.
Cast: 45,000 TS; 229 Brin.
For brake drums, crankshafts, gears, Tr.S. 3300; Tr.D. 34.

GUNITE E-1.
M-223; 0.8 C.C., 2.2 G.C., 2 Si, 0.1 Mo, 0.2 Cu,, bal Fe.
Cast: 40,000 TS; 223 Brin.
For brake drums, cylinder sleeves; Tr.S. 3200; Tr.D. 32; heavy duty service.

GUNITE F.
M-223; 0.8 C.C., 2.2 G.C., 2 Si, 0.8 Mo, 0.6 Cu, 0.35 Cr, bal Fe.
Cast: 50,000 TS; 248 Brin.
For crankshafts; Tr.D. 34; Tr.S. 3500; wear resistant.

GUNITE-K.
M-223; 2.3 C, 1 Si, 0.08 S, 0.16 P, bal Fe.
Cast: 105,000 TS; 85,000 YS; 4 El; 210 Brin.
For gears, shafts, housings; cast iron, high strength.

GUNITE R.
M-223; 0.8 C.C., 2.2 G.C., 2 Si, 1.25 Mo, 1.25 Ni, bal Fe.
Cast: 60,000 TS; 269 Brin.
For heavy crankshafts; Tr.S. 3800; Tr.D. 34; tough.

GUN METAL
M-212; 88 Cu, 8 Sn, 4 Zn.
Cast: 40,000-48,000 TS; 18,000 YS; 50-20 El; 70 Brin.
For steam and structural bronze, gears, bolts; resists salt water corrosion.

GUN METAL NO 1.
M-1518; 88 Cu, 10 Sn, 2 Zn.
Cast: 36,000 TS; 12 El; 50-65 Brin.
For bearings, gears, marine parts; Gun Metal.

GUN METAL NO. 2.
M-1518; 85 Cu, 5 Sn, 5 Zn, 5 Pb.
Cast. 27,000 TS; 12 El; 45-55 Brin.
For steam valves, bearings, gears; pressure tight, creep resistant.

GUN METAL NO. 3
M-1518; 86 Cu, 7 Sn, 5 Zn, 2 Pb.
Cast. 31,500 TS; 12 El; 45-60 Brin.
For backing for white metal lined bearings; pressure tight castings, creep resistant.

GUN METAL NO. 4.
M-1518; Sn, Zn, bal Cu
Cast: 38,100 TS; 25 El; 45-60 Brin.
For bearings, pressure tight castings; pressure tight, not good above 450°F.

GUN METAL-A.
Eng.; 90 Cu, 10 Sn.
For electric contacts, valve disks; corrosion resistant.

GUN METAL-B.
Eng.; 90 Cu, 6.5 Sn, 2 Zn, 1.5 Pb
For steam fittings, valves, cocks, free-cutting.

GUN METAL, CHINESE.
China. 71.16 Cu, 27.36 Zn, 1.40 Fe.
For early cannons and guns.

GUN METAL, CHINESE.
China: 93.2 Cu, 5.05 Sn, 1.72 Fe.
For early cannons and guns

GUN METAL COCHIN CHINA.
China: 77.18 Cu, 3.42 Sn, 5.02 Zn, 13.22 Pb, 1.16 Fe.
For early cannons and guns

GUN METAL COCHIN CHINA.
China: 93.19 Cu, 5.43 Sn, 1.38 Fe.
For early cannons and guns.

GUN METAL, ENGLISH.
Eng.: 89-92 Cu, 8-11 Sn.
For early cannons and guns.

GUN METAL, FRENCH.
Fr.: 90.1 Cu, 9.9 Sn.
For early canons and guns; modern.

GUN METAL, FRENCH.
Fr.: 89.44 Cu, 8.91 Sn, 1.31 Zn, 0.16 Pb.
For early cannons and guns; old.

GUN METAL MODIFIED.
M-212; 86 Cu, 9.5 Sn, 2.5 Pb, 2 Zn.
Cast: 32,000-40,000 TS; 25-15 El; 23-12 RA;
63-72 Brin.
For gears, bearings; "Barr Alloy No. 2."

GUN METAL, PRUSSIAN.
Pruss: 90.9 Cu, 9.1 Sn.
For cannons and guns; modern.

GUN METAL, RUSSIAN.
Russ.: 88-91 Cu, 9-12 Sn, 0.07 Fe.
For early cannons and guns.

GUN METAL, SWISS.
Swiss: 88.93 Cu, 10.37 Sn, 0.42 Zn.
For early cannons and guns; "Lucern."

GUN METAL, TURKISH.
Turk.: 91-95 Cu, 4.7-8.8 Sn, 0-0.2 Fe.
For early cannons and guns.

GUN MOUNT BRONZE.
U.S.; 17 Zn, 3 Sn, bal Cu.
For gun mounts; high strength.

GURLEY'S METAL.
Eng.; 86.5 Cu, 5.4 Zn, 5.4 Sn, 2.7 Pb.
For steam fittings, valves, cocks; free-cutting

GURNEYS BRONZE.
U.S.; 76 Cu, 9 Sn, 15 Pb.
For machine parts; also called
"U S Government Bronze"

GURONIT.
M-1329; C, alloy, bal Fe.
For machine tool products; oil hardened.

GURONIT 1.1 H.
M-1329, 1.2 C, 1.3 Si, 29 Cr, bal Fe.
For wear plates, crushers,
heat and abrasion resistant.

GURONIT 2.2 H.
M-1329; 1.2 C, 1.3 Si, 29 Cr, 2 Mo, bal Fe
For wear plates, crushers,
corrosion, heat and wear resistant.

GURONIT 14
M-1329, 0.25 C, 14.5 Cr, 1 max Ni, bal Fe.
Annealed 85,000 TS; 40,000 YS, 50 El; 65 RA;
185 Brin.
For surgical instruments, gages, valves;
Type 420; stainless, austenitic.

GURONIT 18.
M-1329; 0.25 C, 17 Cr, 1.8 max Ni, bal Fe.
For chemical plant equipment; corrosion resistant.

GURONIT 18-8
M-1329; 0.15 C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 75,000 TS; 35,000 YS; 55 El; 75 RA;
140 Brin.
For chemical plant equipment, tanks, vessels;
Type 302; stainless, austenitic.

GURONIT 18-8E.
M-1329; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C,
bal Fe.
Annealed: 85,000 TS, 35,000 YS; 55 El; 65 RA;
170 Brin.
Cold drawn: 95,000 TS; 60,000 YS; 40 El; 60 RA;
185 Brin.
For welded structures, chemical plant equipment;
Type 321; stainless, austenitic.

GURONIT 18-8Mo.
M-1329; 0.15 C, 18 Cr, 9.5 Ni, 2 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 75 RA;
150 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El;
300 Brin.
For acid resistant equipment;
Type 316; stainless, austenitic.

GURONIT 18-8MoE.
M-1329; 0.12 max C, 2 Mo, 18 Cr, 10.5 Ni,
Cb = 8 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 50 El; 75 RA;
150 Brin
Cold drawn 150,000 TS, 135,000 YS; 6 El,
300 Brin.
For welded acid resistant equipment;
Type 316Cb; stainless, austenitic.

GURONIT 20-25Mo
M-1329, 0.10 C, 24 Ni, 20 Cr, Mo, Cu, bal Fe.
Annealed: 100,000 TS, 45,000 YS; 50 El; 65 RA;
185 Brin
For acid resistant equipment;
corrosion resistant, austenitic

GURONIT 28 4.
M-1329; 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
Cast: 115,000 TS, 80,000 YS, 15 El; 190 Brin.
For furnace equipment, heat treat boxes;
heat resistant

GURONITE
M-1329, 0.7-2.3 C, 30-35 Cr, 0.7 Si, Mo, bal Fe.
For heat treating furnaces, pump fittings, valves,
grates, heat and corrosion resistant.

GURONIT GS22-10
M-1329, 0.4 C, 22 Cr, 9.5 Ni, bal Fe
Cast 85,000 TS; 45,000 YS, 35 El, 165 Brin
For heat treating boxes, furnace parts,
conveyor belts, Type HF,
corrosion and heat resistant

GURONIT GS25-15
M-1329, 0.4 C, 26 Cr, 14 Ni, bal Fe
Cast 75,000 TS; 47,000 YS, 17 El, 25 RA,
200 Brin
For heat treating boxes, salt pots, retorts, chains;
Type HH, corrosion and heat resistant.

GURONIT GS25-35
M-1329, 0.5 C, 25 Cr, 30 Ni, bal Fe.
For furnace parts, retorts, pots, heat treating boxes;
corrosion and heat resistant.

GURONIT GS28-4
M-1329; 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe
Cast: 90,000 TS; 65,000 YS, 2 El; 212 Brin.
For cylinder liners, bushings, valve seats and bodies,
Type CC-50; heat resistant.

GURONIT GS28-10
M-1329, 0.4 C, Cr, 10 Ni, bal Fe.
For furnace parts, heat treating boxes;
Type HE; heat resistant.

GURONIT GS28-20
M-1329, 0.4 C, 25 Cr, 19 Ni, bal Fe.
Cast: 75,000 TS, 50,000 YS, 17 El; 170 Brin.
For furnace parts, retorts, stack dampers;
Type HK; heat resistant

GURONIT H7.
M-1329; 0.3 C, 6 Cr, 2.2 Si, bal Fe.
For oil refinery equipment; creep and heat resistant.

GURONIT H8.
M-1329; 0.5 C, 1.5 Si, 17 Cr, bal Fe.
For furnace parts, heat treating boxes; heat resistant.

GURONIT H9.
M-1329; 0.3 C, 2.2 Si, 17 Cr, bal Fe.
For furnace parts, heat treating boxes, oil refinery equipment; heat and creep resistant.

GURONIT H10.
M-1329; 0.6 C, 1.5 Si, 22 Cr, bal Fe.
For oil refinery equipment, rollers, crushers; heat and wear resistant.

GURONIT H11.
M-1329; 1.3 C, 1.5 Si, 29 Cr, bal Fe.
For crushers, rollers, grate bars; heat and abrasion resistant.

GUSSBRONZE 6.
M-1420; Sn, bal Cu.
Cast: 21,000-29,000 TS; 18 El, 60 Brin.
For hardware; bronze

GUSSBRONZE 10.
M-1420, Sn, bal Cu.
Cast 32,000-36,000 TS; 15 El; 70 Brin
For hardware, bronze

GUSSBRONZE 12.
M-1420, Sn, bal Cu
Cast· 32,000-36,000 TS, 12 El, 85 Brin.
For hardware, bronze

GUSSBRONZE 14
M-1420, Sn, bal Fe
Cast 29,000 32,000 TS, 3 El, 110 Brin
For hardware, bronze

GUSSBRONZE 20
M-1420, Sn, bal Cu.
Cast 15,000-21,000 TS, 0 El, 180 Brin
For hardware; bronze.

GUSS-KORROFFESTAL
M 1376, 9 13 Si, 0.25-0.40 Mg, 0.3-0.5 Mn, bal Al
For light alloy parts; high corrosion resistance

GUSSMESSING 63
M-1420, Zn, bal Cu
Cast 22,000 25,000 TS, 10 6 El, 45 Brin
For air conditioners, housings, machinery parts, brass.

GUSSMESSING 67
M-1420, Zn, bal Cu
Cast 25,000-29,000 TS, 15-12 El; 40 Brin
For air conditioners, housings, machinery parts, brass

GUSSMESSING 90
M-1420, Zn, bal Cu
Cast· 23,000-25,000 TS, 20-18 El; 60 Brin
For current carrying equipment, conductors; brass

GUSS PANTAL
Germ, 2-4 Mg, 1.2-1.5 Mn, 0-0.2 Sb or Ti, bal Al
For light alloy castings, resists sea water corrosion

GUSSTAHL 3W
M-1314; 0.90 C, 0.3-0.8 Mn, bal Fe.
Heat treated: 190,000 TS, 145,000 YS, 10 El; 30 RA, 400 Brin
For cutters, drills, taps, springs, Type W1, water hardened.

GUSSTAHL 4H.
M-1314, 0.75 C, 0.3-0.8 Mn, bal Fe.
Heat treated: 175,000 TS; 130,000 YS; 12 El, 35 RA, 350 Brin
For tools, cutters, drills, punches, springs; Type W1; water hardened.

GUSSTAHL 4W.
M-1314; 0.60 C, 0.3-0.8 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El, 40 RA; 320 Brin.
For crimpers, punches, dies, springs; water hardened.

GUSSTAHL 5H.
M-1314; 0.45 C, 0.3-0.8 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For gears, pinions, shafts, axles; water hardened.

GUSSTAHL 5W.
M-1314; 0.35 C, 3-0.8 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 185 Brin.
For gears, pinions, shafts; water hardened

GUSSSTAHL-D8514.
M-1293; 0.17 C, 0.2 Cb, 11 Cr, 0.6 Mo, 0.55 Ni, 0.6 V, bal Fe
Annealed: 75,000 TS; 40,000 YS; 30 El; 70 RA; B 82 Rock.
Cold Drawn: 95,000 TS; 80,000 YS; 15 El; 60 RA; B 92 Rock.
For springs, table flatware, knives, oil refinery and chemical plant equipment.
Corrosion resistant, hardenable

GUSSSTAHL D8518.
M-1293; 0.22 C, 0.6 Mn, 11.7 Cr, 1.05 Mo, 0.6 Ni, 0.3 V, bal Fe
Annealed· 95,000 TS; 40,000 YS; 25 El, B 94 Rock.
Hardened· 245,000 TS; 205,000 YS; 9 El; C 50 Rock
For cutlery, surgical instruments, hardware, gears, shafts
Corrosion resistant, hardenable.

GUSSSTAHL-D8518W
M-1293, 0.21 C, 12 Cr, 1 Mo, 0.6 Ni, 0.3 V, 0.5 W, bal Fe
Annealed 90,000 TS, 38,000 YS, 25 El, B 92 Rock.
Hardened· 240,000 TS, 205,000 YS, 9 El; C 50 Rock
For surgical instrument, valves, cutlery, gears, shafts
Corrosion resistant, hardenable.

GUTHRIES ALLOY
Eng, 47 Bi, 20 Sn, 19 Pb, 13 Cd.
For fire extinguisher plugs; fusible alloy

GUYS ALLOY
England; 82.5 Ni, 17.5 Al
At 70°F 83,800 TS, 0.6 El
At 1500°F 52,900 TS, 2.9 El
For turbine blades, jet engine components, high stress-rupture strength

G.W. 6-6-2 HIGH SPEED
M-1067, 0.8 C, 4 Cr, 6 W, 4.5 Mo, 1.5 V, bal Fe.
For tools, cutters, chasers, high speed steel

G.W 32
M-1404, 7.6 Zn, 1.7 Mg, bal Al
Heat treated 43,000-50,000 TS, 6-4 El; 130-140 Brin.
For light alloy castings, housings, age-hardenable

G W. NO 99 HOT WORK
M-1067, 0.35 C, 0.35 Mn, 0.9 Si, 4.7 Cr, 1.1 W, 1.5 Mo, 0.25 V, bal Fe
For hot work tools and dies, aluminum die casting dies, hot work steel

G.W NO 265 (HIGH PRODUCTION).
M-1067, 1.6 C, 0.3 Mn, 12 Cr, 0.8 Mo, 0.2 V, bal Fe.
For tools, dies, blanking, forming and drawing dies; abrasion resistant, air or oil hardening.

GW 280 TUF KUT.
M-1067, 0.60 C, 0.85 Mn, 2.0 Si, 0.25 Cr, 0.25 Mo, 0.2 V, bal Fe.
Annealed: 107,000 TS; 64,000 YS; 27 El; 212 Brin.
Oil Hardened: 145,000-340,000 TS;

127,000-283,000 YP; 5-24 El; 20-44 RA; 293-611 Brin.
For shear blades, pneumatic tools, punches, chisels, caulking tools.
Type S5 shock resisting tool steel.
Oil or water hardening.

G.W. NO. 310.
M-1067; 0.30 C, 0.25 Mn, 3.25 Cr, 10 W, 0.35 V, bal Fe.
For hot work dies, brass forming dies; hot work steel.

G.W. NO. 313.
M-1067; 0.35 C, 0.30 Mn, 3 Cr, 13.5 W, bal Fe.
Hot work tools and dies; hot work steel, high abrasion resistant.

G.W. NO. 350.
M-1067; 1.3 C, 0.3 Mn, 3.5 W, bal Fe.
For cutting tools; fast finishing tool steel.

G.W.422 MIRYCAL.
M-1067; 0.5 C, 0.95 Cr, 1 W, 0.2 Mo, bal Fe.
For dies, punches, shear blades; Type S1; oil hardened.

G.W. NO. 515.
M-1067, 0.35 C, 1.0 Si, 5 Cr, 5 W, 0.2 Mo, bal Fe.
For hot work tools and dies; hot work steel, air hardening, tough.

G.W. COLD HEADER.
M-1067; 0.95 C, 0.30 Mn, 0.30 Si, bal Fe.
For cold heading tools, water hardening.

G.W. "C.V.M."
M-1067; 1.0 C, 5 Cr, 1 Mo, bal Fe.
For tools, dies, punches, Type A2; air hardened, non-deforming.

G.W. "C.W OIL."
M-1067; 0.90 C, 1 Mn, 0.50 Cr, 0.50 W, bal Fe
For dies, punches, rollers, mandrels; Type O1; oil hardened. non-deforming.

G.W EXTRA.
M-1067; 1.0 C, bal Fe.
Annealed: 100,000 TS; 53,000 YS, 21 El, 42 RA, 200 Brin.
For drills, taps, reamers, lathe and planer tools, Type W1; water hardened.

G.W. OIL HARDENING (G.W.O.H.)
M-1067; 0.9 C, 1.1 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies; oil hardening.

G.W. PAVEMENT BREAKER.
M-1067; 0.65 C, 0.30 Mn, bal Fe.
For tools, hammers, crushers; water hardening.

G.W. REGULAR.
M-1067; 0.7-1.2 C, 0.3 Mn, bal Fe.
For tools, punches; water hardening.

G.W. SOLID DRILL.
M-1067, 0.85 C, 0.30 Mn, bal Fe
For tools, pivots; water hardening

G.W. SPECIAL.
M-1067; 1-1.1 C, 0.30 Mn, bal Fe
For tools, drills, taps; water hardening.

GYROCAST.
M-977; 0.4 C, 1 Cr, bal Fe.
For straightening rolls, bar mill guides; centrifugally cast castings.

GYROMET.
M-265; 90 W, Cu, Mo, Fe, bal Ni.
Sintered: 140,000 TS; 120,000 YS; 2 El; C 32 Rock.
For gyros, counterweights. High density.

GYROMET 1100.
M-265; 90 W, 4 Ni, 2 Fe, 4 Mo.
Sintered: 150,000 TS; 140,000 YS; 2 El; density: 17.25; hardness 36 Rock C.
For gyroscope rotors, governor counter weights, radiation shielding

H-4-X.
M-750, 0.35 C, 0.8 Cr, 0.5 Mo, 0.7 Mn, 0.2 Si, 0.15 max Ni, bal Fe.
Annealed: 100,000 TS; 80,000 YS; 2 El; 300 Brin.
For gears, shafts, pinions; water hardening.

H5DM.
0.15 C, 1.5 Mn, 0.5 Cr, 0.4 Mo, 4.0 Ni, 0.10 V, bal Fe.
Plate: 107,000 min TS, 92,000 min YS; 13 min El
For pressure vessels, bridges, mine cars, power shovels, cranes, trucks, trailers.
Shock and wear resistant

H-9 DOUBLE HEADER
M-32, 0.90 C, 0.35 Mn, 0.35 Si, bal Fe.
For header dies, punches, coining and striking dies, water hardened, wear resistant.

H-11
M-1602; 0.40 C, 0.4 Mn, 1.05 Si, 5.0 Cr, 0.5 V, 1.35 Mo, bal Fe
Air or oil hardening hot work tool steel, chromium type, AISI H11.

H 12
M-1602, 0.35 C, 0.35 Mn, 1.05 Si, 5.0 Cr, 0.35 V, 1.25 W, 1.35 Mo, bal Fe.
Hot work tool and die steel, chromium type, AISI H12.

H 44 see HEPPENSTALL H 44

HA-0
M-Belgium, 0.9 C, 3 Cr, 0.3 Mn, bal Fe
H max 300, B max 13,500, Br 9900
Coercive force 66, (BdHd) max 320,000
For permanent magnets in electrical and magnetic equipment.
Hardened, high permeability.

HA-1.
M-Belgium, 1.0 C, 9 Cr, 3 Co, 1.5 Mo, bal Fe.
For permanent magnets in electrical and magnetic equipment.
Hardened, high permeability

HA-2
M-Belgium, 1.0 C, 9 Cr, 6 Co, 1.5 Mo, bal Fe
For permanent magnets in electrical and magnetic equipment.
Hardened High permeability

HA-3.
M-Belgium; 1.0 C, 15 Co, 9 Cr, 1.5 Mo, bal Fe.
For permanent magnets in electrical and magnetic equipment.
Hardened High permeability

HA-25 Alloy.
M-167, 0.15 max C, 1.5 Mn, 0.5 Si, 20.0 Cr, 10.0 Ni, 15.0 W, bal Co
Heat Treated: 130,000 TS, 60,000 YS; 35 El; C 20 Rock.
At 1500°F: 50,000 TS, 35,000 YS; 17 El.
For jet engine afterburners, liners, nozzles, gas turbine rotors and buckets.
Good oxidation and corrosion resistance.

HACKER CNBVO.
M-1318, 0.36 C, 1.0 Cr, 0.2 Mn, 1.0 Ni, bal Fe.
For gears, bolts, machine tool parts; oil hardened, shock resistant.

HACKER CNBVO/2H.
M-1318; 0.30 C, 2.0 Cr, 0.3 Mo, 2.0 Ni, bal Fe.
For gears, bolts, machine tool parts;
oil hardened, shock resistant.

HACKER CNBVO/H.
M-1318; 0.34 C, 0.55 Mn, 1.55 Cr, 1.55 Ni, 0.2 Mo, bal Fe.
For gears, bolts, machine tool parts;
oil hardened, shock resistant.

HACKER HWG.
M-1318; 0.55 C, 0.70 Cr, 0.18 Mo, 0.1 V, 1.65 Ni, bal Fe.
For heading and forging dies, upsetters,
punches, oil hardened, tough.

HACKER HWG EXTRA.
M-1318; 0.56 C, 0.85 Cr, 0.2 Mo, 1.8 Ni, 0.1 V, bal Fe.
For forging dies, upsetting dies, punches;
oil hardened, tough.

HACKER LD EXTRA EXTRA ZH.
M-1318, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated 200,000-130,000 TS;
150,000-90,000 YS; 10-20 El, 30-50 RA,
420-270 Brin.
For drills, reamers, taps, hobs;
Type W1, water hardened.

HACKER LD EXTRA H.
M-1318; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe
For engravers' tools, blanking and forming dies;
Type W1, water hardened.

HACKER LD EXTRA MH.
M-1318, 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe
For springs, taps, drills, reamers, broaches;
Type W1, water hardened

HACKER LD EXTRA SEHR ZAH
M-1318, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 175,000-122,000 TS,
130,000-82,000 YS, 12-22 El; 37-52 RA,
360-240 Brin
For springs, rails, punches, clutch discs,
Type W1, water hardened

HACKER LD EXTRA ZAH
M-1318, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated 200,000-130,000 TS,
150,000-90,000 YS, 10-20 El, 30-50 RA;
400-260 Brin
For drills, reamers, taps, hobs, cutters,
Type W1; water hardened

HACKER LD PRIMA EXTRA ZH
M-1318; 0.67 C, 0.40 Si, 0.7 Mn, bal Fe
Heat treated: 170,000-120,000 TS,
125,000-80,000 YS, 15-25 El, 40-55 RA,
350-240 Brin.
For springs, clutch discs, girders, rails,
die blocks; water hardened.

HACKER LD PRIMA H.
M-1318; 0.90 C, 0.40 Si, 0.60 Mn, bal Fe.
Heat treated. 200,000-130,000 TS;
150,000-90,000 YS; 10-20 El; 30-50 RA;
400-260 Brin.
For drills, taps, reamers, cutters;
Type W1; water hardened.

HACKER LD PRIMA MH.
M-1318; 0.75 C, 0.40 Si, 0.60 Mn, bal Fe.
Heat treated: 175,000-125,000 TS;
130,000-85,000 YS; 10-20 El; 35-50 RA;
360-250 Brin.
For wheels, die blocks, rails, springs, clutches;
Type W1; water hardened.

HACKER LD PRIMA SEHR ZAH.
M-1318; 0.35 C, 0.60 Si, 0.60 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA;
185 Brin.
For gears, shafts, axles, bolts, fishplates;
water hardened.

HACKER LD PRIMA ZAH.
M-1318; 0.60 C, 0.35 Si, 0.6 Mn, bal Fe.
Heat treated: 160,000-115,000 TS;
113,000-77,000 YS; 12-23 El; 40-54 RA;
320-230 Brin.
For wheels, die blocks, girders, rails; water hardened.

HACKER LD PRIMA ZW.
M-1318; 0.15 C, 0.4 Si, 0.6 Mn, bal Fe.
Annealed: 70,000 TS; 55,000 YS; 25 El; 60 RA;
145 Brin.
For screws, bolts, nuts, camshafts, rivets;
case hardening steel.

HACKER LDS.
M-1318, 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, crimpers, forming dies;
oil hardened, non-deforming.

HACKER LD SPEZIAL.
M-1318; 0.75 C, 0.25 Si, 0.25 Mn, bal Fe.
Heat treated: 180,000-125,000 TS;
135,000-85,000 YS; 12-22 El; 36-50 RA;
370-250 Brin.
For springs, rails, punches, girders, crimpers;
Type W1, water hardened

HACKER LD SPEZIAL EXTRA ZH
M-1318, 1.0 C, 0.25 Si, 0.25 Mn, bal Fe.
Heat treated. 190,000 TS, 120,000 YS; 10 El;
30 RA; 400 Brin.
For springs, tools, reamers, drills; Type W1,
water hardened.

HACKER LD SPEZIAL MH.
M-1318, 1.1 C, 0.25 Si, 0.25 Mn, bal Fe.
Annealed. 110,000 TS, 58,000 YS; 20 El; 40 RA;
210 Brin
For springs, drills, taps, reamers, broaches;
Type W1, water hardened

HACKER LD SPECIAL ZAH
M-1318, 0.85 C, 0.20 Si, 0.20 Mn, bal Fe.
Heat treated. 180,000-128,000 TS;
135,000-85,000 YS, 12-22 El; 35-50 RA;
400-250 Brin
For springs, tools, cutters, taps, drills, reamers;
Type W1, water hardened.

HACKER LDX.
M-1318; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, punches;
air hardened, non-deforming.

HACKER MN180
M-1318; 0.14 C, 1.1 Cr, 4.5 Ni, bal Fe.
For gears, bolts, crankshafts, cams;
case hardened, shock resistant.

HACKER ON130.
M-1318, 0.15 C, 0.25 Si, 0.5 Mn, 0.65 Cr, bal Fe.
For gears, bolts, camshafts, cams;
case hardened, tough.

HACKER ON160.
M-1318; 0.16 C, 0.25 Si, 1.15 Mn, 0.95 Cr, bal Fe.
For gears, bolts, camshafts, cams;
case hardened, tough.

HACKER ON200.
M-1318, 0.20 C, 1.15 Cr, 1.25 Mn, bal Fe
For gears, bolts, camshafts, cams;
case hardened, tough.

HACKER PS.
M-1318; 0.45 C, 0.2 V, 1.85 W, 1.05 Cr, bal Fe.
For punches, rivet sets, upsetters, forging dies;
oil hardened, tough.

HACKER PS505.
M-1318; 0.55 C, 0.9 Si, 0.3 Mn, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For forging and header dies, upsetters;
oil hardened, tough.

HACKER PSN.
M-1318; 0.45 C, Si, Cr, V, bal Fe.
For springs, gears, bolts, crankshafts;
oil hardened, shock resistant.

HACKER PS SPEZIAL.
M-1318; 0.45 C, W, Cr, V, bal Fe.
For forging and header dies, upsetters;
oil hardened, tough.

HACKER TE.
M-1318; 1.05 C, 0.9 Mn, 1.0 Cr, 1.15 W, bal Fe.
For bearings, cutters, bushings;
oil or water hardened, tough.

HACKER WGNH.
M-1318; 0.60 C, 0.40 Si, 0.60 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 320 Brin.
For wheels, die blocks, clutch discs, rails;
water hardened.

HACKER WGNH EXTRA.
M-1318; 0.90 C, 0.40 Si, 0.60 Mn, bal Fe.
Heat treated: 190,000 TS, 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, taps, drills, hobs, reamers,
Type W1; water hardened.

HACKER WGNH SPEZIAL.
M-1318; 0.50 C, 0.90 Si, 0.90 Mn, bal Fe.
For pneumatic tools, punches, dies, shear blades;
oil hardened, tough.

HACKER WGW.
M-1318; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 188,000 TS, 145,000 YS, 12 El; 35 RA; 400 Brin.
For springs, drills, reamers, taps, tools, hammers;
Type W1; water hardened.

HACKER WHH.
M-1318; 1.3 C, W, bal Fe.
For cutters, engravers' tools, cold headers;
oil or water hardened.

HACKER WHHI.
M-1318; 1.1 C, 0.40 Cr, 0.30 Mn, 0.20 Si, bal Fe.
For bearings, cutters, liners, drills;
Type W5; water hardened.

HACKER WHHS.
M-1318; 1.2 C, 0.20 Cr, 0.1 V, 1.0 W, bal Fe.
For heading and forming dies, punches;
oil hardened, wear resistant.

HACKETT K-COPPER.
M-825; Cu alloy.
Cast: 70,000 TS; 20 El, 50 RA; 150 Brin.
For welding tips and holders;
75-80% conductivity of Cu.

HACKSAW.
M-350; 0.7 C, 2 W, bal Fe.
For tools, hacksaws; oil hardened.

HACKSAW "A."
M-261; C, bal Fe.
For hack saws; water hardening.

HACKSAW "B."
M-261; C, W, bal Fe.
For hack saws; water hardening.

HACKSAW REG. C.
M-350; 0.7-1.0 C, bal Fe.
For tools, hacksaws; water hardened.

HADFIELD MANGANESE STEEL.
M-604; 1.00-1.35 C, 10.5-15.0 Mn, 0.10 max P, 0.1-0.3 Si, bal Fe.
For perforated screens, dipper teeth,
journal box liners, wear plates,
screens, rails; abrasion resistant.

HADFIELD SILICON STEEL.
M-62; 4 Si, C, bal Fe.
For transformer cores, armatures for dynamos
and electric motors, loading coils;
low magnetic hysteresis with high permeability.

HADFIELDS Cr-Mn STEEL.
M-139; 1.0-1.4 C, 10-14 Mn, 2.8-3.1 Cr, bal Fe.
Heat treated 80,000-140,000 TS; 35,000-55,000 YS, 20-30 El; 15-30 RA, 201-255 Brin.
For wear resisting castings; non-magnetic.

HADFIELDS MANGANESE STEEL.
M-139, 1.0-1.4 C, 10-14 Mn, bal Fe.
Heat treated: 80,000-120,000 TS; 30,000-50,000 YS, 25-35 El; 20-35 RA; 170-201 Brin
For rails, wear plates, castings, non-magnetic,
wear resisting.

HADURA
M-62; C, Cr, bal Fe
For rolls for cold rolling, water hardening

HAECKER 135H
M-1318; 0.40 C, Cr, bal Fe
For gears, machine tool parts, water hardened

HAECKER 135M
M-1318, 0.20 C, Cr, bal Fe
For gears, cams, machine tool parts; case hardening.

HAECHER 135W
M-1318, 0.10 C, Cr, bal Fe
For gears, cams, shafts, case hardening

HAECHER ADS
M-1318, 0.38 C, Cr, Si, V, bal Fe
For gears, bolts, crankshafts, oil hardened,
shock resistant.

HAECHER AE13C.
M-1318, 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies;
oil or air hardened, non-deforming.

HAECKER BSL-SPEZIAL.
M-1318; 0.40 C, Ni, Cr, Mo, bal Fe
For gears, bolts, shafts, studs,
oil hardened, shock resistant.

HAECKER F480E.
M-1318, 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Ti = 4 × C, bal Fe.
Annealed: 90,000 TS, 45,000 YS; 50 El; 60 RA; 180 Brin
For chemical plant equipment, mixers, tanks, vessels;
Type 316 Ti; stainless, austenitic.

HAECKER KF17.
M-1318; 0.08 C, Cr, bal Fe.
For gears, cams, camshafts, case hardened.

HAECKER KF17Ni.
M-1318; 0.22 C, Cr, Ni, bal Fe.
For gears, cams, camshafts; case hardened.

HAECKER KF17S.
M-1318; 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For chemical plant equipment;
corrosion and heat resistant.

HAECKER KF300.
M-1318; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For chemical plant equipment; Type 302; stainless, austenitic.

HAECKER KF300E.
M-1318; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 45 El; 60 RA, 180 Brin.
For welded structures, chemical plant equipment; Type 321; stainless, austenitic.

HAECKER KF300S.
M-1318; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed. 80,000 TS; 35,000 YS; 55 El; 70 RA; 150 Brin.
For welded structures, chemical plant equipment; Type 304, stainless, austenitic

HAECKER KF480S.
M-1318; 0.07 max C, 18 Cr, 2 Mo, 10.5 Ni, bal Fe
Annealed 90,000 TS; 45,000 YS, 50 El; 60 RA, 180 Brin.
For acid resistant equipment, tanks, mixers, fitters; Type 316; stainless, austenitic

HAECKER LR
M-1318; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion press dies, mandrels, liners, punches, oil hardened, hot work steel.

HAECKER MN130
M-1318, 0.14 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, camshafts, cams, case hardened, shock resistant

HAECKER PSBG.
M-1318, 1.0 C, 0.1 V, 0.30 Mn, 0.25 Si, bal Fe
Heat treated 185,000 TS, 120,000 YS, 10 El, 30 RA, 400 Brin
For knives, drills, drawing and stamping dies; oil or water hardened, wear resistant.

HAECKER PSX.
M-1318, 1.4 C, 0.30 Cr, 0.1 V, bal Fe.
For bearings, liners, blanking and forming dies, oil hardened, wear resistant

HAFNIA
M-1260, 24.5 Sn, 13 Sb, 0.5 Cu, 62 Pb
Cast: 12,500 TS; 28 Brin.
For refrigerator and electric motor bearings; M P 355-535°F, good castability.

HAGESTA 0060 M.
M-1309, 0.10 C, 28.0 Mo, 65 Ni, bal Fe
Cast, quenched. 64,000-92,000 TS; 50,000 YS; 10 El, 190 Brin, approx.
Highly corrosion resistant cast alloy.
DIN G-X10NiMo6528.

HAGESTA 1855 MW
M-1309, 0.10 C, 16 Cr, 17 Mo, 60 Ni, bal Fe.
Cast, quenched: 64,000-92,000 TS, 50,000 YS; 10 El; 190 Brin, approx.
Highly corrosion resistant cast alloy.
DIN G-X10NiMoCr601716.

HAIRSPRINGS.
U.S.; 4.5-6.5 Sn, 0.2 P, bal Cu.
For hair springs; phosphor bronze

HALBERLAND ALLOY.
Germ., 87 Cu, 13 Zn.
For hardware fittings; Red Brass.

HALCOMB.
M-259; 0.9 C, 1 Cr, bal Fe.
For tools, dies; water hardened.

HALCOMB 218.
M-38; 0.4 C, 1 Si, 5 Cr, 0.3 V, 1.4 Mo, bal Fe.
Air hardened: 400 Brin.
For brass extrusion mandrels, hot heading and forging dies, Al die casting dies, hot punches; tough, resists heat checking, hot work steel. AISI H11.

HALCOMB 236.
M-38; 0.3 C, 13 Cr, 13 W, 0.9 V, bal Fe.
For permanent molds, dies, extension dies; corrosion and heat resistant, hot work steel.

HALCOMB 425.
M-38, 0.40 C, 0.30 Mn, 4.25 Cr, 2.10 V, 4.25 W, 0.4 Mo, 4.25 Co, bal Fe.
At 1200°F 110,000 TS; 16 El; 36 RA; C 44 Rock.
At 800°F: 180,000 TS; 9 El; 36 RA; C 45 Rock.
For hot work tools, brass extrusion dies and dummy blocks, forging dies and inserts.
Shock and abrasion resistant.
Hot work tool steel Type H19

HALCOMB 440.
M-362; 0.8 C, 4.5 Cr, 1.5 V, 20 W, 12 Co, bal Fe.
For lathe and planer tools, reamers, broaches; Type T6; high speed steel.

HALCOMB 777.
M-38; 0.70 C, 0.70 Mn, 0.70 Mo, bal Fe.
For tools; oil or water hardening.

HALCOMB 999.
M-260, M-38; 0.8 C, 14 W, 4 Cr, 2 V, 5 Co, bal Fe
For heavy work on hard stock, high speed steel.

HALCOMB 999.
M-362; 0.75 C, 4 Cr, 2 V, 14 W, 5 Co, bal Fe
For lathe and planer tools, reamers, broaches; Type T8; high speed steel.

HALCOMB 1370.
M-38, 0.43 C, 2.2 Cr, 0.7 Mo, 1.0 W, 0.65 V, bal Fe.
For hot work dies; hot work steel.

HALCOMB BRAKE DIE
M-38, 0.35 C, 0.9 Cr, 0.2 Mo, bal Fe.
Heat treated. 260-300 Brin.
For brake dies; furnished heat treated

HALCOMB C C S
M-260, M-38; 0.4 C, 1.1 Si, 5 Cr, 4 W, bal Fe.
Air-oil· 400 Brin
For tools, die casting dies, press forging dies; tough, wear resistant

HALCOMB CHROME-MOLY HOG KNIFE
M-38, 0.60 C, 0.90 Cr, bal Fe
For knives, water hardening.

HALCOMB CSM NO. 2
M-38; 0.30 C, 0.8 Cr, 0.3 Mo, bal Fe.
200 Brin
For dies for zinc base die castings.

HALCOMB DOUBLE SPECIAL W.
M-260, M-38, 1.19 C, 0.22 Mn, 0.12 Cr, 2.84 W, bal Fe.
Brine harden.
For tools, finishing tools, drawing dies; finishing steel.

HALCOMB FIRST QUALITY.
M-38; 1.25 C, bal Fe.
For tools, drill rod.

HALCOMB GRADE B STAINLESS.
M-260, M-38; 0.75 C, 17 Cr, bal Fe.
For cutlery and dental instruments; corrosion resistant; discontinued.

HALCOMB HOT WORK.
M-260, M-38; 0.4 C, 8.7 W, 3.5 Cr, 0.25 V, bal Fe.
Oil hardened: 400 Brin.
For hot forging dies, punches, grippers; resists heat checking.

HALCOMB L.C.T.
M-260, M-38; 0.4 C, 3.0 Cr, 0.3 V, 15 W, bal Fe.
For hot work dies and tools, shear blades, nut piercers; tough and heat resistant.

HALCOMB L.C.T. NO. 2.
M-260, M-38; 0.45 C, 2 Cr, 0.3 V, 11 W, bal Fe.
Oil hardened: 400 Brin.
For brass forging dies, extrusion dies, dummies for brass; resists heat checking.

HALCOMB NU-DIE.
M-38; 0.38 C, 1.0 Si, 5 Cr, 0.4 V, 1.4 Mo, bal Fe.
Heat treated: 200,000 TS; 180,000 YS; 13.5 El; 47 RA; 420 Brin.
For die casting dies, sleeves, slides, plungers; resists heat checking.

HALCOMB PYRO.
M-260, M-38; 0.7 C, 0.9 Cr, 0.2 V, bal Fe.
For hot and cold work impact tools, bull-dozing tools; resists shock and wear.

HALCOMB SPECIAL.
M-260; 1.35 C, 0.24 Mn, 0.25 Cr, bal Fe.
For tools, dies, taps, reamers; water hardened

HALCOMB "S.R.B."
M-38; 1.08 C, 0.37 Mn, 1.37 Cr, bal Fe.
For tools, dies; oil-hardened.

HALCOMB SS TOOL STEEL.
M-38; 1.05 C, 1.2 Cr, 0.3 Mo, bal Fe.
Hardened: C 58-65 Rock.
Oil hardening tool steel.
For broaches, dies, drills, gages, thread rolling dies.

HALCUT.
M-260, M-38; 0.5 C, 1.3 Cr, 2.7 W, bal Fe.
Oil hardened: 400 Brin.
For hot work tools, chisels, shear blades, forging dies; tough and abrasion resistant.

HALDI.
M-260, M-38; 2.25 C, 11.5 Cr, bal Fe.
For dies, swages, punches, shears, drawing dies; air hardening; resists wear and abrasion.

HALDI NO. 2.
M-38; 1.5 C, 11.5 Cr, bal Fe.
For dies, swages, punches, shears, drawing dies; high abrasion resistant.

HALGRAPH.
M-38; 1.5 C, 0.25 Mo, 1 Si, 0.75 Mn, bal Fe.
For machine tool parts; oil hardened; Type O6.

H.A.L.H. STEEL .
Eng.; C, alloy, bal Fe.
For tools, cutters; same as "Stellite."

HALLAMITE.
M-1202; 0.7 C, 14 W, 4 Cr, 1 V, bal Fe.
For turning and planing tools, shear blades, saws; high speed steel, oil hardened.

HALLAMITIER.
M-1202; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For saws, saw blades, taps, broaches, reamers; high speed steel, oil hardened.

HALLAMITIEST.
M-1202; 0.7 C, 22 W, 4 Cr, 1 V, bal Fe.
For hacksaw blades, saws, lathe and planer tools; high speed steel, oil hardened.

HALLAMSTEEL NO. 1.
M-1202; 1.0-1.2 C, bal Fe.
For circular saws, turning and shaping tools; Type W1; water hardened.

HALLAMSTEEL NO. 2.
M-1202; 0.9-1.0 C, bal Fe.
For saws, drills, pneumatic chisels, shear blades; Type W1; water hardeneed.

HALLAMSTEEL NO. 3.
M-1202; 0.8-0.9 C, bal Fe.
For band saws, caulking tools, shear blades; Type W1; water hardened.

HALLAMSTEEL NO. 4.
M-1202; 0.7-0.8 C, bal Fe.
For cutlery, drills, wood saws, stamping dies, Type W1; water hardened.

HALLAMSTEEL NO. 5.
M-1202; 0.6-0.7 C, bal Fe
For awl blades, blacksmith and boilermaker tools; water hardened.

HALLAMSTEEL NO. 6.
M-1202; 0.5-0.6 C, bal Fe.
For scissors, hammers, chisels, water hardened.

HALLIMAX I.
M-1202, 65 Ni, 15 Cr, bal Fe.
Annealed: 100,000 TS; 25-35 El; 55 RA; 142-157 Brin.
For resistances, heating elements; high heat resistant.

HALLIMAX II.
M-1202; 80 Ni, 20 Cr.
Annealed: 95,000 TS, 25-35 El; 55 RA, 142-157 Brin
For resistances, heating elements; high heat resistant.

HALMO
M-38; 0.35 C, 5 Cr, 5 Mo, bal Fe.
For tools and dies, oil or air hardening.

HALVAN
M-38, 0.50 C, 1.0 Cr, 0.7 Mn, 0.2 V, bal Fe.
Hardened: 540 Brin.
For chisels, die holders, fixtures, jigs, punches; shock resistant, tough. AISI L2.

HAMILOY.
M-1514; Si, bal Al
Die cast: 37,000 TS, 24,000 YS, 5-7 El
For die castings; corrosion resistant.

HAMILTON ALLOYED IRON.
M-850; Alloy cast iron
As cast: 25,000-60,000 TS; 20,000-48,000 YS; 145-360 Brin. (as specified)
Higher strength castings.

HAMILTON DUCTILE IRON
M-850; Several grades.
Cast and heat treated. 60,000-175,000 TS; 40,000-150,000 YS, 143-338 Brin (as specified)
High strength and ductility.

HAMILTON DUCTILE NI-RESIST.
M-850; 8 grades, 18-25% Ni castings.
Cast: 55,000-60,000 TS; 28,000-32,0000 YS; 130-240 Brin.
Austenitic, ductile, corrosion resistant, with good strength.

HAMILTON GRAY IRON.
M-850; Gray iron castings.
As cast: 20,000-25,000 TS; 16,000-20,000 YS; 130-220 Brin.
For general purpose cast iron.

HAMILTON MEEHANITE.
M-850; Quality cast iron; 24 Types.
Cast: 30,000-70,000 TS; 24,000-56,000 YS; 174-600 Brin. (as specified)
For high quality gray iron castings

HAMILTON METAL-A.
Eng.; 93 Zn, 3.5 Cu, 3.1 Pb, 1.5 Sb, 0.5 P + Sn.
For ornamental castings; similar to "Chrysorin."

HAMILTON METAL-B.
Eng.; 33.3 Zn, 66.7 Cu.
For drawn, spun and stamped articles; high ductility.

HAMILTON NI-HARD.
M-850; Ni-Cr cast iron.
Cast: 40,000-75,000 TS; 525-600 Brin.
White cast iron, very good wear properties, not machinable; for pump parts, metal working rolls, coffee grinding burrs.

HAMILTON NI-RESIST.
M-850; 8 grades.
Cast: 20,000-30,000 TS, 100-250 Brin.
Ni or Ni-Cu cast iron; good resistance to corrosion and erosion.

HAMMOND ALLOY NO. 1.
M-992; 80-82 Cu, 2.75-3.50 Sn, 6.5-7.5 Pb, 8-10 Zn.
Cast: 29,000-39,000 TS, 13,700-17,000 YS; 16-30 El; 12-27 RA; 50-60 Brin.
For valve and plumbing castings.

HAMMOND ALLOY NO 2.
M-992, 83 Cu, 4 Sn, 6 Pb, 7 Zn.
Cast. 30,000 TS; 14,000 YS; 16 El; 55 Brin
For hydraulic pumps, free-cutting

HAMMOND ALLOY NO. 3
M-992, 84-86 Cu, 4-6 Sn, 4-6 Pb, 4-6 Zn
Cast: 33,000-48,000 TS, 17,000-24,000 YS, 18-35 El, 12-32 RA, 55-65 Brin
For steam valves, bearings, free cutting.

HAMMOND ALLOY NO 4
M-992, 78.5-81.5 Cu, 9-11 Sn, 9-11 Pb, 0.75 max Zn
Cast 32,000-38,000 TS, 17,000-22,000 YS, 15-20 El; 6-17 RA; 60-70 Brin
For motor bearings, castings, tough.

HAMMOND ALLOY NO. 5.
M-992, 86-89 Cu, 9-11 Sn, 1.0 Pb, 1.0-2.5 Zn
Cast: 36,000-46,000 TS, 20,000-26,000 YS, 17-25 El; 12-26 RA, 70-80 Brin.
For bearings, bushings, gears, tough

HAMMOND ALLOY NO 6
M-992; 86-89 Cu, 9-11 Sn, 0.2 max Pb, 1-3 Zn.
Cast: 38,000-45,000 TS; 21,000-26,000 YS; 22-28 El; 20-28 RA; 70-80 Brin.
For gears, worms, hydraulic castings; tough

HAMMOND ALLOY NO. 7
M-992; 87.0-88.5 Cu, 7.75-8.50 Sn, 0.3 max Pb, 3-5 Zn, 0.4-0.6 Ni.
Cast: 40,000-50,000 TS; 18,000-23,000 YS; 25-40 El; 32-37 RA, 65-75 Brin.
For gears, bolts, pipe fittings, valves; steam metal.

HAMMOND ALLOY NO. 8.
M-992; 88 Cu, 10 Sn, 2 Pb.
Cast: 36,000 TS, 19,000 YS; 22 El; 65 Brin.
For gears, bearings; free-cutting.

HAMMOND ALLOY NO. 9.
M-992; 75 Cu, 8 Sn, 15 Pb, 2 Zn.
Cast: 26,000 TS; 15,000 YS; 10 El; 50 Brin.
For bearings, bushings; tough.

HAMMOND ALLOY NO. 10.
M-992; 86 Cu, 7 Sn, 7 Pb.
Cast: 31,000 TS; 19,000 YS; 15 El; 55 Brin.
For bearings; acid resisting.

HAMMOND ALLOY NO. 11.
M-992; 84.5-86.5 Cu, 8.5-9.5 Sn, 3.5-4.5 Pb, 1-2 Zn.
Cast: 36,000-38,000 TS; 20,000-26,000 YS; 24-30 El; 65-75 Brin.
For bearings; shock resisting.

HAMMOND ALLOY NO. 12.
M-992; 82 Cu, 17 Sn, 1 max P.
Cast.
For journals, trunions.

HAMMOND ALLOY NO. 13.
M-992; 80-82 Cu, 10.5-11.5 Sn, 5.5-6.5 Pb, 1.5-2.5 Ni, 0.4-0.5 P.
Cast: 38,000-42,000 TS; 20,000-24,000 YS; 15-22 El; 75-85 Brin.
For bearings; shock resisting.

HAMMOND ALLOY NO. 14.
M-992; 80 Cu, 8 Sn, 10 Pb, 0.5 P, 1.5 Ni.
Cast: 32,000 TS; 18,000 YS; 15 El; 70 Brin.
For bearings; high speed.

HAMMOND ALLOY NO. 15.
M-992; Si, bal Cu.
Cast: 45,000 TS; 22,000 YS, 18 El; 90 Brin.
For worms, gears, pinions; acid resisting.

HAMMOND ALLOY NO. A-21.
M-992; 74.5 Cu, 8 Fe, 13 Al, 0.5 Mn, 4 Ni.
Cast: 60,000 TS, 60,000 YS, 0 El; 295 Brin.
For guides, dies, pistons; Al-bronze.

HAMMOND ALLOY NO. A-22.
M-992, 85 Cu, 3 Fe, 12 Al, 0.25 Mn.
Cast: 68,000 TS, 45,000 YS; 1 El; 225 Brin.
For castings, Al-bronze.

HAMMOND ALLOY NO. A-23.
M-992; 87 Cu, 4 Fe, 9 Al, 0.1 Mn, 0.1 Ni.
Cast: 78,000 TS; 27,000 YS; 32 El; 100 Brin
For castings; Al-bronze.

HAMMOND ALLOY NO. A-24.
M-992; 89 Cu, 1 Fe, 10 Al, 0.1 Mn, 0.25 Ni.
Cast. 80,000 TS, 28,000 YS; 25 El, 115 Brin.
For castings; Al-bronze.

HAMMOND ALLOY NO A-25.
M-992, 86 Cu, 4 Fe, 10 Al, 0.1 Mn, 0.25 Ni.
Cast. 87,000 TS, 28,000 YS; 18 El; 125 Brin
For gears, bushings, Al-bronze.

HAMMOND ALLOY NO. A-26.
M-992; 83.5 Cu, 4.5 Fe, 10.75 Al, 1.25 Mn.
Cast: 90,000 TS; 35,000 YS, 10 El; 165 Brin.
For gears, Al-bronze.

HAMMOND ALLOY NO. A-27
M-992; 79 Cu, 5 Fe, 11 Al, 0.1 Mn, 5 Ni
Cast: 105,000 TS, 50,000 YS; 5 El; 175 Brin.
For castings; Al-bronze.

HAMMOND ALLOY NO. M-16.
M-992, 55-60 Cu, 38-42 Zn, 1.5 max Sn, 3.5 max Mn.
Cast: 60,000 TS, 28,000 YS; 30 El; 90 Brin.
For valve stems, hubs, free machining.

HAMMOND ALLOY NO. M-17.
M-992; Zn, Fe, Mn, bal Cu.
Cast. 70,000 TS; 30,000 YS; 20 El; 125 Brin.
For castings, corrosion resistant.

HAMMOND ALLOY NO. M-18.
M-992; Zn, Fe, Mn, bal Cu.
Cast: 80,000 TS; 40,000 YS; 20 El; 150 Brin.
For castings; corrosion resistant.

HAMMOND ALLOY NO. M-19.
M-992; Zn, Fe, Mn, bal Cu.
Cast: 90,000 TS; 45,000 YS; 15 El; 170 Brin.
For castings; corrosion resistant.

HAMMOND ALLOY NO. M-20.
M-992; Zn, Fe, Mn, bal Cu.
Cast: 100,000 TS; 60,000 YS; 10 El; 235 Brin.
For castings; high strength.

HAMMONIA METAL.
Germ.; 65 Sn, 32 Zn, 3.3 Cu.
For ornamental parts.

HAMPDEN see CARPENTER MEL-TROL HAMPDEN.

HANCODUR.
M-827; C, alloy, bal Fe.
For valves.

HANDLER BHS.
M-1328; 0.60 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Heat treated: 160,000 TS; 113,000 YS; 12 El, 40 RA; 325 Brin.
For rails, punches, gears, bolts; water hardened

HANDLER BSD.
M-1328; 0.90 C, 1.9 Cr, 0.1 V, bal Fe.
For bearings, cutters, liners, sleeves; water hardened, wear resistant.

HANDLER BSD SPEZIAL.
M-1328; 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For bearings, cutters, liners, sleeves; water hardened, wear resistant.

HANDLER H18.
M-1309; 0.95 C, 4 Cr, W, V, Mo, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

HANDLER H20.
M-1328; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

HANDLER HC EXTRA AH.
M-1328; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 190,000 TS; 145,000 YS, 10 El; 30 RA; 400 Brin
For springs, cutters, taps, hobs, reamers; Type W1, water hardened.

HANDLER HC EXTRA HART.
M-1328; 1.3 C, 0.25 max Mn, 0.25 max Si, bal Fe.
For engraving tools, cutters, broaches, Type W1; water hardened.

HANDLER HC EXTRA MH
M-1328; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS, 55,000 YS; 20 El; 40 RA; 210 Brin.
For springs, cutters, taps, broaches; Type W1; water hardened.

HANDLER HC EXTRA ZH.
M-1328; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, hobs, drills, reamers; Type W1; water hardened.

HANDLER HC PRIMA H.
M-1328; 1.3 C, 0.25 max Mn, 0.25 max Si, bal Fe.
For engraving tools, cutters, broaches; Type W1; water hardened.

HANDLER HC PRIMA MH.
M-1328; 1.15 C, 0.25 max Mn, 0.25 max Si, bal Fe.
Annealed: 110,000 TS; 55,000 YS; 18 El; 40 RA; 210 Brin.
For springs, taps, reamers, broaches; Type W1; water hardened.

HANDLER HC PRIMA WEICH.
M-1328; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 130,000 YS; 12 El; 37 RA; 355 Brin
For rails, axes, punches, crimpers; Type W1; water hardened.

HANDLER HC PRIMA ZAH.
M-1328, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated. 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, tools, cutters, taps, drills, hobs; Type W1; water hardened

HANDLER HC PRIMA ZAHHART.
M-1328; 1.0 C, 0.25 max Mn, 0.25 max Si, bal Fe
Annealed: 100,000 TS, 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, tools, cutters, taps, drills, hobs; Type W1, water hardened.

HANDLER HA GUSSTAHL
M-1328, 0.35 C, 0.4 Si, 0.6 Mn, bal Fe
Hot rolled: 85,000 TS; 54,000 YS; 30 El, 53 RA, 185 Brin
For gears, bolts, machine tool parts; water hardened, SAE 1035

HANDLER MV2
M-1328; 0.42 C, 0.1 V, 1.75 Mn, 0.25 Si, bal Fe
For punches, gears, upsetters, header dies; oil hardened, tough

HANDLER NI 3
M-1328; 0.27 C, 1.1 Al, 1.4 Cr, 0.6 Mn, bal Fe
For oil refinery equipment, heat and creep resistant

HANDLER NI 4.
M-1328, 0.34 C, 1.1 Al, 1.4 Cr, 0.6 Mn, bal Fe.
For oil refinery equipment, heat and creep resistant.

HANDLER NI 7.
M-1328, 0.32 C, 1.1 Al, 1.1 Cr, 0.18 Mo, bal Fe
For oil refinery equipment; heat and creep resistant

HANDLER NI 10
M-1328, 0.33 C, 1.1 Al, 1.7 Cr, 1.0 Ni, 0.5 Mn, bal Fe
For oil refinery equipment, heat and creep resistant

HANDLER NI 19
M-1328, 0.31 C, 2.35 Cr, 0.18 Mo, 0.13 V, 0.6 Mn, bal Fe
For oil refinery equipment, heat and creep resistant.

HANDLER SF2
M-1328, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 174,000 TS, 128,000 YS, 12 El, 37 RA, 350 Brin.
For springs, rails, punches; Type W1 water hardening tool steel.

HANDLER SF3.
M-1328; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, taps, reamers, drills, cutters; Type W1 water hardening tool steel.

HANDLER SF4.
M-1328; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, reamers; Type W1 water hardening tool steel.

HANDLER SF5.
M-1328; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, reamers, cutters; Type W1, water hardened.

HANDLER SF10.
M-1328; 1.0 C, 1.1 Cr, 0.07 Mn, 0.25 Si, bal Fe.
For bearings, cutters, liners, sleeves; water hardened, wear resistant.

HANDLER SF11.
M-1328; 0.85 C, 0.20 Si, 0.30 Mn, 0.30 Cr, bal Fe.
Heat treated: 190,000 TS, 145,000 YS, 10 El, 30 RA; 400 Brin.
For cutters, bearings, liners, sleeves; water hardened, wear resistant.

HANDLER SF12.
M-1328, 1.0 C, 0.10 V, 0.25 Mn, 0.2 Si, bal Fe.
For bearings, dies, cutters, taps; water hardened, wear resistant

HANDLER SF15
M-1328, 0.90 C, Cr, Si, bal Fe
For bearings, dies, cutters, drills, taps, water hardened, wear resistant

HANDLER SF16.
M-1328, 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For drawing and forming dies, cutters; oil hardened, tough.

HANDLER SF18
M-1328, 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, 0.9 Si, bal Fe.
For heading and forming dies, punches, oil hardened, tough

HANDLER SF21
M-1328, 1.42 C, W, V, bal Fe
For bearings, cutters, liners, sleeves; oil or water hardened

HANDLER SF22
M-1328, 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe
For extrusion rams, dies, liners, punches; hot work steel, oil hardened

HANDLER SF25.
M-1328, 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, drills, taps, reamers; high speed steel.

HANDLER SF27.
M-1328; 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, drills, taps, reamers, high speed steel.

HANDLER SF28.
M-1328, 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, drills; high speed steel.

HANDLER SF29.
M-1328; 0.85 C, W, Mo, bal Fe.
For upsetters, punches, dies; hot work steel.

HANDLER SF41.
M-1328; 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 320 Brin.
For wheels, die blocks, rails, girders, springs; water hardened.

HANDLER SF43.
M-1328; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, punches, pneumatic tools; oil hardened, tough.

HANDLER SF46.
M-1328; 0.50 C, 0.95 Mn, 1.05 Cr, 0.1 V, bal Fe.
For gears, bolts, crankshafts, springs; oil hardened, shock resistant.

HANDLER SF62.
M-1328; 2.1 C, 11.5 Cr, 0.70 W, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

HANDLER SF85
M-1328; 0.45 C, Ni, Cr, W, bal Fe.
For forging and heading dies; oil hardened, tough.

HANDLER SF502.
M-1328, 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS, 40,000 YS, 35 El; 70 RA; 155 Brin.
For turbine blades, gages, valves, cutlery; Type 410; stainless.

HANDLER SF511.
M-1328; 0.2 C, 0.4 Si, 13 Cr, bal Fe
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For cutlery, valves, surgical instruments; Type 420, stainless

HANDLER SF512.
M-1328; 0.4 C, 0.4 Si, 13 Cr, bal Fe
Annealed: 100,000 TS; 55,000 YS; 22 El; 52 RA; 200 Brin
For cutlery, valves, surgical and dental instruments, Type 420; stainless

HANDLER SF522
M-1328; 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe.
Aged 115,000 TS; 80,000 YS; 15 El.
Cast· 70,000 TS, 65,000 YS, 12 El; 190 Brin.
For furnace parts, grate bars, salt pots; heat and corrosion resistant.

HANDLER SF527.
M-1328, 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed· 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin
For screw machine products, soot blowers, Type 430 F; corrosion resistant.

HANDLER SF553
M-1328, 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed. 85,000 TS, 35,000 YS; 60 El; 70 RA, 150 Brin
For chemical plant equipment, tanks, agitators; Type 304; stainless, austenitic.

HANDLER SF555.
M-1328, 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin
For chemical plant equipment, tanks, mixers, agitators; Type 302, stainless, austenitic.

HANDLER SF559.
M-1328, 0.10 max C, 12.5 Cr, 12.0 Ni, bal Fe.
For valves, furnace parts; corrosion resistant.

HANDLER SF564.
M-1328; 0.07 max C, 18 Cr, 2.0 Mo, 10.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks; Type 316; stainless, austenitic.

HANDLER SF566.
M-1328; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Cb = 8 × C, bal Fe.
For welded acid resistant chemical plant equipment; Type 316 Cb; stainless, austenitic.

HANDLER SF1951.
M-1328; 0.86 C, 2.5 V, 0.85 Mo, 12 W, bal Fe.
For cutters, forming and drawing dies; high speed steel.

HANDLER SS212.
M-1328; 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

HANDLER SS308.
M-1328; 1.25 C, 1.15 Si, 0.70 Mn, 1.2 Cr, bal Fe.
For blanking and forming dies, headers; oil hardened, tough.

HANDLER SS511
M-1328; 0.56 C, Ni, Cr, Mo, bal Fe.
For forging and heading dies, shears, punches; oil hardened, shock resistant.

HANDLER SS513.
M-1328; 0.45 C, Si, Cr, V, bal Fe.
For springs, gears, bolts, fasteners, crankshafts; oil hardened, shock resistant.

HANDLER SS514
M-1328, 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe
For shear blades, pneumatic tools, chisels; oil hardened, shock resistant.

HANDLER ST Mn 2
M-1328; 0.90 C, 1.9 Mn, 0.10 V, bal Fe.
For punches, shears, blanking and forming dies; oil hardened, non-deforming

HANDY 85 Ag-15 Mn see PREMABRAZE 130

HANDY 94 Cu-6 Ag ALLOY.
M-63, 94 Cu, 6 Ag.
Heat treated. 140,000-165,000 TS.
For spring parts, watch and instrument parts, 70% conductivity, high strength.

HANDY AT SPECIAL see BRAZE 202.

HANDY ATT see BRAZE 200.

HANDY BT see BRAZE 720.

HANDY COIN SILVER.
M-63; 90 Ag, 10 Cu.
For coins; corrosion resistant.

HANDY DE see BRAZE 450.

HANDY DT see BRAZE 400

HANDY ED see BRAZE 451.

HANDY E.T.C. superceded by EASY-FLO

HANDY ETX see BRAZE 501.

HANDY HI-TEMP 90
M-63; 67.5 Cu, 9 Ni, 23.5 Mn, 0.1 max B, 0.1 max Fe
M.P. 1670°F; Flow P 1710°F.
For brazing copper, steel, stainless and nickel base alloys; for combined braze and heat treat.
Ductile, fair corrosion resistance.

HANDY HI-TEMP 095.
M-63; 52.5 Cu, 9.5 Ni, 0.1 max B, 0.1 max Fe, bal Mn.
M.P. 1615°F; Flow P. 1700°F.
For brazing copper, steel, stainless and nickel base alloys; for combined braze and heat treat.
Ductile, fair corrosion resistance. AMS 4764.

HANDY HI-TEMP 710.
M-63; 70.5 Ni, 19 Cr, 10.1 Si, 0.1 max C, 0.1 max Co.
M.P. 1975°F; Flow P. 2075°F.
For brazing stainless steel and high temp alloys.
Good oxidation resistance at high temp.-including against NaK in nuclear reactors.
AMS 4782; AWS BNi-5.

HANDY HI-TEMP 720.
M-63; 72.0 Ni (plus Co), 14 Cr, 4 Si, 3.35 B, 4.5 Fe, 0.75 C.
M P. 1790°F; Flow P. 1900°F.
High temp. brazing alloy for brazing high nickel, cobalt and other high temp. alloys and stainless steels.
Good corrosion resistance and high temp strength
AMS 4775A and AWS B Ni-1

HANDY HI-TEMP 721 (Low Carbon).
M-63; 72 Ni (plus Co), 14 Cr, 4 Si, 3.35 B, 4.5 Fe, 0.6 max C.
M.P. 1780°F; Flow P 1950°F
High temp. brazing alloy for brazing high nickel, cobalt and other high temp. alloys and stainless steels.
Good corrosion resistance and high temp strength
AMS 4776.

HANDY HI-TEMP 820.
M-63; 82 Ni (plus Co), 7 Cr, 4.5 Si, 3.1 B, 3 Fe, 0.15 max C
M.P. 1780°F, Flow P 1830°F.
For brazing stainless steel and high temp alloys; flows into narrow joints
Good corrosion resistance and high temp strength
AMS 4777, AWS B Ni2

HANDY HI-TEMP 910
M-63, 91 Ni (plus Co), 4.5 Si, 3.1 B, 1.5 Fe, 0.06 max C
M P 1800°F, Flow P 1900°F
For brazing stainless steels and high temp alloys, flows into narrow joints
Good corrosion resistance and high temp strength
AMS 4778A, AWS BNi-3

HANDY HI-TEMP 930
M-63, 93 Ni (plus Co), 3.5 Si, 1.6 B, 1.5 Fe, 0.06 max C
M P 1800°F, Flow P 1950°F
For brazing stainless steels and high temp alloys, will bridge wide and irregular joints.
Good oxidation and corrosion resistance
AMS 4779; AWS BNi-4.

HANDY IT see BRAZE 800.

HANDY NE see BRAZE 250

HANDY NT see BRAZE 300

HANDY RE-MN see BRAZE 655

HANDY RE-MN6 see BRAZE 655

HANDY RSNI.
M-63; 63 Ag, 28.5 Cu, 6 Sn, 2.5 Ni.
For silver brazing of 400 series stainless steels; M P 1325-1475°F; overcomes crevice corrosion.

HANDY RT see BRAZE 600

HANDY RT-SN see BRAZE 603.

HANDY SILVER SOLDER see BRAZE 650

HANDY SILVER SOLDER MEDIUM see BRAZE 700.

HANDY SILVER SOLDER HARD see BRAZE 750.

HANDY SN NO 7 see BRAZE 071.

HANDY SS see BRAZE 403.

HANDY SS-5 see BRAZE 404.

HANDY TE SPECIAL see BRAZE 051.

HANDY TL see BRAZE 090.

HANFORD 20.
M-1269; 0.07 max C, 29 Ni, 20 Cr, 2-3 Mo, 4 Cu, bal Fe.
Cast: 65,000-75,000 TS; 28,000-38,000 YS; 50-35 El; 50-40 RA; 120-150 Brin.
For chemical plant equipment, mixers; resists mixed acids, austenitic.

HANOVER WHITE METAL.
U. S.; 86.8 Sn, 7.6 Sb, 5.6 Cu.
For bearings; anti-friction.

HANSA ESPECIAL K5.
M-616; 0.7 C, 18 W, 4 Co, 4 Cr, 1.3 V, bal Fe.
For tools, dies, cutters, drills, taps; high speed steel.

HANSA ESPECIAL K10.
M-616; 0.7 C, 18 W, 9 Co, 1 Mo, 4 Cr, 2 V, bal Fe.
For tools, dies, cutters, reamers, hobs; high speed steel

HANSA ESPECIAL T17 EXTRA.
M-616; 0.7 C, 19 W, 4 Cr, 2 V, bal Fe.
For lathe and planer tools, reamers, drills, broaches, hobs; high speed steel, oil hardened.

HANSA SPEZIAL.
M-1308; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, broaches, drills; high speed steel

HANSA SPEZIAL 325D
M-1308, 0.95 C, 4.1 Cr, W, Mo, bal Fe
For lathe and planer tools, form cutters, drills, taps, hobs; high speed tseel.

HANSA SPEZIAL K3.
M-1308, 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, high speed steel.

HANSA SPEZIAL K6.
M-1308, 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.55 V, 18 W, bal Fe.
For drills, taps, hobs, reamers, lathe and planer tools; high speed steel.

HANSA SPEZIAL T17.
M-1308, 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, broaches, drills; high speed steel.

HANSA SPEZIAL T50.
M-1308; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For engravers' tools, forming cutters, blanking dies; high speed steel.

HARBRONZE
M-1156; Sn, bal Cu.
For bearings.

HARD.
M-388; 1.0 C, bal Fe.
For tools, dies, fixtures; water hardened.

HARD.
M-686; 75 Ag, 22 Cu, 3 Zn.
For silversmithing solder for sterling, M.P. 1365-1450°F.

HARDALLOY.
M-849, 0.43 C, 0.45 Mn, 0.53 Mo, 5.4 Cr, 0.2 Si, bal Fe.
Cast: 575-600 Brin.
For hard surfacing electrode; resists impact, abrasive wear and corrosion.

HARDALLOY 48.
M-849, Cr, bal Fe.
Welded: Rockwell C55.
For hard facing electrode.

HARD BABBITT.
Eng.; 83 Sn, 8.4 Cu, 8.3 Sb.
For bearings; anti-friction.

HARD BEARING.
Eng.; 98.7 Pb, 1.3 Mg.
For bearings.

HARD BRONZE-1.
M-165; 88 Cu, 2 Pb, 7 Sn, 3 Zn.
30,000 TS; 12 El.
For gears, bushings; tough.

HARD BRONZE-2.
M-165; 88 Cu, 10 Sn, 2 Zn.
For gears, bushings; G.M. No. 4048 M.

HARD DEVIL.
M-712, 0.85-1.00 C, bal Fe.
250-400 Brin.
For hard facing welding electrodes.

HARDENITE.
M-502; 0.9 C, 1.2 Mn, bal Fe.
For tools, dies; oil hardened.

HARDENTOUGH 1.
M-118; 0.85 C, bal Fe.
300-425 Brin.
For welding electrodes; hard facing wear resistant

HARDENTOUGH 2.
M-118, C, Mn, Ni, bal Fe.
347 Brin.
For welding electrodes; hard facing wear resistant.

HARDENTOUGH 4.
M-118; C, alloy, bal Fe.
500-600 Brin.
For hard facing welding electrodes; wear resistant.

HARDENTOUGH 5.
M-118, C, alloy, bal Fe.
600-675 Brin.
For hard facing welding electrodes; wear resistant.

HARDENTOUGH 6.
M-118, C, alloy, bal Fe.
700-800 Brin.
For hard facing welding electrodes; wear resistant.

HARDENTOUGH 250.
M-118; C, alloy, bal Fe.
Weld: 230-300 Brin.
For arc welding electrode; hard facing.

HARDENTOUGH 350.
M-118; C, alloy, bal Fe.
Weld: 500 Brin.
For arc welding electrode; hard facing.

HARDENTOUGH 450.
M-118, C, alloy, bal Fe.
Welded: 600 Brin.
For welding electrodes; hard surfacing.

HARDENTOUGH 550
M-118; C, alloy, bal Fe.
Welded: 400-600 Brin.
For arc welding electrodes; hard surfacing.

HARDENTOUGH FORMWEAR.
M-118, C, alloy, bal Fe.
Welded: 500-650 Brin.
For arc-welding electrodes; hard surfacing.

HARDENTOUGH HA.
M-118; C, alloy, bal Fe.
Welded: 575-650 Brin.
For arc welding electrodes; hard surfacing.

HARDENTOUGH MOLYMANG.
M-118; C, 13 Mn, bal Fe.
Weld hardened: 475 Brin.
For arc welding electrodes; abrasion resistant, work hardens.

HARDENTOUGH WH.
M-118; C, alloy, bal Fe.
Cast: 270-380 Brin.
For welding electrodes; hard surfacing.

HARD FACING R 459.
M-9; C, Cr, Mn, Mo, bal Fe.
500-600 Brin.
For hard facing welding rods; wear and heat resistant.

HARDFLEX-11.
M-101; 0.50-0.60 C, 0.6-0.9 Mn, bal Fe.
Heat treated: 128,000-190,000 TS; 107,000-142,000 YS; 10-14 El; 350 DPH; C 36 Rock.
For office and business machine components, electric razors, sewing machines, appliances.
AISI-C1055, Prehardened strip steel, austempered.

HARDFLEX-13M.
M-101; 0.70-0.78 C, 0.7-0.8 Mn, bal Fe.
Hardened: 190,000-228,000 TS, 149,000-200,000 YS; 6-9 El
For office and business machine components, electric razors, sewing machines, appliances.
Prehardened strip steel, austempered AISI-C1074

HARD HEAD.
Eng.; 90 Sn, 8 Sb, 2 Cu.
For bearings; anti-friction.

HARDITE "A."
M-166, 55 Ni, 13 Cr, 1.5-2.0 Si, 2.0 Mn, bal Fe.
At 70°F: 103,000 TS
At 1800°F: 43,000 TS
For carburizing boxes, heating elements, lead pots, retorts, heat resisting.

HARDITE "B."
M-166; 33-35 Ni, 12-14 Cr, 1.5-2.0 Si, 2.0 Mn, bal Fe.
For carburizing boxes, heating elements, lead pots, retorts, heat resisting.

HARDITE "C."
M-166; 93 Ni, 5 Si, 2 Mn.
For heating elements, retorts; high heat resistant

HARDITE "S."
M-166; 88 Ni, 4.5 Si, bal Fe.
For carburizing boxes, heating elements, lead pots, retorts; heat resisting.

HARDITE "X."
M-166; 82-86 Ni, 10-13 Cr, 2-4 Si, 2 Mn.
For heating elements, retorts, heat resisting

HARDITE "Z."
M-166, 6-12 Ni, 15-25 Cr, C, 0.4 Si, 1-3 Mn, bal Fe
For heat treating boxes, furnace parts; stainless.

HARD KOTE "H."
M-139; 1.1 min C, 24-30 W, 16-23 Cr, Ni, bal Fe.
For heat and corrosion resistant parts, tools, dies; heat and corrosion resistant.

HARD KOTE "T."
M-139; 1.1 min C, 24-30 Ni, 16-23 Cr, 16-23 W, bal Fe.
For heat and corrosion resistant parts, tools, dies; heat and corrosion resistant.

HARDNAIR.
M-353; 1.0 C, 5 Cr, 1 Mo, 0.4 Mn, 0.4 V, bal Fe.
Annealed: 103,000 TS; 52,000 YS; 26 El; C 18 Rock.
Hardened: 178,000-253,000 TS; 146,000-200,000 YS; 3-12 El; 7-32 RA; C 41-53 Rock.
For blanking and trimming dies, cams, cutters, gauges, lamination dies, shears.
Type A2 air hardening tool steel, nondeforming.

HARD PHOSPHOR BRONZE.
U.S.; 7 Sn, 0.2 P, bal Cu.
For springs, bearings, electrical parts, gears, strong, corrosion resistant.

HARDRITE.
M-114, M-275; 1.1 C, 1.7 W, 0.6 Cr, 0.25 V, bal Fe.
For light and heavy press dies, punches, taps, reamers, thread rolling dies, knives, cams, forming dies; non-shrinkable, AISI 07.
Was Vulcan Hardrite

HARDROCK 33.
M-829; 7 Co, 18 W, 4 Cr, 1 V, C, bal Fe.
For tool bits, high speed steel.

HARD-ROD NO 100.
M-1096; 0.9 C, 0.6 Mn, 0.3 Mo, 1 Cr, bal Fe.
For hard facing rod; for carbon steels.

HARD-ROD NO. 450.
M-1096, 0.50-0.60 C, 6-8 Cr, 0.6 Si, bal Fe.
Welded: 500 Brin.
For hard facing electrode, for high impact and abrasion

HARD-ROD NO 550
M-1096, 0.6 C, 8 Cr, 0.4 Mn, 0.6 Si, bal Fe.
Welded: 550 Brin
For hard facing electrode, for high abrasion and impact

HARD SILVER SOLDER
Eng ; 80 Ag, 13 Cu, 6.8 Zn
For solder

HARD SOLDER
Eng , 57-50 Cu, 43-50 Zn
For solder

HARDSTEEL NO 2
M-861; 47 Co, 26.8 Cr, 0.7 Mo, trace B, 2.7 Ni, 1.6 W, 0.4 V, 2 Fe.
For hard drills, wear resistant

HARD SURFACE WELDING A-6120
M-12, 0.17-0.22 C, 0.3-0.6 Mn, 0.04 max P, 0.05 max S, 0.15-0.30 Si, 0.8-1.1 Cr, 0.15 min V, bal Fe.
Deposited metal 200-350 Brin
For welding wire (arc or acetylene); hard surfacing for resistance to abrasive wear.

HARDTEM.
M-64, 0.60 C, 0.70 Mn, 0.61 Cr, Ni, 0.17 V, 0.28 Mo, bal Fe
Oil treated: 123,500 TS; 101,500 YS, 53 El, 23 RA, 262 Brin.
For die blocks, drop forged and pressed

HARDWARE BRONZE 267.
M-8; 85 Cu, 13.25 Zn, 1.75 Pb
Soft 40,000 TS; 15,000 YS, 45 El; 72 RA; 62 Brin.
Hard 50,000 TS, 43,000 YS, 20 El; 49 RA; 218 Brin
For bolts, screws, nuts, tie rods

HARDWARE BRONZE-320.
M-8; 85 Cu, 13.25 Zn, 1.75 Pb
Hard: 52,000 TS, 43,000 YS, 20 El; B 55 Rock.
Soft: 40,000 TS; 15,000 YS; 45 El; B 5 Rock.
For screw machine products, hardware, architectural applications.
Elect. cond. 36, corrosion resistant.

HARD YELLOW SOLDER.
Eng.; 58 Cu, 43 Zn, 1.3 Sn, 0.3 Pb.
For solder.

HARDYNE.
M-799; oxides bound with thermoplastic resin.
For permanent magnet; pressed compound oxides.

HARDY NICKEL IRON.
M-435; 0.08 C, 0.20 Mn, 2 Ni, bal Fe.
Annealed: 50,000 TS; 35,000 YS; 35 El; 75 RA; 112 Brin.
For tinning rolls; sub-zero applications.

HARD ZINC (HARTZINK).
Germ.; 92 Zn, 5.3 Fe, 2.4 Pb, 0.1 Cu.
For wash boards.

HARGUS.
M-783; 0.9 C, 1.2 Mn, bal Fe.
For punching and blanking dies; non-deforming.

HARGUS.
M-289, 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For taps, dies, punches, gauges, reamers; non-deforming, oil hardened.

HARLINGTON BRONZE.
Eng; 56 Cu, 43 Zn, 0.9 Sn, 0.6 Fe.
For sheating, condenser tubes, bolts, nuts; high strength

HARMONIA BRONZE.
Eng; 57-55.7 Cu, 40-41.2 Zn, 0.4-0.46 Pb, 1.8-1.29 Fe, 0-0.5 Sn, 0-0.86 Al.
For fittings, hardware

HARTALUMIN.
Al alloy
For light alloy parts.

HARTMETALLE
German; WC For tools, dies; sintered WC

HARVEY 66S
M-1235, 0.70-1.2 Cu, 0.9-1.8 Si, 0.8-1.4 Mg, 0.6-1.1 Mn, bal Al
O-temper: 22,000 TS, 12,000 YS; 18 El, 43 Brin.
T6-temper: 62,000 TS; 55,000 YS, 8 El; 120 Brin
T4-temper. 52,000 TS; 30,000 YS; 18 El; 90 Brin
For structures, bus and truck bodies, boom scaffolds, age hardenable, good weldability

HARVEY HA-1900
M-1235, 0.0125 max H, 0.07 max N, 0.25 max 0, 0.10 max C, 0.30 max Fe, bal Ti.
Bar. 80,000 min TS, 70,000 min YS; 15 El, 30 RA; 10-11 Charpy impact
For non-structural and moderately stressed aircraft parts, corrosion applications
Alpha titanium, corrosion resistant

HARVEY HA-1930.
M-1235, 99.5 Ti
Annealed: 48,000 TS; 25,000 YS, 35 El
At 600°F: 20,000 TS, 10,000 YS, 50 El.
For chemical plant equipment, high temperature applications
Highest formability. Corrosion resistant.

HARVEY HA-1940.
M-1235; 99.2 Ti
Annealed. 65,000 TS; 43,000 YS; 30 El.
At 600°F. 28,000 TS; 13,000 YS; 45 El.
For aerospace equipment, chemical and marine applications.
Pipe and tubing. Corrosion resistant

HARVEY HA-1940 Pd.
M-1235, 0.15-0.20 Pd, bal Ti.
Annealed: 62,000 TS, 46,000 YS; 27 El.
At 600°F: 28,000 TS; 13,000 YS; 30 El.
At 1000°F: 15,400 TS; 90,000 YS; 31 El.
For chemical industry equipment.
Corrosion resistant grade.

HARVEY HA-1950.
M-1235; 99.0 Ti.
Annealed: 75,000 TS; 63,000 YS; 25 El.
At 600°F: 33,000 TS; 19,000 YS; 33 El.
For marine applications, high temperature applications. Corrosion resistant.

HARVEY HA-1970.
M-1235; 99.0 Ti.
Annealed: 95,000 TS; 80,000 YS; 22 El.
At 600°F: 43,000 TS; 27,000 YS; 28 El.
For marine applications, high temperature components.
Commercially pure titanium. Corrosion resistant.

HARVEY HA-4145.
M-1235; 4 Al, 4 Mn, bal Ti.
Annealed: 148,000 TS; 135,000 YS; 15 El.
At 600°F: 110,000 TS; 90,000 YS; 17 El.
Aged: 162,000 TS, 143,000 YS; 10 El.
For heavy section aircraft components, fasteners, jet engine and guided missile parts.
Alpha-beta titanium alloy.

HARVEY HA-5137.
M-1235; 4.0-6.0 Al, 2.0-3.0 Sn, bal Ti.
Bar: 125,000 TS, 120,000 YS; 18 El; 25 RA; C 35 Rock.
At 600°F: 82,000 TS; 65,000 YS, 19 El
For structural aircraft parts, missiles
Weldable, high strength, alpha titanium, corrosion resistant.

HARVEY HA-5137 ELI.
M-1235, 5 Al, 2.5 Sn, low 0, bal Ti
Annealed. 110,000 TS; 95,000 YS; 20 El.
At 600°F 78,000 TS, 60,000 YS; 20 El.
For cryogenic applications, missile and aircraft components
Alpha-titanium, corrosion resistant.

HARVEY HA-5158.
M-1235, 6 Al, 6 V, 2 Sn, 1 (Fe, Cu), bal Ti.
Annealed: 160,000 TS, 155,000 YS; 15 El.
Aged: 190,000 TS; 180,000 YS; 10 El.
For ordnance applications and aircraft components, pressure vessels
Alpha-beta titanium alloy. Hardenable.

HARVEY HA 6148
M-1235, 5.5-6.5 Al, 3.5-4.5 V, bal Ti.
Bar. 130,000 min TS; 120,000 min YS, 10 El; 25 RA, C 38 Rock.
For airframe and jet engine compressor parts, ordnance equipment
Alpha-beta titanium, corrosion resistant.

HARVEY HA-6510
M-1235, 6 Al, 4 V, bal Ti.
Annealed 140,000 TS, 130,000 YS; 18 El
At 600°F: 105,000 TS; 95,000 YS; 11 El.
Aged: 165,000 TS; 155,000 YS; 13 El.
For airframe and jet engine components, ordnance equipment.
Heat treatable to high strength. Alpha-beta type.

HARVEY HA-6510 ELI.
M-1235; 6 Al, 4 V, low 0, bal Ti.
Annealed: 135,000 TS; 125,000 YS; 20 El.
At 600°F: 105,000 TS; 95,000 YS; 12 El.
For cryogenic applications. Aircraft and missile components.
Heat treatable. Alpha-beta alloy.

HARVEY HA-7146
M-1235; 7 Al, 4 Mo, bal Ti.
Annealed: 160,000 TS; 150,000 YS, 16 El.
At 600°F: 127,000 TS; 108,000 YS; 18 El.
Aged: 185,000 TS; 175,000 YS; 15 El.
For engine and airframe applications, jet engine and missile components.
Heat treatable; High creep strength.

HARVEY HA-8116.
M-1235; 8 Al, 1 Mo, 1 V, bal Ti.
Annealed: 140,000 TS; 130,000 YS; 15 El.
At 1000°F: 95,000 TS; 73,000 YS; 14 El; 30 RA.
For aircraft and jet components, discs, spacers and blades.
High strength, long time creep resistant, high temperature stability.

HARVILL NO. 1.
M-830; 0-1.5 Al, 0-0.4 Pb, 0-1.5 Sn, 38-42 Zn, 3.5-4.5 Mn, 55-60 Cu.
Cast: 65,000 TS; 30,000 YS; 10 El; 100-130 Brin.
For casting; corrosion resistant.

HARVILL NO. 2.
M-830; 7-9 Al, 2.5-4.5 Ni, 85-87 Cu.
Cast: 75,000 TS; 25 El; 110 Brin.
For die castings; Al Bronze.

HARVILL NO. 3.
M-830; 18 Ni, 55-64 Cu, bal Zn.
Cast: 55,000 TS; 35,000 YS; 10 El; 115 Brin.
For die castings; white Ni brass.

HARVILL NO. 4.
M-830; 57-59 Cu, 0.5-1.5 Sn, 40-42 Zn.
Cast: 55,000 TS; 40,000 YS; 15 El; 130 Brin.
For die castings; yellow brass.

HARZ REFINED LEAD.
M-382; 99.9 Pb.
For lead tubes and sheets for chemical industry; corrosion resistant.

HAS-ALL.
M-497; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed tools; high speed steel.

HASCROME ALLOY.
M-167; 1.0 C, 14 Cr, 0.5 max Mn, bal Fe.
Welded: 40,000 TS; 250-500 Brin.
For hard facing welding rod; hardens on peening, tough.

HASS.
Eng.; 4.5 Cu, 0.75 Mn, 1.0 Si, bal Al.
For aircraft structures; age-hardening alloy.

HASTELLOY ALLOY 500.
M-167; 16-20 Co, 16-20 Cr, 3-5 Mo, 2 max Fe, 0.10 max C, 2.5-3.5 Al, 2.5-3.2 Ti, 0.01 B, bal Ni.
At 70°F: 195,000 TS; 125,000 YS; 18 El; 23 RA; 400 Brin.
At 1000°F: 185,000 TS; 118,000 YS; 10 El; 15 RA.
At 1400°F: 150,000 TS; 110,000 YS; 20 El; 27 RA.
For high temperature applications, turbine buckets, jet engine components; vacuum melted, age-hardenable, heat resistant to 1700°F.

HASTELLOY ALLOY 700.
M-167; 0.10 C, 0.007 B, 2.9 Cr, 2.9 Ti, 18 Co, 18 Cr, 4 Mo, 2 max Fe, bal Ni.
Aged: 171,000 TS; 104,000 YS; 25 El; 27 RA.
At 1600°F: 84,000 TS; 56,000 YS; 7 El; 8 RA.
For turbine buckets, jet engine components; heat resistant to 1700°F, age-hardenable.

HASTELLOY ALLOY B.
M-167; 26-30 Mo, 4-6 Fe, 0.12 max C, 62 Ni.
Cast: 82,000 TS; 57,000 YS; 9 El; 13 RA; 230 Brin.
Rolled: 140,000 TS; 65,000 YS; 45 El; 45 RA; 235 Brin.
For agitators, heating and cooling coils, pump parts, valves; resists HCl and boiling H_3PO_4.

HASTELLOY ALLOY C.
M-167; 16-18 Mo, 13.0-17.5 Cr, 3.7-5.3 W, 4.5-7 Fe, bal Ni.
Cast: 72,000-80,000 TS; 45,000-48,000 YS; 15-10 El; 16-11 RA; 175-215 Brin.
Rolled: 130,000 TS; 65,000 YS; 25 El; 210 Brin.
For pumps and valves for H_2SO_4 at high temperature; resists SO_3, P_2O_5 and Cl_2.

HASTELLOY ALLOY C-276.
M-167; 14.5-16.5 Cr, 15.0-17.0 Mo, 2.5 max Co, 3.0-4.5 W, 4.0-7.0 Fe, 0.02 max C, 1.0 max Mn, bal Ni.
Hardenable by cold work plus aging from 90 Rock B to max of 49 Rock C.
Excellent corrosion resistance even to such chemicals as wet chlorine gas and hypochlorites.

HASTELLOY ALLOY D.
M-167; 11 max Si, 4 max Cu, bal Ni.
Cast: 36,000-40,000 TS; 35,000-40,000 YS; 0 El; 0 RA; 484-547 Brin.
Pump valves; resists HCl and H_2SO_4, but not HNO_3 or Cl_2.

HASTELLOY ALLOY G.
M-167; 21-23.5 Cr, 5.5-7.5 Mo, 1.0 max W, 1.0-2.0 Mn, 2.5 max Co, 1.0 max Si, 18-21 Fe, 0.05 max C, 1.5-2.5 Cu, 1.75-2.50 Cb + Ta, bal Ni.
Alloy with excellent resistance to hot sulphuric and phosphoric acids. For chemical plant equipment.

HASTELLOY ALLOY N.
M-167; 6-8 Cr, 15-18 Mo, 5 Fe, 0.04-0.08 C, 0.5 Al, 0.01 B, bal Ni.
Annealed: 86,400 TS; 37,300 YS; 17 El.
For containers for molten fluorides; oxidation resistant to 1800°F.

HASTELLOY ALLOY W.
M-167; 0.12 C, 5 Cr, 24.5 Mo, 2.5 Co, 5.5 Fe, 0.6 V, 1 Mn, 1 Si, bal Ni
For high temperature applications, corrosion and heat resistant.

HASTELLOY ALLOY X.
M-167; 0.05-0.20 C, 20.5-23.0 Cr, 17-20 Fe, 8-10 Mo, 0.5-2.5 Co, 0.2-1.0 W, bal Ni.
At 70°F: 113,000 TS; 55,800 YS; 44 El
At 1200°F: 83,000 TS; 40,700 YS; 37 El.
At 1800°F: 21,000 TS; 17,000 YS; 43 El.
For aircraft and jet engine components; good creep and stress rupture properties.

HATHAL-A.
M-1548, 3.0-5.0 Cu, 0.4 Si, 0.4-1.0 Mn, 0.3-1.0 Mg, bal Al.
Heat treated: 23,000-65,500 TS; 10-25 El; 40-120 Brin.
For rivets, hydraulic fittings, hardware.
Age-hardenable. Aluminum 2014.
Good machinability and weldability.

HATHAL-B.
M-1548; 0.2-1.0 Si, 0.2-0.6 Mn, 2.0-8.0 Mg, bal Al.
Heat treated: 31,000-54,000 TS; 5-20 El; 50-85 Brin.
For structural members, marine hardware, fasteners.
Age hardenable. Corrosion resistant.

HATHAL-C.
M-1548; 0.5-1.0 Si, 0.3-1.5 Mn, 0.8-1.5 Mg, bal Al.
Heat teated: 14,000-43,000 TS; 6-22 El; 30-80 Brin.
For structures, marine parts, screw machine products.
Age-hardenable. Corrosion resistant.

HAVAR.
M-1084; 42.5 Co, 13 Ni, 20 Cr, 2 Mo, 0.2 C, 0.04 Be, 1.6 Mn, 2.8 W, bal Fe.
Rolled: 260,000-290,000 TS; 200,000-220,000 YS; 48-50 El.
Aged: 330,000-360,000 TS; 260,000-280,000 YS; 56-60 El.

For watch and power springs, valves, flapper valves, electronic parts, age-hardenable, high strength and fatigue resistance.

HAVOC.
M-373; 0.5 C, 1.0 Si, 0.2 V, 0.5 Mo, bal Fe.
For plug gages, reamers, arbors, punches; water hardening, shock resistant.

HAWK 777.
M-362; 0.7 C, 0.09 Cr, 0.8 Mn, 0.7 Mo, bal Fe.
For drills, cutters, punches, mandrels; oil hardened.

HAWK 977.
M-362, 0.90 C, 0.09 Cr, 0.72 Mo, bal Fe.
For rivet punches; oil hardened; tough.

HAWK 3110.
M-362; 0.10 C, 0.70 Mn, 1.25 Ni, 0.65 Cr, bal Fe.
For plastic mold and die casting dies; case hardened.

HAWK A-2
M-362; 1.0 C, 0.7 Mn, 0.3 Si, 5.25 Cr, 0.3 V, 1.15 Mo, bal Fe.
AISI Type A2 air hardening tool steel.

HAWK A-2-S.
M-362; 1.0 C, 0.7 Mn, 0.3 Si, 5.25 Cr, 0.3 V, 1.15 Mo, 0.15 S, bal Fe.
Free machine grade.
AISI Type A2 air hardening tool steel

HAWK BRAND
M-362, 0.60-1.40 C, 0.15-0.30 Mn, 0.15-0.30 Si, bal Fe
For general tools, dies, shallow hardening, fine grained

HAWKS BRAND WHITE METAL
M-410, 53.2 Sn, 7.87 Sb, 0.48 Cu, 38.48 Pb
For bearings, castings

HAWK COLD HEADER DIE.
M-362, 0.95 C, bal Fe
For heading dies; tough, water hardened.

HAWK D2.
M-362, 1.55 C, 0.35 Mn, 0.45 Si, 11.5 Cr, 0.9 V, 0.8 Mo, bal Fe.
Air or oil hardening cold work tool and die steel, chromium type; AISI D2.

HAWK D2S
M-362; 1.55 C, 0.35 Mn, 0.45 Si, 11.5 Cr, 0.9 V, 0.8 Mo, 0.15 S, bal Fe.
Air or oil hardening cold work tool and die steel, chromium type, free machining grade; AISI D2.

HAWK O1.
M-362, 0.90 C, 1.25 Mn, 0.5 Cr, 0.5 W, bal Fe.
AISI Type O1 oil hardening tool steel.

HAWK SPECIAL.
M-362, 0.90-1.40 C, 0.20-0.30 Cr, 0.15-0.30 Mn, 0.40-0.60 Si, bal Fe.
For general tools, dies, cutters, taps, drills; holds its cutting edge.

HAWK SS EXTRA.
M-362; 1.05 C, 1.2 Cr, 0.3 Mo, bal Fe
For tools, dies; Type L7.

HAWK STANDARD.
M-362; 0.7-1.2 C, bal Fe.
For tools, dies; water hardening.

HAWK VANADIUM.
M-362; 0.70-1.40 C, 0.15-0.25 V, 0.15-0.30 Mn, 0.15-0.30 Si, bal Fe.
For general tools, dies, cutters, punches; tough.

HAWK W1.
M-362; 0.95-1.05 C, Mn, Si, bal Fe.
AISI Type W1 water hardening tool steel.

HAYNES ALLOY NO. 25.
M-167; 19-21 Cr, 14-16 W, 9-11 Ni, 0.15 max C, 2 max Fe, bal Co.
Annealed: 155,000 TS; 70,000 YS; 50 El; 130 Brin.
For turbine blades and discs, combustion chambers, jet stack; corrosion and heat resistant.

HAYNES ALLOY 40.
M-167; 73 Ni, 14 Cr, 0.4 C, 4 Si, 3 B, 5 others.
Welded: 30,000 TS, 0 El; 580-640 Brin.
For hard surfacing electrodes; abrasion and galling resistant.

HAYNES ALLOY 41.
M-167; 76 Ni, 11.5 Cr, 0.4 C, 4 Si, 2.5 B, 5 other elements.
Welded: 60,000 TS, 0 El; 480-540 Brin.
For hard facing electrode, resists galling, abrasion and corrosion

HAYNES ALLOY NO. 44.
M-167, 9 Cr, 3 Si, 0.45 C, 3.75 Fe, 2 B, bal Fe.
Welded: 350-420 Brin.
For hard facing electrode; resists impact, corrosion and impact resistant.

HAYNES ALLOY NO 88.
M-167, 0.07 C, 1.4 Mn, 12 Cr, 15 Ni, 2 Mo, 0.5 W, 0.5 Ti, 0.1 B, bal Fe.
Cold drawn: 104,000 TS; 85,000 YS; 32 El, 63 RA; 233 Brin.
For high temperature bolts, turbine discs and blades; heat resistant, good relaxation properties

HAYNES ALLOY NO 90
M-167, 2.75 C, 27 Cr, 0.65 Mn, bal Fe.
Welded 63,000 TS, 500 Brin.
For hard facing rod, resists heat and abrasion

HAYNES ALLOY NO 92
M-167; 10 Mo, bal Fe
Welded: 25,000 TS
For hard facing electrodes; resists abrasion, bare rod.

HAYNES ALLOY NO 93
M-167, 3 C, 15-19 Cr, 13-17 Mo, 4-7 Co, 0.5-3.0 V, bal Fe.
Heat treated: 90,000 TS, 90,000 YS, 0 El; 0 RA, 650-745 Brin
For hard surfacing electrode, abrasion resistant, high cold hardness.

HAYNES ALLOY NO. 94
M-167; 32 Cr, 3.5 C, 1.6 Mn, 1 Mo, 0.3 max Si, bal Fe
Welded: 580 Brin.
For hard facing electrode; resists corrosion and oxidation.

HAYNES ALLOY NO 151.
M-167; 0.48 C, 0.06 B, 20 Cr, 12.8 W, 3 max Fe + Ni, bal Co.
Cast: 103,000 TS; 74,000 YS; 8 El; 330 Brin.
For turbine vanes, high temperature applications; good creep-rupture properties to 1800°F.

HAYNES ALLOY NO. 188.
M-167, 20-24 Cr, 20-24 Ni, 13-16 W, 3 max Fe, 0.05-0.15 C, 0.20-0.50 Si, 1.25 max Mn, 0.03-0.15 La, bal Co.
Sheet, H.T., Room T.: 139,400 TS; 69,500 YS; 56 El.
Sheet, H.T., 1800°F 36,800 TS; 23,500 YS; 72 El
For high temperature applications in aircraft, space, gas turbine, nuclear industries.
Weldable, oxidation and corrosion resistant.

HAYNES ALLOY NO. 713C.
M-167; 0.08-0.20 C, 11-14 Cr, 3.5-5.5 Mo, 6 Al, 0.6 Ti, 2 Cb, 2.5 max Fe, 0.04 Zr, 0.01 B, bal Ni.
At 70°F: 123,000 TS, 108,000 YS; 7.6 El; 9.9 RA.
At 1800°F: 72,000 TS; 51,300 YS; 14.0 El; 28.0 RA.
For jet engine blades; vacuum melted, vacuum cast, age-hardenable.

HAYNES 4560.
M-167; 0.6 C, 5 Cr, 0.8 Mn, 0.8 Mo, bal Fe.
Welded: 450 Brin.
For hard facing rod; resists cold abrasion.

HAYNES 4561 ALLOY.
M-167; 2.5 Cr, 0.55 C, 1.1 Mn, 0.4 Mo, 0.5 Si, bal Fe.
Welded: 550 Brin.
For hard facing electrode; heavy impact and moderate abrasion resistance.

HAYNES 5260.
M-167, 9 Cr, 1 C, 0.6 Mn, 1.15 Mo, bal Fe
Welded. 520 Brin.
For hard facing rod, low crack sensitivity.

HAYNES 5261 ALLOY.
M-167; 5.5 Cr, 0.70 C, 1.15 Mn, 0.50 Mo, 0.8 Si, bal Fe.
Welded· 570 Brin.
For hard facing electrode; wear resistant.

HAYNES 5461 ALLOY
M-167, 3 C, 12 Cr, 2.5 Mn, 1.5 Si, 1.5 Mo, bal Fe
Welded: 550 Brin
For hard facing electrode; corrosion and erosion resistant.

HAYNES L-605 replaced by **HAYNES ALLOY No. 25**

HAYNES ALLOY NO R-41.
M-167, 0.12 max C, 18-20 Cr, 5 max Fe, 10-12 Co, 3.0-3.3 Ti, 9.0-10.5 Mo, 1.4-1.8 Al, B, bal Ni
Heat treated. 140,000-206,000 TS; 97,000-154,000 YS; 9-18 El; 400 Brin
For high temperature applications, jet engine components; age-hardenable, high oxidation resistance.

HAYNES NICKEL-MANGANESE.
M-167, 0.50 C, 0.70 Cr, 13.5 Mn, 3.5 Ni, 0.8 Si, bal Fe.
Welded. 127,000 TS; 185-450 Brin.
For hard facing electrode; work hardens, abrasion and impact resistant.

HAYNES PATENT.
U S; 8-60 Cr, 1.0 max C, bal Fe
For tools, dies, corrosion and heat resisting parts; stainless and corrosion resistant.

HAYNES STELLITE ALLOY NO. 3.
M-167; 2.5 C, 48-53 Co, 28-32 Cr, 12-16 W, 3 max Ni.
Cast: 68,000 TS; 68,000 YS; 0 El; 0 RA; 600 Brin
For cutting tools, wear resistant castings; heat, wear and corrosion resistant.

HAYNES STELLITE ALLOY NO. 4.
M-167; 0.6 C, 51 Co, 30 Cr, 14 W, 3 max Ni.
Cast: 39,100 TS; 39,100 YS; 1 El, 1 RA, 444 Brin.
For castings for wear resistant cutting tools and dies; heat, wear and corrosion resistant.

HAYNES STELLITE ALLOY NO. 6.
M-167; 1.1 C, 55 min Co, 33 max Cr, 6 max W, 3.5 max Fe, 3 max Ni
Cast: 105,000-120,000 TS; 105,000-120,000 YS; 3 El, 3 RA; 402 Brin.
For hard facing welding rod, tools; heat, wear and corrosion resistant.

HAYNES STELLITE ALLOY NO. 6B.
M-167; 1.1 C, 30 Cr, 4.5 W, 3 max Fe, 3 max Ni, bal Co.
Plate: 148,000 TS; 88,000 YS; 7 El; 9 RA; 380 Brin.
Sheet· 165,000 TS; 110,000 YS; 5 El; 430 Brin.
For high temperature applications, valve parts, liners; heat and corrosion resistant.

HAYNES STELLITE ALLOY NO. 6K.
M-167; 1.6 C, 31 Cr, 4.5 W, 3 max Fe, 3 max Ni, bal Co.
Sheet· 176,500 TS; 3.5 El; 460 Brin
At 1500°F. 70,200 TS, 17.0 El
For high temperature applications, knives, scrapers; heat and corrosion resistant.

HAYNES STELLITE ALLOY NO 12.
M-167; 1.35 C, 47 Co, 34 max Cr, 10 max W, 3 max Fe, 3 max Ni.
Cast· 100,000-115,000 TS, 100,000-115,000 YS; 0 El, 0 RA, 387-477 Brin.
For hard facing welding rod, heat, wear and corrosion resistant.

HAYNES STELLITE ALLOY NO 19
M-167; 53 Co, 31 Cr, 10 W, 1.8 C, 4 other elements
Sand cast 110,000 TS, 1 El, 550 Brin
Permanent mold. 116,000 TS, 1 El, 580 Brin
For nozzle disks, cutting tools, bearings; red hard, abrasion and shock resistant

HAYNES STELLITE ALLOY NO 21
M-167, 0.20-0.35 C, 25-30 Cr, 4.5-6.5 Mo, 1.5-3.5 Ni, 2 max Fe, bal Co
Cast· 100,000 TS, 82,000 YS, 9 El, 9 RA, C-32 Brin
At 1500°F 62,200 TS.
For welding rod, jet engine parts, turbine blades, impeller blades, resists extreme heat

HAYNES STELLITE ALLOY NO 31
M-167, 0.45-0.6 C, 23-28 Cr, 6-9 W, 9-12 Ni, 2 max Fe, bal Co.
Cast· 113,000 TS, 80,000 YS, 8 El; 10 RA, C-30 Brin
For turbine blades, jet engines, high heat resistant

HAYNES STELLITE 98M2 ALLOY.
M-167, 1.8 C, 35 min Co, 35 max Cr, 20 max W, 4.5 Fe, 0.7 Mo, 4.5 V, 3 Ni, 1.2 B
Cast. 65,000-75,000 TS, 65,000-75,000 YS; 0 El, 0 RA, 680-700 Brin
For cutting tools, valves, dies, wear, heat and abrasion resistant

HAYNES STELLITE STAR J METAL
M-167, 2.4 C, 3 Fe, 2.5 Ni, 0.2 B, 35 Cr, 20 max W, 40 min Co.
Cast· 55,000-65,000 TS, 55,000-65,000 YS, 0 El; 0 RA, 640-670 Brin
For tool bits, form tools, milling cutters; wear, heat and abrasion resistant.

HAYWOOD'S HIGH TENSILE BRONZE GRADE 8
M-411; 35 Zn, 7 Al, bal Cu.
Forged. 86,000 TS, 61,000 YS, 36 El, 115 Brin.
For corrosion resisting, high strength cast and forged bronze parts, non-corrosive.

HAZEL BRONZE
M-575; Cu alloy.
For nuts, bolts, studs.

HB see FINKL HB.

HB 5.
10.5 Al, 4 Fe, 4 Mn, 1 Zn, 0.5 Cr, bal Cu
For gears; corrosion resistant Al bronze.

"H" BRAND.
M-40; 0.95 C, 0.35 Cr, 0.2 Si, 1.0 Mn, bal Fe.
For dies, punches; non-deforming.

HC 5.
M-459; 0.1 C, 2.5-2.7 Cr, 0.35 Si, 0.4 Mn, bal Fe
For case hardened parts, dies; carburizing steel.

HC 8.
M-459; 0.25 C, 2.5-2.7 Cr, 0.4 Si, 0.35 Mn, bal Fe
For case hardened parts; carburizing steel.

HC 9.
M-459, 0.2 C, 3-3.2 Cr, 0.25 Mo, 5 V, bal Fe.
For case hardened parts, carburizing steel

HC250
M-1099, C, Cr, bal Fe
Annealed 85,000 TS; 70,000 YS; 3 El, 350 Brin.
Heat treated· 100,000 TS; 80,000 YS, 750 Brin.
For cylinder liners, fan blades, molds, nozzles,
abrasion resistant, hot gas resistant

H.C.A. see **BRAEBURN HCA**

HC-HC.
M-432, 1.85 C, 12.25 Cr, bal Fe
For punches and dies; non-deforming

H C PICK STEEL.
M-38, C, alloy, bal Fe
For mining picks, water hardened

H C POKER BAR STEEL.
M-38, C, bal Fe.
For mining poker bars; water hardened

"HC" QUALITY.
M-179, 60 min Cu, 2 min Pb, bal Zn.
Extruded 55,000 TS; 30-35 El; 25 RA, 100 Brin
Drawn 60,000 TS, 25 El, 22 RA, 110 Brin.
For spun parts, hardware, free-cutting

H.C R
M-108, 50 Ni, 50 Fe, 0.2 Mn, 0.05 Si, 0.005 C,
0.005 S
Rolled. 50,000 TS; 95 Brin
For soft magnets, transformer and choke coils,
high magnetic permeability

H D.A 8151.
M-167, 66.0 Co, 20.0 Cr, 12.5 W, 0.05 B,
0.5 C, 0.6 Mn, 0.6 Si
For jet engine components
High temperature alloys, heat and
corrosion resistant.

HDW 2.
M-57; 0.4 C, 5 Cr, 0.25 V, 1.5 Mo, 0.8 Si, bal Fe
For dies, mandrels, shear blades,
hot work steel, tough

HDW 3.
M-57, 0.4 C, 5 Cr, 1.5 Mo, 1.4 W, 0.8 Si, bal Fe
For dies, mandrels, shear blades,
hot work steel, tough

HE-30
M-833, 3.2-3.3 C, 2.2 Si, 0.8 Mn, bal Fe.
Cast. 30,000-40,000 TS; 180-200 Brin
For motor blocks, machine tool beds, gibs; cast iron.

HE-40
M-833; 3.1-3.25 C, 1.6-1.8 Si, 0.8 Mn, bal Fe.
Cast. 40,000-50,000 TS, 200-240 Brin
For radical drill, arms and bases; cast iron.

HE-50.
M-833, 2.9-3.1 C, 1.3-1.5 Si, 0.8 Mn, bal Fe.
Cast. 50,000-60,000 TS; 230-265 Brin
For machine tool runways, saddles, gears; cast iron.

HE-60
M-833; 2.9-3.1 C, 1.3-1.5 Si, 0.8 Mn, 1.25-1.5 Ni,
0.5 Mo, bal Fe.
Cast: 60,000-70,000 TS; 240-280 Brin.
For crankshafts, hydraulic rams; cast iron, tough.

HE 2048.
U.S.; 0.4 C, 15 Co, 30 Ni, 21 Fe, 26 Cr, 4 Mo, 2 W,
0.15 B.
Cast.
For high temperature applications;
high strength, heat resistant.

HEAT RESISTANT STEEL
Eng ; 70 Fe, 15 Cr, 14 Co, 0.5 Mn, 0.5 C, 0.5 Si.
For corrosion and heat resisting parts;
corrosion and heat resistant; U. S. Pat. 1357549.

HEAT RESISTING ACID METAL.
M-126; 55 Cu, 6 Pb, 9 Zn, 30 Ni.
For chemical apparatus; acid resistant

HEAVY ALLOY.
M-831; 76-90 W, 1-16 Ni, 3-20 Cu.
Sintered. 80,000 TS, 74,000 YS; 1 El, 290 Brin.
For balancing crankshafts of aero motors;
powder metals.

HEAVY AXLE BEARING.
Eng , 47 Zn, 38 Sn, 6 Sb, 4 Pb, 1 Cu
For axle bearings; anti-friction.

HEAVY BEARING.
Eng , 85 Sn, 7.5 Cu, 7.5 Sb.
For bearings, bushings, anti-friction.

HEAVY DUTY SW-16.
M-605, 0.2 C, bal Fe.
For welding electrodes, for light gage steel

HEAVY METAL TM-17
M-1189, Cu, Ni, bal W
Sintered 100,000 TS; 90,000 YS; 4 El, 250-300 Brin
For radioactive shields, pendulums,
counterbalance weights, density 16.7.

HEAVY METAL TM-18.
M-1189, Cu, Ni, bal W
Sintered 117,000 TS; 108,000 YS, 2.5 El;
250-300 Brin
For radioactive shields, pendulums,
counterbalance weights, density 18.0

HEAVY METAL TM-170
M-1189, Cu, Ni, bal W
Sintered 110,000 TS, 95,000 YS, 4 El, 250-300 Brin.
For radioactive shields, pendulums,
counterbalance weights, density 17.0

HEAVY METAL TM-175.
M-1189, Cu, Ni, bal W.
Sintered. 117,000 TS, 102,000 YS, 3.5 El,
250-300 Brin
For radioactive shields, pendulums,
counterbalance weights, density 17.5

HEAVY PRESSURE.
M-88; Sb, Cu, bal Sn
Cast: 30 Brin
For bearings for crushers, heavy duty Babbitt.

HEAVY PRESSURE MILL GLYCO.
M-240, Sn, Sb, bal Pb.
For bearings, Babbitt

HEAVY TUNGSTEN ALLOY CLASS 1.
M-793, 97.5 W, 2.5 Ni.
322 Brin.
For radioactive shielding, balance weights,
sintered, density 18.6.

HEAVY TUNGSTEN ALLOY CLASS 2.
M-793, 95 W, 5 Ni + Cu.
Sintered: 50,000 TS, 270-290 Brin
For radioactive shielding, gyroscope components;
sintered, density 18.0-18.5.

HEAVY TUNGSTEN ALLOY CLASS 3.
M-793; 90 W, 10 Ni + Cu.
Sintered: 80,000 TS; 3 El; 305 Brin.
For radioactive shielding, gyroscope components; density 17.0-17.5.

HEAVY TUNGSTEN-W2.
M-793; 97.5 W, 2.5 Ni.
For shielding, isotope containers, gyro parts, counterweights, electrical contacts.
Heavy metal.

HEAVY TUNGSTEN-W5.
M-793; 95 W, 3.3 Ni, 1.7 Cu.
For rocket nozzles, jet and guide vanes.
Heavy metal, heat resistant.

HEBONITE.
Eng.; C, alloy, bal Fe
For heat resistant parts; heat resistant.

HECLA
M-122; 60 Cu, 1 Pb, 0.7 Sn, bal Zn.
Drawn: 74,000 TS; 43,000 YS; 21 El; 25 RA; 137 Brin.
Normalized: 63,000 TS; 51,000 YS, 43 El; 46 RA; 100 Brin.
For screw machine parts, hot pressings; corrosion resistant, free-cutting.

HECLA.
M-275; 0.5 C, 0.2 V, 0.2 W, 1.0 Cr, bal Fe.
For arbors, spindles, gears, drop hammer clutches, leaf springs, piston rods;
resists vibration and shock. AISI L2.
Was Vulcan Hecla

HECLA NO. 7.
M-122, 60 Cu, 1 Pb, 0.7 Sn, bal Zn.
For screw machine products;
free cutting, corrosion resistant.

HECLA 10
M-62; 0.50-0.60 C, 0.5-0.8 Mn, 0.05-0.35 Si, 0.5-0.8 Ni, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 22 El; 190 Brin
Heat treated: 160,000 TS; 110,000 YS; 12 El; 330 Brin.
For structural parts, shafts, gears, axles, countershafts, punches
Water or oil harden, tough, shock resistant

HECLA NO 13.
M-122, 60 Cu, 1.8 Pb, 0.7 Sn, bal Zn.
Soft: 58,000 TS, 28,000 YS; 35 El; 83 Brin.
½ H-temper: 65,000 TS; 38,000 YS; 25 El; 125 Brin
H-temper: 75,000 TS; 52,000 YS; 20 El; 160 Brin.
For screw machine products, marine hardware; free cutting.

HECLA 18
M-62; 0.65-0.90 C, 0.35 max Si, 0.3-0.6 Mn, bal Fe.
Annealed: 120,000 TS; 66,000 YS; 15 El; 223 Brin.
Oil Hardened: 190,000 TS; 142,000 YP; 12 El; 388 Brin.
For hammers, tools, punches, springs, structural parts, thrust washers, lock washers.
SAE 1064-1078 steel, water hardening.

HECLA 34.
M-62; 0.90-1.25 C, 0.35 max Si, 0.3-0.7 Mn, bal Fe.
Annealed: 100,000 TS; 55,000 YP; 20 El, 200 Brin.
Heat treated: 216,000 TS; 152,000 YP; 11 El; 600 Brin.
For springs, cutting tools, drills, punches, jigs, and fixtures.
SAE 1095 steel. Water harden, wear resistant.

HECLA 35.
M-62; 0.15-0.30 C, 0.40-0.60 Mn, bal Fe.
Forged: 56,000-78,000 TS; 25% El.
Normalized: 62,000-85,000 TS; 25% El; 126-180 Brin.
For structural parts, fasteners, gears, shafts.
SAE 1017-1020 steel, water harden.

HECLA 36.
M-62; 0.70-0.90 C, 0.35 max Si, 0.55-0.80 Mn, bal Fe.
Annealed: 120,000 TS; 66,000 YS; 15 El; 223 Brin.
Water harden: 183,000 TS; 135,000 YS, 13 El; 390 Brin.
For tools, cutters, punches, drills, hammers, springs, bushings, bearings.
SAE-1080 steel, water harden, wear resistant.

HECLA 37
M-62; 0.35-0.45 C, 0.60-1.0 Mn, bal Fe.
Normalized: 78,000-100,000 TS; 20-22% El; 152-255 Brin.
For gears, bolts, fasteners, axles, shafts, structural parts.
SAE 1035-1040 steel, water harden.

HECLA 40
M-62, 0.25-0.35 C, 0.05-0.35 Si, 0.7-0.9 Mn, bal Fe
Normalized: 72,000-100,000 TS; 20-25% El; 143-255 Brin
For structural parts, bolts, gears, shafts, axles.
SAE 1026-1033 steel, water harden.

HECLA 41.
M-62, 0.45-0.60 C, 0.05-0.40 Si, 0.3-1.0 Mn, bal Fe
Normalized: 90,000-112,000 TS; 63,000-69,000 YS; 18% El
For structural parts, gears, shafts, crankshafts, bolts SAE 1046-1050 steels, water harden.

HECLA 42
M-62, 0.60-0.90 C, 0.35 max Si, 0.55-0.80 Mn, bal Fe
Annealed: 120,000 TS, 65,000 YS, 15 El, 223 Brin
Water harden: 183,000 TS; 135,000 YS, 13 El; 390 Brin
For structural parts, gears, shafts, springs, cutlery, punches.
SAE 1064 steel-SAE 1084 steel, water harden.

HECLA 46.
M-62; 0.15 C, 0.05-0.35 Si, 0.40-0.70 Mn, bal Fe
Bar 72,000 TS, 20 El, 64,000 YS; 155 Brin.
Water hardened. 105,000 TS; 80,000 YS, 6 El; 205 Brin.
For case hardened gears, shafts, cams.
SAE 1015 case hardening steel Water harden.

HECLA S55.
M-62; 0.55-0.65 C, 1.5-2.0 Si, 0.7-1.0 Mn, bal Fe.
Annealed 118,000 TS, 68,000 YS, 22 El; 240 Brin
Oil harden: 325,000 TS; 280,000 YS; 9 El; 620 Brin
For springs, pneumatic tools, punches
SAE 9255-9260 spring steel, oil harden, tough.

HECLA 66.
M-62; 0.10-0.15 C, 0.10-0.35 Si, 0.30-0.60 Mn, 0.30 Cr, 2.75-3.5 Ni, bal Fe.
Bar: 101,000 TS, 18 El; 78,000 YP; 200 Brin.
Heat treated: 180,000 TS; 155,000 YS; 14 El; 360 Brin
For gears, bolts, cams, camshafts, clutch parts, piston pins.
Tough, shock resistant case hardening.
Abrasion resistant.

HECLA 67.
M-62; 0.26-0.34 C, 1.1-1.4 Cr, 3.9-4.3 Ni, bal Fe.
Heat treated. 224,000 TS; 180,000 YS; 10% El; 444 Brin.
For structural parts, gears, pinions, shafts, bolts, countershafts.
Shock resisting, oil hardening.

HECLA 67B.
M-62; 0.26-0.34 C, 1.1-1.4 Cr, 3.9-4.3 Ni, 0.2-0.4 Mo, bal Fe.
Heat treated: 224,000 TS; 180,000 YS; 10% El; 444 Brin.
For structural parts, gears, pinions, countershafts, axles, bolts.
Oil hardening, shock resisting.

HECLA NO. 69.
M-122; 60 Cu, 0.7 Pb, 0.75 Sn, bal Zn.
Soft: 58,000 TS; 28,000 YS; 40 El; 83 Brin.
½ H-temper: 65,000 TS; 38,000 YS; 30 El; 125 Brin.
H-temper: 75,000 TS; 52,000 YS; 22 El; 160 Brin.
For screw machine products, marine hardware; free cutting.

HECLA 70.
M-62; 0.35-0.45 C, 0.30 max C, 3.25-3.75 Ni, bal Fe.
Bar: 112,000 TS; 80,000 YS; 20% El; 223-277 Brin.
For gears, shafts, bolts, fasteners, countershafts, pinions.
Oil hardening, shock resisting

HECLA 73
M-62; 0.20-0.35 C, 0.30 max Cr, 2.5-3.5 Ni, bal Fe.
Bar: 101,000-112,000 TS; 72,000-81,000 YS, 20-22% El; 201-277 Brin
For gears, shafts, bolts, fasteners, countershafts
Oil hardening, tough

HECLA 78
M-62; 0.16 C, 0.45 Mn, 0.30 Cr, 4.5-5.2 Ni, bal Fe.
Bar: 90,000 TS, 20 El; 72,000 YP; 180 Brin.
Heat treated: 182,000 TS, 160,000 YP; 15 El; 375 Brin.
For gears, bolts, cams, camshafts, pawls, arbors, pneumatic tools.
Tough, shock resisting, case hardening

HECLA 98.
M-62; 0.30-0.40 C, 0.45-0.75 Cr, 1.0-1.5 Ni, bal Fe.
Bar 100,000-135,000 TS, 72,000-103,000 YS; 17-22% El, 201-321 Brin.
For bolts, gears, countershafts, structural parts, fasteners Oil hardening, tough.

HECLA 100
M-62, 0.35-0.45 C, 1.2-1.5 Mn, 0.3-0.6 Cr, 0.5-1.0 Ni, 0.15-0.25 Mo, bal Fe.
Bar: 101,000 TS, 72,000 YS; 22% El; 201-255 Brin.
For structural parts, gears, shafts, bolts, fasteners.
Oil hardening, shock resisting

HECLA 104.
M-62, 0.50-0.70 C, 0.5-0.8 Cr, 0.5-0.8 Mn, bal Fe.
Bar 123,000-145,000 TS; 12-15% El, 248-341 Brinell.
For structural parts, bolts, crankshafts, punches.
SAE 5160.

HECLA 105.
M-62; 0.25-0.45 C, 0.60-0.95 Mn, 0.85-1.15 Cr, bal Fe.
Bar: 100,000-123,000 TS; 72,000-92,000 YS; 18-22% El, 201-302 Brin
For shafts, bolts, gears, fasteners, countershafts.
SAE 5130-5140 steel, oil hardening.

HECLA 110.
M-62; 0.35-0.45 C, 0.9-1.4 Cr, 1.2-1.6 Ni, 0.1-0.2 Mo, bal Fe.
Bar: 112,000 TS; 81,000 YS; 20% El; 223-277 Brin.
For gears, bolts, countershafts, fasteners, crankshafts. Oil hardening, tough.

HECLA 115.
M-62; 0.30-0.45 C, 0.10-0.35 Si, 0.7-0.9 Mn, 0.6-1.0 Ni, bal Fe.
Normalized: 78,000 TS; 20% El; 152-207 Brin.
For structural parts, gears, axles, shafts, bolts.
Water hardening.

HECLA 116.
M-62; 0.25-0.35 C, 0.50-1.0 Cr, 2.75-3.50 Ni, 0.65 max Mo, bal Fe.
Bar: 112,000-146,000 TS; 80,000-112,000 YS; 16-20% El; 223-341 Brin.
For gears, shafts, axles, bolts, countershafts.
Oil hardening, shock resisting.

HECLA 120.
M-62; 0.6 C, 9 Cr, Si, bal Fe.
For valves; heat resistant.

HECLA 138.
M-62, 0.27-0.35 C, 0.5-0.8 Cr, 2.3-2.8 Ni, 0.4-0.7 Mo, bal Fe.
Bar. 123,000-224,000 TS; 92,000-180,000 YS; 10-18% El, 248-444 Brin.
For gears, shafts, axles, bolts, countershafts.
Shock resisting, oil hardening

HECLA 138H.
M-62; 0.36-0.44 C, 0.5-0.8 Cr, 2.3-2.8 Ni, 0.4-0.7 Mo, bal Fe.
Bar. 134,000-224,000 TS, 103,000-180,000 YS; 10-17% El; 269-444 Brin.
For gears, shafts, axles, bolts, countershafts, fasteners
Shock resisting, oil hardening.

HECLA 142.
M-62; 0.25-0.40 C, 0.75-1.5 Cr, 3.0-4.5 Ni, 0.20-0.65 Mo, bal Fe.
Bar: 134,000-180,000 TS; 103,000-144,000 YS; 14-17% 269-415 Brin
For structural parts, gears, pinions, shafts, bolts, countershafts. Oil hardening, shock resisting.

HECLA 143.
M-62; 0.12-0.18 C, 0.10-0.35 Si, 0.30-0.60 Mn, 0.60-1.1 Cr, 3.0-3.75 Ni, bal Fe.
Bar: 123,000-145,000 TS; 13-15% El.
For gears, bolts, cams, camshafts, fasteners.
Case hardening steel. Tough, shock resistant.

HECLA 143B
M-62, 0.12-0.18 C, 0.60-1.1 Cr, 3.0-3.75 Ni, 0.10-0.25 Mo, bal Fe.
Bar. 145,000 TS; 13 El; 88,000 YS.
Heat treated. 180,000 TS; 145,000 YP; 15 El, 370 Brin.
For gears, bolts, cams, camshafts
Case hardening steel. Tough, shock resistant.

HECLA 146.
M-62, 0.12-0.18 C, 1.0-1.4 Cr, 3.8-4.5 Ni, bal Fe.
Bar: 190,000 TS, 12 El; 145,000 YP; 50 RA; 380 Brin.
For gears, bolts, cams, camshafts, clutch parts, pneumatic tools.
Tough, shock resisting, case hardening; abrasion resistant

HECLA 146B.
M-62; 0.12-0.18 C, 1.0-1.4 Cr, 3.8-4.5 Ni, 0.15-0.35 Mo, bal Fe.
Bar: 190,000 TS; 12 El; 145,000 YP; 50 RA; 375 Brin.
For gears, bolts, cams, camshafts, clutch parts, pneumatic tools.
Tough, shock resisting, case hardening; abrasion resistant.

HECLA 147.
M-62; 0.3 C, 5 Cr, 0.5 Mo, bal Fe.
For oil refinery castings and tubes; creep and corrosion resistant.

HECLA 150.
M-62; 0.35-0.45 C, 0.90-1.5 Cr, 0.20-0.40 Mo, bal Fe.
Bar: 100,000-180,000 T; 72,000-112,000 YS; 16-22% El; 201-341 Brin.
For gears, shafts, bolts, fasteners, countershafts.
SAE 4137-4140 steel, oil hardening.

HECLA 151.
M-62; 0.14-0.20 C, 0.10-0.35 Si, 0.30-0.60 Mn, 1.5-2.0 Ni, 0.2-0.3 Mo, bal Fe.
Bar: 101,000 TS, 18 El; 88,000 YP, 245 Brin.
Heat treated: 150,000 TS; 106,000 YP; 16 El; 300 Brin.
For gears, bolts, cams, camshafts.
SAE 4617 case hardening steel. Tough, wear resistant.

HECLA 151B.
M-62; 0.20-0.28 C, 0.10-0.35 Si, 0.30-0.60 Mn, 1.5-2.0 Ni, 0.2-0.3 Mo, bal Fe.
Bar: 123,000 TS; 15 El; 93,000 YP; 260 Brin.
Heat treated: 186,000 TS, 156,000 YP; 9 El; 360 Brin.
Gears, bolts, cams, camshafts
SAE 4617 & 4620 case hardening steel.
Tough, abrasion resistant.

HECLA 152.
M-62; 0.35-0.45 C, 0.90-1.40 Cr, 1.30-1.80 Ni, 0.20-0.35 Mo, bal Fe.
Bar: 112,000-224,000 TS; 80,000-180,000 YS; 8-20% El; 223-444 Brin.
For gears, shafts, axles, bolts, countershafts, fasteners
Oil hardening, shock resisting

HECLA 153.
M-62, 0.20-0.45 C, 0.5-1.5 Cr, 0.50-0.90 Mo, bal Fe
Bar: 123,000-146,000 TS, 92,000-112,000 YS, 16-18% El, 248-341 Brin.
For bolts, fasteners, gears, shafts, countershafts.
Oil or water hardening.

HECLA 157.
M-62; 0.35-0.45 C, 0.90-1.50 Cr, 0.2-0.4 Mo, bal Fe
Bar: 100,000-180,000 TS; 72,000-112,000 YS; 16-22% El; 201-341 Brin.
For gears, shafts, bolts, fasteners, countershafts
SAE 4137-4140 Steel, oil hardening.

HECLA 159.
M-62; 1.5 C, 12 Cr, Mo, bal Fe.
For tools, dies, cutters; air hardening.

HECLA 163.
M-62; 0.16 max C, 0.30 max Cr, 4.5-5.5 Ni, 0.15-0.30 Mo, bal Fe.
Bar: 146,000 TS; 13 El, 115,000 YP, 275 Brin.
Oil harden: 193,000 TS; 155,000 YP; 14 El; 362 Brin.
For gears, bolts, cams, camshafts, pawls, machinery parts.
Tough, shock resisting, case hardening, oil harden.

HECLA 174.
M-62; 0.4 C, 5 Cr, 1.3 Mo, 0.8 V, bal Fe.
Heat treated: 270,000 TS; 230,000 YS, 6 El.
For hot forging dies for brass and aluminum, extrusion dies; hot work steel, air hardened.

HECLA 181.
M-62; 0.20 max C, 0.4-0.8 Cr, 0.6-1.0 Ni, 0.10 max Mo, bal Fe.
Bar: 101,000 TS; 18 El; 55,000 YP, 200 Brin.
Oil hardened: 146,000 TS; 115,000 YP, 17 El; 302 Brin.
For gears, bolts, cams, camshafts.
Tough, shock resisting, case hardening, wear and abrasion resistant.

HECLA 182.
M-62; 0.20 max C, 0.6-1.0 Cr, 0.85-1.25 Ni, 0.10 max Mo, bal Fe.
Bar: 123,000 TS; 15 El.
Heat treated: 215,000 TS; 170,000 YP; 15 El; 425 Brin.
For gears, bolts, cams, camshafts, chuck jaws.
Tough, shock resisting, case hardening, wear and abrasion resistant.

HECLA 183.
M-62; 0.20 max C, 0.75-1.25 Cr, 1.0-1.5 Ni, 0.08-0.15 Mo, bal Fe.
Bar: 146,000 TS; 12 El.
Heat treated: 218,000 TS; 178,000 YP; 13 El; 430 Brin.
For gears, bolts, cams, camshafts, chuck jaws.
Tough, shock resisting, case hardening, wear and abrasion resistant.

HECLA 184
M-62; 0.20 max C, 0.75-1.25 Cr, 1.5-2.0 Ni, 0.10-0.20 Mo, bal Fe.
Bar: 168,000 TS; 12 El
Heat treated. 200,000 TS; 150,000 YP; 15 El; C 42 Rock.
For gears, bolts, cams, camshafts.
Tough, shock resisting, case hardening, wear resistant.

HECLA 185.
M-62, 0.20 C, 1.4-1.7 Cr, 1.8-2.2 Ni, 0.15-0.25 Mo, bal Fe.
Bar: 120,000 TS; 18 El; 230 Brin
Heat treated: 220,000 TS, 160,000 YP; 13 El; C 40 Rock.
For gears, bolts, cams, camshafts, arbors, bearings, chuck jaws
Tough, shock resisting, case hardening, wear resistant.

HECLA 191.
M-62, 0.13-0.17 C, 0.55-0.80 Cr, 0.40-0.70 Ni, 0.08-0.15 Mo, bal Fe.
Bar 101,000 TS; 18 El, 80,000 YS; 220 Brin
Heat treated. 200,000 TS; 155,000 YS; 15 El; 375 Brin.
For gears, bolts, cams, camshafts
Tough, shock resisting, case hardening, oil harden, wear resistant.

HECLA 192
M-62, 0.18-0.23 C, 0.55-0.80 Cr, 0.40-0.70 Ni, 0.08-0.15 Mo, bal Fe.
Bar 123,000 TS; 15 El, 77,000 YS, 240 Brin
Heat treated: 220,000 TS, 180,000 YS; 12 El; 430 Brin
For gears, bolts, cams, camshafts.
Tough, shock resisting, case hardening, oil harden, wear resistant

HECLA 193
M-62, 0.22-0.26 C, 0.55-0.80 Cr, 0.40-0.70 Ni, 0.08-0.15 Mo, bal Fe
Bar: 146,000 TS; 85,000 YS; 260 Brin.
Heat treated. 220,000 TS; 180,000 YP; 12 El; 440 Brin.
For gears, bolts, cams, camshafts, pawls, chuck jaws, die bodies.
Tough, shock resisting, case hardening, oil hardening

HECLA 196.
M-62; 0.25-0.45 C, 1.4-1.8 Cr, 0.40 max Ni, 0.10-0.25 Mo, 0.90-1.30 Al, bal Fe.
Oil hardened: 100,000-123,000 TS; 72,000-92,000 YS; 17-20% El.
For gears, bolts, cams, camshafts, rolls, crankshafts, anvils.
Nitriding steel, wear and abrasion resistant.

HECLA 197.
M-62; 0.22 max C, 0.40-0.60 Cr, 1.5-2.0 Ni, 0.2-0.3 Mo, bal Fe.
Bar: 123,000 TS; 15 El; 78,000 YS; 248 Brin.
Heat treated: 218,000 TS, 178,000 YP; 13 El; 430 Brin.
For gears, cams, camshafts, bolts.
Tough, shock resisting, case hardening.
SAE 4320, oil hardening.

HECLA 206.
M-62; 0.12-0.17 C, 0.30-0.50 Cr, bal Fe.
Annealed: 75,000 TS; 48,000 YP; 38 El; 145 Brin
Hardened: 145,000 TS; 120,000 YP; 16 El; 310 Brin.
For gears, bolts, cams, camshafts, pawls, machinery parts.
Case hardening, water harden
SAE 5115, wear resistant.

HECLA 207.
M-62; 0.16-0.21 C, 0.60-0.80 Cr, bal Fe
Annealed: 75,000 TS, 50,000 YP, 35 El, 150 Brin.
Water hardened 190,000 TS; 170,000 YP; 13 El, 370 Brin.
For gears, bolts, cams, camshafts, fasteners, pawls, machinery parts Case hardening.
SAE 5120, water or oil hardening.

HECLA 317.
M-62, 0.10-0.30 C, 2.9-3.5 Cr, 0.40 max Ni, 0.40-0.70 Mo, bal Fe
Bar 101,000-135,000 TS; 72,000-103,000 YS; 17-22 El
For gears, bolts, cams, camshafts, rolls, fasteners, crankshafts.
Tough, shock resisting, case hardening and nitriding steel

HECLA A T G.
M-62, 0.2 C, 12 Cr, 60 Ni, 4 W, bal Fe
For glass industry equipment, heat resistant.

HECLA A.T V
M-62, 0.2 C, 11 Cr, 35 Ni, bal Fe.
Treated 110,000 TS; 66,000 YS; 20 El; 35 RA.
For turbine blades and nozzles; heat resistant

HECLA BRONZE
M-832, Sn, Pb, bal Cu
For bearings, heavy duty.

HECLA CH31.
M-62, 0.10-0.18 C, 0.05-0.35 Si, 0.60-1.0 Mn, bal Fe
Bar. 72,000 TS, 20 El, 64,000 YS, 155 Brin.
Water hardened: 105,000 TS, 80,000 YS; 6 El; 205 Brin
For gears, cams, shafts, bolts, fasteners, pawls, machinery parts.
SAE 1016 case hardening steel, water harden

HECLA D17
M-62; 0.60-0.70 C, 0.35 max Si, 0.55-0.80 Mn, bal Fe.
Oil hardened: 180,000 TS; 130,000 YS; 12 El, 360 Brin.
Annealed. 112,000 TS, 60,000 YS, 17 El, 207 Brin.
For structural parts, axles, shafts, springs, cutlery, punches, heavy machine parts, hatchets.
SAE 1064 steel. Water harden, wear resistant.

HECLA-EM20.
M-62; 0.18 C, 1.5 Mn, 20 Ni, 21 Cr, 20 Co, 3 Mo, 2.5 W, 1 Cb, 0.09 N, bal Fe.
Forged: 142,000 TS, 116,000 YS; 16 El; 45 RA.
For jet engine components, turbine rotor blades.
Heat resistant.

HECLA EM35.
M-62; 0.35 C, 1.5 Mn 15 Ni, 17 Cr, 12 Co, 2.9 Mo, 2.5 W, 0.9 N, 1 Cb, bal Fe.
For jet engine components, turbine rotor blades; heat resistant.

HECLA HCT-4.
M-62; 0.17 C, 0.5 Si, 1 Mn, 11.5 Cr, 0.6 Mo, 0.2 Cb, 0.2 V, 0.07 N, 0.3 B, bal Fe.
For jet engine components, turbine rotor blades; heat resistant.

HECLA-H GT4.
M-62; 0.15-0.19 C, 10.5-12.0 Cr, 0.15-0.25 Cb, 0.5-0.7 Mo, 0.15-0.25 V, 0.02 B, 0.08 N, 0.2 Ti, bal Fe.
Annealed: 90,000 TS; 38,000 YS; 26 El; B 90 Rock.
Hardened: 230,000 TS; 195,000 YS; 10 El; C 47 Rock.
For bearings, valves, cutlery, surgical instruments.
Corrosion resistant, hardenable.

HECLA MM20.
M-62; 0.18 C, 1.5 Mn, 20 Ni, 21 Cr, 20 Co, 2.9 Mo, 2.5 W, 1 Cb, 0.12 N, bal Fe.
For jet engine components, turbine rotor blades; heat resistant

HECLA MM35.
M-62; 0.35 C, 1.5 Mn, 20 Ni, 21 Cr, 20 Co, 2.9 Mo, 2.5 W, 1 Cb, 0.12 N, bal Fe.
For jet engine components, turbine rotor blades; heat resistant.

HECLA SNS.
M-62; 0.74-0.84 C, 1.75-2.25 Si, 0.2-0.6 Mn, 19.0-20.5 Cr, 1.15-1.65 Ni, bal Fe
Annealed: 105,000 TS, 65,000 YS, Rock B 95.
For cutlery, valve parts, ball bearings, surgical instruments
Corrosion resistant. Hardenable

HECLA SPECIAL
M-275, 0.5 C, 1.5 Cr, 0.2 V, 0.2 W, bal Fe.
Heat treated. 130,000-165,000 TS, 125,000-160,000 YS, 19.5-18.0 El, 59-51 RA; 241-269 Brin.
For gears, forging dies, clutches, shock resistant, oil hardened.

HECNUM.
M-1554, 55 Cu, 45 Ni.
Annealed: 70,000 TS, 30,000 YS; 50 El; 110 Brin.
For electrical resistances, thermocouples.
Negligible temperature coefficient

HEDDAL
M-297, 0.2 C, 0.3 Mn, 0.25 Si, bal Fe
For machinery parts; water hardened

HEDDAL.
M-1548, 1.5 Mn, bal Al
Soft 14,000 TS; 5690 YS; 30-40 El; 28-32 Brin.
Hard 35,600 TS; 28,500 YS, 3 El; 60 Brin
For heat exchangers, pressure and storage tanks, chemical equipment.
Similar to Aluminum 3003, not heat-treatable.

HEDDENAL 2
M-297; 1.5-3.0 Mg, 0.5-1.5 Mn, 0.3 max Cr, bal Al.
Soft. 26,000 TS, 10,000 YS; 20 El, 45 Brin
Hard: 41,000 TS; 36,000 YS; 5 El; 77 Brin.
For roofing, hydraulic tubing, architectural trim; good forming and welding properties.

HEDDENAL 3.
M-297, 2-4 Mg, 0.4 max Mn, 0.3 max Cr, bal Al.
Soft: 28,000 TS; 13,000 YS; 30 El; 47 Brin.
Hard: 40,000 TS, 35,000 YS; 10 El; 73 Brin.
For aircraft tanks and fittings, fuel lines, marine parts; resists sea water corrosion.

HEDDENAL 5.
M-297, 4.0-5.5 Mg, 0.8 max Mn, 0.3 max Cr, bal Al.
Soft: 42,000 TS; 22,000 YS, 35 El; 65 Brin.
Hard: 60,000 TS; 50,000 YS; 10 El; 105 Brin.
For aircraft and marine parts; good corrosion resistance.

HEDDENAL 7.
M-297; 5.5-7.5 Mg, 0.8 max Mn, 0.3 max Cr, bal Al.
For aircraft and marine parts;
good corrosion resistance.

HEDDRONAL 3.5.
M-1548; 0.5 Mn, 3.5 Mg, bal Al.
Rolled: 35,000 TS; 20-25 El; 70-100 Brin.
For structural towers, unfired pressure vessels,
rocket motor parts, missile containers.
Similar to Aluminum 5086, non-heat treatable.
Corrosion resistant.

HEDDRONAL 5.
M-1548; 0.5 Mn, 5.0 Mg, bal Al.
Rolled: 32,000-38,000 TS; 15-22 El; 70-100 Brin
For deck housing, overhead cranes,
ship unloaders, heavy duty structures
Similar to Aluminum 5456. Not heat treatable;
corrosion resistant.

HEDDRONAL 7.
M-1548; 0.5 Mn, 7.0 Mg, bal Al.
Rolled: 45,000-52,000 TS; 20-25 El; 80-100 Brin.
For heavy duty structures, overhead cranes,
ship unloaders.
Corrosion resistant.

HEDDROXAL.
M-297; 2-4 Mg, 0.4 Mn, 0.3 max Cr, bal Al.
Soft: 28,000 TS; 13,000 YS; 30 El; 47 Brin.
Hard: 40,000 TS; 35,000 YS; 10 El; 73 Brin.
For aircraft tanks and fittings, fuel lines,
marine parts; resists sea water corrosion.

HEDDUR.
M-297; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
Annealed: 27,000 TS; 11,000 YS; 22 El; 47 Brin.
Heat treated: 72,000 TS, 57,000 YS; 130 Brin.
For aircraft structures and fittings,
fasteners; age-hardenable

HEDDUR.
M-983; 0.2-2.0 Mg, 3.5-5.5 Cu, 0.2-1.0 Si,
0.1-1.2 Mn, bal Al.
20,000-31,000 TS; 10,000-14,000 YS; 2-4 El;
60-80 Brin.
For light alloy parts; Duralumin type.

HEDDUR.
M-1545; 3.5-5.0 Cu, 0.3-0.8 Si, 0.2-1.2 Mn,
0.4-1.0 Mg, bal Al.
Heat treated: 68,000-78,000 TS; 50,000-57,000 YS;
12-16 El; 115-130 Brin.
For structural applications, screw machine
products, fasteners.
Heat treatable. Similar to Aluminum 2017.

HEDERVAN.
M-73; 0.90 C, V, bal Fe.
For cold heading and striking dies, punches,
draw dies; water hardened; Type W2.

HEERDT T7P.
M-1324; 0.7 C, 0.25 max Si, 0.25 max P, bal Fe.
Heat treated: 120,000-174,000 TS;
82,000-128,000 YS; 22-12 El; 52-37 RA;
241-352 Brin.
For crimpers, punches, springs, rails, dies;
Type W1; water hardened.

HEERDT T8E.
M-1324; 0.7 C, 0.2 max Si, 0.2 max P, bal Fe.
Heat treated: 120,000-174,000 TS;
82,000-128,000 YS; 22-12 El; 52-37 RA;
241-352 Brin.
For crimpers, punches, dies, springs, rails;
Type W1; water hardened.

HEERDT T8V.
M-1324; 0.8 C, 0.2 Si, 0.2 Mn, bal Fe.
Heat treated: 129,000-188,000 TS;
87,000-143,000 YS; 21-12 El; 50-35 RA;
255-388 Brin.
For tools, dies, springs, cutters; Type W1;
water hardened.

HEERDT T9E.
M-1324; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 130,000-190,000 TS;
88,000-145,000 YS; 20-11 El; 48-32 RA;
260-400 Brin.
For tools, dies, springs, cutters, drills; Type W1;
water hardened

HEERDT T9P.
M-1324; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 130,000-190,000 TS;
88,000-145,000 YS; 20-11 El; 48-32 RA;
260-400 Brin.
For tools, dies, springs, cutters, drills,
Type W1; water hardened.

HEERDT T10E
M-1324; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 121,000-213,000 TS,
84,000-150,000 YS; 20-11 El; 47-33 RA;
235-535 Brin.
For drills, hobs, cutting tools;
Type W1; water hardened.

HEERDT T10P.
M-1324; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 121,000-213,000 TS;
84,000-150,000 YS, 20-11 El; 47-33 RA;
235-535 Brin.
For drills, hobs, cutting tools, reamers;
Type W1; water hardened.

HEERDT T11E
M-1324; 1.1 C, 0.25 max Mn, 0.25 max Si, bal Fe.
Heat treated: 122,000-215,000 TS;
85,000-155,000 YS; 18-10 El, 45-30 RA;
240-555 Brin.
For reamers, drills, taps, hobs, lathe tools;
Type W1, water hardened.

HEERDT T11P.
M 1324; 1.15 C, 0.25 max Mn, 0.25 max Si, bal Fe.
Heat treated: 122,000-215,000 TS;
85,000-155,000 YS; 18-10 El; 45-30 RA;
240-555 Brin.
For reamers, drills, taps, hobs, lathe tools;
Type W1, water hardened.

HEERDT T12E.
M-1324; 1.3 C, 0.25 max Mn, 0.25 max Si, bal Fe.
For reamers, drills, taps, hobs, lathe tools;
Type W1; water hardened

HEERDT T12P.
M-1324, 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For reamers, drills, hobs, lathe tools;
Type W1; water hardened.

HERGERMUHL BRASS.
England; 62-72 Cu, 0.2-1.0 Sn, 0.8 max Pb, bal Zn.
For hardware, fittings, sheathing; good workability.

H-E IRON.
M-833; C, Si, Mn, bal Fe.
Cast: 30,000-60,000 TS; 180-260 Brin.
For machine tool castings, gears, housings;
gray cast iron.

HELBIMPHY.
M-104; C, bal Fe.
For tools; superior quality.

HELBIMPHY 6.
M-772; 0.7-0.8 C, bal Fe.
For tools, springs, punches; water hardened.

HELBIMPHY 7.
M-722; 0.7-0.8 C, bal Fe.
For tools, springs, drills; water hardened.

HELBIMPHY 8.
M-722; 0.9-1.0 C, bal Fe.
For tools, drills, punches, shears; water hardening.

HELBIMPHY 9.
M-772; 1.05-1.15 C, bal Fe.
For tools, reamers, punches; water hardened.

HELBIMPHY 10.
M-772; 1.05-1.15 C, bal Fe.
For tools, taps, drills; water hardened.

HELBIMPHY 12.
M-772; 1.2 C, bal Fe.
For tools, drills, taps; water hardened.

HELBIMPHY 14.
M-772, 1 4 C, bal Fe.
For cutting tools, drills, water hardened.

HELBIMPHY SPECIAL.
M-104; C, bal Fe.
For tools, extra-superior quality.

HELLEFORS 123H.
M-217; 0 4 C, 0.3 Si, 1 25 Mn, bal Fe.
For gears, machinery parts; tough.

HELLEFORS 134 HF
M-217, 0.55 C, 1.7 Si, 0 7 Mn, bal Fe
For leaf and coil springs, shock resistant.

HELLEFORS 206A
M-217, 0 9 C, 0.5 Cr, bal Fe.
For punches, forming dies, headers;
water hardened.

HELLEFORS 209A
M-217, 1 3 C, 0 5 Cr, bal Fe.
For blanking and forming dies, engravers' tools,
water or oil hardened.

HELLEFORS 209H.
M-217, 1 5 C, 2 0 Cr, bal Fe
For bearings, liners, sleeves;
oil or water hardened

HELLEFORS 216 HM.
M-217, 0 95 C, 1 5 Si, 1.0 Cr, bal Fe
For metal and wood working cutting tools,
non-deforming, oil hardening.

HELLEFORS 249A
M-217; 1 35 C, 0 25 Si, 0 25 Mn, 0 30 Cr, bal Fe.
For blanking and forming dies, engravers' tools,
water or oil hardened

HELLEFORS 264HF.
M-217, 0 50 C, 1.05 Cr, 0.85 Mn, 0.15 V, bal Fe
For springs, gears, shafts; shock resistant.

HELLEFORS 267B.
M-217; 1.0 C, 0.3 Mn, 0.5 Cr, 0.1 V, bal Fe.
For bearings, punches, liners, forming dies;
water hardened.

HELLEFORS 288A.
M-217, 1.2 C, 0 2 Si, 0.3 Mn, 0.55 W, 0.1 V, bal Fe.
For cold work tools, punches, heading dies;
oil or water hardened.

HELLEFORS 288 J.
M-217; 1.1 C, 0.3 Cr, 1.1 W, 0.1 V, bal Fe.
For structural parts, cutting tools; drill rod.

HELLEFORS 352H.
M-217; 0.25 C, 0.65 Mn, 1.05 Cr, 0.2 Mo, bal Fe.
For gears, shafts; tough.

HELLEFORS 371H.
M-217; 0.15 C, 0.55 Mn, 0.65 Cr, 1.25 Ni, bal Fe.
For gears, camshafts, crankshafts; case hardened.

HELLEFORS 371 L.
M-217; 0.15 C, 0.6 Cr, 3 Ni, bal Fe.
Hardened: 128,000 TS; 107,000 YS; 16 El; 55 RA;
270 Brin.
For gears, crankshafts, chain balls; case hardened.

HELLEFORS 371L2.
M-217; 0.18 C, 0.55 Mn, 0.75 Cr, 3.0 Ni, bal Fe.
For gears, camshafts, crankshafts; case hardened.

HELLEFORS 371M.
M-217; 0.2 C, 0.55 Mn, 1.8 Cr, 0 25 Mo, bal Fe.
For gears, shafts; case hardened.

HELLEFORS 372H.
M-217; 0.4 C, 0.8 Mn, 0.8 Cr, 1.25 Ni, bal Fe.
For gears, shafts; shock resistant.

HELLEFORS 372J.
M-217; 0.35 C, 1.2 Cr, 2 6 Ni, bal Fe
Oil hardened: 143,000 TS; 130,000 YS; 19-22 El;
55-60 RA; 300 Brin.
For shafts, axles, bolts, gears; tough.

HELLEFORS 372S.
M-217, 0 3 C, 0.55 Mn, 1.25 Cr, 4.25 Ni, bal Fe.
For gears, shafts, machinery parts,
tough, shock resistant.

HELLEFORS 372Y.
M-217, 0 30 C, 0 55 Mn, 1.05 Cr, 3 25 Ni, 0.25 Mo,
bal Fe
For gears, shafts, machinery parts, tough,
shock resistant.

HELLEFORS 374 H.
M-217, 0 5 C, 0 6 Cr, 1.7 Ni, 0 3 Mo, bal Fe.
For hot and cold working tools, oil hardening.

HELLEFORS 374R.
M-217, 0 55 C, 1.5 Cr, 3 0 Ni, 0.4 Mn, bal Fe.
For cold work dies and tools;
oil hardened, shock resistant.

HELLEFORS 374RK.
M-217; 0.55 C, 1 Cr, 3 Ni, 0 3 Mo, 0.4 Mn, bal Fe.
For drop forge dies, cold working tools;
oil hardened, shock resistant.

HELLEFORS 394T.
M-217; 0 55 C, 0.7 Cr, 1.75 Ni, 0.7 Mo, 0.7 Mn,
bal Fe
For forging dies, headers, upsetters;
oil hardened, shock resistant

HELLEFORS 408C.
M-217; 1 2 C, 0 2 Si, 0 3 Mn, 1.0 W, bal Fe.
For cold work tools, punches, heading dies;
oil or water hardened.

HELLEFORS 605 F.
M-217, 0 8 C, 0.1 V, bal Fe.
For chisels, punches, dies, hard and tough.

HELLEFORS 606F
M-217; 0.90 C, 0.20 Si, 0 30 Mn, 0.1 V, bal Fe.
Heat treated 185,000 TS, 118,000 YS, 10 El;
30 RA, 375 Brin.
For springs, taps, reamers, hobs, broaches;
Type W2, water hardened.

HELLEFORS 607C
M-217; 1 0 C, 0.20 Si, 0.30 Mn, 0 1 V, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 42 RA;
200 Brin.
For cold work dies and tools, drills, taps;
Type W2; water hardened

HELLEFORS 666.
M-217; 1.2 C, bal Fe.
For structural parts, tools; water hardening.

HELLEFORS 677R.
M-217; 1 C, 0.2 Si, 0.6 Mn, 5.2 Cr, 1.1 Mo, 0.2 V, bal Fe.
For dies, punches, crimpers; air hardened, wear resistant.

HELLEFORS 782R.
M-217; 0.35 C, 1.0 Cr, 2.5 W, bal Fe.
For pneumatic chisels, shears, hot work tools; oil hardened, shock resistant.

HELLEFORS 783 R.
M-217; 0.45 C, 0.9 Si, 1.1 Cr, 2.1 W, bal Fe
For chisels, punches, oil hardening, tough.

HELLEFORS 786 AM.
M-217; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For punches, dies, shears; non-deforming.

HELLEFORS 920A.
M-217; 0.08 max C, 11.5-13 Cr, 0.1-0.3 Al, bal Fe
Annealed: 71,000 TS, 42,600 YS; 22 El; 70 RA; 150 Brin.
Heat treated 175,000 TS; 145,000 YS, 21 El; 64 RA; 352 Brin
For oil refinery and chemical plant equipment; Type 405; corrosion resistant.

HELLEFORS 920-Al.
M-217; 0.1 C, 14 Cr, 10 Ni, bal Fe.
For fasteners, chemical plant equipment. Stainless steel.

HELLEFORS 920B
M-217; 0.12 max C, 14-18 Cr, bal Fe
Annealed: 70,000 TS, 40,000 YS, 30 El, 55 RA; 150 Brin.
Cold drawn: 130,000 TS; 120,000 YS, 2 El; 185 Brin.
For oil refinery equipment, bolts, kitchen sinks, Type 430; stainless, ferritic.

HELLEFORS 920-H.
M-217, 0.08 C, 17 Cr, 10 Ni, bal Fe.
Annealed: 80,000 TS; 38,000 YS, B 80 Rock.
For chemical and pharmaceutical plant equipment, mixers, agitators, tanks, vessels, digesters
Type 17-10 stainless steel, austenitic

HELLEFORS 920-M.
M-217, 0.15 max C, 11.5-13.5 Cr, bal Fe
Annealed 75,000 TS; 40,000 YS; 35 El, 155 Brin
Cold drawn. 100,000 TS; 85,000 YS; 17 El; 205 Brin
For flat springs, knives, table flatware
Type 410 stainless steel; hardenable.

HELLEFORS 921A
M-217; 0.15 max C, 11.5-13.5 Cr, 1 max Mn, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin
Cold drawn: 100,000 TS, 85,000 YS; 17 El, 60 RA, 205 Brin.
For valve parts, turbine blades, cutlery, knives, Type 410; corrosion resistant.

HELLEFORS 921C.
M-217, 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS; 40,000 YS, 32 El; 68 RA; 170 Brin.
For cutlery, valve trim, turbine blades; Type 420; stainless, hardenable.

HELLEFORS 922-A.
M-217; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; B 92 Rock.
Oil hardened: 250,000 TS; 192,000 YS; 10 El; C 49 Rock.
For cutlery, surgical instruments, scissors, ball bearings, valves, gears.
Type 420 stainless steel, hardenable.

HELLEFORS 923A.
M-217; 0.38-0.45 C, 13 Cr, bal Fe.
Annealed: 95,000 TS, 50,000 YS; 25 El; 55 RA; 196 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; corrosion resistant.

HELLEFORS 930A
M-217, 0.08-0.20 C, 2 max Mn, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 60 El; 70 RA, 150 Brin
Cold drawn: 125,000 TS, 95,000 YS; 22 El; 55 RA, 277 Brin
For oil refinery and chemical plant equipment; Type 302, stainless, austenitic.

HELLEFORS 930-B
M-217; 0.15 max C, 17-19 Cr, 8-10 Ni, bal Fe
Cold rolled 140,000 TS; 100,000 YS, 30 El; B 100 Rock
Annealed 90,000 TS; 40,000 YS, 50 El, B 85 Rock.
For chemical and pharmaceutical plant equipment, valve trim, fasteners
Type 302 stainless steel, austenitic
Hardenable only by cold work

HELLEFORS S-7
M-217, 0.15 C, bal Fe
Hardened 100,000 TS, 78,000 YS, 19 El; 40 RA; 200 Brin
For gears, bolts, pins, case hardened

HELLEFORS V60
M-217, 0.60 C, 0.20 Si, 0.30 Mn, bal Fe
Heat treated 115,000-160,000 TS, 77,000-113,000 YS, 23-12 El, 54-40 RA, 229-320 Brin
For wheels, die blocks, rails, girders; water hardened

HELLEFORS V70
M-217, 0.70 C, 0.20 Si, 0.30 Mn, bal Fe.
Heat treated 122,000-174,000 TS, 82,000-128,000 YS, 22-12 El, 52-37 RA; 40-350 Brin
For springs, rails, girders, clutch discs, water hardened

HELLEFORS V80.
M-217; 0.80 C, 0.20 Si, 0.30 Mn, bal Fe
Heat treated 130,000-188,000 TS, 87,000-143,000 YS, 21-12 El, 50-35 RA, 285-355 Brin.
For drills, reamers, hobs, taps, cutters; water hardened, Type W1

HELLEFORS V100.
M-217, 1.0 C, 0.20 Si, 0.30 Mn, bal Fe.
Annealed. 100,000 TS, 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, reamers, taps, hobs, broaches; water hardened, Type W1.

HELLEFORS V110.
M-217, 1.1 C, 0.20 Si, 0.30 Mn, bal Fe.
Annealed: 105,000 TS; 55,000 YS; 20 El, 40 RA; 210 Brin.
For drills, springs, reamers, taps, broaches; water hardened, Type W1.

HELLEFORS V120.
M-217, 1.2 C, 0.20 Si, 0.30 Mn, bal Fe.
Annealed: 110,000 TS, 55,000 YS; 18 El; 38 RA; 220 Brin.
For cutters, taps, reamers, broaches; Type W1; water hardened.

HELLEFORS V140.
M-217; 1.4 C, 0.30 Si, 0.30 Mn, bal Fe.
For engravers' tools, blanking dies, cutters; Type W1, water hardened.

HELLEFORS W406.
M-217, 1.4 C, 0.4 Cr, 5.5 W, 0.5 V, bal Fe.
For finishing tools, cutters; oil hardened.

HELLER 70-20-M.
M-343, 0 6-0.7 C, 0.15-0 25 Mo, bal Fe
For pneumatic tools; tough

HELLER 70-20 V
M-343, 0 6-0.7 C, 0.15-0.25 V, bal Fe.
For pneumatic tools; tough.

HELLER AIR HARDENING DIE STEEL
M-1221, 0.95-1 05 C, 0 5-0.7 Mn, 0.3-0.5 Si, 5.0-5 5 Cr, 0 9-1.1 Mo, 0.2-0.3 V, bal Fe
Flat ground die steel.
For punches, dies, gauges, wear resisting tools and parts. AISI type A2 tool steel.

HELLER OIL HARDENING DIE STEEL
M-1221, 0 85-0 95 C, 1 0-1.25 Mn, 0.2-0.04 Si, 0 4-0 6 Cr, 0 4-0 6 W, 0 1-0 2 V, bal Fe
Flat ground die steel.
For dies, punches, jigs, gauges, templates stamps, shims, machine parts
AISI Type 01

HELLER'S CHROME DIE
M-343, 0 85-1 0 C, 3-4 Cr, bal Fe
For tools, dies, shears, now "Brown Label."

HELMENT BRONZE
Eng , 70 Cu, 30 Zn
For water pipes, cartridges, shell cases, deep drawn parts; max ductility

HELMET METAL
Eng., 72-70 Cu, 28-30 Zn
For cartridges, shell cases, helmets, deep drawn

HELUMIN
M-834, 1 8 Cu, 1 5 Fe, bal Al.
Heat treated 50,000 TS, 15 El, 50 Brin.
For light alloy parts, non-hardenable

HELVE
M-502; 0 7-1.26 C, bal Fe
For tools, dies, water hardening

HENCKELS AFH
M-1287, 0 60 C, 0 4 Si, 0 6 Mn, bal Fe
Heat treated 160,000 TS, 113,000 YS, 12 El; 40 RA, 325 Brin
For crimpers, axes, rails, water hardened

HENCKELS G5
M-1287; 0 60 C, 0 35 max Si, 0.30-0 80 Mn, bal Fe.
Heat treated 165,000 TS, 118,000 YS, 12 El, 40 RA; 330 Brin.
For gears, springs, shafts, axes, hammers, water hardened

HENCKELS Ni 35.
M-1287; 0 50 C, 1.05 Cr, 3.25 Ni, 0 5 Mn, bal Fe.
For gears, bolts, crankshafts, forging dies; oil hardened, tough.

HENCKELS Ni 44.
M-1287, 0.40 C, Ni, Cr, Mo, bal Fe.
For gears, bolts, crankshafts, oil hardened, shock resistant.

HENCKELS Ni 187.
M-1287; 0.56 C, Ni, Cr, Mo, V, bal Fe.
For forging and heading dies, punches; oil hardened, shock resistant.

HENCKELS SPBA.
M-1287; C, alloy, bal Fe.
For machine tool parts; oil hardened, tough.

HENCKELS SPDM-H.
M-1287; 0.55 C, 0.90 Si, 1.05 Cr, 0 18 V, 1.85 V, 1.85 W, bal Fe.
For pneumatic tools, chisels, punches; oil hardened, shock resistant.

HENCKELS SPDN.
M-1287; 0.45 C, W, Cr, V, bal Fe.
For forging and heading dies, pneumatic tools; oil hardened, tough

HENCKELS SPDN-A.
M-1287, 0 45 C, Si, Cr, V, bal Fe
For gears, springs, crankshafts, bolts; oil hardened, shock resistant.

HENCKELS SPDN-W
M-1287; 0 35 C, 0.90 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe
For pneumatic tools, chisels, rivet sets, oil hardened, shock resistant.

HENCKELS SPEZIAL ZH.
M-1287; 1 45 C, 1 4 Cr, 0 6 Mn, bal Fe
For blanking and forming dies, oil or water hardened

HENCKELS SPG/A.
M-1287, 1.05 C, Cr, bal Fe.
For cutters, bearings, liners, oil or water hardened, wear resistant.

HENCKELS SPHF
M-1287, 1.3 C, 4 75 W, 0 20 max Cr, bal Fe.
For blanking and forming dies, cutters; water hardened

HENCKELS SPHF-A
M 1287, 1 0 C, Cr, bal Fe.
For bearings, cutters, liners, sleeves; water hardened, wear resistant.

HENCKELS SPIII VA
M-1287, C, alloy, bal Fe
For machine tool parts, oil hardened, tough.

HENCKELS SPJ
M-1287, 1 4 C, 0 30 Cr, 0 10 V, 0 30 Mn, bal Fe.
For blanking and forming dies, engravers' tools; oil or water hardened, wear resistant

HENCKELS SPM.
M-1287, 0 90 C, 0 10 V, 1.9 Mn, bal Fe
For blanking and forming dies, punches, cutters; oil hardened, non-deforming.

HENCKELS SPS.
M-1287, 2 1 C, 11 5 Cr, 0 30 Mn, bal Fe
For blanking and forming dies, punches, oil hardened, non-deforming

HENCKELS SPSB
M-1287, 1 65 C, Cr, Mo, V, bal Fe.
For blanking and forming dies, punches, oil hardened, non-deforming.

HENCKELS SPSE
M-1287, 1.05 C, 1.15 W, 0 90 Mn, 1.0 Cr, bal Fe.
For blanking and heading dies; oil hardened, tough.

HENCKLES SPSE/A.
M-1287, 1.25 C, 1.15 Si, 0.70 Mn, 1 2 Cr, bal Fe.
For cold work tools, oil hardened, tough.

HENCKELS SPSWO
M-1287; 2 1 C, 11 5 Cr, 0.70 W, bal Fe
For blanking and forming dies, shears, punches; oil hardened, non-deforming

HENCKELS SPWO4
M-1287; 0 30 C, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For pneumatic tools, shears, punches, chisels; oil hardened, tough.

HENCKELS SPWO5VA.
M-1287; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For pneumatic tools, punches, chisels, shears; oil hardened, tough.

HENCKELS SPWO9.
M-1287, 0.30 C, 8.5 W, 0.35 V, 2.65 Cr, bal Fe.
For extrusion dies, rams, liners, punches; oil hardened, hot work steel.

HENCKELS SPWON
M-1287; 0.30 C, 2 0 Co, 8.5 W, 2 4 Cr, 0.25 V, bal Fe.
For extrusion dies, rams, liners, punches; oil hardened, hot work steel

HENCKLES SPZII.
M-1287; 1.0 C, 0.10 V, 0.25 Mn, 0.25 Si, bal Fe.
For blanking and heading dies, cutters; water hardened; Type W2.

HENNEQUIN METAL
C, bal Fe.

HENRICOT BMES.
M-1188; 0.05 C, Mn, Si, bal Fe
For plastic mold dies; case hardened.

HENRICOT BO.
M-1188, 0.10 C, Mn, Si, bal Fe
For rivets, nails, carburized parts; case hardened

HENRICOT FAMO.
M-1188; C, Mn, Si, Ni, Cr, Mo, bal Fe.
Cast: 55,000-60,000 TS; 270-310 Brin.
For wear plates; acicular cast iron.

HENRICOT FC
M-1188; 3 C, 0.7 Cr, Mn, Si, bal Fe.
Cast: 220-270 Brin.
For wear resistant castings; refractory cast iron.

HENRICOT FC2.
M-1188; 3 C, 2 Cr, Si, Mn, bal Fe.
Cast: 200-300 Brin.
For abrasion resistant castings; cast iron

HENRICOT FP1.
M-1188; 3 C, Mn, Si, bal Fe.
Cast: 25,000-30,000 TS; 180-250 Brin.
For gears, shafts, housings, brackets, pearlitic cast iron.

HENRICOT FP2.
M-1188; 3 C, Mn, Si, bal Fe.
Cast: 40,000-50,000 TS; 230-250 Brin.
For gears, shafts, housings, brackets; pearlitic cast iron.

HENRICOT FPNC.
M-1188; 3 C, Mn, Si, Ni, Cr, bal Fe.
Cast: 35,000-45,000 TS; 200-250 Brin.
For gears, shafts, housings, brackets; pearlitic cast iron.

HENRICOT H1F.
M-1188; C, Ni, Cr, Mo, bal Fe.
Heat treated: 130,000-140,000 TS; 110,000-130,000 YS; 10-8 El.
For gears, shafts, housings; air hardened, tough.

HENRICOT HA0.
M-1188; 1 C, 6 Cr, bal Fe.
For permanent magnets; hardened.

HENRICOT HA1.
M-1188; 1 C, 6 Cr, 3 Co, bal Fe.
For permanent magnets; heat treated.

HENRICOT HA2.
M-1188; 1 C, 8 Cr, 12 Co, bal Fe.
For permanent magnets; hardened.

HENRICOT HA3.
M-1188; 1 C, 10 Cr, 15 Co, bal Fe.
For permanent magnets; hardened.

HENRICOT HA4.
M-1188; 0.7 C, 6 Cr, 4 W, 35 Co, bal Fe.
For permanent magnets; high coercive force.

HENRICOT HA5
M-1188; C, alloy, bal Fe.
For permanent magnets; heat treated.

HENRICOT HBA.
M-1188; 0.40 C, 4.5 Ni, 1.5 Cr, 0.75 W, bal Fe.
Hardened. 500 Brin.
For bakelite molding dies; air hardening.

HENRICOT HBE.
M-1188; 0.10 C, 0 40 Cr, bal Fe.
For dies and molds for plastics; hubbing die steel, water hardened.

HENRICOT HBNO
M-1188, 0 5 C, 12 Cr, bal Fe.
Hardened 500 Brin
For bakelite molding dies, oil or air hardening

HENRICOT HD2
M-1188, 1 C, 5 Cr, 1 Mo, bal Fe.
For dies; oil or air hardening.

HENRICOT HDK.
M-1188; 2 C, 12 Cr, bal Fe.
Hardened 600 Brin
For dies; oil hardening, non-deforming.

HENRICOT HDKW.
M-1188, 1.5 C, 12 Cr, 0 75 Mo, 0 75 W, bal Fe
Hardened 600 Brin
For dies, air hardening, non-deforming

HENRICOT HDZ
M-1188, 1 C, 1 Mn, 0 5 Cr, 0.15 V, bal Fe.
Hardened 650 Brin
For dies, punches, cold forming dies; non-deforming, oil hardening.

HENRICOT HEB
M-1188; 0.52 C, Cr, Si, bal Fe
For shear blades, cutters, pneumatic chisels; oil hardened

HENRICOT HEM3.
M-1188, 0 50 C, 1 Cr, 0.15 V, bal Fe.
Hardened: 142,000 TS; 128,000 YS; 10 El, 50 RA.
For chisels, springs; tough, shock resistant.

HENRICOT HF
M-1188, 0.50-1.25 C, bal Fe.
For hand chisels, shear blades, hammer dies, water hardening.

HENRICOT HF1.
M-1188, 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS, 40,000 YS, 32 El; 68 RA; 170 Brin.
Heat treated· 256,000 TS; 190,000 YS; 6 El; 10 RA, 540 Brin
For cutlery, valve trim, springs, surgical instruments, Type 420, stainless, hardenable.

HENRICOT HF2.
M-1188, 0.7 C, bal Fe.
Heat treated: 174,000 TS; 128,000 YS; 12 El, 37 RA; 352 Brin.
For short shear blades, clutch discs; water hardened; Type W1.

HENRICOT HF3.
M-1188; 0.85 C, bal Fe.
Heat treated: 188,000 TS; 143,000 YS; 12 El; 35 RA; 388 Brin.
For short shear blades, tools; water hardened; Type W1.

HENRICOT HF4.
M-1188; 1.0 C, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For cutting tools, drills, hobs, cold punches; Type W1; water hardened.

HENRICOT HIF.
M-1188; 0.30-0.35 C, 1.4 Cr, 3.2 Ni, Mo, bal Fe.
For gears, pinions, shafts, crimpers; oil hardened, shock resistant.

HENRICOT HKZ.
M-1188; 0.70 C, 1 Cr, 0.15 V, bal Fe.
Hardened· 170,000 TS; 156,000 YS; 7 El; 40 RA.
For tools, shear blades; oil hardening.

HENRICOT HL.
M-1188; C, Cr, Ni, Mo, bal Fe.
For gears, shafts; heat treatable.

HENRICOT HL1.
M-1188; C, 1 Ni, Cr, bal Fe.
For construction and automotive parts, oil hardened, shock resistant.

HENRICOT HL1A.
M-1188, C, 1.5 Ni, 0.75 Cr, 0.15 Mo, bal Fe.
Normalized: 100,000-115,000 TS; 70,000-85,000 YS; 10-8 El.
For cast housings, gears, shafts; oil hardened, tough.

HENRICOT HL1B.
M-1188; C, 1.5 Ni, 0.75 Cr, 0.15 Mo, bal Fe.
Normalized: 115,000-130,000 TS; 85,000-100,000 YS; 8-6 El
For gears, shafts, housings; oil hardened, tough.

HENRICOT HL1C.
M-1188; 0.15 max C, 1 5 Ni, 0 6 Cr, 0.2 Mo, bal Fe.
For gears, pinions, shafts; case hardening steel.

HENRICOT HL1X.
M-1188, C, 1.5 Ni, 0.5 Cr, 0.15 Mo, bal Fe.
Heat treated: 90,000-110,000 TS; 70,000-85,000 YS; 14-12 El
For cast housings, flanges, gears, shafts; water or oil hardened, tough.

HENRICOT HL2.
M-1188; C, 2 Ni, Cr, bal Fe
For construction and automotive parts; oil hardened, shock resistant.

HENRICOT HL2X
M-1188; C, 2.5 Ni, 1 Cr, 0.2 Mo, bal Fe.
Heat treated· 115,000-130,000 TS, 90,000-110,000 YS; 12 El
For gears, shafts, housings; oil hardened, shock resistant.

HENRICOT HL3.
M-1188; 0.4 C, 1.5 Cr, 3 Ni, bal Fe.
For construction and automotive parts, gears; tough, oil hardened.

HENRICOT HL3C.
M-1188; 0.15 C, 3 Ni, 1 Cr, 0.2 Mo, bal Fe.
For gears, pinions, shafts; case hardening steel.

HENRICOT HL3X.
M-1188; C, 3 Ni, 1 Cr, 0.2 Mo, bal Fe.
Heat treated: 115,000-130,000 TS; 100,000-115,000 YS; 13-10 El.
For gears, shafts, housings; oil hardened, shock resistant.

HENRICOT HL5C.
M-1188; 0.15 C, 1.5 Cr, 5 Ni, 0.2 Mo, bal Fe.
Heat treated: 130,000-200,000 TS.
For camshafts, gears, pinions, bolts; case hardened, shock resistant.

HENRICOT HL6.
M-1188; 0.4 C, Cr, 4 Ni, bal Fe.
For gears, pinions, shafts, auto parts; oil hardened, shock resistant.

HENRICOT HL27.
M-1188; 0.30 C, 22 Ni, 5 Cr, bal Fe.
Annealed: 85,000-107,000 TS; 50,000-72,000 YS; 20 El; 50 RA.
For electrical industry; nonmagnetic.

HENRICOT HM.
M-1188; C, Cr, Mo, bal Fe.
For gears, shafts; heat treatable.

HENRICOT HM3.
M-1188; C, Cr, Ni, Mn, bal Fe.
For machine tool parts.

HENRICOT HMA.
M-1188; 0.15 C, 0.5 Cr, bal Fe.
Annealed: 75,000-85,000 TS; 30,000-50,000 YS; 20-18 El; 150-160 Brin.
For oil refinery equipment; creep resistant to 450°C; Type 501.

HENRICOT HME.
M-1188, C, 1 Cr, 0.15 Mo, bal Fe.
Heat treated: 100,000-120,000 TS; 85,000-100,000 YS; 10-8 El.
For housings, flanges, supports, castings; water hardened.

HENRICOT HMES.
M-1188; 0.2 C, 0.5 Cr, 0.1 Mo, bal Fe.
Heat treated· 90,000-100,000 TS; 60,000-70,000 YS; 10-8 El.
For cast housings, flanges, supports; water hardened.

HENRICOT HMH.
M-1188; C, Cr, Mo, bal Fe.
For construction and automotive parts; oil hardened, shock resistant.

HENRICOT HMH1
M-1188; C, 1 Cr, 0.25 Mo, bal Fe.
Heat treated: 110,000-120,000 TS; 80,000-90,000 YS; 10-8 El.
For cast housings, flanges, gears, supports; water hardened.

HENRICOT HMH2
M-1188; C, 1 Cr, 0.25 Mo, bal Fe.
Normalized: 115,000 TS, 80,000 YS; 8 El.
Heat treated: 135,000 TS; 110,000 YS; 7 El.
For cast housings, flanges, supports, gears; water hardened.

HENRICOT HMV.
M-1188; 0.15 C, 1 Cr, 0.5 Mo, 0.2 V, bal Fe.
Annealed: 115,000-135,000 TS; 90,000-120,000 YS; 10-8 El; 150-180 Brin.
For oil refinery equipment; creep resistant to 575°C.

HENRICOT HMV.
M-1188; 0.25 C, 1 Cr, 0.6 Mo, 0.2 V, bal Fe
Heat treated: 142,000 TS; 128,000 YS; 10 El, 45 RA; 250 Brin.
For oil refinery equipment; creep resistant.

HENRICOT HMVX.
M-1188; 0.15 C, 1 Cr, 0.5 Mo, V, bal Fe.
Annealed: 85,000-100,000 TS; 60,000-70,000 YS; 12-10 El; 150-170 Brin.
For oil refinery equipment; creep resistant to 575°C.

HENRICOT HMX.
M-1188; 0.25 C, 1 Cr, 0.75 Mo, bal Fe.
Heat treated: 142,000 TS; 128,000 YS; 10 El; 45 RA; 250 Brin.
For oil refinery equipment; creep resistant.

HENRICOT HMX1.
M-1188; 0.15 C, 1 Cr, 0.5 Mo, bal Fe.
Annealed: 75,000-85,000 TS; 60,000-70,000 YS; 15-12 El; 150-180 Brin.
For oil refinery equipment; creep resistant to 500°C; Type 502.

HENRICOT HMX3.
M-1188; 0.15 C, 2.25 Cr, 1 Mo, bal Fe.
Annealed: 80,000-90,000 TS; 50,000-65,000 YS; 16-14 El; 150-160 Brin.
For oil refinery equipment; creep resistant to 575°C.

HENRICOT HN.
M-1188; 0.2 max C, 30-50 Ni, bal Fe.
Annealed.
For controlled expansion properties; water quenched from 1100°C.

HENRICOT HN50
M-1188; 50-51 Ni, bal Fe.
Annealed: 60,000-75,000 TS; 30,000-40,000 YS; 35-30 El.
For electrical equipment; controlled expansion.

HENRICOT HNF.
M-1188; 45 Ni, bal Fe.
Annealed: 90,000-130,000 TS, 40,000-70,000 YS; 30-20 El.
For electrical equipment, motors, high permeability, soft magnet.

HENRICOT HO.
M-1188, 0.05 C, Mn, Si, bal Fe.
For plastic mold dies; case hardened.

HENRICOT HOT.
M-1188; C, Mn, bal Fe.
For surface hardened gears, shafts, wear resistant.

HENRICOT HP2.
M-1188; 0.35 C, 1 Si, 5 Cr, 1.25 Mo, 1.25 W, bal Fe.
Hardened· 450 Brin
For dies; air hardening.

HENRICOT HP93.
M-1188; 0.55 C, Cr, Mo, bal Fe.
For pneumatic hammers, chisels; oil hardened, tough.

HENRICOT HPB
M-1188; C, 14 W, V, Cr, bal Fe.
For drawing and forming dies, spindles, oil hardened, tough.

HENRICOT HPC.
M-1188; C, 5 Cr, Mo, V, bal Fe
For drawing dies and spindles, Al die casting dies; oil hardened, non-deforming

HENRICOT HPL.
M-1188; 0.50 C, 2.5 Ni, 1 5 Cr, 0.2 Mo, bal Fe.
Hardened: 550 Brin.
For chisels, dies; tough, shock resistant.

HENRICOT HPNR.
M-1188; 0 35 C, 2 5 Cr, 9 W, bal Fe.
Hardened: 400 Brin
For extrusion and drawing dies; hot work steel.

HENRICOT HPO.
M-1188; C, 5 W, Ni, Cr, bal Fe.
For bolt bushing, drawing dies for Cu alloy; oil hardened.

HENRICOT HPT.
M-1188, 0.30 C, 2.5 Cr, 4.5 W, 0.5 V, bal Fe.
Hardened: 450 Brin.
For dies for brass tubing; oil hardening.

HENRICOT HPW.
M-1188; 0.5 C, 1.5 Cr, 3 Ni, 0.75 W, bal Fe.
For dies, chisels; oil or air hardening.

HENRICOT HR1.
M-1188; 0.08 max C, 11.5-13 Cr, 0 1-0.3 Al, bal Fe.
Normalized: 71,000 TS; 42,600 YS; 22 El; 70 RA; 150 Brin.
Heat treated: 175,000 TS; 145,000 YS; 21 El; 64 RA; 352 Brin.
For injectors, table flatware, valves, pumps; Type 405; corrosion resistant.

HENRICOT HR2.
M-1188, 0 20 C, 12 Cr, 0.5 Ni, bal Fe.
Heat treated: 256,000 TS; 190,000 YS; 6 El; 10 RA; 540 Brin
For turbine blading, coal screens; corrosion resistant, hardenable.

HENRICOT HR2F.
M-1188; 3 C, 14 Cr, bal Fe.
For abrasion and heat resistant castings, cast iron, wear and heat resistant.

HENRICOT HR2L
M-1188, C, 14 Cr, bal Fe.
Annealed· 90,000-100,000 TS, 40,000-60,000 YS; 14-12 El.
For oil refinery equipment, furnace parts; heat resistant to 800°C

HENRICOT HR2X
M-1188, 0 08 C, 12 Cr, 0 2 Al, 1 max Mn, 1 max Si, bal Fe
Annealed 85,000 TS, 60,000 YS, 20 El, 150 Brin.
Heat treated 170,000 TS, 145,000 YS; 21 El, 64 RA; 350 Brin.
For injectors, flatware, valve seats, heat resistant, hardenable

HENRICOT HR3
M-1188, 0.10 max C, 18 Cr, bal Fe.
Normalized 86,000 TS, 57,000 YS, 20 El, 50 RA.
For nonsealing purposes up to 900°C, corrosion resistant

HENRICOT HR3I.
M-1188; 0 10 C, 18 Cr, 3 Ni, bal Fe
Heat treated 121,000 TS; 100,000 YS; 15 El; 50 RA; 200-220 Brin
For valves, valve seats, turbine blades; stainless, hardenable.

HENRICOT HR4
M-1188, 0 2 max C, 24-26 Cr, 1 max Si, bal Fe
Annealed· 75,000 85,000 TS, 50,000-60,000 YS; 12 El, 180 Brin
For furnace parts, heat treating boxes, Type 442, corrosion and heat resistant

HENRICOT HR4LA
M-1188, C, 24 Cr, 12 Ni, bal Fe.
Annealed: 100,000-115,000 TS; 40,000-60,000 YS, 6-4 El
For furnace parts and accessories, heat treating boxes; heat resistant to 1050°C.

HENRICOT HR4LB
M-1188, 0.20 C, 23 24 Cr, 12-14 Ni, 1 Si, bal Fe.
Annealed: 85,000-100,000 TS; 40,000-60,000 YS; 15-12 El.
For furnace parts, heat treat equipment, burners, heat resistant to 1050°C.

HENRICOT HR4LX
M-1188, 0 15 C, 0 75 Si, 12 Ni, 23 Cr, bal Fe.
Annealed: 93,000 TS; 50,000 YS; 40 El, 50 RA; 180 Brin.
For heat treating equipment, austenitic, stainless.

HENRICOT HR4M
M-1188, 0.20 C, 23-28 Cr, 2 5-5.0 Ni, 1-2 Mo, bal Fe
Normalized: 103,000 TS; 78,000 YS; 18 El; 45 RA; 235 Brin.

Annealed: 95,000 TS; 41,000 YS; 29 El; 60 RA; 225 Brin.
For valves, pumps, furnace parts; Type 327; heat resistant.

HENRICOT HR5.
M-1188; 2 C, 30 Cr, bal Fe.
Cast: 350 Brin.
For furnace parts; operating temperature to 1050°C.

HENRICOT HR5A.
M-1188; C, 25-30 Cr, bal Fe.
550-650 Brin.
For impellers for grit cleaners; martensitic cast iron.

HENRICOT HR5I.
M-1188; 2 C, 30 Cr, bal Fe.
For furnace parts, heat resistant castings; cast iron, wear and heat resistant.

HENRICOT HR5II.
M-1188; 2 C, 30 Cr, Mo, bal Fe.
Cast: 350 Brin.
For heat and wear resistant castings; cast iron, heat resistant to 1050°C.

HENRICOT HR5III.
M-1188; 2 C, 30 Cr, Mo, bal Fe.
Cast: 350 Brin.
For heat and wear resistant castings; cast iron heat resistant to 1050°C

HENRICOT HR5M
M-1188; 2 C, 30 Cr, Mo, bal Fe
For chemical plant equipment; cast iron; corrosion and wear resistant

HENRICOT HR5VI.
M-1188, 2 C, 30 Cr, bal Fe
For chemical plant equipment, cast iron, corrosion and wear resistant.

HENRICOT HR6.
M-1188; 0.35 C, 23-27 Cr, 0.25 max N, bal Fe
Annealed. 90,000 TS; 60,000 YS, 20 El, 45 RA, 180 Brin.
Cold drawn: 175,000 TS; 155,000 YS, 2 El; 25 RA, 250 Brin
For furnace parts, preheaters, annealing boxes; Type 446, corrosion resistant

HENRICOT HR6P
M-1188, 0.10 max C, 27-30 Cr, bal Fe.
Annealed 75,000-85,000 TS, 50,000-60,000 YS; 12 El
For glass and petroleum industry equipment; corrosion and heat resistant to 1200°C.

HENRICOT HR8S
M-1188; 0.2 C, 5 Cr, 0.5 Mo, bal Fe
Annealed: 100,000 TS; 85,000 YS, 12 El; 160 Brin
For oil refinery equipment; creep resistant to 600°C.

HENRICOT HRC.
M-1188; 0.30 C, 12 Cr, bal Fe.
Hardened: 142,000 TS; 121,000 YS, 8 El, 40 RA
For cutlery; corrosion resistant, hardenable.

HENRICOT HRM.
M-1188; 0.3 C, 14 Cr, 1.2 Mo, bal Fe.
Heat treated: 129,000 TS; 107,000 YS; 13 El, 45 RA.
For paper industry beaters and blades; corrosion resistant, hardenable.

HENRICOT-HRM2M1.
M-1188, 0.15 C, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 70,000 TS, 35,000 YS; 40 El; 80 RA; 145 Brin.
Cold Drawn: 90,000 TS; 80,000 YS; 20 El, 65 RA; 205 Brin.
For chemical plant and oil refinery equipment, table flatware, knives, cutlery.
Corrosion resistant.

HENRICOT-HRM2M2.
M-1188; 0.20 C, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; 55 RA; B 92 Rock.
Heat treated: 240,000 TS; 210,000 YS; 8 El; 25 RA; C 50 Rock
For cutlery, shafts, surgical instruments, gears, knives.
Corrosion resistant, hardenable.

HENRICOT HS1.
M-1188; C, 12-14 Mn, bal Fe.
160-375 Brin
For railroad frogs and tracks; austenitic, wear resistant.

HENRICOT HS2.
M-1188, C, 12-14 Mn, bal Fe.
180-400 Brin
For railroad frogs and tracks; austenitic, wear resistant.

HENRICOT HS3.
M-1188, C, 12-14 Mn, bal Fe
180-425 Brin.
For railroad frogs and tracks, austenitic, wear resistant

HENRICOT HT1.
M-1188, 0.15 C, 2 Si, 15 Ni, 18 Cr, bal Fe
Annealed. 86,000 TS, 43,000 YS; 35 El, 50 RA
For heat resistant applications; heat resistant to 1000°C.

HENRICOT HT2.
M-1188, 0.15 C, 2 Si, 25 Ni, 25 Cr, bal Fe.
Annealed 93,000 TS, 50,000 YS; 30 El, 50 RA.
For heat resistant applications, heat resistant to 1100°C

HENRICOT HT3.
M-1188, 0.15 C, 2 Si, 35 Ni, 20 Cr, bal Fe.
Annealed 100,000 TS, 57,000 YS, 25 El; 45 RA.
For heat resistant applications; heat resistant to 1200°C.

HENRICOT HT3S
M-1188, 0.30 C, 30 Ni, 12 Cr, bal Fe.
Water quenched 85,000-93,000 TS; 35,000-50,000 YS, 20 El, 40 RA.
For the steam turbine industry, corrosion and heat resistant

HENRICOT HT6
M-1188, 0.15 C, 2 Si, 65 Ni, 18 Cr, bal Fe
Annealed 100,000 TS, 57,000 YS, 20 El, 45 RA.
For heat resistant applications; heat resistant to 1250°C.

HENRICOT-H.T.35
M-1188; 0.05-0.12 C, 0.18 Ti, 0.6 Cb, 26-30 Cr, 47-52 Co, bal Fe
Cast. 135,000 TS; 48,000 YS; 10 El; 10 RA; 250 Brin.
Wrought: 132,000 TS; 61,000 YS; 7 El, 6 RA; 350 Brin.
For furnace baffles, burner tips, sintering grates, quench baskets.
Corrosion, heat, thermal shock resistant.

HENRICOT HTL.
M-1188; 0.20 C, 19 Cr, 9 Ni, 1.5 Mo, 1.5 W, bal Fe.
For blades for gas turbines; austenitic, stainless.

HENRICOT HTY.
M-1188; 0.15 C, 1 Cr, 0.4 Mo, 0.4 V, 0.5 W, bal Fe.
Annealed: 80,000-90,000 TS; 60,000-70,000 YS; 16-14 El; 150-170 Brin.
For oil refinery equipment; creep resistant to 575°C.

HENRICOT HV1S.
M-1188; 0.08 max C, 8 Ni, 18 Cr, bal Fe.
Annealed: 79,000 TS; 36,000 YS; 40 El; 50 RA; 150 Brin.
For chemical plant equipment; Type 304; stainless, austenitic.

HENRICOT HV2S.
M-1188; 0.15 max C, 18 Cr, 9 Ni, bal Fe.
Annealed: 75,000-85,000 TS; 30,000-40,000 YS; 45-40 El; 150-160 Brin.
For chemical and textile plant equipment, tanks, mixers; stainless, austenitic; Type 302.

HENRICOT HV3.
M-1188; 0.08 max C, 11 Ni, 18 Cr, 2.5 Mo, bal Fe.
Annealed: 95,000-85,000 TS; 50,000-36,000 YS; 60-50 El; 75-60 RA; 190-150 Brin.
For chemical and plastic plant equipment; Type 316; stainless, austenitic.

HENRICOT HV3P.
M-1188; 0.2 C, 18 Cr, 8 Ni, 1.5 Mo, bal Fe.
Annealed: 70,000-80,000 TS; 30,000-40,000 YS; 25-20 El; 150-160 Brin.
For marine ornamental trim, hardware; Type 316; stainless, austenitic.

HENRICOT HV4.
M-1188; 0.08 C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 60 El; 135 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 330 Brin.
For chemical plant equipment, welded structures; Type 304; stainless, austenitic.

HENRICOT HV5.
M-1188; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El; 65 RA; 180 Brin.
At 1200°F: 57,000 TS; 22,000 YS; 32 El; 45 RA.
For engine components, valves, furnace equipment; Type 310; austenitic, heat resistant.

HENRICOT HV6.
M-1188; 0.08 max C, 9 Ni, 18 Cr, 0.6 Ti, bal Fe.
Annealed: 86,000 TS; 43,000 YS; 40 El; 50 RA.
For welded stainless construction; austenitic, stainless, stabilized.

HENRICOT HV6S.
M-1188; 0.08 max C, 17-19 Cr, 9-12 Ni, Cb = 10 × C, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 55-50 El; 175 Brin.
For welded structures, chemical plant equipment; Type 347; corrosion and heat resistant.

HENRICOT HV7.
M-1188; 0.08 max C, 20 Ni, 15 Cr, 4.5 Mo, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-50,000 YS; 60-50 El; 60-75 RA; 150-190 Brin.
For chemical plant equipment, furnace parts; stainless, austenitic.

HENRICOT HV8.
M-1188; 0.07 max C, 17 Cr, 13 Ni, 4.5 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 180 Brin.
For acid resistant chemical plant equipment; Type 317; stainless, austenitic.

HENRICOT HV9.
M-1188; 0.08 max C, 25 Ni, 20 Cr, 4.5 Mo, bal Fe.
Annealed: 85,000-100,000 TS; 35,000-57,000 YS; 60-50 El; 70-60 RA; 150-190 Brin.
For chemical plant equipment, furnace parts; stainless, austenitic.

HENRICOT HV30.
M-1188; 0.2 C, 18 Cr, 10 Ni, 2.5 Mo, bal Fe.
Annealed: 75,000-100,000 TS; 30,000-50,000 YS; 25-20 El; 150-170 Brin.
For acid resistant chemical and textile plant equipment; Type 316; stainless, austenitic.

HENRICOT HV6.
M-1188; 0.2 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 75,000-90,000 TS; 30,000-40,000 YS; 25-20 El; 150-160 Brin.
For nitric acid and chemical plant equipment; stainless, austenitic.

HENRICOT HV90.
M-1188; 0.2 C, 20 Cr, 30 Ni, 4.5 Mo, others, bal Fe.
Annealed: 75,000-100,000 TS; 30,000-50,000 YS; 25-20 El; 150-160 Brin.
For H_2SO_4 and HCl, chemical plant equipment; stainless, austenitic.

HENRICOT HVI.
M-1188; 0.08-0.20 C, 2 max Mn, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 25,000 TS; 95,000 YS, 25 El; 55 RA; 277 Brin.
For oil refinery and chemical plant equipment; Type 302; stainless, austenitic.

HENRICOT HVIR.
M-1188; 0.3-0.4 C, 18 Cr, 8 Ni, bal Fe.
For beating trough blades in paper refining machines; austenitic, stainless

HENRICOT HVIX.
M-1188; 0.05-0.08 C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 75,000-85,000 TS; 25,000-35,000 YS; 45-40 El; 150-160 Brin.
For chemical plant equipment, trim, tanks; stainless, austenitic; Type 304.

HENRICOT HW2.
M-1188; 0.5 C, 1 Cr, 2 W, bal Fe.
For punches, chisels; tough, shock resistant.

HENRICOT HW2E.
M-1188; 0.37 C, 1 Cr, 1.75 W, bal Fe.
For punches, chisels; water hardening.

HENRICOT HW2E.
M-1188; 0.38 C, 16-18 Cr, bal Fe. For oil refinery equipment, bolts; corrosion resistant.

HENRICOT HW3.
M-1188; 1.25 C, 3 W, bal Fe
Hardened: 650 Brin.
For punches, chucks, wood working tools; water hardening.

HENRICOT HWC.
M-1188; 0.8 C, 4 Cr, 19 W, 1.6 V, 13 Co, 1 Mo, bal Fe.
For cutters, lathes and planer tools; high speed steel.

HENRICOT HWD.
M-1188; 0.7 C, 21 W, Cr, V, bal Fe.
For lathe and planer tools, cutters; high speed steel.

HENRICOT HWF.
M-1188; 0.7 C, 4 Cr, 18 W, 1.25 V, bal Fe.
For cutters, hobs, drills; high speed steel.

HENRICOT HWF1.
M-1188; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutters, drills, taps, hobs, broaches; high speed steel, oil hardened.

HENRICOT HWF2.
M-1188; 0.7 C, 4 Cr, 1 V, 18 W, bal Fe.
For cutters, drills, reamers, taps, broaches; high speed steel.

HENRICOT HWIE.
M-1188; 1.2 C, 1 W, bal Fe.
For punches; water hardening.

HENRICOT HWMO4.
M-1188; 0.85 C, 4 Cr, 2 V, 6 W, 5 Mo, bal Fe.
Hardened: 640 Brin.
For twist drills, reamers, milling cutters; high speed steel.

HENRICOT HWMO7.
M-1188; 0.85 C, 4 Cr, 1.5 V, 1.5 W, 8 Mo, bal Fe.
Hardened: 650 Brin.
For gear cutters, broaches, boring tools; high speed steel.

HENRICOT HWS.
M-1188; 0.7 C, 4 Cr, 14 W, 1.2 V, bal Fe
Hardened: 610 Brin.
For tools, cutters, hobs, drills, reamers; high speed steel.

HENRICOT HWT.
M-1188; 0 8 C, 4 Cr, 19 W, 1.6 V, 6 Co, 1 Mo, bal Fe.
For cutters, broaches, lathe tools, drills, high speed steel.

HENRICOT Ni-Al-0.
M-1188, 22 Ni, 10 Al, bal Fe.
For permanent magnets; high permeability.

HENRICOT Ni-Al-1
M-1188; 30 Ni, 12 Al, bal Fe.
For permanent magnets, high permeability

HENRICOT Ni-Al-Co-2
M-1188, 28 Ni, 10 Al, 6 Co, bal Fe.
For permanent magnets, high permeability.

HENRICOT Ni-Al-Co-2B.
M-1188, 26 Ni, 12 Al, 8 Co, bal Fe
For permanent magnets, high permeability.

HENRICOT Ni-Al-Co 6.
M-1188, 20 Ni, 10 Al, 12 Co, 6 Cu, bal Fe.
For permanent magnets, high permeability.

HEPOSIL.
M-Germany; 21-22 Si, 1.5 Cu, 1.5 Ni, 0 7 Mn, 1 2 Co, 0 5 Mg, bal Al
For pistons in engines, liners
Low expansivity, high corrosion resistance.

HEPPENSTALL 2 C 30
M-64, 0 35 C, 0 7 Mn, 0.8 Cr, 0.45 Mo, 1.75 Ni, bal Fe.
Hardened: 135,000 TS, 115,000 YS; 20 El; 50 RA, 293 Brin.
For piston rods, crankshafts, rams; upsetter.

HEPPENSTALL 2V72.
M-64; 0.75 C, 0.4 Mn, 0.1 V, 0.6 Si, bal Fe.
For coining and crimping dies, striking dies, shear knives, trimmers; water hardening tool steel; AISI W2.

HEPPENSTALL Gr. 2V90.
M-64; 0.90-0 95 C, 0.3-0.5 Mn, 0.5-0.7 Si, 0 08-0.10 V, bal Fe.
Water hardened: 216,000 TS; 152,000 YP; 11 El; 600 Brin.
For coining and crimping dies, embossing dies, and rolls, heading and forming dies, swaging and trimming dies.
Type W2 water hardening tool steel, wear and abrasion resistant.

HEPPENSTALL 3C40.
M-64; 0.43 C, 2.6 Ni, 1.35 Cr, 0.55 Mo, 0.18 V, bal Fe.
Annealed: 250 Brin.
Heat treated: 470 Brin.
For die blocks; oil hardened, shock resistant.

HEPPENSTALL 5H50.
M-64; 0.55 C, 0.90 Cr, 0.43 Mo, 0.06 V, bal Fe.
Annealed: 210 Brin.
Heat treated: 450 Brin.
For die blocks, inserts; oil hardened, tough.

HEPPENSTALL GR. 5M21.
M-64; 0.18-0.23 C, 3.0-3.25 Ni, 3.25-3.50 Mo, 0.15 max C, 0.7 Mn, 0.3 Si, bal Fe.
For press and upsetter dies, piercers, punches, die casting dies; supplied in two grades, hardened and annealed.

HEPPENSTALL Gr. 6E14GV.
M-64; 0.15 C, 3.5 Ni, 1.6 Cr, 0.05 V, bal Fe.
Ht Tr.: 320 Brin; Annealed: 230 Brin.
For piston rods, cams, camshafts.
Case hardening and shock resisting.

HEPPENSTALL 6H55.
M-64, 0.55 C, 1.05 Cr, 0.47 Mo, 0.13 V, bal Fe.
Annealed: 210 Brin.
Heat treated 500 Brin.
For die blocks, inserts; oil hardened, tough.

HEPPENSTALL 9C60.
M-64; 0 60 C, 1 25 Ni, 0 65 Cr, 0.45 Mo, bal Fe.
Annealed: 250 Brin.
Heat treated: 540 Brin.
For miscellaneous forgings, shear knives; oil hardened, shock resistant.

HEPPENSTALL Gr. 9C68
M-64, 0.65-0 70 C, 0 4-0.5 Mo, 1.0-1.5 Ni, 0.5-0.8 Cr, 0 5-0.8 Mn, 0.2-0 35 Si, bal Fe.
Oil harden: 208,000 TS, 180,000 PL; C 45 Rock.
For spindles, punches, brake dies, collets, plastic mold dies, idler rolls, rocker plates, stamping dies, shear blades.
Type L6 tool steel. Deep oil hardening.
Tough and wear resistant.

HEPPENSTALL Gr. 9R40.
M-64, 0.40 C, 0.95 Cr, 0.45 Mo, bal Fe.
Annealed: 220 Brin, Ht. Tr.. 370 Brin.
For piston rods, shafts, counter-shafts, gears.
Oil hardening, shock resistant.

HEPPENSTALL Gr. 14A60.
M-64; 0 55-0 65 C, 0 7-0.9 Mn, 0.15-0 35 Si, 0 2-0 3 Cr, bal Fe.
Heat Treated: 285-461 Brin.
For trimmers, die and sow blocks, axles, crankpins, rollers, shafting. Shallow hardening, wear resistant. Type W4 water hardening tool steel

HEPPENSTALL Gr. A110.
M-64; 1.05-1.15 C, 0 25-0.35 Mn, 0.25-0.35 Si, bal Fe.
Annealed: 100,000 TS; 54,000 YS, 21 El; 197 Brin.
Water Hardened: 216,000 TS; 152,000 YS; 11 El; 600 Brin.
For cold header and striking dies, arbors, coining and broaching tools, mandrels, pipe cutters, tube drawing dies.
Water hardening Type W1 tool steel, wear and abrasion resistant.

HEPPENSTALL B76
M-64; 0.97 C, 1.15 Mn, 0.53 Cr, 0.20 V, 0.50 W, bal Fe.
Annealed: 250 Brin.
Heat treated: 620 Brin.
For stamping, forming and blanking dies; shear knives; oil hardened, tough. AISI W1.

HEPPENSTALL GRADE "C."
M-64; 0.55 C, Ni, Cr, Mo, C, bal Fe.
Oil treated: 305,000-206,000 TS; 288,000-195,000 YS; 6-18 El; 17-52 RA; 555 Brin.
For die blocks, inserts; drop forged.

HEPPENSTALL C50.
M-64; 0.5 C, 0.55 Mn, 1 Cr, 1.5 Ni, bal Fe.
Oil hardened: 115,000-125,000 TS; 85,000-100,000 YS; 20-18 El; 50-45 RA; 248-293 Brin.
For large mill pinions, couplings; high tensile forgings.

HEPPENSTALL C55.
M-64; 0.55 C, 0.90 Cr, 0.30 Mo, 1.5 Ni, bal Fe.
For hot work dies, punches; oil hardened, tough.

HEPPENSTALL Gr. C57.
M-64; 0.52-0.57 C, 2.0-2.2 Ni, 0.53-0.68 Mn, 0.80-0.95 Cr, 0.5-0.7 Si, 0.70-0.75 Mo, bal Fe.
For hammer dies, press and upsetter dies, gripper and header dies, piercing mandrels, shear blades
Hot work steel. High compressive strength.

HEPPENSTALL Gr. C58.
M-64; 0.42-0.47 C, 4.1-4.5 Ni, 1.25-1.65 Cr, 0.7-0.8 Mo, 0.12-0.16 V, bal Fe.
Heat treated: 218,000 TS; 190,000 YS; 12 El; 33 RA; C 45 Rock.
At 1000°F: 144,000 TS; 133,000 YS; 9 El; 39 RA.
For press and hammer dies, insert and upsetter dies, deep drawing dies.
Resists softening at elevated temperatures.
High compressive strength.

HEPPENSTALL C93.
M-64; 0.57 C, 1.2 Ni, 2 65 Cr, 0.45 Mo, bal Fe.
Annealed: 250 Brin.
Heat treated: 580 Brin.
For cold shear knives, oil hardened, shock resistant.

HEPPENSTALL H41
M-64; 0.95 C, 3.75 Cr, 0.23 Mo, 0.16 V, bal Fe.
Annealed: 220 Brin.
Heat treated: 510 Brin.
For hot and cold trimmers; oil hardened.

HEPPENSTALL Gr. H44.
M-64; 0.95-1.05 C, 0.2-0.4 Si, 0.5-0.7 Mn, 0.95-1.05 Mo, 4.9-5.3 Cr, 0.2-0.3 V, bal Fe.
Annealed: 104,000 TS; 51,000 YS; 26 El; C 18 Rock.
Air Hardened: 253,000 TS; 200,000 YS; 3 El; C 53 Rock.
For cold work trimming and blanking dies, forming and drawing dies, gauges, rolls, punches, thread rolling dies.
Cold work Type A2 tool steel. Deep air hardening, tough, wear resistant.

HEPPENSTALL Gr. H230
M-64; 0.32 C, 3.3 Cr, 2.4 Mo, 0.37 V, bal Fe.
Air Hardened. 180,000-296,000 TS; 160,000-247,000 YS; 10-14 El; 16-42 RA; C 40-59 Rock.
For hot extrusion dies, punches, shear blades, gauges.
Hot work tool and die steel, Type H10, air hardening.

HEPPENSTALL H340.
M-64; 0.41 C, 3.3 Cr, 2.25 Mo, 0 38 V, bal Fe
Annealed. 250 Brin.
For extrusion parts; oil hardened, tough.

HEPPENSTALL Gr. H720.
M-64; 0.37-0.42 C, 5.0-5.5 Cr, 0.23-0.38 Mn, 1.0-1.3 Mo, 0.85-1.10 Si, 0.9-1.0 V, bal Fe.
At 80°F: 217,000 TS; 184,000 YS; 13 El; 40 RA.
At 1100°F: 110,000 TS; 88,000 YS; 21 El; 69 RA.
For extrusion rams and liners, mandrels, punches, piercers, upsetting and forging dies, die casting dies. Type H13 hot work steel.

HEPPENSTALL Gr. H722.
M-64; 0.37-0.42 C, 5.0-5.5 Cr, 0.23-0.38 Mn, 1.0-1.2 Mo, 0.85-1.1 Si, 0.45-0.55 V, bal Fe.
At 80°F: 217,000 TS; 184,000 YS; 13 El; 40 RA.
At 1100°F: 110,000 TS; 88,000 YS; 21 El; 69 RA.
For extrusion rams and liners, mandrels, punches, piercers, upsetting dies, die casting dies.
Air hardening and non-deforming. Type H11.
High resistance to wash and erosion and heat checking.

HEPPENSTALL R43.
M-64; 1.55 C, 11.5 Cr, 0.55 Mo, 0.55 W, bal Fe.
Annealed: 250 Brin.
Heat treated. 610 Brin.
For shear knives, cold work dies; air hardened, non-deforming.

HEPPENSTALL R45.
M-64; 0 83 C, 11 5 Cr, 0 43 Mo, bal Fe.
Annealed: 250 Brin.
Heat treated: 560 Brin.
For shear knives, cold work dies; air hardened, non-deforming.

HEPPENSTALL R97.
M-64; 0.55 C, 1 05 Mn, 2 1 Si, 0 3 Cr, 0.38 Mo, bal Fe
Annealed. 250 Brin.
Heat treated: 570 Brin
For shear knives, cold work dies; oil hardened, shock resistant. AISI S5.

HEPPENSTALL R718
M-64; 0 33 C, 4 75 Cr, 1.87 Mo, bal Fe.
Annealed: 250 Brin
Heat treated· 510 Brin.
For extrusion parts, shear knives; oil hardened.

HEPPENSTALL SPECIAL.
M-64, 0 45 C, 4 3 Ni, 1.45 Cr, 0.75 Mo, 0.14 V, bal Fe
For hot work dies, trimmers, punches
Tough, oil hardening.

HEPPENSTALL T51.
M-64, 0 63 C, 1 35 Ni, 0.70 Cr, 2.12 W, bal Fe.
Annealed: 250 Brin.
Heat treated 580 Brin.
For hot and cold trimmers; oil hardened, tough

HEPPENSTALL T71.
M-64; 0 50 C, 1 12 Cr, 2 35 W, bal Fe.
Annealed· 250 Brin
Heat treated: 560 Brin.
For cold shear knives, hot heading dies; oil hardened, tough

HEPPENSTALL Gr T72.
M-64, 0 45-0 50 C, 1 2-1.5 Cr, 1 8-2 05 W, 0 20-0 25 V, bal Fe
For chisels, punches, compression and trimming dies, hot swaging and heading dies, insert dies.
Hot and cold work tool steel.
Oil harden. Fatigue resistance

HEPPENSTALL T73.
M-64, 0 28 C, 3.4 Cr, 0.23 V, 8.75 W, bal Fe.
Annealed: 250 Brin.
Heat treated: 500 Brin.
For shear knives, inserts, hot work dies; oil hardened, tough.

HEPPENSTALL Gr. T74.
M-64; 0.47-0.53 C, 1.3-1.5 Cr, 2.25-2.50 W, 0.18-0.23 V, 0.40 max Mo, bal Fe.
For chisels, punches, compression and trimming dies, hot swaging and heading dies, insert dies.
Hot and cold work tool steel. Oil harden. Fatigue resistant.

HEPPENSTALL T75.
M-64; 0.68 C, 4 Cr, 1 V, 18 W, bal Fe.
Heat treated: 650 Brin.
For shear knives; oil hardened, high speed steel.

HEPPENSTALL Gr. T77.
M-64; 0.30-0.35 C, 0.20-0.25 V, 0.2-0.4 Mn, 3.75-4.15 Cr, 11.0-12.0 W, bal Fe.
Heat treated: Rock C, 40-53; 220,000-240,000 TS; 180,000-215,000 YS; 10-12 El; 37-42 RA.
For die casting dies, forging and press dies, extrusion and gripper dies, piercers, punches, extrusion mandrels.
Hot work steel, Type H21. High resistance to heat. Wear and abrasion resistant.

HEPPENSTALL T78.
M-64; 0.85 C, 4.25 Cr, 5 Mo, 1.85 V, 6.25 W, bal Fe
Annealed: 250 Brin.
Heat treated: 630 Brin.
For shear knives; high speed steel, oil hardened.

HEPPENSTALL T79
M-64; 0.43 C, 5.25 Cr, 0.22 V, 4 W, bal Fe.
Annealed: 250 Brin.
Heat treated: 600 Brin.
For rams, die casting dies, shear knives; oil hardened.

HEPPENSTALL Gr. T716.
M-64, 0.44-0.50 C, 0.70-0.90 Cr, 0.4-0.6 Mn, 0.20-0.35 Si, bal Fe.
Heat treated. 415-601 Brin.
For punches, chisels, pneumatic tools, rivet busters, hubbing dies, hot heading and swaging dies, hot forming dies
Type S3 tool steel for cold and hot working

HEPPENSTALL T717.
M-64, 0.33 C, 4.75 Cr, 1.3 Mo, 1.1 W, bal Fe.
Annealed 250 Brin
Heat treated. 530 Brin.
For shear knives, dies, punches, mandrels, oil hardened.

HEPPENSTALL Gr T719.
M-64, 0.62-0.67 C, 0.90-1.10 Si, 1.4-1.6 Mo, 0.2-0.4 Mn, 4.5-5.0 Cr, 1.0-1.2 W, bal Fe.
For cold work plastic dies and forming dies.
For hot work gripper and compression dies, trimming dies, aluminum extrusion dies Air or oil hardened Tough and wear resistant

HEPPENSTALL Gr T721
M-64, 0.34-0.40 C, 0.25-0.45 Mn, 0.85-1.15 Si, 4.75-5.25 Cr, 1.25-1.65 Mo, 1.05-1.45 W, 0.25-0.45 V, bal Fe
At 80°F 217,000 TS, 184,000 YS, 13 El, 40 RA.
At 1100°F 110,000 TS, 88,000 YS; 21 El; 69 RA.
For extrusion rams and liners, mandrels, punches, piercers, dummy blocks, shear blades, aluminum die casting dies
Type H12 hot work steel Resists heat checking

HEPPENSTALL T745.
M-64, 0.45 C, 8.5 Cr, 1.1 Mo, 1.1 W, bal Fe
Annealed 250 Brin.
Heat treated: 580 Brin.
For chipper knives; oil hardened.

HEPPENSTALL T746.
M-64; 0.68 C, 8.5 Cr, 1.1 Mo, 1.1 W, bal Fe
Annealed: 250 Brin.
Heat treated 620 Brin
For flaking knives, oil hardened.

HERBOHN BELL METAL
Germany; 60-71.43 Cu, 35-26.4 Sn, 5-2.7 Zn
For bells; corrosion resistant.

HERC-ALLOY.
M-835; 0.4 C, 1.5 Ni, 0.2 Mo, bal Fe.
Heat treated: 125,000-150,000 TS; 275-290 Brin.
For chains, fittings, joining links, sling chains; wear and impact resistant.

HERCULES.
M-114; 1.0 C, 0.5 Cr, 0.2 V, bal Fe.
For blanking, forming and drawing dies; fatigue resistant. AISI W7.

HERCULES BRONZE-A.
U.S.; 86 Cu, 10 Sn, 2.5 Al, 2 Zn.
For hardware, worm gears; high strength.

HERCULES BRONZE-B.
U.S.; 54 Cu, 36 Zn, 7.5 Fe, 2.5 Al.
For hardware.

HERCULOY 420.
M-238; 3.0-3.25 Si, 1.0 Mn, bal Cu.
Hard: 92,000 TS; 55,000 YS; 22 El, 890 Brin.
For bolts, hardware; corrosion resistant.

HERCULOY 421.
M-238; 1.5-2.0 Si, 0.25 Mn, bal Cu.
Hard: 70,000 TS, 55,000 YS; 15 El; 880 Brin.
For bolts, hardware; corrosion resistant.

HERKULES BS.
M-1322, 2.1 C, 0.30 Si, 0.35 Mn, 11.5 Cr, bal Fe.
For forming and blanking dies, punches; oil or air hardened, non-deforming.

HERKULES FZ.
M-1322; 2.1 C, 11.5 Cr, 0.3 Mn, 0.3 Si, bal Fe.
For forming and blanking dies, punches; oil or air hardened, non-deforming.

HERKULES ME.
M-1322; 2.1 C, 0.3 Si, 0.35 Mn, 11.5 Cr, bal Fe.
For forming and blanking dies, punches; oil or air hardened, non-deforming

HERMES 35.
M-1308, 0.35 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
For gears, shafts, machine tool parts; water hardened.

HERMES 45.
M-1308, 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
For gears, bolts, shafts, machine tool parts; water hardened.

HERMES 60
M-1308, 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
For axes, hammers, crimpers, water hardened

HERMES 90.
M-1308; 0.90 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
For drills, taps, hobs, reamers, springs, cutters, Type W1, water hardened.

HETZEL L Sn 25.
M-1181, 25 Sn, bal Pb.
Solder, soft

HETZEL L Sn 40.
M-1181; 40 Sn, bal Pb.
For solder; soft.

HETZLEL L Zn 98
M-1181, 98 Zn, 2 Cu.
For solder; M.P. 790°F.

HEUSLER ALLOY-1
Germ.; 11.1 Al, 66.5 Cu, 22.4 Mn.
For electrical machinery, ferromagnetic.

HEUSLER ALLOY-2.
Germ.; 10 Al, 4 Pb, 68 Cu, 18 Mn
For electrical machinery; ferromagnetic.

HEUSLER ALLOY-3.
Germ.; 4-15 Al, 54-76 Cu, 16-30 Mn
For electrical machinery; ferromagnetic.

HEUSLER ALLOY-4.
Germ.; 61 Cu, 13 Al, 26 Mn.
For electrical machinery; ferromagnetic.

HEVI-DUTY SW-14.
M-605; 0.3 C, bal Fe.
For welding rod; high tensile.

HEVIMET see CARBOLOY HEVIMET.

HEWITT COPPER-HARD.
M-959; 4.5 Cu, 4.5 Sb, bal Sn.
Cast: 11,050 TS; 24 Brin.
For heavy duty bearings, bushings; Babbitt, M.P. 365-590°F.

HEWITT GENUINE.
M-959; 7.5 Sb, 3.5 Cu, bal Sn.
Cast: 15,150 TS; 29 Brin.
For heavy duty bearings, bushings; Babbitt, M.P. 460-682°F.

HEWITT MILL.
M-959; Pb, Sn, Sb.
For steel mill bearings; Babbitt.

HEWMET.
M-959; 5 Sn, 15 Sb, bal Pb.
Cast: 7580 TS; 23.7 Brin.
For bearings, bushings; Babbitt, heavy loads.

HF1.
M-Germany; 73.5 WC, 24 TiC, 2.5 Co.
Sintered: A 92 Rock.
For cutters to machine steel, wear dies.
Sintered carbides; hard and abrasion resistant.

HG-NICKEL.
M-121; 99.0 min Ni, 0.06 min C.
For forming gassy seals, terminal pins, electronic valves.
Heat and corrosion resistant.

HGT3.
M-62; 0.20 C, 3 Cr, 0.5 Mo, 0.5 W, 0.75 V, bal Fe.
For gas turbine discs and rotors; creep and heat resistant.

HH1.
M-Germany; 97.5 WC, 2.5 Co.
Sintered: A 92 Rock.
For cutters to machine cast iron, form tools.
Sintered carbide. Hard and abrasion resistant.

HI-120.
M-118; Cb-Ti.
For superconducting wires.
High magnetic fields at low reduced power use.

HIA.
M-1; 0.4 C, 0.45 Cr, 4 Mo, 1.6 Ni, bal Fe.
For tools, gears, oil hardening.

HI-ALLOY.
M-43; 5.6-6.7 Al, 0.18 Mn, 2.5-3.5 Zn, 0.3 Si, 0.05 Cu, bal Mg.
For anodes; for cathodic protection from corrosion.

HIBBO NO. 100
M-215; Al, bal Cu.
50,000 TS; 100 Brin.
For light bearings and bushings; heavy duty.

HIBBO NO. 125.
M-215; Al, bal Cu.
Cast: 81,000 TS; 29,000 YS; 24 El; 22 RA; 120 Brin.
For gears, worm wheels, bearings; for general service.

HIBBO NO. 150.
M-215; Al, bal Cu.
Cast: 83,000 TS; 35,000 YS; 13 El; 19 RA; 140 Brin.
For bearings, gears, bushings, pinions; heavy duty, shock resistant.

HIBBO NO. 175.
M-215; Al, bal Cu.
Cast: 82,000 TS; 36,000 YS; 9 El; 10 RA; 180 Brin.
For gears, pinions, shafts; heavy compressive loading.

HIBBO GR. 200.
M-215; Al, bal Cu.
Cast: 96,400 TS; 48,000 YS; 6 El; 6.5 RA; 190-220 Brin.
For bushings, bearings, gears, welder dies and jaws; wear and corrosion resistant, Al-bronze.

HIBBO NO. 225.
M-215; Al, bal Cu.
85,000 TS; 190-240 Brin.
For forming dies, bearing slides, cam rollers, non-sparking tools; resists shock, fatigue and corrosion

HIBBO GR. 250.
M-215; Al, bal Cu.
Cast: 81,000 TS; 76,000 YS; 0.5 El; 0 RA; 230-260 Brin
For bearing slides, cam rollers, wear strips; high wear resistance.

HIBBO NO. 275
M-215; Al, bal Cu.
90,000 TS; 250 Brin.
For dies, rolls, pins, cams, bushings; resists shock, fatigue and corrosion.

HIBBO GR 300
M-215; Al, bal Cu
270-300 Brin.
For forming and drawing dies; very hard, tough to machine.

HICKORY NO. 7.
M-1423, 0.50 C, 1.5 Cr, 2.5 W, bal Fe.
For punches, rivet sets, Type S1; shock resistant.

HI-COBALT.
M-1076, 40 Co, bal Fe.
For permanent magnets, Br 9800, Hc 240.

HICORE 75.
M-1724, 0.13 C, 0.9 Cr, 3.1 Ni, bal Fe.
Heat treated· 155,000-180,000 TS, 123,000-156,000 YS, 20-15 El, 60-50 RA.
For gears, pinions, differential axles; case-hardening steel, Iz-50-30.

HICORE 90
M-1724, 0.16 C, 4.2 Ni, 1.2 Cr, Mo, bal Fe
Heat treated· 190,000-213,000 TS, 145,000-180,000 YS; 18-13 El, 60-45 RA
For gears, pinions; case-hardening steel, Iz-25-35

HICRO.
M-822; 1.5 C, 12 Cr, 0.8 Mo, 0.35 V, bal Fe.
For cold forming dies; oil hardened

HICRO-150.
M-822, 1.5 C, 12 Cr, 0.4 V, 1.0 Mo, bal Fe.
Hardened: 278,000 TS, 214,000 YS; 1 El; 567 Brin.
For blanking and drawing dies, wire drawing and stamping dies, punches, gauges, hobs.
Type D2 air hardening, nondeforming, cold work tool steel, tough.

HICRO 200.
M-822, 2.0 C, 0.7 Mn, 0.3 Si, 13.0 Cr, 1.2 W, bal Fe.
Air or oil hardening cold work tool steel, chromium type; AISI D3.

HICRO T.
M-822; 2.10 C, 0.7 Mn, 0.3 Si, 13.0 Cr, 1.3 W, bal Fe.
Air or oil hardenable cold work tool and die steel, chromium type; AISI D6.

HI-C-SUPER HY-TUF.
M-38; 0.47 C, 1.38 Mn, 2.4 Si, 1.1 Cr, 0.4 Mo, 0.25 V, bal Fe.
Heat treated: 325,000 TS.
For aircraft structures, landing gears; tough, shock resistant.

HIDALGO.
M-614; 0.7 C, 14 W, 4 Cr, 2 V, bal Fe.
For cutters, tools; high speed steel.

HIDALGO I.
M-614; 0.55 C, 0.9 Si, 1 Cr, 0.18 V, 1.85 W, bal Fe.
For cold work tools, punches, headers; oil hardened, tough.

HIDALGO II.
M-614; 0.40 C, 0.9 Si, 1 Cr, 0.18 V, 1.85 W, bal Fe.
For cold work tools, punches; oil hardened, tough.

HIDALGO III.
M-614; 0.35 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For cold work tools, headers, punches, upsetters; oil hardened, tough.

HIDALGO NO. 48 ALLOY.
M-344, 0.55 C, 0.20 Cr, 0.75 Mn, 0.20 V, 2.0 Si, bal Fe.
For chisels, shear blades, punches; shock resistant.

HIDALGO RL.
M-344; 1.25 C, 0.4-0.5 Cr, 5.5 W, bal Fe.
For cutting tools; for finishing cuts on hard material.

HI-DI 5.
M-336; 1.0 C, 5.0 Cr, 1.0 Mo, 0.4 Mn, 0.4 V, bal Fe
Annealed. 103,000 TS, 51,000 YS, 26 El; C 18 Rock.
Hardened 178,000-255,000 TS; 145,000-200,000 YS, 3-12 El; 7-32 RA; C 41-53 Rock.
For blanking and trimming dies, shear blades, punches gauges, master tools, rolling dies, broaches
Type A2 air hardening, nondeforming cold work tool steel, tough.

HIDUMINIUM 00
M-426, 0 75-2.5 Cu, 9.0-11.5 Si, 3 max Ni, bal Al
Sand cast. 16,000 TS.
Die cast: 29,000 TS; 13,500 YS; 2 El, 85 Brin.
For general purpose castings of thin wall sections; high fluidity.

HIDUMINIUM 01.
M-137, M-426; 4 Cu, 0 6 Mg, 0 5 Mn, bal Al.
Forged: 54,000 TS; 30,500 YS, 15 El.
Extruded: 54,000 TS; 31,500 YS; 12 El.
Tube· 62,000 TS, 47,000 YS; 12 El.
For general engineering components; age-hardenable.

HIDUMINIUM 1A.
M-426; 99.8 Al.
O-temper: 11,200 TS; 35 El.
½ H-temper: 13,500 TS; 8 El.
H-temper: 18,000 TS; 5 El.
For light alloy parts.

HIDUMINIUM 1B.
M-426; 99.5 Al.
O-temper: 13,500 TS; 30 El.
½ H-temper: 14,500 TS; 8 El.
H-temper: 19,000 TS; 5 El.
For light alloy parts.

HIDUMINIUM 1C.
M-426; 99.0 Al.
O-temper: 14,500 TS; 5600 YS; 30 El.
½ H-temper: 15,700 TS; 14,500 YS; 7 El.
H-temper: 20,000 TS; 19,000 YS; 3 El.
For light alloy parts.

HIDUMINIUM 02.
M-426; 4 Cu, 1.5 Mg, 2 Ni, bal Al.
Heat treated: 49,000-58,000 TS; 32,000-31,500 YS; 20-8 El; 115 Brin.
For pistons, cylinder heads; age hardenable, high temperature uses.

HIDUMINIUM 03.
M-239, M-426; 1 Cu, 1 Mg, 1 Si, bal Al.
T4-temper: 38,000 TS; 22,400 YS; 15 El.
T6-temper: 56,000 TS; 45,000 YS; 10 El.
For aircraft forgings and extrusions; age hardened.

HIDUMINIUM 05.
M-239, M-426; 5 Mg, bal Al.
Annealed: 38,000 TS; 18,000 YS; 18 El.
½ Hard· 40,500 TS; 31,500 YS; 5 El.
For marine structures; corrosion resistant.

HIDUMINIUM 07.
M-239, M-426; 7 Mg, 0.6 Mn, 0.6 max Fe, bal Al.
Annealed: 45,000 TS; 18,000 YS; 18 El; 20 RA.
½ Hard: 56,000 TS, 36,000 YS; 5 El.
For hardware, sporting goods, machine tool parts; high corrosion resistance.

HIDUMINIUM 08.
M-426, 1 Cu, 1 Mg, 11 Si, 1 Ni, bal Al.
Heat treated: 47,000 TS; 33,500 YS; 5 El; 115 Brin.
For pistons, cylinder heads; age hardenable.

HIDUMINIUM 10.
M-426, 10-13 Si, 0.2 max Ti, 0.1 max Cu, 0 6 max Fe, bal Al.
Sand cast· 26,000 TS; 8000 YS; 8 El; 55 Brin.
Die cast: 30,500 TS; 10,000 YS, 10 El; 65 Brin.
For general purpose castings of intricate shape; good fluidity.

HIDUMINIUM 11.
M-426, 0.15 max Cu, 0.6 max Si, 0.75 max Fe, 1-1.5 Mn, bal Al.
Soft temper. 15,000 TS; 12,000 YS, 25 El; 27 Brin.
¾ H temper 22,000 TS; 19,000 YS; 5 El, 55 Brin.
For structures, not heat treatable, corrosion resistant.

HIDUMINIUM-12.
M-426, 1.3 Mg, bal Al
Hard drawn· 36,000 TS; 35,000 YS; 4 El; H 105 Rock.
For deep drawn parts.
For trim molding, washing machine tubs, vacuum cleaner hoods, fan blades.
Corrosion resistant, low strength.
Similar to Aluminum 5050.

HIDUMINIUM-14.
M-426, 1 0 Mg, 0.5 Mn, bal Al.
Hard Drawn: 40,000 TS; 36,000 YS; 6 El; 77 Brin.
Annealed: 26,000 TS; 10,000 YS, 25 El; 45 Brin.
For general purpose applications, commercial roofing, vessels, tanks.
Corrosion resistant Similar to Aluminum 3004.

HIDUMINIUM 20.
M-426; 2-4 Cu, 3-6 Si, 0.3-0.7 Mn, 0.5 max Zn, 0.8 max Fe, bal Al.
Sand cast: 18,000 TS; 8000 YS; 2 El; 55 Brin.
Die cast: 20,000 TS; 9000 YS; 2 El; 80 Brin.
For marine castings; age-hardenable.

HIDUMINIUM-21.
M-426, 3.0 Cu, 5.0 Si, 0.5 Mn, 0.25 Mg, bal Al.
Heat treated: 36,000 TS; 24,000 YS; 2 El; 80 Brin.
Cast. 27,000 TS, 18,000 YS; 2 El; 70 Brin.
For sand and permanent mold castings, crankcases, housings, cylinder heads, oil pans.
Heat treatable, pressure-tight.

HIDUMINIUM 22.
M-426; 0.15 max Cu, 1.5-2.5 Mg, 0.6 max Si, 0.75 max Fe, bal Al.
Soft temper: 24,000 TS; 12,000 YS; 18 El; 45 Brin.
½ H temper: 35,000 TS; 27,000 YS; 5 El; 85 Brin.
For fuel pipes; high corrosion resistance.

HIDUMINIUM 24.
M-426; 2 Mg, bal Al.
O-temper: 24,500-27,000 TS; 10,500 YS, 18 El.
For deep drawn and formed parts; high ductility.

HIDUMINIUM 29.
M-426; 6.5 Sn, 1.0 Cu, 0.8 Ni, bal Al.
Sand cast: 18,000 TS; 7800 YS; 8 El.
Permanent mold: 20,000 TS; 18,000 YS; 15 El.
For bearings; shock resistant.

HIDUMINIUM 33.
M-426; 3-4 Mg, 1.0 max Mn, 0.15 max Cu, 0.7 max Fe, 0.5 max Cr, bal Al.
Soft temper: 28,000 TS; 14,000 YS, 18 El; 55 Brin.
½ H temper: 36,000 TS; 30,000 YS; 5 El; 100 Brin.
For marine parts; highest corrosion resistance.

HIDUMINIUM 35.
M-426; 4.25 Mg, bal Al.
O-temper: 32,000 TS; 15,700 YS; 18 El.
M-temper: 38,000 TS; 18,000 YS; 12 El.
For light alloy parts; high corrosion resistance and ductility.

HIDUMINIUM 40.
M-426; 0.2-0.8 Mg, 4.5-6 Si, 0.2 max Ti, bal Al.
Cast: 17,000 TS; 10,000 YS; 2.5 El; 50 Brin.
W-temper. 22,000 TS; 14,000 YS; 2.5 El; 60 Brin.
WP-temper: 30,000 TS; 26,000 YS; 100 Brin.
For marine castings; high fluidity, pressure tight

HIDUMINIUM 42.
M-426; 0.75 Mg, 1 Si, bal Al.
W-temper: 26,700 TS; 15,700 YS, 18 El.
WP-temper: 43,600 TS, 40,300 YS; 10 El.
For light alloy parts; good corrosion resistance and formability, age-hardenable.

HIDUMINIUM 44.
M-426; 0.5-1.2 Mg, 0.75-1.3 Si, 1 max Mn, 0.6 max Fe, bal Al
Annealed and tempered: 18,000 TS, 10,000 YS; 27 El, 30 Brin
WP-temper: 46,000 TS; 36,000 YS, 8 El, 110 Brin.
For marine applications; heat treatable, resists sea-water corrosion.

HIDUMINIUM 46.
M-426; 0.7 Mg, 0.5 Si, 0.05 Ti, bal Al.
W-temper: 27,100 TS; 16,200 YS, 25 El.
WP-temper: 35,800 TS, 27,000 YS; 18 El.
For structural extrusions; heat treatable, corrosion resistant.

HIDUMINIUM 51.
M-426; 0.8-2.0 Cu, 0.05-0.2 Mg, 0.75-2.8 Si, 0.25-1.4 Fe, 0.8-1.75 Ni, bal Al.
Sand cast: 23,000 TS; 11,000 YS; 2 El, 55 Brin.
Die cast: 25,000 TS; 13,000 YS; 2 El; 80 Brin
For general purpose castings; fair corrosion resistance.

HIDUMINIUM 55.
M-426; 1.75-2.7 Cu, 0.5-1.3 Mg, 0.4-1.5 Si, 1.4 max Fe, 1.4 max Ni, 0.2 max Ti, bal Al.
Forged: 50,000 TS; 38,000 YS; 8 El; 148 Brin.
WP-temper: 44,000 TS; 36,000 YS; 8 El.
For high strength parts, aircraft structures; heat treatable.

HIDUMINIUM 66.
M-426; 3.5-4.8 Cu, 0.3-0.6 Mg, 0.5-1.5 Si, 1.2 max Mn, bal Al.
WP-temper: 64,000 TS; 52,000 YS; 8 El; 160 Brin.
For high strength parts, aircraft structures; heat treatable.

HIDUMINIUM 72.
M-426; 4.6 Cu, 1.3 Mg, 0.25 Si, 0.25 Fe, 0.7 Mn, bal Al.
Heat treated: 67,000 TS; 51,000 YS; 8 El.
For aircraft and general engineering parts; age-hardenable.

HIDUMINIUM 80.
M-426; 4-5 Cu, 0.1-0.25 Ti, 0.25 max Si, bal Al.
W-temper: 33,000 TS, 18,000 YS; 10 El; 60 Brin.
WP-temper: 48,000 TS; 27,000 YS; 10 El; 95 Brin.
For brackets, levers, housings, aircraft castings; age-hardenable, hot-short.

HIDUMINIUM 90.
M-426, 9.5-11.0 Mg, 0.15 max Cu, 0.25 max Si, bal Al.
Sand cast: 45,000 TS; 22,000 YS; 15 El; 90 Brin.
Die cast: 47,000 TS; 25,000 YS; 17 El, 95 Brin.
For gasoline flow meters; age-hardenable, corrosion resistant.

HIDUMINIUM 100
M-239, M-426, M-86, Al_2O_3 + Al.
Sintered.
For components operating above 250°C; high temperature resistance.

HIDUMINIUM DU BRAND
M-426, 3.5-4.8 Cu, 0.6 Mg, 0.5 Mn, 0.3 Ti, bal Al
Rolled: 54,000 TS; 35,000 YS, 18 El; 120 Brin.
For light alloy parts, seamless tubes, airscrews; age-hardened.

HIDUMINIUM R.R. 50
M-239, M-86, M-426, M-137, 0.8-2 Cu, 0.05-2 Mg, 0.2 Ti, 1.5-2.8 Si, 0.8-1.4 Fe, 0.8-1.7 Ni, bal Al.
Sand cast. 20,000-25,000 TS, 18,000-20,000 YS; 4 El, 8 RA; 65 Brin
Heat treated: 25,000-30,000 TS, 3 El, 5 RA, 72 Brin
For cylinder blocks, cylinder heads, pistons, crank-cases; heat treatable

HIDUMINIUM R R 53.
M-137, 1.5-2.5 Cu, 0.5-2.0 Ni, 1.4-1.8 Mg, 1.2-1.5 Fe, 0.02-0.12 Ti, 2 max Si, bal Al.
Heat treated 50,000 TS, 44,000 YS, 2 El; 140 Brin.
For pistons, cylinder heads; die casting

HIDUMINIUM R R 53
M-239, M-426, 2.2 Cu, 1.3 Ni, 1.6 Mg, 1.4 Fe, 0.08 Ti, 1.2 Si, bal Al.
Die cast 31,300 TS, 28,000 YS; 3 El; 4 RA, 80 Brin
Heat treated: 56,000 TS; 50,400 YS; 1 El; 1.5 RA, 130 Brin.
For pistons for automobile and aircraft engines, cylinder heads, die cast; Rolls-Royce automobile.

HIDUMINIUM RR 53 B
M-137, 1.5 Cu, 1-2 Ni, 0.6-1.0 Mg, 0.8-1.5 Fe, 0.7-0.9 Si, bal Al.
Cast: 21,000 TS; 14,000 YS; 3 El; 78 Brin
Heat treated. 42,000 TS, 37,000 YS; 2 El; 138 Brin.
For levers, brackets, textile and food machinery, pistons, high temperature strength.

HIDUMINIUM RR 53 C.
M-426, 0.8-2.0 Cu, 0.5-1.5 Ni, 0.3-0.8 Mg, 0.8-1.4 Fe, 2-3 Si, 0.3 Ti, bal Al.
Cast: 30,000 TS; 20,000 YS, 2 El; 75 Brin.
Heat treated: 44,000 TS; 40,000 YS; 2 El; 115 Brin.
For stand and die castings; light alloy.

HIDUMINIUM R.R. 56.
M-239, M-426; 2 Cu, 1.25 Ni, 1.2 Fe, 0.8 Mg, 0.08 Ti, 0.6 Si, bal Al.

Heat treated: 60,000-72,000 TS; 54,000-58,000 YS; 10-20 El; 14-25 RA; 120-160 Brin.
For automobile forgings, connecting rods, supercharger rotors; forgings; Rolls-Royce automobile.

HIDUMINIUM R.R. 57.
M-426; 5.75-6.25 Cu, 0.2 max Si, 0.2-0.3 Mn, 0.1-0.15 Ti, bal Al.
At 70°F: 54,000 TS; 33,000 YS; 8 El; 121 Brin.
At 650°F: 14,000 TS; 9000 YS; 27 El.
For high temperature applications, aircraft structures; heat treatable.

HIDUMINIUM R.R. 58.
M-426; 1.5-3.0 Cu, 1.2-1.8 Mg, 1-1.5 Fe, 0.5-1.5 Ni, 0.2 max Ti, bal Al.
At 70°F: 60,000 TS; 44,000 YS; 10 El; 148 Brin
At 650°F 12,500 TS; 10,000 YS; 27.5 El.
For high temperature applications, aircraft structures; heat treatable.

HIDUMINIUM R.R. 59.
M-239, M-426; 2.2 Cu, 1.35 Ni, 1.25 Mg, 1.35 Fe, 0.08 Ti, 0.8 Si, bal Al.
Forged: 52,000-65,000 TS; 50,000-56,000 YS; 6-10 El; 10-20 RA; 120-150 Brin
Heat treated. 55,000 TS; 47,000 YS; 8 El; 17 RA; 127 Brin
For pistons, cylinder heads, forgings; Rolls-Royce automobile; aero-engines

HIDUMINIUM R.R. 60
M-426, 1.5-3.0 Cu, 0.3-1.5 Si, 0.5-1.5 Mg, 5-1.5 Fe, 2 max Ni, 0.3 Ce, bal Al
For light alloy parts; antifriction properties

HIDUMINIUM RR-66
M-426, 0.5 Cu, 0.33 Ni, 4.8 Mg, 0.33 Fe, bal Al
Annealed. 45,000 TS; 22,000 YS; 24 El, 80 Brin.
Cold worked 60,500 TS, 49,000 YS, 10 El, 121 Brin.
For automobile parts, airplanes, boats; corrosion resistant.

HIDUMINIUM RR72
M-426, 94 Al, 4 Cu, 1.2 Mg, 0.8 Mn.
Extruded 60,000 TS, 15 El, 148 Brin
For extruded sections, solid drawn tubes; heat treatable

HIDUMINIUM RR 75
M-426, 97.6 Al, 2 Cu, 0.4 Mg
For wire, rivets

HIDUMINIUM RR 77
M-426, 1.5 Cu, 4-6 Zn, 2-4 Mg, 0.6 Fe, 0.6 Si, 1.0 max Ni, 0.3 Ti, bal Al
Annealed 32,000 TS, 19,000 YS, 20 El; 65 Brin
Heat treated· 85,000 TS; 74,000 YS, 16 El; 180 Brin.
For extruded and drawn tubing, rolled sheet; light alloy, high strength.

HIDUMINIUM RR 82.
M-426, Cu, Si, bal Al.
For fuel pipes.

HIDUMINIUM RR88.
M-426; 3 max Cu, 4 max Mg, 4.0-8.5 Zn, 1 max Cr, bal Al.
Aged: 89,000 TS; 78,000 YS; 7 El; 180 Brin.
For aircraft construction, high strength applications; age-hardenable.

HIDUMINIUM RR250.
M-239, M-426; 5 Cu, 0.2 Ti, 0.25 Mn, 0.25 Co, 1 Ni, 0.25 Sb, bal Al.
Heat treated: 36,000 TS; 22,500 YS, 2 El.
For engine components; age hardenable, sand castings.

HIDUMINIUM RR257.
M-426; 6 Cu, 0.25 Co, 1 Ni, 0.25 Sb, 0.25 Mn, 0.2 Ti, bal Al.
WP-temper: 54,000 TS; 33,500 YS; 8 El.
For engine castings; age-hardenable.

HIDUMINIUM RR350.
M-426; 5 Cu, 0.25 Co, 0.25 Zr, 1.5 Ni, 0.25 Sb, 0.2 Ti, 0.25 Mn, bal Al.
WP-temper: 36,000 TS; 24,000 YS; 1 El.
For engine castings; age-hardenable.

HIDUMINIUM RRAC9A.
M-239, M-426; Al alloy.
For light alloy parts.

HIDUMINIUM S 12.
M-426; 12 Si, 1.0 Cu, 1.0 Ni, 1.2 Mg, bal Al.
Forged: 38,000 TS; 7 El; 105 Brin.
For aircraft pistons; forging alloy.

HIDUMINIUM SR.
M-426, 2.5 Cu, 0.1 Mg, 1.0 Fe, 0.75 Ni, 0.1 Ti, bal Al
60-85 Brin.
For gasket sealing rings; corrosion resistant

HIDUMINIUM Y.
M-426; 4 Cu, 1.5 Mg, 2 Ni, 0.6 Fe, 0.5 Mn, bal Al.
Forged: 55,000 TS; 35,000 YS, 2 El, 120 Brin.
Cast· 40,000 TS; 34,000 YS, 1 El; 105 Brin.
For pistons, cylinder heads; age-hardenable, high heat applications.

HIDURAX ½A
M-1169; 10.5-11.0 Al, 4-6 Fe, 4-6 Ni, 0.5 Mn, bal Cu
Heat treated 125,000-150,000 TS, 70,000-100,000 YS, 20-10 El.
For axial flow compressor blades, high temperature strength and fatigue resistance.

HIDURAX 1A
M-1169, 10 Al, 5 Ni, 5 Fe, 1.5 Mn, bal Cu.
Rolled: 85,000-94,000 TS; 36,000-54,000 YS, 35-25 El; 150-200 Brin
For valves, pumps, chemical plant equipment, BS-2032, corrosion resistant, aluminum bronze

HIDURAX 2-CAST.
M-1169, 8.5-10.5 Al, 1.5-3.5 Fe, 0.5 Mn, bal Cu
Cast· 72,000-85,000 TS, 25,000-30,000 YS; 30-20 El; 110-140 Brin.
For pumps, valves, gears, bushings, resists wear, corrosion and erosion

HIDURAX 2-WROUGHT
M-1169, 8.5-10.5 Al, 0.5-2.5 Fe, 1-3 Ni, bal Cu
Rolled 85,000-108,000 TS; 45,000-56,000 YS; 25-18 El; 149-212 Brin
For shafts, spindles, gears, liners, bushings; resists wear, corrosion and erosion.

HIDURAX 3.
M-1169, 8.5-9.5 Al, 4-6 Fe, 4-6 Mn, bal Cu
Sand cast 70,000-85,000 TS; 25,000-30,000 YS; 30-20 El; 110-140 Brin.
For pumps, valves, liners, sheaves, gears; resists corrosion in H_2SO_4.

HIDURAX 4
M-1169; 11 Al, 4-5 Fe, 4 Ni, bal Cu.
Heat treated. 110,000-135,000 TS; 67,000-90,000 YS; 12-5 El; 218-270 Brin
For valve inserts, plastic molding dies, nozzles; tough, hardenable, corrosion resistant.

HIDURAX 4/16A.
M-1169; Al, bal Cu.
Rolled: 107,000-121,000 TS, 67,000-79,000 YS; 10-4 El; 250-280 Brin.
For valves, pumps; aluminum bronze, corrosion resistant.

HIDURAX 4/17A.
M-1169; Al, bal Cu.
Rolled: 112,000-135,000 TS; 67,000-90,000 YS; 12-5 El; 218-270 Brin.
For valves, pumps; aluminum bronze, corrosion resistant.

HIDURAX 5.
M-1169; 9.0-9.8 Al, bal Cu.
Forged: 72,000-85,000 TS; 34,000-45,000 YS; 30-15 El; 126-179 Brin.
For valve seat inserts, rotors, shafts; Al-bronze, corrosion resistant.

HIDURAX 5/2A.
M-1169; Al, bal Cu.
Rolled: 72,000-85,000 TS; 33,000-45,000 YS; 30-15 El; 126-179 Brin.
For valves, pumps; DTD 160; aluminum bronze, corrosion resistant.

HIDURAX 5/27A.
M-1169; Al, bal Cu.
Rolled: 76,000 TS; 38,000 YS; 35 El; 130-180 Brin.
For valves, pumps; aluminum bronze, corrosion resistant.

HIDURAX 21A.
M-1169; 4-7 Ni, 8-11 Al, 0.5-2.0 Mn, 1.5-3.5 Fe, bal Cu.
Rolled: 90,000 TS; 23,000 YS; 10 El.
For valves, pumps; ASTM-B171 Alloy E; aluminum bronze, corrosion resistant.

HIDURAX 26A.
M-1169; 1.5-3.5 Fe, 6.0-8.0 Al, bal Cu.
Rolled: 72,000 TS; 36,000 YS; 35 El.
For valves, pumps; ASTM-B171 Alloy D; aluminum bronze, corrosion resistant.

HIDURAX I-CAST.
M-1169; 8.5-10.5 Al, 3.0-5.5 Fe, 3.0-5.5 Ni, bal Cu.
Cast: 90,000-100,000 TS; 40,000-45,000 YS; 20-12 El; 170-180 Brin.
For pumps, valves, gears, bearings, bushings, valve seats; resists corrosion and cavitation erosion.

HIDURAX I-WROUGHT.
M-1169; 8.5-10.5 Al, 4-6 Fe, 4-6 Ni, 0.5 Mn, bal Cu.
Forged: 100,000-116,000 TS; 56,000-76,000 YS; 25-15 El; 180-240 Brin.
For shafts, gears, spindles, valve seats; resists corrosion and cavitation.

HIDURAX SPECIAL.
M-1169; 2-4 Al, 1-3 Fe, 12-16 Ni, bal Cu.
Forged: 123,000-134,000 TS; 90,000-112,000 YS; 20-12 El; 240-270 Brin.
For pump shafts, valve cones, valve seats; high strength, corrosion resistant.

HIDUREL 5.
M-1169; Sn, Pb, bal Cu.
Cast: 68,000 TS; 49,000 YS; 12 El; 160 Brin.
Cold drawn: 108,000 TS; 95,000 YS; 20 El; 190 Brin.
For bearings, bushings; high strength and ductility, corrosion resistant.

HIDUREL-5.
M-1169; 2.0-3.5 Ni, 0.4-0.8 Si, bal Cu.
Bar: 85,000-117,000 TS; 61,000-105,000 YS; 15-25 El; 160-210 Brin.
Strip: 85,000-108,000 TS; 61,000-94,000 YS; 15-25 El; 160-210 Brin.
For switch gears, contacts, gears, current carrying parts; high conductivity and high strength.

HIDUREL 5-CAST.
M-1169; 1.8-2.6 Ni, 0.3-5 Si, bal Cu.
Heat treated: 63,000-72,000 TS; 40,000-54,000 YS; 15-8 El; 140-170 Brin.
For switchgear, bushings, electrical conductors; high strength and conductivity.

HIDUREL 5-WROUGHT.
M-1169; 2.0-3.5 Ni, 0.4-0.8 Si, bal Cu.
Heat treated: 85,000-116,000 TS; 60,000-105,000 YS; 25-15 El; 160-210 Brin.
For worm wheels, switchgears, electrical conductors; high strength and conductivity.

HIDUREL 6.
M-1169; 0.4-1.2 Cr, 0.2 others, bal Cu.
Heat treated: 40,000-85,000 TS; 27,000-78,000 YS; 30-15 El; 90-150 Brin.
For switchgear, resistance welding electrodes; high strength at high temperature.

HIDUREL 7.
M-1169, Zn, bal Cu.
Cast· 78,000-90,000 TS; 36,000-49,000 YS; 20-10 El; 130-160 Brin.
For general castings; high conductivity bronze.

HIDURIT 10.
M-1169; Zn, bal Cu.
Cast: 100,000-112,000 TS, 56,000-67,000 YS, 12-18 El, 180-220 Brin.
For general castings; high strength brass.

HIDURIT 11.
M-1169; Zn, bal Cu
Cast 85,000-95,000 TS; 38,000-54,000 YS; 30-20 El, 130-160 Brin
For general castings, BS-1400; high strength brass.

HIDURIT 12.
M-1169; Zn, bal Cu.
Cast· 67,000-75,000 TS, 27,000-41,000 YS; 35-20 El; 110-130 Brin.
For general castings; B-1400, high strength brass.

HIDURIT 15.
M-1169; Zn, bal Cu.
Rolled 67,000-85,000 TS; 34,000-45,000 YS; 30-15 El; 120-180 Brin.
For general castings, BS-250; high strength brass.

HIFLEX
M-1431; C, alloy, bal Fe.
For tools, dies, machinery parts, fatigue resistant.

HIGH BRASS
M-8, M-33; 65 Cu, 35 Zn.
Rolled: 47,000-75,000 TS, 20,000-60,000 YS; 5-60 El; 5-75 RA; 45-180 Brin.
For spun parts, tanks, vessels; high strength, good ductility.

HIGH BRASS 262.
M-279; 68.5 Cu, 31.5 Zn.
Ann: 44,000-61,000 TS; 13,000-34,000 YS; 35-65 El.
Cold rolled: 49,000-110,000 TS; 20,000-100,000 YS; 1-52 El.
A general purpose yellow brass.
For formed parts, hardware, electrical assemblies.

HIGH CARBON ALLOY.
M-389; 0.9 C, 0.2 V, bal Fe.
For tools, drills, taps; water hardening.

HIGH CHROME-NICKEL.
M-200; 0.33-0.45 C, 0.40-0.75 Cr, 1.0-1.35 Mn, 0.90-1.20 Ni, 0.40-0.75 Si, bal Fe.
Annealed: 85,000-100,000 TS; 60,000 YS; 18 El; 23 RA.
For gears, shafts; tough.

HIGH CONDUCTIVITY BRONZE 405.
M-279; 95 Cu, 4 Zn, 1 Sn.
Ann: 38,000-45,000 TS; 9000-17,000 YS; 40-50 El.
Cold rolled: 41,000-82,000 TS; 15,000-74,000 YS; 2-45 El.
A moderate strength high conductivity bronze for fuse clips, meter clips, electrical assemblies.

HIGH DUTY.
M-1409; 2.2 C, 0.6 W, 12.8 Cr, 0.4 Mn, bal Fe.
For blanking and thread rolling dies, molds; oil or air hardened, abrasion resistant.

HIGH LEADED BRASS 62.
M-141; 62.25 Cu, 35.75 Zn, 2 Pb.
Hard: 74,000 TS; 60,000 YS; 7 El; 150 Brin.
Soft: 49,000 TS; 17,000 YS; 52 El; 61 Brin.
For clock gears, key stock; high leaded brass.

HIGH LEADED BRASS-342.
M-8; 64.0 Cu, 34.0 Zn, 2.0 Pb.
Annealed: 49,000 TS, 17,000 YS; 52 El; F 68 Rock
Half Hard: 61,000 TS; 50,000 YS; 20 El; B 70 Rock.
For plaques, hinges, gears, pinions, wheels, valve stems, rivets.
Corrosion resistant. Electrical conductivity 26. Free cutting

HIGH LEADED BRASS-353.
M-8; 61.5 Cu, 36.7 Zn, 1.8 Pb.
Annealed: 49,000 TS; 17,000 YS; 52 El; F 68 Rock.
Half Hard: 61,000 TS; 50,000 YS, 20 El, B 70 Rock.
For plaques, hinges, gears, pinions, wheels, valve stems, rivets.
Corrosion resistant
Electrical conductivity 26, free-cutting.

HIGH LEADED BRASS 353
M-279, 61 Cu, 37 Zn, 2 Pb.
Ann: 45,000-54,000 TS; 12,000-24,000 YS; 45-60 El
Cold rolled: 49,000-99,000 TS; 20,000-80,000 YS; 1-50 El
High strength yellow brass, good machinability.
For clock and watch plates, and gears, brass keys

HIGH LEADED BRASS, Copper Alloy No. 342.
M-33; 63.5 Cu, 34.6 Zn, 1.9 Pb.
Half hard strip: 61,000 TS, 50,000 YS; 20 El; 40,000 shear; 70 Rock B
For clock and watch gears, plates and cases, keys, nuts.
ASTM B121 Alloy 4 & 5.

HIGH LEADED BRASS 3531.
M-8; 37 Zn, 2 Pb, bal Cu.
Hard: 58,000 TS, 42,000 YS; 22 El; 125 Brin.
Soft: 47,000 TS; 18,000 YS; 58 El, 62 Brin.
For hardware, clock parts, screw machine parts; free-cutting.

HIGH LEADED BRASS 3532.
M-8; 38 Zn, 1.5 Pb, bal Cu.
Hard: 73,000 TS; 60,000 YS; 7 El; 150 Brin.
Soft: 45,000 TS; 17,000 YS; 50 El; 60 Brin.
For hardware, clock parts; free-cutting.

HIGH LEADED TUBE BRASS.
M-33; 66 Cu, 32.25 Zn, 1.75 Pb.
Annealed: 52,000 TS; 20,000 YS; 50 El.
Drawn: 75,000 TS; 60,000 YS; 7 El.
For screw machine products; free cutting.

HIGH MANGANESE NICKEL.
Eng.; 98-94 Ni, 2-6 Mn.
For spark plug wire; heat resistant.

HIGH PERMEABILITY "49."
M-32; 0.1 max C, 49 Ni, bal Fe.
Rolled: 25 El; 62 RA; 200 Brin.
For transformer cores; high permeability.

HIGH PHOSPHORUS COPPER.
M-33; 99.9 + Cu, 0.02 P.
For condenser and distiller tubes, radiators, water tubes; deoxidized copper, low conductivity.

HIGH PRODUCTION.
M-365; 1.55 C, 11.5 Cr, 0.75 Mo, bal Fe.
For blanking and forming dies, mandrels, coining dies; non-deforming.

HIGH SPEED.
M-370; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed cutters, drills; high speed steel.

HIGH SPEED BABBITT.
M-665; Sn, Pb, bal Cu.
For bearings; Babbitt.

HIGH SPEED BRASS.
M-256; 88 Cu, 7 Sn, 5 Zn.
For high speed bearings; heavy duty.

HIGH SPEED TOOL-A.
Eng.; 5-12 W, 6-12 Ti, 3-6 Si, 3-5 Al, up to 1.0 B, bal Ni.
For cutting tools, dies; cast nonferrous.

HIGH STRENGTH.
18.5-21.5 Zn, 2-3 Fe, 6-7 Al, 1.5-2.25 Ni, bal Cu.
For high strength corrosion resistant parts; corrosion resistant

HIGH STRENGTH COMMERCIAL BRONZE.
M-8; 89.5 Cu, 7.65 Zn, 1.75 Pb, 0.1 P, 1.0 Ni.
Hard: 68,000 TS; 58,000 YS, 10 El; B 75 Rock.
For cable clamps, pole-line hardware, screw machine products.
High strength, corrosion resistance. Elect. cond. 32.

HIGH TEMPERATURE BRONZE.
U.S.; 6.3 Zn, 2.7 Sn, bal Cu.
For fittings, hardware, high strength.

HIGH TENSILE ALLOY
M-836; 0.4-0.5 C, bal Fe.
For gears, shafts; water hardening.

HIGH TENSILE BRASS NO. 1.
M-1518, Zn, Sn, bal Cu.
Cast 67,200 TS, 20 El; 120-165 Brin.
For high strength castings, corrosion resistant.

HIGH TENSILE BRASS NO. 2.
M-1518; Zn, Sn, bal Cu
Cast 85,200 TS; 15 El; 170-220 Brin.
For heavy castings, high strength.

HIGH TENSILE BRASS NO. 3.
M-1518, Zn, Sn, bal Cu
Cast: 107,500 TS; 12 El, 180-229 Brin
For machine tool parts, high strength.

HIGH TENSILE BRONZE
U.S.; 68.5 Cu, 6.5 Al, 2.2 Mn, 2.5 Fe.
Forged: 101,000-110,000 TS; 50,000-57,000 YS, 10-5 El; 200-220 Brin.
For propellers, nuts, bolts; corrosion resistant.

HIGHTENSILE BRONZE NO. 1.
M-508, 60-70 Cu, 21-25 Zn, 3-7 Al, 3-7 Mn, 2-5 Fe.
Cast: 120,000 TS; 55,000 YS; 15 El; 220 Brin.
For pump liners, sleeves, bushings, gears, pinions; pressure tight castings.

HIGHTENSILE BRONZE NO. 2.
M-508, 60-70 Cu, 21-25 Zn, 3-7 Al, 3-7 Mn, 2-5 Fe.
Cast: 100,000 TS, 50,000 YS, 20 El; 200 Brin.
For pump liners, sleeves, bushings; pressure tight castings.

HIGHTENSILE BRONZE NO. 3.
M-508, 60-70 Cu, 21-25 Zn, 3-7 Mn, 2-5 Fe.
Cast: 90,000 TS; 45,000 YS; 25 El; 180 Brin.
For pump liners, sleeves, bushings; centrifugal castings.

HIGH TEST.
M-68; 2.75-3.15 T.C., 1.0-1.25 Ni, 0.6-1.0 Mn, 0.9-1.1 Si, bal Fe.
For brake drums, valve bodies; cast iron.

HIGH TIN COMMERCIAL BRONZE.
M-33; 88 Cu, 2 Sn, bal Zn.
Annealed: 46,000 TS; 20,000 YS; 55 El.
For condenser and heat exchanger tubes; corrosion resistant.

HIGHWAY.
M-131; C, Cu, bal Fe.
For building construction.

HIGH YIELD.
M-633; C, bal Fe.
For transportation equipment, buses, bridges.

HIGH YIELD 70/30
M-141; 31.0 Ni, 0.5 Fe, 0.75 Mn, bal Cu.
Cold drawn: 72,000 TS; 50,000 YS; 15 El; 125 Brin.
For condenser and heat exchanger tubes, feed-water heaters; high strength, corrosion resistant.

HILANIC.
M-897; 79 Ni, 18 Co, 1 Si, 2 Fe.
Annealed: 85,000 TS; 60,000 YS; 35 El.
For cathodes and filaments in electronic tubes, heat resistant.

HILLS-McCANNA NO. 1.
M-168, 89 Cu, 11 Sn.
35,000-40,000 TS; 22,000-25,000 YS; 6-10 El, 7-9 RA; 75-85 Brin.
For gears, worm wheels; known as "Stones English Worm Gear Bronze."

HILLS-McCANNA NO. 2
M-168; 88 Cu, 10 Sn, 2 Zn.
32,000-45,000 TS, 19,000-23,000 YS; 15-30 El, 12-25 RA; 65-75 Brin.
For gears, superheated steam and hydraulic castings, bearings; known as "Gun Metal" or "G-Bronze."

HILLS-McCANNA NO. 10.
M-168; 80 Cu, 10 Sn, 10 Pb.
28,000-33,000 TS, 19,000-22,000 YS; 5-10 El, 6-11 RA; 52-60 Brin.
For bearings for heavy duty; resists shock and vibration.

HILLS-McCANNA NO. 11.
M-168; 88 Cu, 10 Sn, 2 Pb
30,000-40,000 TS; 19,000-23,000 YS; 15-25 El; 12-20 RA; 65-70 Brin.
For centrifugal pump parts, mine pump bodies, rods, gears; C.E.L. 15000.

HILLS-McCANNA NO. 20.
M-168, 85 Cu, 5 Sn, 5 Pb, 5 Zn.
27,000-33,000 TS; 15,000-19,000 YS; 16-20 El; 15-20 RA; 50-60 Brin.
For pump bodies, valves, bearings; known as "Ounce Metal" or "Red Composition."

HILLS-McCANNA NO. 20 P.
M-168; 2 Si, 0.5 Fe, bal Cu.
Cast: 40,000 TS; 19,000 YS, 35 El; 30 RA; 70 Brin
For bronze castings; corrosion resistant.

HILLS-McCANNA NO. 21.
M-168; 82 Cu, 4 Sn, 6 Pb, 8 Zn.
28,000-33,000 TS; 14,000-16,000 YS; 15-20 El; 20-26 RA; 55-60 Brin.
For general use, bearings; C.E.L. 10000.

HILLS-McCANNA NO. 22.
M-168; 65 Cu, 2 Pb, 30 Zn, 1 special element.
Cast: 30,000-35,000 TS; 25-35 El; 20-30 RA; 40-50 Brin.
For plumbing fixtures; SAE-41.

HILLS-McCANNA NO. 25.
M-168; 99.6-99.9 Cu.
17,000-20,000 TS; 6000-9000 YS; 50-40 El; 70-60 RA; 30-40 Brin.
For electrical installations, parts of electric welding machines; C.E.L. 4000.

HILLS-McCANNA NO 30.
M-168; 56 Cu, 41 Zn, 1 Fe, 1 Al, 0.5 Mn, 0.5 Sn
65,000-85,000 TS; 26,000-33,000 YS, 20-35 El; 18-30 RA, 104-119 Brin.
For propeller blades, hubs, valve stems, engine frames, bearings, gears; C.E.L. 28000.

HILLS-McCANNA NO. 30 A.
M-168; 39 Zn, 0.5 Mn, 1.5 Al, bal Cu.
Cast: 57,000-62,000 TS, 32,000-35,000 YS; 24-35 El, 27-30 RA, 96-99 Brin.
For bronze castings, Mn bronze

HILLS-McCANNA NO. 30 B
M-168, 40 Zn, 1 Al, 1.5 Fe, bal Cu.
Cast: 71,000-80,000 TS, 30,000 35,000 YS; 25-30 El; 25-30 RA, 130-135 Brin.
For bronze castings, SAE-43.

HILLS-McCANNA NO. 30 C.
M-168; 38 Zn, 1 Al, 0.5 Mn, bal Cu
Cast: 115,000-119,000 TS, 99,000-102,000 YS; 9-9.5 El; 8.4-8.6 RA, 220-235 Brin.
For Mn bronze castings, corrosion resistant.

HILLS-McCANNA NO. 35.
M-168; 92 Al, 8 Cu.
16,000 22,000 TS, 11,000-13,000 YS, 1-2 El, 1-2 RA, 50-55 Brin
For crankcases, housings, automobile castings, C.E.L. 10000

HILLS-McCANNA NO 39
M-168, special hardener, 3 Si, 1 Fe, bal Cu
Cast: 57,000 TS; 26,000 YS, 27 El, 27 RA; 100 Brin
For castings, same as "Everdur D."

HILLS-McCANNA NO 40
M-168, 90 Cu, 10 Al
65,000-80,000 TS, 23,000-28,000 YS, 20-30 El, 21-29 RA
For structural parts, non-magnetic; wear resistant.

HILLS-McCANNA NO 41
M-168, 77 Cu, 11 Al, 5 Fe, 7 Mn.
80,000 97,800 TS, 28,000-26,200 YS; 30-10 El; 29-12 RA; 190 Brin
For structural parts, wear resistant; C.E.L. 28300

HILLS-McCANNA NO 42.
M-168, 88 Cu, 8 Al, 4 Fe
65,000-80,000 TS, 23,000-28,000 YS, 20-30 El, 21-29 RA, 92-100 Brin.
For gears, bushings, bolts, wear resistant, C.E.L. 19000.

HILLS-McCANNA NO. 43
M-168, special hardener, 10 Al, 1 Fe, bal Cu
Cast: 84,000 TS; 33,000 YS, 22 El, 25 RA; 134 Brin.
For bearings, bushings, Al bronze.

HILLS-McCANNA NO. 45.
M-168; 89 Cu, 10 Al, 1 Fe
65,000-80,000 TS; 23,000-28,000 YS; 20-30 El; 21-29 RA, 92-100 Brin.
For equipment in oil refineries; wear and corrosion resistant; C.E.L. 19000.

HILLS-McCANNA NO 46.
M-168; 81 Cu, 11 Al, 5 Fe, 3 Mn.
80,000-94,300 TS; 28,000-26,400 YS; 30-10 El; 29-11 RA; 176 Brin.
For packing tools in the explosive industry; wear resistant; C.E.L. 26100.

HILLS-McCANNA NO. 47.
M-168; 80 Cu, 12 Al, 8 Fe.
65,000-80,000 TS; 23,000-28,000 YS; 20-30 El; 21-29 RA.
For bearings, gears to resist heavy loads and shocks; wear resistant; C.E.L. 22100.

HILLS-McCANNA NO. 48.
M-168, special hardener, 9 Al, bal Cu
Cast: 72,000 TS; 55,000 YS; 3 El; 3 RA; 229 Brin.
For construction parts; Al bronze.

HILLS-McCANNA NO. 49.
M-168, special hardener, 10 Al, 4 Fe, bal Cu.
Cast: 55,000 TS; 55,000 YS; 0 El; 0 RA; 300 Brin.
For dies for forming tools, Al bronze.

HILLS-McCANNA NO 50
M-168, 52 Cu, 31 Ni, 12 Fe, 5 Cr.
92,300-75,000 TS; 26,400-42,000 YS; 8.5-4.5 El, 8.5-7.8 RA; 206-190 Brin
For hydraulic valve seats, corrosion resistant, C E.L. 33040.

HILLS-McCANNA NO 50A.
M-168, 60.5 Cu, 23.5 Ni, 2 Sn, 3 Pb, 11 Zn.
38,000-45,000 TS, 19,000-22,000 YS, 13-21 El, 15-20 RA, 85-90 Brin
For vessels to resist H_2SO_4, corrosion resistant.

HILLS-McCANNA NO 52.
M-168, 74.5 Cu, 16.5 Ni, 9 Al.
85,000 TS, 36,000 YS; 4 El, 3.5 RA, 213 Brin.
For vessels to resist hot oils; corrosion resistant, C E.L. 29610

HILLS-McCANNA NO. 53.
M-168, 80 Cu, 10 Al, 5 Ni, 5 Fe
Untreated 95,000 TS, 44,000 YS; 9 El, 18 RA, 170 Brin
Heat treated 110,000 TS, 77,000 YS; 3 El, 9 RA, 235 Brin
For spark proof tools, corrosion resistant

HILLS-McCANNA NO 54
M-168, 60-65 Ni, 23-28 Cu, 3.5 Fe, 2 Mn, 0.75 Si, 0.25 C.
65,000-70,000 TS; 35,000-40,000 YS, 30-25 El; 100 Brin.
For chemical apparatus, corrosion resistant, C E.L. 29610.

HILLS-McCANNA NO 55
M-168, 65-67 Ni, 30-32 Cu, 2.5-3.5 Si, 2.5-3.5 Fe
75,000-80,000 TS, 44,000-48,000 YS, 10.5-10 El, 16-13 RA; 170 Brin
For still plugs in oil industries; corrosion resistant.

HILLS-McCANNA NO 102.
M-168, 88 Cu, 10 Sn, 2 Zn
Cast 48,000 TS, 24,000 YS, 42 El, 35 RA; 85 Brin.
For castings; SAE-62.

HILLS-McCANNA NO 102 P.
M-168, special hardener, 2 Si, 1 Fe, bal Cu.
Cast: 52,000 TS, 26,000 YS, 17 El; 19 RA; 119 Brin
For castings; Si bronze

HILLS-McCANNA NO 105
M-168; 85.75 Cu, 10 Sn, 2.5 Pb, 1.75 Ni.
Cast: 44,500 TS, 33,500 YS, 12 El, 15 RA; 96 Brin.
For gears

HILLS-McCANNA NO 110.
M-168; 80 Cu, 10 Sn, 10 Pb.
Cast: 45,000 TS, 25,000 YS; 32 El, 24 RA, 64 Brin.
For bearings, SAE-64.

HILLS-McCANNA NO 111.
M-168; 88 Cu, 10 Sn, 2 Pb.
Cast: 49,000 TS; 24,000 YS; 49 El, 36 RA; 81 Brin.
For bearings; SAE-63.

HILO.
M-61; 75 Ni, 18 Co, 2 Ti, bal Fe.
Annealed: 106,000-90,000 TS; 30-20 El.
For radio tube filaments; magnetic.

HILO.
M-897; 75 Ni, 18 Co, 2 Ti, 5 Fe.
Annealed: 105,000 TS; 75,000 YS; 30 El.
For cathodes and filaments in electronic tubes; heat resistant.

HILO, MODIFIED.
M-61; 79 Ni, 18 Co, 2 Fe.
Annealed: 82,000 TS.
For vacuum tube filaments, heat and corrosion resistant.

Hi Mag Perm.
M-1425, 0.03-0.05 C, 0.005-0.009 P, 0.01-0.02 Si, 0.03-0.07 Cr, 0.006-0.01 Al, 0.04-0.07 Mo, bal Fe
Annealed 40,000 TS; 20,000 YS; 40 El; 78 RA; 69 Brin.
For electrical applications, magnetic control devices, magnetic clutches and chucks, pole pieces, armatures.
High magnetic permeability Vacuum degassed

HI-MAN.
M-67, 0.25 C, 1.35 Mn, 0.30 Si, 0.20 Cu, bal Fe.
Rolled 75,000 TS, 50,000 YS; 20 El.
For railroad and agriculutre equipment, mine cars, auto bodies, high strength, low alloy construction steel.

HI-MAN 440.
M-67, 0.28 C, 1.35 Mn, 0.30 Si, 0.20 Cu, bal Fe
Rolled. 70,000 TS, 50,000 YS
For railroad and agriculture equipment, mine cars; high strength, low alloy construction steel.

HI-Mo
M-57; 0.83 C, 1.5 W, 8.75 Mo, 4 Cr, 1.25 V, bal Fe
For cutting tools, reamers, high speed steel.

HINGE
M-338, 62.0-63.5 Cu, 1-2 Pb, bal Zn.
Soft 50,000 TS, 50 El, 65 Brin
Hard 85,000 TS, 0 El, 180 Brin
Engraving brass

HI-NICKEL ALLOY.
M-373; C, Ni, bal Fe
For corrosion and heat resistant parts; corrosion and heat resistant.

HIOLOY-0-2
M-95, 0.20-0.35 C, 0.30-0.55 Si, 0.60-0.90 Mn, 0.4-0.6 Mo, bal Fe.
85,000 TS, 55,000 YS, 20 El, 30 RA.
For oil refinery equipment, water hardened

HIOLOY-0-4
M-95, 0.15-0.35 C, 0.30-0.55 Si, 0.4-0.7 Mn, 4-6 Cr, 0.4-0.65 Mo, bal Fe.
110,000 TS; 75,000 YS, 16 El; 30 RA.
For oil refinery equipment, corrosion resistant.

HIOLOY 0-6.
M-95, 0.55-0.75 C, 0.30-0.55 Si, 0.8-1.2 Cr, 0.5-0.8 Mn, bal Fe.
For liner plates, screen plates, cement mills; wear resistant, formerly "Hioloy W."

HIOLOY-0-7
M-95; 0.20-0.35 C, 0.5-0.8 Mn, 1.75-2.25 Ni, 0.6-0.9 Cr, 0.2-0.3 Mo, bal Fe.
100,000 TS; 65,000 YS; 18 El; 30 RA.
For oil refinery equipment; oil hardened.

HIPERCO.
M-118; 35 Co, 1 Cr, bal Fe.
Annealed: 25,000 TS; 20,000 YS; 1-2 El.
Unannealed: 80,000 TS; 60,000 YS; 20 El.
For core material, magnets for electric motors and generators; magnetic alloy of high permeability.

HIPERCO 27.
M-118; 27 Co, 0.5 max Cr, 0.3 max Ni, 0.3 max Mn, 0.03 max C, bal Fe.
Annealed: 80,000 TS; 45,000 YS; 20 El; 48.8 RA; 150 Brin.
For aircraft generators, current transformers, rectifiers; high magnetic saturation.

HIPERCO 35.
M-118; 35 Co, 0.3 max Mn, 0.5 max Cr, 0.3 max Ni, 0.03 max C, bal Fe.
Annealed: 36,000 TS; 36,000 YS; 0 El; 0 RA; 190 Brin.
For servo mechanism, torque motors, magnetic clutches; high magnetic saturation.

HIPERCO-50.
M-118; 2.V, 49 Co, 49 Fe.
Cold Rolled: 195,000 TS; 185,000 YS, 1 El; C 35 Rock.
Annealed: 80,000 TS; 48,000 YS; 0.5 El; B 97 Rock.
For applications requiring high magnetic inductions at low fields of 10-50 oersteds, diaphragms, motors, generators, relays. High permeability at high induction.

HIPERNIK
M-118; 50 Ni, 50 Fe, traces Mn.
Annealed: 55,000 TS; 20,000 YS, 50 El; 50 RA.
For core material for radio and current transformers, motors, relays, soft and ductile magnetic alloy.

HIPERNIK V.
M-118, 50 Ni, 50 Fe, trace Mn.
Annealed: 55,000 TS; 20,000 YS; 33 El.
For magnetic core materials for transductor applications; magnetic amplifiers, saturated reactors.

HIPERNOM V.
M-118; 79 Ni, 4 Mo, bal Fe.
40,000 to 50,000 permeability in the 40 gauss range
250,000 to 500,000 permeability at 3500 gauss
For sensitive saturable core devices where extreme sensitivity is required. Audio transformers, relays, amplifiers.
Processed to exhibit square loop properties. High permeability.

HIPERSIL.
M-118; 3-4 Si, bal Fe
Cast: 50,000 TS; 45,000 YS; 6 El.
For transformer cores; high permeability.

HI-PHY KIRKSITE.
M-88, M-794; Cu, Al, Mg, bal Zn.
For forming dies; refined grain.

HI-PRO.
M-275; 2.2 C, 12 Cr, 0.25 V, bal Fe.
For blanking and deep drawing dies, punches, trimming dies, shear blades, ring gages, liners, lamination dies; high resistance, to wear and abrasion; AISI D3.
Was Vulcan Hi-Pro.

HI-PROOF 304.
M-1724; 0.06 max C, 2.0 max Mn, 18.0-20.0 Cr, 8.0-11.0 Ni, 0.2 N, bal Fe.
Room temp: 85,000-114,000 TS; 42,500 YS; 35 El;
At 400°C: 20,000 min YS.
For stainless parts in food industry.

HI-PROOF 304L.
M-1724; 0.03 max C, 2.0 max Mn, 18.0-20.0 Cr, 8.0-11.0 Ni, 0.2 N, bal Fe.
Room temp: 85,000-114,000 TS; 42,500 YS; 35 El.
At 400°C: 20,000 min YS.
Weldable: for stainless parts and assemblies.

HI-PROOF 316
M-1724; 0.07 max C, 2.0 max Mn, 16.0-18.0 Cr, 10.0-14.0 Ni, 2.0-3.0 Mo, 0.2 N, bal Fe.
Room temp: 92,000-114,000 TS; 46,000 YS; 35 El;
At 400°C: 22,400 min YS.
For stainless steel parts.

HI-PROOF 316L
M-1724; 0.03 max C, 2.0 max Mn, 16.0-18.0 Cr, 10.0-14.0 Ni, 2.0-3.0 Mo, 0.2 N, bal Fe.
Room temp: 92,000-114,000 TS; 46,000 YS; 35 El;
At 400°C: 22,400 min YS.
Weldable, for stainless steel parts and assemblies

HI-PROOF 347
M-1724, 0.08 max C, 2.0 max Mn, 17.0-19.0 Cr, 9.0-11.0 Ni, 0.2 N, Nb = 10 × %C min, bal Fe.
Room temp: 92,000-114,000 TS, 49,000 YS; 35 El.
At 400°C: 31,000 min YS.
Weldable; for stainless parts and assemblies.

HI-QUA-LED.
M-1378, leaded alloy steels.
For screw machine products, free-cutting

HI-QUA-LED 10L45
M-1378, 0.43-0.50 C, 0.6-0.9 Mn, Pb, bal Fe.
Heat treated: 110,000 TS; 68,500 YS; 22 El; 44 RA; 230 Brin.
For gears, bolts, machine tool parts; free-cutting, leaded steel.

HI-QUA-LED 10L50.
M-1378, 0.48-0.50 C, 0.6-0.9 Mn, Pb, bal Fe
Heat treated 117,000 TS, 72,500 YS; 22 El; 43 RA; 235 Brin
For crankshafts, gears, tie rods, bushings; free-cutting, leaded steel

HI-QUA-LED 10L60
M-1378; 0.55-0.65 C, 0.7-1.0 Mn, Pb, bal Fe.
Heat treated 142,000 TS; 81,000 YS, 16 El, 32 RA; 270 Brin.
For crankshafts, die blocks, girders; free-cutting, leaded steel

HI-QUA-LED 10L70
M-1378, 0.65-0.75 C, 0.9 Mn, Pb, bal Fe
Heat treated 145,000-157,000 TS; 87,000-104,000 YS, 14.0-15.5 El, 26.5-37.0 RA, 321-285 Brin.
For punches, hammers, tools, free-cutting leaded steel.

HI-QUA-LED 41L30.
M-1378, 0.28-0.35 C, 0.4-0.6 Mn, 0.8-1.1 Cr, 0.15-0.25 Mo, Pb, bal Fe.
Heat treated: 126,000 TS; 105,000 YS; 18 El; 52 RA; 262 Brin.
For gears, bolts, crankshafts; free-cutting, leaded steel.

HI-QUA-LED 41L37.
M-1378; 0.35-0.40 C, 0.8-1.1 Cr, 0.15-0.25 Mo, Pb, bal Fe.
Heat treated: 122,000 TS; 100,000 YS; 23 El; 62 RA; 248 Brin
For gears, bolts, crankshafts; free-cutting, leaded steel.

HI-QUA-LED 41L40.
M-1378; 0.38-0.43 C, 0.75-1.0 Mn, 0.8-1.1 Cr, 0.20 Mo, Pb, bal Fe.
Heat treated: 118,000-132,000 TS; 92,000-106,000 YS; 20-17 El; 57-46 RA; 235-277 Brin.

For gears, bolts, machine tools parts; free-cutting, leaded steel.

HI-QUA-LED 43L40.
M-1378; 0.38-0.43 C, 1.6-2.0 Ni, 0.7-0.9 Cr, 0.3 Mo, Pb, bal Fe.
Heat treated: 145,000 TS; 125,000 YS; 16 El; 48 RA; 310 Brin.
For machine tool parts; free-cutting, leaded steel.

HIROX.
M-118; 6-10 Al, 3-9 Cr, 0-4 Mn, B, Zr, bal Fe.
At 70°F: 118,850 TS; 111,650 YS; 15 El; 42 RA.
At 1300°F: 15,000 TS; 14,950 YS; 94 El; 98 RA.
For resistances, heating elements; high electrical resistivity and high oxidation resistance to 2300°F.

HI-RUN.
M-335; 1.55 C, 11.5 Cr, 0.8 Mo, 0.9 V, bal Fe.
Air hardening.
For tools, dies.
AISI D2 Hi Chrome-Hi Carbon tool steel.

HI-SHOCK 60.
M-32; 0.68 C, 0.5 Mn, 0.3 Si, 1.0 Cr, 0.5 Ni, 1.0 Mo, 2.5 Cu, 0.15 V, bal Fe.
Air hardened: 363,000-226,000 TS; 316,000-206,000 YS; 1.6-10.2 El; 3.1-30.9 RA; 580-500 Brin.
For hobs, punches, mandrels, tools and dies; air hardened, shock resistant.

HI-TEM IRON NO. 7.
M-23; 3 C, 1.5 Si, Ni, Cr, bal Fe.
For retorts, dye and paint equipment; corrosion and heat resisting, cast iron.

HI-TEMP 72 see HANDY HI-TEMP 720.

HI-TEMP 82 see HANDY HI-TEMP 820.

HI-TEMP 91 see HANDY HI-TEMP 910.

HI-TEMP 93 see HANDY HI-TEMP 930.

HI-TEMP AF-183.
M-1; 0.25-0.40 C, 11.5-13.5 Cr, 2.75-3.25 Mo, 0.60-0.95 V, 17.0-19.0 Mn, 0.15-0.25 N, bal Fe.
Bar: 137,000 TS; 82,000 YS; 33 El; 23 RA.
At 1500°F: 34,000 TS, 29,400 YS; 34 El; 58 RA.
For gas turbines, jet engines, nozzles, afterburner.
Good heat and corrosion resistance, austenitic, non-heat treatable.

HI-TENSILE.
M-801, 7-8 Zn, 0.2-0.5 Mg, 0.4-1.0 Cu, 0.2 Ti, bal Al.
T5-temper: 35,000 TS; 26,000 YS; 6 El; 75 Brin.
For aircraft and machine tool castings; room temperature aging properties.

HITENSILOY NO. 11.
M-122, 57 Cu, 1 Pb, 1.75 Ni, bal Zn.
Rolled. 80,000 TS; 45,000 YS; 165 Brin.
For pump rods, valve stems, bolts, nuts, die castings; nickel brass.

HITENSO 162.
M-8; 99.0 Cu, 1.0 Cd.
(Formerly Hitenso 961)
Soft (rod) 37,000 TS; 12,000 YS; 50 El; 47 Rock F.
Hard (rod) 58,000 TS; 50,000 YS; 15 El; 65 Rock B.
For electrical equipment, trolley wire, contact shoes.
High electrical conductivity, wear resistant.
Copper Alloy No. 162.

HITENSO 165.
M-8; 0.8 Cd, 0.02 Si, 0.60 Sn, bal Cu.
Hard: 65,000 TS; 55,000 YS; 15 El; B 75 Rock.
Soft: 40,000 TS; 14,000 YS; 55 El; B 6 Rock.
Wire: 95,000 TS; 1.5 El.
For electrical equipment, trolley wire, contact shoes, electrical welding tips and wheels. 58% electrical conductivity, high strength. Copper Alloy No. 165.

HI-TENSO 961 see HITENSO 162.

HI-TENSO 965 see HI-TENSO 165.

HI-TENSO 1622.
M-8; 1 Cd, bal Cu.
Hard wire: 90,000 TS; 1.5 El.
For low load transmission lines, trolley wire, spring contacts.
Corrosion and wear resistant.
Copper Alloy No. 1622.

HITEN-SPEED 45.
M-478; 0.33-0.41 C, 1.3-1.6 Mn, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, tough.

HITEN-SPEED 55.
M-478; 0.30-0.41 C, 1.3-1.9 Mn, 0.25-0.34 Mo, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, tough.

HITEST.
M-1441; 3 C, Si, Mn, bal Fe.
For gears, shafts, housings, machinery parts; cast iron.

HI-THORIA.
M-60; W, ThO_2.
For welding electrodes; stable arc.

HI TM 900.
M-1439, 0.37-0.43 C, 5 Cr, 1.2 Mo, 0.5 V, 0.9 Si, 0.3 Mn, bal Fe
Heat treated: 220,000 TS; 185,000 YS; 10 El; 35 RA; 460 Brin
For fasteners, bolts; high strength at elevated temperature.

HI-VAN.
M-341; 0.40 C, 1.1 Si, 5.25 Cr, 1.2 Mo, 0.9 V, bal Fe.
For punches, upsetters, forming dies; hot work steel, oil hardened.

HI-VAN NO. 28.
M-341; 0.85 C, 4 Cr, 19 W, 2 V, 0.75 Mo, bal Fe.
For tools, cutters, reamers, taps, gauges; high speed steel.

HI-WEAR 64. see CARPENTER HI-WEAR 64.

HI-YAW-TEN.
M-1540, 0.12 max C, 0.25-0.75 Si, 0.2-0.5 Mn, 0.06-0.12 P, 0.25-0.5 Cu, 0.65 max Ni, 0.4-1.0 Cr, 0.15 max Ti, bal Fe.
Annealed: 67,000 min TS; 50,000 min YP;
Rolled: 71,000 min TS; 57,000 min YP.
For buildings, rolling stock, buses, mine cars, bridges. Resists atmosphere corrosion.

HI-YIELD 42.
M-633; 0.21 C, 0.9 Mn, 0.01 min Cb, bal Fe.
Plate: 63,000 TS; 42,000 YS, 24 El.
For trucks, mine cars, derricks, bridges, plow frames, pressure vessels.
Good fabricability and weldability.

HI-YIELD 45.
M-633; 0.22 C, 1.25 Mn, 0.01 min Cb, bal Fe.
Plate: 60,000 TS; 45,000 YS; 22 El.
For trucks, mine cars, derricks, bridges, plow frames, pressure vessels.
Good fabricability and weldability.

HI-YIELD 50.
M-633; 0.22 C, 1.25 Mn, 0.01 min Cb, bal Fe.
Plate: 65,000 TS; 50,000 YS; 20 El.
For trucks, mine cars, derricks, bridges, plow frames, pressure vessels.
Good fabricability and weldability.

HI-YIELD 55.
M-633; 0.25 C, 1.35 Mn, 0.01 min Cb, bal Fe.
Plate: 70,000 TS; 55,000 YS; 18 El.
For trucks, mine cars, derricks, bridges, plow frames, pressure vessels.
Good fabricability and weldability.

HI-Z.
M-1538; 0.10-0.18 C, 0.60-1.0 Mn, 0.15-0.35 Si, 0.002-0.006 B, 0.4-0.8 Cr, 0.15-0.50 Cu, 0.4-0.6 Mo, 0.7-1.0 Ni, 0.03-0.10 V, bal Fe.
Plate: 114,000-135,000 TS; 100,000 min YS; 20 min El.
For pressure vessels, bridges, mine cars, power shovels, cranes, trucks, trailers.
Shock and wear resistant. Heat treated by mill.

HK31A.
M-43; 3.0 Th, 0.7 Zr, bal Mg.
O-temper: 30,000-33,000 TS; 18,000-20,000 YS; 12-23 El.
H 24-temper: 34,000-39,000 TS; 24,000-31,000 YS; 4-14 El.
Sheet and plate have good formability and weldability; used at 400°F to 600°F in aircraft and missiles.
ASTM B90-69; AMS 4384, 4385

HK31A.
Various foundries; 0 7 Zr, 3.0 Th, bal Mg.
T6-temper: 27,000-32,000 TS; 13,000-15,000 YS; 4-8 El.
At 700°F· 13,000 TS; 8000 YS; 26 El.
Magnesium sand castings with good pressure tightness, weldability and corrosion resistance
For parts operating at 400-700°F.
ASTM B80-69; AMS 4445; SAE 507, QQ-M-56

HM.
M-459; C, Mn, bal Fe.
For hand chisels; water hardened

HM21A.
M-43; 0 6 Mn, 2 0 Th, bal Mg.
T8-temper: 33,000-35,000 TS; 18,000-23,000 YS; 6-11 El; 56 Brin.
Sheet and plate have good properties 400-750°F; good formability and weldability
Used primarily for aircraft and missiles.
ASTM B90-69; AMS 4383, 4390.

HM31A (Extrusions).
M-43; 1.2 Mn, 3.0 Th, bal Mg.
T5-Temper: 37,000-44,000 TS; 26,000-38,000 YS, 4-13 El; 63 Brin
Extrusions: good elevated temperature properties, 400-800°; used in aircraft and missiles.
AMS 4388, 4389.

HMS STEELS.
M-459; C, bal Fe.
For general machine parts; water hardened.

HOB-A-DIE.
M-289; 0.06 C, 0.3 Mn, 0.2 Si, 0.25 Mo, 1 0 Cr, bal Fe.
For Zn casting dies; resists heat checking.

HOB-A-FORM.
M-341; 0.06 max C, 0.15 Mn, 0.10 Si, bal Fe.
For plastic mold dies; water hardening, hobbed cavity.

HOBALITE.
M-40; C, alloy, bal Fe.
Air hardened.
For mold dies, hobs; air hardening.

HOBALITE
M-289; 0.05 C, 0.15 Mn, bal Fe.
For plastic mold dies; case hardening steel.

HOBALITE.
M-783; 0.05 C, 0.16 Mn, bal Fe.
For mold dies; water hardened.

HOBALITE 500A.
M-217; 0.05 C, 0.05 Si, 0.10 Mn, bal Fe.
For deep hobbing steel for bakelite dies; case hardened.

HOBALLOY.
M-38; 0.1 max C, 1.3 Ni, 0.6 Cr, bal Fe.
For Bakelite molds; shock resistant.

HOBART NO. 12.
M-1000; 2 C, bal Fe.
For welding electrode.

HOBART NO. 13.
M-1000, 0.1 C, bal Fe.
For welding electrodes; for light gage steel.

HOBART NO. 90-PL.
M-1000; C, bal Fe.
For welding electrode; for high tensile, low alloy steels.

HOBART NO. 111.
M-1000; 0.1 C, 0 4 Mn, 0.1 Si, bal Fe.
Welded 61,000-69,000 TS, 52,000-60,000 YS; 25-31 El
For welding electrodes for steel; arc

HOBART NO 335
M-1000; 0 08 C, 0.3 Mn, 0.14 Si, bal Fe.
Welded 62,000-71,000 TS, 52,000-61,000 YS; 22-26 El.
For welding electrodes for steel, arc

HOBART NO 477.
M-1000, C, bal Fe
Welded 68,000-78,000 TS, 58,000-56,000 YS; 19-26 El.
For welding electrodes for mild steel, arc

HOBART NO. 885
M-1000; 0.1 C, 0 5 Mn, 0 2 Si, 0.5 Mo, bal Fe.
Welded· 80,000 TS; 64,000 YS; 22 El
For welding electrodes for high tensile steel; arc, coated.

HOBART NO 912.
M-1000, Mn, Zn, bal Cu.
For welding rod for cast iron and steel, low fuming for gas welding, M P. 1600°F

HOBART NO 932
M-1000; Si, bal Cu.
For welding electrode; M P. 1010°C.

HOBART ALUMINUM
M-1000, 5 Si, bal Al.
For welding electrodes for aluminum; coated

HOBART HI-CARBON NO. 40-HC.
M-1000, high C, bal Fe.
For welding electrodes for high C steels, coated.

HOBART HOBRONZE.
M-1000; Cu alloy.
For welding electrodes for Cu alloys; carbon or metallic arc.

HOBART NICKEL-CAST.
M-1000, Ni.
For welding electrode for cast iron; coated.

HOBART SOFTCAST A.
M-1000; C, bal Fe.
Welded: 200 Brin
For welding electrodes of cast iron; coated, arc, machinable.

HOBART SOFTCAST C.
M-1000; C, bal Fe.
For welding electrodes for cast iron; coated cast electrode, machinable.

HOBART STAINLESS NO. 308.
M-1000; 0.08 max C, 10-12 Ni, 19-21 Cr, bal Fe.
For welding electrodes for Cr-Ni alloys; arc, stainless.

HOBART STAINLESS NO. 309.
M-1000; 0.20 max C, 12 min Ni, 25 min Cr, bal Fe.
For welding electrodes for Cr-Ni alloys; arc, coated, stainless.

HOBART STAINLESS NO. 310.
M-1000; 0.25 max C, 20 min Ni, 25 min Cr, bal Fe.
For welding electrodes for Cr-Ni alloys; coated, stainless.

HOBART STAINLESS NO. 316.
M-1000; 0.10 max C, 10-14 Ni, 1.7-2.5 Mo, 16-18 Cr, bal Fe.
For welding electrodes for Type 316 steel; coated, stainless.

HOBART STAINLESS NO. 330.
M-1000; 0.06 C, 33 Ni, 1.4 Mn, 15 Cr, bal Fe.
For welding electrodes for Type 330 steel; coated, corrosion and heat resistant.

HOBART STAINLESS NO. 347
M-1000; 17-19 Cr, Cb = 10 × C, bal Fe.
For welding electrodes for Cr-Ni alloys; coated, sterilized, stainless.

HOBART STRONGCAST.
M-1000, C, bal Fe.
For welding electrodes for cast iron; coated, arc

HOBART SULKOTE
M-1000; 0.13-0.18 C, bal Fe.
Welded: 48,000 TS, 8 El.
For welding electrodes for mild steel, arc, iron oxide coating.

HOBB DIE STEEL.
M-627, 0.07 max C, 0.15 Mn, bal Fe.
For plastic molds, hobs, carburizing steel

HOBRITE.
M-333, 0.05 max C, 0.11 Mn, bal Fe
For hobbing molds; plastic mold dies, water hardening.

HOBSON NON-SHRINK.
M-340; 0.9 C, 1.2 Mn, 0.2 V, bal Fe.
For dies and tools; non-deforming.

HOBSON'S CHOICE.
U. S.; 1.48 C, 0.34 Mn, bal Fe.
For tools, cutters; water hardened

HOBSON'S CHOICE DRILL RODS
M-340; 1.1 C, bal Fe.
For tools, drills, taps, water hardened

HOBSON'S CHOICE XX
M-340; 0.7-1.2 C, 0.3 Mn, 0.3 Si, bal Fe.
For drills, punches, taps, reamers, hobs, broaches; water hardened, Type W1.

HOBSON'S FAST FINISHING.
M-340; 1.2 C, 0.2 V, bal Fe
For fast finishing tools, cutters; water or oil hardened.

HOBSON'S OIL HARDENING.
M-340; 0.9 C, 1.2 Mn, bal Fe.
For tools, dies, punches; non-deforming.

HOBSON'S SPECIAL TAP RODS.
M-340; 1 C, bal Fe.
For tools, taps; water hardened.

HOBSON'S WARRANTED BEST.
M-340; 0.7-1.2 C, bal Fe.
For general tools; water hardening.

HOCKLEISTEUNGSTAHL.
Germ.; 10 Cr, 2 W, 0.5 V, 1.5 C, 1.2 Si, 0.4 Mn, bal Fe.
For shear blades, dies.

HOCO EXTRA EXTRA MH.
M-1338; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 18 El; 40 RA; 210 Brin.
For springs, taps, cutters, drills, hobs; Type W1; water hardened.

HOCO EXTRA EXTRA SEHR ZAH.
M-1338; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, axes, punches, crimpers; Type W1; water hardened.

HOCO EXTRA EXTRA ZAH.
M-1388; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, taps, drills, hobs, reamers; Type W1; water hardened.

HOCO EXTRA EXTRA ZH.
M-1338; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin
For springs, drills, reamers, broaches; Type W1; water hardened

HOCO EXTRA HART.
M-1338, 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers tools, forming dies, reamers; Type W1, water hardened.

HOCO EXTRA MH.
M-1338; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed 110,000 TS; 58,000 YS; 20 El; 40 RA; 210 Brin.
For springs, tools, reamers, hobs, drills, taps, Type W1; water hardened

HOCO EXTRA SEHR HART
M-1338; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated. 175,000 TS, 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, rails, punches, axes, hammers, Type W1, water hardened

HOCO EXTRA WEICH SCHWEISSBAR.
M-1338, 0.55 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Heat treated 160,000 TS, 115,000 YS, 12 El; 40 RA; 325 Brin
For gears, bolts, shafts, machine tool parts; water hardened

HOCO EXTRA ZAH
M-1338; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El, 30 RA; 400 Brin.
For springs, taps, reamers, drills, broaches, Type W1, water hardened.

HOCO EXTRA ZH.
M-1338; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, tools, cutters, drills; Type W1; water hardened.

HOCO HSSP
M-1338; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs; oil hardened, tough.

HOCO HWA.
M-1338; 0.30 C, 0.25 Si, 0.25 Mn, 2.5 Cr, 0.15 Mo, 0.1 V, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

HOCO HWA50.
M-1338; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For extrusion dies, rams and liners; oil hardened, tough.

HOCO HWA90.
M-1338; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion dies, rams and liners; hot work steel, oil hardened.

HOCO HWA95K.
M-1338; 0.30 C, 2.4 Cr, 2.0 Co, 0.25 V, 8.5 W, bal Fe.
For extrusion dies and liners; hot work steel, oil hardened.

HOCO HWA100M.
M-1338; 0.65 C, 3.75 Cr, 0.85 Mo, 0.7 V, 8.5 W, bal Fe.
For lathe and planer tools, taps, reamers; high speed steel.

HOCO HWAA40.
M-1338; 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For punches, upsetters, riveters; oil hardened, tough.

HOCO HWAMV.
M-1338; 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe.
For header and forging dies; oil hardened, tough.

HOCO HWR4.
M-1338; 1.42 C, W, V, bal Fe.
For bearings, bushings, cutters; water or oil hardened, wear resistant.

HOCO HZR.
M-1338; 1.4 C, 0.30 Cr, 0.1 V, bal Fe.
For bearings, bushings, cutters; water or oil hardened, wear resistant.

HOCO KG.
M-1338; 1.0 C, 1.55 Cr, 0.35 Mn, bal Fe.
For bearings, cutters, liners; water or oil hardened, shock resistant.

HOCO PRIMA-MH.
M-1338; 0.90 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 185,000 TS; 118,000 YS; 10 El; 30 RA; 375 Brin.
For springs, taps, drills, reamers; Type W1; water hardened.

HOCO PRIMA SEHR WEICH.
M-1338; 0.35 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 84,000 TS; 54,000 YS, 30 El; 53 RA; 185 Brin.
For gears, shafts, axles, bolts, screws; water hardened.

HOCO PRIMA WEICH.
M-1338; 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 98,000 TS; 60,000 YS; 24 El; 54 RA; 212 Brin.
For axles, gears, bolts, shafts; water hardened.

HOCO PRIMA ZAH.
M-1338; 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El; 40-54 RA; 320-230 Brin.
For wheels, die blocks, girders, rails; water hardened.

HODI.
M-435; 0.28 C, 9 W, 4 Cr, 0.4 V, bal Fe.
For hot gripping and swaging dies.

HODUR.
M-1364; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
Annealed: 27,000 TS; 11,000 YS; 22 El; 47 Brin.
Heat treated: 72,000 TS; 57,000 YS; 130 Brin.
For aircraft structures, fittings, fasteners; age-hardenable.

HOFORS-1.
M-224; 1.0 C, 1.1 Mn, 0.6 Si, 1.0 Cr, bal Fe.
For large bell and roller bearing rings; oil hardened; non-deforming.

HOFORS-3.
M-224; 1.0 C, 1.5 Cr, bal Fe.
For ball bearings, master gauges, taps.

HOFORS-7.
M-224; 1.1 C, 0.6 Cr, bal Fe.
For taps, twist drills, dies, punches, reamers.

HOFORS-9.
M-224; 1.1 C, 0.5 Cr, bal Fe
For bearings, rollers, reamers, taps.

HOFORS-13.
M-224; 1.05 C, 1.0 Cr, bal Fe
For ball bearing rings, rollers, punches, taps.

HOFORS-22.
M-224; 1.0 C, 1.1 Cr, 0.35 Mo, bal Fe.
For cutting tools, chisels, drills, rollers, taps; wear resistant.

HOFORS-46.
M-224; 0.90 C, 1.15 Mn, 0.5 Cr, 0.5 W, 0.1 V, bal Fe.
For blanking dies, broaches, form tools, punches, taps; oil hardened; tough.

HOFORS-100.
M-224, 1.0 C, bal Fe.
For twist drills, punches, shear blades; water hardened.

HOFORS-711.
M-224; 0.50 C, 0.70 Si, 1.15 Cr, 2.5 W, 0.15 V, bal Fe.
For broaches, milling cutters, blanking and heading dies; oil hardened.

HOFORS KN-13.
M-224; 0.18 C, 0.3 Si, 0.55 Mn, 0.75 Cr, 3 Ni, bal Fe.
For gears, camshafts, crankshafts; case hardened.

HOFORS KN-14.
M-224, 0.4 C, 0.3 Si, 0.8 Mn, 0.8 Cr, 1.25 Ni, bal Fe.
For gears, shafts; shock resistant.

HOFORS KN-16.
M-224; 0.15 C, 0.3 Si, 0.55 Mn, 0.65 Cr, 1.25 Ni, bal Fe.
For gears, camshafts, crankshafts; case hardened.

HOFORS KN-17.
M-224, 0.12 C, 0.75 Cr, 3.0 Ni, bal Fe.
For gears, camshafts, crankshafts; case hardened.

HOFORS KN-18.
M-224; 0.35 C, 0.3 Si, 0.55 Mn, 1.15 Cr, 2.6 Ni, bal Fe.
For gears, machinery parts; shock resistant.

HOFORS KN-19.
M-224; 0.3 C, 0.3 Si, 0.55 Mn, 1.25 Cr, 4.25 Ni, bal Fe.
For gears, shafts; tough, oil hardened.

HOFORS KNY-1.
M-224; 0.3 C, 0.55 Mn, 1.05 Cr, 3.25 Ni, 0.25 Mo, bal Fe.
For gears, machinery parts, shafts; tough.

HOFORS KY-2.
M-224; 0.25 C, 0.65 Mn, 1.05 Cr, 0.2 Mo, bal Fe.
For gears, machinery parts; tough.

HOFORS M-11.
M-224; 0.40 C, 0.30 Si, 1.25 Mn, bal Fe.
For machinery parts; tough.

HOFORS NY-1.
M-224; 0.2 C, 0.55 Mn, 1.8 Ni, 0.25 Mo, bal Fe.
For gears, shafts; case hardened.

HOFORS SM-5.
M-224; 0.55 C, 1.75 Si, 0.75 Mn, bal Fe.
For springs; oil hardened.

HOHENZOLLERN BRASS.
Germ.; 30-40 Zn, bal Cu.
For gears, worm wheels; a high tensile brass.

HOLDERTEM.
M-64, 0.40 C, 0.85 Mn, 0.95 Cr, 0.2 Mo, bal Fe.
Prehardened low alloy steel for shafts, arbors, structural parts, and special purpose tools.

HOLFOS 10% LEAD BRONZE.
M-169; 80 Cu, 10 Sn, 10 Pb.
Cast: 29,000-36,000 TS; 22,500-27,000 YS; 6-2 El; 70-85 Brin.
For bushings, bearings; free cutting, SAE 64.

HOLFOS 20% LEAD BRONZE.
M-169; 75 Cu, 5 Sn, 20 Pb
Cast 22,500-29,500 TS; 13,500-18,000 YS, 10-7 El, 50-60 Brin
For bushings, bearings; operates best with soft shafts.

HOLFOS AB1 As Cast.
M-169; 88 Cu, 9.5 Al, 2.5 Fe
Cast: 72,000-78,000 TS, 25,000-31,000 YS, 20 El; 120-140 Brin
For high strength components in food handling, acid resistant fittings, flanges
BS 1400 AB1-C; BS 1032; SAE 68A.

HOLFOS AB1 Heat Treated
M-169, 88 Cu, 9.5 Al, 2.5 Fe.
Cast and heat treated 85,000-94,000 TS; 43,000-50,000 YS, 12 El, 130-180 Brin
Gears, shafts, splined couplings for hydraulic systems, food processing.

HOLFOS AB2 As Cast
M-169, 80 Cu, 10 Al, 4.5 Fe, 5.5 Ni
Cast 90,000-95,000 TS, 36,000 YS, 15 El, 165 Brin.
For gears, shafts, components in marine equipment, food and oil industry.
BS 1400 AB2-C, BS 1073; ASTM B148-65T-9D.

HOLFOS AB2 Heat Treated
M-169, 80 Cu, 10 Al, 4.5 Fe, 5.5 Ni.
Cast and heat treated. 87,000-100,000 TS; 38,000-54,000 YS, 8-12 El; 155-190 Brin.
For highly stressed equipment in marine, food, petroleum industries.
Near ASTM B148-65T-9D-HT.

HOLFOS B O
M-169, 87.8 Cu, 11.5 Sn, 0.7 P.
Cast: 38,000-54,000 TS; 27,000-47,000 YS; 5-7 El; 90-130 Brin. (Properties vary with method of casting).
Good wear and abrasion characteristics.
For gears, shafts, wear parts.
BS 1400 PB1-C and PB2-C; BS 1059.

HOLFOS B O.H.T.
M-169; 87.8 Cu, 11.5 Sn, 0.7 P
Centrifugally-spun and continuously cast.
As cast: 45,000-54,000 TS; 22,400-23,500 YS; 20-40 El; 85-90 Brin
Good wear and abrasion resistance, resistant to sea water.
For elevating nuts, bearings, small worm gears.
DTD 900/4454/A.

HOLFOS G1.
M-169; 88 Cu, 10 Sn, 2 Zn.
Cast: 38,000-50,000 TS; 18,000-27,000 YS; 3-15 El; 85-100 Brin (Properties vary with method of casting).
(known as Admiralty Gunmetal).
For pumps, shaft liners, hydraulic parts.
BS 1400 G1-C; BS 383; SAE 62; AMS 4845D.

HOLFOS G2.
M-169; 88 Cu, 8 Sn, 4 Zn.
Cast. 31,000-45,000 TS; 17,000-22,400 YS; 3-15 El, 85-100 Brin. (Properties vary with method of casting: continuous cast is strongest, shell or sand is most ductile)
For pump fittings, valve nuts, bolts.
BS 1400 G2-C; BS 1022; SAE 620.

HOLFOS G3
M-169, 84.75 Cu, 7 Sn, 2.25 Zn, 0.5 max Pb, 5.5 Ni.
Cast 40,000-50,000 TS; 20,000-30,000 YS, 12-20 El, 85-100 Brin. (Properties vary with method of casting).
Age hardenable alloy.
For roller bearing cages, gear wheels, actuating nuts, insulator hanger supports.
BS 1400 G3-C.

HOLFOS G3-WP.
M-169; 84.75 Cu, 7 Sn, 2.25 Zn, 0.5 max P, 5.5 Ni
Cast, then age hardened 63,000 TS; 40,000 YS; 3 El; 160-200 Brin.
High strength bronze for critical applications.
BS 1400 G3-W

HOLFOS HTB 1.
M-169, 60 Cu, 36 Zn, 1 Al, 2 Mn, 1 Fe.
Cast: 67,000-70,000 TS, 25,000-31,000 YS, 20 El; 110-120 Brin
For screw down nuts in rolling mills and screw presses, neck bushings and stuffing boxes
BS 1400 HTB1-C; SAE 43, AMS 4860A.

HOLFOS HTB 2
M-169; 60 Cu, 33 Zn, 3.5 Al, 2 Mn, 1.5 Fe.
Cast. 85,000-87,000 TS; 40,000-42,000 YS, 15 El, 130-140 Brin
For valve and control parts, seatings, cones, marine hardware
BS 1400 HTB2-C.

HOLFOS HTB 3
M-169; 60 Cu, 30 Zn, 5 Al, 3 Mn, 2 Fe.
Cast: 107,000 TS, 60,000 YS, 12-15 El; 180-185 Brin
For highly stressed hardware and components.
BS 1400 HTB3-C.

HOLFOS J H 17
M-169; 84.7 Cu, 14.0 Sn, 1.3 P.
Centrifugally spun and continuously cast
As cast. 49,000-63,000 TS; 43,000-58,000 YS, 1-1.5 El, 130-160 Brin
Good wear resistance and resistant to sea water.
For aircraft auxiliary driving gears, timing gears
(Ger) DIN 1705 G-SnBz14.

HOLFOS JHR42.
M-169; 92.5 Cu, 2 Zn, 0.5 Mn, 1.5 Fe, 3.5 Si.
Cast: 49,000 TS; 29,000 YS, 18 El; 110 Brin.
For bushings and bearings, esp. for top end bushings for diesel engines.
BS 1400 SB1-C (1948); BS 1030.

HOLFOS LB1.
M-169; 76 Cu, 9 Sn, 15 Pb.
Cast: 25,000-34,000 TS; 11,200-22,400 YS; 3-8 El; 65-90 Brin. (Properties vary with method of casting).
For bearings and bushings, acid resistant fittings.
BS 1400 LB1-C; ASTM B144-52-3D.

HOLFOS LB2.
M-169; 80 Cu, 10 Sn, 10 Pb.
Cast: 27,000-40,000 TS; 11,200-25,000 YS; 3-10 El; 70-95 Brin. (Properties vary with method of casting).
Good sliding properties, corrosion resistant.
For bearings for heavy duty.
BS 1400 LB2-C; BS 963; SAE 64.

HOLFOS LB3.
M-169, 85 Cu, 10 Sn, 5 Pb.
Cast: 27,000-45,000 TS, 11,200-34,000 YS, 3-15 El; 80-100 Brin. (Properties vary with method of casting).
For bearings, acid resistant fittings.
BS 1400 LB3-C; BS 961.

HOLFOS LB4.
M-169; 85 Cu, 5 Sn, 10 Pb.
Cast: 22,400-38,000 TS; 9,000-22,400 YS; 5-25 El, 65-75 Brin. (Properties vary with method of casting).
For shafts, bushes and bearings.
BS 1400 LB4-C, SAE 66.

HOLFOS LB5.
M-169; 75 Cu, 5 Sn, 20 Pb
Cast: 22,400-27,000 TS; 9,000-22,400 YS, 6-8 El; 60-70 Brin. (Properties vary with method of casting)
For bearings for agricultural and railroad equipment, flour mill equipment
BS 1400 LB5-C; ASTM B144-52-3E

HOLFOS LG1.
M-169; 83 Cu, 3 Sn, 9 Zn, 5 Pb.
Cast: 25,000-38,000 TS; 13,500-18,000 YS; 12-40 El; 55-70 Brin. (Properties vary with method of casting).
For lightly loaded marine hardware.
BS 1400 LGI-C; BS 1159; ASTM B145-63-5A.

HOLFOS LG2
M-169; 85 Cu, 5 Sn, 5 Zn, 5 Pb.
Cast: 25,000-38,000 TS; 13,500-22,400 YS; 7-25 El; 65-80 Brin. (Properties may vary with method of casting).
For pump casings, water pump impellers, hose couplings
BS 1400 LG2-C; SAE 40, AMS 4855 B.

HOLFOS LG3.
M-169; 86 Cu, 7 Sn, 5 Zn, 2 Pb.
Cast 31,000-45,000 TS; 13,500-25,000 YS; 5-15 El, 70-85 Brin. (Properties vary with method of casting).
For valves, hydraulic systems, super heated steam components.
BS 1400 LG3-C; BS 1024.

HOLFOS LG4.
M-169; 87 Cu, 7 Sn, 3 Zn, 3 Pb.
Cast: 36,000-43,000 TS; 18,000-22,400 YS, 5-20 El; 65-75 Brin. (Properties vary with method of casting).
For hydraulic pressure control equipment, petrol pump meters, valve bodies, compressor parts.
BS 1400 LG4-C.

HOLFOS LG773.
M-169; 83 Cu, 7 Sn, 3 Zn, 7 Pb.
Cast: 31,000-54,000 TS; 14,500-22,400 YS; 12-18 El; 75-90 Brin. (Properties vary with method of casting).
For shafts, bearings, bushings, sliding surfaces, marine equipment.
SAE 660; ASTM B144-52-3B.

HOLFOS LPB1.
M-169; 88.2 Cu, 7.5 Sn, 4 Pb, 0.03 min P.
Cast: 27,000-46,000 TS; 11,200-27,000 YS; 2-30% El; 65-90 Brin. (Properties vary with method of casting).
Free machining bronze for bushings, valves, steam pressure fittings.
BS 1400 LPB1-C; BS 1061.

HOLFOS PB1.
M-169; 89.5 Cu, 10 Sn, 0.5 min P.
Cast: 34,000-66,000 TS; 18,000-45,000 YS; 2-20 El; 70-120 Brin. (Properties vary with method of casting).
Good bearing properties.
For shafts, guide wheels, blade wheels for pumps and water turbines.
BS 1400 PB1-C; BS 1059; BS 2B8.

HOLFOS PB2
M-169, 88.35 Cu, 11.5 Sn, 0.15 min P
Cast 36,000-54,000 TS; 20,000-47,000 YS; 6-10 El; 85-130 Brin (Properties vary with method of casting).
Good wear and abrasion resistance.
For bearings, feed nuts operating under load, coupling blocks, worm wheels.
BS 1400 PB2-C; BS 421; SAE 65.

HOLFOS PB3.
M-169, 90.2 Cu, 9.5 Sn, 0.3 P.
Cast: 34,000-50,000 TS; 20,000-36,000 YS, 5-20 El, 80-110 Brin (Properties vary with method of casting)
For pressure vessels, pump bodies, casings, impellers, piston shafts.
BS 1400 PB3 C; ASTM B139-66 Alloy 524 (Chem)

HOLFOS W W
M-169; 88.3 Cu, 11.5 Sn, 0.2 P
Sand cast: 36,000 TS, 20,000 YS; 10 El; 85 Brin.
Good wear properties
For gears, shafts, splined couplings.
BS 1400 PB2-C, BS 421; SAE 65

HOLLO
M-344, C, bal Fe
For rock drills, water hardening.

HOLLOBAR
M-341, 1.0 C, 1.2 Cr, 0.3 Mo, bal Fe.
For tools; water hardened

HOLLOBAR
M-822, 1.05 C, 0.38 Mn, 1.46 Cr, 0.28 Si, bal Fe
For cold work dies, oil hardened.

HOLLOW BAR
M-80, C, Cr, bal Fe
For dies, punches; oil hardening.

HOLLOW BLUE BAND.
M-844, 0.10 max C, 25 Cr, 12 Ni, bal Fe
For welding electrodes for stainless steels, stainless; coated.

HOLLOW DRILL.
M-289; 1.2 C, bal Fe.
For hollow drills, water hardened.

HOLLOW DRILL.
M-783; 1 0 1 1 Cr, 0.35 Mn, C, 0.30 Si, bal Fe.
For rock drills, water hardened.

HOLLUP GRADE 1.
M-844; 0.06 max C, bal Fe.
Cast 45,000 TS, 13 El
For welding electrodes for low carbon steel, coated.

HOLLUP GRADE 3.
M-844; 0.10-0.15 C, bal Fe.
Cast: 60,000 TS; 12 El.
For welding electrodes for boiler flues and fire boxes, coated.

HOLLUP GRADE 3R.
M-844; 0.10-0.15 C, bal Fe.
Cast: 60,000 TS; 12 El.
For welding electrodes for boiler tubes; special coating.

HOLLUP GRADE 5.
M-844; 0.18-0.25 C, bal Fe.
Cast: 70,000 TS.
For welding electrodes for building up bearing surfaces; coated, wear resistant.

HOLLUP GRADE 6.
M-844; C, Ni, bal Fe.
For welding electrodes; coated, shock resistant.

HOLLUP GRADE 7.
M-844, 0.85-1.10 C, bal Fe.
For welding electrodes for high carbon steel parts; coated

HOLLUP GRADE 9.
M-844; 0.75-0.95 C, 12-14 Mn, 3-4 Ni, bal Fe
190-500 Brin.
For welding electrodes for high manganese steels; coated.

HOLLUP GRADE 10.
M-844, 0.06 max C, bal Fe
Cast: 45,000 TS; 13 El.
For welding electrodes; coated

HOLLUP GRADE 10X
M-844, 0.06 max C, bal Fe
For welding electrodes, coated, ductile.

HOLLUP GRADE 11
M-844; 0.06 max C, bal Fe.
For welding rod for wrought iron and steel, Cu coated

HOLLUP GRADE 15
M-844, 0.08-0.10 C, bal Fe
Cast: 45,000 TS, 13 El
For welding electrodes, coated

HOLLUP GRADE 20
M-844; Cu alloy
Cast: 40,000 TS
For coated bronze welding rod for copper alloys

HOLLUP GRADE 20B
M-844, Cu alloy
Cast: 40,000 TS
For coated bronze welding rod, for light gauge sheets

HOLLUP GRADE NO 22
M-833; C, bal Fe
For welding electrodes.

HOLLUP GRADE NO 30.
M-844; 0.10-0.15 C, bal Fe
Cast: 60,000 TS, 12 El
For welding electrodes for flues, boilers and fire boxes, coated

HOLLUP GRADE NO 30A
M-844; 0.10-0.15 C, bal Fe
For coated welding electrodes; for automatic welding at high speeds

HOLLUP GR 30-S
M-275, 0.10-0.15 C, bal Fe
Welded: 50,000 TS, 8 El.
For welding electrodes, coated

HOLLUP GR NO 30SB.
M-844, 0.10-0.15 C, bal Fe
Welded: 55,000 TS, 10 RA
For welding electrodes, coated

HOLLUP GR NO. 30-X
M-844; 0.10-0.15 C, bal Fe.
For welding electrode; coated.

HOLLUP GR. NO. 30XB.
M-844; 0.10-0.15 C, bal Fe.
For welding electrodes; coated.

HOLLUP GR. 30XL.
M-884; C, bal Fe.
Welded: 60,000 TS; 12 El.
For welding rods; coated.

HOLLUP GR. NO. 33
M-844, 0.08-0.10 C, bal Fe.
For welding electrodes; copper coated.

HOLLUP GR NO. 50.
M-844; 0.18-0.25 C, bal Fe.
Welded: 70,000 TS.
For welding electrodes; coated.

HOLLUP GR NO. 50A.
M-844; 0.18-0.25 C, bal Fe.
For welding electrodes, coated

HOLLUP GR. NO 55
M-844; 0.2 C, bal Fe.
For welding rod, for pipe and pressure weld

HOLLUP GRADE NO 70
M-844, 0.85-1.10 C, bal Fe.
For welding electrodes; coated.

HOLLUP GR NO 70A
M-844, 0.85-1.1 C, bal Fe.
For welding electrodes, coated.

HOLLUP GRADE NO 90
M-844, 0.75-0.95 C, 12-14 Mn, 3-4 Ni, bal Fe.
For welding electrodes, for high Mn steel.

HOLLUP GR NO 120S
M-844, 0.1 C, 18 Cr, 8 Ni, bal Fe
For welding rod, stainless

HOLLUP GR NO 150.
M-844, 0.08-0.10 C, bal Fe.
Welded: 45,000 TS, 13 El
For welding electrodes, coated.

HOLLUP GRADE NO 170E.
M-844, C, Cr, V, bal Fe.
For coated welding electrodes; shock resistant

HOLLUP GRADE NO 250
M-844, C, 25 Cr, 12 Ni, bal Fe
For welding electrodes, for stainless clad steel

HOLLUP NO 1217
M-844, Al alloy
For coated Al welding rod

HOLLUP NO 2320
M-844, 0.10 C, 3.5 Ni, bal Fe
90,000 TS: 27 El
For coated welding electrodes for Ni steels; shock resistant.

HOLLUP NO 2512
M-844, 0.2 C, 5 Ni, bal Fe
Cast: 100,000 TS, 25 El.
For coated welding electrodes for Ni steels, tough

HOLLUP NO 6723
M-844, 23 min Cu, 3.5 max Fe, bal Ni.
50,000 TS
For Monel metal welding rod; corrosion resistant.

HOLLUP GRADE CI-3
M-844, C, bal Fe.
For welding electrodes for cast iron; coated.

HOLLUP GRADE CI-8.
M-844; C, bal Fe.
For welding electrodes for cast iron; coated.

HOLLUP GRADE CI-9.
M-844, C, Ni, Cu, bal Fe.
For welding electrodes for cast iron; coated.

HOLLUP GRADE CI-10.
M-844; C, bal Fe.
435 Brin.
For welding electrodes for hard surfacing cast iron; coated.

HOLLUP GR. YOLOY.
M-844; 0.15 C, 0.5 Cu, bal Fe.
For welding electrodes; coated.

HOLLUP H.S.V.
M-844; 0.2 C, 1 Ni, 0.6 Cr, 0.15 V, bal Fe.
For coated welding electrodes.

HOLLUP I.H.S.
M-844; C, alloy, bal Fe.
For coated welding electrodes.

HOLLUP MCM.
M-844; 0.2 C, 1.2 Cr, 0.2 Mo, bal Fe.
Cast: 85,000 TS; 27 El.
For coated welding electrodes; for aircraft tubing.

HOLLUP N.C.
M-844; C, bal Fe.
For coated welding electrodes.

HOLLUP PHOS-COPPER.
M-844; 7-9 P, bal Cu.
For P-Cu brazing rod for copper alloys; self-fluxing.

HOLLUP R.D.S.
M-844; 0.2 C, bal Fe.
For coated welding electrodes.

HOLLUP RED BAND.
M-844; 0.1 C, 18 Cr, 8 Ni, bal Fe.
Cast: 90,000 TS; 30 El.
For stainless steel welding electrodes; stainless.

HOLLUP YELLOW BAND.
M-844, 0.10 C, 4-6 Cr, 0.5 Mo, bal Fe.
Cast: 75,000 TS; 35 El.
For welding electrodes for 5 Cr steel.

HOLTO 1948
M-1546; 0.28 C, 1.5 Cr, 0.6 Mo, 5.0 W, 0.15 V, 5.0 Co, bal Fe.
Heat treated: 128,000-270,000 TS.
For die casting dies, brass forging dies.
Hot work tool steel, deep hardening.

HOLTO A.C.M.
M-1546; 0.60 C, 1.6 Ni, 0.8 Cr, 0.30 Mo, 0.10 V, bal Fe.
Heat treated: 150,000-220,000 TS; 130,000-200,000 YS; 12-20 El; 40-58 RA; 150-400 Brin.
For hot work tools, punches, hot shears, upsetters, caulking tools.
Hot work steel, oil hardening, shock resistant.

HOLTO A.F.L.M.
M-1546; 0.60 C, 2.5 Ni, 0.9 Cr, 0.35 Mo, 0.15 V, bal Fe.
For hot work tools, punches, hot shears, upsetters.
Hot work steel, oil hardening, tough.

HOLTO C.R.V.
M-1546; 1.5 C, 1.8 Cr, 0.25 V, bal Fe.
For gauges, taps, threading dies, cold cutting and stamping tools, plastic molds.
Cold working tool steel, oil hardening.

HOLTO D.R.B.
M-1546; 1.0 C, 1.25 Cr, bal Fe.
Oil hardened: 288,000 TS; 278,000 YS; 540 Brin.
For rollers, bearings, taps, punches, cutters, pivot pins, stamping dies, plug gages.
Cold working steel, oil hardening, deep hardening, medium toughness.

HOLTO N.B.2.
M-1546; 0.90 C, 1.3 Mn, 0.5 Cr, bal Fe.
Annealed: 85,000 TS; 60,000 YS; 26 El; 185 Brin.
Oil Hardened: 280,000 TS; 272,000 El; 535 Brin.
For dies, punches, gauges, cutters, cold headers, stamping dies, broaches.
Non-deforming tool steel, oil hardening, shock resistant, tough.

HOLTO R.B.L.
M-1546; 1.4 C, 0.70 Cr, bal Fe.
For cutters, bearings, cold heading dies, hand taps, bearings, reamers, boring tools.
Cold working steel. Oil hardening.

HOLTO R.B.O.
M-1546; 0.95 C, 0.75 Cr, bal Fe.
Annealed: 85,000 TS; 46,000 YS; 175 Brin.
Hardened: 260,000 TS; 240,000 YS; 525 Brin.
For bearings, rollers, bushings, gauges, mandrels, punches, cold heading tools.
Cold work tool steel, oil or water harden, wear resistant.

HOLTO SPECIAL B.M.
M-1546; 0.70 C, 1.40 Cr, 0.70 Mo, 0.15 V, bal Fe.
For punches, shears, die casting dies.
Hot and cold work tool steel, oil hardening, shock resisting

HOLTO SPECIAL D.
M-1546; 0.28 C, 9.5 W, 3.1 Cr, 0.3 V, bal Fe.
Heat treated: 142,000-350,000 TS; 120,000-180,000 YS; 6-12 El
For drawing dies, extrusion rams and dies, valve heads, stamping dies
Hot work tool steel High hot hardness above 650°C.

HOLTO SPECIAL D.A
M-1546; 0.40 C, 3.25 Cr, 2.5 W, 0.4 V, bal Fe.
Hardened: 250,000 TS; 200,000 YS; 8 El; 12 RA.
For press dies, upsetters, rivet sets, forging and punching dies, dummy blocks
Hot work steel up to 600°C applications.

HOLTO SPECIAL D.C.
M-1546, 0.21 C, 8.0 W, 2.6 Cr, 2.0 Co, 1.0 Mo, 0.4 V, bal Fe
Heat treated: 135,000-340,000 TS, 110,000-214,000 YS; 10-14 El
For wire drawing dies, hot upsetters, stamping dies, forging dies
Hot work tool steel. High hot hardness.

HOLTO SPECIAL E.X
M-1546; 0.45 C, 4.60 Ni, 1.75 W, 0.40 Cr, 0.30 Mo, bal Fe.
For forging and riveting dies, shears, punches.
Hot and cold work steel Shock resistant. Oil hardening.

HOLTO SPECIAL F.A.41.
M-1546; 0.45 C, 4.75 Cr, 3.75 W, 0.45 V, bal Fe.
Air Hardened: 270,000 TS; 208,000 YS; 5 El; 9 RA.
For forging dies and inserts, extrusion dies and rams, dummy blocks.
Hot work steel, oil or air hardening, non-deforming, deep hardening.

HOLTO SPECIAL F.A.48.
M-1546; 0.42 C, 4.75 W, 2.0 Co, 4.75 Cr, 0.45 V, bal Fe.
Heat treated: 170,000-300,000 TS; 156,000-256,000 YS; 4-8 El.
For thread rolling dies, spinning tools, dies.
Hot work steel, oil hardening. Resists cyclic heating.

HOLTO SPECIAL F.A.82.
M-1546; 0.38 C, 5.0 Cr, 1.3 Mo, 1.0 Si, 0.5 V, bal Fe.
Annealed: 90,000 TS; 46,000 YS; 18 El.
Air Hardened: 217,000 TS; 184,000 YS; 13 El; 40 RA; C 53-55 Rock.
For die casting dies, forging dies and inserts, stamping dies, extrusion dies, hot punches.
Hot work steel, oil hardening, non-deforming, shock resistant.

HOLTO SPECIAL M.
M-1546; 0.42 C, 1.6 Si, 0.8 Cr, 0.8 Mo, bal Fe.
Water Hardened: 190,000-300,000 TS; 6-16 El; 15-50 RA; C 40-55 Rock.
For cold headers, punches, chisels, rivet sets, upsetters, pneumatic tools.
Cold working steel. Shock resistant. Oil hardening

HOLTO SPECIAL M.D.
M-1546; 0.55 C, 1.90 W, 1.10 Cr, 0.9 Si, bal Fe.
For chisels, rivet sets, upsetters, pneumatic tools.
Cold work steel, shock resistant.

HOLTO SPECIAL M.O.V.
M-1546, 0.45 C, 1.9 Cr, 0.6 Mo, 0.35 V, bal Fe.
Annealed: 100,000 TS; 48,000 YP; 22 El, 197 Brin
Hardened: 290,000 TS, 245,000 YP, 10 El; 580 Brin.
For hot work tools, hot upsetters, rivet sets, punches, forging dies, inserts, molds for plastics.
Hot work steel, oil hardening, shock resistant.

HOLTO SPECIAL M.O.V.2.
M-1546, 0.37 C, 3.0 W, 2.5 Cr, 0.70 Mo, 0.25 V, bal Fe.
For wire cutters, forging die inserts, die casting dies, hot heading bolts
Hot work steel, oil hardening, wear resistant

HOLTO SPECIAL P.
M-1546; 0.42 C, 4.60 Ni, 1.15 Mo, 0.30 Cr, bal Fe.
For hot work tools, punches, upsetters.
Hot work steel, oil hardening.

HOLTO SPECIAL R.
M-1546, 1.0 C, 1.65 Cr, 0.15 V, bal Fe.
Hardened: 280,000 TS; 255,000 YS; 555 Brin.
Annealed 90,000 TS; 50,000 YS; 28 El; 185 Brin.
For rolling mill cylinders, cold headers, gauges, bearings, bushings, drawing dies, punches, drills.
Cold work tools, oil hardening, deep hardening.

HOLTO SPECIAL R.K.
M-1546; 1.4 C, 1.45 Cr, 0.30 Mo, 0.15 V, bal Fe.
For gauges, headers, drawing dies, punches.
Cold work tool steel, oil hardening

HOLTO SPECIAL R.U.
M-1546; 0.95 C, 0.90 Cr, 0.45 Mo, bal Fe.
For bearings, bushings, gauges, rollers, cold header dies.
Cold work steel, oil hardening.

HOLTO SPECIAL S.C.1.
M-1546; 1.2 C, 1.25 W, bal Fe.
Heat treated. 280,000 TS; 270,000 YS; 540 Brin.
Annealed: 85,000 TS, 22 El; 45 RA; 185 Brin.
For fast finishing cutters, drills, taps, cold cutting tools, augers, paper knives.
Cold work steel, oil or water hardening, wear resistant.

HOLTO S.P.2.
M-1546; 0.28 C, 5.0 Mo, 0.25 V, 6.0 Cr, 5.0 W, 0.6 Co, bal Fe.
Hot rolled: 114,000 TS.
Heat treated: Rockwell C 47-56.
For die casting dies, extrusion rams and liners, brass forging dies.
Hot work steel. High hot hardness and resistance to thermal shock.

HOLTO SPECIAL-U.
M-1546; 0.9 C, 2.0 Mn, bal Fe.
Hardened: C 64-65 Rock.
For stamping dies, gauges, punches, taps, cold headers, broaches, trimming dies.
Non-deforming, oil hardening, shock resistant, Type 02 cold work tool steel.

HOLTO V.D.L.D.M.
M-1546; 0.35 C, 4.0 Ni, 1.7 Cr, 0.5 Mo, bal Fe.
For hot work tools, punches, hot shears, upsetters.
Hot work steel, oil hardening, tough, shock resistant.

HOMBERGS ALLOY.
33.3 Pb, 33.3 Sn, 33.3 Bi.
For sprinkler plugs, fusible metal; M.P. 251°F.

HONDA NEW.
Japan, 6.7 Ti, 3.7 Al, 18 Ni, 27 Co, 45 Fe.
For permanent magnets.

HONSEL HO 3
M-1364; 1.0-1.5 Mn, 0.3 max Cr, bal Al.
Soft 16,000 TS, 6000 YS; 40 El.
Hard: 29,000 TS; 27,000 YS; 10 El.
For cooking utensils, heat exchangers, tanks, furniture; good forming and welding properties.

HONSEL HO S.
M-1364; 1.5-3.0 Mg, 0.5-1.5 Mn, 0.3 Cr, bal Al.
Soft: 26,000 TS; 10,000 YS; 20 El; 45 Brin.
Hard: 41,000 TS; 36,000 YS; 5 El; 77 Brin.
For roofing, hydraulic tubing, architectural trim; good forming and welding properties.

HOOKER BRASS
Eng; 61 Cu, 37 Zn, 2 Pb
For hot forgings, brass parts; free-cutting.

HOPKINSON ALLOY
75 Fe, 24.5 Ni, traces Si
160,000 TS, 88,000 YS; 45 El, 68 RA.
For corrosion and heat resistant parts; Sc.-21.

HORBACH HH80
M-1377, 0.12 C, 13 Cr, 2.2 Si, bal Fe.
Annealed. 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin
For valves, cutlery, pump bodies, bolts, Type 410; corrosion resistant

HORBACH HH100.
M-1377, 0.12 max C, 1 Al, 18 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant.

HORBACH HH110A.
M-1377; 0.15 C, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 160 Brin.
For chemical plant equipment, tanks, mixers; Type 302; stainless, austenitic.

HORBACH HH120.
M-1377; 0.12 max C, 1.5 Al, 24 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant.

HORBACH HH120A.
M-1377; 0.15 C, 24 Cr, 19 Ni, bal Fe.
Annealed: 100,000 TS, 45,000 YS; 50 El; 65 RA; 185 Brin.
For valves, pumps, furnace parts, turbine and jet parts; Type 310; stainless, austenitic.

HORBACH HN1.
M-1377; 0.15 max C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, agitators; Type 302; stainless, austenitic.

HORBACH HN1 EXTRA.
M-1377; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, tanks, mixers; Type 321; stainless, austenitic.

HORBACH HN1 SUPRA.
M-1377; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, vessels; Type 304; stainless, austenitic.

HORBACH HN2 EXTRA.
M-1377; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For chemical plant equipment, welded structures; Type 316 Ti; stainless, austenitic.

HORBACH HN2 SUPRA.
M-1377; 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

HORBACH HNH.
M-1377; 0.4 C, 13 Cr, 0.4 Si, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; stainless.

HORBACH HNM.
M-1377; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For valves, cutlery, surgical instruments; Type 420; stainless.

HORBACH HNW.
M-1377; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, cutlery, valves; Type 410; stainless.

HOSKINS 717 see CHROMEL 1A.

HOSKINS ALLOY 750.
M-65; 15.0 Cr, 4.0 Al, 0.5 Si, 0.1 C, bal Fe.
Elec resistance: 750 ohms/circular mil ft.
Resistance wire for furnaces, kilns, other heating devices; requires adequate support at high temperatures. Useful to 2050°F.

HOSKINS 815.
M-65; 0.1 C, 0.5 Si, 4.6 Al, 22.5 Cr, bal Fe.
Hot rolled: 143,000 TS; 12 El; 234 Brin.
Annealed: 108,000 TS; 27 El; 190 Brin.
For resistances, heating elements, rheostats; heat resistant to 2150°F.

HOSKINS 827.
M-65; 20 Cr, 8 Fe, 2 Si, bal Ni.
For thermoelements.
Heat and oxidation resistant.

HOSKINS 831.
M-65; 15 Cr, 7.5 Fe, bal Ni.
Drawn: 100,000 TS.
For spark plugs.
Electrode alloy, oxidation resistant.

HOSKINS 875.
M-65; 22.5 Cr, 5.5 Al, 0.5 Si, 0.1 C, bal Fe.
Hot rolled: 143,000 TS; 12 El; 185 Brin.
Annealed: 108,000 TS; 27 El; 190 Brin.
For electrical resistances, heating elements; high heat resistant to 2350°F.

HOSKINS CUNIFE.
M-65; 60 Cu, 20 Ni, 20 Fe.
Ductile permanent magnet alloy.
Speedometers, instruments, electronic equipment, and control systems.

HOT DIE.
M-350; C, W, bal Fe.
For tools; oil hardened.

HOT DIE.
M-435; 0.3 C, 11 W, 3 Cr, 0.5 V, bal Fe.
For hot die tools, punches; hot die steel.

HOT DIE 593.
M-1; 0.38 C, 0.25 Mo, 5 W, 5 Cr, 0.2 V, 0.25 Mn, 0.45 Co, 0.9 Si, bal Fe.
Heat treated: 270,000 TS; 208,000 YS; 5 El; 9 RA.
At 900°F: 217,000 TS; 172,000 YS; 10 El; 31 RA.
Uses extrusion dies, hot upset punches, insert forging dies, dummy blocks.
Type H14 Hot work steel.

HOT DIE "C".
M-140; 0.30 C, 2.5 Cr, 12 W, 3.6 Co, 4 Cr, bal Fe.
For hot punches, forming and extrusion dies; hot work steel, oil hardened.

HOT-DIE (Chrome).
M-39, M-73; 3.5-4.0 Cr, 0.8-0.9 C, bal Fe.
For dies for hot metal, tools; shock and wear resistant.

HOT-DIE (Tungsten).
M-39, M-73; 2-3 Cr, 0.3-0.45 C, 1.0 V, 10-14 W, bal Fe.
For dies for hot metal, tools; shock and wear resistant.

HOTFORM NO. 1.
M-115, M-342; 0.32 C, 1.5 Mo, 0.9 Si, 1.0 W, 4.75 Cr, 0.25 Mn, bal Fe.
For tools and dies for Al die castings; hot work steel

HOTFORM NO 2.
M-115, 0.33 C, 0.9 Si, 4.7 Cr, 1.3 Mo, 0.5 V, bal Fe
For punches, upsetters, hot work tools and dies, extrusion press; Type H11; hot work steel.

HOTFORM NO 3.
M-115; 0.52 C, 0.9 Si, 1.4 Mo, 4.75 Cr, bal Fe
For punches, upsetters, hot dies and tools; Type H12; air hardened.

HOT FORM DRILL ROD
M-115; 0.35 C, 1 Si, 1.25 W, 5 Cr, 0.5 V, 1.45 Mo, bal Fe
For die casting die tools, high temperature fasteners; hot work steel, oil hardened.

HOTFORM DRILL ROD.
M-342; 0.35 C, 0.9 Si, 5 Cr, 1.4 Mo, 1.4 W, 0.5 V, bal Fe.
For hot punches, piercers; hot work steel.

HOTFORM V.
M-115; 0.37-0.43 C, 1.0 Si, 5.0-5.5 Cr, 1.2 Mo, 1.1 V, bal Fe
For Al die casting dies, shear blades, forging dies; hot work steel, oil hardened.

HOTPRESS.
M-115; 0.35 C, 2 Cr, 9.5 W, 0.5 V, bal Fe.
For hot work dies, upsetter dies; tough and heat resistant; hot work steel.

HOTSPUR.
M-472; 0.20 C, 12-14 Cr, 7-25 Ni, bal Fe.
Cast: 89,600 TS.
For furnace parts and equipment; heat and oxidation resistant.

HOTSPUR-F.
M-472; 0.20 max C, 22-24 Cr, 12-15 Ni, bal Fe.
Annealed: 100,000 TS; 50,000 YS; 55 El; 160 Brin.
For furnace parts, oil burners and heaters, chemical plant equipment, skid rails.
Type 309 stainless steel, austenitic, non-hardenable.

HOTSPURO.
M-472; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El; 65 RA; 180 Brin.
At 1200°F: 57,000 TS; 22,000 YS; 32 El; 45 RA.
For furnace part and equipment, valves, pumps; Type 310; austenitic, heat resistant.

HOT STAMPING ALLOY DIE.
M-261; C, alloy, bal Fe.
For hot stamping dies, tools; oil hardened.

HOT STAMPING ALLOY DIE.
M-389; 0.5 C, 3 Cr, bal Fe.
For hot stamping dies; hot work steel.

HOT WORK 8.
M-24; 0.6 C, 8.5 Mo, 1.5 V, 3.2 Cr, bal Fe.
For hot work tools and dies, punches, blanking dies; hot work steel, wear resistant.

HOT WORK NO. 22.
M-341; 0.4 C, 3 Cr, 9 W, 0.2 V, bal Fe.
For tools, dies; hot work steel.

HOT WORK NO. 23.
M-341, 0.45 C, 3 Cr, 14 W, 0.3 V, bal Fe.
For tools, cutters, taps, gauges, reamers; high speed steel.

HOUGHTON'S SHAVING PACKING.
Eng., 5.97 Sn, trace Cu, 94.02 Pb.
For piston rod packing for steam engines.

HOVER 91C.
M-1306, 0.55 C, 1 Cr, 0.18 V, 1.85 W, bal Fe.
For cold work tools, hammers, upsetters; oil or water hardened

HOVER 91KA.
M-1306; 0.45 C, 1 Cr, 0.2 V, bal Fe.
For gears, pinions, shafts, bolts, crankshafts, oil hardened, shock resistant

HOVER 123
M-1306; 1.45 C, 1.4 Cr, bal Fe.
For bearings, liners, races, sleeves; water hardened

HOVER 151.
M-1306, 0.61 C, 1.18 Cr, 0.1 V, bal Fe
For springs, shafts, crankshafts, punches, crimpers; oil or water hardened, tough.

HOVER 210
M-1306; 1.25 C, 1.15 Si, 0.7 Mn, 1.2 Cr, bal Fe.
For dies, punches, shock resistant cutters; oil hardened, tough.

HOVER 350.
M-1306; 1.0 C, 0.1 V, 0.25 Mn, bal Fe.
For cutters, tools, dies, taps, drills; Type W2; water hardened.

HOVER 401.
M-1306; 1.05 C, 0.9 Mn, 1.0 Cr, 1.15 W, bal Fe.
For fast finishing cutters, reamers; water hardened.

HOVER 550.
M-1306; 0.7 C, 1.7 Si, 0.7 Mn, bal Fe.
For punches, upsetters, riveters, springs; oil hardened, tough.

HOVER 702.
M-1306; 0.28 C, Ni, Cr, Mo, V, bal Fe.
For gears, bolts, machine tool parts; oil hardened, shock resistant.

HOVER A18A.
M-1306; 0.12 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 75,000 TS; 35,000 YS; 50 El; 65 RA; 150 Brin.
For chemical plant equipment; Type 302; stainless, austenitic.

HOVER A18N.
M-1306; 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn: 100,000 TS; 65,000 YS; 40 El; 60 RA; 212 Brin.
For welded structures, chemical plant equipment; Type 347; stainless, austenitic.

HOVER A18T.
M-1306; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 55 El; 65 RA; 150 Brin.
Cold drawn: 95,000 TS; 60,000 YS; 40 El; 60 RA; 185 Brin
For welded structures, chemical plant equipment; Type 321; stainless, austenitic.

HOVER A18Z.
M-1306; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed. 85,000 TS, 35,000 YS; 60 El; 70 RA· 150 Brin.
Cold drawn. 180,000 TS; 125,000 YS; 10 El: 330 Brin For welded structures, chemical plant equipment; Type 304; stainless, austenitic.

HOVER A18ZS
M-1306, 0.1 max C, 18 Cr, 8.5 Ni, bal Fe
Annealed: 75,000 TS; 35,000 YS, 55 El; 75 RA; 155 Brin.
For chemical plant equipment, welded tanks and vessels; Type 304; stainless, austenitic.

HOVER A20T
M-1306, 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Ti = 4 × C, bal Fe.
Annealed 85,000 TS, 35,000 YS, 50 El; 75 RA; 150 Brin
Cold drawn 150,000 TS, 130,000 YS; 6 El; 300 Brin
For acid resistant equipment, welded structures; Type 316 Ti, stainless, austenitic

HOVER A20Z.
M-1306; 0.07 C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe.
Annealed. 85,000 TS, 35,000 YS, 50 El; 75 RA; 150 Brin.
Cold drawn: 150,000 TS; 130,000 YS, 6 El, 300 Brin.
For acid resistant equipment; Type 316; stainless; austenitic.

HOVER A20ZS.
M-1306, 0.1 max C, 18 Cr, 9.5 Ni, 2 Mo, 2.2 Si, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 75 RA; 150 Brin.
Cold drawn· 150,000 TS; 135,000 YS; 6 El; 300 Brin
For acid resistant equipment, chemical plant apparatus; Type 316; stainless, austenitic.

HOVER A21Z13.
M-1306; 0.07 max C, 17 Cr, 4.75 Mo, 13 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 70 RA; 160 Brin.
For acid resistant equipment, chemical plant apparatus; Type 317; stainless, austenitic.

HOVER A21Z18.
M-1306; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Cb = 8 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 75 RA; 150 Brin.
For welded acid resistant equipment; Type 316 Cb; stainless, austenitic.

HOVER C10.
M-1306; 0.58 C, 1.0 Cr, 0.09 V, bal Fe.
For springs, gears, crankshafts, bolts, studs; oil hardened, shock resistant.

HOVER D3.
M-1306; 1.42 C, W, V, bal Fe.
For bearings, bushings, cutters; oil hardened, wear resistant.

HOVER ES26.
M-1306; 0.15 C, 0.65 Cr, 0.50 Mn, 0.25 Si, bal Fe.
For gears, bolts, machine tool parts; case hardened.

HOVER EXTRA FS.
M-1306; 0.80 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Heat treated: 188,000 TS; 143,000 YS; 12 El; 35 RA; 390 Brin.
For springs, tools, taps, drills, reamers; Type W1; water hardened.

HOVER EXTRA HART.
M-1306; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For blanking and forming dies, punches; Type W1; water hardened.

HOVER EXTRA MH.
M-1306; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 57,000 YS; 19 El; 40 RA; 210 Brin.
For springs, cutters, drills, taps, broaches; Type W1; water hardened.

HOVER EXTRA SEHR ZAH.
M-1306; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, rails, hammers, punches, axes; Type W1; water hardened.

HOVER EXTRA ZAH.
M-1306; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, cutters, drills, taps, reamers; Type W1; water hardened.

HOVER EXTRA ZH.
M-1306; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, cutters, drills, hobs, broaches; Type W1; water hardened.

HOVER F131.
M-1306; 0.42 C, 0.1 V, 1.75 Mn, 0.25 Si, bal Fe.
For punches, gears, machine tool parts; oil hardened, tough.

HOVER G3.
M-1306; 0.50 C, 1.0 Cr, 0.09 V, bal Fe.
For gears, springs, crankshafts; oil hardened, shock resistant.

HOVER G5.
M-1306; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, shafts, crankshafts; oil hardened, tough.

HOVER GHK6.
M-1306; 0.30 C, 0.35 V, 8.5 W, 2.65 Cr, bal Fe.
For extrusion rams and liners, punches, upsetters; oil hardened, hot work steel.

HOVER GHK243.
M-1306; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

HOVER H10.
M-1306; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 56,000 YS; 20 El; 40 RA; 210 Brin.
For springs, cutters, drills, taps, reamers; Type W1; water hardened.

HOVER H15.
M-1306; 0.15 C, 1.55 Cr, 1.55 Ni, bal Fe.
For gears, cams, camshafts; case hardening.

HOVER H20.
M-1306; 0.18 C, 2.0 Ni, 2.0 Cr, 0.50 Mn, bal Fe.
For gears, bolts, camshafts, cams; case hardened, tough.

HOVER H20.
M-1306, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For springs, tools, drills, taps, reamers; Type W1; water hardened.

HOVER H127.
M-1306; 1 C, 0.25 max Mn, 0.25 max Si, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, reamers, hobs, Type W1; water hardened.

HOVER H391
M-1306, 0.90 C, 0.80 Cr, 0.30 Mn, bal Fe.
For drills, punches, springs, taps, reamers; water hardened.

HOVER H680.
M-1306, 0.50 C, 0 85 Mn, 1 Cr, 0.1 V, bal Fe.
For gears, shafts, crankshafts; oil hardened, shock resistant.

HOVER H1000.
M-1306; 0.15 C, 2 Si, 19 5 Cr, 9.5 Ni, bal Fe.
Annealed. 85,000 TS; 40,000 YS; 50 El; 65 RA; 160 Brin.
For chemical and oil refinery equipment; Type 302; stainless, austenitic.

HOVER H1050-ON
M-1306, 0 12 max C, 18 Cr, 0.95 V, bal Fe
Annealed: 80,000 TS; 35,000 YS; 50 El, 65 RA; 160 Brin.
For chemical plant and oil refinery equipment; corrosion and heat resistant.

HOVER H1200.
M-1306; 0 15 C, 24 Cr, 19 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 55 El; 70 RA, 165 Brin.
For heat treating boxes, furnace parts and equipment; heat resistant, austenitic.

HOVER HED16.
M-1306; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin
For gears, bolts, machine tool parts; case hardened.

HOVER HK904.
M-1306; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For extrusion press dies, rams, liners; hot work steel, oil hardened.

HOVER HNRO 7.
M-1306; 0.15 max C, 8.5 Ni, 18 Cr, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks; Type 302; stainless, austenitic.

HOVER HNRO 8.
M-1306; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, vessels; Type 304; stainless, austenitic.

HOVER HNRO 9.
M-1306; 0.07 max C, 18 Cr, 2 Mo, 10.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks; Type 316; stainless, austenitic.

HOVER HNRO 11.
M-1306; 0.20 C, Cr, Mo, bal Fe.
For chemical plant equipment; stainless.

HOVER HNRO 12.
M-1306; 0.1 max C, 18 Cr, 9.5 Ni, 2 Mo, bal Fe
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks; Type 316; stainless, austenitic.

HOVER HNRO 14.
M-1306; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, tanks; Type 321; stainless, austenitic

HOVER HNRO 16
M-1306, 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS, 90,000 YS; 20 El, 55 RA, 260 Brin.
For pumps, marine hardware, valves; Type 321, stainless.

HOVER HNRO 17
M-1306, 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe
Annealed 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin.
For welded acid resistant chemical plant equipment, Type 316 Ti; stainless, austenitic.

HOVER HNRO 19.
M-1306, 0.35 C, 1.15 Mo, 16.5 Cr, bal Fe.
For oil refinery equipment; heat resistant.

HOVER HNRO 20
M-1306, 0.8 C, 17 Cr, bal Fe.
Heat treated: 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin
For bearings, surgical instruments, cutlery; corrosion resistant, wear resistant; Type 440B.

HOVER HNRO 24.
M-1306; 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe
Annealed 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For welded structures, pump parts; corrosion resistant; Type 431 Ti.

HOVER HNRO 27.
M-1306; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 55 El; 65 RA; 160 Brin.
For welded chemical plant equipment, tanks, mixers; Type 347; stainless, austenitic.

HOVER HSE.
M-1306; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For camshafts, cams, gears, bolts; case hardened.

HOVER HVU 2½.
M-1306; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed. 75,000 TS; 42,000 YS; 20 El; 55 RA; 150 Brin.
For gears, bolts, machine tool parts; case hardened.

HOVER HVU 3½.
M-1306; 0.35 C, 0.25 Si, 0.55 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 185 Brin.
For gears, bolts, machine tool parts; water hardened.

HOVER HVU 4½.
M-1306; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 98,000 TS; 60,000 YS; 24 El; 45 RA; 212 Brin.
For gears, bolts, machine tool parts; water hardened.

HOVER HVU 6
M-1306; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 98,000 TS; 60,000 YS; 24 El; 45 RA; 212 Brin.
For gears, bolts, machine tool parts; water hardened.

HOVER HW.
M-1306; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
For machine tool parts, punches; oil hardened

HOVER I-EBN.
M-1306; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel.

HOVER I-EC.
M-1306; 0.15 C, 1.15 Cr, 0.25 Mo, bal Fe.
For gears, cams, camshafts, fasteners, case hardening steel.

HOVER I-ECN.
M-1306; 0.16 C, 1.15 Mn, 0.95 Cr, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel.

HOVER I-ED
M-1306, 0.20 C, 1.15 Cr, 0.25 Mo, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel

HOVER I-EDN
M-1306, 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, cams, camshafts; case hardening steel.

HOVER II-VA.
M-1306; 0.25 C, 0.65 Mn, 1 Cr, bal Fe.
For gears, pinions, bolts, fasteners, water hardened.

HOVER II-VB
M-1306; 0.33 C, 0.65 Mn, 1 Cr, bal Fe
For gears, shafts, crankshafts, water hardened.

HOVER II-VC.
M-1306, 0.33 C, 0.65 Mn, 1 Cr, bal Fe.
For gears, shafts, crankshafts; water hardened.

HOVER II-VD.
M-1306; 0.42 C, 1 Cr, 0.2 Mo, bal Fe.
For gears, shafts, crankshafts; oil hardened, shock resistant.

HOVER II-VE.
M-1306; 0.50 C, 1.0 Cr, bal Fe.
For gears, shafts, crankshafts, bolts; oil or water hardened.

HOVER ILO-35H.
M-1306; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, drills, taps; high speed steel.

HOVER ILO-45H.
M-1306; 0.80 C, 4 Cr, Co, V, W, Mo, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

HOVER ILO-55H.
M-1306; 1.35 C, W, Cr, V, Co, bal Fe.
For blanking and forming dies, engravers tools; high speed steel.

HOVER ILO-105H.
M-1306; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, drills, taps, hobs, reamers; high speed steel.

HOVER ILO-ABC II.
M-1306; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, hobs, taps, drills; high speed steel.

HOVER ILO-BCO.
M-1306; 0.79 C, 4.7 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For drills, taps, hobs, reamers, lathe tools; high speed steel.

HOVER ILO-EXTRA.
M-1306; 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 18 W, bal Fe.
For lathe and planer tools, drills, taps, reamers; high speed steel.

HOVER ILO-PRIMA.
M-1306; 0.95 C, 4.1 Cr, 0.85 Mo, V, W, bal Fe.
For lathe and planer tools, drills, reamers; high speed steel.

HOVER ILO-SUPER B.
M-1306; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For blanking and forming dies, form cutters; high speed steel.

HOVER ILO-ULTRA W.
M-1306; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel.

HOVER IV-SF EXTRA QUALITY.
M-1306; 0.55 C, 0.3 Si, 0.6 Mn, bal Fe
Heat treated: 110,000-160,000 TS, 75,000-112,000 YS; 25-13 El, 55-42 RA; 230-325 Brin.
For gears, axles, crankshafts; water hardened.

HOVER M48.
M-1306; 0.38 C, Si, Cr, V, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

HOVER P12.
M-1306; 0.56 C, Ni, Cr, Mo, V, bal Fe.
For forging and heading dies; oil hardened, tough.

HOVER P14.
M-1306; 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For forging and heading dies; oil hardened, tough.

HOVER P15.
M-1306; 0.45 C, Cr, Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

HOVER P16.
M-1306; 1.1 C, 0.2 Si, 0.4 Cr, 0.3 Mn, bal Fe.
For bearings, cutters, liners, sleeves; water hardened, wear resistant.

HOVER P35.
M-1306; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant

HOVER PRIMA SEHR ZAH.
M-1306, 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El; 40-54 RA; 320-230 Brin.
For wheels, die blocks, rails, girders; water hardened.

HOVER PRIMA WEICH
M-1306, 0.75 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Heat treated: 180,000-125,000 TS; 140,000-85,000 YS; 12-20 El; 38-52 RA; 360-240 Brin.
For springs, clutch discs, rails, hammers; Type W1; water hardened.

HOVER PRIMA ZH.
M-1306, 0.90 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Heat treated: 180,000 TS, 118,000 YS, 10 El, 30 RA; 375 Brin
For springs, cutters, hobs, drills, taps; Type W1; water hardened.

HOVER R5.
M-1306, 0.30 C, 0.25 Si, 0.55 Mn, 2.5 Cr, 0.2 Mo, 0.15 V, bal Fe
For die casting dies, upsetters, rivet sets; oil hardened, tough

HOVER R10
M-1306; 0.45 C, 1.4 Cr, 0.70 Mo, 0.30 V, 0.7 Mn, bal Fe.
For die casting dies, forging and heading dies, oil hardened, tough.

HOVER R11.
M-1306, 1.4 C, 0.1 V, 0.3 Cr, 0.3 Mn, bal Fe
For engravers' tools, textile needles, cutters; oil or water hardened

HOVER SBL1
M-1306, 0.12 max C, 0.4 Si, 13 Cr, bal Fe
Annealed 75,000 TS, 40,000 YS, 35 El, 70 RA; 155 Brin
For turbine blades, valves, cutlery; Type 410, stainless

HOVER SBL2
M-1306; 0.2 C, 0.4 Si, 13 Cr, bal Fe
Annealed 95,000 TS, 50,000 YS; 25 El; 55 RA, 195 Brin.
For turbine blades, valves, cutlery, knives, Type 420, stainless.

HOVER SBL4.
M-1306; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS, 20 El; 50 RA; 210 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; stainless.

HOVER SBL9
M-1306; 0.90 C, 0.4 Si, 18 Cr, 1.15 Mo, 1.0 V, bal Fe.
Annealed: 110,000 TS; 65,000 YS; 16 El; 30 RA; 230 Brin.
For cutlery, ball bearings; Type 440BMo; stainless.

HOVER SP50.
M-1306; 1.15 C, 0.65 Cr, 0.10 V, 0.30 Mn, bal Fe.
For heading and forming dies, cutters; oil hardened, wear resistant.

HOVER SPEZIAL MH.
M-1306; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, cutters, reamers, drills, broaches; Type W1, water hardened.

HOVER SPEZIAL SEHR HART.
M-1306; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 174,000 TS, 128,000 YS; 12 El; 37 RA; 352 Brin.
For springs, rails, girders, dies, Type W1; water hardened.

HOVER SPEZIAL ZAH.
M-1306, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated. 188,000 TS, 145,000 YS, 10 El, 30 RA; 400 Brin
For drills, taps, reamers, broaches, hobs; Type W1; water hardened.

HOVER SPEZIAL ZH.
M-1306, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 100,000 TS; 53,000 YS, 21 El; 42 RA, 200 Brin
For drills, springs, taps, reamers, broaches; Type W1; water hardened.

HOVER WA18.
M-1306; 0.55 C, 0.90 Si, 0.30 Mn, 1.05 Cr, 0.18 V, 1.85 W, bal Fe
For heading and forming dies, punches, cold work steel, tough.

HOWAI
M-1364, 0.6-1.4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, 0.3 Cr, bal Al
Annealed 21,000 TS, 8000 YS; 24 El
For window frames, gutters, fan blades, boats, good formability and weldability.

HOWARD ALLOY NO 1
M-1045, 2.5-3.25 Th, 2.0-2.5 Zn, 0.5 min Zr, bal Mg
T-5 Temper 32,000 TS, 14,000 YS; 10 El, 60 Brin
For engine parts, structural components
Good creep properties to 650°F Requires no solution treatment

HOWARD ALLOY NO. 3
M-1045, 4.5 Zn, 0.7 Zr, bal Mg
T5-Temper 40,000 TS; 24,000 YS, 8 El, 60 Brin.
For structural parts or engine sections
High strength ASTM B80, ZK51 Alloy.
Requires no solution treatment

HOWARD ALLOY NO. 4
M-1045, 9 Al, 2 Zn, 0.1 Mn, bal Mg.
As Cast 25,000 TS, 14,000 YS; 2 El; 65 Brin.
T6-Temper 39,000 TS, 21,000 YS; 2 El, 85 Brin.
F-Temper 24,000 TS, 14,000 YS, 2 El; 65 Brin.
For aircraft engine parts, crankcases, housings, pressure-tight castings.
Age hardenable, ASTM B80, Alloy AZ92.

HOWARD ALLOY NO 5.
M-1045; 8.6 Al, 0.7 Zn, 0.15 Mn, bal Mg.
As Cast: 24,000 TS, 14,000 YS, 3 El; 55 Brin.
T6-Temper: 38,000 TS; 18,000 YS; 5 El; 80 Brin.
For casings, housings, portable tools, leakproof die and sand castings, aircraft and automotive parts. Pressure tight.
Heat treatable. ASTM B80, Alloy AZ91.

HOWARD ALLOY NO. 6.
M-1045; 5.5 Zn, 1.7 Th, 0.7 Zr, bal Mg.
T5-Temper: 40,000 TS, 26,000 YS; 9 El; 60 Brin.
For airframe castings, engine casings, gear casings.
Good castability and weldability.
Requires no solution treatment.

HOWARD ALLOY NO. 7.
M-1045, 3.0 rare earths, 2.5 Zn, 0.6 Zr, bal Mg.
T5-Temper: 23,000 TS; 16,000 YS; 3 El; 58 Brin
For engine castings operating between 300 and 500°F
Good creep properties to 500°F.
Requires no solution treatment

HOWARD ALLOY NO 8.
M-1045, 6 Al, 3 Zn, 0.2 Mn, bal Mg.
As cast 26,000 TS, 12,000 YS, 5 El; 55 Brin.
T6-Temper 38,000 TS; 18,000 YS; 4 El, 80 Brin.
For airplane wheels and brakes, gear housings, crankcases, oil pumps.
Age hardenable. ASTM B80, Alloy AZ63.
Good properties to 300°F.

HOWARD A
M-373; 0.35 C, 5.0 Cr, 0.4 V, 1.5 Mo, bal Fe.
Air or oil hardening hot work tool and die steel for forging dies, hot forming tools.
AISI H11

HOWARD B
M-373, 0.35 C, 5.0 Cr, 0.4 V, 1.5 W, 1.5 Mo, bal Fe.
Air or oil hardening hot work tool and die steel for forging dies, hot work forming tools.
AISI H12.

HOWARD C.
M-373, 0.35 C, 5.0 Cr, 1.0 V, 1.5 Mo, bal Fe
Air or oil hardening hot work tool and die steel, AISI H13

HOWE BROWN EXTRA
M-38, C, alloy, bal Fe.
For tools, dies, water hardened.

HOWE BROWN SPECIAL
M-38, C, alloy, bal Pb
For tools, dies, water hardened

HOWEGE EXTRA
M-1348, 0.55 C, 0.7 Cr, 0.18 Mo, 1.85 W, 0.1 V, bal Fe
For cold work tools, headers, upsetters, oil hardened, tough

HOWEGE EXTRA I.
M-1348, 0.56 C, 0.7 Cr, 0.18 Mo, 1.85 W, 0.1 V, bal Fe
For cold work tools, headers, upsetters; oil hardened, tough

HOWEGE SPEZIAL
M-1348, 0.40 C, Cr, Mo, bal Fe
For gears, shafts, bolts, studs, crankshafts; oil hardened, tough

HOWES SHEAR BLADE.
M-38, 0.90 C, 0.30 Mo, bal Fe
For shear blades, water hardening.

HOWMET NO 3
M-1512, 2.45 C, 31.0 Cr, 12.5 W, 3 max Fe, 3 max Ni, bal Co.
Cast 64,000 TS, 0 El, 0 RA, C 53 Rock.
For cutting tools, ball bearing rolls, sleeves, bushings, wear strips, valve seat inserts, scraper blades, valves.
High heat and abrasion resistance, non-galling; Corrosion and oxidation resistant.

HOWMET-25
M-1512; 0.12 C, 1.5 Mn, 1.0 Si, 20 Cr, 10 Ni, 51 Co, 15 W, 1 Fe.
Cast: 106,800 TS; 24.1 El; C 18-25 Rock.
Heat Treated 145,000-165,000 TS; 65,000-80,000 YS; 55-70 El; B 95-C 25 Rock.
For gas turbine rotors and buckets, nozzles, afterburners, valves.
Similar to L605 Alloy. Investment cast.

HOWMET-50
M-1512; 0.05-0.12 C, 0.18 Ti, 0.6 Cb, 26-30 Cr, 47-52 Co, bal Fe.
Cast: 135,000 TS; 48,000 YS; 10 El, 10 RA; 250 Brin.
For furnace baffles, burner tips, sintering grates, quench baskets.
Corrosion, heat and thermal shock resistant.

HOWMET FA see FA.

HOWMET STANDARD.
M-1512; 2.45 C, 31 Cr, 12.5 W, 3 max Fe, 3 max Ni, bal Co.
Cast: 64,000 TS; 0 El; 0 RA; 530 Brin.
For cutting tools, high temperature parts.
Oxidation and wear resistant.

HOWMET STANDARD NO. 6.
M-1512; 0.9-1.4 C, 3 max Fe, 3 max Ni, 1.5 max Mo, 27-31 Cr, 3.5-5.5 W, bal Co
Cast: 115,000 TS; 96,000 YS; 3 El; 410 Brin.
At 1500°F: 70,000 TS; 5 El; 8 RA.
For turbine blades, valve parts, hot work punches
Heat and thermal shock resistant.

HOWMET SUPER-3.
M-1512; 2.45 C, 31 Cr, 12.5 W, 6 max Fe, 6 max Ni, bal Co.
Cast: 62,000 TS; 0 El. 0 RA; 560 Brin
For cutting tools, high temperature parts.
Oxidation and wear resistant

HOWMET SUPER-6.
M-1512; 0.9-1.4 C, 6 max Fe, 6 max Ni, 1.5 max Mo, 27-31 Cr, 3.5-5.5 W, bal Co.
Cast: 114,000 TS; 101,000 YS; 1.5 El, 430 Brin.
At 1500°F: 72,000 TS, 7 El; 7 RA; 230 Brin.
For turbine blades, valve parts, hot work punches
Heat and thermal shock resistant.

HOYLES METAL.
U.S.; 46 Sn, 12 Sb, 42 Pb.
For bearings; Babbitt.

HOYT.
M-88; Sn, Sb, bal Fe.
For bearings; Babbitt.

HOYT NO. 1.
M-317; Sn, Sb, bal Pb.
For bearings for heavy loads and medium speeds; antifriction metal, tough.

HOYT NO 1 PHOSPHOR BRONZE.
M-317; P, Sn, bal Cu.
For chill castings; tough, wear resistant

HOYT NO 3M.
M-317, Sn, Sb, bal Pb.
For bearings, antifriction metal.

HOYT NO 4A.
M-317; Sn, Sb, bal Pb.
For bearings for light pressure and medium speed, antifriction metal.

HOYT 11.
M-88, Pb, Cu, Sb, bal Sn.
For bearings; Babbitt.

HOYT NO. 11 D.
M-317; 0.55 Ni, 0.18 Pb, 3.5 Sb, 4.3 Cu, bal Sn.
Cast: 11,000 TS; 7500 YS; 13.5 El; 27 Brin.
For connecting rod bearings; for severe duty.

HOYT NO. 14.
M-317; Sn, Sb, bal Pb.
For stern tubes; zinc-free Babbitt.

HOYT NO. 40.
M-317; Sn, Sb, bal Pb.
For stern tubes and outer bearings; Babbitt.

HOYT NO. 71.
M-317; Sn, Sb, bal Pb.
For engine bearings; Babbitt.

HOYT NO 133C.
M-317; Sn, Sb, bal Pb.
For bearings; Babbitt.

HOYT NO. 156B.
M-317; Sn, Sb, bal Pb.
For bearings, Babbitt.

HOYT NO. 175.
M-317; Pb, Sb, bal Sn.
Cast: 12,000 TS; 10,500 YS, 1.6 El, 35 Brin.
For bearings for locomotives, crushers and tube mills; Babbitt.

HOYT NO 400
M-317; Sn, Sb, bal Pb
For bearings operating in sea water, Babbitt

HOYT ARROW
M-317, Cu, Pb, bal Sn
For bearings for heavy loads and high speeds; antifriction metal, tough

HOYT NO ELEVEN R
M-317, 4 Sb, 4 Cu, 0.5 Ni, 0.2 Pb, bal Sn.
Cast. 12,200 TS; 9000 YS; 11.7 El, 32 Brin.
For bearings for compressors and engines, Babbitt

HOYT NO ELEVEN Z3.
M-317, 4 Sb, 4 Cu, 0.5 Ni, 0.2 Pb, bal Sn
Cast: 13,500 TS, 9300 YS, 13.9 El; 30 Brin
For bearings for compressors and gasoline engines, Babbitt

HOYT I.C.E
M-317; Pb, Sb, bal Sn.
For bearings for internal combustion engines, antifriction metal

HOYT MARINE A
M-317; Pb, Sb, bal Sn
For bearings for marine steam engines; antifriction metal.

HOYT MARINE B
M-317, Pb, Sb, bal Sn.
For bearings for marine steam engines, antifriction metal

HOYT METAL
M-88, M-317, 10 Cu, 78 Sn, 12 Pb
26 Brin
For bearings for internal combustion engines and pumps, bronze Babbitt; M.P. 360°C.

HOYT METAL
M-317, 94-90 Pb, 6-10 Sb.
For bearings; hard.

HOYT STAR BRAND.
M-317, Sn, Sb, bal Pb.
For bearings for fans, stone crushers, mining machinery; antifriction metal.

HOYT STAR M
M-317, Sb, Cu, Pb, bal Sn.
Cast: 11,500 TS; 11,200 YS; 1.5 El; 30 Brin.
For machine tool bearings; Babbitt.

H.P.A NICKEL.
M-121; 0.10 max C, 0.04 max Cu, 0.05 max Fe, 0.02 max Mn, 99.5 min Ni + Co.
For electronic valves, cathodes; high temperature applications.

H.P.B. NICKEL.
M-121; 0.10 max C, 0.04 max Cu, 0.05-1.00 Fe, 0.15-0.25 Si, bal Fe.
For electronic valves, cathodes; high temperature applications.

H.P.D.
M-289; 0.35 C, 1.05 Si, 5.15 Cr, 0.3 V, 1.25 W, 1.55 Mo, bal Fe.
Air or oil hardening hot work tool and die steel; AISI H12.

HPM-NICKEL.
M-121; 99.9 Ni.
For components of special valves,
hydrogen thyratrons,
electric resistance thermometers and controls.
Oxidation and corrosion resistant.

HPW-NICKEL.
M-121; 96.5 Ni, 3.5 W.
For oxide-coated cathodes of special valves, submarine repeaters. Heat resistant.

H RAPID 199.
M-1328; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, high speed steel.

H RAPID 200.
M-1328; 1 35 C, 4 Cr, W, Co, bal Fe.
For blanking and forming dies, engravers tools; high speed steel

H RAPID 201
M-1328; 0.79 C, 4.3 Cr, 4.75 Co, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, cutters, reamers, taps; high speed steel

H & R NO. 1.
M-363; 0.55-0 75 C, 3.8-4.3 Cr, 0.90-1.25 V, 17 75-18.85 W, bal Fe
For lathe and planer tools, cutters; high speed steel.

H & R NO 2.
M-363, 0 80-0 85 C, 4.0-4.5 Cr, 2 0-2.25 V, 18-19 W, 0 6-0.8 Mo, bal Fe
For lathe tools, drills, taps, reamers, high speed steel

H & R NO 3.
M-363; 1 0 C, 0.25 Mn, 4 Cr, 18 W, 0 8 Mo, 3.4 V, bal Fe
For cutters, tools; high speed steel.

H & R NO 4
M-363; 0.8 C, 18 5 W, 4.5 Cr, 1.75 V, 7.5 Co, 0 8 Mo, bal Fe
For cutters, reamers; high speed steel.

H & R NO. 7.
M-363; 1.3 C, 5.5 W, 4 5 Cr, 4.5 Mo, 4 V, bal Fe.
For broaches, reamers, chasers, high speed steel.

H & R NO. 8
M-363; 0.55 C, 0 85 Mn, 0.25 Cr, 0 25 V, 2.1 Si, bal Fe.
For carbide tool shanks; water or oil hardened.

H & R NO. 8M.
M-363; 0.55 C, 0.75 Mn, 0.2 Mo, 2.0 Si, bal Fe.
For carbide tool shanks, water or oil hardened.

H & R NO 14.
M-363; 0.75 C, 4 Cr, 2 V, 14 W, 5 Co, bal Fe.
For lathe and planer tools, reamers, broaches; Type T8; high speed steel.

H & R NO. 15.
M-363; 0.37 C, 3 Mo, 15.5 W, 4 Cr, 2 Ni, bal Fe.
For extrusion dies, hot piercing punches; hot work steel.

H & R NO. 19.
M-363; 0.9 C, 1.5 Mn, 0.3 Mo, bal Fe.
For precision tools, dies; oil hardening.

H & R NO. 44.
M-363; 0.80 C, 4 Cr, 4.2 Mo, 1.1 V, 6 W, bal Fe.
For cutting tools, drills, hobs, reamers; high speed steel.

H & R NO. 45.
M-363; 0.65 C, 4 Cr, 2 V, 6 W, 5 Mo, bal Fe.
For drills, reamers, lathe and planer tools; Type M2; high speed steel.

H & R NO. 50.
M-363; 0.57 C, 18 W, 4 Cr, 1.15 V, bal Fe.
For drills, reamers, taps, milling cutters; high speed steel.

H & R NO. 55.
M-363; 0.35 C, 5.2 Cr, 5.2 W, 0.2 Mo, 0.2 V, 0.5 Co, 0.9 Si, bal Fe.
For die casting dies; oil hardening.

H & R NO. 57.
M-363, 0.8 C, 3 75 Cr, 5.75 W, 4.5 Mo, 1.5 V, bal Fe.
For taps, chasers, broaches, reamers; high speed steel.

H & R NO. 59.
M-363; 0.88 C, 4.1 Cr, 1.8 V, 4.25 Mo, 6 W, bal Fe.
For thread chasers, drills, pipe taps, tools; high speed steel.

H & R NO. 60.
M-363, 1 2 C, 0 7 Cr, 0.25 Mo, 1.6-0.2 V, bal Fe.
For taps, broaches, punches, gauges; non distorting

H & R NO. 61
M-363, 1.3 C, 12 Cr, 0.6 Mo, 3 Co, 0 5 Si, bal Fe.
For blanking and forming dies, cold heading dies; air hardened

H & R NO 80
M-363; 1.0 C, 0.5 Cr, 0 7 Mn, 0.25 V, 1.25 Mo, bal Fe.
For lamination dies, gages, reamers; oil hardened.

H & R NO 85.
M-363; 0 50 C, 0.95 Cr, 0.20 V, bal Fe.
For die casting dies, shear blades; shock resistant.

H & R NO 150
M-363; 0.7 C, 0.85 Cr, 0.42 Mo, 1.4 Ni, bal Fe.
For carbide tool shanks, oil hardened.

H & R NO. 225.
M-363, 0 5 C, 1.5 Cr, 2 5 W, 0.25 V, bal Fe.
For dies, shear blades, cutters, oil hardening.

H & R NO. 434
M-363; 1 18 C, 4.25 Mo, 3.1 V, 4.1 Cr, bal Fe.
For cutting tools; for cutting abrasive materials.

H & R NO. 444.
M-363, 1 4 C, 4.1 Cr, 4 25 Mo, 4.15 V, bal Fe.
For cutting tools; abrasion resistant.

H & R NO. 445.
M 363; 1.5 C, 13.5 W, 4.5 Cr, 4.75 V, 5 Co, 0.5 Mo, bal Fe.
For cutting tools; high speed steel.

H & R A4
M-363; 0.95 C, 2.0 Mn, 0.35 Si, 2.2 Cr, 1.1 Mo, (lead added) bal Fe.
Free machining grade of air hardening cold work tool steel; AISI A4.

HRA 376.
M-England; 0.03-0.15 C, 4-8 Cr, 3.5-10.5 W, 5-7 Al, 3-9.5 Ta, 0.005-0.04 B, 10-14 Co, 4 max Mo, 3.5 max Cb, 0.15 max Zr, bal Ni.
For cast turbine blades.
Vacuum cast. High creep fatigue resistance.

H & R BRAKE DIE.
M-363; 0.50 C, 1 Mn, 0.95 Cr, 0.20 Mo, bal Fe.
For brake dies; pre-heat treated.

H & R CARBON.
M-363; 0.9-1.05 C, bal Fe.
For punches, dies, tools; water hardening.

H.R.C. MAX.
M-521; 0.25 max C, 18-20 Cr, 24-26 Ni, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 60-50 El; 75-60 RA; 150-190 Brin.
For furnace parts, heat treating boxes, valves, pumps; Type 311; austenitic, heat resistant.

H & R COBALT HIGH SPEED STEEL.
M-363; 0.75-0.80 C, 4 Cr, 18 W, 5 Co, 1 V, bal Fe.
For cutting tools; high speed steel.

H & R COBALT MOLY.
M-363; 0.88 C, 4.1 Cr, 6 W, 6 Mo, 1.9 V, 9 Co, bal Fe.
For cutters, tools, high speed steel.

H.R. CROWN MAX.
M-56, M-52; 0.2 C, 11.5 Ni, 23 Cr, 3 W, bal Fe.
Annealed: 101,000-123,000 TS; 56,000 YS; 35-25 El; 50-40 RA; 205-230 Brin.
For furnace parts, mechanical stokers, exhaust valves, annealing boxes; corrosion and heat resistant; Firth Brown J-184.

H REKORD EMINENT.
M-1328; 0.76 C, 10 Co, 4.3 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel

H REKORD SUPERIOR.
M-1328; 0.74 C, 4.1 Cr, 1.1 18.5 W, bal Fe.
For lathe and planer tools, reamers; high speed steel.

H & R GOLD LABEL.
M-363; 1.33 C, 0.35 Mo, 4.25 W, bal Fe.
For drawing dies, finishing tools; keen cutting edge.

H & R GRAY LABEL.
M-363; 0.90-1.05 C, bal Fe
For punches, dies, stamp, headers.

H & R HEADING DIE STEEL.
M-363, 0.9-1.0 C, bal Fe.
For embossing dies, cold heading dies; water hardening.

H & R HOT WORK.
M-363; 0.30-0.35 C, 3.0-3.5 Cr, 0.3-0.5 V, 10.0-11.5 W, bal Fe.
For extrusion and swedging dies, shear blades; hot work steel.

H & R HOT WORK NO. 2.
M-363; 0.33 C, 3.5 Cr, 9.25 W, 0.5 V, bal Fe.
For die casting dies, extrusion dies; hot work steel.

H & R HOT WORK NO. 4.
M-363; 0.97 C, 3.9 Cr, bal Fe.
For upsetting dies, gripper dies; oil or air hardening.

H & R HOT WORK NO. 5.
M-363; 0.35 C, 1.0 Si, 5 Cr, 0.4 V, 1.0 Mo, bal Fe.
For die casting dies, tools, hot punches; hot work steel.

H & R WORK 5V.
M-363; 0.35 C, 5 Cr, 1 V, 1.5 Mo, bal Fe.
For hot work steel, extrusion rams and liners; Type H13; hot work steel .

H & R HOT WORK NO. 6.
M-363; 0.35 C, 1.0 Si, 5 Cr, 1.35 W, 1.75 Mo, bal Fe.
For extrusion dies, piercing mandrels; hot work steel.

H & R HOT WORK 7.
M-363; 0.55 C, 1.2 W, 1.2 Mo, 0.95 Si, 0.3 Mn, bal Fe.
For dies, hot work tools, punches; air or oil hardened, shock resistant.

H & R HOT WORK NO. 10
M-363; 0.23 C, 0.6 Mn, 1.25 Si, 10.0 Cr, 0.75 Ni, 1.0 V, 0.45 W, 1.2 Mo, 0.10 N, bal Fe.
Air or oil hardening hot work tool and die steel, chromium type.

H & R HOT WORK NO. 12.
M-363; 0.30 C, 0.35 Mn, 0.5 Si, 12.0 Cr, 0.9 V, 12.0 W, bal Fe.
Air or oil hardening hot work tool and die steel; tungsten type; AISI H23.

H & R HOT WORK NO 15A.
M-363, 0.25 C, 14-16 W, 3.75-4.25 Cr, 0.4-0.6 V, bal Fe.
For hot heading dies, gripper dies, high temperature springs; hot work steel, oil hardened

H & R-K.
M-363; 2.25-2.40 C, 0.25-0.40 Mn, 12.75-13.25 Cr, 0.15-0.25 V, bal Fe.
For plug gauges, punches, forming dies; non-deforming

H & RK2
M-363; 1.5 C, 11.5 Cr, 0.75 Mo, 0.25 V, bal Fe.
For blanking and forming dies, lamination dies; non-deforming

H & R K2L
M-363, 0.85 C, 1 Ni, 0.45 Mo, 11.5 Cr, 0.3 V, bal Fe.
For shear blades, punches, dies, shock and abrasion resistant, non-deforming.

H & R K3.
M-363, 2.4 C, 12.75 Cr, 4 V, 1.1 Mo, bal Fe.
For mold liners, lamination dies; oil hardened, non-deforming

H & R K4
M-363; 1.4 C, 4.1 Cr, 4.1 V, 4.25 Mo, bal Fe.
For cutting tools, machining scaly material.

H & R M4.
M-363; 1.28 C, 4.5 Cr, 4.0 V, 5.5 W, 4.5 Mo, bal Fe.
Molybdenum-tungsten-vanadium grade of high speed steel for cutting tools; AISI M4.

H & R M7.
M-363; 1.0 C, 3.75 Cr, 2.05 V, 1.75 W, 8.75 Mo, bal Fe.
High speed tool steel, molybdenum type; AISI M7.

H & R M42.
M-363; 1.07 C, 3.75 Cr, 1.15 V, 1.5 W, 9.5 Mo, 8.0 Co, bal Fe.
High speed tool steel, molybdenum-cobalt type, AISI M42

H & R M43.
M-363; 1.20 C, 3.75 Cr, 1.6 V, 2.7 W, 8.0 Mo, 8.2 Co, bal Fe.
High speed tool steel, molybdenum-cobalt type; AISI M-43.

H & R MOLYHI.
M-363; 0.8 C, 4 Cr, 1.5 W, 8.5 Mo, 1.15 V, bal Fe.
For cutters, tools; high speed steel.

H & R MOLY VAN.
M-363; 0.8 C, 4 Cr, 9 Mo, 2.2 V, bal Fe.
For cutters, tools; high speed steel.

"HR" MONEL.
M-68; 0.35 max C, 0.5-1.5 Mn, 2.5 max Fe, 2 Si, 62-68 Ni, bal Cu.
Cast. 100,000 TS, 70,000 YS; 15 El; 200 Brin.
For corrosion resistant parts; free-cutting

H & R MULTIMOLD.
M-363; 0.35 C, 0.80 Cr, 0.30 Mo, 0.70 Mn, bal Fe.
For plastic mold dies; for high mold pressures.

H & R-MY.
M-363, M-27; 0.42 C, 1.4 Cr, 1.5 Si, 0.25 V, bal Fe.
For pneumatic tools, chisels, snaps, hot dies, hot shears; shock resistant.

H & R MY-A.
M-363, 0.40 C, 1.5 Cr, 1.5 Si, 0.25 V, bal Fe
For rivet sets, hand chisels, punches, shears; tough, shock resistant.

H & R-MY EXTRA.
M-363; 0.4 C, 0.9 Si, 1 Cr, 2 W, bal Fe
For pneumatic tools, chisels, snaps, hot dies, hot shears, water hardening.

H & R N175
M-363, 0.75 C, 0.75 Mn, 0.3 Si, 0.9 Cr, 1.75 Ni, 0.42 Mo, bal Fe
Oil hardening low alloy tool steel for shafts, arbors, lathe centers; AISI I 6.

H & R NON-TEMPERING.
M-363, 0.35 C, 0.7 Mn, 0.45 Si, 0.8 Cr, 0.3 Mo, 0.3 Cu, bal Fe.
Oil hardening tool steel, shock resisting type.

H & R 06 GRAPHITIC.
M-363; 1.45 C, 1.0 Mn, 1.25 Si, 0.25 Mo, bal Fe
AISI Type 06 oil hardening tool steel.

H & R OIL HARDENING.
M-363; 0.90-1.00 C, 0.90-1.00 Mn, 0.5-0.6 Cr, 0.2 V, bal Fe.
For cold forming tools and dies, punches, broaches, gauges

H & R PISTON.
M-363, 1.14 C, 0.58 Cr, 0.19 V, 0.2 Si, 0.3 Mn, bal Fe
For pistons, water hardening

H & R PLASTIC MOLD-A
M-363, 0.07 C, 4.5 Cr, 0.45 Mo, 0.4 Mn, 0.25 Si, bal Fe.
For plastic mold dies; hobbing die steel, air hardened

H & R PLASTIC MOLD-B
M-363; 0.06 C, 1 Cr, 0.25 Mo, B, bal Fe
For plastic mold dies, for cold hobbing, oil hardened

H & R PLASTIC MOLD-C
M-363, 0.1 C, bal Fe
For plastic mold dies; case hardened

H & R PLASTIC MOLD L.
M-363; 0.50 C, 1.0 Mn, 0.3 Si, 1.1 Cr, 0.25 Mo, bal Fe.
Oil hardening tool and die steel designed for plastic molds.

H & R SILICO 1.
M-363, 0.5 C, 0.5 Mo, 0.2 V, 1.1 Si, bal Fe.
For impact tools, punches, chisels, shock resistant, oil or water hardened.

H & R SILICO 2.
M-363, 0.55 C, 0.7 Mn, 0.45 Mo, 0.2 V, 2.15 Si, bal Fe.
For impact tools, punches, chisels; shock resistant, oil or water hardened.

H & R SPECIAL CARBON.
M-363; 1.0-1.2 C, 0.3 Mn, 0.2 Si, bal Fe.
For drills, taps, hobs, reamers; Type W1; water hardened.

H & R SPECIAL HARDENING DIE.
M-363; 0.9-1.0 C, 0.2 Mn, 0.3 Si, bal Fe.
For hardening dies; water hardened.

H & R SPECIAL HEADING DIE.
M-363; 0.9-1.0 C, 0.2 Mn, 0.3 Si, bal Fe.
AISI Type W1 water hardening tool steel.

H & R SUPER COBALT.
M-363; 0.8 C, 20-21 W, 4-4.5 Cr, 1.3 V, 12 Co, 0.6 Mo, bal Fe.
For cutters, hobs, millers; high speed steel.

H & R SUPER MOLYHI.
M-363, 0.8 C, 4 Cr, 1.5 W, 8.5 Mo, 1.2 V, 5 Co, bal Fe.
For cutters, tools; high speed steel.

H & R TUNGSTEN OIL HARDENING
M-363; 0.9 C, 1.1 Mn, 0.5 W, 0.2 V, 0.5 Cr, bal Fe.
For hobs, reamers, broaches, gauges; fast finishing tool steel.

H & R VANADIUM.
M-363; 1.05-1.15 C, 0.18 V, bal Fe
For striking and heading dies, swedging tools; water hardened.

H & R VH
M-363, 1.4 C, 0.4 Mn, 0.35 Si, 0.15 max Cr, 3.5 V, 0.1 max Mo, bal Fe.
Water hardening tool steel.

H R.W. DIE STEEL
M-357, 0.9 C, 3.7 Cr, 0.15 V, bal Fe
For dies, tools, forging mandrels; hot work steel

HS-1.
M-1542; 0.18 max C, 0.14 max Mn, 0.55 max Si, bal Fe
Rolled 71,000-85,000 TS, 47,000 min YP; 23 min El
For bridges, booms, buildings, bus and truck bodies Constructional steel

HS-12 (LESCO).
M-73; 0.99 C, 0.72 W, 3.9 Cr, 1.96 V, 8.11 Mo, bal Fe
Hardened C 63-66 Rock
For lathe tools and other cutting tools and dies requiring extra hardness and wear resistance.
AISI Type M-7 (Mod) High speed tool steel

HS 25
M-73, Composition similar to HSS Type M-1 except higher carbon content
Hardened. C 63-67 Rock.
For lathe tools and other cutting tools and dies requiring extra high hardness and wear resistance.
AISI Type M-1 (Mod) High speed tool steel

HS 29 XL.
M-73, 0.98 C, 4.15 Cr, 6.3 W, 1.85 V, 5.05 Mo, bal Fe, plus alloy sulphides.
Hardened C 64-67 Rock; free machining.
For lathe tools and other cutting tools requiring extra high hardness and wear resistance.
AISI Type M2 (Mod) High speed tool steel.

HS-220
M-376, 0.30 C, 2 Ni, 1.2 Cr, 0.45 Mo, bal Fe.
Heat treated: 237,000-258,000 TS; 201,000-212,000 YS; 11-13 El; 36-51 RA; 500-540 Brin.
For aircraft structures, landing gears; tough, shock resistant, oil hardened.

HS-260.
M-376; 0.40 C, 1.25 Cr, 2.2 Ni, 0.50 Mo, bal Fe.
Heat treated: 271,000-280,000 TS; 221,000-235,000 YS; 7-10.5 El; 24.5-38.5 RA; 510-530 Brin.
For aircraft structures, landing gears; tough, shock resistant, oil hardened.

H.S.C. 6-6-2.
M-908; 0.8 C, 4 Cr, 5.75 W, 5 Mo, 1.5 V, bal Fe.
For tools, drills, cutters, chasers, broaches; high speed steel.

H.S.C. 18-4-1.
M-908; 0.70 C, 4 Cr, 18 W, 1 V, bal Fe.
For tools, taps, cutters, chasers, punches; high speed steel.

HSC NO. 33.
M-908; 0.30-0.35 C, 0.9 Si, 5 Cr, 1.2 W, 1.5 Mo, bal Fe.
For hot work tools, Al-die casting dies; hot work steel.

HSC NO. 265.
M-908; 1.55-1.70 C, 11.5-12.5 Cr, 0.7-0.9 Mo, 0.15-0.25 V, bal Fe.
For dies, tools, blanking and forming dies; non-deforming.

HSC NO. 280.
M-908; 0.55 C, 1.5 Si, 0.35 Mo, bal Fe.
For tools, punches, chisels; shock resistant.

H.S.C. NO. 310.
M-908; 0.30 C, 3.25 Cr, 10 W, 0.35 V, bal Fe.
For hot work dies, brass forging dies; oil and air hardening.

H.S.C. NO. 313.
M-908; 0.35 C, 3 Cr, 13.5 W, bal Fe.
For hot work dies, hot punching and extruding dies; hot work steel.

H.S.C. 350.
M-908; 1.3 C, 3.5 W, 0.3 Mn, 0.45 Si, bal Fe.
For cutters, tools, cold extrusion dies; fast finishing steel.

HSC NO. 422.
M-908; 0.45-0.50 C, 0.85-1.05 Cr, 0.9-1.2 W, 0.15-0.25 Mo, bal Fe.
For tools, punches, shear blades; shock resistant.

H.S.C. NO. 515.
M-908; 0.35 C, 1.0 Si, 5 Cr, 5 W, 0.2 Mo, bal Fe.
For hot work dies; hot work steel, air hardening.

H.S.C. ALLOY SHOE DIE.
M-908; 0.5 C, 0.6 Cr, 0.6 Mn, 0.4 Mo, bal Fe.
For shoe dies; wear resistant; oil hardening.

H.S.C. COBALT 5.
M-908; 0.7 C, 4 Cr, 18 W, 0.5 Mo, 5 Co, 1 V, bal Fe.
For tools, cutters, broaches, chasers, reamers; high speed steel.

H.S.C. COLD HEADER.
M-908; 0.95 C, 0.30 Mn, bal Fe.
For cold headed dies, tools.

H.S.C. CUTLERY.
M-908; 1.1 C, 0.2 Mn, bal Fe.
For tools, cutlery, pocket knives; water hardening.

HSC-CVM.
M-908; 1.0 C, 0.7 Mn, 5.25 Cr, 1.1 Mo, 0.25 V, bal Fe.
For cold work dies, shears, punches; air hardening.

H.S.C. OVERCOAT AXE.
M-908; 1.0 C, 0.25 Mn, 0.15 Si, bal Fe.
For axe, tools; water hardening.

H.S.C. PAVEMENT BREAKER.
M-908; 0.65 C, 0.3 Mn, 0.1 Si, bal Fe.
For tools, sledges, pavement breakers; tough.

H.S.C. REGULAR.
M-908; 0.7-1.1 C, 0.3 Mn, bal Fe.
For tools, cold work tools; water hardened.

H.S.C. SHOE DIE.
M-908; 0.9 C, 0.35 Mn, 0.15 Si, bal Fe.
For shoe dies; water hardening.

H.S.C. SOLID DRILL.
M-908; 0.85 C, bal Fe.
For drills; tough.

H.S.C. SPECIAL.
M-908; 1.1 C, 0.3 Mn, 0.3 Si, bal Fe.
For tools, cold work tools, taps, blanking dies; water hardened.

HSC-SS EXTRA.
M-908; 1.0-1.1 C, 0.3 Mn, 0.3 Si, bal Fe.
For drills, taps, hobs, reamers, broaches; Type 1; water hardened.

H.S.M. COPPER 194.
M-279; 97.5 Cu, 2.35 Fe, 0.12 Zn, 0.03 P.
Ann: 40,000-60,000 TS; 24,000-45,000 YS; 20-35 El.
Cold rolled: 53,000-85,000 TS; 48,000-78,000 YS; 1-13 El.
For electrical connectors and terminals, springs, tubular products; high conductivity, strength, corrosion resistance.

HS PRIMA.
M-459; 1-1.2 C, bal Fe.
For tools; water hardening.

"HS" QUALITY.
M-179; 58 Cu, 40 Zn, 2-2.5 Pb.
Extruded: 60,000 TS, 28-32 El; 25-30 RA; 120 Brin.
Drawn: 68,000 TS; 25-30 El; 20-25 RA; 130 Brin.
For screw machine products, hardware; free-cutting.

HST.100.
M-430; 0.40 C, 3.0 Cr × Mo + V, bal Fe.
For high temperature service.

HST.120.
M-430; 0.30 C, 3 Cr + Mo + V, bal Fe.
For high temperature service.

HST.140.
M-430, 0.40 C, 5 Cr + Mo + V, bal Fe.
For high temperature service.

H SUPER REKORD.
M-1328; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For engravers tools, blanking and forming tools; high speed steel.

H SUPER REKORD CO.
M-1328; 1.35 C, Cr, Co, V, W, bal Fe.
For engravers tools, blanking and forming dies; high speed steel.

HTB-1.
M-1; 1.02 C, 0.35 Mn, 0.40 Si, 1.45 Cr, 1.0 Al, bal Fe.
For jet engine bearings; for high temperature applications.

HTB-2.
M-1; 0.58 C, 0.30 Mn, 1.15 Si, 4.75 Cr, 5.25 Mo, 0.55 V, bal Fe.
For gears operating up to 900°F; high temperature applications.

HTB-3.
M-1; 0.57 C, 0.30 Mn, 1.15 Si, 4.75 Cr, 5.25 Mo, 0.55 V, bal Fe.
For jet engine bearings; for high temperature operation.

H.T.C. NICKEL.
M-121; Ni.
Cold drawn: 67,000 TS; 40-50 El; 60-75 RA; 110 Brin.
For resistance thermometers; high temperature coefficient.

HT IRON-40.
M-637; 3.1 T.C., 0.2 Si, 0.7 Mn, 1.5 Ni, bal Fe.
Cast: 40,000 TS; 220 Brin.
For roller bearing cages; cast iron; Tr.S. 3800.

HTM
M-89; 3 C, Mn, Si, bal Fe.
For tractor parts; high strength malleable iron.

HT Molybdenum.
M-1246; 100 Mo.
For electronic, nuclear, chemical, aerospace, metallurgical and electrical industries, vacuum equipment.
Ductile after exposure to 2700-3600°F.

H.T.S 33
M-845; Al alloy.
For castings, not hardenable.

H.T. SILVER FUSE
M-1243
For solder, M.P. 600-700°F.

HUBARD SPECIAL.
M-225, M-451, C, Ni, Cr, bal Fe.
For rolls, guides, castings, high wear resistance.

HUCKINGERHUTTE HH428U.
M-1381, 0.15 C, 0.60 Mn, 0.30 Mo, bal Fe
For gears, bolts, shafts, cams, fasteners, case hardened

HUCKINGERHUTTE HH432.
M-1381; 0.19 C, 0.50 Si, 1.15 Mn, bal Fe.
For gears, pinions, camshafts, cams, bolts, case hardened, tough

HUCKINGER KI.
M-1381; 0.17 max C, 0.35 max Si, 0.35 Mn, bal Fe
Annealed: 70,000 TS, 55,000 YS, 25 El, 60 RA, 143 Brin
Cold drawn: 72,000 TS; 60,000 YS, 22 El, 58 RA, 146 Brin.
For screws, bolts, gears, shafts, nails, bushings; case hardened

HUCKINGER KIW.
M-1381; 0.16 max C, 0.35 max Si, 0.40 max Mn, bal Fe.
Annealed: 70,000 TS; 55,000 YS, 25 El; 60 RA; 143 Brin
Cold drawn. 72,000 TS; 60,000 YS; 22 El; 58 RA; 146 Brin.
For screws, bolts, gears, shafts, nails, bushings; case hardened.

HUCKINGER KII.
M-1381; 0.23 max C, 0.25 max Si, 0.35 max Mn, bal Fe.
Hot rolled: 70,000 TS; 45,000 YS; 31 El; 58 RA; 143 Brin.
Cold drawn: 80,000 TS; 69,000 YS; 18 El; 48 RA; 162 Brin.
For crankshafts, gears, bolts, armature shafts; water hardened.

HUCKINGER KIIW.
M-1381; 0.20 max C, 0.35 max Si, 0.50 max Mn, bal Fe.
Cold drawn: 78,000 TS; 68,000 YS; 20 El; 55 RA; 149 Brin.
For fan blades, bushings, gears, bolts; water hardened.

HUCKINGER KIIIW.
M-1381; 0.22 max C, 0.35 max Si, 0.55 max Mn, bal Fe.
Cold drawn: 78,000 TS; 68,000 YS; 20 El; 55 RA; 159 Brin.
Annealed: 73,000 TS; 61,000 YS; 22 El; 58 RA; 149 Brin.
For gears, bolts, crankshafts, fan blades; water hardened.

HUCKINGER KIVW.
M-1381; 0.26 max C, 0.35 max Si, 0.60 max Mn, bal Fe.
Hot rolled: 70,000 TS; 45,000 YS, 31 El; 58 RA; 143 Brin
Cold drawn: 80,000 TS; 69,000 YS; 18 El; 48 RA; 162 Brin.
For crankshafts, gears, bolts, armature shafts; water hardened.

HUGHES ALLOY
M-161, 17 Sn, 70 Pb, 13 Sb.
30 Brin
For metallic packing.

HUNDRED METAL.
England, Ni, Cr.
For high temperature applications, heat and corrosion resistant.

HUNTER-DOUGLAS ZG73.
M-1389, Al alloy.
For extrusions; heat treatable, resists fuming nitric acid

HUNT-SPILLER NO 101.
M-664; 0.3 C, bal Fe.
Cast: 70,000-75,000 TS; 40,000-45,000 YS; 30-25 El, 50-45 RA
For castings, gears, shafts, water hardening

HUNT-SPILLER NO. 101A.
M-664, 0.4 C, bal Fe.
Cast: 70,000-75,000 TS; 40,000-45,000 YS; 30-25 El; 50-45 RA.
For castings, gears, shafts; water hardening

HUNT-SPILLER NO. 104.
M-664, 0.25 max C, 0.4-0.6 Mo, 0.3 max Cu, 1 max Ni, 0.2 max Cr, bal Fe
Cast: 65,000 TS, 35,000 YS; 20 El; 30 RA
For valves, fittings, water hardening

HUNT-SPILLER HIGH CARBON GUN IRON.
M-664; 3.6 T.C., 1.5 Si, bal Fe
Cast: 35,000 TS.
For brake drums, clutch pressure plates; resists heat or thermal checking.

HURBENIUM "B."
M-892; 91 Pb, 8 Sn, 1 Bi.
For hot dip plating; corrosion resistant.

HURON.
M-1; 2.1 C, 12.5 Cr, 1.0 V, 0.32 Mn, 0.45 Si, bal Fe
Heat treated: 744-418 Brin.
For dies, tools, blanking and cold forming dies and rolls, gages; abrasion and wear resistant.

HURON ALUMINUM ALLOY.
Eng.; 3-7 Cu, 0-0.6 Mn, 0.5 Mg, 0-1.25 Ni, Cr, Co, Cd, bal Al.
For light alloy parts; heat treatable.

HURON ALUMINUM ALLOY "A," ROLLED.
3.5 Cu, 0.6 Mn, 0.5 Mg, 0.1 Cr, bal Al.
For light alloy parts; heat treatable.

HURON ALUMINUM ALLOY "B," ROLLED.
4 Cu, 0.6 Mn, 0.5 Mg, 0.1 Cr, bal Al.
For light alloy parts, heat treatable.

HURON ALUMINUM ALLOY "D," ROLLED
4 Cu, 0.5 Mg, 0.6 Cr, bal Al.
For light alloy parts; heat treatable.

HURON ALUMINUM CASTINGS "A-5" ALLOY
6.6 Cu, 0.5 Mg, 1.25 Ni, 0.25 Co, 0.5 Mn + Sn + Cd, bal Al.
For light alloy parts; heat treatable.

HURON-EZ.
M-1; 2.1 C, 12.5 Cr, 1 V, 0.3 Mn, 0.4 Si, bal Fe
For blanking and forming dies, rolls, gages; Type D3, oil hardened, abrasion resistant

HURON METAL, CAST.
6.6 Cu, 1.3 Ni, 0.5 Mg, 0.3 Co, bal Al
For light alloy parts; heat treatable.

HURON METAL ROLLED
3.5-4.0 Cu, 0.5 Mg, 0-0.6 Mn, 0.1-0.6 Cr, bal Al
For light alloy parts; heat treatable.

HURON V
M-1, 2.45 C, 12 Cr, 4 V, 1.8 Mo, bal Fe
Annealed 269 Brin.
Heat treated: 640 Brin
For brick mold liners, blanking and lamination dies; oil hardened, nondeforming

HUSMANN METAL
Eng., 74 Sn, 11 Sb, 11 Pb, 4 Cu, 0.2 Fe, 0.2 Zn
For bearings, bushings; anti-friction.

HUSQUARNA HVA
M-1271; 0.05 max C, 0.02 max Si, 0.06 max Mn, 0.01 max S, bal Fe.
Sintered.
For sintered parts; electrolytic powdered iron

H V. BLUE CHIP.
M-57, 0.82 C, 4 Cr, 2 V, 18 W, bal Fe.
For finishing tools and cutters, high speed steel

HW8 see BETHLEHEM HW8

H-W-A
M-40; 0.6 C, 5 Cr, 1 Mo, 1 V, bal Fe
Heat treated 440-550 Brin
For die casting dies, hot working tools and dies, hot work steel, air or oil hardening

H W D. NO 1
M-57, 0.4 C, 0.5 Cr, 0.15 V, 1.1 W, 1.5 Mo, 0.8 Si, bal Fe.
At 950°F 141,000 TS; 130,000 YS, 19 El, 61 RA, 275 Brin
At 1150°F: 80,000 TS; 68,000 YS; 29 El; 80 RA; 165 Brin.
For hot punches, mandrels, shear blades, Type H12; hot work steel.

H.W.D 2
M-57, 0.38 C, 5.25 Cr, 0.5 V, 1.35 Mo, 0.4 Mn, bal Fe.
For hot punches and dies; hot work steel, oil hardened

H W.D.3.
M-57; 0.4 C, 1.05 V, 5.25 Cr, 1.25 Mo, bal Fe.
At 950°F: 153,000 TS, 138,000 YS; 17 El; 63 RA, 260 Brin.
At 1150°F: 86,000 TS; 78,000 YS; 27 El; 78 RA; 155 Brin.
For hot punches, shear blades, die casting dies; Type H13; hot work steel, oil hardened.

HWD MOD.
M-57; 0.55 C, 1.4 W, 5 Cr, 1.5 Mo, 0.3 V, bal Fe.
For shear blades, forging dies, punches; air hardened, non-deforming.

HWS see DARWIN HWS.

HY 43.
M-116; 4.5 Zn, 3.5 Mg, 0.3 Mn, 0.1 max Cr, 0.4 Cu, 0.2-0.6 V, bal Al.
Aged: 71,000-77,000 TS; 64,000-68,000 YS; 8 El.
For light alloy parts; high strength, age-hardenable.

HY-65.
U.S., 0.12 C, 0.48 Mn, 2.16 Ni, 0.39 Mo, 0.70 Cu, bal Fe.
For pressure vessels; tough, corrosion resistant

HY-80.
England; 0.22 max C, 1.9-3.3 Ni, 0.8-1.9 Cr, 0.13-0.63 Mo, bal Fe
Heat treated: 105,000 TS; 80,000 YS; 20 El, 72 RA.
For structural and pressure vessels; good weldability.

HY-80
M-604; 0.18 C, 0.1-0.4 Mn, 2.0-3.25 Ni, 1.0-1.8 Cr, 0.2-0.6 Mo, 0.02 Ti, 0.02 V, 0.25 Cu, bal Fe
Plate 80,000 YS; 84,800 CYS; 20 El; 55 RA, 50 Charpy at −120°F
For pressure vessels, submarine hulls.
Tough, good weldability

HY-100
M-604, 0.2 C, 0.1-0.4 Mn, 2.25-3.5 Ni, 1.0-1.8 Cr, 0.2-0.6 Mo, 0.02 Ti, 0.02 V, 0.25 Cu, bal Fe.
Plate: 100,000 120,000 YS. 18 min El; 50 min RA, 105,700 CYS
For warship hulls, structures, deck railings, heat exchangers, submarine hulls, pressure vessels
Supplied in quenched and tempered condition

HY-130 (T)
M-604, 0.12 C, 0.6-0.9 Mn, 4.75-5.25 Ni, 0.4-0.7 Cr, 0.3-0.65 Mo, 0.02 Ti, 0.05-0.10 V, 0.15 Cu, bal Fe
Plate 130,000 TYS, 141,000 CYS, 15 El, 50 RA
For submarine hulls, pressure vessels
Tough, high impact resistance

HY-140
M-604, 0.12 max C, 0.6-0.9 Mn, 0.2-0.35 Si, 4.75-5.25 Ni, 0.4-0.7 Cr, 0.3-0.65 Mo, 0.05-0.1 V, 0.02 Ti, 0.15 max Cu, bal Fe
Plate 140,000-155,000 YS, 50 min Charpy
For pressure vessels, submarine hulls
Tough, shock resistant

HY-150 STEEL
M-604, 0.16 0.20 C, 3.5-4.0 Ni, 1.2 1.7 Cr, 0.3-0.5 Mo, 0.07-0.12 V, 0.4-0.6 Mn, 0.01 P & S, bal Fe
Heat treated 125,000-180,000 YS
For ship hulls, structures, deck railings, heat exchangers
Supplied in quenched and tempered condition

HY 180
M-604, 0.1 C, 10 Ni 8 Co, 2 Cr, 1 Mo, bal Fe.
Plate 180,000 YS; 95 Charpy V-notch

HY-511.
Germany, 5 Mg, 1 Si, Mn, Fe, 0.2 Ti, bal Al
Cast
For cylinder heads, heat resistant.

HY-BB
M-1635; C, Cr, Ni, Mo, V, bal Fe
For bleach rings and breech blocks.
MIL-S-10185A.
High yield and impact strength.

HYB-LUM.
M-305; 2.0 Ni + Cr, bal Al.
For light alloy parts; non-corrosive.

HYB-LUM GRADE A.
M-305; Ni, Cu, Mn, Si, bal Al.
For light alloy parts; corrosion resistant.

HYB-LUM GRADE B.
M-305; Ni-Cu-Mn-Si, bal Al.
For light alloy parts; corrosion resistant.

HYBNICKEL A
M-194; 12-25 Ni, 20-24 Cr, bal Fe.
Cast: 50,000 TS; 40,000 YS, 0-10 El
Forged: 100,000 TS; 70,000 YS; 20 El.
For carburizing boxes, hearth plates, furnace conveyor parts; heat resisting; maximum operating temperature 2100°F.

HYBNICKEL A-1
M-194, 31-39 Ni, 16-23 Cr, 0.51-0.65 C, bal Fe
For furnace parts; heat resistant.

HYBNICKEL B
M-194; 5-7 Ni, 18-22 Cr, bal Fe.
Cast: 50,000 TS; 40,000 YS, 0-15 El
Forged 100,000 TS; 70,000 YS, 25 El.
For carburizing boxes, hearth plates, furnace conveyor parts; heat resisting; maximum operating temperature 1800°F

HYBNICKEL C.
M-194; 15-35 Ni, 25-35 Cr, bal Fe
Cast: 50,000 TS; 40,000 YS, 0.15 El
Forged 100,000 TS, 70,000 YS, 25 El
For carburizing boxes, hearth plates, furnace conveyor parts; acid resisting, maximum operating temperature 2200°F

HYBNICKEL D
M 194, 0.25-0.50 C, 20-30 Cr, 5-10 Ni, bal Fe
For heat and corrosion resistant parts, heat and corrosion resistant

HYBNICKEL R
M 194; 0.2 C, 31 39 Ni, 7-11 Cr, bal Fe
For heat and corrosion resistant parts; heat resistant

HYBNICKEL S
M 194, 25 Ni, 20 Cr, bal Fe
Cast 50,000 TS, 40,000 YS, 0-15 El
Forged 100,000 TS 20,000 YS, 25 El.
For furnace parts, acid and alkali resistant

HYCC
M-38, 2.2 C, 12 Cr, 0.25 V, 0.8 Mo, bal Fe
For forming and crimping rolls, perforating dies, plug gages, wear resistant, air or oil hardened

HYCHROME 5616
M-73, 0.18 C, 0.35 Mn, 0.35 Si, 13 Cr, 2 Ni, 3 W, bal Fe
Heat treated 125,000 218,000 TS; 98,000 180,000 YS, 16-22 El, 53-62 RA.
For steam turbine buckets and blades, compressor parts; hardenable, martensitic, heat resistant to 1200°F

HYCO
M-365, 0.7 C, 18 W, 4 Cr, 1-2 V, 3.0-5.5 Co, bal Fe.
For tools, cutters, high speed steel

HYCO
M-688, 2 C, 12.5 Cr, 1.0 V, 0.75 Mo, bal Fe
For dies, punches, rivet sets, rolls; wear and abrasion resistant.

HYCO 1
M-688; 1.50 C, 0.35 Mn, 0.3 Si, 12.0 Cr, 0.9 V, 0.8 Mo, bal Fe
Air or oil hardening cold work tool steel, chromium type, AISI D2

HYCO 2.
M-688, 2.25 C, 0.3 Si, 11.5 Cr, 0.2 V, 0.8 Mo, bal Fe.
Air or oil hardening cold work tool and die steel, chromium type, AISI D3

HYCOMAX-I.
M-650; 21 Ni, 20 Co, 9.5 Al, 2 Cu, bal Fe.
Annealed: 850 Hc, 9000 Br.
For electrical and magnetic equipment
Permanent magnet. High permeability.

HYCOMAX-II
M-210; 21 Ni, 20 Co, 9.5 Al, 2 Cu, bal Fe
For permanent magnets in electrical and magnetic equipment.
High permeability. Permanent magnet

HYCOMAX-II
M-650; 14 Ni, 29 Co, 3 Cu, 7 Al, 4 Ti, 2 Cb, bal Fe.
8500 Br, 1200 Hc, 4,000,000 (BH) max.
For electrical and magnetic equipment.
Permanent magnet

HYCOMAX-III.
M-650, 14 Ni, 34 Co, 4 Cu, 7 Al, 5 Ti, bal Fe.
8800 Br, 1500 Hc, 5,300,000 (BH) max.
For electrical and magnetic equipment
Permanent magnet. Similar to Alnico VIII
High permeability

HYCOMAX-IV
M-650, 14 Ni, 40 Co, 3 Cu, 7.5 Al, 8 Ti, bal Fe
7400 Br, 2100 Hc, 6,000,000 (BH) max
For electrical and magnetic equipment.
Permanent magnet

HYCO-SPAN
M-12; 0.12 max C, 17-19 Cr, 10-13 Ni, bal Fe
For aircraft control cables; stainless

HYCRO V80
England; 0.2 C, 3 Cr, 0.6 Mo, 0.5 W, 0.8 V, bal Fe
For gas turbine components, creep resistant.

HYCV
M-38, 2.45 C, 3.75 V, 1 Mo, 12.25 Cr, bal Fe
Heat treated 660 Brin
For brick mold liners, porcelain molds, punches; air or oil hardened, non-deforming

HY-DI 5
M-336, M-387, 1 C, 0.3 Si, 0.7 Mn, 5.2 Cr, 1-1 Mo, 0.2 V, bal Fe
For dies, cutters, cold working tools, air hardened, nondeforming

HYDRA
M-1411, 0.65 C, 15 W, 4 Cr, 0.5 V, bal Fe
For lathe and planer tools, drills, hobs, taps; high speed steel

HYDRA F
M-1411, 0.30 C, 8.5 W, 3.5 Cr, 0.35 V, bal Fe.
For hot extrusion dies for brasses; hot work steel, oil hardened.

HYDRA-H.D
M-1411; 0.4 C, 14 W, 4 Cr, 0.7 V, bal Fe.
For die casting dies, hot work steel, oil hardened.

HYDRA HUSKY
M-1411, 0.80 C, 22 W, 4.5 Cr, 1.5 V, bal Fe.
For broaches, hobs, reamers, drills, high speed steel

HYDRA-M
M-1411; 0.35 C, 4 W, 1.5 Cr, 0.5 Mo, 4 Ni, bal Fe
For mandrels, pilger bars, hot punches; hot work steel, oil hardened

HYDRA MULTICO.
M-1411, 0.85 C, 22 W, 4.5 Cr, 1.5 V, 11 Co, 0.75 Mo, bal Fe.
For broaches, drills, reamers, hobs, lathe tools; high speed steel.

HYDRAULIC 56.
M-32; 0.85 C, 0.3 Mn, 0.3 Si, 1.75 Cr, 0.2 V, bal Fe.
Oil hardening tool steel for shafts, arbors, drill bushings, lathe centers; AISI L3.

HYDRAULIC BRONZE.
U.S.; 72.5 Cu, 19.5 Zn, 1.75 Sn, 6.5 Pb.
For pumps, cocks, valves, pressure tight.

HYDRAULIC BRONZE.
U.S; 83 Cu, 11 Sn, 6 Zn, 0.1 Pb.
For pumps, cocks, valves; pressure tight.

HYDRA VANTAGE.
M-1411; 1.25 C, 13.5 W, 4.5 Cr, 4 V, bal Fe.
For drills, taps, hobs, milling cutters; high speed steel.

HYDRA-V.K.
M-1411, 0.4 C, 5 Cr, 0.6 V, 1.4 Mo, 1 Si, bal Fe.
For Al die casting dies; hot work steel, oil hardened.

HYDRA-Z.
M-1411, 0.26 C, 8.5 W, 3 Cr, 0.25 V, 0.5 Mo, 2.5 Ni, bal Fe.
For hot forging dies, punches; hot work steel, oil hardened

HYDREX 188.
M-1411; 0.12 max C, 17.5-18.5 Cr, 7.5-9.5 Ni, bal Fe
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA, 150 Brin.
For fittings, chemical plant equipment; Type 302, stainless, austenitic.

HYDREX 367.
M-1411; 0.07 C, 17.2-19.0 Cr, 7.2-9.0 Ni, bal Fe
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For fittings, chemical plant equipment, Type 304; stainless, austenitic.

HYDREX 368.
M-1411; 0.07 max C, 17-19 Cr, 7-9 Ni, 0.25-0.40 Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El, 65 RA; 150 Brin.
For acid resistant chemical plant equipment, Type 321; stainless, austenitic.

HYDREX 369.
M-1411; 0.12 max C, 18-19 Cr, 12-13 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS, 55 El, 65 RA; 160 Brin
For chemical plant equipment, tanks, mixers, stainless, austenitic.

HYDREX 372.
M-1411; 0.10 max C, 18-20 Cr, 8-9.5 Ni, 0.8 Cb, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 56 El, 65 RA; 160 Brin.
For welded chemical plant equipment, Type 347; stainless, austenitic

HYDREX 375.
M-1411; 0.12 max C, 19-21 Cr, 10.5-12 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For core wire for welding electrodes; stainless, austenitic.

HYDREX 399
M-1411; 0.10 max C, 18.5-20 Cr, 8.5-10 Ni, 1.0-1.5 Mo, bal Fe
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For core wire for welding electrodes, stainless, austenitic.

HYDREX 1212.
M-1411; 0.12 max C, 12-13 Cr, 11.5-12.5 Ni, bal Fe.
For auto trim, kitchenware, architectural uses; austenitic, stainless, malleable.

HYDREX CTY.
M-1411; 0.25-0.35 C, 12-14 Cr, 1 max Ni, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 50 RA; 210 Brin.
For cutlery, scissors, surgical instruments; Type 420; stainless, hardenable.

HYDREX ENGG.
M-1411; 0.19-0.25 C, 12-14 Cr, 1 max Ni, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El, 55 RA; 195 Brin.
For pump and piston rods, surgical instruments, cutlery; Type 420, stainless, hardenable.

HYDREX ENGG-FM.
M-1411; 0.20-0.27 C, 12-14 Cr, 1 max Ni, 0.4 Mo, 0.2 S, bal Fe
Annealed 100,000 TS; 55,000 YS, 20 El; 50 RA; 200 Brin.
For fittings, piston and pump rods, valves and valve seats; Type 420F, stainless, free-cutting

HYDREX HCI.
M-1411; 0.12 max C, 19.5-22.5 Cr, 0.25 max Ni, bal Fe.
For valve seats, stokers, fire grids; heat and scale resistant to 1000°C.

HYDREX HR356
M-1411, 0.15 max C, 20-22 Cr, 7-8 Ni, bal Fe
For welding electrodes, resists heat and scaling to 900°C

HYDREX HR393
M-1411; 0.25 C, 22-24 Cr, 10-12 Ni, 3 W, bal Fe.
For exhaust inlet valves, furnace impellers, stainless, austenitic, resists scaling to 1050°C.

HYDREX HR2520
M-1411, 0.12 max C, 24-26 Cr, 19-21 Ni, bal Fe.
For heat treating boxes, furnace muffles, oxidation and heat resistant to 1150°C

HYDREX HR6015
M-1411, 0.20 max C, 15 min Cr, 60 Ni, bal Fe
For furnace parts, recuperators, heat treating boxes, resists heat and scaling to 1100°C

HYDREX HRV
M-1411, 0.39-0.45 C, 13-14 Cr, 13.2-14.2 Ni, 2.5-3.0 W, bal Fe.
For exhaust and inlet valves, furnace impellers; high heat and corrosion resistance.

HYDREX MC1
M-1411; 0.12 max C, 12-14 Cr, 0.25 max Ni, bal Fe
Annealed. 75,000 TS; 40,000 YS; 35 El; 70 RA, 155 Brin
For turbine blades, cutlery, valves, fittings; Type 410; stainless

HYDREX MC1-FM
M-1411; 0.12 max C, 12-14 Cr, 1 max Ni, 0.4 Mo, 0.2 S, bal Fe.
Annealed. 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For screw machine products, turbine blades; Type 410 F, free-cutting, stainless.

HYDREX MODIFIED WIM.
M-1411, 0.12 max C, 19-20 Cr, 9-10 Ni, 1.5-2.0 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El, 65 RA; 160 Brin.

For paper and pulp equipment, dye and bleaching equipment; Type 316; stainless, austenitic.

HYDREX S80.
M-1411; 0.13-0.18 C, 16.5-17.5 Cr, 1.6-2.0 Ni, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For valve spindles, impeller shafts, Type 430, stainless, martensitic.

HYDREX SPECIAL HR2520.
M-1411; 0.12 max C, 25-28 Cr, 19-21 Ni, bal Fe.
For welding electrodes; high creep and oxidation resistance.

HYDREX W.
M-1411; 0.12 max C, 18-20 Cr, 8-10 Ni, 0.5 Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA, 150 Brin
For welded chemical plant equipment; Type 321; stainless, austenitic.

HYDREX W-FM.
M-1411; 0.15 C, 17-20 Cr, 7-10 Ni, 0.2-0.4 Mo, 0.5 Ti, bal Fe
Annealed: 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin
For acid resistant chemical plant equipment, Type 316Ti; stainless, austenitic

HYDREX WIM
M-1411, 0.12 max C, 19-20 Cr, 9-10 Ni, 2.7-3.2 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 170 Brin
For paper and pulp industry equipment; Type 317, stainless, austenitic

HYDREX XB (HR329)
M-1411; 0.74-0.89 C, 19.0-20.5 Cr, 1.15-1.65 Ni, bal Fe
For exhaust and inlet valves; resists exhaust gases containing lead

HYDRIL BEARING METAL.
M-42, 70 Cu, 30 Pb
10,000 TS
For bearings, heavy duty.

HYDRONALIUM.
M-1372, M-1375; 6-10 Mg, 0.2-0.7 Mn, 1.5 max Fe, bal Al
Heat treated: 48,000 TS; 26,000 YS, 16 El, 75 Brin
For light alloy parts, age hardenable

HYDRONALIUM.
M-1420, 1.5-3.5 Mg, bal Al
Sand cast: 19,900-27,000 TS, 11,400-14,000 YS, 8-3 El; 50-60 Brin.
For marine castings; corrosion resistant.

HYDRONALIUM 2
M-1375, 1.3 Mg, 0.4 max Mn, 0.3 max Cr, bal Al
Soft: 28,000 TS; 13,000 YS; 30 El; 47 Brin.
Hard: 42,000 TS; 37,000 YS; 8 El; 77 Brin
For marine products, aircraft structures; resists sea water corrosion.

HYDRONALIUM 3.
M-1375, 2-4 Mg, 0.4 max Mn, 0.3 max Cr, bal Al.
Soft: 30,000 TS; 15,000 YS; 28 El; 50 Brin.
For marine and aircraft parts; resists sea water corrosion

HYDRONALIUM 5.
M-78; 95 Al, 5 Mg.
Extruded: 33,000-36,000 TS; 13,000-14,000 YS; 16-22 El; 60-70 Brin.
For seaplane pistons, propellers; resists sea water.

HYDRONALIUM 5.
M-1375; 4.0-5.5 Mg, 0.8 max Mn, 0.3 max Cr, bal Al
Soft: 42,000 TS; 22,000 YS; 35 El; 65 Brin.
Hard: 60,000 TS; 50,000 YS; 15 El; 100 Brin.
For marine hardware, aircraft parts; corrosion resistant.

HYDRONALIUM 7
M-78; 7 Mg, 0.45 Mn, bal Al.
Rolled: 52,000 TS; 32,000 YS; 12 El; 115 Brin.
For light alloy parts, seaplane pontoons and propellers; resists sea water corrosion

HYDRONALIUM 7.
M-1375; 5.5-7.5 Mg, 0.8 max Mn, 0.3 max Cr, bal Al.
For light alloy parts; corrosion resistant.

HYDRONALIUM 9.
M-78, 9 Mg, bal Al.
Rolled: 60,000 TS; 40,000 YS; 10 El.
Extruded: 54,000 TS; 25,000 YS, 20 El, 45 RA; 82 Brin.
For seaplane pontoons and propellers; resists sea water corrosion.

HYDRONALIUM 10.
M-78; 1.0 Mg, 0.5 Mn, 0.2-1.5 Si, bal Al.
Forged: 54,000 TS; 32,000 YS; 15 El; 93 Brin
For seaplane pontoons and propellers; resists sea water corrosion.

HYDRONALIUM 21.
M-1375, 0.6-1.4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, 0.3 max Cr, bal Al
Soft: 28,000 TS, 13,000 YS; 30 El, 47 Brin.
For marine products, aircraft structures, corrosion resistant.

HYDRONALIUM 43.
M-78; 4.5 Zn, 3.5 Mg, bal Al.
Wire: 70,000 TS, 45,000 YS; 16 El.
Sheet: 63,000 TS; 40,500 YS; 18.5 El.
For light alloy parts, heat treatable.

HYDRONALIUM 43
M-1375, Mg, Zn, bal Al.
For aircraft and light alloy parts.

HYDRONALIUM 51
M-78, 0.2-1.5 Si, 5-12 Mg, 0.2-0.5 Mn, bal Al.
Cast: 23,000-27,000 TS, 13,000-18,000 YS; 2-5 El; 60-70 Brin
For light alloy parts, aircraft components; corrosion resistant.

HYDRONALIUM 51.
M-1375, 5-12 Mg, 0.2-1.5 Si, 0.2-0.5 Mn, Cr, Ti, bal Al
Sand cast: 23,000-27,000 TS; 13,000-18,000 YS; 2-5 El; 60-70 Brin.
For gasoline flow meters, engine components; corrosion resistant.

HYDRONALIUM 71.
M-78; 7 Mg, bal Al.
Cast: 32,000-36,000 TS; 17,000-20,000 YS; 5-8 El; 70-80 Brin.
For gasoline flow meters and aircraft parts; corrosion resistant.

HYDRONALIUM 71.
M-1375; 7 Mg, Si, Mn, Cr, Ti, bal Al.
Permanent mold: 32,000-36,000 TS; 17,000-20,000 YS, 5-8 El; 70-80 Brin.
For marine and aircraft parts; corrosion resistant.

HYDRONALIUM 91.
M-1375; Mg, Si, Mn, Cr, Ti, bal Al.
For light alloy parts.

HYDRONALIUM 511.
M-78; 0.3 Fe, 0.2 Mn, 5 Mg, 1 Si, 0.1 Ti, bal Al.
For castings; sand.

HYDRONALIUM 5112.
M-78; 1 Cu, 0.3 Fe, 0.1 Mn, 5 Mg, 1 Si, 0.1 Ti, 0.18 Be, bal Al.
For sand castings; heat treatable.

HYDRONALIUM D.B.A.
M-78; Al alloy.
For light alloy parts, aircraft parts; corrosion resistant.

HYDRONALIUM HY25.
M-1548, 0.2-1.0 Si, 0.2-0.5 Mn, 3.0-12.0 Mg, bal Al.
Soft: 27,000 TS, 12,800 YS, 24 El; 50 Brin.
Half Hard: 36,000 TS; 26,000 YS; 10 El, 60 Brin
For hardware, aircraft parts.
Not heat treatable.

HYDRONALIUM HY51.
M-1420; 5-12 Mg, 0.2-1.5 Si, 0.2-0.5 Mn, bal Fe.
Sand Cast: 23,000-28,000 TS; 11,400-14,400 YS; 5.0-2.5 El; 55-70 Brin.
For aircraft and marine equipment; corrosion resistant to sea water.

HYDRONALIUM HY71.
M-1420, 7 Mg, Si, Mn, bal Al.
Permanent mold 32,000-36,000 TS; 17,000-20,000 YS; 8-5 El; 70-80 Brin.
For aircraft and marine equipment, corrosion resistant to sea water.

HYDRONE.
Eng.; 67 Pb, 33 Sb
For bearings; light shocks only

HYDRONE.
M-308, 31 Na, bal Pb.
Used as a deoxidizer; for non-ferrous metals

HYDRO-T-METAL.
M-1505; 0.4-0.7 Cu, 0.08-0.16 Ti, 0.002-0.010 Mn, 0.003-0.02 Cr, bal Zn.
Rolled: 26,500 TS; 20,000 YS, 36 El
For auto trim, furniture, rain gutters, hardware, electrical fixtures; stable, corrosion resistant.

HYDRO-T-METAL 200
M-1505, M-226; 0.3-1.25 Cu, 0.1-0.4 Ti, bal Zn.
Sheet 24,000 TS, 10 El; 55 Brin
For roofing, gutters, trim, fuses, housings, curtain walls. High creep resistance.

HYFLUX ALNICO V
M-1076; 8 Al, 14 Ni, 24 Co, bal Fe
For permanent magnets, high energy product

HYFLUX ALNICO V-7.
M-1076; 8 Al, 14 Ni, 24 Co, bal Fe.
5000 TS.
For permanent magnets, oscillographs, galvanometers; 7 million energy product.

HYFLUX ALNICO-IX.
M-1076; 7 Al, 15 Ni, 35 Co, 34 Fe, 4 Cu, 5 Ti.
Energy product 9,500,000 gauss-oersteds.
Coercive force 1400 oersteds.
Residual induction 10,500 gausses.
For straight field focusing devices, repulsion and torque transmitters, motors, space age applications.
Permanent magnet. Resists demagnetization.

HY-GLO HYGLO 440A.
M-73; 17-18 Cr, 0.5 max Mn, 0.6-0.7 C, bal Fe.
Annealed: 100,000 TS; 70,000 YS; 20 El; 50 RA; 187 Brin.
Heat treated: 282,000-215,000 TS; 248,000-190,000 YS; 0-3 El; 0-7 RA; 580-420 Brin.
For cutlery, tools, machine parts; stainless, corrosion resistant.

HYKRO.
M-50, M-1414; 0.25 C, 0.55 Mn, 3.2 Cr, 0.50 Mo, bal Fe.
Oil Harden: 104,000-145,000 TS; 83,000-121,000 YS, 20-28 El; 65-72 RA; 75-110 Izod.
For crankshafts, cylinder liners, gears, machine parts.
Nitriding steel Wear resistant

HYKRO-V.
M-50, M-1414, 0.40 C, 0.60 Mn, 3.0 Cr, 0.90 Mo, 0.20 V, bal Fe.
Oil Hardened: 184,000-260,000 TS; 157,000-197,000 YS; 15-20 El, 54 RA, 23-40 Izod.
For gears, cams, camshafts, rollers
Oil or nitride hardening

HYKRO V-80.
England; 0.2 C, 3 Cr, 0.6 Mo, 0.5 W, 0.8 V, bal Fe.
For oil refinery equipment, corrosion and heat resistant

HYLASTIC.
M-473; 0.30 C, 1.6 Mn, 0.10 V, 0.4 Si, bal Fe
Normalized 100,000-90,000 TS; 76,000-60,000 YS; 28-25 El; 58-50 RA, 180 Brin
For railroad and structural work where high physicals are required, Iz-40

HYLITE-1
M-261; 100 Ti
Rolled: 78,000 TS; 38,000 YS, 30 El
For the chemical industries
Commercially pure Ti

HYLITE 10
M-261, Ti
Bar: 60,500 TS, 36,000 YS, 30 El, 150 Brin
Sheet. 61,600 TS, 44,800 YS, 20 El; 160 Brin
For aircraft parts, good form- and weldability

HYLITE 15
M-261, Ti
Bar 71,700 TS; 44,800 YS, 25 El
Sheet 76,200 TS; 56,000 YS; 18 El
For aircraft parts, alpha type

HYLITE-15H
M-261, 100 Ti
Rolled. 98,000 TS, 78,000 YS, 27 El
For the chemical industry
Commercially pure Ti with addition of oxygen to raise strength

HYLITE 20
M-261; 5 Al, 2.5 Sn, bal Ti
Bar 125,500 TS; 103,000 YS; 18 El
For aircraft and missile components, alpha type.

HYLITE-25
M-261, 2.5 Cu, bal Ti
Rolled 85,000 TS; 64,000 YS; 27 El
For the chemical industry
Alpha-eutectoid alloy. Good weldability, and ductility.

HYLITE 30
M-261; 2 Mn, 2 Al, bal Ti
Bar: 98,600 TS; 80,600 YS; 20 El.
For compressor discs and blades, fasteners, fuel systems; heat treatable.

HYLITE 40.
M-261; 4 Mn, 4 Al, bal Ti.
Bar: 138,900 TS; 130,000 YS; 18 El.
For compressor discs and blades, fasteners, fuel systems; heat treatable.

HYLITE 45.
M-261; 6 Al, 4 V, bal Ti.
Bar 141,200 TS; 130,000 YS; 22 El.
For compressor discs and blades, fasteners, fuel systems; heat treatable.

HYLITE-50.
M-261, 4 Al, 4 Mo, 2 Sn, 0.5 Si, bal Ti.
Bar 161,300 TS; 143,400 YS; 15 El.
For compressor discs and blades, fuel systems, fasteners.
Heat treatable.

HYLITE-51
M-261; 4 Al, 4 Mo, 4 Sn, 0.5 Si, bal Ti
Heat treated. 200,000 TS, 179,000 YS, 15 El.
For heavy duty service aircraft structural members
Alpha-beta alloy. Good creep properties.

HYLITE-55.
M-261; 6 Sn, 5 Zr, 3 Al, 0.5 Si, bal Ti
Heat treated: 130,000 TS, 116,000 YS, 16 El
For turbine compressor blades and discs.
Alpha titanium alloy. Good properties, to over 500°C High temperature strength.

HYLITE-60
M-261; 3 Al, 6 Sn, 5 Zr, 2 Mo, 0.4 Si, bal Ti
At 70°F: 157,000 TS, 135,000 YS, 14 El.
At 1000°F. 90,000 TS, 81,000 YS
For turbine compressor blades and discs up to 500°C
Good creep and tensile properties Alpha-beta titanium alloy

HYLITE-65
M 261; 6 Sn, 5 Zr, 3 Al, 0.5 Mo, 0.5 Si, bal Ti
Heat treated 155,000 TS, 136,000 YS, 13 El, 27 RA
At 600°C 91,400 TS, 69,500 YS, 16.5 El, 49 RA
For jet engine compressor components, discs, spacers, blades
High creep resistance, weldable
Near alpha alloy, heat treatable

HY-I O
M-336, 0.85 C, 2.24 Mn, 0.1 V, bal Fe
For dies, non-shrinking

HY-I O
M-712, 0.12 C, 0.77 Mn, 0.72 Si, 0.8 Mo, bal Fe
Welded 79,000-85,000 TS, 67,000-72,000 YS, 26-20 El, 50-35 RA
For welding, A.W.S.-E7015, low H_2 content

HYMALAYA
M-1308, 1.2 C, 0.40 Si, 12.5 Mn, bal Fe
For earth moving equipment, dipper teeth; wear and abrasion resistant

HYMAN
Eng., 58.3 Ag, 16.7 Cu, 16.7 Zn, 8.3 Ni.
For jewelry, ornaments, Nickel silver

HYMAN ALLOY
0.8 Si, 3 Cu, 0.5 Mg, 0.5 Ni, bal Al
Heat treated 36,000-43,000 TS, 6-9 El
For light alloy parts; age-hardenable.

HYMAX 3% COBALT MAGNET
M-210; 3 Co, 1.15 C, 10 Cr, 1.5 Mo, bal Fe
Cast
For magnet steel; Br-7000-6750; Hc-140-130; B.H. max 410,000.

HYMAX 6% COBALT MAGNET
M-210; 1.15 C, 6 Co, 10 Cr, 1.5 Mo, bal Fe
Cast.
For magnet steel; Br-7250-7000; Hc-160-145; B.H. max 460,000

HYMAX 9% COBALT MAGNET.
M-210, 9 Co, 1.15 C, 10 Cr, 1.5 Mo, bal Fe.
Cast.
For magnet steel; Br-7550-7250; Hc-175-165; B.H. max 527,000

HYMAX 15% COBALT MAGNET.
M-210; 15 Co, 1.15 C, 10 Cr, 1.5 Mo, bal Fe.
Cast
For magnet steel; Br-7850-7600; Hc-200-220; B.H. max 648,000

HYMAX 35% COBALT MAGNET.
M-210; 35 Co, 0.85 C, 4.5 W, 6 Cr, bal Fe.
Cast
For magnet steel; Br-8800-8350, Hc-265-240.

HYMU 80
M-32, 0.1 max C, 80 Ni, 4 Mo, bal Fe.
Cold Drawn: 97,000 TS; 69,000 YS; 37 El; 71 RA; 220 Brin
For transformer cores, magnetic shields, hydrogen annealed.

HYMU-400
M-32; 4 Mo, 79 Ni, bal Fe.
For laminations for motor cores, toroids
High permeability, soft magnet.

HYMU-800
M-32, 4 Mo, 79 Ni, bal Fe
For laminations for motor cores, toroids
High magnetic permeability, soft magnet.

HYNICAL
M-England, 31 Ni, 12.5 Al, 0.4 Ti, bal Fe
For permanent magnets, electrical and magnetic equipment High permeability.

HYNICO-I
M 200, 19 Ni, 12 Co, 10 Al, 6 Cu, bal Fe
For permanent magnets, electrical and magnet equipment High permeability

HYNICO-II
M-200; 20 Ni, 20 Co, 8 Al, 4 Cu, 4 Ti, 0.8 Cb, bal Fe
For permanent magnets, magnetic and electrical equipment High magnetic permeability

HYPERM 4
M-72, C, 2.5-4.5 Si, bal Fe
For precision transformers; magnetic alloy.

HYPERM 6
M-72 C, Si, bal Fe For magnets, electrical apparatus, magnetic alloy, high induction

HYPERM 36
M-72, C, alloy, bal Fe
For magnets, electrical apparatus, magnetic alloy, high permeability.

HYPERM 50 Y
M 72, C, high Ni, bal Fe
For magnets, electrical apparatus; magnetic alloy, high permeability

HYPERM-702
M-1309, 0.10 C, 0.10 Si, 1.4 Mn, 3.25 Mo, 9.0 Cu, 74 Ni, bal Fe
For electrical and magnetic equipment magnets.
High permeability

HYPERM 766
M-1309, 0.10 C, 0.10 Si, 0.65 Mn, 2.0 Cr, 3.25 Mo, 5.0 C, 76.0 Ni, bal Fe.
For electrical and magnetic equipment magnets.
High permeability

HYPERM-Co 27
M-72; 0.006 C, 27.5 Co, 0.002 Oxy., bal Fe.
Annealed: 80,000 TS; 45,000 YS; 15 El; R 85 Rock

Cold Rolled: 100,000 TS; 90,000 YS; 1 El; C 30 Rock.
For torque motors, generators, pole pieces, relays, alternators, transformer rectifiers.
Soft magnetic alloy, high magnetic saturation.
Operates at high flux levels.

HYPERM-Co 50.
M-72; 49 Co, 2 V, bal Fe.
Annealed: 80,000 TS; 48,000 YS; 0.5 El; B 97 Rock.
Cold Rolled: 195,000 TS; 185,000 YS; 1 El; C 35 Rock.
For electric motors, computors, transformers, magnetic amplifiers, magnetostriction reducers.
Magnetically soft for high flux levels.
High permeability at high inductions.

HYPERM-O.
M-72; Ni, bal Fe.
For electrical equipment.

HYPERNOM.
M-118; 79 Ni, 4 Mo, bal Fe.
Hot rolled: 125,000 TS; 112,000 YS; 17.5 El; 165 Brin; 85 Rock B
For telephone loading coils, instrument transformers, electronic shields, magnetometers; high permeability, low fields

HYPERSILICIE.
English; 3 Cu, 0.5 Fe, 18 Si, bal Al.
For pistons; low density, cast

HYPERSILID.
M-846; C, 14-16 Si, bal Fe.
For castings; cast iron, acid resistant.

HYPOCRODE.
M-494; C, 12.5-14.5 Ni, 6.5-7.5 Cu, 4.75-5.75 Cr, bal Fe.
25,000-30,000 TS; 150 Brin.
For hydraulic parts, pump bodies, impellers, plungers, liners, furnace parts, burners, fire bars; austenitic cast iron; corrosion, heat and erosion resistant.

HY-PRESS 20.
M-1724; 0.06 C, 0.58 Mn, 0.16 Cu, 0.02 Nb, bal Fe.
As rolled: 63,000-72,000 TS; 47,000-54,000 YS; 30-34 El.
Sheet and strip for stamped and formed parts; weldable.

HY-PRESS 23.
M-1724; 0.08 C, 0.56 Mn, 0.16 Cu, 0.025 Nb, bal Fe.
As rolled: 67,000-76,000 TS; 51,000-58,000 YS; 28-34 El.
Sheet and strip for stamped and formed parts; weldable.

HY-PRESS 26.
M-1724; 0.10 C, 0.90 Mn, 0.17 Cu, 0.024 Nb, bal Fe.
As rolled: 74,000-85,000 TS; 56,000-65,000 YS; 25-31 El.
Sheet and strip for stamped and formed parts; weldable.

HY-PRESS 29.
M-1724; 0.12 C, 1.2 Mn, 0.17 Cu, 0.03 Nb, bal Fe.
As rolled: 78,000-87,000 TS; 65,000-72,000 YS; 24-29 El.
Sheet and strip for stamped and formed parts; weldable.

HYPRO 61 AIR HARDENING.
M-336; 1.5 C, 11.5 Cr, 0.8 Mo, 2 V, bal Fe.
For gages, drawing dies, trimmers; air hardening.

HYPRO NO. 62.
M-336; 2.0 C, 12 Cr, 0.6 Mn, bal Fe.
122,000 TS; 54,000 YS; 7.6 El; 257 Brin.
For general tools, high production tools, stamping and blanking dies; non-deforming.

HYPRO-62-O.H.
M-336; 2.2 C, 12 Cr, 1 V, bal Fe
Hardened: C 64-67 Rock.
For blanking and forming dies, burnishing tools and rolls, plug gauges, slitting cutters, drawing dies.
Type D3 oil hardening cold work steel, deep hardening, abrasion resistant.

HYPRO 63.
M-336; 1.7 C, 18 Cr, bal Fe.
For dies, punches, rotary shears, gauges; non-shrink, deep hardening.

HYPRO A.
M-334; 0.35 C, 7.5 Cr, 7.5 W, 1.5 Si, bal Fe.
For dies; oil or air hardened

HYPRO B
M-334; 0.35 C, 5.2 Cr, 5.2 W, 0.2 V, 0.2 Mo, 0.3 Co, 0.9 Si, bal Fe
For dies, punches; air hardened

HY-RA 49.
M-32; 49 Ni, bal Fe.
For electronic devices, magnetic amplifiers; high permeability.

HY-RA 80.
M-32, 79 Ni, 0.05 C, 4 Mo, 0.5 Mn, 0.15 Si, bal Fe
For electronic devices, magnetic amplifiers, high permeability

HY-SPEED
M-256; 88 Cu, 10 Sn, 2 Pb
For bushings, bearings; heavy duty

HYTEMPCO
M-44; 70 Ni, bal Fe.
Wrought 150,000-70,000 TS
For immersion heaters, heater pads, electrical resistances; max operating temperature 500°C

HY-TEN "A" NO 1-S.
M-119, 0.15 C, Mn, Mo, bal Fe
Hot rolled: 80,000 TS, 50,000 YS, 37 El; 68 RA; 163 Brin
Cold rolled: 98,000 TS, 90,000 YS, 15 El, 56 RA; 200 Brin
For gears, cams, worms, bolts, clutches, case hardening

HY-TEN A NO. 1 X.
M-119; 0.20 C, Mo, Mn, bal Fe.
Rolled: 85,000 TS; 55,000 YS; 35 El, 65 RA, 163 Brin
Heat treated: 140,000 TS; 120,000 YS; 10 El; 35 RA; 311 Brin.
For carburized pins, cams, gears, gauges, bolts, shafts, case-hardening steel.

HY-TEN A2
M-119; 1.0 C, 5 Cr, 1 Mo, 0.4 Mn, 0.4 V, bal Fe.
Annealed: 103,000 TS; 52,000 YS; 26 El; C 18 Rock.
Hardened: 178,000-253,000 TS, 146,000-200,000 YS; 3-12 El; 7-32 RA; C 41-53 Rock.
For blanking and trimming dies, cams, cutters, gauges, lamination dies, shears.
Type A2 air hardening tool steel, nondeforming.

HY-TEN "A" NO. 15.
M-119; 0.15 C, Ni, Mo, bal Fe.
Heat treated: 118,000 TS; 85,000 YS; 25 El; 65 RA; 235 Brin.

For carburized arbors, camshafts, piston pins, ratchets, worms, valve tappets, pinions; similar to SAE 4615.

HY-TEN "A" Temper NO. 20.
M-119; 0.20 C, 0.60 Ni, 0.55 Cr, 0.20 Mo, bal Fe.
Heat treated: 167,000 TS; 138,000 YS; 11 El; 52 RA; 352 Brin.
For gears, worms, clutches, arbors, spindles, rolls, toggle pins
Carburizing alloy steel, shock resistant.

HY-TEN "B" NO. 2
M-119, 0.40 C, Mn, Cr, bal Fe.
Hot rolled: 100,000 TS; 62,000 YS; 25 El; 47 RA; 201 Brin.
Heat treated 160,000 TS, 122,000 YS, 11 El; 33 RA, 321 Brin.
For shafts, spindles, tap shanks, sleeves, worms, arbors, gears; free machining; tough

HY-TEN "B" NO. 3 X
M-119, 0.5 C, Cr, Mn, Mo, bal Fe
Rolled: 135,000 TS, 70,000 YS; 18 El; 45 RA; 293 Brin.
Heat treated: 240,000 TS, 220,000 YS, 10 El; 40 RA; 477 Brin.
For clutches, gears, drive shafts, pinions, connecting rods, mandrels, readily machined at high hardness

HY-TEN "B" TEMPER NO. 3-X-40.
M-119, 0.40 C, 1.1 Mn, 0.75 Cr, 0.20 Mo, 0.08 S, bal Fe
Heat treated 230,000 TS; 215,000 YS; 11 El, 43 RA; 460 Brin
Annealed 95,000 TS; 64,000 YS, 25 El, 57 RA; 183 Brin
For gears, clutches, arbors, cams, mandrels; oil hardened, impact resistant

HY-TEN "B" NO 4
M-219, 0.50 C, Mn, Cr, bal Fe
Annealed: 95,000 TS; 60,000 YS, 28 El, 60 RA, 179 Brin
Heat treated. 240,000 TS, 222,000 YS, 10 El; 43 RA, 477 Brin
For gears, clutches, shafts, pins, springs, oil hardened, tough

HYTEN B-43
M-119, 0.40-0.45 C, 0.65-0.85 Cr, 1.5-2.0 Ni, 0.3 Mo, bal Fe
Heat treated: 326,000-132,000 TS; 294,000-117,000 YS, 10-61 El, 32-69 RA, 627-285 Brin.
For heavy duty gears, shafts, pinions, bolts, oil hardened.

HY-TEN B NO 340
M-119; 0.43 C, 0.95 Mn, 0.75 Cr, 0.25 Mo, bal Fe.
Heat treated 265,000-167,000 TS, 235,000-153,000 YS, 10-17 El, 32-54 RA; 555-341 Brin
For zinc die casting dies, gears, shafts, cutters, impact resistant, deep hardening

HY-TEN B NO 350
M-119; 0.45 C, 1.05 Mn, 0.85 Cr, 0.25 Mo, bal Fe.
Heat treated. 290,000-185,000 TS, 255,000-170,000 YS; 10-16 El; 32-52 RA; 555-321 Brin
For plastic molds, stripper and bolter plates; impact resistant, deep hardening.

HYTENAL BRONZE.
Eng.; 60 Cu, 10 Al, 6 Fe, 19 Zn, 5 Mn
105,000 TS; 65,000 YS; 20 El.
For staybolts, pump rods, valves, valve spindles; corrosion resistant.

HY-TEN D-2.
M-119; 1.5 C, 11.5 Cr, 0.9 V, 0.4 Mn, 0.8 Mo, bal Fe.
For forming and drawing dies, punches; air hardened, non-deforming.

HY-TEN M.
M-119; 0.7 C, 0.6 Mn, 1.35 Ni, 0.65 Cr, 0.25 Mo, bal Fe.
Annealed: 95,000 TS; 55,000 YS; 25 El; 55 RA, 180 Brin.
Heat treated: 230,000 TS; 200,000 YS; 10 El; 35 RA, 444 Brin.
For cams, arbors, gauges, springs, clutches, dies; Type L6, shock and wear resistant.

HY-TEN "MC" TEMPER.
M-119, 0.70 C, 0.80 Cr, 0.50 Ni, 0.25 Mo, 0.08 V, bal Fe.
Annealed: 96,000 TS; 71,000 YS; 24 El; 53 RA; 200 Brin.
Heat treated: 302,000 TS, 279,000 YS; 653 Brin
For gears, arbors, punches, clutches, oil hardened, shock resistant

HY-TEN MOLD
M-119, 0.35 C, Mn, Cr, Mo, bal Fe
Heat treated 160,000-240,000 TS; 132,000-205,000 YS, 19-10 El; 58-37 RA; 311-475 Brin.
For plastic molds, Zn die cast molds, tie rods, shock and impact resistant.

HY-TEN PNEUMATIC CHISEL
M-119, 0.60 C, 0.85 Mn, 2 Si, 0.30 Cr, bal Fe
For chisels, punches, cold cutters, pick points; oil hardened, shock resistant.

HYTENSIL ALUMINUM NO 375
M-847, 98 Al.
Heat treated 48,000 TS, 3 El, 100 Brin.
For light alloy parts, corrosion resistant

HYTENSILITE
M-847, 98 Al, bal other elements
Cast 32,000 TS; 28,000 YS, 15 El; 40 Brin
Heat treated: 45,000 TS, 41,000 YS; 5 El, 100 Brin
For light alloy parts; corrosion resistant

HY-TEN-SL GR 1 A
M-129, 60-68 Cu, 20-24 Zn, 3-7 Al, 2-5 Mn, 2-4 Fe.
Sand cast. 115,000 TS, 70,000 YS, 12 El, 12 RA; 210 Brin
Forged 120,000 TS, 73,000 YS, 8 El, 8 RA; 240 Brin
For gears, worm wheels, bearings, wear and corrosion resistant.

HY-TEN SL BRONZE GRADE 1
M-129, 60-68 Cu, 20-24 Zn, 3-7 Al, 2.5-5.0 Mn, 2-4 Fe
Cast 108,000 TS, 65,000 YS, 14 El, 14 RA; 220 Brin
For pump and fan impellers, gears, valves; wear and corrosion resistant

HY-TEN-SL BRONZE GR. 2.
M-129, 60-68 Cu, 20-24 Zn, 3-7 Al, 2.5-5.0 Mn, 2-4 Fe.
Cast 100,000 TS; 55,000 YS, 16 El; 16 RA, 200 Brin
For pump and fan impellers, gears, valves, wear and corrosion resistant.

HY-TEN-SL BRONZE GR. 3
M 129, 60-68 Cu, 20-24 Zn, 3-7 Al, 2.5-5.0 Mn, 2-4 Fe.
Cast: 90,000 TS; 45,000 YS, 20 El; 20 RA; 175 Brin
For impellers, gears, valves; wear and corrosion resistant.

HY-TEN-SL BRONZE GR. 4.
M-129; 60-68 Cu, 20-24 Zn, 3-7 Al, 2.5-5.0 Mn, 2-4 Fe
Rolled: 85,000 TS; 40,000 YS; 25 El; 25 RA; 150 Brin.
For impellers, gears, valves; wear and corrosion resistant.

HY-TENSO M20.
M-775; 2.4 C, 1.2 Si, alloy, bal Fe.
Cast: 75,000 TS, 50,000 YS; 5 El, 200 Brin.
For stoker parts, stove and grate parts, dampers, cast iron, pearlitic

HY-TENSO M-51.
M-775; 2.3 C, 1.2 Si, bal Fe.
Cast: 65,000 TS; 40,000 YS; 4-8 El, 185 Brin.
For chain links, connecting rods, gears; refined pearlitic malleable iron.

HY-TEST-ROD NO 85.
M-1096; 0.10-0.15 C, 0.95-1.05 Mn, 0.25-0.35 Si, 0.4-0.6 Mo, bal Fe
Welded: 85,000-95,000 TS, 65,000-75,000 YS; 18-22 El; 25-35 RA.
For welding rod; AWS-E8011.

HY-TEST-ROD NO 110.
M-1096; 0.12 C, 0.6 Mn, 0.3 Mo, 0.6-1.0 Cr, bal Fe.
Welded. 110,000 TS, 100,000 YS, 15 El, 20 RA; 200 Brin.
For hard facing electrode; for moderate shock resistance.

HY-TUF
M-38; 0.25 C, 1.3 Mn, 1.5 Si, 1.8 Ni, 0.4 Mo, bal Fe.
Heat treated. 234,000 TS; 193,000 YS; 13 El; 50 RA; 470 Brin
For engineering parts, gears, shafts, tough

HZ32A.
Various foundries; 2.1 Zn, 0.7 Zr, 3.0 Th, bal Mg.
T5-temper: 27,000-30,000 TS, 13,000-14,000 YS; 4-7 El, 57 Brin; 68 Rock E.
At 700°F. 10,000 TS, 7000 YS, 29 El
Magnesium sand castings with good pressure tightness and weldability, some permanent mold
For parts operating at 350-700°F
ASTM B80-69, AMS 4447; QQ-M-56

IA-IA
M-345, M-303, 58-60 Cu, 42-40 Ni, 1.0 Fe + Mn
70,000 TS; 46 El
For resistances, thermocouples, negligible temperature coefficient

I A S INVINCIBLE
M-1406, 1.2 C, 1.6 W, 0.75 Cr, 0.25 Mo, 0.25 V, bal Fe.
For finishing tools, paper and wood working knives; tough, cold work steel.

"IAT" QUALITY.
M-179, Cu, Mn, 0.3 max Pb, bal Zn.
Extruded 75,000 TS, 37,000 YS; 28 El; 20 RA; 130 Brin.
Drawn. 85,000 TS; 42,000 YS, 25 El; 18 RA; 135 Brin.
For hardware; manganese bronze.

ICI 13518.
M-282; 0.25 C, 27.5 Cr, 5.5 Mo, 2.75 Ni, 3 max Fe, bal Co.
Cast: 52,000 TS; 10 El; 340 Brin.
For high temperature applications; heat resistant

ICI 13530.
M-282; 0.5 C, 25.5 Cr, 2 max Fe, 10.5 Ni, 7.5 W, bal Co.
Cast: 50,000 TS; 10 El; 340 Brin.
For high temperature applications; heat resistant.

I.C.I. TITANIUM 115
M-282, 0.010 max H_2, 0.20 max Fe, bal Ti.
Bar: 58,300 max TS; 30 min El.
For high temperature applications, corrosion resistant parts.
Commercially pure titanium.

I.C.I. TITANIUM 120
M-282; 0.010 max H_2, 0.20 max Fe, bal Ti.
Sheet 67,000 max TS; 25 min El.
For high temperature components, corrosion resistant parts
Commercially pure titanium

I.C.I. TITANIUM 125
M-282, 0.010 max H_2, 0.20 max Fe, bal Ti.
Sheet 56,000-78,500 TS, 22 min El.
For high temperature components, corrosion resistant parts
Commercially pure titanium

I.C.I. TITANIUM 130
M-282; 0.010 max H_2, 0.20 max Fe, bal Ti.
Sheet: 56,000-79,000 TS, 22 min El
For high temperature components, corrosion resistant parts.
Commercially pure titanium

I.C.I. TITANIUM 150
M-282, 0.010 max H_2, 0.20 max Fe, bal Ti
Bar 79,000-100,000 TS, 18 El
For high temperature components, corrosion resistant parts
Commercially pure titanium.

I.C.I. TITANIUM 160
M-282; 0.010 max H_2, 0.20 max Fe, bal Ti
Bar 89,000-112,000 TS, 18 El, 40 RA
For high temperature applications, corrosion resistant parts, non-structural aircraft parts
Commercially pure titanium DTD 5063 spec

I.C.I. TITANIUM 230
M-282, 1.8-2.8 Cu, bal Ti
Bar 71,000-100,000 TS, 20 min El
For high temperature applications, corrosion resistant parts.
Good strength retained up to 300°C

I.C.I. TITANIUM 314A
M-282, 3.0-5.0 Al, 3.0-5.0 Mn, bal Ti.
Bar 139,000 min TS, 15 min El.
For jet engine and guided missile components
High strength and good creep resistance, to 300°C

I.C.I. TITANIUM 314C
M-282, 2 Al, 2 Mn, bal Ti
Bar 94,000-117,000 TS, 20 min El.
For high temperature applications, missile and jet engine components
Heat and corrosion resistant

I.C.I. TITANIUM 317
M-282; 4.5-5.5 Al, 2.0-3.0 Sn, bal Ti.
Bar. 116,000 min TS; 10 min El
For aircraft and guided missile components.
Good retention of strength and creep resistance up to 400°C Good weldability.

I.C.I. TITANIUM 318A.
M-282; 5.5-6.5 Al, 3.5-4.5 V, bal Ti
Bar: 139,000 min TS; 10 min El.
For jet engine components, airframe forgings and fasteners.
Good retention of strength and creep resistance to 300°C.

I.C.I. TITANIUM 679
M-282; 2.0-2.5 Al, 0.8-1.2 Mo, 0.1-0.5 Si, 10.5-11.5 Sn, 4.0-6.0 Zr, bal Ti
Bar: 150,000 min TS, 12 min El.
For compressor blades
High creep resistance.

ICN 001.
M-1302; 0.08-0.20 C, 2 max Mn, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed 85,000 TS; 35,000 YS, 60 El, 70 RA; 150 Brin
Cold drawn· 125,000 TS; 95,000 YS, 25 El, 55 RA, 277 Brin
For oil refinery and chemical plant equipment, Type 302, stainless, austenitic.

ICN 164
M-1302, 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Annealed 85,000-95,000 TS; 35,000-45,000 YS, 60-50 El; 75-60 RA, 150-190 Brin
For acid-resistant chemical plant equipment, Type 316, stainless, austenitic

ICN 164 T (Ti)
M-1302, 0.10 C, 16-18 Cr, 10-14 Ni, 1.7-2.7 Mo, Ti, bal Fe
Annealed 85,000-95,000 TS, 35,000-45,000 YS, 60-50 El, 75-60 RA, 150-190 Brin
For acid resistant chemical plant equipment, Type 316 Ti, stainless, austenitic

ICN 472
M-1302, 0.08 max C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe
Annealed 90,000 TS, 45,000 YS, 60 El, 135 Brin
Cold drawn 180,000 TS, 150,000 YS, 10 El; 330 Brin
For chemical plant equipment welded structures; Type 304, stainless, austenitic

ICN 472T
M-1302, 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe
Normalized 93,000 TS; 36,000 YS, 45 El, 60 RA, 165 Brin
Annealed· 87,000 TS, 33,000 YS, 57 El, 73 RA; 155 Brin
For chemical plant equipment, Type 321, stainless, austenitic

IDEAL
40-45 Ni, 1.0-0.66 Fe, 0.45-1.0 Mn, 53.4-58 Cu, 0-0.66 Al.
For resistances, heat resistant

IDEAL (ELALCO)
M-44, 58-53 Cu, 40-45 Ni, 0.6-1.0 Fe, 0.5-1.0 Mn
For electrical resistors, heating elements, heat resistant

IDEAL BC12V.
M-1346, 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies, punches; oil or air hardened, nondeforming

IDEAL BC13V.
M-1346; 1.65 C, 11.5 Cr, 0.1 V, 0.35 Si, 0.3 Mn, bal Fe.
For blanking and forming dies, punches, nondeforming, air hardened.

IDEAL BCK1.
M-1346; 1.45 C, 1.4 Cr, bal Fe
For fast finishing cutters, bearings, liners; water hardened, wear resistant

IDEAL BCK2.
M-1346; 1.0 C, 1.55 Cr, bal Fe.
For bearings, bushings, liners, water hardened, wear resistant.

IDEAL BCK3.
M-1346, 1.05 C, 1.0 Cr, bal Fe

IDEAL BCK4.
M-1346; 1.0 C, 1.1 Cr, bal Fe
For bearings, liners, bushings, sleeves, cutters; water hardened.

IDEAL BCR.
M-1346, 1.05 C, 1.0 Cr, 0.3 Mn, bal Fe
For bearings, liners, pivots, sleeves, water hardened, wear resistant.

IDEAL BCS
M-1346, 0.90 C, Cr, Si, bal Fe.
For bearings, liners, sleeves, water hardened, wear resistant

IDEAL BCZ1
M-1346; 1.4 C, 0.3 Cr, 0.1 V, bal Fe
For bearings, liners, bushings, sleeves, cutters, water hardened

IDEAL BCZ2.
M-1346, 0.90 C, 0.80 Cr, bal Fe
For bearings, liners, bushings, sleeves, cutters, water hardened

IDEAL BDS
M-1346; 0.5 C, 0.9 Mn, 1.05 Cr, 0.1 V, bal Fe
For gears, shafts, springs, crankshafts, oil hardened, shock resistant.

IDEAL BEE
M-1346, 0.15 C, 0.2 Si, 0.4 Mn, bal Fe
Annealed 70,000 TS, 40,000 YS; 25 El, 60 RA, 145 Brin
For gears, pinions, cams, camshafts, case hardening steel

IDEAL BFM
M-1346, 0.70 C, 1.7 Si, 0.70 Mn, bal Fe
For springs, punches, oil hardened, tough.

IDEAL BG1.
M-1346, 1.05 C, 1 Cr, 1.15 W, bal Fe
For bearings, cold work tools, drawing dies, water hardened

IDEAL BG2
M-1346, 0.45 C, Ni, Cr, W, bal Fe.
For cold work tools, upsetters, oil hardened, tough

IDEAL BGW
M-1346, 0.5 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, shafts, crankshafts, bolts, fasteners; oil hardened, shock resistant

IDEAL BHM
M-1346, 0.56 C, Ni, Cr, Mo, V, bal Fe
For gears, shafts, crankshafts, bolts, studs; oil hardened, shock resistant

IDEAL BKS.
M-1346; 0.45 C, Si, Cr, V, bal Fe
For gears, springs, crankshafts, axles, oil hardened, shock resistant

IDEAL BKV
M-1346, 1.0 C, 0.1 V, 0.25 Mn, bal Fe.
For drills, taps, reamers, broaches; Type W2, water hardened

IDEAL BME
M-1346; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, pinions, crankshafts; oil hardened, shock resistant.

IDEAL BMK.
M-1346; 0.85 C, Cr, bal Fe.
For tools, dies, cutters, taps, bearings; water hardened.

IDEAL BMS.
M-1346; 0.53 C, 0.8 Si, 1.05 Mn, bal Fe.
For gears, axles, crankshafts, water hardened.

IDEAL BMV.
M-1346; 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For dies, punches, upsetters, cutters;
oil hardened, nondeforming.

IDEAL BPK2
M-1346; 0.2 C, 1.15 Cr, 1.25 Mn, bal Fe.
For cams, fasteners, camshafts, case hardened

IDEAL BRF1.
M-1346; 0.2 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA;
195 Brin
Cold drawn: 105,000 TS; 85,000 YS, 17 El,
50 RA, 215 Brin.
For turbine blades, valves, cutlery,
surgical instruments; Type 420; stainless

IDEAL BRF2
M-1346, 0.4 C, 13 Cr, 0.4 Si, 0.3 Mn, bal Fe
Annealed. 95,000 TS; 50,000 YS; 25 El, 55 RA,
195 Brin.
For valves, cutlery, surgical and dental instruments,
Type 420, stainless.

IDEAL BSA.
M-1346, 0.38 C, Si, Cr, V, bal Fe
For gears, punches, bolts,
machine tool parts; oil hardened, tough.

IDEAL BSE.
M-1346, 0.15 C, 0.65 Cr, 0.25 Si, 0.5 Mn, bal Fe
For gears, cams, camshafts, fasteners,
case hardening steel, tough

IDEAL BW6.
M-1346; 1.2 C, 0.2 Cr, 0.1 V, 1 W, bal Fe.
For bearings, cutters, sleeves,
water hardened, wear resistant.

IDEAL BWP EXTRA.
M-1346, 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe
For extrusion dies, upsetters, header dies;
oil hardened, tough

IDEAL BWPKO
M-1346; 0.30 C, 2.4 Cr, 2 Co, 0.25 V, 8.5 W,
bal Fe.
For shears, punches, upsetters, header dies;
hot work steel, oil hardened

IDEAL BWP-PRIMA.
M-1346; 0.30 C, 1 Si, 1.1 Cr, 0.18 V, 3.75 W,
bal Fe.
For header dies, crimpers, punches;
oil hardened, tough.

IDEAL BWP SPEZIAL
M-1346, 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For header dies, extrusion dies and rams, shears;
hot work steel, oil hardened

IDEAL BWPU.
M-1346; 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, 0.7 Mn,
bal Fe.
For gears, bolts, crankshafts, fasteners,
oil hardened, tough.

IDEAL EXTRA HART 1.
M-1346; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers' tools, forming and blanking dies;
Type W1; water hardened.

IDEAL EXTRA HART 2.
M-1346, 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 18 El; 38 RA;
220 Brin.
For springs, drills, reamers, taps, tools;
Type W1; water hardened.

IDEAL EXTRA HART 3.
M-1346; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS, 53,000 YS; 21 El;
42 RA; 200 Brin.
For springs, tools, drills, taps, cutters;
Type W1, water hardened.

IDEAL EXTRA HART 4.
M-1346; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS, 145,000 YS; 10 El,
30 RA; 400 Brin
For springs, drills, cutters, tools, punches;
Type W1, water hardened

IDEAL EXTRA HART 5
M-1346, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS, 128,000 YS, 12 El,
37 RA, 355 Brin
For springs, rails, punches, tools, axes,
Type W1, water hardened

IDEAL NIT 1
M-1346, 0.26 C, 1.4 Cr, 1.1 Al, 0.6 Mn, bal Fe
For oil refinery equipment,
creep and heat resistant

IDEAL NIT 3
M-1346, 0.34 C, 1.4 Cr, 1.1 Al, 0.6 Mn, bal Fe
For oil refinery equipment, creep and heat resistant

IDEAL NIT 7
M-1346, 0.32 C, 1.1 Cr, 1.1 Al, 0.18 V, 0.6 Mn,
bal Fe
For oil refinery equipment,
creep and heat resistant.

IDEAL NIT 9
M-1346, 0.33 C, 1.7 Cr, 1.0 Ni 0.5 Mn, bal Fe
For dies, upsetters, punches, shafts,
oil hardened, shock resistant

IDEAL NIT 11
M-1346; 0.31 C, 0.6 Mn, 2.35 Cr, 0.18 Mo, bal Fe
For gears, dies, crankshafts, oil hardened, tough

IDEOR
M-40, M-487, 0.4 C, 2 W, 1 Cr, 1 Si, 0.3 Mn,
bal Fe
For chisels, punches, rivet sets, shears, picks,
Type S1, tough

IDEOR SPECIAL
M-487, 0.5 C, 1 Cr, 2 W, 0.15 V, bal Fe
For blanking and piercing dies,
shock resistant, oil hardened

IDIART
3 C, 2 Si, bal Fe.
For compressor pistons; cast iron

IDRONAL
Italian, 7 Mg, bal Al
For marine parts, resists sea water corrosion

IDRONAL
Italian, 5 Mg, 1 Si, bal Al.
For marine parts; resists sea water corrosion

IGEDUR
M-78, 0.2-2.0 Mg, 3.5-5.5 Cu, 0.2-1.0 Si, 0.1-1.2 Mn,
bal Al
For light alloy parts, Duralumin type.

IGETALLOY
M-1515, WC.
For cutting tools; sintered carbide.

IGNIDUR PC8.
M-1325, 0.3 C, 2.2 Si, 6 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

IGNIDUR PC9.
M-1325; 0.5 C, 1.5 Si, 17 Cr, bal Fe.
Annealed: 100,000 TS; 60,000 YS; 20 El;

38 RA; 210 Brin.
For valve parts, cylinder liners, furnace parts; Type 440; stainless, hardenable.

IGNIDUR PC10.
M-1325; 0.6 C, 1.5 Si, 22 Cr, bal Fe.
For cylinder liners, rollers, bushings, furnace parts; heat resistant.

IGNIDUR PC11.
M-1325; 1.3 C, 1.5 Si, 29 Cr, bal Fe.
For bushings, valve parts, rollers; heat and wear resistant.

IGNIDUR PC12
M-1325; 0.6 C, 1.5 Si, 29 Cr, bal Fe.
Cast: 90,000 TS, 65,000 YS; 2 El; 212 Brin.
For cylinder liners, bushings, valve seats, furnace parts; heat resistant.

IGNIDUR PK4
M-1325; 0.4 C, 1 3 Si, 27 Cr, 4 Ni, bal Fe.
Cast 70,000 TS; 65,000 YS; 2 El; 190 Brin.
Heat treated: 115,000 TS; 80,000 YS; 15 El.
For furnace parts, grate bars, salt pots, baffles; heat resistant.

IGNIDUR PK9
M-1325; 0.4 C, 2 Si, 22 Cr, 9.5 Ni, bal Fe
Cast: 85,000 TS; 45,000 YS; 35 El; 165 Brin.
For heat treating boxes, baskets, chains, conveyors, belts, corrosion and heat resistant; Type HF

IGNIDUR PK14
M-1325; 0 4 C, 2 Si, 26 Cr, 14 Ni, bal Fe.
Cast· 75,000 TS; 47,000 YS; 17 El, 25 RA; 200 Brin
For furnace parts, heat treating boxes, salt pots, belts, Type HH, corrosion and heat resistant

IGNIDUR PK19.
M 1325, 0 4 C, 2 Si, 25 Cr, 19 Ni, bal Fe
Cast 75,000 TS, 50,000 YS, 17 El, 170 Brin
Aged 85,000 TS, 50,000 YS; 10 El; 190 Brin.
For furnace parts, retorts, skids, rabble arms; Type HK, corrosion and heat resistant.

IGNIDUR PK30.
M-1325; 0 5 C, 1.8 Si, 25 Cr, 30 Ni, bal Fe.
For furnace parts, heat treating boxes; heat and corrosion resistant

IGNITION PIN ALLOY-1.
Eng ; 61 Ce, 39 Fe
For ignition pins, pyrophoric

IGNITION PIN ALLOY-2
Eng ; 73-70 Ce, 1.6-6 0 Fe, 17-24 Zn, 0-2.4 Al.
For ignition pins; pyrophoric

IH-50
M-1613; 0 22 max C, 1.5 max Mn, 0.7 max Si, 0 20 min Cu, bal Fe.
Plate· 75,000 min TS; 50,000 min YP, 20 El.
For earth moving and agricultural equipment, tractors, trucks, trailers, bridges, bus bodies.
Good fabricability and weldability.
Good fatigue strength and ductility.

IH-65.
M-1613; 0.22 max C, 1 5 max Mn, 0.7 max Si, 0.20 min Cu, 0 01 min Cb, bal Fe.
Plate: 90,000 min TS; 65,000 min YP, 18 El.
For earth moving and agricultural equipment, tractors, trucks, trailers.
Good fabricability and weldability.
Good fatigue strength and ductility.

IHX-42.
M-1613; 0.21 C, 1.35 Mn, 0.01 min Cb or V, bal Fe.
60,000 min TS; 42,000 min YS, 24 min El.
For structural parts.

IHX-45.
M-1613; 0.20 max C, 1.0 max Mn, 0.10 max Si, 0.01 min Cb or V, bal Fe.
Plate· 60,000 min TS; 45,000 min YS; 22 El.
For earth moving and agricultural equipment, trucks, trailers, tractors, mine cars.
High strength, low alloy steel.

IHX-50.
M-1613; 0.22 max C, 1.1 max Mn, 0.1 max Si, 0.01 min Cb or V, bal Fe.
Plate; 65,000 min TS; 50,000 min YP; 20 El.
For earth moving and agricultural equipment, mine cars, trucks, trailers, derricks, booms.
Shock resistant.

IHX-55.
M-1613; 0.24 max C, 1.4 max Mn, 0.3 max Si, 0 01 min Cb or V, bal Fe.
Plate. 70,000 min TS; 55,000 min YP; 18 El.
For earth moving and agricultural equipment, trucks, trailers, tractors, booms, mine cars.
Shock resistant.

IHX-60
M-1613; 0.26 max C, 1.55 max Mn, 0.3 max Si, 0.01 min Cb or V, bal Fe
Plate: 75,000 TS; 60,000 YP; 18 El
For earth moving and agrictural equipment, trucks, trailers, tractors, booms, mine cars.
Shock ersistant.

IHX-65
M-1613; 0.26 max C, 1.6 max Mn, 0.3 max Si, 0 01 min Cb or V, bal Fe.
Plate. 80,000 min TS; 65,000 min YP; 17 El.
For earth moving and agricultural equipment, tractors, trailers, booms, mine cars.
Shock resistant.

IHX-70.
M-1613, 0 26 max C, 1.65 max Mn, 0.30 max Si, 0 01 min Cb or V, bal Fe
Plate· 85,000 min TS; 70,000 min YP; 16 El.
For earth moving and agricultural equipment, tractors, trailers, mine cars, buildings
Shock resistant.

IH-WX STEEL
M-1613, 0 09 max C, 0.75-1 05 Mn, 0.05-1.0 P, 0 24-0.33 S, bal Fe
For screw machine products, fasteners, hardware, cams.
Free-machining, case-hardening.

IK
French, 4.5 Cu, bal Al.
64,000 TS; 5 El, 110 Brin.
For light alloy parts.

IK1.
M-459; 0 1 C, Ti, bal Fe.
For chromizing surface treat.

IK STEELS.
German, C, Cr, bal Fe.
For heat and corrosion resistant parts; chromized steel, surface layer.

ILLINOIS NICKEL STEEL.
M-240; 0.3-0.4 C, 3.5 Ni, bal Fe.
Hot rolled: 85,000-100,000 TS; 50,000-60,000 YS; 18 El; 25 RA.
For dredging cranes, motor truck frames, elevators, power shovels; oil hardening, tough.

ILLIUM 98
M-1262; 55 Ni, 28 Cr, 8 0 Mo, 5.0 Cu, 0.05 C.
Cast: 54,000 TS; 41,000 YS; 18 El; 22 RA; 143 Brin.
For acid pumps, hardware, impellers, valves, nozzles; resists sulphuric acid.

ILLIUM 98LSi.
M-1262; 50.25-62.50 Ni, 26.0-30.0 Cr, 7.5-9.0 Mo,
4.0-6.5 Cu, 1.5 max Mn, 0.50 max Si,
1.5 max Fe, 0.07 max C.
Cast: 54,000 TS; 41,000 YS; 18 El; 22 RA, 160 Brin.
Solution Heat treated: 78,000 TS, 43,000 YS;
43 El; 39 RA; 150 Brin.
For fluorine service. Corrosion resistant casting alloy.

ILLIUM-B.
M-1262; 28 Cr, 0.05 C, 8 Mo, 5 Cu, 5 Fe, bal Ni.
Cast: 60,000 min TS, 41,000 min YS; 0.5 El;
221-420 Brin.
Hardenable, max wear and galling resistance;
resists sulphuric acid; For pumps, valves,
chemical plant equipment.

ILLIUM-G
M-29, M-1262; 0.2 C, 22 Cr, 5 Fe, 6 Mo, 5 Cu,
bal Ni.
Cast: 60,000 min TS; 35,000 min YS; 5 El;
159 Brin
Excellent resistance to corrosion from hot H_2SO_4,
H_3PO_4, acid-salt mixtures, sea water.
For pumps, valves, chemical and marine equipment

ILLIUM-H.
M-1262, 0.1 C, 0.18 Ti, 0.6 Cb, 26-30 Cr, 47-52 Co,
bal Fe
Cast: 135,000 TS; 48,000 YS, 10 El, 10 RA;
257 Brin.
Wrought 132,000 TS; 61,000 YS, 7 El, 6 RA,
350 Brin.
For furnace baffles, burner tips,
sintering grates, quench baskets.
Corrosion, heat and thermal shock resistant.

ILLIUM-M.
M-1262; 0.08 C, 28 Mo, bal Ni.
Cast: 72,000 min TS; 46,000 min YS; 6 El, 190 Brin.
Resists halogen chemicals and HCl
For chemical plant equipment.

ILLIUM-P.
M-1262, 28 Cr, 8 Ni, 3 Cu, 2 Mo, bal Fe.
Cast: 99,000-110,000 TS, 65,000-81,000 YS,
10-18 El, 217-255 Brin
Resists erosion and corrosion by mixed acids;
resists phosphoric acid
For chemical plant equipment.

ILLIUM-PD
M 1262, 0.08 C, 26 Cr, 5 Ni, 2 Mo, bal Fe
Cast: 95,000 min TS, 65,000 min YS, 30 El,
212 Brin.
High erosion-corrosion resistance; for equipment in
pulping liquors, dairy and chemical plants.

ILLIUM-R.
M-29 & M-1262; 68 Ni, 3 Cu, 1 Fe, 21 Cr, 5 Mo,
0.05 C, 1.25 Mn, 0.7 Si
Annealed 105,000 TS, 55,000 YS; 45 El, 240 Brin
Cold Drawn. 150,000 TS, 100,000 YS; 12 El,
365 Brin.
For chemical plant equipment, kettles,
pumps, spray nozzles.
Resists strong acids and thermal shock

ILLIUM-W.
M-1262; 0.15 C, 6 Fe, 4 W, 17 Mo, 16 Cr, bal Ni.
Cast: 72,000 TS; 46,000 YS; 4 El.
For chemical equipment; resists Cl_2, H_2SO_4,
and HNO_3.

ILLIUM-X.
M-1262; 0.75 C, 29 Cr, 14 W, 55 Co
Cast: 100,000 min TS, 90,000 min YS; 2 El;
293 Brin.
Corrosion and abrasion resistant, particularly for
equipment for dry battery manufacture.

ILSSA AT-15.
M-1452, 0.25 max C, 25 Cr, 20 Ni, 1.5 max Si,
bal Fe.
Annealed: 100,000 TS; 45,000 YS, 50 El; 65 RA;
185 Brin.
For furnace parts, valves, pumps, jet engine parts;
Type 310; corrosion and heat resistant

ILSSA IC
M-1452, 0.09-0.12 C, 13 Cr, 0.5 max Si, bal Fe.
Annealed: 75,000 TS, 40,000 YS; 35 El; 70 RA;
155 Brin
For turbine blades, valves, cutlery,
surgical instruments; Type 403 and 410;
corrosion resistant

ILSSA ICC.
M-1452, 0.13-0.25 C, 17 Cr, bal Fe.
Annealed 90,000 TS, 55,000 YS, 20 El; 45 RA;
170 Brin.
For oil refinery equipment, oil burners and heaters;
Type 430, corrosion resistant.

ILSSA ICMS
M-1452, 0.10 max C, 17 Cr, 1.5 Mo, bal Fe
Annealed: 90,000 TS, 55,000 YS, 20 El; 45 RA;
170 Brin
For oil refinery equipment, oil burners and heaters,
corrosion resistant.

ILSSA ICS
M-1452, 0.07-0.12 C, 17 Cr, bal Fe
Annealed 80,000 TS, 50,000 YS, 25 El, 50 RA,
150 Brin
For oil refinery equipment, oil burners and heaters,
Type 430, corrosion resistant

ILSSA IN
M-1452, 0.11-0.16 C, 18 Cr, 8 Ni, bal Fe.
Annealed 80,000 TS, 35,000 YS, 55 El, 75 RA,
150 Brin
For chemical plant equipment, tanks, mixers,
agitators; Type 302; stainless, austenitic

ILSSA INF 20
M 1452, 0.35 max C, 25 Cr, bal Fe
Annealed 85,000 TS, 50,000 YS; 30 El, 55 RA,
180 Brin
For furnace parts and equipment,
heat treating boxes, Type 446, heat resistant

ILSSA INF 25/5
M-1452, 0.12 max C, 26 Cr, 4 Ni, bal Fe
Cast 90,000 TS; 65,000 YS, 2 El, 212 Brin.
For cylinder liners, bushings, valve seats and bodies,
Type CC50, corrosion and heat resistant

ILSSA INI.
M-1452, 0.08 max C, 18 Cr, 8 Ni, bal Fe
Annealed 85,000 TS, 35,000 YS, 60 El, 70 RA;
150 Brin
For chemical plant equipment, tanks, mixers, filters;
Type 304, stainless, austenitic

ILSSA INI/BC
M 1452, 0.05 max C, 18 Cr, 8 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS, 60 El, 70 RA,
150 Brin.
For chemical plant equipment, tanks, mixers,
Type 304; stainless, austenitic.

ILSSA INI.
M-1452, 0.08-0.20 C, 18 Cr, 9 Ni, 2.5 Si, bal Fe.
Annealed: 85,000 TS, 40,000 YS; 50 El; 70 RA,
160 Brin
For chemical plant and oil refinery equipment, Type
302B, stainless, austenitic.

ILSSA INMI.
M 1452; 0.12 max C, 18 Cr, 10 Ni, 2.5 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA;
160 Brin.

For acid resistant chemical plant equipment; Type 316; stainless.

ILSSA INS.
M-1452; 0.08-0.15 C, 18 Cr, 9 Ni, P, S, Se, Zr, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 40 El; 60 RA; 160 Brin.
For screw machine products, shafts; Type 303; stainless, free-cutting.

ILSSA MIC
M-1452; 0.26-0.37 C, 13 Cr, bal Fe
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; corrosion resistant

ILZRO-12.
M-130, 11.0-13.0 Al, 0.5-1.25 Cu, 0.01-0.03 Mg, bal Zn
Sand cast 43,000 TS; 30,000 YS; 2.0-3.5 El; 95-113 Brin
Chill cast 51,000 TS, 30,000 YS; 5.0-7.0 El, 95-113 Brin
Good properties cast in sand, plaster or permanent mold.

ILZRO-12
M-1661; 11-13 Al, 0.5-1.25 Cu, 0.01-0.03 Mg, bal Zn
Chill cast 50,000-53,000 TS, 30,000-31,000 YS; 5-7 El
Sand cast. 41,000-45,000 TS; 30,000-31,000 YS; 2-3.5 El
For general purpose castings, housings, instrument cases, fuel pumps, automotive parts.
Insensitive to cooling rate Low casting temperature.

ILZRO-14
M-130, 0.01-0.03 Al, 1.0-1.5 Cu, 0.25-0.30 Ti, bal Zn
Die cast 33,000 TS, 20,000 YS, 5.0-6.0 El, 71-77 Brin
Good creep strength at ambient and elevated temperatures.

ILZRO-14
M-1661, 1.0-1.5 Cu, 0.25-0.30 Ti, 0.01-0.03 Al, bal Zn
Die cast 33,000 TS, 5-6 El; 20,000 YS, 79-86 Vickers
For die castings, carburetors, fuel pumps, valve bodies Creep resistant

ILZRO-16
M-1661, 1.0-1.5 Cu, 0.15-0.25 Ti, 0.10-0.20 Cr, 0.1-0.04 Al, bal Zn
Die cast 33,000 TS; 5 El, 84 Vickers
For automobile die castings
Good creep resistance at high temperatures.

IMACTO
M 1636, 0.20 C, 0.8 Mn, 0.55 Ni, 0.50 Cr, 0.20 Mo, bal Fe.
Heat treated: 121,000 TS, 84,500 YS; 19 El; 248 Brin.
For carburized splined shafts, piston pins, cam shafts, guide pins, ratchets.
Tough, case hardening steel

IMI 100
M-1578; 99.95 Cu (including Silver), oxygen free.
Bar, sheet, strip, wire.
For thermionic valves, transistors, welding and brazing wire, glass-metal seals, high conductivity and ductility; not subject to hydrogen embrittlement during annealing and brazing.
ASTM B170; BS 1861 2873.C103 (wire).

IMI 103.
M-1578; 99.9 min Cu (including silver).
Electrolytic tough pitch copper wire, sheet, strip.
Standard copper for electrical purposes and stampings, spinning etc Ductile, high conductivity.
BS 125,128,1432-3: 2873.C101 (Wire).

IMI 111.
M-1578; 99.9 min Cu, (including silver).
Fire refined tough pitch copper.
For electrical applications and cold heading wire, and rods for bus bars.
BS1037/2870 C102 etc.; ASTM B5, B124 etc.

IMI 125.
M-1578; Sulphur addition to copper.
Sulphur copper bar and rod
Improved machinability; good conductivity.

IMI 131.
M-1578, Cu, phosphorus deoxidized, non-arsenical.
Ductile and corrosion resistant; for severe heading and forming.
Drawn shapes, rod, bar, sheet and strip.
ASTM B152 (DHP), BS 2870 C106.

IMI 145
M-1578; 99.8 Cu, 0.2 Cd
High conductivity copper for radiator fin manufacture

IMI 146
M-1578; 99.85 min Cu, 0.3-0.5 As, 0.013-0.05P.
Phosphorized deoxidized arsenical copper.
Used in some chemical plants where resistance to scaling is desirable; rods, strip and sheet
BS 2870-C 107

IMI 151.
M-1578, 99.85 Cu, 0.05 Ag
Higher softening temperature to resist softening during tinning and soldering, for electrical commutators, for printers engraving plates.
ASTM B152-STP.

IMI 153 (Kufil)
M-1578, 99 Cu, 1 Ag
Rods, spooled wire or slittings; for oxyacetylene welding of copper.
BS 1453 C1

IMI 156 (Nitrofil)
M-1578, 99.4 Cu, 0.3 Al, 0.3 Ti
For nitrogen arc welding of copper
BS 2901 C8

IMI 161 (Borofil)
M-1578, 99.92 Cu, 0.08 B
For argon arc welding of copper, retaining high conductivity.
BS 2901 C21

IMI 166
M-1578; Cd addition to copper.
Increased strength and hardness while still retaining high conductivity
For line wire, trolley wires, overhead conductors, welding tips
BS 23,175,672,2755,2870 C108,2873.C108.

IMI 171 (Kumium).
M-1578; Chromium addition to copper
Heat treatable alloy retaining strength up to 350°C with high electrical conductivity
For electrode tips for resistance welding; for certain electronic applications.
ASTM F268 (Chromium copper).

IMI 176 (ARGOFIL).
M-1578; 99.5 Cu, 0.25 Si, 0.25 Mn.
For argon arc welding of copper.
BS 2901.C7; ASTM B225,B259.

IMI 195.
M-1578; Copper containing small amounts Pb.
Improved machinability while still
retaining good electrical and thermal conductivity.
Called leaded copper.

IMI 203.
M-1578; 97 Cu, 3 Zn.
Considered to be copper deoxidized with zinc;
called "cap copper" because of wide use
for ammunition priming cap cups and other small
pressings. Weldable by TIG.
BS 2870 CZ.125.

IMI 210.
M-1578; 90 Cu, 10 Zn.
Known as 90/10 Gilding metal and as
"commercial bronze.".
For ornaments, imitation jewelry.
BS 2870 CZ.101; ASTM B36-220.

IMI 215.
M-1578; 85 Cu, 15 Zn.
Known as 85/15 Gilding metal or as "red brass".
For ornamental work, vanity cases,
piping for carrying liquids,
diaphragms and bellows.
BS 2870 CZ.102; ASTM B36-230.

IMI 220.
M-1578; 80 Cu, 20 Zn.
Known as 80/20 Gilding metal and as "low brass".
For architectural work, costume jewelry,
strip for slide fasteners, diaphragms, bellows,
wire for Fourdrinier wire cloth.
BS 2870 CZ.103; ASTM B36-240.

IMI 230 (Cartridge Brass).
M-1578; 70 Cu, 30 Zn.
High ductility for deep drawing into cartridge cases,
rivets, screws, lamp fixtures, pen and pencil parts
and many similar drawn or formed parts.
BS 2870 CZ.106; ASTM B36-260.

IMI 235.
M-1578; 65 Cu, 35 Zn.
As sheet and strip for general commercial presswork
and general coppersmith work.
BS 2870 CZ.107; ASTM B36-268.

IMI 236.
M-1578; 64 Cu, 36 Zn.
As sheet and strip for general commercial presswork
and general coppersmith work.

IMI 237.
M-1578; 63 Cu, 37 Zn.
Wire and drawn shapes for cold forming of screws,
rivets and cold headed products.
BS 265; 2870.CZ108; 2873.CZ108; ASTM B19.

IMI 239.
M-1578; 61 Cu, 39 Zn.
Often called "pin wire"
because of use in making brass pins.

IMI 240.
M-1578; 60 Cu, 40 Zn.
Wire and rod for brazing ferrous and
non-ferrous materials; yellow brass.
BS 1845.C23.

IMI 306 ('Alumbro').
M-1578; 76 Cu, 22 Zn, 2 Al, 0.04 As.
Arsenic inhibited aluminum brass
to meet stringent operating conditions
common in marine condensers; also evaporators,
boat sheathing and instrument bellows.
BS 2870. CZ.110; ASTM B111.

IMI 345.
M-1578; Zn, Sn, bal Cu.
Wire for safety pins, decorative pins,
spectacle frames.

IMI 360 (Naval Brass).
M-1578; 62 Cu, 1.25 Sn, bal Zn.
Sheet, strip, bar for underwater fittings for ships
and other marine hardware.
BS 250, 409 2872.CZ112, 2874.CZ112.
ASTM B171.

IMI 365.
M-1578; 60 Cu, 0.75 Sn, bal Zn.
Sheet and strip for underwater fittings
for ships and general marine hardware.
BS 2870.CZ.113; ASTM B21A.

IMI 388.
M-1578; 59.4 Cu, 0.3 Si, 40.3 Zn.
Wire and rod for brazing ferrous and
non-ferrous materials; called "silicon brass".
BS 1845.C26.

IMI 410.
M-1578; 64 Cu, 1 Pb, bal Zn.
Leaded brass strip, particularly for stamped
and machined watch, clock and instrument parts;
called "clock and matrix brass".
BS 2870.CZ.116.

IMI 421
M-1578; 63 Cu, 1 Pb, bal Zn.
Called "matrix and key brass". For key blanks,
watch, clock and instrument parts;
free machining.

IMI 432.
M-1578; Leaded brass wire.
Called "nipple wire". For cold heading,
riveting and cold forming
BS 2873.CZ119; ASTM B146.

IMI 433.
M-1578; 62 Cu, 2 Pb, bal Zn.
Strip is called "clock brass",
wire is heading and drilling wire.
For mild cold work; free machining; clock and
instrument work.
BS 2800 CZ119, ASTM B121-353.

IMI 441.
M-1578; 61 5 Cu, 3 25 Pb, bal Zn.
Leaded brass rod and extruded or drawn sections
for easy machining to bolts, nuts, screws, fittings.
ASTM B16.

IMI 442.
M-1578; 61.25 Cu, 2.5 Pb, bal Zn.
Leaded brass rod and extruded or drawn sections
for easy machining to bolts, nuts, screws,
fittings; limited deformation.

IMI 443
M-1578; 61 Cu, 0.25 Pb, bal Zn.
Low leaded wire called "shoe rivet wire",
main use is upsetting to shoe rivets,
and heading operations where some machining
is required.

IMI 444.
M-1578; 61 Cu, 1 Pb, bal Zn.
Free machining brass sheet called "engraving brass";
For ornamental work, plaques.

IMI 445.
M-1578; 61 Cu, 1.5 Pb, bal Zn.
Sheet and strip, called "rule brass". For engraving,
key blanks, watch and clock parts.

IMI 452 (Muntz Metal).
M-1578; 60 Cu, 0.5 max Pb, bal Zn.
Rod and extruded or drawn sections for cold work, bending, riveting, machining.
BS 1949 2872 CZ123; 2874.CZ123.

IMI 453.
M-1578; 60 Cu, 0 7 max Pb, bal Zn.
Rod and extruded or drawn sections, called "special bending brass", for cold forming and machining
BS 1949 2872.CZ123; 2874.CZ123

IMI 456.
M-1578, 59 Cu, 0.75 Pb, bal Zn.
Rod and extruded or drawn sections called "riveting quality brass". For upsetting, stamping and limited turning.
BS CZ9B/12872.CZ119; 2874 CZ119.

IMI 458
M-1578; 59 Cu, 2 Pb, bal Zn
Strip, called "clock brass". For stamped parts requiring machining to make clock and instrument parts
BS 2870 CZ120

IMI 467
M-1578; 57 75 Cu, 2 25 Pb, bal Zn.
Rod and extruded or drawn sections for hot stamping and forging, free machining.
BS 218 2872 CZ122; 2874 CZ122

IMI 469
M-1578, 57.5 Cu, 3 25 Pb, bal Zn
Rod and extruded or drawn sections for easy machining to bolts, nuts, screws and fittings
BS 249 2872 CZ121; 2874 CZ121

IMI 506 (Nickel Silver).
M-1578, 65 Cu, 18 Ni, 17 Zn
Wire and drawn shapes for decorative purposes, springs, fishing tackle, ductile, malleable, machinable, corrosion resistant
BS 790, 1824, 2870, 2873; ASTM B122, B206

IMI 511 (Nickel Silver)
M-1578, 62 Cu, 10 Ni, 28 Zn
Wire, drawn shapes, sheet for decorative purposes, jewelry, tableware, fishing tackle, ductile, malleable, machinable, corrosion resistant
BS 2870 NS 103, ASTM B122, B206,
BS 790, 1824, 2873

IMI 512 (Nickel Silver).
M-1578; 62 Cu, 12 Ni, 26 Zn
Wire, drawn shapes, sheet for decorative purposes, jewelry, slide fasteners, nameplaces; ductile, malleable, machinable, corrosion resistant
BS 790, 1824, 2870, 2873, ASTM B122, B206

IMI 513 (Nickel Silver)
M-1578; 62 Cu, 15 Ni, 23 Zn.
Wire and drawn shapes for decorative purposes, tableware, jewelry; ductile, malleable, machinable, corrosion resistant.
BS 790, 1824, 2870, 2873; ASTM B122, B206.

IMI 514 (Nickel Silver).
M-1578, 62 Cu, 18 Ni, 20 Zn
Wire, drawn shapes and sheet for decorative purposes, tableware, name plates, engraving plates, springs; ductile, malleable, machinable, corrosion, resistant
BS 790, 1824, 2870, 2873; ASTM B122, B206.

IMI 515 (Nickel Silver)
M-1578; 62 Cu, 20 Ni, 18 Zn.
Wire and drawn shapes for decorative purposes, tableware, springs for electronics and telecommunications; ductile, malleable, machinable, corrosion resistant.
BS 790 1824 2870 2873: ASTM B122. B206.

IMI 525.
M-1578; Brass plus 10% Ni.
Nickel brass rod, stamping grade; good white color for sanitary fittings.
ASTM B124-55 alloy 14.

IMI 551.
M-1578; Free machining brass plus 10% Ni.
Nickel brass rod, free turning grade, good white color for sanitary fittings.
BS (near) 2872.NS101, 2874.NS101

IMI 575 ("Kutherm" 3).
M-1578, Resistance alloy wire, maximum continuous operating temperature 150°C; for electric blankets, under-road, under-ramp heating.

IMI 576 ("Kutherm" 10)
M-1578, Resistance alloy wire, maximum continuous operating temperature 250°C; for "Cold tails" electric blankets, under-road, under-ramp heating

IMI 579 ("Kutherm" 26).
M-1578; Resistance alloy wire, maximum continuous operating temperature 250°C, for electric blanket heating cables, fixed resistance, space heating systems

IMI 581 ("Kutherm" 41)
M-1578, Resistance alloy, intermediate electrical resistivity, outstanding stability up to 350°C, for heating cables, thermocouples, space heating systems

IMI 651
M-1578, 99 Cu, 1 Sn
Conductivity bronze wire, for high strength conductors, rivets and chains

IMI 656
M-1578, 95 Cu, 5 Sn, P
Phosphor bronze sheet, various tempers, for springs and stampings in textile, paper and chemical plant operations
BS 2870 PB.102, ASTM B 103-Al

IMI 657
M-1578, 95 Cu, 5 Sn, P
Phosphor bronze wire, various tempers.
For springs, electrical contacts, switch parts, chains, welding wire
BS 369, 384, 407 etc, ASTM B103, B159, B225.

IMI 658
M-1578, 93 Cu, 7 Sn, P
Phosphor bronze sheet, various tempers; for springs and stampings.
BS 2870 PB 103

IMI 659
M-1578, 93 Cu, 7 Sn, P
Phosphor bronze wire, various tempers, for flat and coiled springs, welding wire, Fourdrinier cloth warp
BS 2873 PB103 etc; ASTM B103, B159, B225

IMI 660 (Carobronze)
M-1578, 92 Cu, 8 Sn.
Tin bronze wire and drawn shapes for bushes and piston rings.

IMI 661.
M-1578, 62 Cu, 8 Sn, P.
Phosphor bronze wire. for Fourdrinier cloth warp

IMI 705 ("Everdur" A).
M-1578; 96 Cu, 3 Si, 1 Mn.
Good strength bars and rods, weldable, and corrosion resistant to weak acids; for screws, bolts, nuts, particularly marine.
Sheet for chemical plant tanks; welding wire.
BS 1948 2872.CS101; 2874.CS101; ASTM B98.

IMI 757.
M-1578; 93 Cu, 7 Al.
Aluminum bronze welding wire;
for welding aluminum bronzes. BS 2901.C12.

IMI 758 ("Silvabronze").
M-1578; 92.6 Cu, 7 Al, 0.3 Sn, 0.1 Ag.
Bronze strip, good resistance to flue gas condensates
and to stress corrosion,
particularly in chloride-contaminated waters.

IMI 837 (Cupro-Nickel).
M-1578; 94 Cu, 6 Ni.
Wire and drawn shapes; good strength,
ductility and resistance to corrosion.

IMI 838 (Cupro-Nickel).
M-1578; 90 Cu, 10 Ni.
Wire and drawn shapes; good strength,
ductility and resistance to corrosion.
BS 374.

IMI 842 (Cupro-Nickel).
M-1578; 80 Cu, 20 Ni.
Wire and drawn shapes; good strength,
ductility and resistance to corrosion.
BS 374; ASTM B122.

IMI 848 (Cupro-Nickel).
M-1578, 75 Cu, 25 Ni
Coinage alloy.
BS 2870 CN 105.

IMI 849 (Cupro-Nickel).
M-1578; 70 Cu, 30 Ni
Wire and drawn shapes, good strength,
ductility and resistance to corrosion.
BS 374; ASTM B122.

IMI 885 ('Kunifer' 10).
M-1578; 87 Cu, 10 Ni, 2 Fe, 1 Mn
Sheet and strip for marine parts;
good strength and corrosion resistance,
especially against sea water; also for
heat exchangers.
BS 2870 CN.102.

IMI 891 ('Kunifer 5T').
M-1578; 5 Ni, 1.3 Fe, 0.2-0.5 Ti, bal Cu.
Welding wire, for Argon arc welding of 'Kunifer' 5
and 95/5 cupro-nickel.
BS 2901 C19.

IMI 892 ('Kunifer 10T').
M-1578; 10 Ni, 1.5 Fe, 0.8 Mn, 0.2-0.5 Ti, bal Cu.
Welding wire, for Argon arc welding
of 'Kunifer' 10 and 90/10 cupro-nickel.

IMI 893 ('Kunifer 30 T').
M-1578; 30 Ni, 0.5 Fe, 0.8 Mn, 0.2-0.5 Ti, bal Cu.
Welding wire for Argon arc welding of
'Kunifer' 30 and 70/30 cupro-nickel.
BS 2901.C18.

IMI 895 ('Kunifer' 30).
M-1578; 68.25 Cu, 30 Ni, 0.75 Fe, 1.0 Mn.
Sheet and strip for marine parts;
good strength and corrosion resistance,
especially against sea water.
Also for heat exchangers.
BS 2870 CN.107.

IMI 981.
M-1578; Tin coated tough pitch or
oxygen free HC copper.
For electrical windings and conductors
that have to be soldered.
BS 128; ASTM B33.

IMI TITANIUM 115.
M-1578; Commercially pure titanium.
Sheet, strip, bar, wire, extrusions.
42,500-60,000 TS; 29,000 YS; 25 El.
Ductile, formable, corrosion resistant.
BS TA 1; DTD 501 3B.

IMI TITANIUM 125
M-1578, Commercially pure titanium.
Sheet, bar, tubes.
54,000-78,000 TS; 42,500 YS; 22 El.
Ductile, formable, corrosion resistant.
BS TA 2,3,4,5; AMS 4902 etc.

IMI TITANIUM 130.
M-1578, Commercially pure titanium
Sheet, strip, bar, wire, extrusions, tubes (welded).
67,000-90,000 TS; 49,000 YS, 20 El
Corrosion resistant, formable
DTD 5003B, 5023B; AMS 4900B.

IMI TITANIUM 155
M-1578, Commercially pure titanium.
Sheet: 83,000-105,000 TS; 67,000 YS; 15 El
Corrosion resistant; slight forming only
BS TA6; AMS 4901, 4921.

IMI TITANIUM 160
M-1578, Commercially pure titanium
Bar, wire, extrusions
78,000-108,000 TS, 63,000 YS; 15 El.
Corrosion resistant
BS TA 7,8,9, AMS 4921.

IMI TITANIUM 230.
M-1578, 2.5 Cu, bal Ti
Sheet, bar, wire, extrusions.
Annealed 78,000-112,000 TS; 67,000 YS; 15 El
Sol tr & age: 110,000-134,000 TS; 80,000 YS,
10 El
Fatigue limit. 60-65% of TS
Formable, corrosion resistant
DTD 5233, 5243, 5253, 5263,
BS TA21,22,23,24

IMI TITANIUM 260
M-1578; Pd (slight), bal Ti
Sheet: 42,500-60,000 TS, 29,000 YS, 25 El
Improved resistance to non-oxidizing acids.

IMI TITANIUM 315.
M-1578, 2 Al, 2 Mn, bal Ti
Bar: 94,000-116,000 TS, 67,000 YS, 20 El
Fatigue limit: 60-65% of TS.
DTD 5043B

IMI TITANIUM 317
M-1578, 5 Al, 2.5 Sn, bal Ti.
Sheet, bar, extrusions.
118,000-157,000 TS, 112,000 YS; 10 El
Weldable, high strength.
BS TA14,15,16,17, AMS 4910, 4926 etc

IMI TITANIUM 318
M-1578; 6 Al, 4 V, bal Ti
Sheet, bar, wire, extrusions, rod.
Rod: 130,000-168,000 TS; 120,000 YS; 8 El.
(variable properties with varying heat treatment).
Fatigue limit: 50-60% of TS
Most popular titanium alloy;
weldable, machinable, corrosion resistant.
BS TA10,11,12,13,28; AMS 4911, 4928 etc.

IMI TITANIUM 550.
M-1578; 4 Al, 4 Mo, 2 Sn, 0.5 Si, bal Ti.
Bar: 164,000 min TS, 145,000 YS; 9 El.
High strength alloy, creep resistant up to 400°C.
DTD 5103, 5153 (Hylite 50).

IMI TITANIUM 551.
M-1578; 4 Al, 4 Mo, 4 Sn, 0.5 Si, bal Ti.
Bar: 179,000 min TS; 159,000 YS; 8 El.
Very high strength titanium alloy.
DTD 5203, 5223 (Hylite 51).

IMI TITANIUM 679.
M-1578; 11 Sn, 5 Zr, 2.25 Al, 1.0 Mo, 0.2 Si, bal Ti.
Bar, quenched and aged: 160,000-195,000 TS; 141,000 YS; 8 El.
High strength alloy; creep resistant up to 450°C.
BS TA18,19,20,25,26,27; AMS 4974.

IMI TITANIUM 680.
M-1578; 11 Sn, 4 Mo, 2.25 Al, 0.2 Si, bal Ti.
Bar, quenched and aged: 178,000 min TS; 156,000 YS; 10 El.
High strength alloy.
DTD 5213, M160.

IMI TITANIUM 684.
M-1578; 6 Al, 5 Zr, 1 W, 0.3 Si, bal Ti.
Bar: 143,000 min TS; 127,000 YS; 6 El.
Good strength alloy, weldable; creep resistant up to 520°C.
DTD M200

IMI TITANIUM 685.
M-1578; Al, Zr, Mo, Si, bal Ti.
Bar: 143,000 min TS; 127,000 YS; 6 El.
Good strength alloy, weldable; creep resistant up to 550°C.
France: T-A6Z-5D.

IMI TITANIUM 700
M-1578, 6 Al, 5 Zn, 4 Mo, 1 Cu, 0.2 Sn, bal Ti.
Air-cooled and aged, bar: 183,000 min TS; 166,000 YS, 8 El.
Quenched and aged, bar: 195,000 min TS; 179,000 YS; 6 El
Fatigue limit. 45-55% of TS.
Ultra high strength alloy, creep resistant up to 400°C.
DTD M201

IMITA GOLD.
Eng., 89 Cu, 10.3 Al, 0.33 Fe, 0.25 Ni, 0.23 Sn, 0.2 Mn.
For cheap jewelry, ornaments, corrosion resistant

IMMACULATE 2W
M-521; 0.30 C, 1.3 Si, 0.8 Mn, 20 Cr, 7.5 Ni, 2 W, bal Fe
Annealed 119,000 TS, 54,500 YS; 49 El; 56 RA; 220 Brin.
For valves, furnace equipment; austenitic, stainless.

IMMACULATE 4 W.
M-521, M-50, 0.3 C, 20 Cr, 8 Ni, 4 W, bal Fe.
Annealed 130,000-141,000 TS; 83,000-94,000 YS, 35-25 El, 45-35 RA, 250-280 Brin.
For exhaust valves, turbine blades, furnace parts, heat and scale resistant.

IMMACULATE 5T
M-521; 0.15 max C, 1.0 max Si, 2.0 max Mn, 21.5-23.5 Cr, 16.0-17.5 Ni, 1.0 Ti, bal Fe.
Ann, Room Temp 90,000 TS; 40,000 YS; 45 El.
At 800°C 42,000 TS, 52 El.
Good strength and resistance to scaling at elevated temperatures. For radiant tube supports, furnace brackets.

IMMADIUM I
M-179, Zn, Al, Mn, bal Cu.
Cast: 72,400 TS, 19.5 El; 12 RA; 152 Brin.
Rolled 70,000 TS, 35,000 YS; 33 El; 125 Brin
For pump rods, valve spindles, stay bolts, propeller shafts; high strength and corrosion resistance.

IMMADIUM II
M-179; Zn, Al, Mn, bal Cu.
Cast: 68,400 TS, 10 El; 9 RA; 149 Brin.
Rolled: 81,000 TS; 40,000 YS; 28 El; 135 Brin.
For pump rods, valve spindles, staybolts, shafts, impellers; high strength and corrosion resist.

IMMUNIT 2E.
M-1331; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, Type 321; stainless, austenitic.

IMMUNIT 2G.
M-1331; 0.15 C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS, 35,000 YS; 55 El; 75 RA; 150 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, mixers, filters, tanks; Type 302, stainless, austenitic.

IMMUNIT 2N
M-1331; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
Cold drawn: 180,000 TS, 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, mixers, filters, tanks; Type 302; stainless, austenitic.

IMMUNIT 2NA.
M-1331; 0.15 max C, 18 Cr, 8.5 Ni, 0.2 S, bal Fe
Annealed: 80,000 TS, 35,000 YS; 45 El; 65 RA; 150 Brin.
For screw machine products, bolts, fasteners, shafts, Type 303; stainless, free-cutting

IMMUNIT 2S
M-1331, 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed. 85,000 TS, 35,000 YS, 60 El, 70 RA, 150 Brin
Cold drawn. 180,000 TS, 135,000 YS; 10 El; 330 Brin
For welded chemical plant equipment, tanks, dryers, Type 304, stainless, austenitic.

IMMUNIT 2X(G)
M-1331, 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe
Annealed 90,000 TS; 45,000 YS, 56 El, 65 RA, 160 Brin.
Cold drawn: 100,000 TS, 65,000 YS, 40 El; 60 RA; 205 Brin
For welded structures, chemical plant equipment, tanks; Type 347; stainless, austenitic

IMMUNIT 4E
M-1331, 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe
Annealed 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin.
For welded chemical plant equipment, Type 316 Ti, stainless, austenitic

IMMUNIT 4G
M-1331; 0.15 C, 18 Cr, 2 Mo, 9.5 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS, 50 El, 65 RA; 160 Brin
For chemical plant equipment, mixers, agitators, filters, Type 316; stainless, austenitic

IMMUNIT 4N
M-1331, 0.1 C, Si, 18 Cr, 8 Ni, bal Fe.
Annealed. 85,000 TS, 35,000 YS, 50 El; 70 RA; 150 Brin.
For chemical plant equipment, corrosion resistant, austenitic

IMMUNIT 4S
M-1331; 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe.
Annealed. 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn: 150,000 TS, 135,000 YS; 6 El; 300 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic

IMMUNIT 4SL.
M-1331; 0.1 C, 18 Cr, 9.5 Ni, 2 Mo, bal Fe.
Annealed; 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El; 300 Brin.
For acid resistant chemical plant equipment, tanks; Type 316; stainless, austenitic.

IMMUNIT 4X(G).
M-1331; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Cb = 8 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 45 El; 60 RA; 170 Brin.
For welded chemical plant equipment, mixers, tanks; Type 316 Cb; stainless, austenitic.

IMMUNIT 8E.
M-1331; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 45 El; 60 RA; 170 Brin.
For welded chemical plant equipment, tanks, mixers; Type 316 Ti; stainless, austenitic.

IMMUNIT 14S.
M-1331; 0.07 max C, 17 Cr, 4.75 Mo, 13 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 40 El; 55 RA; 180 Brin.
For acid resistant chemical plant equipment, tanks; Type 317; stainless, austenitic.

IMMUNIT 16S.
M-1331; 0.07 max C, 17.5 Cr, 17.5 Ni, 2 Cu, 2 Mo, Cb = 8 × C, bal Fe
Annealed: 100,000 TS; 50,000 YS; 40 El; 50 RA; 190 Brin.
For acid resistant chemical plant equipment, valves; stainless, austenitic

IMMUNIT 68G.
M-1331; 0.25 C, 1.18 Cr, 0.1 V, 0.7 Mn, 0.8 Si, bal Fe.
For gears, shafts, cams, bolts, camshafts; case hardening steel, tough.

IMMUNIT C58G.
M-1331; 0.25 C, 14.5 Cr, 1 max Ni, bal Fe.
Annealed. 95,000 TS; 50,000 YS; 25 El; 55 RA, 200 Brin
For turbine blades, cutlery, surgical and dental instruments; Type 420, corrosion resistant

IMMUNIT-R1013 MoNi.
M-1331; 0.10 C, 12.5 Cr, 0.4 Mo, 0.45 Ni, bal Fe
Annealed: 70,000 TS; 35,000 YS; 40 El; 80 RA; 145 Brin.
Cold Drawn: 90,000 TS; 80,000 YS; 20 El, 65 RA; 205 Brin.
For oil refinery and chemical plant equipment, table hardware, flatware, knives.
Corrosion resistant

IMMUNIT-R1213 MoA.
M-1331; 0.15 max C, 13 Cr, 0.3 Mo, bal Fe
Annealed: 80,000 TS; 40,000 YS, 25 El, B 93 Rock.
For springs, shafts, table flatware, oil refinery equipment.
Corrosion resistant, hardenable.

IMMUNIT-R1513 Mo.
M-1331, 0.15 C, 13 Cr, 1 Mo, bal Fe
Annealed: 80,000 TS; 40,000 YS; 25 El; B 93 Rock.
Cold Drawn: 100,000 TS; 80,000 YS; 15 El; B 96 Rock .
For springs, table flatware, oil and chemical plant equipment.
Corrosion resistant, hardenable.

IMMUNIT-R2013 Mo.
M-1331; 0.20 C, 13 Cr, 1 Mo, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; B 92 Rock.
Heat treated: 240,000 TS; 200,000 YS; 10 El; C 50 Rock.
For cutlery, bearings, knives, shafts, surgical instruments, scissors.
Corrosion resistant, hardenable.

IMMUNIT-R2213.
M-1331, 0.20 C, 12 Cr, 1 Mo, 0.3 V, 0.5 W, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened 240,000 TS, 210,000 YS; 9 El; C 50 Rock
For valves, bearings, cutlery, surgical instruments.
Corrosion resistant.

IMPACTO.
M-38; 1 C, 0.4 Si, bal Fe.
For tools, dies, water hardening.

IMPACTO
M-435, 0.15 C, 0.5 Mn, 0.25 Mo, 1.75 Ni, bal Fe.
Normalized. 80,000 TS; 45,000 YS; 30 El; 65 RA; 163 Brin
For case hardened parts, gears, pinions, cams; carburizing steel

IMPALCO 740
M-1547, 0.3-0.7 Cu, 2.2-3.2 Mg, 0.5 max Si, 0.5 max Fe, 0.3-0.7 Mn, 5.2-6.2 Zn, bal Al.
Heat treated 72,000 min TS; 7 min El
For machining applications of high strength parts, structural members
Poor weldability Heat treatable

IMPALCO 750
M-1547, 0.3-0.7 Cu, 2.2-3.2 Mg, 5.2-6.2 Zn, 0.08-0.25 Cr, bal Al.
Heat treated 72,000 min TS, 7 min El
For machining applications of high strength parts, structural members. Poor weldability. Heat treatable

IMPALCO 760
M-1547, 0.8-1.4 Cu, 2.2-3.2 Mg, 0.3-0.7 Mn, 5.0-6.0 Zn, bal Al.
Heat treated 78,000 min TS, 5 min El.
For machining applications of high strength parts, structural members Heat treatable. Poor weldability

IMPALCO C66
M-1547, 3.5-4.8 Cu, 0.85 max Mg, 0.9 max Si, 1.0 max Fe, 1.2 max Mn, bal Al.
Heat Treated: 69,000 min TS; 8 min El.
At 200°C 55,000 TS, 7.5 El
For highly stressed structural members
Heat treatable Not corrosion resistant. Fair ductility and weldability

IMPALCO C66A
M-1547, 3.5-4.8 Cu, 0.85 max Mg, 0.90 max Si, 1.0 max Fe, 1.2 max Mn, bal Al
T-4 Temper: 54,000 min TS; 15 min El.
T-6 Temper: 58,000 min TS; 8 min El.
For stressed skin structures where corrosion resistance is important
Clad with pure aluminum. High strength Heat treatable.

IMPALCO C69.
M-1547; 1.0-2.0 Cu, 0.5-1.2 Mg, 0.8-1.3 Si, 0.7 max Fe, 1.0 max Mn, bal Al.
Heat treated: 58,000 min TS; 8 min El.
For medium and high strength applications.
Heat treatable. Poor resistance to atmospheric attack.

IMPALCO C80.
M-1547; 5.0-6.0 Cu, 0.4 max Si, 0.7 max Fe, 0.2-0.6 Pb, 0.2-0.6 Bi, 0.3 max Zn, bal Al.
Heat Treated: 42,000 min TS; 12 min El.
For screw machine products, fasteners, shafts, screws.
Free-machining. Poor resistance to atmospheric attack. Age-hardenable.

IMPALCO M31.
M-1547; 0.15 max Cu, 0.4-0.8 Mg, 0.15 max Si, 0.2 max Fe, 0.25 Mn, bal Al.
O-Temper: 18,000 max TS.
H-Temper: 24,600 min TS.
For bright trim, automobile panels, architectural applications.
Good formability and weldability. Non-heat treatable.

IMPALCO M32.
M-1547; 0.15 max Cu, 0.8-1.2 Mg, 0.15 max Si, 0.2 max Fe, 0.25 Mn, bal Al.
O-Temper. 22,400 max TS.
H-Temper: 29,200 min TS.
For bright trim, architectural applications, automobile panels Good ductility, formability and weldability. Non-heat treatable.

IMPALCO M32X.
M-1547, 0.15 max Cu, 0.8-1.2 Mg, 0.15 max Si, 0.2 max Fe, 0.25 Mn, bal Al.
O-Temper: 22,400 max TS.
H-Temper· 29,200 min TS.
For automobile trim, architectural applications, panelling
Good ductility, formability and weldability
Non-heat treatable.

IMPALCO M34.
M-1547, 0.1 max Cu, 0.8-1.2 Mg, 0.35 max Si, 0.5 max Fe, 0.15-0.30 Mn, bal Al
O-Temper 18,000 min TS; 20 min El
H-Temper 33,600 min TS; 29,200 min YS; 4 min El
For tubular furniture, television antennae
Non-heat treatable Good formability and weldability

IMPALCO M35/1.
M-1547, 0.10 max Cu, 1.8-2.7 Mg, 0.6 max Si, 0.7 max Fe, 0.5 max Mn, 0.5 max Cr, bal Al
At 25°C· 25,700 TS; 10,000 YS, 29 El.
At 200°C 20,700 TS; 10,700 YS, 50 El
For architectural and marine applications, panelling, containers, welded structures.
Non-heat treatable Good formability and weldability

IMPALCO M35/2
M-1547; 0.10 max Cu, 3.0-4.0 Mg, 0.6 max Si, 0.7 max Fe, 1.0 max Mn, 0.5 max Cr, bal Al.
At 25°C· 32,000 TS; 10,000 YS; 29 El.
At 200°C: 23,500 TS; 11,200 YS; 53 El.
For welded structures, casings.
Good formability and weldability. Work hardens rapidly Non-heat treatable.

IMPALCO M35/3.
M-1547; 0.10 max Cu, 3.5-5.5 Mg, 0.7 max Si, 0.7 max Fe, 1.0 max Mn, 0.5 max Cr, bal Al.
M-Temper: 38,100 min TS; 12 min El.
O-Temper: 38,100 min TS; 18 min El.
For riveted and welded vessels or containers subjected to relatively high stresses
Non-heat treatable. Good formability and weldability. Work hardens rapidly.

IMPALCO M36.
M-1547; 0.10 max Cu, 4.5-5.5 Mg, 0.6 max Si, 0.7 max Fe, 1.0 max Mn, 0.5 max Cr, bal Al.
M-Temper: 38,100 min TS; 18 min El.
¼ H-Temper: 42,000 min TS; 8 min El.
For marine, chemical and food industries, aircraft, welded structures.
Non-heat treatable. Good formability and weldability. Work hardens rapidly.

IMPALCO M38.
M-1547; 0.04 max Cu, 0.4-0.9 Mg, 0.3-0.7 Si, 0.5 max Fe, bal Al.
At 25°C: 33,000 TS; 17 El.
At 150°C: 21,300 TS; 20 El.
For busbars.
Heat treatable. Good ductility and weldability.
High electrical conductivity of 55% min.

IMPALCO M39/1.
M-1547; 0.10 max Cu, 0.4-0.9 Mg, 0.3-0.7 Si, 0.6 max Fe, 0.3 max Mn, bal Al.
O-Temper: 15,700 min TS; 15 El.
Heat Treated: 27,000 min TS; 12 min El.
For glazing bars, window frames, curtain walls.
Heat treatable: Good formability and weldability.

IMPALCO M39/2.
M-1547, 0.10 max Cu, 0.4-1.5 Mg, 0.6-1.3 Si, 0.6 max Fe, 0.4-1.0 Mn, 0.3 max Cr, bal Al.
Heat Treated· 42,600 min TS; 10 min El.
O-Temper: 15,700 min TS; 15 min El.
For automobile and bus bodies, coke skips, crossbearers.
Heat treatable: Good weldability and ductility. Resists stress and shock.

IMPALCO M40
M-1547; 0.15-0.40 Cu, 0.8-1.2 Mg, 0.4-0.8 Si, 0.7 max Fe, 0.2-0.8 Mn, 0.15-0.35 Cr, bal Al.
Heat Treated: 40,400 min TS; 10 min El.
O-Temper. 15,700 min TS; 15 min El.
For tubular furniture.
Good formability and weldability. Heat treatable.

IMPALCO M42.
M-1547; 0.10 max Cu, 0.4-1.5 Mg, 0.6-1.3 Si, 0.6 max Fe, 0.2 max Mn, 0.1 max Cr, bal Al.
Heat treated: 40,400 min TS; 10 min El.
O-Temper. 15,700 min TS; 15 min El.
For general purpose applications requiring good surface finish and medium strength.
Heat treatable. Good ductility and weldability. Not shock resistant.

IMPALCO P3.
M-1547; 0.02 max Cu, 0.15 max Si, 0.15 max Fe, 99.8 min Al.
O-Temper: 11,200 max TS; 35 min El.
½H-Temper. 13,500-16,800 TS; 8 min El.
For chemically brightened and anodized components, costume jewelry.
High ductility, poor machinability, low strength, high corrosion resistance.

IMPALCO P5
M-1547; 0.05 max Cu, 0.3 max Si, 0.4 max Fe, 0.05 max Mn, 99.5 min Al.
M-Temper: 9000 min TS; 25 min El.
O-Temper: 13,500 max TS; 30 min El.
For food, pharmaceutical and chemical processing equipment, containers.
High corrosion resistance, high ductility, and workability.

IMPALCO P5E.
M-1547; 0.05 max Cu, 0.5 max Cu + Si + Fe, 99.5 min Al
O-Temper: 10,000-14,500 TS; 25 min El.
For electrical applications, busbars.
Low strength, high conductivity.

IMPALCO P10.
M-1547; 0.1 max Cu, 0.5 max Si, 0.7 max Fe, 0.1 max Mn, 99.0 min Al.
At 25°C: 12,800 TS; 5200 YS; 45 El.
At 200°C: 6000 TS; 2500 YS; 70 El.
H-Temper: 20,200 min TS; 3 El.
For processing equipment for chemical, pharmaceutical, petroleum and food industries.
High corrosion resistance, good ductility, low strength.

IMPALCO PA15.
M-1547; 10.0-13.0 Si, 0.10 max Cu, 0.6 max Fe, 0.5 max Mn, bal Al.
For brazing applications. Filler alloy.
Non-heat treatable. Good fluidity. Good corrosion resistance.

IMPALCO PA16.
M-1547; 0.10 max Cu, 4.5-6.0 Si, 0.6 max Fe, 0.5 max Mn, bal Al.
For brazing applications. Filler alloy.
Non-heat treatable. Good fluidity and corrosion resistance.

IMPALCO PA17.
M-1547; 0.10 max Cu, 7.0-8.0 Si, 0.6 max Fe, 0.5 max Mn, bal Al
For brazing applications Filler alloy.
Non-heat treatable. Good fluidity and corrosion resistance.

IMPALCO PA19
M-1547, 0.15 max Cu, 0.6 max Si, 0.7 max Fe, 1.0-1.5 Mn, bal Al.
At 25°C 15,200 TS; 5000 YS; 40 El
At 200°C: 11,200 TS; 4480 YS, 43 El
For panelling of buildings, or vehicles, containers, holloware, roofing
Not hardenable by heat treatment. Good ductility, fair machinability.

IMPAX
M-111, M-111a; 0.36 C, 1.4 Cr, 1.4 Ni, 0.2 Mo, bal Fe.
Heat treated: 300-330 Brin.
For molds, dies, tools, die casting tools for zinc, plastic molds
Prehardened Type P20 tool steel.

IMPERATOR 15.
M-1345; 0.3 C, 1 Si, 0.4 Mn, 1.1 Cr, 0.18 V, 3.7 W, bal Fe.
For upsetters, cold headers, crimpers, oil hardened, tough.

IMPERATOR 200
M-1345, 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe
For upsetters, header dies, crimpers; oil hardened, tough.

IMPERIAL
M-24; 0.50 C, 0.3 Mn, 1.0 Si, 0.45 Mo, bal Fe.
For cold work applications as beading tools, pipe cutter wheels, caulking tools, concrete breakers, staking tools.
AISI Type S2 shock resisting steel

IMPERIAL.
M-49; 80 Cu, 20 Ni.
For condenser tubes; corrosion resistant.

IMPERIAL
M-210, 1.4 C, 0.75 Cr, 4.5 W, bal Fe.
For cutting tools, drills, reamers, textile needles.
Water hardening. Wear resistant.

IMPERIAL ALL-METAL SOLDER.
M-786; Pb, Sn.
For Al solder; high strength.

IMPERIAL C.R. 17.
M-210, 0.12 C, 17 Cr, 0.3 Mn, bal Fe.
Annealed. 78,000 TS; 49,000 YS; 32 El; 50 RA; 160 Brin.
For chemical plant equipment, oil burner parts; corrosion resistant, ferritic.

IMPERIAL C.T.
M-210; 0.32 C, 13 Cr, 0.3 Mn, bal Fe.
Heat treated: 202,000 TS, 190,000 YS; 15 El; 35 RA; 450 Brin.
For surgical instruments, valve bodies, pump parts; impellers, corrosion and heat resistant, hardenable.

IMPERIAL E.Q.
M-210, 0.20 C, 12-14 Cr, bal Fe.
Heat treated: 100,000 TS; 80,000 YS; 30 El; 65 RA; 200 Brin.
For steam valves, pump bodies, stainless, hardenable.

IMPERIAL MAJOR.
M-365, 21-22 W, 4-5 Cr, 13 Co, 1.5 V, 0.5 Mo, bal Fe
For tools, cutters; high speed steel.

IMPERIAL MANGANESE
M-210, 12 Mn, 1.2 C, bal Fe.
123,000 TS, 200 Brin
For tracks, dredger buckets, dipper teeth, gears, sheave wheels, sprockets, tube mill liners; wear resistant; difficult to machine

IMPERIAL R 1
M-210, 0.12 C, 13 Cr, 0.3 Mn, bal Fe
Heat treated 85,000 TS; 56,000 YS; 35 El; 75 RA; 175 Brin
Annealed 67,000 TS, 38,000 YS, 38 El; 77 RA; 140 Brin
For shafts, housings, valve bodies, pump casings, corrosion resistant.

IMPERIAL R I O
M-210, C, Ni, Cr, bal Fe
For plastic mold dies, stainless, hobbed dies

IMPERIAL S 61
M 210, 0.3 C, 13 Cr, bal Fe.
For turbine blades, valves, cutlery; stainless, hardenable

IMPERIAL S 80
M-210, 0.20 C, 18 Cr, 1.25 Ni, bal Fe
Heat treated 130,000 TS, 107,000 YS; 20 El; 45 RA, 270 Brin
Annealed 112,000 TS, 80,000 YS; 14 El; 245 Brin.
For steam valves, pump bodies; stainless, hardenable

IMPERIAL STAINLESS IRON
M-210; 0.10 C, 13 Cr, bal Fe
Oil treated 161,000-116,500 TS, 12-20 El, 37-67 RA, 360-220 Brin
For dental mirrors, nitric acid equipment, dye vats, heat exchangers, stove fittings, acid and heat resistant, malleable.

IMPERIAL STEEL
Eng., 6.4 W, 2.1 Mn, 1.6 C, bal Fe.
For tools, cutters; oil hardening.

IMPERIAL TOOL.
M-210, 1.4 C, 0.75 Cr, 4.5 W, bal Fe.
For fast finishing cutters; water hardened.

IMPHY 4.
M-771; 0.12 max C, 1.25 max Mn, 14-18 Cr, bal Fe.
Annealed: 80,000 TS, 45,000 YP; 25 El; 165 Brin.
Cold Rolled: 130,000 TS; 125,000 YP; 2 El; 270 Brin

For chemical and textile plant equipment, oil burner and heater parts.
Type 430 stainless steel; ferritic.

IMPHY 6.
M-771; 0.20 C, 28 Cr, 4 Ni, bal Fe.
Cast: 100,000 TS; 61,000 YS; 13 El; 207 Brin.
At 1000°F: 64,000 TS; 38,000 YS; 25 El; 27 Brin.
For furnace blowers, gas burners, recuperators, ore roasting furnaces.
Type 327 stainless steel. Resists high sulphur atmospheres

IMPHY 30CD12SP.
M-771; 0.30 C, 3.0 Cr, 0.4 Mo, bal Fe.
Annealed 114,000 TS.
Heat treated: 157,000 TS.
For casings, liners, cylinder liners; Afnor 30CD12; nitriding steel.

IMPHY 31 BIS SP.
M-771, 0 16 C, Ni, Cr, Mo, bal Fe.
Annealed. 92,000 TS, 65,000 YS; 20 El.
Heat treated: 186,000 TS, 143,000 YS, 10 El.
For gears, cams, camshafts; case hardened; Afnor 16NCD13

IMPHY 32SP.
M-771, 0 30 C, 1.2 Ni, 0.6 Cr, 0 2 Mo, bal Fe.
Normalized 120,000 TS, 85,000 YS; 16 El.
Heat treated: 135,000 TS; 114,000 YS, 14 El.
For crankshafts, gears, bits, Afnor 30NCD11; oil hardened.

IMPHY 34R
M-771, 0 32 C, Ni, Cr, Mo, bal Fe.
Normalized 121,000 TS; 85,000 YS; 16 El
Heat treated 242,000 TS, 200,000 YS; 6 El.
For crankshafts, gears, bolts; Afnor 32NCD11, oil hardened

IMPHY 34/SP
M-104, C, 2 Ni, 2 Cr, Mo, bal Fe
For gears, shafts, oil hardening

IMPHY 34SP
M-771, 0 32 C, 2 2 Ni, 2.2 Cr, 0 7 Mo, bal Fe
Normalized· 121,000 TS, 92,000 YS, 16 El.
Heat treated 250,000 TS; 220,000 YS, 8 El.
For crankshafts, gears, bolts; Afnor 32NCD8; oil hardened.

IMPHY 38MS5SP
M-771, 0 9 C, alloy, bal Fe
Annealed 114,000 TS, 58,000 YS; 15 El
Heat treated· 200,000 TS, 177,000 YS; 8 El
For springs; Afnor 38MS5, water hardened

IMPHY 41SP
M-771, 0 42-0 50 C, 1.25-1.75 Si, 0 7-0.9 Cr, 0 2-0 3 Mo, bal Fe
Normalized. 108,000 TS; 58,000 YS; 16 El
Heat treated: 242,000 TS, 221,000 YS, 6 El.
For springs, Afnor 45SCD6; oil hardened.

IMPHY 301.
M-771; 0.20 max C, 1 max Si, 2 max Mn, 7 Ni, 17 Cr, bal Fe.
Annealed: 110,000 TS; 40,000 YS; 60 El, B 85 Rock.
Half Hard· 150,000 TS; 110,000 YS; 15 El; C 32 Rock.
For aircraft structural members, trailer bodies, household utensils, architectural trim; work hardens rapidly
AISI Type 301, stainless.

IMPHY 302
M-771; 0.12 max C, 1 max Si, 2 max Mn, 9 Ni, 18 Cr, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; B 85 Rock.
Cold Drawn: 140,000 TS; 100,000 YS; 30 El; B 100 Rock.
For chemical plant and food processing equipment, valve trim, fasteners.
AISI Type 302. Stainless.

IMPHY 304.
M-771; 0.08 max C, 1 max Si, 2 max Mn, 10.5 Ni, 19 Cr, bal Fe
Annealed. 85,000 TS; 30,000 YS; 60 El; B 80 Rock.
Cold Drawn: 150,000 TS; 100,000 YS; 30 El; C 23 Rock.
For architectural molding and trim, welded structures, processing equipment.
Type 304 stainless.

IMPHY 304L
M-771, 0 03 max C, 1 max Si, 2 max Mn, 11.5 Ni, 19 Cr, bal Fe.
Annealed. 80,000 TS; 30,000 YS, 60 El; B 80 Rock.
Cold Drawn· 150,000 TS; 100,000 YS; 30 El; C 22 Rock
For architectural molding and trim, welded structures, processing equipment.
AISI Type 304L Stainless

IMPHY 305
M-771, 0 12 max C, 1 max Si, 2 max Mn, 11.5 Ni, 18 Cr, bal Fe
Annealed. 85,000 TS, 38,000 YS; 55 El; B 80 Rock
For electrical instruments, cold headed fasteners, chemical and textile processing equipment
AISI Type 305

IMPHY 308.
M-771, 0 08 max C, 1 max Si, 2 max Mn, 11 Ni, 20 Cr, bal Fe.
Annealed· 85,000 TS; 30,000 YS; 55 El, B 80 Rock
For welded structures, valve trim, oil refinery and chemical plant equipment, industrial furnaces, welding rod Heat and corrosion resistant. AISI Type 308

IMPHY 309
M-771; 0 15 max C, 14 Ni, 23 Cr, bal Fe
Annealed 90,000 TS; 45,000 YS, 45 El; B 85 Rock
For oil burners, furnace parts, oil refinery and chemical plant equipment.
High creep and oxidation resistance
AISI Type 309 Stainless

IMPHY 310
M-771, 0 15 max C, 20 Ni, 25 Cr, bal Fe
Annealed 90,000 TS; 40,000 YS; 55 El, B 80 Rock.
At 1200°F. 57,000 TS, 22,000 YS, 32 El, 45 RA.
For carburizing boxes, oil burner parts, baffle plates, oil refinery equipment, recuperators.
Heat and corrosion resistant.
AISI Type 310 austenitic.

IMPHY 316
M-771; 0.08 max C, 1 max Si, 2 max Mn, 13 Ni, 17 Cr, 2 5 Mo, bal Fe.
Annealed· 80,000 TS; 30,000 YS; 60 El; B 80 Rock
Cold Rolled· 150,000 TS; 135,000 YS; 6 El; C 32 Rock.
For chemical plant equipment, tanks, agitators, evaporators, valve trim. Acid resistant, stainless.
AISI Type 316, Austenitic.

IMPHY 316L.
M-771; 0.03 max C, 13 Ni, 18 Cr, 2.5 Mo, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El; B 80 Rock.
Cold Rolled: 125,000 TS; 90,000 YS; 30 El; C 24 Rock.
For chemical plant equipment, tanks, agitators, evaporators. Acid resistant, stainless.
AISI Type 316L, austenitic.

IMPHY 317.
M-771; 0.08 max C, 14 Ni, 19 Cr, 3.5 Mo, bal Fe.
Annealed: 90,000 TS; 55,000 YS; 50 El; B 90 Rock.
Cold Rolled: 150,000 TS; 125,000 YS; 15 El; C 30 Rock.
For textile and dye plant equipment, paper and pulp mill equipment, chemical plant equipment. Stainless, acid resistant.
AISI Type 317, Austenitic.

IMPHY 317L.
M-771; 0.03 max C, 14 Ni, 19 Cr, 3.5 Mo, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 70 El; B 70 Rock.
Cold Rolled: 125,000 TS; 90,000 YS; 35 El; C 22 Rock.
For textile, die and chemical plant equipment, paper and pulp mills. Agitators, digesters, Stainless, acid resistant.
AISI Type 317L. Austenitic.

IMPHY 321.
M-771; 0.08 max C, 0.75 max Si, 2 max Mn, 12 Ni, 18 Cr, Ti = 5 × C, bal Fe.
Annealed: 85,000 TS; 30,000 YS; 55 El; B 80 Rock.
Cold Drawn: 95,000 TS; 60,000 YS; 40 El; 185 Brin.
For welded structures, tanks, exhaust systems, engine manifolds, oil refinery and chemical plant equipment.
AISI Type 321. Austenitic, stainless.

IMPHY 347.
M-771; 0.08 max C, 1 max Si, 2 max Mn, 11 Ni, 18 Cr, Cb = 10 × C, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; B 83 Rock.
Cold Drawn: 100,000 TS; 65,000 YS; 40 El; B 95 Rock.
For welded structures, exhaust manifolds, radiant superheaters, low temperature processing.
Welding grade, stainless.
AISI Type 347, austenitic.

IMPHY 410.
M-771; 0.15 C, 1 max Si, 1 max Mn, 12.5 Cr, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 30 El; B 80 Rock.
Oil Hardened: 190,000 TS; 145,000 YS; 15 El; 390 Brin.
For flat springs, knives, cutlery, table flatware.
Corrosion and heat resistant.
AISI Type 410. Hardenable.

IMPHY 430.
M-771; 0.12 max C, 1 max Si, 1 max Mn, 16 Cr, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 28 El; 142 Brin.
Cold Rolled: 110,000 TS; 95,000 YS; 12 El; 190 Brin.
For automotive and architectural trim, hardware, fasteners, kitchen sinks, septic tanks, storage vessels.
AISI Type 430. Nonhardenable, corrosion resistant.

IMPHY 431.
M-771; 0.20 max C, 1 max Si, 1 max Mn, 2 Ni, 16 Cr, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; C 24 Rock.
Heat Treated: 180,000 TS; 125,000 YS; 17 El; C 38 Rock.
For pump shafts, marine hardware, surgical trusses, valve trim, aircraft structural members.
Corrosion and heat resistant.
AISI Type 431. Hardenable.

IMPHY 505.
M-104; C, 5 Cr, 0.5 Mo, bal Fe.
For petroleum industry equipment; corrosion resistant.

IMPHY 766
M-104, 0.4 C, 1.5 Cr, Si, Mo, V, bal Fe.
For gears, shafts; oil hardening

IMPHY 1640
M-104; C, Cr, bal Fe.
Annealed: 101,000 TS, 58,000 YS, 18 El.
Heat treated: 135,000 TS; 114,000 YS; 14 El.
For crankshafts; tough.

IMPHY 1691.
M-104, C, Ni, Cr, Mo, bal Fe.
Annealed. 121,000 TS, 92,000 YS, 18 El.
Oil treated: 144,000 TS; 128,000 YS, 14 El.
For gears, crankshafts, still parts, bolts, resists high temperatures.

IMPHY 3693.
M-104; C, 1.5 Cr, Mo, V, bal Fe.
For gears, shafts; oil hardening.

IMPHY A8
M-771, 0.06 C, 12-14 Cr, 0.2 Al, bal Fe.
Annealed. 70,000 TS; 40,000 YS, 30 El; 160 Brin.
Cold Drawn: 85,000 TS; 70,000 YS; 20 El; 185 Brin.
For heat treating boxes, oil refinery equipment, quenching racks
Type 405 stainless steel, ferritic.

IMPHY ADR
M-104; 38-40 Ni, 1 Mn, bal Fe
For use in construction of rotary converters, thermostats, geodesic measures; low coefficient of expansion.

IMPHY AFK
M-771; Si, bal Fe
For magnetic equipment; soft magnet for strong or moderate field.

IMPHY AMF
M-104, 55-60 Ni, 0.3 Mn, 0.2-0.4 C, bal Fe.
Annealed: 100,000 TS, 62,000 YS; 40 El; 50 RA.
Liquid air T 102,000 TS; 50,000 YS; 40 El; 55 RA.
For valves of expansion engines used in liquid air plants, refrigeration machines; great ductility at low temperature.

IMPHY ARC
M-104; 0.2 C, 18 Cr, 8 Ni, bal Fe.
For chemical apparatus, nitrogen fixation and synthetic ammonia apparatus, valves, pumps; resists chemical attack; stainless.

IMPHY ARC 098.
M-104, M-771; 0.1 C, 14 Ni, 25 Cr, 1.2 Mo, bal Fe.
For chemical plant equipment; resists nitric acids.

IMPHY ARC 164.
M-104, M-771; 0.12 C, 60 Ni, 18 Mo, bal Fe.
For chemical plant equipment; resists HCl.

IMPHY A.R.C. 1047.
M-104; C, 18 Cr, 8 Ni, W, bal Fe.
For chemical equipment; corrosion resistant.

IMPHY ARC-2266.
M-104, M-771; 0.2 max C, 18 Cr, 8 Ni, 3 Mo, bal Fe.
Annealed: 90,000 TS; 38,000 YS; 55 El; 65 RA; 160 Brin.
For chemical plant equipment, Type 317; stainless, austenitic.

IMPHY ARC 2266S.
M-104, M-771; 0.08 max C, 20 Cr, 10 Ni, 3 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For chemical plant equipment, tanks, agitators; acid resistant, austenitic; Type 317.

IMPHY ARC 2266SP.
M-104, M-771; 0.06 max C, 18 Cr, 11 Ni, 3 Mo, 0.4 Ti, bal Fe.
Annealed. 85,000 TS; 35,000 YS; 40 El; 55 RA; 160 Brin.
For oil refinery and chemical plant equipment; acid resistant, austenitic.

IMPHY ARC 2266T
M-104, M-771, 0.06 max C, 17 Cr, 12 Ni, 3 Mo, bal Fe.
Annealed· 85,000 TS, 35,000 YS; 50 El, 65 RA; 160 Brin.
For oil refinery and chemical plant equipment; acid resistant, austenitic; Type 316L

IMPHY ARC 2702A.
M-104, M-771, 0.04 C, 18 Cr, 8 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS; 60 El, 70 RA; 150 Brin
Rolled· 125,000 TS, 95,000 YS, 25 El, 55 RA; 277 Brin
For chemical plant equipment, Type 304, stainless, austenitic.

IMPHY ARC-2702B
M-104, M-771, 0.09-0.15 C, 18 Cr, 8 Ni, Ti, bal Fe
Annealed 85,000 TS, 35,000 YS; 60 El; 70 RA; 150 Brin
For welded parts, chemical plant equipment; Type 321, stainless, austenitic

IMPHY A R C. 2702S
M-104, 0.2 C, 18 Cr, 8 Ni, bal Fe
For corrosion resistant parts, stainless, corrosion resistant

IMPHY A.T E.
M-104; 95 Ni, 2 Mn, 2 Al, 1 Si.
For thermocouple element to be used with Imphy B T.E., max operating temperature 1100°C.

IMPHY A T.G.
M-104; 60 Ni, 26 Fe, 10 Cr, 4 W.
Forged: 121,000 TS; 91,000 YS; 20 El.
Annealed. 100,000 TS, 52,000 YS, 30 El.
For gas turbines, internal combustion engines; heat resisting, corrosion resisting

IMPHY ATG-B.
M-771, C, alloy, bal Fe.
For heat resistant parts, oil refinery equipment; heat resistant.

IMPHY ATG-M.
M-771; C, alloy, bal Fe.
For heat resistant parts, oil refinery equipment; heat resistant.

IMPHY ATG-R.
M-771; C, alloy, bal Fe.
For heat resistant parts, oil refinery equipment; heat resistant.

IMPHY ATG-S
M-771; C, alloy, bal Fe.
For oil refinery equipment; heat resistant.

IMPHY ATG-S4.
M-771; C, alloy, bal Fe.
For oil refinery equipment; heat resistant.

IMPHY ATG-S7.
M-771; C, alloy, bal Fe.
For oil refinery equipment; heat resistant.

IMPHY ATG-T
M-771, C, alloy, bal Fe.
For oil refinery equipment, heat resistant.

IMPHY ATG-Z
M-771, C, alloy, bal Fe
For oil refinery equipment; heat resistant

IMPHY A T.V.-1
M-104; 0.30 C, 35 Ni, 11 Cr, bal Fe.
Forged: 107,000 TS; 78,000 YS; 20 El.
Annealed· 88,000 TS, 46,000 YS, 25 El
For turbines, exhaust valves for internal combustion engines; corrosion and heat resistant.

IMPHY ATV-1
M-771, C, alloy, bal Fe
For oil refinery equipment; oxidation resistant

IMPHY ATV-3
M-771, C, alloy, bal Fe
For oil refinery equipment, oxidation resistant.

IMPHY ATV-R
M-771, C, alloy, bal Fe
For oil refinery equipment; oxidation resistant.

IMPHY ATV-S
M-771, C, alloy, bal Fe
For oil refinery equipment, oxidation resistant

IMPHY BCM.
M-771; 0.10 C, bal Fe
Heat treated. 50,000-72,000 TS; 36,000-50,000 YS; 30-25 El.
For valves, punches, drivers, gears; case hardened; Afnor XC10

IMPHY B T E
M-104, 91 Ni, 9 Cr
For thermocouple element to be used with Imphy A T E , C.T F or nickel; max operating temperature 1100°C.

IMPHY BTE-ATE.
M-771; iron alloy
For pyrometers, good to 1000°C

IMPHY BTE CTE
M-771, iron alloy.
For pyrometers, good to 700°C.

IMPHY BTE-NTE
M-771, iron alloy.
For pyrometers, good to 900°C.

IMPHY B Y -1.
M-104; 0.25 C, 4 Ni, 1 Cr, bal Fe
Heat treated 107,000-228,000 TS, 85,000-213,000 YS, 15-8 El.
For shafts; air hardening.

IMPHY B.Y.2.
M-104; 0.35 C, 4.25 Ni, 1.20 Cr, bal Fe.
121,000 TS; 100,000 YS; 12 El.
For machinery parts, gears; shock resistant.

IMPHY CCA 1007.
M-771; 0.08 C, 13 Cr, 0.20 Al, 1.0 max Mn; bal Fe.
Annealed: 65,000 TS; 38,000 YS; 30 El; 160 Brin.
Cold Drawn: 85,000 TS; 70,000 YS, 20 El; 185 Brin.
For annealing boxes, quenching racks, heat treating equipment, oil refinery and chemical plant equipment.
Type 405 stainless steel, heat and corrosion resistant.

IMPHY CCR.
M-104; 2 C, 13 Cr, bal Fe.
Annealed: 100,000-121,000 TS; 58,000-78,000 YS; 20-15 El.
Heat treated: 192,000 TS; 163,000 YS, 5 El.
For gages, mirrors, abrasion resistant.

IMPHY C C.R.-Co
M-104; 1.5 C, 13 Cr, 0.7 Mo, 3 Co, bal Fe.
For bearings, knives, cutlery, heat resistant, hardenable.

IMPHY CMO
M-771, C, alloy, bal Fe.
For oil refinery equipment; oxidation resistant

IMPHY CRB.
M-771; 1.0 C, 1.5 Cr, 0.3 Si, 0.4 Mn, bal Fe.
For rolls, ball bearings; Afnor 100C6, water hardened.

IMPHY C T.E
M-104, 45 Ni, 55 Cu.
For thermocouple element to be used with Imphy B T E., useful range (−220 to +700°C).

IMPHY CVC
M-104, C, 1.5 Cr, 0.25 V, bal Fe
Annealed: 64,000-73,000 TS, 50,000 58,000 YS; 28-22 El
Water quenched: 163,000-186,000 TS; 156,000-177,000 YS; 10-17 El
For piston pins; case-hardening steel.

IMPHY "D."
M-104; 0.25 C, Si, Mn, bal Fe
Annealed 70,000-78,000 TS, 43,000-52,000 YS; 28-25 El
For machine parts, locomotive axles, water hardening

IMPHY "D D"
M-104, 0.20 C, Si, Mn, bal Fe
Annealed. 64,000-71,000 TS, 38,000-46,000 YS; 31-28 El.
For wagon axles, marine forgings; water hardening

IMPHY "D D D"
M-104, 0.15 C, Si, Mn, bal Fe
Annealed: 58,000-64,000 TS, 39,000-45,000 YS; 33-28 El.
For rivets, stamped pieces; easily worked.

IMPHY "D T"
M-104; 0.40 C, Si, Mn, bal Fe.
Annealed 85,000-92,000 TS, 50,000-56,000 YS, 24-20 El.
For fire arms, cutlery, edge tools, water hardening

IMPHY ERA HR1.
M-104, M-771; 0.30 C, 18 Cr, 8 Ni, 3 W, 1.5 Si, bal Fe.
Rolled: 114,000 TS, 71,000 YS; 22 El.
For chemical plant equipment; stainless, austenitic

IMPHY ERA HR2.
M-104, M-771; 0.13 C, 18 Cr, 8 Ni, bal Fe.
Rolled. 100,000 TS; 55,000 YS; 25 El.
For chemical plant equipment; Type 302; stainless, austenitic

IMPHY "F.F."
M-104; 0.10 C, Si, Mn, bal Fe.
Annealed: 52,000-58,000 TS; 32,500-38,000 YS; 39-42 El.
For welding; replaces Swedish Iron.

IMPHY HPM.
M-771, Si, bal Fe.
For armatures, transformers, relays; soft magnet for strong or moderate field.

IMPHY ICR.
M-771, C, bal Fe
For welded structures.

IMPHY IR
M-771, 0.7 C, 14 W, 4 Cr, 1 V, bal Fe.
Hardened. C 64-66 Rock.
For cutting tools, drills, reamers, broaches, lathe and planer tools
High speed steel, high red-hardness

IMPHY I R R -S.
M-104, 0.7 C, 20 W, 1 Mo, 1.5 V, 10 Co, bal Fe.
For tools, cutters, high speed steel.

IMPHY I.R U.
M-104, 0.7 C, 18 W, 1 Mo, 1 V, bal Fe
For tools, cutters, high speed steel.

IMPHY IRU
M-771, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe
Hardened C 64-66 Rock
For cutting tools, taps, drills, lathe and planer tools, reamers, hobs, milling cutters, thread chasers High speed steel, Type T1.
High red hardness

IMPHY ISO
M-771, C, bal Fe
For welded structures

IMPHY I T R.
M-104, 0.7 C, 18 W, 1 Mo, 1 V, 5 Co, bal Fe
For tools, cutters, high speed steel

IMPHY ITR
M-771, 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe
Hardened C 64-66 Rock
For cutting tools, reamers, drills, lathe and planer tools, broaches
High speed steel, high red-hardness

IMPHY IVO
M-771, C, bal Fe
For welded structures

IMPHY IW1
M 771, C, bal Fe
For welded structures

IMPHY I W 3
M 104, C, 9 W, 2.5 Cr, 0.5 V, bal Fe
For hot work dies, hot work steel

IMPHY M 550
M-104, C, 2.5 Cr, Mo, V, bal Fe
For gears, shafts, oil hardening

IMPHY M-1628
M-104, M-771, C, 65 Ni, 25 Mo, bal Fe
For chemical plant equipment; resists HCl.

IMPHY MA-42.
M-104; C, 20 Ni, 25 Cr, Si, bal Fe
For stainless and wear resistant parts, corrosion resistant, austenitic.

IMPHY M C T 1
M-104, 0.1-0.2 C, Cr, Mo, bal Fe
72,000 TS, 43,000 YS; 26 El.
For gun tubes, general parts; water hardening.

IMPHY M C.T. 2.
M-104; 0.2-0.3 C, Cr, Mo, bal Fe.
93,000 TS; 58,000 YS; 22 El.
For shafts, axles, aircraft fuselage; high workability

IMPHY MCT2S.
M-771; 0.25 C, 1.0 Cr, 0.25 Mo, bal Fe.
Annealed: 94,000 TS, 58,000 YS, 20 El.
Heat treated. 157,000 TS, 128,000 YS, 12 El
For axles, gears, spindles, Afnor 25CD4, case hardened

IMPHY M C.T. 3.
M-104; 0.3-0.4 C, Cr, Mo, bal Fe.
101,000 TS; 65,000 YS, 20 El
For crankshafts, gears, levers, axles, tough

IMPHY MCT4
M-771, 0.42 C, 1.0 Cr, 0.25 Mo, bal Fe.
Annealed 114,000 TS; 72,000 YS; 16 El
Heat treated. 280,000 TS. 230,000 YS, 4 El
For gears, shafts, crankshafts, Afnor 42CD4, oil hardened

IMPHY MCT-19
M-771, C, alloy, bal Fe
For oil refinery equipment, oxidation resistant.

IMPHY MCTO
M-771, 0.12 C, 1.0 Cr, 0.20 Mo, bal Fe
Annealed 72,000 TS, 43,000 YS, 24 El
Heat treated 150,000 TS, 123,000 YS, 10 El.
For case hardened gears, shafts, cams; Afnor 12CD4, case hardened

IMPHY "M D"
M 104, 0.30 C, Si, Mn, bal Fe
Annealed 78,000-85,000 TS, 46,000-52,000 YS, 26-23 El.
For fire arms, edge tools; water hardening

IMPHY MIPI
M-771, C, bal Fe
For welded structures

IMPHY MOS
M-104, 1.5 Si, Mn, C, bal Fe
Annealed 105,000 TS, 65,000 YS, 20 El
Heat treated 186,000 TS, 163,000 YS, 7 El
For gears, springs, silico-manganese steel

IMPHY "M T"
M-104, 0.45 C, Si, Mn, bal Fe
Annealed 91,000-100,000 TS, 52,000-60,000 YS, 22-17 El
For paper cutters, sledges, wedges, mining bars; water hardening

IMPHY MWS.
M-104, C, Si, Mn, bal Fe
Annealed 107,000 TS, 69,000 YS, 22 El
Heat treated: 193,000 TS; 171,000 YS, 7 El
For gears, crankshafts, wearing parts, tough

IMPHY N5CM
M-104, C, Si, Mn, 5 Ni, bal Fe
69,000-83,000 TS, 50,000-60,000 YS; 30-24 El
For case hardened parts, gun tubes, locomotive parts, shock resistant.

IMPHY N.7C.M.
M-104, C, 7 Ni, bal Fe.
Heat treated: 140,000-164,000 TS; 100,000-114,000 YS; 10-7 El.
Case-hardened parts; special Ni steel carburized.

IMPHY N42.
M-771, 42 Ni, bal Fe.
for glass sealing.
For electrical equipment; controlled expansion,

IMPHY N48
M-771; 48 Ni, bal Fe.
For glass sealing electronic rectifiers.
Stepped expansion.

IMPHY N54
M-771, 54 Ni, bal Fe.
For glass to metal seals.
Stepped expansion

IMPHY N58
M-771; 58 Ni, bal Fe.
For electrical equipment and glass sealing, controlled expansion.

IMPHY N A
M-104, C, 2 Ni, bal Fe.
Annealed. 78,000 TS, 50,000 YS; 26 El.
Heat treated 143,000 TS, 116,000 YS, 11 El.
For crankshafts, transmission shafts, forged parts, tough.

IMPHY NB
M-104, C, Si, Mn, 3 Ni, bal Fe.
81,000-96,000 TS, 54,000-67,000 YS, 25-20 El.
For crankshafts, transmission shafts, forgings; shock resistant.

IMPHY NC3HO
M-771; 0.14 C, 2.7 Ni, 0.8 Cr, bal Fe.
Annealed 82,000 TS, 52,000 YS, 22 El.
Heat treated 170,000 TS, 143,000 YS; 10 El
For case hardened gears, shafts; case hardened, Afnor 14NC11.

IMPHY N C 3 H-1.
M-104, C, 3 Ni, 1 Cr, bal Fe.
Annealed 81,000 TS, 55,000 YS, 25 El
Heat treated 164,000 TS, 150,000 YS, 10 El.
For crankshafts, machine parts, dies; shock resistant

IMPHY NC3H1.
M 771, 0.20 C, 3 Ni, 0.7 Cr, bal Fe
Annealed 92,000 TS, 58,000 YS, 20 El
Heat treated 157,000 TS; 143,000 YS; 10 El.
For arbors, axles, shafts, gears, spindles, Afnor 20NC11, oil hardened, case hardening.

IMPHY NC3H1R
M 771, 0.25 C, 1.4 Ni, 1.0 Cr, bal Fe
Annealed 92,000 TS, 58,000 YS, 18 El
Heat treated. 120,000 TS, 107,000 YS, 12 El
For arbors, shafts, axles, spindles; Afnor 25NC6; oil or water hardened

IMPHY NC-3H2
M-104, C, 3 Ni, 1 Cr, bal Fe
96,000-108,000 TS, 63,000-77,000 YS; 24-18 El.
For pinions, crankshafts, forging dies, auto construction, shock resistant

IMPHY NC3H2R
M-771, 0.35 C, 1.4 Ni, 1.0 Cr, bal Fe.
Annealed 100,000 TS, 65,000 YS; 17 El.
Heat treated 242,000 TS; 213,000 YS, 5 El
For arbors, axles, shafts, spindles; Afnor 35NC6, oil hardened.

IMPHY NC3H8R
M-771; 0.08 C, 1.4 Ni, 1.0 Cr, bal Fe.
Heat treated 78,000-128,000 TS; 43,000-85,000 YS; 25-12 El
For case hardened parts, gears, shafts; case hardened, Afnor 8NC6.

IMPHY NC3H10R
M-771; 0.10 C, 1.4 Ni, 1.0 Cr, bal Fe.
Annealed: 83,000 TS, 50,000 YS; 22 El.
Heat treated. 164,000 TS, 127,000 YS; 9 El.
For case hardened gears, shafts; case hardened; Afnor 10NC6.

IMPHY NC3H16R.
M-771; 0.16 C, 1.4 Ni, 1.0 Cr, bal Fe.
Annealed: 85,000 TS; 58,000 YS; 20 El.
Heat treated: 193,000 TS; 157,000 YS; 9 El.
For case hardened gears, shafts; case hardened; Afnor 16NC6.

IMPHY NC3H20R.
M-771; 0.18 C, 3.5 Ni, 1.5 Cr, 0.4 Mo, bal Fe.
Annealed: 107,000 TS; 72,000 YS, 15 El
Heat treated: 200,000 TS; 150,000 YS; 8 El.
For gears, shafts, cams; case hardened; Afnor 18NCD6.

IMPHY N.C.-4.
M-104; C, 25 Cr, bal Fe.
Forged: 121,000 TS, 85,000 YS; 25 El.
Annealed· 92,000 TS; 39,000 YS; 40 El.
For rotor housings, naval compass construction, non-magnetic.

IMPHY N C M.
M-104; 0.2 C, 2 Ni, bal Fe.
Heat treated 78,000-100,000 TS, 50,000-71,000 YS; 25-15 El.
For case-hardened parts; carburized.

IMPHY NCM.
M-771; 0.08 C, 1.3-2.3 Ni, bal Fe.
Heat treated: 60,000-86,000 TS; 46,000-58,000 YS; 32-20 El.
For case hardened parts, gears, shafts; case hardened; Afnor 8N8.

IMPHY N.D.
M-104, C, 5 Ni, bal Fe.
Annealed 81,000 TS; 55,000 YS; 25 El.
Heat treated. 177,000 TS, 143,000 YS, 10 El
For turbine buckets; resists fatigue stresses

IMPHY N.F.
M-104; 0 2 C, 3 Ni, bal Fe.
Heat treated: 100,000-114,000 TS, 78,000-100,000 YS; 16-8 El
For case-hardened parts; carburized.

IMPHY N.F.C. NO. 1.
M-104; C, 3.5 Ni, 1 Cr, bal Fe.
Annealed· 81,000-91,000 TS; 61,000-71,000 YS; 25-18 El.
Oil quenched: 171,000-200,000 TS; 156,000-192,000 YS; 10-7 El.
For case hardened parts, axles, shafts, steering parts, carburized

IMPHY N.F.C.-2.
M-104, C, 3 Ni, 1 Cr, bal Fe.
83,000-200,000 TS, 61,000-192,000 YS, 25-7 El.
For axles, shafts, steering parts; oil hardening, tough.

IMPHY N.F.C.-3.
M-104; C, 4 Ni, 1 Cr, bal Fe.
86,000-214,000 TS; 72,000-199,000 YS; 20-6 El
For axles, shafts, steering parts; shock resistant

IMPHY NFCO.
M-771; 0 08 C, Ni, Cr, bal Fe
Annealed 78,000 TS; 50,000 YS, 25 El.
Heat treated: 143,000 TS; 100,000 YS; 11 El.
For case hardened gears, shafts; case hardened; Afnor 8NC13.

IMPHY N.M.F.
M-104; C, 8 Ni, 8 Mn, 4 Cr, bal Fe.
For corrosion and heat resistant parts; corrosion and heat resistant.

IMPHY NMHG.
M-771; 70 Fe, 30 Ni.
For compensating shunts, electrical devices; controlled expansion.

IMPHY NY.
M-104; C, Si, Mn, 6 Ni, bal Fe
78,000-107,000 TS; 58,000-85,000 YS; 25-18 El.
For axles, gears, shafts; tough.

IMPHY R23.
M-771; 0 7 C, 6 5 W, 5.0 Mo, 4 Cr, 1 V, bal Fe.
Hardened: C 64-66 Rock.
For cutting tools, lathe and planer tools, drills, milling tools, broaches.
High speed steel High red-hardness

IMPHY R24.
M-771; 0.7 C, 10.0 W, 1.0 Mo, 4 Cr, 1 V, bal Fe.
Hardened· C 64-66 Rock.
For cutting tools, lathe and planer tools, drills, reamers
High speed steel, high red-hardness

IMPHY RAPIDE ULTRA
M-772, 0 7 C, 19 W, 4 Cr, 2 2 V, bal Fe.
For tools, dies, cutters; high speed steel.

IMPHY RCA 33
M-104, 20 Cr, 5 Al, bal Fe
For electrical resistances, heat resistant

IMPHY RCA 33
M-771, C, Cr, Al, bal Fe
For resistances, radiators, good to 1200°C application

IMPHY RCA 44
M-104, 32 Cr, 5 Al, bal Fe
For electrical resistances, heat resistant.

IMPHY RCA 44.
M-771, C, Cr, Al, bal Fe
For heating elements, radiators, good to 1200°C

IMPHY RES
M-104, C, 1.5 Si, Mn, bal Fe.
Annealed. 107,000 TS, 65,000 YS, 20 El.
Heat treated 186,000 TS, 164,000 YS; 7 El.
For springs, tough

IMPHY RNCO.
M-104, 12 Ni, 12 Cr, bal Fe.
For electrical resistances, rheostats, heat and corrosion resistant

IMPHY RNCI
M-104, C, 36 Ni, 10 Cr, bal Fe
For rheostats, electrical heating units, metallic heat screens, heat resistant to 600°C

IMPHY RNC 2
M-104, low C, 60 Ni, 11 Cr, bal Fe
For rheostats, electrically heated apparatus; heat resistant

IMPHY RNC 3.
M-104, low C, 80 Ni, 20 Cr
For rheostats, electrically heated apparatus; heat resistant to 1100°C.

IMPHY RNC 30
M-104, 40 Ni, 22 Cr, bal Fe.
For electrical resistances for industrial equipment; heat and corrosion resistant.

IMPHY RNC 44.
M-104, 5 Al, 30 Cr, bal Fe
For electrical heating resistances; heat resistant.

IMPHY RWS
M-104; C, Si, Mn, bal Fe.
Annealed· 107,000 TS; 69,000 YS; 22 El.
Heat treated: 193,000 TS; 171,000 YS; 7 El.
For motor car springs; tough.

IMPHYSIL.
M-771; Si, bal Fe.
For motors, transformers; soft magnet for strong or moderate field.

IMPHYSTA.
M-104; C, bal Fe.
For airplane construction; class of Imphy alloys.

IMPHY "T."
M-104; 0.5 C, Si, Mn, bal Fe.
Annealed: 100,000-107,000 TS; 55,000-64,000 YS; 19-14 El.
For hammers, punches, dies, cutlery; oil hardening.

IMPHY TRIPLE RAPIDE.
M-772; 0.7 C, 18 W, 5 Co, 4 Cr, 1.3 V, bal Fe.
For tools, dies, cutters; high speed steel.

IMPHY "T.T."
M-104, 0.65 C, Si, Mn, bal Fe.
Annealed: 107,000-120,000 TS; 56,000-71,000 YS; 15-10 El.
For files, saws, dies, ball mills; water harden.

IMPHY "T.T.T."
M-104; 0.70 C, Si, Mn, bal Fe.
Annealed: 120,000-143,000 TS; 64,000-78,000 YS; 12-7 El.
For files, saws, tools; water hardening.

IMPHY TUNGSTENE.
M-772; 1.3 C, 4 5 W, bal Fe.
For tools, dies; oil hardened

IMPHY UM Co50.
M-771; 0 05-0 12 C, 0.18 Ti, 0.6 Cb, 26-30 Cr, 47-52 Co, bal Fe.
Cast: 135,000 TS, 48,000 YS; 10 El; 10 RA; 250 Brin
Wrought 132,000 TS; 61,000 YS, 7 El; 6 RA; 350 Brin
For furnace baffles, burner tips, sintering grates, quench baskets.
Corrosion, heat and thermal shock resistant.

IMPHY VY2-SP.
M-771, 0 40 C, 4 6 Ni, 1.6 Cr, 0 5 Mo, bal Fe.
Heat treated 300,000 TS; 230,000 YS; 5 El.
For crankshafts, gears; Afnor 40NCD18; oil hardened

IMPHY VYP
M-771, 0 30 C, 4 0 Ni, 1.4 Cr, 0 5 Mo, bal Fe.
Annealed. 128,000 TS.
Heat treated 250,000 TS; 212,000 YS; 6 El.
For crankshafts, gears, bolts; Afnor 30NCD16, oil hardened.

IMPHY ZCR 716C
M-771, 10-12 Ni, 8-11 Cr, 2 0-2.5 Mo, 2.0-3.5 Al, 0 05 C, 0.13 Si, 0.47 Mn, bal Fe.
Maraged· 230,000 TS; 219,000 YS, 11 3 El; 56 RA.
For aircraft landing gears, special springs, used in marine atmospheres
Maraging steel High yield strength and corrosion resistant

IMPRESS.
M-336, 0 45 C, 1.0 Si, 1 4 Cr, 2.2 W, 0.2 V, 0 3 Mo, bal Fe.
For impression dies; non-deforming.

IMPROVED ELECTRIC.
M-806, 0 04 C, 0.1 Si, bal Fe.
Annealed: 50,000 TS; 30,000 YS; 20 El.
For small motors; good magnetic properties.

IMPROVED KS.
Japan; 20 Ni, 15 Ti, 20 Co, bal Fe.
For magnetic and electrical equipment; permanent magnet.

IMPROVITE.
M-346; 66-68 Ni, 3-4 Si, 28-31 Cu.
For introducing Ni and Cu into cast iron.

IN-40.
M-1570, M-1540; 0.10 C, 0.25 Si, 1.0 Mn, 0.04-0.075 N, bal Fe.
Rolled: 69,100 TS; 48,600 YS; 32 El.
Heat treated: 60,700 TS; 45,800 YS; 44 El; 79 RA.
For bridges, structures, booms, bus bodies.
Tough and readily welded.

IN-50.
M-1540, M-1570; 0.14 C, 0.30 Si, 1.4 Mn, 0.04-0.075 N, bal Fe.
Rolled: 77,500 TS; 54,400 YS; 29 El.
Heat Treated: 72,100 TS; 56,000 YS; 38 El; 75.6 RA.
For bridges, structures, booms, mine and railroad cars.
Good fabricability and weldability.

IN-60.
M-1540, M-1570; 0.17 C, 0.35 Si, 1.3 Mn, 0.3 Cr, 0.04-0.075 N, bal Fe.
Rolled: 87,300 TS; 59,700 YS; 35 El; 69 RA.
Heat treated: 90,700 TS; 72,800 YS; 32 El; 68.5 RA.
For bridges, structures, bus and truck bodies, booms, mine cars.
High strength-low alloy steel. Good weldability.

IN-80.
M-1540, M-1570; 0.16 C, 0.25 Si, 0.85 Mn, 1.0 Cr, 0.4 Mo, 0.25 Cu, 0.04-0.075 N, bal Fe.
Heat treated: 107,000 TS; 102,000 YS; 23 El.
For structures, buildings, bridges, mine cars, truck and bus bodies. High strength-low alloy steel, good weldability.

IN-80N.
M-1540, M-1570; 0.15 C, 0.25 Si, 0.40 Mn, 2.25 Ni, 1.2 Cr, 0.35 Mo, 0.04-0.075 N, bal Fe.
Heat Treated: 120,600 TS; 105,200 YS; 27 El; 73 RA.
For mine cars, crushers, bridges, truck and bus bodies, booms. High strength-low alloy steel, good weldability.

IN-80V.
M-1540, M-1570; 0.14 C, 0.25 Si, 0.85 Mn, 0.85 Ni, 0 50 Cr, 0.45 Mo, 0.07 V, 0.3 Cu, 0.06 N, bal Fe.
Heat Treated: 113,000 TS; 103,000 YS; 24 El; 67 RA.
For bridges, booms, structures, truck and bus bodies, mine cars.
High strength-low alloy steel, tough and shock resistant.

IN-100
M-68; 8-11 Cr, 13-17 Co, 2-4 Mo, 0 7-1.2 V, 5-6 Al, 4.5-5.5 Ti, 0.18 C, 0.01 B, 0 06 Zr, bal Ni.
Cast: 142,000 TS; 122,000 YS; 8 El.
At 1800°F· 75,000 TS; 60,000 YS; 5 El.
For jet engine parts, turbine blades; for operating temperatures up to 1900°F.

IN-100.
M-1540, M-1570; 0.16 C, 0 25 Si, 0.85 Mn, 1.2 Ni, 0.6 Cr, 0.55 Mo, 0.07 V, 0.25 Cu, 0.06 N, bal Fe.
Heat treated: 144,200 TS; 138,000 YS; 20 El.
For mine cars, bus and truck bodies, booms, derricks.
High strength—low alloy steel, tough and shock resistant.

IN-102.
M-68; 7 Fe, 15 Cr, 3 Cb, 3 Mo, 3 W, 0.5 Al, 0.5 Ti, 0.06 C, B, Zr, bal Ni.
Annealed: 130,000 TS; 60,000 YS; 45 El.
At 1200°F: 103,000 TS; 50,000 YS; 52 El; 42 RA.
For high-temperature, high-pressure steam turbines; for long service up to 1200°F, high strength and ductility.

IN-732.
M-68; 30 Ni, 2.8 Cr, bal Cu.
Air Cooled: 55,000 YS; 150 Charpy Impact; 90,000 TS; 30 El; 60 RA.
For marine hardware.
High strength, tough, corrosion resistant, good weldability.

IN-738.
M-68; 0.17 C, 8.5 Co, 16 Cr, 1.75 Mo, 2.6 W, 1.75 Ta, 0.9 Cb, 3.4 Al, 3.4 Ti, 0.01 B, 0.1 Zr, bal Ni.
Heat treated: 160,000 TS; 140,000 YS; 4 El; 4 RA.
At 1200°F: 155,000 TS; 130,000 YS; 3 El; 5 RA.
For jet engine and gas turbine components, blades, vanes, integral-wheel configuration.
Precipitation hardenable. Sulfidation resistant. High rupture strength at elevated temperatures.

INAFOND C5.
M-1445, 4.2-5.0 Cu, 0.3 Mg, 0.2 Ti, bal Al.
Heat treated: 47,000-54,000 TS; 28,000-37,000 YS; 14-7 El; 100-115 Brin
For light alloy parts, age-hardenable

INAFOND C8.
M-1445; 7.0-8.5 Cu, 0.6 max Fe, 0.5 max Si, 0.2 Ti, bal Al.
Cast: 20,000-26,000 TS; 11,000-13,500 YS; 5-2 El; 55-70 Brin.
For light alloy parts.

INAFOND C41.
M-1445; 4.5 Cu, 0.8 max Fe, 1 max Si, 0.2 max Ti, bal Al.
Heat treated: 36,000-43,000 TS; 28,000-33,000 YS; 4-2 El; 75-95 Brin.
For light alloy parts; age-hardenable.

INAFOND C4S.
M-1445, 4.5 Cu, 2-3 Si, 0.45 max Fe, 0.1 max Ti, bal Al.
Heat treated: 36,000-40,000 TS; 18,000-23,000 YS; 6-3 El; 75-85 Brin
For light alloy parts; age-hardenable.

INAFOND S7.
M-1445; 7 Si, 0.3 Mg, 0.5 Mn, 0.15 Ti, bal Al.
Cast: 37,000-43,000 TS, 25,000-30,000 YS; 10-6 El, 90-110 Brin
For light alloy parts; corrosion resistant

INAFOND S9.
M-1445, 9 Si, 0.35 Mg, 0.5 Mn, bal Al
Cast. 35,000-43,000 TS, 28,000-37,000 YS; 5.5-3.5 El, 80-95 Brin
For light alloy parts; corrosion resistant

INAFOND S12.
M-1445, 11.5-13.0 Si, 0.3 Mg, 0.5 Mn, bal Al
Cast: 34,000-46,000 TS; 28,000-40,000 YS, 4-1 El; 80-110 Brin
For light alloy parts; corrosion resistant.

INAFOND S13.
M-1445; 12.75-13.25 Si, bal Al
Cast: 31,000-34,000 TS; 14,000-17,000 YS; 3.0-1.5 El; 60-80 Brin
For light alloy parts, corrosion resistant.

INAFOND S52.
M-1445; 1.3 Cu, 5 Si, 0.5 Mg, bal Al.
Heat treated: 50,000-57,000 TS; 40,000-46,000 YS; 5-2 El; 110-140 Brin
For light alloy parts; age-hardenable.

INAFOND S71.
M-1445; 7 Si, 0.3 Mg, bal Al
Cast: 37,000-43,000 TS; 25,000-30,000 YS, 10-6 El, 90-110 Brin.
For light alloy parts; corrosion resistant.

INAFOND S131.
M-1445; 0.8 Cu, 12.0-13.3 Si, 0.3 Mn, bal Al.
Cast: 31,000-37,000 TS; 17,000-20,000 YS; 3.0-1.5 El; 60-80 Brin.
For light alloy parts, corrosion resistant.

INAFOND S132.
M-1445; 1.75-2.25 Cu, 12.0-13.3 Si, 0.3 Mn, bal Al.
Cast. 33,000-23,000 TS, 18,000-23,000 YS; 2.5-1.0 El, 65-85 Brin.
For light alloy parts; corrosion resistant.

INAFOND Z5F.
M-1445, 1 Fe, 0.6 Mg, 5 Zn, 0.2 Ti, bal Al.
Heat treated: 42,000-50,000 TS; 24,000-30,000 YS; 14-9 El; 90-105 Brin
For light alloy parts; heat treatable.

INALIUM.
M-623, 0.5 Si, 1.2 Mg, 1.7 Cd, bal Al.
26,000-29,000 TS, 10,000-18,500 YS, 22-18 El; 50-60 Brin
For light alloy parts.

INALIUM
M-1394, 0.8 Mg, 0.25 Fe, 0.45 Si, 0.18 Zn, 0.08 W, bal Al
For light alloy parts

INCO 13.
M-68, 5 Al, bal Ni
For jet engine components, corrosion and heat resistant

INCO 220 NICKEL replaced by NICKEL 220

INCO 546 replaced by INCONEL ALLOY 721.

INCO 550 replaced by INCONEL ALLOY 751

INCO A-2
M-68, 3.4 T.C., 2.3 Si, 0.5 Mn, 1.0 Ni, 1.0 Cr, bal Fe
For bottom plates in chain drag conveyors, heat resistant

INCO A-15
M-68, 3.3 C, 1.5 Ni, 2.0 Si, bal Fe
Cast: 40,000 TS
For machine tool castings; cast iron.

INCO "B" MONEL replaced by MONEL ALLOY 400

INCOLOY renamed INCOLOY ALLOY 800

INCOLOY ALLOY 800
M-1499, 32.5 Ni, 0.05 C, 0.75 Mn, 46.0 Fe, 0.008 S, 0.50 Si, 0.38 Cu, 21.0 Cr, 0.38 Al, 0.38 Ti
Cold drawn: 100,000-150,000 TS, 75,000-125,000 YS, 30-10 El, 180-300 Brin
For heat exchangers and process piping, carburizing fixtures and retorts, electric range heating element sheathing, resistant to elevated temperature oxidation and carburization

INCOLOY ALLOY 801
M-1499, 32.0 Ni, 0.05 C, 0.75 Mn, 44.5 Fe, 0.008 S, 0.50 Si, 0.25 Cu, 20.5 Cr, 1.13 Ti
For jet engine combustion liners and transition pieces. High temperature tensile and rupture strength. Formerly INCOLOY T

INCOLOY 802
M-1499, 32.5 Ni, 0.35 C, 0.75 Mn, 46.0 Fe, 0.008 S, 0.38 Si, 21.0 Cr, 0.58 Al, 0.75 Ti.
Hot finished and annealed: 80,000-105,000 TS; 35,000-50,000 YS, 47-18 El; 140-188 Brin.
For hot sizing dies for aerospace industry, connecting pins for cast link heat treating furnace belts; good high temperature strength and corrosion resistance.

INCOLOY ALLOY 804.
M-1499; 41.0 Ni, 0.25 C, 0.75 Mn, 25.4 Fe, 0.008 S, 0.38 Si, 0.25 Cu, 29 5 Cr, 0.30 Al, 0.60 Ti.
Annealed: 95,000 TS; 45,000 YS; 40 El.
High-temperature strength; resistant to carburization and sulfidation.

INCOLOY ALLOY 805.
M-1499; 36.0 Ni, 0.12 C, 0.6 Mn, 54.5 Fe, 0.008 S, 0.50 Si, 0.10 Cu, 7.5 Cr, 0.5 Mo.

INCOLOY ALLOY 825.
M-1499; 42.0 Ni, 0.03 C, 0.50 Mn, 30.0 Fe, 0.015 S, 0 25 Si, 2.25 Cu, 21.5 Cr, 0.10 Al, 0.90 Ti, 3.0 Mo.
Annealed: 85,000-105,000 TS, 35,000-65,000 YS; 50-30 El; 120-180 Brin.
For phosphoric acid evaporators, pickling tank heaters, pickling hooks and equipment, propeller shafts, tank trucks; corrosion resistant.
Formerly Ni-O-NEL alloy 825.

INCOLOY ALLOY 901.
M-1499; 0.05 C, 12.8 Cr, 43 Ni, 5.7 Mo, 2 4 Ti, 35 Fe.
Heat treated: 168,000 TS; 110,000 YS; 23 El.
At 1200°F: 125,000 TS; 95,000 YS; 5 El.
For aircraft gas turbine blades, turbine discs, age hardenable, up to 1400°F service

INCOLOY DS.
M-121; 0.15 max C, 2 0-2.5 Si, 36-39 Ni, 17-19 Cr, bal Fe.
At 68°F· 105,300 TS; 38 El; 50 RA.
At 1112°F. 66,100 TS, 45 El, 38 RA.
At 1832°F· 12,300 TS, 124 El; 83 RA.
For furnace parts, high temperature equipment; useful to 950°C in oxidizing atmosphere

INCOLOY FILLER METAL 65
M-1499, 42 0 Ni, 0.03 C, 0 70 Mn, 30 0 Fe, 0.007 S, 0 30 Si, 1 7 Cu, 21.0 Cr, 1 0 Ti, 3.0 Mo
For gas-shielded arc welding of INCOLOY alloy 825.
MIL-E-21562

INCOLOY T replaced by INCOLOY ALLOY 801

INCOLOY WELDING ELECTRODE 135.
M-1499, 36.0 Ni, 0.05 C, 2 0 Mn, 26.0 Fe, 0 008 S, 0 40 Si, 1 8 Cu, 29.0 Cr, 3 75 Mo.
Electrode for shielded metal-arc welding of Incoloy alloy 825 to itself and to steels

INCOMPARABLE.
M-1409; 0 8 C, 22 W, 4 5 Cr, 1 5 V, bal Fe
For form tools, cutters, lathe and planer tools; high speed steel

INCONEL renamed INCONEL ALLOY 600

INCONEL 62
M-1499; 0.10 max C, 6-10 Fe, 14-17 Cr, Cb = 4 × Si max, 70 min Ni.
For welding rods; corrosion resistant.

INCONEL 132.
M-897; 0.2 max C, 6-10 Fe, 14-17 Cr, bal Fe.
For heat resistant parts; high heat resistance.

INCONEL ALLOY 600
M-1499; 76.0 Ni, 0.08 C, 0 5 Mn, 8.0 Fe, 0.008 S, 0.25 Si, 0.25 Cu, 15.5 Cr.
Annealed. 80,000-100,000 TS; 30,000-50,000 YS; 50-35 El; 120-170 Brin.
Cold drawn: 105,000-150,000 TS; 80,000-125,000 YS; 30-10 El; 180-300 Brin.
For furnace muffles, electronic components, heat exchanger tubing, nuclear reactors, springs, jet engine parts; good high temperature properties.

INCONEL ALLOY 601.
M-1499; 60.5 Ni, 0.05 C, 0.5 Mn, 14.1 Fe, 0.007 Si, 0.25 Si, 0.50 Cu, 23.0 Cr, 1.35 Al.
HR, Annealed. 86,000-107,000 TS; 29,000-48,000 YS; 46-60 El.
For heat treating baskets and fixtures, radiant furnace tubes, thermocouple protection tubes, furnace muffles and retorts; good high temperature strength and corrosion resistance.

INCONEL ALLOY 625.
M-1499, 61.0 Ni, 0 05 C, 0.25 Mn, 2.5 Fe, 0.008 S, 0.25 Si, 21 5 Cr, 0.2 Al, 0 2 Ti, 9 0 Mo, 3.65 Cb + Ta
Sol Ann. 105,000-130,000 TS; 42,000-60,000 YS; 65-40 El; 116-194 Brin
As rolled 120,000-160,000 TS; 60,000-110,000 YS; 60-30 El; 175-240 Brin.
For ducting systems, combustion systems, fuel nozzles, after burners; high strength and corrosion resistance

INCONEL ALLOY 702.
M-1499; 79 5 Ni, 0.05 C, 0 50 Mn, 1 0 Fe, 0.005 S, 0.35 Si, 0.25 Cu, 15.5 Cr, 3.25 Al, 0.63 Ti.
For afterburner liners, furnace components and fixtures; oxidation resistant to 2400°F

INCONEL ALLOY 706
M-1499; 41 5 Ni, 0 3 C, 0 18 Mn, 40 0 Fe, 0.008 S, 0 18 Si, 0 15 Cu, 16 0 Cr, 0.20 Al, 1 75 Ti, 2 9 Cb + Ta
Sol treated and aged 185,000-193,000 TS, 143,000-161,000 YS, 20-19 El.
For gas turbine components· high strength, machinable and weldable

INCONEL ALLOY 717C
M-1499; 10-14 Cr, 3 5-5 0 Mo, 1-3 Cb, 7-9 Co, 0 75-1 25 Ti, 7 2 8 0 Al, bal Ni.
For turbine blades, 1800°F rupture strength.

INCONEL ALLOY 718
M-1499, 52 5 Ni, 0 04 C, 0 18 Mn, 18 5 Fe, 0 008 S, 0 18 Si, 0 15 Cu, 19 0 Cr, 0 50 Al, 0.90 Ti, 3 05 Mo, 5 13 Cb + Ta
HR & Aged 203,500 TS, 181,000 YS; 16 El, 393 Brin
For jet engines, pump bodies and parts, rocket motors and thrust reversers, space craft High strength, weldable in aged condition

INCONEL ALLOY 721.
M-1499, 71 0 Ni, 0 04 C, 2 25 Mn, 4.0 Fe, 0 005 S, 0 08 Si, 0 10 Cu, 16 0 Cr, 3 05 Ti
For internal combustion engine valves, age-hardenable; high creep strength.
Formerly INCONEL M

INCONEL ALLOY 722.
M-1499, 75 0 Ni, 0 04 C, 0 50 Mn, 7 0 Fe, 0.005 S, 0 35 Si, 0.25 Cu, 15.5 Cr, 0.7 Al, 2.38 Ti.
For jet engine components; age-hardenable; high temperature strength and oxidation and corrosion resistant.
Formerly INCONEL W.

INCONEL ALLOY 751.
M-1499, 72.5 Ni, 0 05 Cr, 0.5 Mn, 7.0 Fe, 0.005 S, 0 25 Si, 0 25 Cu, 15 5 Cr, 1.2 Al, 2 3 Ti, 0 95 + Ta
For diesel exhaust valves; high rupture strength at 1600°F.

INCONEL ALLOY 806.
M-68; 0.06 C, 6-8 Cr, 15-18 Mo, 5 max Fe, 0.01 max B, bal Ni.
Ht. Tr.. 87,000 TS; 38,000 YS; 17 El.

At 1000°F: 63,000 TS; 22,000 YS; 29 El.
For equipment handling hot fluoride salts, high temperature applications.
Heat and corrosion resistant.

INCONEL ALLOY X-750.
M-1499; 73.0 Ni, 0.04 C, 0.50 Mn, 7.0 Fe, 0.005 S, 0.25 Si, 0.25 Cu, 15.5 Cr, 0.7 Al, 2.5 Ti, 0.95 Cb + Ta.
Hot finished and aged: 170,000-206,000 TS; 100,000-163,000 YS; 30-15 El; 302-400 Brin.
For aviation and industrial gas turbine parts, springs for steam service and nuclear reactors, bolts, heat treating fixtures;
corrosion and oxidation resistant; age hardenable; high creep-rupture strength.

INCONEL FILLER METAL 62.
M-1499; 74.0 Ni, 0.02 C, 0.10 Mn, 7.5 Fe, 0.005 S, 0.10 Si, 0.03 Cu, 16.0 Cr, 2.25 Cb.
For gas-shielded arc welding of Inconel alloy 600 and Incoloy alloy 800; overlaying on steel.
AWS A 5.14 Class ERNiCrFe-5; AMS 5679.

INCONEL FILLER METAL 69.
M-1499; 73.0 Ni, 0.04 C, 0.55 Mn, 6.5 Fe, 0.007 S, 0.30 Si, 0.05 Cu, 15.2 Cr, 0.7 Al, 2.5 Ti, 0.85 Cb.
For gas tungsten-arc welding of Inconel alloys 722 and X750.
AWS A 5.14 Class ERNiCrFe-7; AMS-5778.

INCONEL FILLER METAL 82.
M-1499; 72.0 Ni, 0.02 C, 3.0 Mn, 1.0 Fe, 0.007 S, 0.20 Si, 0.04 Cu, 20.0 Cr, 0.55 Ti, 2.5 Cb.
For gas-shielded arc welding of Inconel alloy 600, Incoloy alloy 800 Inconel alloy 600 to steel, other dissimilar combinations of nickel-base and iron-base alloys; overlaying on steel.
AWS A 5.14 class ERNiCr-3; ASME SFB 5 14

INCONEL FILLER METAL 92.
M-1499; 71.0 Ni, 0.03 C, 2.3 Mn, 6.6 Fe, 0.007 S, 0.10 Si, 0.04 Cu, 16.4 Cr, 3.2 Ti.
For gas shielded arc welding of dissimilar alloys such as austenitic and ferritic steels, to each other and to high-nickel alloys; overlaying on steel.
AWS A 5.14 class ERNiCrFe-6; ASME SFB 5.14.

INCONEL FILLER METAL 601.
M-1499; 60.5 Ni, 0.05 C, 0.50 Mn, 14.1 Fe, 0.007 S, 0.25 Si, 0.50 Cu, 23.0 Cr, 1.35 Al.
For gas tungsten-arc welding of Inconel alloy 601.

INCONEL FILLER METAL 625.
M-1499; 61.0 Ni, 0.05 C, 0.25 Mn, 2.5 Fe, 0 008 S, 0.25 Si, 21.5 Cr, 0.2 Al, 0.2 Ti, 9.0 Mo, 3.65 Cb + Ta.
For gas-shielded arc welding of Inconel alloy 625.
AMS 5837.

INCONEL FILLER METAL 718.
M-1499; 52.5 Ni, 0.04 C, 0.20 Mn, 18.5 Fe, 0.007 S, 0.30 Si, 0.07 Cu, 18.6 Cr, 0 40 Al, 0 90 Ti, 5.0 Cb, 3.1 Mo.
For gas tungsten-arc welding of Inconel alloys 718 and X-750.
AMS 5832.

INCONEL M replaced by INCONEL ALLOY 721.

INCONEL X renamed INCONEL X750.

INCONEL X550 replaced by INCONEL 751.

INCONEL W replaced by INCONEL ALLOY 722.

INCONEL WELDING ELECTRODE 112.
M-1499; 61.0 Ni, 0.05 C, 0.3 Mn, 4.0 Fe, 0.010 S, 0.40 Si, 21.5 Cr, 9.0 Mo, 3.65 Cb + Ta.
Electrode for shielded metal-arc welding of Inconel alloy 625 and dissimilar nickel-base and iron-base alloys.
MIL-E-22200/3.

INCONEL WELDING ELECTRODE 132.
M-1499; 73.0 Ni, 0.04 C, 0.75 Mn, 8.5 Fe, 0.006 S, 0.20 Si, 0.04 Cu, 15.0 Cr, 2.1 Cb, 0.05 Co, 0.05 Ta.
Electrode for shielded metal-arc welding of Inconel alloy 600.
AWS A 5.11 Class ENiCrFe-1; AMS 5684.

INCONEL WELDING ELECTRODE 182.
M-1499; 67.0 Ni, 0.05 C, 7.75 Mn, 7.50 Fe, 0.008 S, 0.50 Si, 0.10 Cu, 14.0 Cr, 0.40 Ti, 1.75 Cb, 0.08 Co, 0.03 Ta.
Electrode for shielded metal-arc welding of Inconel alloy 600; welding dissimilar combinations of nickel-base and iron-base alloys; overlaying on steel
AWS A 5.11 Class ENiCrFe-3; ASME SFB 5.11.

INCORO 20.
M-1493; In, Cu, Au.
For brazing alloy; M.P. 970-1015°C.

INCORO-60.
M-1493; 60 Au, 32 Cu, 3 In.
For brazing Kovar.
M P 860-900°C Low vapor pressure.

INCO-WELD A ELECTRODE.
M-1499, 70.0 Ni, 0.03 C, 2 0 Mn, 9.0 Fe, 0.008 S, 0 30 Si, 0.06 Cu, 15.0 Cr, 2.0 Cb, 1.5 Mo, 0 05 Co, 0.03 Ta.
Electrode for shielded metal-arc welding of dissimilar alloys such as austenitic and ferritic steels to each other and to high-nickel alloys; welding Incoloy alloy 800 to itself.
AWS A5.11 Class ENiCrFe-2; ASME SFB 5.11

INCRA 4040-6.
M-1037; 13 5-16.5 Ni, 9.5-10 5 Al, 0.4-1.0 Fe, 1.0-2.0 Co, bal Cu
At R.T : 91,000 TS; 60,000 YS; 5 El; 195 Brin.
For molds and accessory components in the glass industry
Thermal shock and fatigue resistant.
Good oxidation and growth resistance.

INCRAMET-800.
Mfg.· Licensees of International Copper Res Assoc
13.5-16.5 Ni, 10 75-11.50 Al, 0.4-1 0 Fe, 1.0-2 0 Co, bal Cu.
Cast 91,000 TS; 60,000 YS, 5 El; 195 Brin.
At 1100°F: 25,000 TS; A 30 Rock.
For glass molds, sheet glass rolls.
Heat and corrosion resistant.

INCUS.
M-111; 0.55 C, 0.7 Mn, 0 7 Cr, 1.75 Ni, 0 7 Mo, bal Fe
For drop forging dies; tough.

INCUSIL 10.
M-1493; 63 Ag, 27 Cu, 10 In.
For brazing glass headers.
M.P. 685-730°C.

INCUSIL 15.
M-1493; 61 5 Ag, 24 Cu, 14 In.
For brazing glass headers.
M.P 630-705°C.

INCUT 4140.
M-67; 0.38-0.43 C, 0.75-1 0 Mn, 0.15-0.30 Si, 0 15-0.35 Pb, 0.035 min Te, 0.8-1.1 Cr, 0.15-0.25 Mo, bal Fe
Rolled: 137,600 TS; 96,800 YS; 19 El; 47 RA.
Heat Treated· 139,000-203,000 TS; 116,000-186,000 YS; 9-19 El; 27-55 RA.
For gears, shafts, axles, fittings, collets, forge hammer rams, studs, wrenches;
Free-machining, oil hardening.

INCUT 4142.
M-67; 0.40-0.45 C, 0.75-1.00 Mn, 0.15-0.30 Si, 0.15-0.35 Pb, 0.035 min Te, 0.80-1.1 Cr, 0.15-0.25 Mo, bal Fe.
Rolled: 137,600 TS; 96,800 YS; 19 El; 47 RA.
Heat treated: 139,000-203,000 TS; 116,000-186,000 YS; 9-19 El; 27-55 RA.
For gears, shafts, axles, fittings, collets, forge hammer rams, studs, wrenches.
Free-machining, oil hardening.

INDALLOY.
M-1076; 12 Co, 17 Mo, bal Fe.
For permanent magnets; sintered; Br 9000, Hc 240.

INDALLOY-1.
M-1041; 50 In, 50 Sn.
Cast: 1720 TS; 83 El.
For solder; M.P. 117°C.

INDALLOY-2.
M-1041; 80 In, Ag, Pb.
Cast: 2550 TS; 58 El
For solder, M.P. 156.7°C.

INDALLOY-3.
M-1041; 90 In, 10 Ag.
Cast: 1650 TS; 61 El
For solder; M.P. 230°C.

INDALLOY-4.
M-1041; 100 In
Cast: 515 TS; 41 El
For solder, M.P. 156.7°C

INDALLOY-5.
M-1041, 25 In, Pb, Sn
Cast: 5260 TS, 101 El
For solder; M.P. 138°C.

INDALLOY-6.
M-1041, 5 In, Ag, Pb.
Cast: 4560 TS; 36 El.
For solder, M.P. 285°C

INDALLOY-7.
M-1041; 50 In, 50 Pb
Cast: 4670 TS; 55 El
For solder, M.P. 215°C.

INDALLOY-8
M-1041; 18.3 In + Lipowitz.
For solder; M.P. 110°C.

INDALLOY-9
M-1041, 12 In, Pb, Sn
Cast: 5320 TS; 135 El
For solder; M.P. 174°C

INDALLOY-10.
M-1041; 25 In, 75 Pb.
Cast: 5450 TS; 47.5 El.
For solder, M.P. 230°C.

INDALLOY-11
M-1041; 5 In, Pb
Cast: 4330 TS; 52 El
For solder; M.P. 230°C.

INDALLOY-12.
M-1041; 5 In, Ag, Pb.
Cast: 5730 TS; 23 El.
For solder; M.P. 290°C

INDALLOY NO. 160
M-1041; Indium plate.
For Indium plate, surface protection, decorative finish; alloyed with base metal by diffusion.

INDAR 5003.
M-265; 64 Cu, 16.5 Zn, 18 Ni, 1.5 Pb.
Sintered: 27,600 TS; 8 El; H 76 Rock.
Repressed: 35,000 TS; 15 El; H 80 Rock.
For corrosion resistant and decorative parts, marine components.
Nickel Silver, stainless.

INDAR 6003.
M-265; 99.75 Fe, 0.25 C.
Sintered: 18,500-34,000 TS, 2 El; F 47-81 Rock.
For structural parts and bearings.
Carbon steel, water hardening.

INDAR 6005.
M-265; 100 Fe.
Sintered: 19,500 TS; 1.5 El; F 54 Rock.
For low strength structural parts and bearings.
SAE 850. Powder metallurgy.

INDAR 6012.
M-265; 1.0 C, 99.0 Fe.
Sintered: 34,000-52,000 TS, 1 El; B 48-64 Rock
For structural parts and bearings
Water hardening, wear resistant.

INDAR 6015
M-265; 99.50 Fe, 0.50 C.
Sintered: 27,000-42,000 TS; 1-2 El, B 28-55 Rock.
For structural parts and bearings.
Water hardening

INDAR 6016
M-265; 100 Fe.
Sintered: 30,000 TS, 10 El; F 78 Rock
Repressed: 41,000 TS, 25 El
For magnetic pole pieces, relay armatures.
Soft magnetic properties, high permeability

INDAR 6022
M-265, 2 Cu, 98 Fe
Sintered: 21,000-39,000 TS; 0-1 El; B 60-68 Rock
For structural parts and bearings
May be oil impregnated. Good corrosion resistance

INDAR 6027
M-265, 100 Fe
Sintered: 26,000-36,000 TS; 1-3 El; F 64-72 Rock.
For soft magnetic applications, yokes, pole pieces
High permeability.

INDAR 6028
M-265, 0.5 C, 0.75 Mo, 0.35 Ni, 0.40 Mn, 0.25 Si, bal Fe
Sintered: 32,000-51,000 TS; 0 El, B 46-68 Rock
Heat Treated: 37,000-65,000 TS, 0 El C 28-48 Rock
For structural parts, gears, fasteners.
Oil hardening

INDAR 6030
M-265; 7 Cu, 93 Fe.
Sintered: 29,000-50,000 TS, 0.5-1.0 El; F 72-86 Rock.
For structural parts and bearings
May be oil impregnated

INDAR 6031
M-265; 5 Cu 95 Fe
Sintered: 27,000-48,000 TS; 0.5-1.0 El, F 72-86 Rock.
For structural parts and bearings
May be oil impregnated

INDAR 6051
M-265, 25 Cu, 75 Fe
Sintered: 20,000-40,000 TS, 1-2 El, F 37-75 Rock.
For structural parts and bearings.
May be oil impregnated.

INDAR 6053.
M-265; 4 Ni, 1 Cu, 0.7 C, bal Fe.
Heat treated: 90,000-135,000 TS; 0.5 El; Rock C 25-45.
For high strength structural parts.
Supplied heat treated; wear resistant.

INDAR 7004.
M-265; 78.5 Cu, 20 Zn, 1.5 Pb.
Sintered: 28,400 TS; 15 El; H 74 Rock.
Repressed. 40,900 TS; 3 El; H 97 Rock.
For bolts, fasteners, screw machine products.
Leaded brass, corrosion resistant.

INDAR 8001.
M-265; 100 Cu.
Sintered: 35,000 TS, 18 El; F 70 Rock.
For power switchgear, heat sinks, current carrying structural parts.
High conductivity of 90% min. Powder metallurgy

INDEFATIGABLE.
French; 0.26 C, 4 Ni, 0.6 Cr, 0.9 Mo, bal Fe
Heat treated. 230,000 TS; 190,000 YS; 6 El.
Annealed: 120,000 TS, 100,000 YS, 16 El.
For rail and switch parts, street car tracks; oil hardening.

INDEPENDENCE
M-618, 0.8 C, bal Fe
For tools, springs; water hardened

INDEX
M-1322, 1.0 C, 0.2 Si, 0.25 Mn, 0 1 V, bal Fe
For springs, tools, cutters, reamers; Type W2; water hardened.

INDIE ZP
M-64, 0 35 C, 0.8 Mn, 0.45 Si, 1 65 Cr, 0 43 Mo, bal Fe
Oil hardening tool and die steel designed for molds; AISI P20

INDOX I.
M-1076; BaO + Fe_2O_3
For magnets; hard and brittle

INDOX V
M-1076, BaO + FeO.
For permanent magnet for D C motors; ferrite, high peak energy product, cermet.

INDOX-VI.
M-1076, $BaFe_{12}O_{19}$.
For permanent magnets, focusing magnets for traveling wave tubes; ferrite, ceramic

INDOX VI-A
M-1076, Barium ferrite
Coercive force-3000 oersteds
Peak energy product -2.6 × 10^6 gauss-oersteds
Residual induction -3300 gausses
For applications requiring good resistance to demagnetization Highly oriented Permanent magnet.

INDUSTRIAL NO 12.
M-440; 0.15 max C, 11 5-13 5 Cr, bal Fe.
Annealed 85,000 TS; 60,000 YS; 35 El, 75 RA; 135 Brin
For valves, cutlery, turbine blades; Type 410; corrosion resistant

INDUSTRIAL NO 12T
M-440; 0 15 max C, 11.5-13.0 Cr, 1 max Mn, bal Fe.
Annealed· 85,000-100,000 TS; 60,000-75,000 YS; 35-25 El; 75-60 RA; 135-165 Brin
Heat treated: 100,000-200,000 TS; 60,000-175,000 YS; 30-10 El; 75-50 RA; 200-390 Brin.
For chemical plant equipment; Type 403, corrosion resistant.

INDUSTRIAL NO. 17.
M-440; 0.12 max C, 14-18 Cr, 1 max Mn, 1 max Si, bal Fe.
Cold drawn: 130,000 TS; 120,000 YS; 3 El; 10 RA; 270 Brin.
Annealed: 75,000 TS; 35,000 YS; 40 El; 60 RA; 145 Brin.
For auto trim, kitchen sinks, oil refinery equipment; Type 430; corrosion resistant.

INDUSTRIAL NO. 17-7.
M-440; 0.09-0.20 C, 16-18 Cr, 7-9 Ni, 1.2 max Mn, bal Fe.
Annealed· 100,000 TS; 40,000 YS; 60 El; 160 Brin.
½ H-temper: 150,000 TS; 110,000 YS; 15 El; 320 Brin.
For chemical plant equipment, structural members, austenitic, stainless.

INDUSTRIAL NO. 18.
M-440; 0.12 max C, 18 Cr, bal Fe.
For corrosion resistant parts, corrosion resistant.

INDUSTRIAL NO. 18-8S.
M-440; 0 08 max C, 18-20 Cr, 8-12 Ni, 2 max Mn, bal Fe.
Annealed. 80,000 TS, 35,000 YS, 60 El; 70 RA; 135 Brin.
Cold drawn· 180,000 TS, 150,000 YS; 10 El; 330 Brin
For kitchen equipment, welded structures, process equipment; stainless, austenitic; Type 304.

INDUSTRIAL NO. 18-10CB
M-440, 0 08 max C, 17-19 Cr, 9-13 Ni, Cb = 10 × C, bal Fe
Annealed· 80,000-90,000 TS, 35,000-45,000 YS; 60-55 El, 70-60 RA; 135-185 Brin.
Cold drawn. 100,000-180,000 TS; 50,000-120,000 YS; 50-10 El; 180-300 Brin.
For chemical plant equipment, welded structures; Type 347, austenitic, stainless

INDUSTRIAL NO. 18-10 Ti
M-440, 0.08 max C, 17-19 Cr, 9-12 Ni, Ti = 5 × C, bal Fe.
Annealed 80,000 TS, 35,000 YS; 60 El, 70 RA; 135 Brin
Cold rolled 180,000 TS, 120,000 YS; 10 El; 300 Brin
For welded chemical plant equipment, Type 321, austenitic, stabilized

INDUSTRIAL NO 18-12MO.
M-440, 0 08 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Cold drawn· 100,000-150,000 TS; 50,000-125,000 YS, 55-15 El, 180-200 Brin
Annealed: 80,000-90,000 TS, 35,000-50,000 YS; 70-60 El, 70-60 RA, 135-185 Brin
For chemical plant equipment, mixers, agitators; Type 316, austenitic, acid resistant.

INDUSTRIAL NO 19-12-3MO
M-440, 0.10 max C, 18-20 Cr, 11-15 Ni, 3-4 Mo, bal Fe.
Cold drawn: 100,000 150,000 TS; 50,000-125,000 YS; 50-15 El, 180-300 Brin.
Annealed. 80,000-90,000 TS, 35,000-50,000 YS; 70-60 El; 70-60 RA; 135-185 Brin
For chemical plant equipment, mixers, agitators; Type 317; austenitic, acid resistant.

INDUSTRIAL NO. 20-10S.
M-440, 0.08 max C, 19-22 Cr, 10-12 Ni, 2 max Mn, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; 65 RA; 150 Brin.
For chemical plant equipment; stainless, austenitic; Type 308.

INDUSTRIAL NO. 20-25.
M-440, 0.25 max C, 19-21 Cr, 24-26 Ni, bal Fe.
Annealed: 100,000 TS; 50,000 YS; 45 El; 60 RA; 180 Brin.
For furnace parts, heat treat equipment; Type 311; austenitic, heat resistant.

INDUSTRIAL NO. 21.
M-440; 0.35 max C, 18-23 Cr, bal Fe.
Cold drawn: 70,000-80,000 TS; 45,000-55,000 YS; 40-55 El; 60-55 RA; 150-180 Brin.
For furnace parts, chemical plant equipment; Type 442; corrosion resistant.

INDUSTRIAL NO. 25-12.
M-440; 0.20 max C, 22-24 Cr, 12-15 Ni, bal Fe
Cold drawn: 100,000-250,000 TS; 50,000-200,000 YS; 45-5 El; 60-50 RA; 160-400 Brin.
Annealed: 90,000-110,000 TS; 35,000-45,000 YS; 55-40 El; 65-50 RA; 170-200 Brin.
For chemical plant equipment, furnace parts; Type 309; stainless, austenitic.

INDUSTRIAL NO. 25-12S.
M-440; 0.08 max C, 22-26 Cr, 12-14 Ni, bal Fe.
Cold drawn: 100,000-250,000 TS, 50,000-200,000 YS; 45-5 El; 60-50 RA; 160-400 Brin
For heat treat boxes, furnace parts, kiln linings; Type 309S; austenitic, heat resistant.

INDUSTRIAL NO. 25-20.
M-440, 0 25 max C, 24-26 Cr, 19-22 Ni, 2 max Mn, bal Fe.
Annealed: 95,000 TS; 45,000 YS, 50 El; 65 RA; 170 Brin.
For furnace parts, heat treat equipment, Type 310; austenitic, heat resistant.

INDUSTRIAL NO. 27.
M-440; 0 35 max C, 23-30 Cr, bal Fe.
Cold drawn: 75,000-85,000 TS, 50,000-60,000 YS, 35-50 El, 55-50 RA; 150-200 Brin.
For furnace parts, chemical plant equipment; Type 443; corrosion resistant.

INDUSTRIAL NO. 35
M-440, 0.30-0 45 C, 12-14 Cr, 0.5 max Ni, 0.5 max Mo, bal Fe
Annealed. 95,000 TS, 60,000 YS; 30 El; 50 RA, 190 Brin
Heat treated: 300,000 TS, 250,000 YS, 1 El, 3 RA, 620 Brin.
For surgical instruments, valves, cutlery; Type 420, corrosion resistant

INDUSTRIAL NO 65
M-440, 0.60-0 70 C, 16-17 Cr, bal Fe
Heat treated 250,000-143,000 TS, 223,000-115,000 YS, 4-13 El, 8-42 RA, 512-302 Brin
For corrosion resistant parts, cutlery; corrosion resistant.

INDUSTRIAL NO 100
M-440, 0 95-1 2 C, 16-18 Cr, 0.75 max Mo, bal Fe
Annealed 95,000 TS, 60,000 YS; 30 El; 50 RA; 190 Brin
Heat treated· 300,000 TS; 250,000 YS, 1 El, 3 RA, 620 Brin.
For bearings, valves, cutlery; corrosion and wear resistant; Type 440C.

INDUSTRIAL NO. 100FM.
M-440; 0.95-1.2 C, 16-18 Cr, 0.75 max Ni, 0.6 max Mo, bal Fe.
Annealed: 95,000 TS; 60,000 YS; 30 El; 50 RA; 190 Brin.
Heat treated: 300,000 TS; 250,000 YS; 1 El; 3 RA; 620 Brin.
For bearings, cutlery, valves; Type 440F; wear resistant.

INDUSTRIAL NO. 188.
M-440; 0.15 max C, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 60 El; 70 RA; 135 Brin.
Cold rolled. 180,000 TS, 150,000 YS; 10 El; 330 Brin.
For chemical plant equipment, tanks, mixers; Type 302; austenitic, stainless.

INDUSTRIAL NO 188-M.
M-440, 0.2 C, 18 Cr, 8 Ni, 2-4 Mo, bal Fe.
For stainless and corrosion resistant parts and equipment, stainless and corrosion resistant.

INDUSTRIAL NO. 188-U.
M-440; 0 07 max C, 17.5-18 5 Cr, 8 5-9.5 Ni, bal Fe.
113,000-90,000 TS; 84,000-35,000 YS, 40-61 El; 60-68 RA; 223-135 Brin.
For stainless parts, chemical plant equipment; stainless, austenitic.

INDUSTRIAL NO 512
M-440, 0.15 max C, 12-14 Cr, 0 15 min S, 0 06 max P, 1.2 Mn, bal Fe
Heat treated 100,000-200,000 TS; 60,000-125,000 YS, 30-10 El; 75-50 RA; 200-390 Brin
Annealed: 85,000-100,000 TS; 60,000-75,000 YS; 35-25 El; 75-60 RA; 135-165 Brin
For screw machine products, valve trim, pump shafts, Type 416, corrosion resistant.

INDUSTRIAL NO 512 FREE MACHINING
M-440, 0 12 max C, 11 5-13 0 Cr, 0 3-0.4 S, bal Fe.
175,000-40,000 TS; 160,000-25,000 YS, 15-35 El; 60-75 RA; 375-150 Brin.
For corrosion resistant parts, new machine products; corrosion resistant, free-cutting

INDUSTRIAL NO 517
M-440, 0 12 max C, 14-18 Cr, 0.07 min S or Se, 0 6 max Mo, bal Fe.
Cold drawn 75,000-100,000 TS; 45,000-90,000 YS; 34-8 El, 62-58 RA, 140-250 Brin
For screw machine products, shafts, pumps; Type 430F, corrosion resistant

INDUSTRIAL NO. 530.
M-440, 0 21-0 35 C, 12-15 Cr, S, bal Fe.
For stainless and corrosion resistant parts; corrosion resistant.

INDUSTRIAL NO 5188
M-440, 0 15 max C, 17-19 Cr, 8-10 Ni, 0 15 min S, bal Fe
Cold drawn· 150,000 TS, 120,000 YS, 10 El; 330 Brin
Annealed 80,000 TS, 35,000 YS, 60 El, 75 RA; 130 Brin.
For screw machine products, free-cutting, stainless, Type 303.

INDUSTRIAL CRO-TUNG
M-440; 0 30 max C, 4 5-6 5 Cr, 0.75-1 0 W, bal Fe
193,000-100,000 TS, 167,000-85,000 YS; 5-24 El; 6-62 RA, 490-210 Brin
For corrosion resistant parts; corrosion resistant.

INFILOY
M-1708; 90-93 Cu, 3 5-6 0 Fe, 1.0-1 5 Mn, 0 4-0 6 Ni, 0.5-2 0 others.
Metal Powder Used in copper infiltration of powder metallurgy parts

INGACLAD
M-328; 20% layer 18-8 stainless welded to carbon steel
62,000-68,000 TS; 48,000-50,000 YS; 48 El; 50 RA.
For tanks, vessels, kettles, bins, table tops, vats; corrosion resistant.

INGACLAD TYPE 304.
M-328; 0.8 C, 18-20 Cr, 8-10 Ni, bal Fe.
For stainless parts, stainless clad steel.

INGACLAD TYPE 309.
M-328; 0.20 C, 22-26 Cr, 12-14 Ni, 2 max Mn, bal Fe.
Annealed: 60,000-70,000 TS; 40,000-50,000 YS; 30-50 El; 150-200 Brin.
For heat and corrosion resistant parts; heat and corrosion resistant clad steel.

INGACLAD TYPE 316.
M-328; 0.10 C, 16-18 Cr, 14 max Ni, 2-3 Mo, bal Fe.
For heat and corrosion resistant parts; stainless clad steel.

INGACLAD TYPE 317.
M-328; 0.10 C, 18-20 Cr, 14 max Ni, 3-4 Mo, bal Fe.
For heat and corrosion resistant parts; stainless clad steel.

INGACLAD TYPE 347.
M-328; 0.10 C, 17-20 Cr, 8-12 Ni, Cb = 10 × C, bal Fe.
For corrosion resistant parts; stainless clad steel.

INGERSALL.
M-328; 0.1 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 85,000 TS; 165 El.
For stainless steel parts; stainless.

INGERSOLL.
M-328; 0.7-0.9 C, 0.2 V, bal Fe.
For tools, drills, punches; water hardening.

INGERSOLL 18-4-1.
M-328; 0.8 C, 18 W, 4 Cr, 1 V, bal Fe.
For hack saw blades; high speed steel.

INGERSOLL DBL.
M-328, 0.75-0.80 C, 4 Cr, 5 W, 1.5 V, 4 Mo, bal Fe
For tools, cutters; high speed steel.

INGERSOLL D-B-L 2.
M-328; 0.8 C, 6 W, 5 Mo, 2 V, 4 Cr, bal Fe.
For hack saw blades; high speed steel.

INGERSOLL I-50.
M-328, 0.50 C, 0.75 Mn, bal Fe.
For knives, saws, water hardened.

INGERSOLL I-60
M-328; 0.60 C, 0.75 Mn, bal Fe.
For knives, saws; water hardened

INGERSOLL I-75.
M-328; 0.75 C, 0.75 Mn, bal Fe.
For knives, saws; water hardened

INGERSOLL I-85
M-328; 0.85 C, 0.85 Mn, bal Fe
For knives, saws; water hardened.

INGERSOLL IC-3C.
M-328; 0.80 C, 0.65 Mn, 0.35 Cr, bal Fe.
For knives, saws, water hardened.

INGERSOLL IC-4C.
M-328; 0.85 C, 0.60 Mn, 0.25 Cr, bal Fe.
For knives, saws; water hardened.

INGERSOLL IC-66.
M-328, 0.70 C, 0.65 Mn, 0.45 Cr, bal Fe.
For knives, saws; water hardened

INGERSOLL IC-77.
M-328, 0.75 C, 0.75 Mn, 0.45 Cr, bal Fe.
For knives, saws; water hardened.

INGERSOLL IC-88.
M-328; 0.85 C, 0.45 Mn, 0.45 Cr, bal Fe.
For knives, saws; water hardened.

INGERSOLL IC-125.
M-328; 1.25 C, 0.20 Mn, 0.20 Cr, bal Fe.
For saws, knives, circular and hack saws; water hardened.

INGERSOLL IC-M.
M-328; 0.90 C, 0.90 Mn, 0.80 Cr, bal Fe.
For knives and saws; water hardened.

INGERSOLL ICN-70.
M-328; 0.70 C, 0.25 Mn, 0.35 Cr, 1.35 Ni, bal Fe.
For knives, saws; oil hardened.

INGERSOLL ICN-75.
M-328; 0.75 C, 0.35 Mn, 0.35 Cr, 1.25 Ni, bal Fe.
For knives, saws, valve discs; oil hardened.

INGERSOLL ICN-80.
M-328; 0.80 C, 0.40 Mn, 0.25 Cr, 0.60 Ni, bal Fe.
For circular saws, hog knives, cordwood saws; water or oil hardened.

INGERSOLL ICN-100.
M-328, 1.0 C, 0.40 Mn, 0.75 Cr, 1.35 Ni, bal Fe.
For circular and hack saws, hog and meat knives; oil hardened.

INGERSOLL ICN-K.
M-328, 0.80 C, 0.25 Mn, 0.25 Cr, 2.5 Ni, bal Fe.
For saws, knives, valve discs; oil hardened.

INGERSOLL ICNM-9M.
M-328; 0.75 C, 0.35 Mn, 0.20 Cr, 2.65 Ni, 0.20 Mo, bal Fe.
For circular and hack saws, knives; oil hardened.

INGERSOLL ICNM-55.
M-328; 0.70 C, 0.50 Mn, 0.60 Cr, 0.80 Ni, 0.20 Mo, bal Fe.
For circular and hack saws, knives, valve discs, oil hardened.

INGERSOLL ICNM-CS
M-328, 0.75 C, 0.30 Mn, 0.20 Cr, 0.70 Ni, 0.15 Mo, bal Fe.
For circular and hack saws, knives; oil hardened

INGERSOLL ICNV-1 A
M-328, 1.25 C, 0.30 Mn, 1.0 Cr, 0.55 Ni, 0.25 V, bal Fe
For hack and circular saws, knives, oil hardened

INGERSOLL ICV-35.
M-328; 0.35 C, 0.45 Mn, 1.0 Cr, 0.20 V, bal Fe
For knives, saws, valve discs, water hardened

INGERSOLL ICV-60.
M 328, 0.60 C, 0.45 Mn, 1.0 Cr, 0.20 V, bal Fe.
For circular and hack saws, knives, water or oil hardened.

INGERSOLL ICV 90.
M-328, 0.90 C, 0.35 Mn, 0.40 Cr, 0.20 V, bal Fe
For circular and hack saws, knives; oil or water hardened

INGERSOLL ICV-100
M-328; 1.0 C, 0.40 Mn, 1.4 Cr, 0.20 V, bal Fe.
For circular and hack saws, knives; oil or water hardened

INGERSOLL ICW-90
M-328, 0.90 C, 1.1 Mn, 0.50 Cr, 0.50 W, bal Fe
For hack and circular saws, hog knives; oil hardened, tough

INGERSOLL IN-8
M-328; 0.75 C, 0.40 Mn, 2.05 Ni, bal Fe.
For knives, saws; oil hardened.

INGERSOLL IN-8B.
M-328, 0.75 C, 0.85 Mn, 2.05 Ni, bal Fe.
For knives, saws; oil hardened.

INGERSOLL IN-9
M-328; 0.75 C, 0.40 Mn, 2.75 Ni, bal Fe.
For knives, saws; oil hardened.

INGERSOLL IN-9B.
M-328; 0.75 C, 0.85 Mn, 2.75 Ni, bal Fe.
For knives, saws; oil hardened.

INGERSOLL IN-40.
M-328; 0.40 C, 0.80 Mn, 3.5 Ni, bal Fe.
For knives, saws; oil hardened.

INGERSOLL INM-45.
M-328; 0.45 C, 0.50 Mn, 1 4 Ni, 0.35 Mo, bal Fe.
For saws, knives, friction saws; oil hardened.

INGERSOLL INV-75.
M-328; 0.75 C, 0.35 Mn, 2.0 Ni, 0.10 V, bal Fe.
For circular saws, meat knives, drag saws; oil hardened.

INGERSOLL IV-85.
M-328; 0.85 C, 0.25 Mn, 0.25 V, bal Fe.
For friction and hack saws, knives; water hardened.

INGERSOLL IW-120.
M-328, 1.2 C, 0 30 Mn, 1.15 W, bal Fe.
For saws, knives, friction saws; water hardened

INGERSOLL IWM-65.
M-328, 0.65 C, 0 70 Mn, 0 45 W, 0.45 Mo, bal Fe
For valve discs, saws, knives; water hardened.

INHIBITED ADMIRALTY, TYPE B
M-33; 71.5 Cu, 27 5 Zn, 1 0 Sn, 0.035 As.
Hard: 85,000 TS, 65,000 YS; 15 El; 88 Rock B.
For condenser tubes, distiller tubes, heat exchanger tubes.
ASTM B111 and B171; CDA 443.

INHIBITED ADMIRALTY, TYPE C.
M-33; 71 5 Cu, 27 5 Zn, 1.0 Sn, 0.035 Sb.
Annealed: 58,000 TS, 22,000 YS; 65 El, 70 Rock F
For heat exchanger tubes, distiller tubes, condenser tubes
ASTM B111 and B171; CDA 444.

INHIBITED ADMIRALTY, TYPE D
M-33; 71 5 Cu, 27 5 Zn, 1.0 Sn, 0 04 P
Prop & uses same as Types B and C.
CDA 445

INHIBITED ALUMINUM BRASS, No 687.
M-33, 77 5 Cu, 20.5 Zn, 2.0 Al, 0 035 As.
Ann 58,000 TS, 25,000 YS, 65 El; 80 Rock F.
Hard: 85,000 TS, 65,000 YS; 15 El; 88 Rock B.
For condenser tubes, distiller tubes, heat exchanger tubes, ferrules
ASTM B111; CDA 687.

INJECTOR BRONZE
U.S , 8.5 Sn, 2.5 Pb, bal Cu.
For injectors, fittings, hardware; free-cutting

INKOMO
M-618, 0.32 C, 2 75-3.15 Ni, 0.8 Cr, 0.5 Mo, bal Fe
Heat treated: 145,000-225,000 TS; 123,000-235,000 YS; 12-22 El, 33-60 RA; 269-504 Brin.
For tappet rods, gears, shafts, crankshafts; tough, shock resistant.

INKROMSTAHL IK1.
M-1234; 0 1 C, 0.3 Si, 0.5 Mn, 0.45 Ti, bal Fe.
For molten salt bath fixtures; suitable for chromizing.

INKROMSTAHL IK3.
M-38, 0.1 C, 3 min Mn, bal Fe.
For molten salt bath fixtures; suitable for chromizing

INKROMSTAHL IK25.
M-1234; 0.09 C, 0.35 Mn, 1.0 Si, 2.5 Cr, 0.17 V, 0.2 Cu, bal Fe.
For molten salt bath fixtures; suitable for chromizing.

INKROMSTAHL IK85.
M-1234; 0.15 C, 0.8 Si, 7.5 Cr, 0.5 V, 1.2 Mo, bal Fe.
For molten salt bath fixtures; suitable for chromizing.

INKUS.
M-111; 0.56 C, 0.85 Cr, 0.2 Mo, 1.8 Ni, 0.10 V, bal Fe.
For forging dies, punches; oil hardened, tough.

INLAND AA.
M-67; 0.10 C, 0.65 Mn, 0.010 P, 0.20 S, 0.10 Si, 0.005 Al, 0 010 N_2, bal Fe.
Cold Rolled: 45,000 YS; 64,000 TS; 26.1 El.
Aged: 70,000 YS; 15 El.
For formed sheet products, sills, containers, vessels, trunk hinges. Age-hardens, readily fabricated.

INLAND COPPER ALLOY STEEL.
M-67; 0 05-0.15 C, 0.2-0.3 Cu, bal Fe.
For corrosion resistance applications, roofing; corrosion resistant.

INLAND HI-STEEL.
M-67, 0 1 C, 0 6 Mn, 0 2 Si, 1 1 Cu, 0.55 Ni, bal Fe.
70,000 TS; 55,000 YS.
For structural applications, mining and transportation; weldable and workable.

INLAND LEDLOY.
M-67; C, 0 15-0.35 Pb, bal Fe.
For machinery parts, free cutting.

INLAND ZINC-ALLOY STEEL.
M-67; Zn coated S.A E. 1010 Steel.
For sheets for fabricated parts; Zn alloyed to steel surface.

INMET.
Poland, Cu, Mn, Ni, Fe, bal Al.
For light alloy parts; age hardened.

INNERBERG HG
M-27, 0.55 C, 0.10-0 40 Si, 0.50-0.70 Mn, bal Fe.
Normalized. 105,000 TS; 65,000 YS; 17 El; 24 RA; 220 Brin
For gears, bolts, machine tool parts, shafts; water hardened

INNERSHIELD NR-1.
M-578, C, bal Fe
Self-shielded flux-cored arc welding electrode.

INNERSHIELD NR-5
M-578, C, bal Fe
Self-shielded flux-cored arc welding electrode.

INNERSHIELD NR-201
M-578; C, bal Fe.
Self-shielded flux-cored arc welding electrode.
AWS Class E70T-G

INNERSHIELD NR-202.
M-578, C, bal Fe.
Self-shielded, flux-cored arc welding electrode.
AWS Class E60T-7.

INNERSHIELD NR-203
M-578, C, bal Fe.
Self-shielded flux-cored arc welding electrode.
AWS Class E60T-7.

INNERSHIELD NR-311.
M-578; C, bal Fe.
Self-shielded flux-cored arc welding electrode.
AWS Class E70T-G.

INNERSHIELD NS-3M.
M-578; C, bal Fe.
Self-shielded flux-cored arc welding electrode.
AWS Class E70T-4.

INNOSEIN.
French; 5-6 Cu, bal Al.
For light alloy parts; age-hardenable.

INOCULOY 63.
M-394; 60-65 Si, 9-12 Mn, 1.5-3.0 Ca, 4-6 Ba, 1.0-1.5 Al, bal Fe.
For reducing chill in gray cast iron.
Cast iron inoculant.

INOFO 1.
M-1487;
Stainless steel; similar to AISI 410.

INOFO 1S.
M-1487;
Stainless steel; similar to AISI 416.

INOFO 2.
M-1487;
Stainless steel, similar to AISI 420.

INOFO 4.
M-1487;
Stainless steel; similar to AISI 430.

INOFO 4S.
M-1487;
Stainless steel; similar to AISI 430F.

INOFO 5.
M-1487;
Stainless steel; similar to 431.

INOFO 10.
M-1487;
Stainless steel; similar to AISI 302.

INOFO 10B.
M-1487;
Stainless steel, similar to AISI 304.

INOFO 10Ti.
M-1487;
Stainless steel; similar to AISI 321.

INOFO 11.
M-1487;
Stainless steel; similar to AISI 304L.

INOFO 12.
M-1487;
Stainless steel; similar to AISI 316.

INOFO 12B.
M-1487;
Stainless steel; similar to AISI 316 L.

INOFO 12Ti
M-1487;
Stainless steel, similar to AISI 316 Ti.

INOFO 13S.
M-1487;
Stainless steel; similar to AISI 303.

INOR-8.
M-118; 0.06 C, 7 Cr, 17 Mo, 5 max Fe, 0.8 max Mn, 0.5 max Al + Ti, bal Ni.
Heat treated: 115,100 TS; 45,500 YS, 50.7 El.
At 1600°F: 35,000 TS; 25,000 YS; 30 El.
For high temperature applications, resists hot fluoride salts; high oxidation resistance, resists aging and embrittlement.

INOR-8.
M-1490; 0.06 C, 7 Cr, 0.2 Co, 16 Mo, 0.5 Ti, 0.005 B, 4 Fe, 1 Si, bal Ni.
At R.T.: 100,000 TS; 45,000 YS; 50 El.
At 1200°F: 70,000 TS; 30,000 YS; 45 El.
For high temperature applications, jet engine and gas turbine components.
High heat and corrosion resistant.
Resists hot fluoride salts.

INOSSIDALFA.
M-658; Al alloy.
For light alloy parts.

INOX 1.
M-884; 0.15 max C, 13 Cr, 0.5 max Ni, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, cutlery, valves; Type 410; stainless.

INOX 2.
M-884; 0.20 C, 13.5 Cr, 0.5 max Ni, bal Fe.
Annealed: 95,000 TS, 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, cutlery, valves, surgical instruments, Type 420; stainless, hardenable.

INOX 3.
M-884; 0.30 C, 13.5 Cr, 0.5 max Ni, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 22 El; 52 RA; 210 Brin.
For turbine blades, valves, cutlery, surgical instruments, Type 420; stainless, martensitic

INOX 16.
M-884, 0.08 C, 16 Cr, 0.5 max Ni, bal Fe.
Annealed 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For bolts, shafts, oil refinery equipment, heaters, Type 430, stainless, ferritic.

INOX 431.
M-884; 0.15 C, 16 Cr, 2 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431; stainless

INOXALIUM
M-787; 0.2 C, bal Fe
For machinery parts; water hardenable.

INOXARGENT.
M-1120, 0.12 max C, 12-14 Cr, 12-14 Ni, Cu, bal Fe
Annealed. 70,000-78,000 TS; 28,000-44,000 YS; 45-50 El.
For clocks, decorative trim, furniture, corrosion resistant.

INOXESCO 1
M-1495; 0.08 max C, 2.0 max Mn, 18-20 Cr, 8-12 Ni, bal Fe.
Annealed: 75,000 TS; 30,000 YS; 35 El; 190 Brin.
For oil refinery tubes and equipment; stainless, austenitic

INOXESCO 2
M-1495; 0.08 max C, 17-20 Cr, 9-13 Ni, Ti = 5 × C, bal Fe.
Annealed: 75,000 TS, 30,000 YS, 35 El; 190 Brin.
For welded oil refinery equipment and tubes; stainless, austenitic.

INOXESCO 13.
M-1495, 0.17 C, 0.6 Mn, 13 Cr, 0.6 Mo, 0.5 Ni, 0.2 V, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 24 El; B 95 Rock.
Hardened: 200,000 TS; 165,000 YS; 12 El; C 48 Rock.
For cutlery, valves, bearings, surgical instruments, gears. Corrosion resistant, hardenable.

INOXESCO 16.
M-1495, 0.12 max C, 1.0 max Mn, 14-18 Cr, 0.5 max Ni, bal Fe.
Annealed: 60,000 TS; 35,000 YS; 20 El; 190 Brin.
For oil refinery tubes and equipment; stainless, ferritic.

INOXYDA BRONZE.
1-9 Al, 82-89 Cu, 0-1 Zn.
For steam fittings; corrosion resistant.

IN-STEEL.
M-1570; 0.18 max C, 1.5 max Ni, 0.4-0.8 Cr, 0.6 max Mo, 0.10 max V, 0.15-0.35 Si, 0.6-1.2 Mn, bal Fe.
Plate: 138,000-163,500 TS; 128,000 YS; 15 El.
For heavy duty welded structures and equipment, mine cars, bus bodies. Ultra-high strength, excellent weldability.

INSTRUMENT BRONZE.
U.S.; 13 Sn, 5 Zn, bal Cu.
For instruments, utensils; corrosion resistant.

INTENSIV.
M-1339; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

INTENSIV SPEZIAL.
M-1339; 1.6 C, Cr, Mo, W, V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

INTENSIV WO.
M-1339, 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For blanking and forming dies, punches; oil hardened.

INTENSIV Z
M-1339; 1 65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

INTERMEDIATE MANGANESE ABRASION. STEEL.
M-377, M-604; 0 35-0 50 C, 1.5-2.0 Mn, 0.5 max P, 0 055 max S, 0 15-0 30 Si, bal Fe.
Hot rolled· 100,000-125,000 TS; 200-250 Brin
For dredge pipe, screens; abrasion resistant. Billets, sheets, plates

INTERMEDIATE MANGANESE MEDIUM CARBON
M-377; 0.28-0 38 C, 1.1-1 4 Mn, 0.04 max P, 0 15-0 30 Si, bal Fe
Hot rolled: 90,000 TS; 55,000 YS; 18 El; 50 RA.
For sucker rods, bars and rods; Iz-45 min

INTERMEDIATE MANGANESE RAIL STEEL
M-377, 0.50-0.65 C, 1.2-1.5 Mn, 0 04 max P, 0 10-0.23 Si, bal Fe.
For railways, rails; wear resistant.

INTRA
M-345; 1 2 C, 1.3 W, bal Fe.
For dies, reamers, blanking dies; water hardening.

INUSO.
French; 0.1 C, bal Fe.
For welding rods.

INVAR.
M-44, M-121, M-104; 0.18 C, 35.5 Ni, 0.42 Mn, bal Fe.
Annealed: 72,500 TS; 24,000 YS; 39 El; 67 RA.
For measuring tapes and instruments, automobile and aircraft engine parts, thermostats; low coefficient of expansion.

INVAR.
M-73; 0.15 C, 38 Ni, 0.8 Mn, bal Fe.
Annealed: 70,000 TS; 24,000 YS; 36 El; 68 RA; 143 Brin.
Cold drawn: 90,000 TS; 70,000 YS; 20 El; 60 RA; 185 Brin.
For bimetal thermostats, geodetic instruments; low coefficient of expansion.

INVAR 36 FREE-CUT.
M-32, M-38, M-73, M-114; 0.12 C, 0.90 Mn, 0.35 Si, 0.20 Se or S, 36 Ni, bal Fe.
Annealed: 65,000 TS; 40,000 YS; 35 El; B 70 Rock.
For geodetic instruments, thermostats, temperature control and indicating devices, component parts requiring minimum expansivity.
Free-cutting, low coefficient expansion.

INVAR FREE-MACHINING.
M-73; 0.12 C, 38 Ni, 0.8 Mn, 0.25 Se, bal Fe.
Annealed: 70,000 TS; 24,000 YS; 36 El; 68 RA; 143 Brin.
Cold drawn: 90,000 TS; 70,000 YS; 20 El; 60 RA; 185 Brin.
For bimetal thermostats, geodetic instruments; low coefficient of expansion, free-cutting.

INVARIANT.
Eng ; 47 Ni, 53 Fe.
For surveyors tape, piston struts; corrosion resistant.

INVARO-B.
M-57; 0.94 C, 1.2 Mn, 0.53 W, 0.22 V, 0.5 Cr, bal Fe.
For punches, forming dies, shears, tough, nondeforming, oil hardened.

INVARO NO. 1.
M-57; 0.88 C, 1 0-1 25 Mn, 0.5 Cr, 0.2 V, 0.5 W, bal Fe.
For tools, hobs, milling cutters, taps; Type Ol; oil hardened

INVAROD.
M-32, 36 Ni, 2.5 Mn, 0.75 Ti, bal Fe.
Hot Rolled· 77,500 TS; 42,000 YS; 40 El, 71 RA,
For welding Invar parts.
Weld wire permits crack-free welding Aids cryogenic joining

INVARSTAHL
M-303; 36 Ni, bal Fe
86,000 TS; 32 El.
For clocks, balances, measuring devices; same as "Invar.' '

INVENTOR.
M-472, 0 13-0.20 C, 12-14 Cr, bal Fe.
Heat treated: 90,000-123,000 TS; 25 El; 179-228 Brin.
For turbine blades, surgical instruments; Type 420; corrosion resistant

INVINCIBLE.
M-1406; 0 70 C, 18 W, 4 Cr, 1 V, bal Fe.
For turning tools, reamers, drills, chasers, taps; high speed steel.

INVINCIBLE 22%.
M-1406; 0.75 C, 22 W, 4 Cr, 1.2 V, bal Fe.
For lathe tools, reamers, drills, hobs; high speed steel.

INVINCIBLE DRILL ROD.
M-339, 1-1.2 C, bal Fe.
For drills, general tools; water hardening.

INVINCIBLE DRILL ROD.
M-1703; 1 15-1 25 C, 0.15-0 40 Mn, bal Fe.
Water hardening drill rod; AISI W1.

INX-42.
M-67; 0 2 C, 0.9-1.35 Mn, 0.01 Cb, bal Fe.
Rolled (min.): 63,000 TS; 42,000 YS; 20 El.
For trucks, plow frames, pressure vessels, building components, automobiles, trailers, railroad accessories.
Good weldability, tough.

INX-45.
M-67; 0.2 C, 1.2 Mn, 0.02 Cb, bal Fe.
Rolled: 45,000 min YS; 65,000 min TS; 19 min El.
For trucks, plow frames, pressure vessels, automobiles, trailers, buildings. Good weldability, tough.

INX-50.
M-67; 0.2 C, 1.3 Mn, 0.01 Cb, bal Fe.
Rolled (min): 70,000 TS; 50,000 YP; 18 El.
For trucks, plow frames, pressure vessels, building components, water heaters, railroad accessories. Good weldability, tough.

INX-55.
M-67; 0.22 C, 1.35 Mn, 0.01 Cb, bal Fe.
Rolled (min): 75,000 TS; 55,000 YP; 17 El.
For trucks, plow frames, pressure vessels, construction equipment, water heaters, railroad accessories. Good weldability, tough.

INX-60.
M-67; 0.25 C, 1.35 Mn, 0.01 Cb, bal Fe.
Rolled (min): 80,000 TS; 60,000 YS; 16 El.
For trucks, plow frames, pressure vessels, building components, pipe, railroad accessories, automobiles. Good weldability, tough.

INX-65.
M-67; 0.25 C, 1.3 Mn, 2 Si, 0.03 Cb, bal Fe.
Rolled: 85,000 min TS; 65,000 min YS; 15 min El.
For trucks, plow frames, pressure vessels, automobiles, railroad accessories.
Good weldability.

INX-70.
M-67; 0.26 C, 1.3 Mn, 0.2 Si, 0.03 Cb, 0.01 V, bal Fe.
Plate: 90,000 min TS; 70,000 min YP; 14 min El.
For structures, plow shares, pressure vessels, railroad accessories, building components, water heaters.
Good weldability and forming properties.

IOCHROME.
M-1492; 99.997 Cr.
Rolled: 44 El; 78 RA.
Alloying ingredient for high Cr alloys; for high temperature service.

IRALITE.
M-229; 3.1 C, 1.2 Cr, 0.3 Mo, bal Fe.
Cast: 36,000-52,000 TS; 150-180 Brin.
For sheaves, sprockets, plungers, glass rolls, brake drums, conveyor parts.
Pearlitic cast iron, wear resistant.

IRCAMET.
M-1224; 0.07 C, 20 Cr, 29 Ni, 2.75 Mo, 1 Si, 4 Cu, 0.8 Mn, bal Fe.
Cast: 65,000 TS; 30,000 YS; 30-45 El; 40-50 RA; 140 Brin.
Rolled: 85,000 TS; 35,000 YS; 35-50 El; 50-70 RA; 170 Brin.
For furnace parts, chemical plant equipment; stainless, austenitic, nonmagnetic.

IRIDAL.
M-1397; 0.3 B, 5 Si, 0.7 Mg, bal Al.
For architectural uses; heat treatable.

IRIDIUM.
Eng.; 77-83 Zn, 1.21-1.25 Cu, 21.6-15.7 Sn, trace Sb.
For bearings; Babbitt.

IRIDIUM II.
England; 77.25 Zn, 21.63 Sn, 1.12 Cu.
For bearings; will not resist heat or live steam.

IRIDIUM B.M.
England; 83 Zn, 15.75 Sn, 1.25 Cu, trace Sb.
For bearings; will not resist heat or live steam.

IRIDIUM EXTRA SPECIAL.
M-613; 0.7 C, 18 W, 4 Cr, 2 V, 5 Co, bal Fe.
For cutters, tools; high speed steel.

IRIDOSMINE.
Eng.; 57 Os, 34 Rh + Ir, 8 Ru.
For pen points; "Osmiridium."

I.R. METAL
M-788; 2.5-3.25 C, 0.7-1.1 B, 0.5-1.5 Si, 0.5-1.25 Mn, 3.5-4.5 Ni, bal Fe.
For oil field accessories; abrasion resistant cast iron.

IRON "8-J"
M-664; 2.9-3.3 C, 1.6-2.0 Si, 0.6 Mn, 1.0-1.25 Ni, 0.3 Mo, 0.3 Cr, bal Fe.
Cast 42,000 TS; 235 Brin.
For cams, gears, alloy cast iron.

IRONAC.
England; 13.2 Si, 0.77 Mn, 1.1 C, 0.8 P, bal Fe.
For pumps, valves, ejectors, nozzles, fans; acid resistant cast iron.

IRON BRONZE.
M-2, M-2a, 8.6 Sn, 4.4 Zn, 4 Fe, bal Cu.
Cast: 20-35 El; 70-85 Brin.
Pressed: 20-35 El; 80-90 Brin.
For shafts, piston rods, screws, marine parts; resists sea water corrosion.

IRONIERS BRONZE.
England, Sn, 1 Hg, bal Cu.
For special applications, corrosion resistant.

IRON OILITE.
M-211; 97.25 min Fe, 0.25 max C.
Sintered. 10,000-15,000 TS, 5.7-6.1 density.
Oilite bearing material.
ASTM B439-67 Gr 1; SAE 850; PMPMA F-0000-N

IRON OILITE-1.
M-211; 97 min Fe, 0.6-1.0 C.
Sintered: 24,000 TS, 5.7-6.1 Density.
ASTM B310-67 Type I Cl.C; SAE 852.

IRON OILITE-1 IM.
M-211; 15-25 Cu, 69.0-84.4 Fe, 0.6-1.0 C.
Sintered· 85,000 TS; 7.1 min density. 40,000 shear, 17,000 fatigue.
ASTM B303-67 Cl C; SAE 872. PMPMA FX-2010-T.

IRONWELD
M-607, 3.2 C, 2.2 Si, bal Fe.
For welding rod for cast iron, flux-coated.

IROQUOIS.
M-435; 1.25 C, 1.4 W, bal Fe.
For taps, cartridge dies, punches; water hardening.

IRRUBIGO see also MAERKER IRRUBIGO.

IRRUBIGO 16W.
M-1305, 0.08 C, 17 Cr, bal Fe.
Annealed· 80,000 TS, 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refining equipment, sinks, soot blowers; Type 430; corrosion resistant.

IRRUBIGO 17A.
M-1305; 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For screw machine products, fasteners; Type 430F; corrosion resistant, free-cutting.

IRRUBIGO 17W.
M-1305; 0.1 max C, 17.5 Cr, Ti = 4 × C, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 30 El; 55 RA; 160 Brin.

For welded oil refinery equipment; corrosion resistant.

IRRUBIGO EXTRA W.
M-1305; 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe.
Annealed: 85,000 TS; 55,000 YS; 20 El; 45 RA; 160 Brin.
For welded oil refinery equipment; heat and corrosion resistant.

IRRUBIGO GS18.
M-1305; 0.25 C, 17 Cr, 1.8 max Ni, bal Fe.
For welded oil refinery equipment; corrosion and heat resistant.

IRRUBIGO GS30.
M-1305; 1.2 C, 1.3 Si, 29 Cr, bal Fe.
For rollers, crushers, grates, rabble arms; corrosion, heat and abrasion resistant.

IRRUBIGO MC18.
M-1305, 0 90 C, 18 Cr, 2 Mo, bal Fe.
Annealed: 105,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin.
Heat treated· 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin
For cutlery, valves, bearings, surgical instruments; Type 440B-Mo, stainless, hardenable.

IRRUBIGO S14.
M-1305; 0 25 C, 14 5 Cr, 1 max Ni, bal Fe.
Annealed: 80,000 TS; 45,000 YS; 30 El; 65 RA, 170 Brin.
For oil refinery equipment; corrosion resistant.

IRRUBIGO S18
M-1305, 0.25 C, 17 Cr, 1.8 max Ni, bal Fe.
Annealed 125,000 TS, 95,000 YS; 20 El; 55 RA; 260 Brin
For pumps, valves, marine hardware; Type 431; corrosion and heat resistant.

IRRUBIGO S30
M-1305, 1 2 C, 1 3 Si, 29 Cr, bal Fe.
For crushers, rollers, grates, baffles; corrosion, heat and abrasion resistant

IRRUBIGO S30M.
M-1305, 1.2 C, 1 3 Si, 29 Cr, 2 Mo, bal Fe
For crushers, rollers, grates, baffles, corrosion, heat and abrasion resistant.

IRRUBIGO SN5
M-1305, 0.4 C, 27 Cr, 1.3 Si, 4 Ni, bal Fe.
Cast: 70,000 TS, 65,000 YS, 2 El; 190 Brin
Aged 115,000 TS; 80,000 YS, 15 El.
For furnace parts, grate bars, salt pots; Type HC, heat resistant

IRRUBIGO SN8.
M-1305, 0.15 C, 1.5 Si, 18 Cr, 8 Ni, bal Fe.
Annealed 80,000 TS; 35,000 YS, 55 El; 75 RA; 150 Brin
Cold drawn· 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302, stainless, austenitic.

IRRUBIGO SN8S.
M-1305, 0 12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed· 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, tanks, mixers; Type 321; stainless, austenitic.

IRRUBIGO SN9.
M-1305; 0.15 C, 2 Si, 18 Cr, 2 Mo, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks; Type 316; stainless, austenitic.

IRRUBIGO SN9S.
M-1305; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 50 El; 65 RA; 170 Brin.
For welded acid resistant chemical plant equipment; Type 316 Ti; stainless, austenitic.

IRRUBIGO SN12.
M-1305; 0.05 C, 17 Cr, 13 Ni, 2 Mo, Ta, Cb, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 170 Brin.
For welded acid resistant chemical plant equipment; Type 316 Cb; stainless, austenitic.

IRRUBIGO SN18.
M-1305, 0.05 C, 17 Cr, 17 Ni, 2 Mo, 0.2 Cu, Ta, Cb, bal Fe.
For valves, pumps, chemical plant equipment; corrosion and heat resistant, austenitic.

ISA-13.
M-789; 96 Cu, 2 Mn.
Hard: 100,000-114,000 TS.
Annealed. 42,000-50,000 TS.
Temp. coef. resistance per °C: + 0.0004.
For electrical equipment and instruments.
Resistance alloy. Max working temperature 300°C.

ISA-50.
M-789; 81 Cu, 5 Ni, 12 Mn, 1.5 Al.
Hard: 115,000-128,000 TS
Soft: 58,000-65,000 TS
Temp. coef. resist per °C: ± 0.00002.
For electrical equipment and instruments.
Resistance alloy Max. working temperature 500°C

ISABELLIN
M-789, Cu, Mn, Al.
For electrical resistance parts.

ISABELLIN-A.
M-789; 84 Cu, 13 Mn, 3 Al
Hard 128,000-144,000 TS
Soft. 72,000-78,000 TS.
For electrical equipment and instruments.
Resistance alloy Max. operating temperature to 400°C.

ISA-NICKEL.
M-789; 32 Cu, 67 Ni.
Hard. 120,000-135,000 TS.
Soft 64,000-78,000 TS.
Thermal coef. resist. per °C: + 0.0005.
For electrical equipment and instruments.
Resistance alloy. Max. operating temperatures to 600°C

ISA-OHM
M-789, 3 Cu, 71 Ni, 21 Cr.
Annealed 157,000-170,000 TS.
Temp coef. resistance per °C· ± 0.00001.
For electrical equipment and instruments.
Resistance alloy. Max. working temperature 250°C.

ISA-SPRAY.
M-789, 88 Cu, 10 Mn, 2 Al.
Hard· 128,000-144,000 TS.
Soft. 64,000-72,000 TS.
For electrical equipment and instruments.
Resistance alloy Max working temperature to 400°C.

ISA-ZIN.
M-789; 77 Cu, 21 Ni, 1 5 Mn.
Hard: 78,000-85,000 TS.
Soft: 50,000-60,000 TS.
Temp. coef. resist. per °C: + 0.00025.
For electrical equipment and instruments.
Resistance alloy. Max. operating temperature to 400°C.

ISERLOHN.
Eng.; 70.1 Cu, 29.9 Zn.
For cartridges, shell cases, condenser tubes; maximum ductility.

ISERLOHN.
64 Cu, 34 Zn, 2.4 Sn, 0.3 Pb.
For fittings, hardware; corrosion resistant.

ISERLOHN BRASS.
England; 70 Cu, 30 Zn.
¼ H-temper: 54,000 TS; 40,000 YS; 43 El; 100 Brin.
½ H-temper: 62,000 TS; 52,000 YS; 23 El; 116 Brin.
For cartridge cases, condenser tubes; high ductility and workability.

ISO-CAST 1.
M-162; 0.2-0.3 C, 0.6-0.8 Mn, 0.35-0.50 Si, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 40 RA; 130 Brin.
For castings; general purpose.

ISO-CAST 1A.
M-162; 0.3-0.4 C, 0.5-0.7 Mn, 0.35-0.50 Si, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 25 El; 40 RA; 165 Brin.
For castings; general purpose.

ISO-CAST 1B.
M-162; 0.4-0.5 C, 0.6-0.8 Mn, 0.35-0.50 Si, bal Fe.
Annealed: 85,000 TS; 55,000 YS; 20 El; 30 RA; 174 Brin.
For castings; general purpose.

ISOCAST 1EL.
M-162; 0.10 max C, 0.5-0.7 Mn, 0.6 max Si, bal Fe.
For electric motors and generators; good magnetic permeability.

ISOCAST 1L.
M-162; 0.20 max C, 0.5-0.7 Mn, 0.6 max Si, bal Fe.
For electric motors and generators.

ISO-CAST 2.
M-162, 0.5-0.6 C, 0.6-0.8 Mn, 0.35-0.50 Si, bal Fe.
Annealed: 95,000 TS, 60,000 YS; 15 El; 20 RA; 202 Brin.
For castings; high strength.

ISO-CAST 2A.
M-162; 0.6-0.7 C, 0.6-0.8 Mn, bal Fe.
Annealed: 105,000 TS; 65,000 YS; 12 El; 15 RA; 222 Brin.
For castings; high strength.

ISO-CAST 2B.
M-162; 0.70-0.80 C, 0.6-0.8 Mn, 0.35-0.50 Si, bal Fe.
Annealed 112,000 TS; 75,000 YS; 10 El; 12 RA; 235 Brin.
For castings; abrasion resistant.

ISOCAST 3.
M-162; 0.25-0.35 C, 1.25-1.5 Mn, bal Fe.
Heat treated: 90,000 TS; 55,000 YS; 25 El; 40 RA; 200 Brin.
For machine and railroad parts; castings.

ISOCAST 4.
M-162; 0.15-0.25 C, 0.5-0.7 Mn, 0.4-0.6 Mo, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 25 El; 40 RA.
For turbines, locomotives, valves, pumps; castings.

ISOCAST 5.
M-162; 0.25-0.35 C, 1.0-1.2 Mn, 0.35-0.45 Mo, bal Fe.
Heat treated: 80,000 TS; 55,000 YS; 25 El; 40 RA.
For cars, excavating machinery sheaves; castings.

ISOCAST 6.
M-162; 0.25-0.35 C, 0.5-0.7 Mn, 1.75-2.25 Ni, bal Fe.
Heat treated: 95,000 TS; 60,000 YS; 22 El; 40 RA; 179 Brin.
For mining, excavating and ship castings; castings.

ISO-CAST 6A.
M-162; 0.15-0.25 C, 0.6-0.8 Mn, 2.75-3.50 Ni, bal Fe.
Tempered: 85,000 TS; 55,000 YS; 20 El; 40 RA; 159 Brin.
For castings, machinery parts.

ISOCAST 7.
M-162; 0.85 C, 0.5 Mn, 0.5 Si, 2.5 Cr, 0.2 V, bal Fe.
Heat treated: 95,000-165,000 TS; 60,000-135,000 YS, 15 El; 30 RA, 179-302 Brin
For machine tools, sheaves, brick making equipment, wear resistant castings.

ISOCAST 8.
M-162, 0.25-0.35 C, 0.6-0.9 Mn, 1.0-1.25 Cr, 0.2-0.3 Mo, bal Fe.
Heat treated: 90,000-105,000 TS; 55,000-65,000 YS; 15-25 El; 30-45 RA; 210 Brin
For railroads, connecting rods, valves, castings.

ISO-CAST 8A
M-162, 0.35-0.45 C, 1 Cr, 0.3 Mo, 0.7 Mn, 0.5 Si, bal Fe.
Normalized: 90,000-105,000 TS, 60,000-80,000 YS, 18-24 El; 35-50 RA; 207-220 Brin.
For gears, shafts, machine tool housings; SAE 4142, tough and wear resistant.

ISO-CAST 8B
M-162, 0.2 max C, 1.0-1.5 Cr, 0.45-0.65 Mo, bal Fe.
Normalized: 75,000-90,000 TS; 45,000-65,000 YS; 30-25 El, 50-40 RA; 159-170 Brin.
For steam service castings, for strength at elevated temp

ISOCAST 9
M-162, 0.2-0.3 C, 0.5-0.7 Ni, 0.5-0.7 Cr, 0.1-0.2 Mo, bal Fe
Heat treated: 110,000-120,000 TS; 70,000-100,000 YS; 18-12 El: 35-30 RA, 230-270 Brin.
For valve bodies, turbines, gears, shafts, housings; SAE 8630, castings

ISOCAST 9A.
M-162, 0.25-0.35 C, 1.0-1.2 Ni, 1.0-1.5 Cr, 0.1-0.2 V, bal Fe.
Heat treated. 115,000 TS; 65,000 YS; 20 El; 40 RA, 235 Brin
For impellers, pump casings, structural castings; ASTM 4C4; abrasion resistant.

ISOCAST 20
M-162, 0.07 max C, 19-22 Cr, 27.5-30.0 Ni, 2 min Mo, 3 min Cu, bal Fe.
Cast: 65,000 TS; 30,000 YS; 35 El, 140 Brin.
For pumps, valves, chemical plant equipment; austenitic, stainless, resists H_2SO_4.

ISOCAST 31.
M-162, 0.12 max C, 1 max Cr, 63 Ni, 28 Mo, 6 Fe.
Cast: 80,000 TS; 57,000 YS; 8 El; 11 RA; 200 Brin
For agitators, valves, pump parts; resists HCl and H_3PO_4.

ISOCAST 32.
M-162; 0.15 max C, 17 Cr, 55 Ni, 17 Mo, 6 Fe, 4 25 W.
Cast: 78,000 TS; 57,000 YS; 7 El; 10 RA; 210 Brin.
For pump and valves, for strongly oxidizing acids; highly acid resistant.

ISOCAST 35.
M-162; 0.15 max C, 24 Cr, 56 Ni, 8 Cu, 4 Mo, bal Fe.
Cast: 60,000 TS; 50,000 YS; 5 El; 5 RA; 180 Brin.
For chemical plant equipment, valves, pumps; resists H_2SO_4 and thermal shock.

ISOCAST 40.
M-162, 0 04 max C, 25-57 Cr, 4 7-6 0 Ni, 1.7-2.2 Mo, 2.7-3.2 Cu, bal Fe.
Annealed: 100,000 TS; 80,000 YS; 30 El; 250 Brin.
Heat treated: 145,000 TS; 120,000 YS; 10 El; 350 Brin
For high temperature applications, age-hardenable, corrosion resistant.

ISO-CAST 85.
M-162, 0.2 max C, 4.0-6 5 Cr, 0 45-0.65 Mo, bal Fe.
Normalized. 90,000-105,000 TS; 60,000-70,000 YS; 24-18 El, 50-35 RA; 192-200 Brin.
For pump valves, for strength at elevated temp.

ISO-CAST B
M-162, 0 12 max C, 1 0 max Cr, 63 Ni, 28 Mo, 6 Fe
Cast· 80,000 TS; 57,000 YS; 8 El, 11 RA; 200 Brin
For equipment handling HCl in all concentrations Corrosion resistant to H_2SO_4 and H_3PO_4.

ISO-CAST C
M-162, 0 12 max C, 17 Cr, 55 Ni, 17 Mo, 6 Fe, 4 25 W, 0.8 Co, 0 3 V.
Cast. 78,000 TS, 57,000 YS, 7 El, 10 RA; 200 Brin.
For equipment handling nitric acid, solutions containing Cl_2. Corrosion resistant

ISO-CAST CA-15
M-162, 0 15 C, 1 Ni, 11-14 Cr, bal Fe
Quenched and treated 95,000 TS, 65,000 YS; 20 El, 45 RA; 200 Brin
For valves, pumps, castings, corrosion resistant, hardenable.

ISO-CAST CA-40
M-162, 0 2-0 4 C, 1 Ni, 11.5-14 0 Cr, bal Fe.
Quenched and treated: 110,000 TS, 75,000 YS, 18 El, 35 RA, 220 Brin
For valves, pumps, castings; corrosion resistant, hardenable.

ISO-CAST CB-30.
M-162, 0 3 C, 2 Ni, 18-22 Cr, bal Fe.
Cast· 90,000 TS, 40,000 YS; 200 Brin.
For valves and heat resisting castings; corrosion and heat resistant.

ISOCAST CC-50
M-162; 0 5 max C, 26-30 Cr, 4 max Ni, bal Fe.
Cast: 60,000 TS; 190 Brin.
For ore roasting equipment, stainless.

ISO-CAST CE-30.
M-162; 0.3 C, 8-11 Ni, 26-30 Cr, bal Fe.
Cast· 90,000 TS; 55,000 YS; 25 El; 25 RA; 200 Brin.
For corrosion and heat resisting castings; corrosion and heat resistant.

ISOCAST CF3.
M-162; 0.03 max C, 18-21 Cr, 9-12 Ni, bal Fe.
Annealed: 75,000 TS; 36,000 YS; 45 El; 140 Brin.
For chemical plant equipment, food processing equipment; Type 304L; stainless, austenitic.

ISOCAST CF3M.
M-162; 0.03 max C, 18-21 Cr, 10-13 Ni, 2-3 Mo, bal Fe.
Annealed· 78,000 TS, 40,000 YS; 44 El, 150 Brin.
For acid resistant chemical plant castings; Type 316L; stainless, austenitic.

ISO-CAST CF-8.
M-162; 0.08 C, 8-11 Ni, 18-21 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS, 45 RA; 140 Brin.
For stainless castings, pumps, valves, processing equipment, stainless, austenitic.

ISOCAST CF-8C.
M-162, 0 08 max C, 18-21 Cr, 9-12 Ni, 1 0 max Cb, bal Fe.
Cast 80,000 TS, 44,000 YS; 40 El, 160 Brin.
For dairy and chemical plant equipment, valves, tanks, Type 347; stainless, austenitic

ISO-CAST CF-8M.
M-162; 0.08 C, 9-12 Ni, 18-21 Cr, 2-3 Mo, bal Fe,
Annealed 80,000 TS, 40,000 YS; 50 El, 156 Brin
For stainless castings, valves, pumps, stainless, austenitic

ISOCAST CF-16F.
M-162; 0 08 max C, 18-21 Cr, 9-12 Ni, $Cb = 8 \times C$, bal Fe
Cast. 80,000 TS, 44,000 YS, 40 El, 156 Brin.
For stainless and heat resistant parts, stainless and heat resistant; welding grade

ISOCAST CF16FA.
M-162, 0 16 max C, 18-21 Cr, 9 12 Ni, 0.20-0 35 Se or 0 2-0.4 S, bal Fe
Annealed 75,000 TS, 35,000 YS; 40 El, 160 Brin.
For chemical plant equipment; free-cutting, stainless, austenitic

ISOCAST CF-20.
M-162, 0 20 max C, 20 Cr, 8-11 Ni, bal Fe
Cast· 80,000 TS, 40,000 YS, 45 El, 160 Brin.
For valves, pumps; austenitic, corrosion resistant.

ISOCAST CF30
M-162, 0 30 max C, 17-20 Cr, 8-11 Ni, bal Fe.
Annealed 80,000 TS, 40,000 YS; 40 El; 160 Brin.
For chemical plant equipment; stainless, austenitic

ISO-CAST CG-8M.
M-162, 0 08 max C, 10-14 Ni, 18-21 Cr, 3-4 Mo, bal Fe
Cast 80,000 TS, 44,000 YS; 33 El; 165 Brin.
For paper and textile equipment, bleaching equipment; Type 317; stainless, austenitic.

ISOCAST CG-12
M-162, 0 12 max C, 20-23 Cr, 10-13 Ni, bal Fe
Cast 80,000 TS, 40,000 YS, 40 El, 156 Brin
For paper and textile processing equipment; stainless

ISOCAST CH-20.
M-162; 0 20 max C, 24-26 Cr, 12-15 Ni, bal Fe.
Cast· 85,000 TS; 50,000 YS; 30 El; 170 Brin.
For paper and pulp and chemical plant equipment; Type 309; stainless, austenitic

ISOCAST CK-20
M-162; 0.20 max C, 23-27 Cr, 19-22 Ni, bal Fe.
Cast 75,000 TS; 45,000 YS; 30 El; 190 Brin.
For paper and pulp and chemical plant equipment; Type 310; stainless, austenitic.

ISOCAST HC.
M-162; 0.5 max C, 26-30 Cr, 4 max Ni, bal Fe.
Cast: 60,000 TS; 200 Brin
For ore roasting equipment; austenitic, heat resistant.

ISOCAST HE.
M-162; 0.20-0.50 C, 26-30 Cr, 8-11 Ni, bal Fe.
Cast. 90,000 TS; 55,000 YS; 20 El; 200 Brin
For oil still parts; austenitic, corrosion and heat resistant.

ISOCAST HF.
M-162; 0.2-0.4 C, 18-23 Cr, 8-12 Ni, bal Fe
Cast: 85,000 TS; 40,000 YS; 45 El, 160 Brin.
At 1400°F. 37,200 TS; 19,750 YS; 20 El
For valves, pumps, chemical plant equipment; corrosion resistant, austenitic.

ISO-CAST HH
M-162; 0.25-0.50 C, 24-28 Cr, 11-14 Ni, bal Fe.
Cast: 85,000 TS, 50,000 YS; 35 El; 170 Brin.
For corrosion and heat resisting castings, furnace parts; corrosion and heat resistant.

ISO-CAST HK.
M-162, 0.20-0.60 C, 18-22 Ni, 24-28 Cr, bal Fe.
Cast: 80,000 TS, 45,000 YS; 25 El; 190 Brin
For corrosion and heat resisting castings, furnace parts, corrosion and heat resistant, austenitic.

ISO-CAST HT.
M-162; 0.35-0.75 C, 33-37 Ni, 13-17 Cr, bal Fe.
Cast: 75,000 TS; 7 El; 180 Brin.
For corrosion and heat resisting castings, furnace parts; corrosion and heat resistant.

ISO-CAST HW.
M-162, 0.35-0.75 C, 58-62 Ni, 10-14 Cr, bal Fe.
Cast: 65,000 TS; 180 Brin
At 1800°F: 10,000 TS, 8000 YS; 40 El.
For furnace equipment, retorts, pots; heat and corrosion resistant

ISO-CAST M
M-162; 0.1-0.2 C, 0.6-0.8 Mn, bal Fe.
Annealed: 55,000 TS; 30,000 YS; 35 El; 55 RA; 120 Brin.
For castings, instrument parts.

ISOCAST N.
M-162; 97 Ni, bal Fe, Mn, Si.
Cast: 50,000 TS, 25,000 YS; 20 El; 100 Brin.
For caustic soda equipment; corrosion resistant.

ISOCAST WC1.
M-162, 0.20-0.30 C, 0.5-0.75 Mn, bal Fe
Heat treated 95,000 TS, 60,000 YS, 22 El; 35 RA, 210 Brin.
For valve bodies; castings.

ISOCAST WC9.
M-162; C, Ni, Cr, Mo, bal Fe
For general engineering castings; oil hardened, tough.

ISODISC-1.
M-27, M-1618; 0.35 C, 5 Cr, 1 V, 1 Mo, bal Fe.
Ht. Tr.: 276,000 TS; 224,000 YS; 8 El; C 54 Rock.
For extrusion and forging dies.
Modified Type H13 tool steel. Hot work steel, shock resistant.

ISODISC-2.
M-27, M-1618; 0.35 C, 1.0 Si, 0.4 Mn, 5.0 Cr, 1.3 W, 1.4 Mo, 0.35 V, bal Fe.
Forged: 224,000 TS; 207,800 YP; 8.4 El; 30 RA.
For aluminum and brass extrusion dies and press components, forging dies, mandrels, punches, rivet sets. Type H12 hot work steel.

ISODISC-4.
M-27, M-1618; 0.33 C, 0.5 V, 3 Cr, 3 Mo, bal Fe.
For extrusion and forging dies, rams, upsetters.
Similar to Bohler WMD alloy.
Hot work tool steel, shock resistant.

ISO-ELASTIC.
M-520, 36 Ni, 8 Cr, 4 Mn-Si-V, 0.5 Mo, bal Fe.
Heat treated: 160,000 TS; 140,000 YS; 4 El; 40 RA.
For springs, precision springs; similar to "Elinvar."

ISOLOY 302
M-98, 0.15 max C, 18 Cr, 8 Ni, bal Fe.
Cold drawn: 250,000-350,000 TS.
For springs, wire rope; stainless, austenitic, non-magnetic

ISOLOY 304
M-98, 0.08 max C, 18 Cr, 10 Ni, bal Fe.
Cold drawn: 250,000-350,000 TS.
For springs, wire rope; stainless, austenitic, non-magnetic

ISOLOY 316
M-98, 0.08 max C, 17 Cr, 12 Ni, 2 Mo, bal Fe.
Cold drawn 200,000-250,000 TS
For springs, wire rope; stainless, austenitic, non-magnetic.

ISOPERM-1.
M-621; 40-55 Ni, bal Fe
For magnets; high permeability.

ISOPERM 2.
M-621, 35-50 Ni, 9-15 Cu, bal Fe.
For magnets, high permeability.

ISOPERM 3.
M-621, 40-60 Ni, 3-4 Al, bal Fe.
For magnets; high permeability.

ISOROD.
M-507; 0.2 C, 0.5 Si, 0.2 Mn, 15.0 Cr, 8.0 Mo, 1.0 Ti, bal Fe
Coated, hardfacing electrode.
As arc welded. 185,000 psi, 520-580 BHN.
For overlay or build up on tractor sprockets, shovel teeth, dredge pump impellers, heavy hammers, strong and tough

ISOTAN.
M-789; 55 Cu, 44 Ni.
Annealed. 65,000-72,000 TS.
Hard: 107,000-121,000 TS
Temp coef. resistance per °C (−0.00008 to + 0.00004).
For electrical equipment and instruments.
Resistance alloy. Max working temperature 600°C.

ISTEG STEEL
M-471, C, bal Fe.
For reinforcing steel; mild steel, pre-stressed

ITALSIL.
Italy; 5 Si, bal Al.
For light alloy parts; die and sand castings.

I.W. 1
M-772; 0.5 C, 1.5 Cr, 2.2 W, 0.2 V, bal Fe.
For tools, dies; hot work steel.

I.W. 2.
M-772; 0.6 C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe.
For hot work tools and dies; hot work steel.

IWI see DARWIN IWI.

"IX" QUALITY.
M-179; Cu, Mn, Pb, bal Zn.
Extruded: 72,000 TS, 35,000 YS; 26 El; 20 RA; 130 Brin.
Drawn: 80,000 TS; 38,000 YS; 25 El; 18 RA; 135 Brin.
For hardware; manganese bronze.

IZETT STEEL NO. 1.
M-72; 0.125 C, 0.56 Mn, 0.018 P, 0.15 S, 0.10 Si, bal Fe.
At 20°C: 62,600 TS; 39,000 YS; 43 El; 68 RA.
At 400°C: 50,300 TS; 22,000 YS; 39 El; 70 RA.
For boilers; tough, Al deoxidized; non-aging.

IZETT STEEL NO. 2.
M-72; 0 15 C, 0.54 Mn, 0.025 P, 0.039 S, 0.06 Si, 10.06 Al, bal Fe.
At 20°C: 91,800 TS; 44,500 YS.
At 400°C: 68,000 TS; 23,000 YS.
For boilers; tough, Al deoxidized; non-aging.

IZETT STEEL NO. 3.
M-72; 0.355 C, 0.49 Mn, 0.024 P, 0.024 S, 0.10 Si, bal Fe.
At 20°C: 98,500 TS; 51,000 YS.
At 400°C: 77,000 TS; 29,000 YS.
For boilers; tough, Al deoxidized; non-aging.

IZETT STEEL NO. 4.
M-72; 0 34 C, 0.48 Mn, 0.025 P, 0.025 S, 0.11 Si, bal Fe.
At 20°C· 105,000 TS; 54,000 YS.
At 400°C. 81,000 TS, 30,000 YS.
For boilers, tough, Al deoxidizing; non-aging.

J-4 CHISEL.
M-261, M-486; 0.44 C, 1.3 Cr, 2.3 W, 0.15 V, bal Fe.
For chisels, shear blades, punches; shock resistant.

J-4 CHISEL.
M-694; 0.44 C, 0.25 Mn, 0.7 Si, 1.3 Cr, 2.3 W, 0 15 V, bal Fe
For dies, hot work steel

J.A C -ACM.
M-1179; C, 28 Cr, Mo, bal Fe.
Normalized. 100,000 TS.
For glass, chemical and dying industries; acid resistant.

J.A C.-ACN 1
M-1179; C, 18 Cr, 8 Ni, bal Fe.
Normalized· 100,000-120,000 TS; 50,000-60,000 YS, 25 El.
For food, chemical, petroleum industries; stainless

J.A.C -ACN 2
M-1179, C, 26 Cr, 10 Ni, bal Fe.
Heat treated: 110,000-120,000 TS; 50,000-60,000 YS; 18 El.
For furnace parts, grates; heat resistant.

J.A.C.-ACN 3.
M-1179; C, Cr, Ni, Mo, bal Fe
Heat treated: 110,000-130,000 TS; 50,000-70,000 YS; 18 El.
For furnace parts, grates; heat resistant, scale resistant.

J.A C -ACR.
M-1179; C, 30 Cr, bal Fe.
Heat treated: 84,000-100,000 TS
For furnace parts; scale and heat resistant.

J.A C.-AMH.
M-1179; C, 12-14 Mn, bal Fe.
Heat treated: 180,000 TS; 80,000 YS; 35 El; 40 RA.
For crusher plates, hammers, harrowers, mixers; wear resistant.

J.A.C.-AMH 2.
M-1179; C, 12-14 Mn, Cr, bal Fe.
Heat treated: 180,000-200,000 TS.
For crusher plates, hammers, harrowers, mixers; wear and abrasion resistant.

J.A.C.-ARF.
M-1179; C, Ni, Cr, Mo, bal Fe.
Heat treated: 160,000-180,000 TS; 120,000-140,000 YS; 12 El; 25 RA.
For crusher plates, hammers, harrowers, mixers; easily machined and welded.

J.A.C.-B 1.
M-1179; C, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 18 El; 35 RA.
For general usage; Bessemer steel.

J.A.C.-B 1 S.
M-1179; C, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 22 El; 40 RA.
For general usage; Bessemer steel.

J.A.C.-B 2.
M-1179; C, bal Fe.
Annealed: 90,000 TS; 60,000 YS; 16 El; 30 RA.
For general usage; Bessemer steel.

J.A.C.-B 2 S.
M-1179; C, bal Fe.
Annealed: 90,000 TS; 60,000 YS; 20 El; 35 RA.
For general usage; Bessemer steel.

J.A.C.-B 3.
M-1179; C, bal Fe.
Annealed. 110,000 TS; 66,000 YS; 12 El; 25 RA.
For general usage; Bessemer steel.

J.A.C.-E 1.
M-1179, C, 0 03 P, 0.3 S, bal Fe.
Normalized: 76,000 TS; 48,000 YS; 25 El; 50 RA.
For motor frames, rotors, dynamo parts; high magnetic permeability.

J.A.C.-E 2.
M-1179; C, bal Fe.
Normalized: 80,000 TS; 52,000 YS; 22 El; 45 RA.
For wheels, gears, axles; high yield strength.

J.A C -E 3.
M-1179; C, bal Fe.
Normalized: 90,000 TS; 60,000 YS; 20 El; 35 RA.
For bridge bearings, rudder frames, gears, naval construction.

J A C.-E 4.
M-1179, C, bal Fe.
Normalized: 100,000 TS; 64,000 YS, 20 El; 35 RA.
For machine tool parts, bridge gear boxes.

J.A C -E 5.
M-1179; C, bal Fe.
Normalized: 110,000 TS; 72,000 YS; 17 El; 32 RA.
For gears, axles, couplings, water hardening.

J.A C.-E 6.
M-1179; C, bal Fe.
Normalized: 120,000 TS; 80,000 YS; 15 El; 25 RA.
For pinions, block dies, gears; wear resistant.

J.A.C.-EA 1.
M-1179, C, Cr, Mn, bal Fe.
Normalized: 120,000-160,000 TS; 80,000-110,000 YS; 15-7 El.
For gears, excavator parts, tractors, cranes, dies; tough, wear resistant.

J.A C.-EA 2.
M-1179; C, Ni, bal Fe.
Normalized: 120,000 TS; 96,000 YS; 14 El.
For drills, pinions, roller mill cylinders, brake drums; wear and shock resistant.

J.A.C -EA 3.
M-1179; C, Cr, Ni, bal Fe.
Normalized: 150,000 TS; 120,000 YS; 12 El.
For drills, pinions, roller mill cylinders; wear and shock resistant.

J.A.C.-EA 4.
M-1179; C, Cr, Ni, Mo, bal Fe.
Normalized: 160,000-180,000 TS; 110,000-150,000 YS; 10 El.
For rollers, gears, valves; heat resistant to 500°F.

J.A.C.-EA 5.
M-1179; C, Cr, Mo, bal Fe.
Normalized: 130,000-150,000 TS; 90,000-100,000 YS; 10 El.
For rollers, gears, valves; shock and wear resistant.

J.A.C.-EA 6.
M-1179; C, Cr, Mo, bal Fe.
Normalized: 100,000-120,000 TS; 80,000-90,000 YS; 15 El.
For valves, collectors, piping; maximum operating temp. 550°F.

JACKMANIZED STEEL.
M-477; 0.5 C, bal Fe.
For dredger bucket pins, bushes, tin rolls.

JACKSBERG.
M-477; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed tools and cutters; high speed steel.

JACKSONS BUTTON ALLOY.
England; 30-35 Zn, 2-5 Sb, bal Cu.
For ornamental and architectural parts; high strength.

JACOBY METAL.
Eng., 85 Sn, 10 Sb, 5 Cu.
For bearings; liners; Babbitt.

JACOL 1886.
M-1546; 0.08 C, 1.4 Cr, 1 1 Mo, 0 6 V, bal Fe.
Heat treated: 107,000 TS; 93,000 YS; 15% El.
For gas turbine and steam turbine rotors and discs.
Holds properties up to 600°C.
Resists oxidation up to 550°C.

JACOL-CVM6.
M-1546, 0 17 C, 5.5 Cr, 0.55 Mo, 0 25 V, bal Fe.
Annealed· 64,000 TS; 40,000 YS; 32% El.
Heat treated: 107,000 TS; 88,000 YS; 17% El.
For piping equipment in oil refineries.
Resistant to oxidation to 750°C.

JACONA METAL.
Eng.; 70 Pb, 20 Sb, 10 Sn
For bearings, liners, Babbitt.

JADE.
M-1120; 1.0 C, bal Fe.
For reamers, taps, punches, cold work tools; Type W1, water hardened.

JADOT J1.
M-1297; 0.08 max C, 13 Cr, bal Fe
Annealed: 75,000 TS; 40,000 YS, 35 El; 70 RA; 155 Brin
For valves, cutlery, surgical instruments; Type 403; corrosion resistant.

JADOT J1.
M-1297; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Heat treated: 120,000-135,000 TS; 110,000-117,000 YS; 16-15 El; 63-58 RA; 220-240 Brin.
For cutlery, valves, turbine blades, fasteners; Type 410; corrosion resistant.

JADOT J2.
M-1297; 0.26-0.43 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; corrosion resistant.

JADOT JA.
M-1297; 0.08-0.20 C, 17-19 Cr, 8-10 Ni, 2 max Mn, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 125,000 TS; 95,000 YS; 25 El; 55 RA; 277 Brin.
For oil refinery and chemical plant equipment; Type 302; stainless, austenitic.

JADOT JA1.
M-1296; 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 60-50 El, 75-60 RA; 150-190 Brin.
For chemical plant equipment, mixers, agitators, filters; Type 316; austenitic, stainless.

JADOT JA2.
M-1297; 0 10 C, 18 Cr, 10 Ni, 2.5 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, mixers; Type 316; stainless, austenitic.

JADOT JA2E
M-1297; 0 10 C, 19 Cr, 12 Ni, 3 5 Mo, bal Fe.
Annealed· 90,000 TS, 40,000 YS, 45 El; 60 RA; 180 Brin
For acid resistant chemical plant equipment; mixers; Type 317; stainless, austenitic.

JADOT JAA.
M-1297; 0 07 C, 17 Cr, 13 Ni, 4.5 Mo, bal Fe.
Annealed· 90,000 TS; 40,000 YS; 45 El; 60 RA; 180 Brin
For acid resistant chemical plant equipment, mixers; Type 317; stainless, austenitic.

JADOT JAS.
M-1297, 0 12 C, 18 Cr, 8 Ni, bal Fe.
Annealed· 85,000 TS; 35,000 YS; 60 El; 70 RA, 150 Brin
For chemical plant equipment, tanks, mixers, filters; Type 304, stainless, austenitic.

JADOT JD.
M-1297; 0.25 max C, 15 Cr, 35 Ni, bal Fe.
For furnace parts and equipment, salt pots; Type 330, heat resistant.

JADOT JH.
M-1297, 0 12 max C, 14-18 Cr, bal Fe.
Annealed· 70,000 TS, 40,000 YS; 30 El; 55 RA; 150 Brin
Cold drawn: 130,000 TS; 120,000 YS; 2 El; 185 Brin
For oil refinery equipment, bolts, kitchen sinks; Type 430, stainless, ferritic.

JADOT JH1.
M-1297, 0 2 max C, 24-26 Cr, 1 max Si, bal Fe.
Annealed: 75,000-85,000 TS; 50,000-60,000 YS; 12 El; 180 Brin.
For furnace parts, heat treating boxes; Type 442; corrosion and heat resistant.

JADOT JH1A.
M-1297; 0.35 C, 23-27 Cr, 0.25 max N, bal Fe.
Annealed 90,000 TS, 60,000 YS; 20 El; 45 RA; 180 Brin.
Cold drawn: 175,000 TS; 155,000 YS; 2 El; 25 RA; 250 Brin
For furnace parts, preheaters, annealing boxes; Type 446; corrosion resistant.

JADOT JH2.
M-1297; 0.2 max C, 22-24 Cr, 12-15 Ni, 2 max Mn, 3.5 max Si, bal Fe.
Annealed· 85,000-95,000 TS; 40,000-50,000 YS; 45-55 El; 150-185 Brin.

For heat treat boxes, furnace parts and equipment; Type 309; austenitic, heat resistant.

JADOT JH3.
M-1297; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El; 65 RA; 180 Brin.
At 1200°F: 57,000 TS; 22,000 YS; 32 El; 45 RA.
For furnace parts, valves, pumps, engine parts, Type 310; heat resistant, austenitic.

JADOT JH3AS.
M-1297; 0.12 C, 20 Cr, 20 Ni, bal Fe.
For furnace parts, salt pots; corrosion and heat resistant.

JADOT JH4.
M-1297; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El; 65 RA; 180 Brin.
At 1200°F. 57,000 TS; 22,000 YS; 32 El; 45 RA.
For furnace parts, valves, pumps, engine components; Type 310; austenitic, heat resistant.

JADOT JH6.
M-1297; 0.10 max C, 18-20 Cr, 11-14 Ni, 3-4 Mo, bal Fe.
Annealed· 85,000-95,000 TS; 35,000-45,000 YS; 60-50 El, 75-60 RA; 150-190 Brin.
For acid resistant chemical plant equipment; Type 317, stainless, austenitic.

JAE METAL.
M-121, 70 Ni, 30 Cu.
Annealed: 63,000 TS; 22,000 YS; 52 El, 81 RA; 110 Brin
For compensating shunts on magnetic instruments, high reg temp coef. of magnetic permeability.

JALCASE 1.
M-173; 0.10-0.16 C, 1.0-1.3 Mn, bal Fe, 0.24-0.33 S
Water hardened 138,000 TS, 100,000 YS; 10 El; 30 RA, 315 Brin.
Cold rolled 65,000 TS; 55,000 YS, 17 El; 45 RA, 137 Brin
For case-hardened parts, screw stock; free cutting C-1113.

JALCASE 2
M-173, 0.10-0.16 C, 1.0-1.3 Mn, bal Fe. 0.08-0.13 S
Water hardened: 150,000 TS, 135,000 YS; 12 El, 50 RA, 325 Brin
Cold rolled 65,000 TS; 55,000 YS, 17 El; 45 RA, 137 Brin.
For general use, shafts, gears, free cutting C-1114

JALCASE 3
M 173; 0.14-0.20 C, 1.10-1.4 Mn, bal Fe, 0.16-0.23 S
Water hardened 190,000 TS, 167,000 YS, 10 El; 38 RA, 375 Brin.
Cold rolled· 70,000 TS; 60,000 YS; 15 El, 35 RA; 143 Brin
For general use, shafts, gears, free cutting C-1116.

JALCASE 4
M-173, 0.14-0.20 C, 1.0-1.3 Mn, bal Fe, 0.08-0.13 S.
Oil hardened: 150,000 TS; 128,000 YS; 12 El; 36 RA; 310 Brin
Cold rolled: 70,000 TS, 60,000 YS; 15 El, 35 RA; 143 Brin.
For general use, shafts, gears; free cutting C-1117.

JALCASE 5.
M-173; 0.14-0.20 C, 1.30-1.60 Mn, bal Fe, 0.08-0.13 S.
Oil hardened: 166,000 TS; 138,000 YS; 10 El; 39 RA; 380 Brin.
Cold rolled: 70,000 TS; 60,000 YS; 15 El; 35 RA; 149 Brin.
For general use, shafts, gears; free cutting C-1118.

JALCASE 6.
M-173; 0.14-0.20 C, 1.0-1.3 Mn, 0.20-0.33 S, bal Fe,
Cold rolled: 70,000 TS; 60,000 YS; 15 El; 35 RA; 143-192 Brin.
For gears, shafts, cams, camshafts; C-1119; free-cutting.

JALCASE 7.
M-173; 0.32-0.39 C, 1.35-1.65 Mn, 0.08-0.13 S, bal Fe
Cold rolled: 90,000 TS; 75,000 YS; 10 El; 35 RA, 192-241 Brin.
For gears, shafts; C-1137, free-cutting.

JALCASE 8
M-173; 0.37-0.45 C, 1.35-1.65 Mn, 0.08-0.13 S, bal Fe.
Cold rolled. 95,000 TS; 80,000 YS; 10 El; 28 RA; 197-248 Brin.
For gears, shafts; C-1141; free-cutting.

JALCASE 9.
M-173; 0.40-0.48 C, 1.35-1.65 Mn, 0.24-0.33 S, bal Fe
Cold rolled· 100,000 TS; 85,000 YS; 8 El; 25 RA, 207-255 Brin.
For gears, shafts; C-1144, free-cutting.

JALCASE 10
M-173, 0.40-0.48 C, 1.35-1.65 Mn, 0.24-0.33 S, bal Fe
Cold rolled 115,000 TS; 100,000 YS; 7 El; 20 RA, 235-285 Brin
For gears, shafts; C-1144, free-cutting.

JALCASE 100
M-173, 0.40-0.48 C, 1.35-1.65 Mn, 0.24-0.33 S, bal Fe.
Cold drawn 115,000 TS, 100,000 YS, 10-20 El, 30-50 RA, 241 Brin
For screw machine products, gears, bolts; free-cutting, stress stabilized.

JALCOLD
M-173, 0.2 C, bal Fe
For welding rods

J-ALLOY
0.76 C, 23 Cr, 6 Ni, 6 Mo, 2 Ta, bal Co
For jet engine and gas turbine parts; high heat resistant

JALLOY-1.
M-173; 0.13-0.18 C, 1.0-1.3 Mn, 0.1-0.2 Mo, bal Fe.
Hot rolled 85,000 TS; 57,000 YS; 30 El, 63 RA, 179 Brin.
Cold drawn 98,500 TS; 98,000 YS, 17.5 El, 65 RA.
For tank armor, mine equipment; shock resistant

JALLOY 3
M-173, 0.25-0.31 C, 1.35-1.65 Mn, 0.10-0.20 Mo, bal Fe
Rolled 102,000 TS; 80,000 YS, 21 El; 51 RA, 241 Brin
Hardened· 150,000 TS, 140,000 YS, 14 El; 55 RA; 364 Brin
For mining equipment, buckets; tough.

JALLOY 7.
M-173, 0.5-0.6 C, 1.35-1.65 Mn, 0.10-0.20 Mo, bal Fe
Rolled· 134,000 TS; 100,000 YS; 15 El; 31 RA; 269 Brin.
For mining equipment, buckets; tough.

JALLOY 280.
M-173; 0.25-0.31 C, 1.35-1.65 Mn, 0.1-0.2 Mo, 0.2 min Cu, Al, B, Ti, bal Fe.
Heat treated: 115,000 TS; 100,000 YS; 15 El; 260-300 Brin.
For liners, power shovels, mining equipment, fan blades; resists impact and abrasion.

JALLOY 320.
M-173; 0.25-0.31 C, 1.35-1.65 Mn, 0.1-0.2 Mo, 0.2 min Cu, Al, B, Ti, bal Fe.
Heat treated: 300-340 Brin.
For liners, power shovels, mining equipment, fan blades, stone crushers;
resists impact and abrasion.

JALLOY AR-360.
M-173; 0.25-0.31 C, 1.35-1.65 Mn, 0.10-0.20 Mo, 0.20 min Cu, bal Fe.
Heat treated: 164,000 TS; 157,000 YS; 14 El; 50 RA; 360 Brin.
For mining, transportation and construction equipment; pre heat treated to 340-380 Brinell.

JALLOY AR-400.
M-173; 0.25-0.31 C, 1.35-1.65 Mn, 0.10-0.20 Mo, 0.20 min Cu, bal Fe.
Heat treated: 190,000 TS; 184,000 YS; 13 El; 45 RA; 420 Brin.
For mining, transportation and construction equipment; pre heat treated to
400 Brinell minimum.

JALLOY-S-90.
M-173; 0.10-0.20 C, 1.1-1.5 Mn, 0.15-0.30 Si, 0.20-0.30 Mo, bal Fe.
Plate: 101,000 TS; 92,700 YS; 20 El; 61.5 RA; 241 Brin.
For missiles, hoists, construction and ordnance machinery, cranes, trucks;
preheat treated to 9000 psi yield strength.

JALLOY-S-100.
M-173; 0.10-0.20 C, 1.1-1.5 Mn, 0.15-0.30 Si, 0.20-0.30 Mo, bal Fe.
Plate: 115,000 TS; 107,000 YS; 18.5 El; 60 RA; 255 Brin.
For missiles, hoists, construction and ordnance machinery, cranes, trucks;
preheat treated to 100,000 psi yield strength.

JALLOY-S-110.
M-173; 0.10-0.20 C, 1.1-1.5 Mn, 0.20-0.30 Mo, bal Fe.
Plate: 122,000 TS; 114,000 YS; 17 El; 60 RA; 269 Brin.
For missiles, hoists, construction and ordnance machinery, cranes, trucks;
preheat treated to 110,000 psi yield strength.

JALLOY S-340.
M-173; 0.10-0.20 C, 1.1-1.5 Mn, 0.2-0.3 Mo, 0.0005 min B, bal Fe.
Plate: 156,000 TS; 149,000 YS; 16 El; 53 RA; 320-360 Brin.
For mine cars, railroad equipment, agricultural and earth moving equipment.
Abrasion resistant, good weldability.

JALTEN NO. 1.
M-173; 0.15 max C, 1.3 max Mn, 0.30 min Cu, 0.035-0.065 V, bal Fe.
Rolled: 65,000 TS; 50,000 YS; 22 El.
For structural parts, truck bodies, mine cars; good formability and weldability.

JALTEN NO. 2.
M-173; 0.15 max C, 1.4 max Mn, 0.14 max P, 0.30 min Cu, bal Fe.
Hot rolled: 70,000 TS; 50,000 YS; 22 El.
For structural parts, truck bodies, railroad cars; good formability and weldability.

JALTEN NO. 3.
M-173; 0.25 max C, 1.6 max Mn, 0.20 min Cu, bal Fe.
Hot rolled: 70,000 TS; 50,000 YS; 22 El.
For construction equipment, truck bodies; moderate formability.

JALWELD.
M-173; 0.15 C, bal Fe.
For welding rods.

JAMAG.
M-1640; 2.2 C, 1.6 Si, 0.3 Mn, 0.1 Mg, bal Fe.
Heat treated: 50,000-110,000 YS.
For electrical parts, where
high rotation speeds are involved.
High magnetic permeability, malleable iron.

JAMALEX.
M-1640; 2.2 C, 1.6 Si, 0.3 Mn, 0.05 Mg, bal Fe.
Heat treated: 65,000-140,000 TS; 50,000-110,000 YS; 2-9 El.
For gears, sprockets, hubs, cams, bearings, wear resistant parts.
Malleable iron, high magnetic permeability.

JAMAPPES BRASS.
England; 0.2 Sn, 1.4 Pb, 33.4 Zn, bal Cu.
For hardware, fittings, forgings; good workability, free-cutting.

JAMISON HOBBING IRON.
M-1423; 0.05 C, bal Fe.
For plastic molding hobs.

JAMISON K46.
M-1423; 0.85 C, 1.2 Mn, 1.5 Cr, 0.5 W, 0.1 V, bal Fe.
For blanking and forming dies, reamers, punches; oil hardened, non-deforming.

JAMISON K-46 O H.
M-1423; 0.90 C, 1 Mn, 0.5 Cr, 0.5 W, bal Fe.
For reamers, broaches, punches, cutters, Type 01; oil hardened, non-deforming.

JAMISON SPECIAL.
M-1423; 0.7-1.4 C, 0.3 Mn, 0.3 Si, bal Fe.
For drills, reamers, hobs, planer tools, springs; Type W1; water hardened.

JANO.
M-344; C, 4 Cr, 2 V, 19 W, 0 6 Mo, bal Fe.
For tools, cutters; high speed steel.

JANUS.
M-344; C, bal Fe.
For cold dies; very tough.

JANUS EXTRA ZH.
M-614; 1.0-1.1 C, 0.25 max Mn, 0.25 max Si, bal Fe
For drills, taps, reamers, broaches, hobs; Type W1; water hardened.

JANUS GHC17M.
M-614; 0.35 C, 17 Cr, 2 Mo, bal Fe.
For acid-resistant chemical plant equipment; corrosion resistant.

JANUS GR15.
M-614; 0.15 max C, 0.75 Si, 13 Cr, 1.8 max Ni, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 150 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For tableware, hardware, turbine blades; Type 410; corrosion resistant.

JANUS GR18.
M-614; 0.25 max C, 0.7 Si, 17 Cr, 1.8 max Ni, bal Fe.
For furnace parts, chemical plant equipment; corrosion resistant.

JANUS GR25.
M-614; 0.25 C. 0.7 Si, 14.5 Cr, 1.8 max Ni, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For cutlery, turbine blades, surgical instruments; Type 420; corrosion resistant

JANUS GSA.
M-614; 0.15 C, 1.5 Si, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 55 El; 65 RA; 160 Brin.
For chemical plant equipment, tanks, mixers, vessels; Type 302; stainless, austenitic.

JANUS GSAT.
M-614; 0.12 max C, 18 Cr, 9.5 Ni, Co = 8 × C, bal Fe.
Annealed· 90,000 TS, 45,000 YS; 45 El, 60 RA; 170 Brin.
For chemical plant equipment, welded structures; Type 346; stainless, austenitic.

JANUS GSAW
M-614; 0 07 max C, 18 Cr, 9.5 Ni, bal Fe
Annealed: 85,000 TS; 40,000 YS; 55 El; 65 RA, 160 Brin.
For chemical plant equipment, welded structures; Type 304, stainless, austenitic.

JANUS GSB.
M-614, 0.15 C, 2 Si, 18 Cr, 9 5 Ni, 2 Mo, bal Fe.
Annealed· 90,000 TS; 45,000 YS; 50 El; 60 RA; 180 Brin
For acid-resistant chemical plant equipment; Type 316, stainless, austenitic.

JANUS GSBT.
M-614; 0 12 max C, 18 Cr, 10.5 Ni, 2 Mo, Cb = 10 × C, bal Fe.
Annealed· 85,000 TS; 40,000 YS, 50 El; 60 RA; 180 Brin
For acid resistant, welded structures, mixers, filters; Type 316 Cb; stainless, austenitic.

JANUS GSBW
M-614, 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe.
Annealed. 80,000 TS; 35,000 YS; 55 El, 65 RA; 160 Brin
For chemical plant equipment, mixers, agitators, filters; Type 316L; stainless, austenitic

JANUS HC17M.
M-614; 0 35 C, 17 Cr, 2 Mo, bal Fe.
For acid-resistant chemical plant equipment; corrosion resistant

JANUSIT-A.
M-614; 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe
For furnace parts and equipment, heat treating boxes; heat resistant.

JANUSIT-B.
M-614; 0 4 C, 2 Si, 22 Cr, 9 5 Ni, bal Fe.
For furnace parts, heat treating boxes; corrosion and heat resistant.

JANUSIT-C.
M-614; 0.4 C, 2 Si, 26 Cr, 14 Ni, bal Fe.
For furnace parts and equipment, heat treating boxes; corrosion and heat resistant, austenitic.

JANUSIT-D.
M-614; 0.4 C, 2 Si, 25 Cr, 19 Ni, bal Fe.
For furnace parts and equipment, heat treating boxes; corrosion and heat resistant, austenitic.

JANUSIT-E.
M-614; 0.5 C, 1.8 Si, 25 Cr, 30 Ni, bal Fe.
For furnace parts and equipment, heat treating boxes; corrosion and heat resistant, austenitic.

JANUS MH.
M-614; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For drills, hobs, reamers, taps, punches; Type W1; water hardened.

JANUS R3V.
M-614; 0.30 C, 14 Cr, Ni, V, bal Fe.
Annealed: 100,000 TS; 60,000 YS; 40 El; 50 RA; 200 Brin.
For oil refinery equipment; corrosion and creep resistant.

JANUS R15.
M-614; 0.15 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS, 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For valves, turbine blades, tableware, hardware; Type 410; corrosion resistant

JANUS R15W
M-614; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed· 75,000 TS, 40,000 YS, 35 El; 70 RA; 155 Brin.
Cold drawn· 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For valves, turbine blades, tableware, hardware; Type 410; corrosion resistant.

JANUS R17.
M-614; 1 0 C, 18 Cr, W, Mo, V, bal Fe
Annealed 110,000 TS; 65,000 YS; 17 El; 32 RA; 220 Brin.
Heat treated. 280,000 TS; 270,000 YS; 3 El; 15 RA; 550 Brin.
For bearings, sleeves, liners, corrosion resistant, wear resistant.

JANUS R18
M-614, 0 22 C 0 4 Si, 17 Cr, 1 5 Ni, bal Fe.
Annealed: 120,000 TS; 90,000 YS; 15 El; 20 RA; 260 Brin
Heat treated· 180,000 TS, 130,000 YS; 10 El, 15 RA; 420 Brin
For pump shafts, surgical trusses, valve trim, Type 431; corrosion resistant.

JANUS R25.
M-614; 0 2 C, 0 4 Si, 13 Cr, bal Fe
Annealed: 95,000 TS; 50,000 YS, 25 El; 55 RA; 195 Brin.
Cold drawn. 105,000 TS; 85,000 YS, 17 El, 50 RA; 215 Brin.
For cutlery, valves, surgical instruments; Type 420, stainless, hardenable.

JANUS R45.
M-614; 0 40 C, 14 Cr, 0 4 Si, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 50 El, 65 RA; 180 Brin.
For oil refinery equipment, cutlery, valves; Type 420; corrosion resistant.

JANUS R50
M-614; 0.50 C, 16 Cr, 0.4 Si, bal Fe.
For oil refinery equipment, corrosion resistant.

JANUS SA.
M-614, 0.15 max C, 0.4 Si, 18 Cr, 8.5 Ni, bal Fe.
Annealed· 85,000 TS; 40,000 YS; 50 El; 65 RA; 160 Brin.
For chemical plant and oil refinery equipment; Type 302; austenitic, stainless.

JANUS SAT.
M-614; 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 45 El; 60 RA; 170 Brin.
For chemical plant equipment, welded structures; Type 346; stainless, austenitic.

JANUS SAW.
M-614; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed· 85,000 TS; 40,000 YS; 55 El; 65 RA; 160 Brin.
For chemical plant equipment, welded structures; Type 304; stainless, austenitic.

JANUS SB.
M-614; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El, 65 RA; 160 Brin.
For chemical plant equipment, tanks; Type 302; stainless, austenitic.

JANUS SBT.
M-614; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Cb = 8 × C, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 50 El, 60 RA; 180 Brin.
For acid resistant welded structures; Type 316 Cb; stainless, austenitic.

JANUS SBW.
M-614; 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El, 65 RA; 160 Brin
For chemical plant equipment, mixers, agitators, tanks; Type 316L; stainless, austenitic.

JANUS SPEZIAL.
M-614; 1 4 C, 13 W, V, 0.30 Mn, bal Fe.
For cutters, tools, fast finishing.

JANUS SPEZIAL EXTRA.
M-614, 1.3 C, 0.2 max Cr, 4.7 W, bal Fe.
For cutters, tools, fast finishing.

JANUS V.
M-614; 0.9 C, 1 9 Mn, 0.1 V, bal Fe.
For dies, punches, cutters, crimpers; oil hardened, nondeforming.

JANUS ZAH.
M-614; 0.70 C, 0.25 max Mn, 0.25 max Si, bal Fe.
For drills, punches, crimpers, springers; Type W1; water hardened.

JANUS ZH.
M-614, 0 85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For drills, taps, reamers, hobs, Type W1; water hardened.

JAPAN 2H-SUPER.
M-1539, 0 08-0 16 C, 0 6-1.2 Mn, 1.0 max Ni, 0.5 max Cu, 0.4 max Mo, bal Fe.
Heat treated: 110,000-114,000 TS; 90,000 min YP; 22% min El.
For mine cars, agricultural equipment, railroad car and automobile bodies.
High-strength low-alloy constructional steel.

JAPAN 2H-ULTRA.
M-1539; 0.08-0.16 C, 0.6-1.2 Mn, 0.15-0.50 Cu, 1.5 max Ni, 0.8 max Cr, 0.7 max Mo, 0.1 max V, 0.006 max B, bal Fe.
Heat treated: 114,000-135,000 TS; 100,000 min YP; 20% min El.
For mine and railroad cars, booms, agricultural equipment, structures. High-strength low-alloy constructional steel.

JAPAN BRASS.
Japan; 66.6 Cu, 33.4 Zn.
For hardware, fixtures, radiators; high strength.

JBR ALLOY.
M-790; C, 6 Co, W, Cr, V, bal Fe.
For tools, cutters; tipped tools.

J.C./C.
M-359, M-584.
For general tools; water hardening.

JEFFALOY 55M.
M-170; 2.85-3.05 T.C., 0.5-0.7 Mn, Si, 0.7-0.9 Mo, bal Fe.
Cast: 50,000-60,000 TS; 248-269 Brin.
For castings; wear resisting.

JEFFALOY A.
M-170; 2.85-3 5 T.C., 0 3-0.7 Mn, Si, bal Fe.
Cast: 35,000-50,000 TS; 192-248 Brin.
For castings, pump parts, sprockets, housings; wear resistant cast iron, processed.

JELENKO, NO 7.
M-791; Tu.
For dental work; cast

JELLIFF ALLOY 30.
M-231; 2 Ni, bal Cu.
Annealed: 30,000 TS, 30 El.
Hard 60,000 TS, 3 El.
For relays, low resistance resistors, rheostats; non-magnetic, easily soldered

JELLIFF ALLOY 45.
M-231, 45 Ni, bal Cu.
Annealed: 60,000 TS; 30 El.
Hard 135,000 TS, 3 El.
For thermocouples, resistance coils, low temperature heaters, zero temperature coefficient of res ; resists oxidation and corrosion at lower temperature, max operating temperature 930°F.

JELLIFF ALLOY 60.
M-231; 6 Ni, mal Cu
Annealed 35,000 TS, 30 El.
Hard· 70,000 TS, 3 El.
For relays, low resistance resistors, rheostats; non-magnetic, easily soldered.

JELLIFF ALLOY 90
M-231; 12 Ni, bal Cu.
Hard· 75,000 TS, 3 El
Annealed 35,000 TS, 30 El
For resistance wire, rheostats, potentiometers; maximum operating temperature 850°F.

JELLIFF ALLOY 180.
M-231; 22 Ni, bal Cu
Hard· 100,000 TS, 3 El.
Annealed 50,000 TS, 30 El.
For resistance wire, rheostats, potentiometers, max operating temperature 750°F, low temp coef. of resistance.

JELLIFF ALLOY 800
M-231; 20 Cr, 17 5 Mn, 1.5 Mo, bal Ni.
Annealed· 150,000 TS, 30 El
Hard 250,000 TS, 3 El.
For precision resistors, potentiometers; electrical resistance, 800 ohms/c.m.f.

JELLIFF ALLOY A
M-231; 80 Ni, 20 Cr.
Annealed: 95,000 TS; 30 El
Hard: 105,000 TS; 3 El
For industrial furnace elements, voltmeter windings, electrical instruments; max operating temperature 2100°F; high resistance to oxidation and corrosion.

JELLIFF ALLOY C.
M-231; 60 Ni, 16 Cr, bal Fe.
Annealed: 95,000 TS; 30 El.

Hard: 200,000 TS; 3 El.
For heating elements, rheostats, resistors, potentiometers; max operating temperature 1700°F; heat and corrosion resistant.

JELLIF ALLOY C.O.J.
M-231; Ni, Cr, Mn, Mo.
Fine wire with very high elec. resistivity.
Elec. Resistivity: 1040 ohms/cmf.
Temp coeff. of Resistance, −65 to + 150°C, ± 5 ppm/°C.
Thermal EMF vs Copper, max.: 0.010 mV/°C.
Magnetic attraction: none.

JELLIFF ALLOY K.
M-231; 15.5 Cr, 5.5 Al, bal Fe
Annealed. 100,000 TS; 20 El.
Hard: 200,000 TS; 3 El.
For high temperature heating elements, resistors; maximum operating temperature 2200°F, magnetic.

JELLIFF ALLOY K20.
M-231, 15.5 Cr, 5.5 Al, bal Fe
Annealed. 100,000 TS, 20 El.
Hard: 200,000 TS, 3 El
For precision resistors, power resistors, zero temperature co-efficient of resistance.

JESSAIR
M-69, 0.70 C, 2.0 Mn, 0.3 Si, 1.0 Cr, 1.35 Mo, bal Fe.
Heat Treated: 293,000 TS, 265,000 YS; 1 El; 2 RA; C 55 Rock
For blanking and forming dies, trimming and notching dies, master hubs, shear blades, bending tools, mandrels, heavy duty punches.
Type A6 air hardening tool steel

JESSOP 2B (HC)
M-69, 0.48 C, 2.75 Cr, 0.3 V, 11.25 W, bal Fe.
For piecing punches, mandrels, grippers, heading dies, hot work steel.

JESSOP 2B (LC)
M-69, 0.30 C, 3.15 Cr, 0.3 V, 10 W, bal Fe
For forming dies, hot work steel

JESSOP 2 B (MC)
M-69, 0.35 C, 3 Cr, 0.25 Mn, 0.3 V, 13.5 W, bal Fe.
For tools, bolts and rivet dies, mandrels; tough, hot work steel

JESSOP 3 C DIES
M-69, 2.25 C, 12 Cr, 0.2 V, 0.8 Mo, bal Fe.
For coining, crimping and cutting dies, hobs, punches, wear resistant, oil hardening

JESSOP 3-C SPECIAL
M-69, 1.45 C, 12.5 Cr, 0.8 Mo, 3.2 Co, 0.4 Si, bal Fe
For die casting dies, air hardening

JESSOP NO. 5
M-69, 0.56-0.65 C, 0.1-0.2 Si, 0.25-0.6 Mn, bal Fe.
For tools

JESSOP 6 STAR VANADIUM.
M-261, M-486; 1 C, 0.3 Mn, 0.2 V, bal Fe.
For coining and cutlery dies, cold-heading dies; tough.

JESSOP NO. 9.
M-69; 0.35 C, 12.4 Mn, 3.25 Ni, 4.15 Cr, 0.5 Mo, bal Fe
Rolled: 115,000-160,000 TS; 55,000-100,000 YS; 45-35 El; 50-40 RA
For armor plate, coal chutes, mine cars; austenitic, tough and wear resistant.

JESSOP NO. 27.
M-69; 1.15 C, 0.55 Mn, 0.55 Cr, 0.95 W, 0.2 V, bal Fe.
For cold metal saws; oil or water hardened.

JESSOP NO. 27-V.
M-69; 1.25 C, 0.60 Cr, 1.0 W, 0.20 V, bal Fe.
Annealed: 200 Brin.
For milling saw plates; oil hardening.

JESSOP NO. 29-V.
M-69; 0.90 C, 1.2 Cr, 0.25 V, bal Fe.
Annealed: 200 Brin.
For milling saw plates, metal band saw; oil hardening.

JESSOP NO. 51.
M-69, 1.15 C, 0.3 Mn, 0.2 Si, 1.1 W, bal Fe.
For hacksaws; water or oil hardened.

JESSOP NO. 67.
M-69; 0.8 C, 0.25 Mn, 1.35 Ni, 0.35 Cr, bal Fe.
For cross-cut saws, circular wood saws; oil hardened

JESSOP NO. 91.
M-69, 0.7 C, 0.5 Mn, 0.7 Ni, 0.5 Cr, 0.15 Mo, bal Fe
For circular wood saws, segment plates; oil hardened

JESSOP NO. 96.
M-69, 0.75 C, 0.25 Mn, 1.4 Ni, 0.2 Cr, bal Fe.
For woodworking tools, oil hardened, tough.

JESSOP NO. 96C
M-69, 0.9 C, 0.35 Mn, 1.4 Ni, 0.3 Cr, bal Fe.
Heat treated: 380-620 Brin.
For crosscut saws, ripsaws; oil hardened, tough.

JESSOP NO. 96K
M-69, 1 C, 0.4 Mn, 1.4 Ni, 0.65 Cr, bal Fe
Heat treated: 380-630 Brin
For saw bits; oil hardened, tough.

JESSOP NO. 96-KC
M-69, C, 1.5 Ni, 0.30 Cr, bal Fe
Heat treated: 190,000-200,000 TS; 160,000-170,000 YS; 12 El.
For wood saws, circular and band saws, Rockwell "C"-42.

JESSOP NO. 139B.
M-69, 0.82 C, 0.35 Mn, 2.6 Ni, 0.25 Cr, bal Fe
Heated treated: 320-620 Brin
For woodworking knives, saws, oil hardened, tough.

JESSOP 145.
M-69, 2.3 C, 0.7 Mn, 5.25 Cr, 4.75 V, 1.1 Mo, 1.4 W, bal Fe
Hardened: C, 65-67 Rock
For drawing and forming dies, grinding wheel molds, brick mold liners.
Cold work tool steel, Type A7, abrasion resistant. Oil or air hardening

JESSOP NO. 200
M-69, 0.35 C, 11.5 Mn, 7.5 Ni, 0.5 max Cr, bal Fe.
Annealed: 80,000-95,000 TS, 30,000-60,000 YS; 50-30 El, 60-30 RA
For circuit breakers, transformers, motor shafts, nonmagnetic, austenitic.

JESSOP NO. 202
M-69, 0.25 C, 17.5 Mn, 1.5 Ni, bal Fe
Rolled. 85,000-95,000 TS, 30,000-60,000 YS, 50-25 El, 60-30 RA.
For induction furnace parts, switch covers, austenitic, non-magnetic

JESSOP NO. 259.
M-69, 0.54 C, 0.75 Mn, 2.0 Si, 0.15 Cr, 0.2 V, 0.5 Mo, bal Fe.
Shock resisting tool steel, AISI S5.

JESSOP NO. 271.
M-69; 0.9 C, 0.7 Mn, 0.25 Cr, bal Fe.
Annealed: 100,000 TS; 53,100 YS; 21 El; 42 RA; 200 Brin.
For cross-cut saws, circular and hand saws; oil or water hardened.

JESSOP NO. 276.
M-69; 0.9 C, 0.35 Mn, 0.25 Si, 0.5 Cr, bal Fe.
Heat treated: 185,000 TS; 120,000 YS; 10 El; 30 RA; 375-400 Brin.
For cross-cut saws; oil or water hardened.

JESSOP 302.
M-69; 0.08-0.20 C, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 50 El; 65 RA; 150 Brin.
For springs, screens, chemical plant equipment; Type 302; stainless, austenitic.

JESSOP 303.
M-69; 0.15 max C, 17-19 Cr, 8-10 Ni, 0.07 min P, S or Se, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 40 El; 55 RA; 150 Brin.
For screw machine products, bolts, fasteners; Type 303; stainless, free-cutting.

JESSOP 304.
M-69; 0.08 max C, 18-20 Cr, 8-11 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn. 180,000 TS; 125,000 YS; 10 El; 330 Brin.
For architectural molding and trim, kitchen equipment; Type 304; stainless, austenitic.

JESSOP 309.
M-69; 0.2 max C, 22-24 Cr, 12-15 Ni, bal Fe
Annealed: 90,000 TS; 40,000 YS; 50 El; 65 RA; 180 Brin
For furnace parts, tube supports, heat treat boxes; Type 309; stainless, austenitic.

JESSOP 310.
M-69; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 100,000 TS; 45,000 YS; 50 El; 65 RA; 180 Brin.
For furnace parts and equipment, valves, pumps, baffles; Type 310; austenitic, heat resistant.

JESSOP 316.
M-69; 0.1 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 80,000 TS, 30,000 YS, 60 El; 80 RA; 135 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El; 300 Brin.
For chemical plant equipment, agitators, digesters, valve trim; Type 316; austenitic, stainless.

JESSOP 317.
M-69; 0.1 max C, 18-20 Cr, 11-14 Ni, 3-4 Mo, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 50 El; 70 RA; 150 Brin.
For chemical plant equipment, agitators, digesters, valve trim; Type 317; stainless, austenitic.

JESSOP 317Cb.
M-69; 0.1 max C, 18-20 Cr, 11-14 Ni, 3-4 Mo, Cb = 8 × C, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 50 El; 70 RA; 150 Brin.
For welded equipment, chemical plant equipment; Type 317 Cb; stabilized, stainless.

JESSOP 318.
M-69; 0.1 max C, 2 max Mn, 16-18 Cr, 10-14 Ni, 2-3 Mo, Cb = 10 × C, bal Fe.
For welded structures and equipment; stainless, austenitic.

JESSOP 321.
M-69; 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe.
Annealed: 85,000 TS; 33,000 YS; 58 El; 75 RA; 165 Brin.
For jet aircraft, chemical plant equipment, refinery tubes; Type 321; stabilized, stainless.

JESSOP 347.
M-69; 0.08 max C, 17-19 Cr, 9-12 Ni, Cb = 10 × C, bal Fe.
Annealed: 91,000 TS; 39,500 YS; 50 El; 71 RA; 200 Brin.
For welded structures, chemical plant equipment, vessels, tanks; Type 347; stabilized, stainless.

JESSOP 410.
M-69; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For tableware, hardware, flat springs; Type 410; corrosion resistant

JESSOP 416.
M-69; 0.15 max C, 12-14 Cr, 0.07 min P, S or Se, bal Fe.
Annealed: 75,000 TS, 40,000 YS; 30 El, 60 RA, 155 Brin.
Heat treated: 110,000 TS; 85,000 YS, 18 El; 55 RA, 230 Brin.
For screw machine products, shafts, fasteners, gears Type 416; stainless, free-cutting

JESSOP 420
M-69; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El, 55 RA; 195 Brin.
Heat treated: 250,000 TS; 215,000 YS; 8 El; 25 RA; 512 Brin.
For cutlery, surgical instruments, tableware, gauges, Type 420, stainless, hardenable.

JESSOP 430.
M-69, 0.12 max C, 14-18 Cr, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 30 El; 55 RA; 140 Brin
Cold drawn 130,000 TS; 120,000 YS; 2 El; 185 Brin
For kitchen sinks, fasteners, soot blowers, bolts; Type 430; corrosion resistant.

JESSOP 440A.
M-69; 0.60-0.75 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Annealed. 95,000 TS; 55,000 YS; 20 El; 220 Brin.
Heat treated: 225,000 TS; 240,000 YS; 2 El; 550 Brin.
For needle valves, ball bearings, pivots, shafts, surgical instruments; Type 440A; stainless, hardenable.

JESSOP 440B.
M-69; 0.75-0.95 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Annealed: 107,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin.
Heat treated: 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin.
For dental and surgical instruments, pivots, ball bearings, valves; Type 440B; stainless, hardenable.

JESSOP 440C.
M-69; 0.95-1.2 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Annealed: 110,000 TS; 70,000 YS; 15 El; 30 RA; 225 Brin.
For ball bearings, valve parts, pivots, Type 440C; stainless, hardenable.

JESSOP 446.
M-69; 0.35 max C, 23-27 Cr, 0.25 max N, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 35 El; 65 RA; 160 Brin.
Cold drawn: 175,000 TS; 155,000 YS; 2 El; 25 RA; 250 Brin.
For annealing boxes, oil burner and furnace parts; Type 446; stainless and heat resistant.

JESSOP 494E.
M-261, M-486; 1.1 C, 0.3 Mn, 0.5 W, bal Fe.
For taps, drills, reamers; tough core.

JESSOP NO. 773.
M-69, 0.68 C, 0.68 Mn, 0.3 Mo, bal Fe.
For cutting tools, dies, punches, stamps, shears; tough, oil hardening.

JESSOP NO. 4824.
M-261; 0.40 C, 1.5 Cr, 0.65 Ni, 0.5 Mo, 0.27 V, 1 Mn, 1.6 Si, bal Fe.
Heat treated: 275,000 TS; 220,000 YS; 12 El; 37 RA.
For aircraft parts, gears, shafts; oil hardened, high tensile.

JESSOP NO 4828.
M-261, 0.26 C, 0.6 Mn, 1.8 Si, 2.9 Ni, 0.47 Mo, 1.2 Cr, bal Fe
Heat treated: 246,000 TS, 189,000 YS; 12.5 El; 40 RA
For aircraft parts, gears, shafts; oil hardened, high tensile.

JESSOP A-1.
M-261, M-486, 0.15 C, 0.6 Mn, 0.25 S, bal Fe.
60,000 TS, 15 El
For bolts, screws, shafts, bushes; free-cutting, case-hardening.

JESSOP A-2 A.
M-261, M-486; 0.15 C, 0.6 Mn, bal Fe.
Rolled: 65,000 TS, 20 El
For camshafts, tappets, rollers, spindles; case-hardening.

JESSOP A-3.
M-261, M-486, 0.22 C, 0.7 Mn, bal Fe.
For turbine casings, engine frames; good moldability.

JESSOP A-3C
M-69, 0.90 C, 0.70 Mn, 0.27 Cr, bal Fe.
For saws, water hardened.

JESSOP A-4.
M-486; 0.3 C, 0.5 Mn, bal Fe.
Rolled: 76,200-81,000 TS, 45,000-51,000 YS; 35-30 El; 60-55 RA; 150-160 Brin.
For bolts, studs, brake drums; water hardening.

JESSOP A-5.
M-486; 0.4 C, 0.8 Mn, bal Fe.
Rolled: 85,200-89,600 TS; 49,000-65,000 YS; 26 El; 55 RA; 170 Brin.
For axles, axle tubes, bolts; low stress applications.

JESSOP ALLOY C.
M-261; 2.3 C, 0.35 Mn, 13 Cr, bal Fe.
For shear blades, liners, thread rolling dies; cold work steel, nondeforming.

JESSOP A-M-2.
M-261, M-486; 0.15 C, 1.5 Mn, bal Fe.
Rolled: 80,000 TS; 20 El;
For rifle parts, general engineering parts; case-hardening.

JESSOP A-M-2 S.
M-261, M-486; 0.15 C, 1.5 Mn, 0.10 S, bal Fe.
Rolled: 80,000 TS; 18 El.
For general engineering parts; case-hardening, free-cutting.

JESSOP AM-3.
M-261, M-486; 0.25 C, 1.6 Mn, bal Fe.
For welded structures; tough.

JESSOP AM-4.
M-261, M-486; 0.35 C, 1.4 Mn, bal Fe.
For axles, shafts, gas cylinders; water hardened.

JESSOP AM-4 NICKEL.
M-261, M-486; 0.35 C, 1.3 Mn, 0.5 Ni, bal Fe.
For axles, shafts, gas cylinders; tough.

JESSOP AOO.
M-261, M-486; 0.08 C, bal Fe.
For plastic molding dies; hobbing steel.

JESSOP B-1.
M-261, M-486; 0.55 C, bal Fe.
For die blocks; oil or air hardening.

JESSOP B-1 NICKEL.
M-261, M-486; 0.55 C, 0.6 Mn, 0.5 Ni, bal Fe.
For rifle barrels, gear wheels, housings; water hardening

JESSOP BLACK LABEL.
M-261; 0.7-1.4 C, 0.3 Mn, 0.3 Si, bal Fe.
For tools, punches, shear blades, taps, drills; water hardened, Type W1.

JESSOP BLUE LABEL.
M-261; 0.7-1.2 C, 0.3 Mn, bal Fe.
For taps, mandrels, punches, drills; water hardening

JESSOP BX-3.
M-69, 2.45 C, 5 Cr, 4.5 V, 1.1 Mo, bal Fe.
For blanking and forming dies, headers; cold work steel. Wear resistant, AISI A7.

JESSOP C.
M-486; 1.65 C, 0.45 Mn, 13 Cr, 0.7 Mo, 0.3 V, bal Fe.
For burnishing rolls, shear blades, gauges; tough, nondeforming.

JESSOP CNS NO. 1.
M-69; 1.55 C, 12.5 Cr, 0.8 V, 0.8 Mo, bal Fe
For blanking and forming dies, punches, air-hardened, non-deforming. AISI D2.

JESSOPS CNS-2.
M-69; 1.5 C, 13 Cr, Mo, bal Fe.
For blanking and forming dies; air hardened, non-deforming.

JESSOP CNS NO. 2.
M-69; 2.15 C, 12 Cr, 0.25 V, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

JESSOP CNS-3
M-69; 2.25 C, 12.0 Cr, 0.2 V, 0.8 Mo, bal Fe.
Hardened: C 65-67 Rock.
For coining and crimping dies, forming and extruding dies, punches, hobs, taps, gauges, lamination dies. Air hardening, nondeforming, high wear resistance. Type D4 tool steel.

JESSOP COMPOSITE "R."
M-69; tool steel welded to machinery steel.
For tools, cutters, dies; composite steel.

JESSOP CORROSION RESISTANT "R-1."
M-261; 0.15 max C, 12 Cr, 1 max Ni, bal Fe.
For corrosion resistant parts; corrosion resistant.

JESSOP CORROSION RESISTANT "R-2."
M-261; 0.30 C, 14 Cr, 1 max Ni, bal Fe.
For corrosion resistant parts; corrosion resistant.

JESSOP CORROSION RESISTANT "R-3."
M-261; 0 12 C, 18 Cr, 11 max Ni, bal Fe.
For stainless parts; stainless.

JESSOP CORROSION RESISTANT "R-4."
M-261; 0.25 C, 18 Cr, 1 Ni, bal Fe.
For corrosion resistant parts; corrosion resistant.

JESSOP DB NO. 1.
M-69; 0.50 C, 0.55 Mn, 1.6 Ni, 0.7 Cr, bal Fe.
For castings.

JESSOPS E-0.
M-261, M-486; 0 12 C, 0.4 Mn, 3 Ni, bal Fe.
Rolled. 90,000 TS; 18 El.
For gears, pinions, shafts, collets; tough, case-hardening.

JESSOP E-1 A.
M-261, M-486; 0.3 C, 3 25 Ni, bal Fe.
At 70°F: 102,000 TS; 25 El.
At 1100°F: 32,000 TS; 50 El.
At 1300°F· 12,000 TS; 70 El.
For inlet valves, exhaust valves; low to medium temperature applications.

JESSOP E-4.
M-261, M-486; 0.12 C, 0 5 Mn, 5 Ni, bal Fe.
Rolled: 80,000 TS; 20 El.
For gears, pinions, shafts, collets; shock resistant, case-hardening

JESSOP E-4 MOLYBDENUM.
M-261, M-486, 0 12 C, 0.35 Mn, 5 Ni, 0.25 Mo, bal Fe.
Rolled: 130,000 TS; 13 El
For rocker arms, camshafts, gears, pinions; shock resistant, case-hardening.

JESSOP E-5.
M-261, M-486; 0.6 C, 1.25 Ni, bal Fe
For dies; high core toughness.

JESSOP E-6.
M-261, M-486; 0.15 C, 0.5 Mn, 2 Ni, 0.25 Mo, bal Fe.
Rolled: 90,000 TS; 18 El.
For pinions, shafts, rifle parts; shock resistant, case-hardening.

JESSOP E-8.
M-261, M-486, 0.55 C, 0.9 Ni, 0.25 Cr, 0.95 Mn, bal Fe
For mandrel bars, resists heat checking.

JESSOP E-9.
M-69; C, bal Fe
For engineering parts; super high tensile.

JESSOP E-9.
M-261, M-486; 0.25 C, 0.5 Mn, 2 Ni, 0.25 Mo, bal Fe.
Rolled: 110,000 TS; 15 El.
For rocker arms, camshafts, gears, pinions; shock resistant.

JESSOP ET NO. 4.
M-69; 0.70 C, 0.65 Mn, 1.3 Ni, 0.55 Cr, 0.25 Mo, bal Fe.
For castings.

JESSOP ET NO. 6.
M-69; 0.50 C, 0.8 Mn, 0.3 Si, 0.95 Cr, 0.2 V, bal Fe.
Temper to desired hardness from 300°F to 1000°F.
For keys, gears, shafts, bushings, springs, etc.
AISI Type L2 tool steel.

JESSOP F 2.
M-261; 0.57 C, 0.7 Cr, 0.2 V, bal Fe.
For die casting dies; hot die steel.

JESSOP F-5.
M-261, M-486; 0 44 C, 1.3 Cr, 2.3 W, 0.15 V, bal Fe.
For mandrel bars; resists heat checking.

JESSOP F 7.
M-261, M-486; 0 48 C, 0.7 Ni, 1.5 Cr, 0.2 Mo, 0.12 V, 1.2 W, bal Fe.
For punches, chisels, shear blades, dies; shock resistant, durable cutting edge.

JESSOP G-2.
M-261; 0 4 C, 13 Ni, 13 Cr, 2 5 W, bal Fe.
At 70°F· 106,000 TS; 31 El
At 1100°F: 66,000 TS, 35 El.
For valves, dies for extruding steel tubes, exhaust valves; high heat resistant, shock resistant.

JESSOP G-3.
M-261, M-486; 0 55 C, 1 5 Ni, 0 65 Cr, bal Fe.
For dies; tough.

JESSOP G-5 SPECIAL.
M-261, M-486; 0 32 C, 1 55 Ni, 1 1 Cr, 0.2 Mo, bal Fe.
For mandrel bars, gears, connecting rods; resists heat checking

JESSOP G-7.
M-261, M-486; 0 55 C, 1 75 Ni, 0 6 Cr, 0 12 Mo, bal Fe
For stamping dies; deep hardening, tough

JESSOP G-8
M-261, M-486, 0.25 C, 3 Ni, 1.2 Cr, 0 4 Mo, bal Fe
For mandrel bars, crankshafts; resists heat checking.

JESSOP G-11.
M-261, M-486, 0 3 C, 0 6 Mn, 2.5 Ni, 0 8 Cr, 0 6 Mo, bal Fe
Hardened 110,000-200,000 TS, 88,000-170,000 YS; 18-10 El; 248-444 Brin
For crankshafts, connecting rods, engine parts; shock resistant

JESSOP G-12
M 261, M-486, 0 4 C, 0 6 Mn, 2 5 Ni, 0 6 Cr, 0 6 Mo, bal Fe
For connecting rods, gears, turbine parts; shock resistant.

JESSOP G 14.
M-261, M-486, 0.39 C, 0 5 Mn, 4.1 Ni, 1.3 Cr, 0.3 Mo, bal Fe
For cold punches, shear blades, chisels; air hardening, shock resistant

JESSOP G-15
M-261, M-486, 0.12 C, 0.45 Mn, 3 Ni, 1 Cr, bal Fe.
Heat treated: 110,000-160,000 TS; 15-13 El.
For gears, cams, pinions, camshafts, case-hardening, shock resistant.

JESSOP G-16.
M-261, M-486; 0.15 C, 0.5 Mn, 4.25 Ni, 1.3 Cr, 0.3 Mo, bal Fe.
Heat treated: 170,000 TS; 12 El.
For gears, pinions, tappets, valve rockers; shock resistant, case-hardening.

JESSOP G-18B.
M-486; 0.4 C, 0.8 Mn, 1 Si, 13 Ni, 13 Cr, 10 Co, 2.5 W, 2 Mo, 3 Cb, bal Fe.
At 70°F: 92,000 TS; 40 El.
At 1500°F: 44,000 TS; 9 El.
For turbine discs, rotor blades, engine exhaust valves; high heat resistant

JESSOP G19.
M-261; 0.4 C, 0.8 Mn, 1 Si, 13 Ni, 19 Cr, 2 Mo, 2.5 W, 3 Cb, 10 Co, bal Fe.
Heat treated: 102,500 TS; 30,000 YS; 42 El; 50 RA.
For nozzle guide vanes in gas turbines; high heat and oxidation resistant.

JESSOP G-20.
M-261, M-486; 0.40 C, 1.35 Mn, 0.65 Ni, 0.45 Cr, 0.2 Mo, bal Fe.
For gears, shafts, drop forgings, shock resistant.

JESSOP G-21
M-261, M-486; 0.42 C, 1.3 Si, 13 Cr, 13 Ni, 2.5 W, 1.0 Nb, bal Fe.
106,000 TS; 50,000 YS; 31 El.
For furnace parts, bolts, stays, mandrels; high hot strength.

JESSOP G-24.
M-261, M-486, 3 C, 1.5 Si, 13 Ni, 5 Cr, 5 Cu, 1.2 Mn, bal Fe
Annealed
For impellers, pump parts; austenitic, castings, stainless.

JESSOP G-25
M-261, M-486, 0.17 C, 0.5 Mn, 2 Ni, 2 Cr, 0.2 Mo, bal Fe
Heat treated: 170,000 TS; 12 El
For camshafts, gears, bearings; shock resistant, case-hardening

JESSOP G-26
M-261, M-486, 0.4 C, 0.55 Mn, 1.55 Ni, 1.15 Cr, 0.15 Mo, bal Fe
Heat treated: 92,000-150,000 TS, 70,000-120,000 YS, 22-15 El, 240-360 Brin.
For forging bars, stampings, shock resistant

JESSOP G-27.
M-261, M-486, 0.30 C, 0.55 Mn, 3.5 Ni, 0.95 Cr, 0.4 Mo, bal Fe
Heat treated 120,000-160,000 TS; 100,000-140,000 YS, 17-14 El; 300-400 Brin
For crankshafts, connecting rods, gears; shock resistant

JESSOP G29
M 261, 0.35-0.45 C, 11-13.5 Ni, 19-20.5 Cr, 7-10 Co, bal Fe
Normalized. 110,000 TS; 43,000 YS; 40 El; 210 Brin.
For gas turbine components, furnace parts, high creep resistance, good to 1740°F.

JESSOP G30
M-261, C, alloy, bal Fe
For machine tool parts; oil hardened.

JESSOP G32
M-261; 0.3 C, 12 Ni, 19 Cr, 16 Fe, 2.8 V, 2 Mo, 1.2 Cb, bal Co.
144,000 TS; 85,000 YS; 10 El
For gas turbine rotors; high creep and fatigue strength

JESSOP G-32.
M-261; 0.4 C, 1.0 Si, 13 Cr, 13 Ni, 15 Co, Cb, Mo, W, bal Fe.
For jet engine parts; high heat resistant.

JESSOP G-32.
M-486; 0.27 C, 19 Cr, 10.5 Ni, 2.2 Mo, 1.4 Cb, 0.8 Mn, 3 V, 16 Fe, bal Co.
Rolled: 126,000 TS; 78,000 YS; 10 El.
For gas turbine disc shafts, rotor blades; heat and oxidation resistant.

JESSOP G-33.
M-261, M-486; 0.4 C, 1.4 Ni, 0.6 Cr, 0.25 Mo, bal Fe.
For mandrel bars; resists heat checking.

JESSOP G34.
M-261; 1 max C, 0.8 Mn, 0.3 Si, 13 Ni, 19 Cr, 2 Mo, 46 Co, 1.2 Cb, 2.8 V, bal Fe
Cast: 89,600 TS; 58,200 YS; 2.5 El; 2.5 RA; 300 Brin.
For turbine blades, nozzle guide vanes; high creep and heat resistance, shock resistant.

JESSOP G39.
M-261, 0.5 C, 20 Cr, 3 W, 3 Mo, 1.5 Cb, 1.5 Ta, bal Ni
Cast 73,200 TS, 5 El, 5 RA, 190 Brin.
For nozzle guide vanes in gas turbines; high heat and oxidiation resistant.

JESSOP G 42.
M-261, C, 19 Cr, 15 Ni, 25 Co, bal Fe.
For high temperature applications; corrosion and heat resistant.

JESSOP G42B.
M-261, 0.26 C, 25 Co, 20 Cr, 15 Ni, plus carbide formers
Heat treated 120,000 TS, 91,000 YS, 10 El; 12 RA, 260 Brin
For turbine blades; high heat and creep resistance, used to 1650°F.

JESSOP G56
M-261, 0.2 C, 13 Cr, 23 Ni, bal Fe
Heat treated 151,000 TS, 94,700 YS; 26 El; 27 RA
For turbine discs; good creep and heat resistance, stainless

JESSOP GB 18.
M-261, 0.4 C, 1.0 Si, 13 Cr, 13 Ni, 10 Co, 3 Cb, 2 Mo, 2.5 W, bal Fe
Age-hardened 107,500 TS, 62,700 YS; 12 El; 15 RA
For high temperature parts, gas turbine discs; heat resistant

JESSOP G I SPECIAL
M-261, 0.32 C, 4.1 Ni, 1.3 Cr, 0.2 Mo, bal Fe.
Hardened: 215,000 TS; 190,000 YS, 12 El, 477 Brin
For plastic molding dies, mandrels; shock resistant, air hardening.

JESSOP GO
M-261, M-486; 0.33 C, 0.6 Mn, 3.5 Ni, 0.75 Cr, bal Fe
For collets, cold punches, dies; oil hardening.

JESSOP H-3.
M-486; 0.6 C, 1.55 Si, 5.8 Cr, bal Fe.
At 70°F 110,000 TS; 24 El
At 1100°F 40,000 TS; 50 El.
At 1500°F: 8000 TS, 140 El
For inlet and exhaust valves, heat resistant; Silchrom type steel.

JESSOP H3A.
M-261; 0.6 C, 1.2 Si, 6 Cr, 0.5 Mo, bal Fe.
Heat treated: 135,000 TS; 100,000 YS; 20 El; 40 RA.
For turbine disks, heat resistant.

JESSOP H 4.
M-261, M-486; 0.85 C, 1.9 Mn, bal Fe.
For press tools, gauges taps, dies; non-distorting.

JESSOP-H4 SPECIAL.
M-261; 0.90 C, 1.6 Mn, bal Fe.
For dies, punches, upsetters, crimpers; Type O2; oil hardened, non-deforming.

JESSOP H-18.
M-261, M-486; 0.45 C, 3.3 Si, 8.5 Cr, bal Fe.
At 70°F: 114,000 TS; 24 El.
At 1100°F: 36,000 TS; 60 El.
For auto inlet and exhaust valves; resists scaling.

JESSOP H-22.
M-261, M-486; 0.2 C, 1.55 Cr, 0.5 Mo, bal Fe.
For small stamping dies, heading dies; shock resistant.

JESSOP H-23.
M-261, M-486; 0.47 C, 0.6 Mn, 1.0 Si, 1.4 Cr, bal Fe.
For shear blades, punches, chipping chisels; oil hardening.

JESSOP H-24.
M-261, M-486; 0.4 C, 0.65 Mn, 1.2 Cr, 0.3 Mo, bal Fe
Heat treated: 90,000-140,000 TS; 70,000-120,000 YS; 22-15 El; 220-360 Brin.
For gun barrels, superheater tubes; creep and shock resistant.

JESSOP H27.
M-261; 0.4 C, 0.6 Mn, 0.3 Si, 3 Cr, 0.8 Mo, bal Fe.
Oil hardened: 135,000 TS; 112,000 YS; 18 El, 40 RA.
For turbine disks; heat resistant.

JESSOP H-28.
M-261, M-486; 0.4 C, 0.8 Mn, 1 Cr, bal Fe.
Heat treated: 90,000-110,000 TS; 64,000-88,000 YS; 22-18 El; 240-302 Brin.
For general engineering components; water hardening.

JESSOP H-29.
M-261, M-486; 0.8 C, 2 Si, 1.5 Ni, 19.5 Cr, bal Fe
At 70°F: 120,000 TS; 15 El.
At 1100°F: 40,000 TS; 40 El.
At 1500°F: 10,000 TS; 90 El.
For inlet and exhaust valves; resists leaded fuels and scaling.

JESSOP H 30.
M-261, M-486; 0.6 C, 0.65 Mn, 0.6 Cr, bal Fe.
For chisels, rivet snaps, expander mandrels, wear and shock resistant.

JESSOP H31.
M-261; 0.4 C, 0.4 Mn, 0.3 Si, 1.1 Cr, 0.7 Mo, bal Fe.
Oil hardened: 130,000 TS; 96,000 YS; 20 El; 40 RA.
For turbine disks; heat resistant.

JESSOP H-32.
M-261; M-486; 0.3 C, 0.6 Mn, 0.55 Mo, 3.22 Cr, bal Fe.
Heat treated: 90,000-200,000 TS; 34,000-170,000 YS; 22-10 El; 248-444 Brin.
For crankshafts, cylinder liners; shock resistant, nitriding steel.

JESSOP H 33.
M-261, M-486; 1 C, 0.35 Mn, 6.25 Cr, 1 Mo, bal Fe.
For shear blades, press tools, taps, dies; abrasion resistant.

JESSOP H-34.
M-261, M-486; 0.35 C, 0.6 Mn, 1 Cr, 0.7 Mo, bal Fe
Heat treated: 90,000-140,000 TS; 70,000-120,000 YS; 22-15 El; 230-360 Brin.
For superheater tubes, gears; creep and shock resistant.

JESSOP H-35.
M-261, M-486; 0.3 C, 0.5 Mn, 1 Cr, 1.2 Mo, bal Fe.
Heat treated: 110,000 TS; 90,000 YS; 18 El; 293 Brin.
For crankshafts; shock resistant, nitriding steel.

JESSOP H-36
M-261, M-486; 0.35 C, 0.5 Mn, 1.5 Cr, 0.2 Mo, 1 Al, bal Fe.
Heat treated: 70,000-90,000 TS; 48,000-84,000 YS; 24-17 El; 207-302 Brin
For crankshafts, cylinder liners; shock resistant, nitriding steel

JESSOP H-38.
M-261, M-486; 0.5 C, 3 Si, 7.5 Cr, 0.5 Mo, bal Fe
At 70°F. 135,000 TS, 25 El
At 1100°F 44,000 TS, 55 El
At 1500°F 7000 TS; 110 El
For auto inlet and exhaust valves; resists scaling.

JESSOP-H39
M-261; 1 C, 1.4 Cr, 0.4 Mo, bal Fe.
For bearings, heading dies; Type L7.

JESSOP H40
M-261, 0.25 C, 0.4 Mn, 0.4 Si, 3 Cr, 0.5 Mo, 0.5 W, 0.75 V, bal Fe
Oil hardened 135,000 TS; 112,000 YS, 18 El, 45 RA.
For turbine disks, heat resistant.

JESSOP H 42.
M-261, M-486; 1.65 C, 0.45 Mn, 13 Cr, 0.7 Mo, 0.3 V, bal Fe
For drawing and extrusion dies, gauges, shear blades; shock resistant.

JESSOP H 44
M-261, M-486, 1 C, 0.7 Mn, 1.45 Cr, bal Fe
For shear blades, punches, press tools; deep hardening, abrasion resistant

JESSOP H-46.
M-261, M-486; 0.2 C, 0.6 Mn, 12 Cr, 0.6 Mo, 0.15 Cb, 0.75 V, bal Fe.
Annealed: 120,000 TS; 90,000 YS; 20 El; 241 Brin
For aircraft gas turbine discs and blades, furnace parts; corrosion and heat resistant, hardenable.

JESSOP H49.
M-261; 0.07 max C, 5 Cr, Mo, V, bal Fe.
For hobbed molds, soft, deep hardening, hobbing steel

JESSOP H50.
M-261; 0.37 C, 1 Si, 5 Cr, 1.1 V, 1.35 Mo, bal Fe.
For extrusion and die casting dies, hot work steel; Type H13 Hot punches, shear blades

JESSOP HIGH SPEED STEEL.
M-69; 13-19 W, 0.6-0.77 C, 3-4 Cr, 0.25-2.25 V, bal Fe.
For high speed cutting tools, drills, reamers; high speed steel.

JESSOP HP.
M-261, M-486; 0.9 C, 0.9 Mn, 1.15 C, 1.5 W, bal Fe.
For press tools, cold punches, gauges, taps; abrasion resistant.

JESSOPS "J-4" STEEL.
M-261; 0.5 C, 1.5 Cr, 2.2 W, 0.25 V, bal Fe.
For hand and pneumatic chisels, boiler cups, punches, shear blades, tools; oil hardened.

JESSOP J 13.
M-261, M-486; 1.2 C, 4.35 Cr, 0.25 Mo, 4.5 V, 14 W, bal Fe.
For broaches, reamers, drills, taps; high speed steel.

JESSOP J 18
M-261, M-486; 0.84 C, 4.5 Cr, 5.5 Mo, 1.4 V, 6 W, bal Fe.
For milling cutters, drills, taps, reamers, broaches; high speed steel.

JESSOP J 23.
M-261, 0.36 C, 0.4 Si, 2.6 Cr, 1 V, 1.8 W, 4.3 Mo, bal Fe
For die casting dies, extrusion dies; hot die steel.

JESSOP J 27.
M-261, M-486; 0.42 C, 3.25 Cr, 0.25 V, 14 W, bal Fe
For die casting dies; resists heat checking hot die steel.

JESSOP J 32
M-261, M-486, 0.35 C, 4 Ni, 1.5 Cr, 5.8 W, 0.35 V, bal Fe.
For mandrels, punches, hot stamping dies; hot work steel

JESSOP J34
M-261; 0.80 C, 4 Cr, 2 V, 6 W, 5 Mo, bal Fe
For drills, taps, reamers, broaches, cutters; high speed steel, Type M2.

JESSOP J35.
M-261; 0.80 C, 4 Cr, 1 V, 1.5 W, 8 Mo, bal Fe.
For drills, taps, reamers, hobs, lathe cutters; high speed steel, Type M1

JESSOP "J" HOT WORK.
M-69, 0.62 C, 3.8 Cr, 0.55 Mo, 0.55 V, bal Fe
For hot work dies, bloom shears, shears, trimmer dies, hot die steel

JESSOP J J
M-69, 0.92 C, 3.8 Cr, 0.5 Mo, 0.5 V, bal Fe
For hot work tools, piercing punches, hot pressed nut dies; hot work steel, wear resistant

JESSOP JS700
M-69; 0.03 C, 25.0 Ni, 21.0 Cr, 4.5 Mo, 1.7 Mn, 0.50 Si, 0.30 Cb, bal Fe
Bar 85,000 TS; 39,000 YS, 45 El; 50 RA; 170 Brin
For agitators, centrifuges, mixers, filters, separators, seals, valves, tanks, Austenitic stainless Resists phosphoric acid in presence of halogens

JESSOP K4 SPECIAL
M-261; 0.90 C, 1 Mn, 0.5 Cr, 0.5 W, bal Fe.
For dies, cutters, punches, hobs, broaches; Type 01; oil hardened, non-deforming

JESSOP K 15.
M-261, M-486; 1.25 C, 1.1 Cr, 0.2 V, 4.5 W, bal Fe
For broaches, reamers, taps, punches; abrasion resistant.

JESSOP K 18.
M-261; 0.32 C, 0.95 Si, 5 Cr, 1.4 W, 1.7 Mo, bal Fe.
For die casting dies, swaging dies; hot die steel.

JESSOP M-1.
M-261, M-486; 0.37 C, 1.5 Mn, 0.25 Mo, bal Fe.
Heat treated: 90,000-130,000 TS; 70,000-105,000 YS; 22-16 El; 241-341 Brin.
For general engineering parts; shock resistant.

JESSOP M-2.
M-261, M-486, 0.35 C, 1.5 Mn, 0.5 Mo, bal Fe.
Heat treated: 90,000-130,000 TS; 70,000-105,000 YS; 22-16 El; 241-341 Brin.
For general engineering components; shock resistant.

JESSOP M-3 Type 1.
M-69; 1.15 C, 4.15 Cr, 3.25 V, 6.00 W, 6.00 Mo, bal Fe.
Hardened. C 64-66 Rock
For broaches, chasers, drills, hobs, lathe and milling tools, reamers, taps and dies.
Good red-hardness.
High speed steel High abrasion resistance.

JESSOP M-3 Type 2
M-69, 1.15 C, 4.15 Cr, 3.25 V, 6 W, 6 Mo, bal Fe.
Hardened. C 64-66 Rock.
For broaches, chasers, drills, hobs, lathe and planer tools, reamers, taps and dies.
Good red-hardness
High speed steel High abrasion resistance

JESSOP NEW PROCESS
M-69, 0.91-0.98 C, 0.2-0.3 Mn, 0.20 Si, bal Fe.
For cold header dies and punches; water hardening

JESSOP NON-MAGNETIC STEEL.
M-69, 0.25-0.40 C, 10.5-12 Mn, 7-8 Ni, bal Fe
80,000-110,000 TS, 35,000-60,000 YS; 25-50 El; 30-60 RA.
For transformer covers, switch covers, electric equipment; austenitic, non-magnetic.

JESSOP OK.
M-261, 0.44 C, 0.35 Mn, 1.3 Cr, 0.15 V, 2.3 W, bal Fe
For punches, chipping chisels, pneumatic tools, tough, shock resistant

JESSOP R-1
M-261, M-486, 0.10 C, 13 Cr, bal Fe
70,000-160,000 TS, 25-15 El, 153-360 Brin.
For fittings, golf club heads, hardware; hardenable, corrosion resistant.

JESSOP R 1A.
M-261, M-486, 0.08 C, 13 Cr, bal Fe.
Hardened. 125,000 TS; 110,000 YS, 16 El, 277 Brin.
For plastic molding dies, corrosion resistant

JESSOP R-2
M-261, M-486, 0.20 C, 13 Cr, bal Fe
90,000-200,000 TS; 20-10 El; 207-444 Brin.
For steam valves, knives, piston rods, bolts, hardenable, corrosion resistant

JESSOP R-3.
M-261, M-486, 0.12 C, 10.5 Ni, 17 Cr, bal Fe.
Annealed 70,000 TS; 30 El.
For fittings, chemical plant equipment, austenitic, stainless

JESSOP R-4.
M261 M-486; 0.16 C, 1.5 Ni, 16.5 Cr, bal Fe.
110,000-180,000 TS; 15-10 El, 241-400 Brin
For seaplane parts, propeller shafts, steam valves; corrosion resistant, hardenable.

JESSOP R-9
M-261, M-486; 0.12 C, 1.2 Si, 10 Ni, 18 Cr, 2 Mo, 0.5 Ti, bal Fe.
Annealed: 70,000 TS; 30 El.
For chemical plant equipment, textile equipment; austenitic, stainless.

JESSOP R-10.
M-261, M-486; 0.12 C, 12 Ni, 12 Cr, bal.Fe.
Annealed: 66,000 TS; 35 El.
For cooking utensils, hollowware; austenitic, stainless.

JESSOP R-11.
M-261, M-486; 0.15 C, 1.2 Si, 14 Ni, 23 Cr, 0.8 Mo, bal Fe.
For furnace parts, annealing boxes, dampers; heat resistant, austenitic.

JESSOP R-12.
M-261, M-486; 0.12 C, 1.25 Si, 1.25 Ni, 27 Cr, 0.7 Mo, 0.4 Ti, bal Fe.
For furnace linings, flame tubes, tubes, cowling; high scale resistant.

JESSOP R-13.
M-261, M-486; 0.30 C, 0.5 Mn, 6.5 Ni, 18 Cr, 2 W, 1.6 Si, bal Fe.
For salt pots, lead baths, recuperators; heat and corrosion resistant.

JESSOP R-15.
M-261, M-486; 0.17 C, 14 Cr, S and Zr, bal Fe.
90,000 TS; 20 El; 192-269 Brin.
For food processing equipment, nuts, bolts, rivets; corrosion resistant.

JESSOP R-16.
M-261, M-486; 0.10 C, 1.2 Si, 9.5 Ni, 18.5 Cr, 0.7 Ti, bal Fe.
Annealed: 70,000 TS; 30 El.
For exhaust manifolds and cowling; austenitic, stainless.

JESSOP R-17.
M-261, M-486; 0.35 C, 0.6 Mn, 1.4 Si, 25 Ni, 18 Cr, 2 W, bal Fe.
For salt pots, carburizing boxes; austenitic, heat resistant.

JESSOP R-18.
M-261, M-486; 0.35 C, 1.8 Si, 18 Cr, 8 Ni, 3.5 W, bal Fe.
For furnace parts, impellers; scale resistant, austenitic.

JESSOP R-19.
M-261, M-486; 0.30 C, 14 Cr, S and Zr, bal Fe.
100,000 TS; 20 El; 227-277 Brin.
For shafts, steam valves, chemical industries; corrosion resistant.

JESSOP R-20
M-261, M-486; 0.10 C, 14 Ni, 19 Cr, 1.7 Nb, bal Fe
For exhaust manifolds, furnace parts, cowlings; austenitic, heat resistant.

JESSOP R-22.
M-261; 0.3 C, 25 Cr, 14.5 Ni, 3.2 W, 1.3 Si, bal Fe
For in-let nozzle blades; high heat resistant.

JESSOP R-22.
M-486; 0.30 C, 0.6 Mn, 25 Cr, 14 Ni, 1.35 Si, 3 W, bal Fe.
For furnace parts, valves, impellers; austenitic, heat resistant.

JESSOP R-23.
M-261, M-486; 0.12 C, 22 Ni, 25 Cr, 1.7 Si, bal Fe.
For gas burners, pyrometer tubes; resists heat, austenitic.

JESSOP R-24.
M-261, M-486; 0.10 C, 10.5 Ni, 17.5 Cr, Zr, S or Se, bal Fe.
Annealed: 70,000 TS; 30 El.
For valve and pump parts, chemical plant; austenitic, stainless, free-cutting.

JESSOP R-25.
M-261, M-486; 0.12 C, 9.5 Ni, 18.5 Cr, 2.75 Mo, bal Fe.
Annealed: 70,000 TS; 30 El.
For chemical plant and textile equipment; austenitic, stainless.

JESSOP R-28.
M-261, M-486; 0.16 C, 1.9 Ni, 17 Cr, S and Zr, bal Fe.
110,000 TS; 13 El; 241-302 Brin.
For steam valves, seaplane parts, bolts; corrosion resistant.

JESSOP R-29.
M-261, M-486; 0.12 C, 0.9 Si, 21 Cr, 0.45 Mo, 0.35 Ti, bal Fe.
For nitriding boxes, cowlings for gas turbines; scale resistant.

JESSOP RAPID FINISHING STEEL.
M-69; 1.35 C, 3.75 W, 0.75 Cr, bal Fe
For boring tools, drawing dies, lathe tools, shaving dies; wear resistant.

JESSOP RTS.
M-69; 0.55 C, 0.8 Si, 0.5 Mn, 0.45 Mo, bal Fe.
Heat treated: 290,000 TS; 270,000 YS; 5 El; 15 RA; 60 Rockwell C.
For chisels, punches, dies, sledges; water hardening. Tough, shock resistant.

JESSOP-SAVILLE 6 Star Vanadium.
M-261, 1.0 C, 0 3 Mn, 0 25 Si, 0 12 V, bal Fe
For coining and medal dies, striking dies, parts for cold heading operations
Water hardening, wear resistant.

JESSOP-SAVILLE G.30.
M-261; 0.05-0.12 C, 27-29 Cr, 48-52 Co, 0.5-1.0 Si, 0.3-1.0 Mn, bal Fe.
Forged: 134,000 TS; 88,000 YS, 10 El; 350 DPH.
At 1290°F: 47,000 TS, 33,000 YS; 21 El, 18 RA
For furnace parts, burner tips, quenching baskets, sintering machines
Good oxidation resistance at 2200°F.

JESSOP-SAVILLE G.31.
M-261; 0 25-0.30 C, 2 0-2 2 Cb, 27-29 Cr, 48-52 Co, 0 5-1 0 Si, 0 5-1 0 Mn, bal Fe
Cast. 89,500 TS; 64,000 YS, 4 El, 280 DPH.
For furnace baffles, grates, clinker coolers, rolls. High stress rupture properties. High resistance to thermal shock and oxidation

JESSOP-SAVILLE G 35.
M-261, 0 15 C, 0 50 Si, 12.0 Ni, 19 5 Cr, bal Fe
Annealed: 90,000 TS, 40,000 YS; 60 El; B 82 Rock.
At 1200°F. 45,000 TS; 30,000 YS, 32 El.
For gas turbine rotor blades and nozzle guide vanes.
Austenitic, heat and corrosion resisting, non-hardening.

JESSOP-SAVILLE G.38.
M-261; 0.15 C, 0.50 Si, 12.0 Ni, 16 0 Cr, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 60 El, B 80 Rock.
Cold Drawn: 100,000 TS, 65,000 YS; 40 El; B 95 Rock.
For gas turbine and steam turbine rotors and blades, superchargers.
Austenitic, high creep and heat resistance.

JESSOP-SAVILLE G.40.
M-261; 0.20 C, 0.30 Si, 25.0 Ni, 20.0 Cr, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El; B 89 Rock.

Normalized: 108,000 max TS; 30 El.
For gas turbine rotor blades, jet engine components, heat exchangers. Austenitic. Heat and corrosion resisting

JESSOP-SAVILLE G.41.
M-261; 0.17 C, 12.0 Ni, 16.0 Cr, bal Fe.
Normalized: 98,500 max TS; 36 El.
For gas turbine blades, high temperature bolts, jet engine components.
Austenitic, heat and corrosion resistant.

JESSOP-SAVILLE G.46.
M-261; 0.16 C, 0.30 Si, 11.5 Cr, Mo, V, Cb, bal Fe
Heat treated: 146,000 max TS; 20 El.
For aircraft and gas turbine discs.
High creep strength. Good scale resistance up to 1380°F.

JESSOP-SAVILLE G.47.
M-261; 0.17 C, 0.80 Mn, 1.0 Ni, 0.80 Cr, bal Fe.
Heat treated. 124,000 max TS, 15 El.
For gudgeon pins, pinions, shafts, rifle components
Case hardening steel. Shock resisting

JESSOP-SAVILLE G.48.
M 261; 0.18 C, 0.80 Mn, 1.25 Ni, 0.90 Cr, 0.11 Mo, bal Fe
Heat treated 145,000 max TS, 12 El
For rocker arms and shafts, camshafts, gears, clutch plates, levers, bushings.
Case hardening steel, shock resisting

JESSOP-SAVILLE G.49
M 261, 0.18 C, 0.80 Mn, 1.75 Ni, 0.90 Cr, 0.15 Mo, bal Fe
Heat treated 168,000 max TS; 12 El
For gears, pinions, cams, camshafts, fasteners
Case hardening steel, shock resisting

JESSOP-SAVILLE G.50
M-261, 0.18 C, 0.60 Mn, 2.0 Ni, 1.6 Cr, 0.2 Mo, bal Fe
Heat treated 190,000 max TS, 12 El
For gears, pinions, shafts, camshafts, levers, clutch plates, magneto drive wheels
Case hardening steel. Shock resisting

JESSOP-SAVILLE G.51
M-261, 0.15 C, 0.80 Mn, 0.60 Ni, 0.65 Cr, 0.11 Mo, bal Fe
Heat treated: 101,000 max TS; 18 El.
For rocker arms and shafts, gears, camshafts, rifle components, levers, bushings, pinions.
Case hardening steel Shock resisting.

JESSOP-SAVILLE G.52.
M-261; 0.20 C, 0.80 Mn, 0.60 Ni, 0.65 Cr, 0.11 Mo, bal Fe.
Heat treated: 124,000 max TS; 15 El.
For high duty gears and pinions, bearings, camshafts, clutch plates, tappets.
Case hardening steel Shock resisting.

JESSOP-SAVILLE G.53.
M-261; 0.25 C, 0.80 Mn, 0.60 Ni, 0.65 Cr, 0.11 Mo, bal Fe.
Heat treated: 145,000 max TS.
For rocker arms and shafts, gears, camshafts, bushings, levers.
Case hardening. Shock resisting.

JESSOP-SAVILLE G.64.
M-261; 0.1 C, 11 Cr, 3 Mo, 3.5 W, 2 Cb, 6 Al, B, bal Fe.
For high temperature castings, turbine blades, gas turbine rotors, turbo-blower impellers.
Heat and corrosion resistant.

JESSOP-SAVILLE G.68.
M-261; 0.05 C, 1.5 Mn, 0.5 Si, 25.4 Ni, 14.0 Cr, 1.4 Mo, 2.35 Ti, 0.3 V, 0.35 Al, 0.005 B, bal Fe.
Heat treated: 160,000 TS; 115,000 YS; 20 El; 30 RA; 250-325 Brinell.
For jet engines and superchargers, turbine wheels and blades, afterburners. Precipitation hardening.
Austenitic. Similar to A286

JESSOP-SAVILLE G.84.
M-261, 0.14 C, 10 Cr, 15 Co, 2.5 Mo, 1.25 W, 5 Al, 5.2 Ti, B, bal Ni.
For high temperature castings, turbine blades, gas turbine rotors, turbo-blower impellers
Heat and corrosion resistant.

JESSOP-SAVILLE G.94.
M-261; 0.06 C, 6 Al, 9 Cr, 4 Cb, 10 Co, 4 W, 4 Mo, B, Zr, bal Ni
For high temperature castings, turbine blades, gas turbine rotors, turbo-blower impellers.
Heat and corrosion resistant.

JESSOP-SAVILLE G.110
M-261; 0.02 max C, 0.25 max Cr, 17-19 Ni, 7.0-8.5 Co, 4.6-5.2 Mo, 0.3-0.6 Ti, 0.05-0.15 Al, 0.02 Zr, 0.003 B, 0.05 Ca, bal Fe
Heat treated: 258,000 TS; 247,000 YS; 10 El; 40 RA, 520 Vickers
For rocket motor cases and accessories, bolts, fasteners, pressure vessels.
Maraging steel Tough and ductile at 250,000 YS.

JESSOP-SAVILLE G 125 D V.
M-261, 0.01 C, 18.5 Ni, 9 Co, 4.85 Mo, 0.75 Ti, 0.10 Al, 0.05 Si, 0.05 Mn, bal Fe.
Aged. 318,000 TS, 294,000 YS, 8 El; 50 RA.
For rotor motor cases and accessories, fasteners, aircraft structures, pressure vessels
Maraging steel, weldable, hardened by aging. Good notch toughness.

JESSOP-SAVILLE H 48.
M-261, 0.45 C, 0.6 Si, 4.7 Ni, 24.0 Cr, 2.9 Mo, bal Fe
At 70°F: 150,000 max TS; 11 El
At 1470°F: 34,000 max TS, 50 El.
For exhaust valves for aircraft and automobile engines.
Corrosion and heat resisting. Air hardening

JESSOP-SAVILLE H 51.
M-261; 0.19 C, 0.25 Si, 0.55 Mo, 0.25 V, bal Fe.
Heat treated 130,000 max TS; 24 El
For gas turbine rotors and discs, high temperature stressed components.
High creep strength up to 1020°F., shock resistant.

JESSOP-SAVILLE H.52.
M-261, 0.12 C, 0.35 Si, 16.0 Cr, bal Fe
Bar: 90,000 max TS; 15 El.
For steam turbine and gas turbine components.
Non-hardenable. Good creep resistance. Suitable for welding.

JESSOP-SAVILLE H. 53.
M-261; 0.06 C, 11 Cr, 0.8 Mo, 0.45 Cb, 0.5 V, 6.5 Co, 0.8 W, B, bal Fe.
At 75°F: 148,000 TS, 130,000 YS, 18 El; 62 RA.
At 1200°F: 56,000 TS; 50,200 YS; 28 El; 76 RA.
For gas turbine discs, compressor discs.
High heat resistance. Martensitic stainless steel.

JESSOP-SAVILLE H.55.
M-261; 0.55 C, 0.8 Mn, 1.0 Cr, 0.42 Mo, 0.5 Ni, 0.2 V, bal Fe.
Ht. Tr.: 265,000 TS; 250,000 YS; 10 El; 514 Brin.
For die blocks, forging dies, punches, turbine rotors, rollers.
High strength, tough, shock resistant.

JESSOP-SAVILLE H.59.
M-261; 0.07 C, 0.15 Cb, 11 Cr, 1.5 Mo, 3.0 Ni, 0.3 V, bal Fe.
Annealed: 80,000 TS; 38,000 YS; 24 El; B 95 Rock.
For table flatware, oil refinery and chemical plant equipment.
Corrosion resistant, nonhardenable.

JESSOP-SAVILLE-H.D.S.
M-261; 0.28 C, 3.2 Cr, 9.5 W, 0.3 V, bal Fe.
Hardened: 243,000 TS; 215,000 YP, 12 El; 37 RA; Rock C 50.
For extrusion dies and liners, forging dies, trimming dies, punches, rotary shear blades.
Hot work steel, AISI Type H21.

JESSOP-SAVILLE J.12.
M-261; 0.26 C, 3.0 Ni, 2.75 Cr, 10.0 W, 0.50 Mo, 0.30 V, bal Fe.
For forging dies for brass, die inserts.
Tough, oil hardening, hot work steel.

JESSOP-SAVILLE J.36.
M-261; 1.5 C, 4.75 Cr, 5 V, 12.5 W, 5 Co, bal Fe.
Hardened: C 64-68 Rock.
For form and planing tools, roll turning tools, broaches, milling cutters, end mills, gear cutters.
High speed steel. Highest wear resistant. High red-hardness.

JESSOP-SAVILLE J.O. SPECIAL.
M-261; 0.28 C, 3.2 Cr, 9.5 W, 0.3 V, bal Fe.
Heat treated: 224,000 TS; 191,000 YS, 12 El; C 51 Rock.
At 600°C: 134,000 TS; 103,000 YS; 10 El; 28 RA.
For extrusion dies and liners, forging and trimming dies, hot punches, rotary shear blades.
Hot work steel, Type H21.

JESSOP-SAVILLE K.S.A.
M-261; 0.90 C, 1.85 Mn, 0.25 Si, 0.45 Cr, 0.45 W, bal Fe.
Hardened: C 60-65 Rock.
For gages, taps, dies, chasers, cams, blanking and forming dies.
Oil hardening, tough, shock resisting, non-deforming.

JESSOP-SAVILLE R.27.
M-261; 0.42 C, 3.25 Cr, 14 W, 0.25 V, bal Fe.
For forging dies, extrusion dies, punches, shear blades.
Hot work steel. Oil hardening, good red-hardness.

JESSOP-SAVILLE R.34.
M-261; 0.30 C, 13.0 Cr, bal Fe.
Heat treated: 246,000 max TS; 10 El; C 52 Rock.
Annealed: 95,000 TS; 50,000 YS; 25 El; 196 Brin.
For knife blades, cutlery, surgical instruments, needle valves, gauges.
Hardenable, corrosion resisting steel.

JESSOP-SAVILLE R.40.
M-261; 0.21 C, 1.0 Si, 11.5 Ni, 22.5 Cr, 1.0 W, bal Fe.
For unstressed furnace parts, valves, impellers, dampers, roller hearths, burner nozzles.
Heat and corrosion resistant. Not hardenable, austenitic.

JESSOP-SAVILLE R.41.
M-261; 0.10 max C, 12.0 Ni, 17.0 Cr, 2.35 Mo, bal Fe.
Annealed: 78,000 TS; 30 El; B 78 Rock.
Cold Rolled: 125,000 TS; 100,000 YS; 25 El; 250 Brin.
Chemical plant equipment, paper making and textile plant equipment.
Stainless, acid resisting, austenitic, non-hardenable.

JESSOP-SAVILLE R.42.
M-261; 0.08 max C, 8.5 Ni, 18.0 Cr, bal Fe.
Annealed: 78,000 max TS; 30 El; B 80 Rock.
Cold Rolled: 150,000 TS; 100,000 YS; 25 El; B-100 Rock.
For chemical plant equipment, airscrews, fish knives, fittings, cooking utensils.
Austenitic, stainless steel, Type 304, non-heat treatable.

JESSOP-SAVILLE SPECIAL-BB
M-261; 0.28 C, 3.20 Cr, 9.5 W, 0.3 V, bal Fe.
Heat treated: 224,000 TS; 191,000 YS; 12 El; C 51 Rock.
At 600°C: 134,000 TS; 103,000 YS; 10 El; 28 RA.
For extrusion dies and liners, forging dies, hot trimming dies, and punches, rotary shear blades.
Hot work steel, Type H21.

JESSOP-SAVILLE S.V.L.
M-261; 0.32 C, 1.3 Cr, 0.3 Mo, 0.5 Mn, 0.25 Si, bal Fe
For cold punches, trimming dies, shear blades, chisels
Oil or air hardening. Shock resistant.

JESSOP-SAVILLE W P S
M-261; 2.3 C, 0.35 Mn, 0.30 Si, 13 Cr, bal Fe
Hardened: C 65-67 Rock
For blanking and forming dies, gauges, shear blades, thread rollers, mandrels
Oil or air hardening. Nondeforming, wear and abrasion resistant.

JESSOP-SAVILLE ZIRCONIUM.
M-261; 1.5 Sn, 0.12 Fe, 0.10 Cr, 0.05 Ni, bal Zr.
At 70°F. 74,000 TS, 42,700 YS, 28 El, 38 RA.
At 930°F: 24,200 TS; 12,000 YS; 40 El, 60 RA
For canning and structural material for use in pressurized water reactors
Corrosion resistant and low neutron absorption.

JESSOP SHEET SPRING
M-261; 0.95 C, 0.30 Mn, bal Fe.
For tools, springs, water hardened.

JESSOP SPECIAL ALLOY B.
M-261, M-486; 1.6 C, 0.6 Cr, 5.5 W, bal Fe.
For drawing dies, working tools, stone cutting tools; wear resistant.

JESSOP SPECIAL H 4.
M-261, 0.9 C, 1.85 Mn, 0.45 Cr, 0.45 W, bal Fe.
For gauges, taps, dies, chasers, cams, pawls; non-deforming, oil hardening.

JESSOP SPECIAL K 4.
M-261, M-486; 0.92 C, 1.25 Mn, 0.45 Cr, 0.45 W, bal Fe.
For gauges, taps, dies, chasers, cams; non-deforming, oil hardening

JESSOP STEEL NO. 5.
M-69; 0.2 C, 20 Cr, 12 Ni, bal Fe.
Hot rolled: 130,500 TS; 107,300 YS; 31 El; 60 RA; 260 Brin.
At 1000°C: 18,000 TS; 26 El, 42 RA.
For furnace parts, recuperators, pumps, boiler baffles, annealing boxes, oil stills; heat and corrosion resistant; resists scaling to 2100°F.

JESSOP STEEL "A-2."
M-261; 0.10-0.18 C, 0.6-0.09 Mn, bal Fe.
Case hardened core: 85,000 TS; 56,000 YS; 25 El; 60 RA; 180 Brin.
For case hardened parts; case-hardening steel.

JESSOP STEEL "A-4." (S.M.-30).
M-261; 0.25-0.35 C, 0.6-0.8 Mn, bal Fe.
76,200-80,100 TS; 45,000-51,500 YS; 30-35 El; 55-60 RA; 150-160 Brin. For shafts, axles, machinery parts; water hardened.

JESSOP STEEL "A-5" (S.M.-40).
M-261; 0.35-0.45 C, 0.6-0.8 Mn, bal Fe.
85,200-89,600 TS; 49,000-65,000 YS; 26 El; 55 RA; 170 Brin. For gears, pinions, shafts, machinery parts; water hardening.

JESSOP STEEL "B" (S.M.-50).
M-261; 0.5-0.6 C, 0.5-0.7 Mn, bal Fe.
89,600-112,000 TS; 51,500-56,000 YS; 20-25 El; 45-50 RA; 187-217 Brin.
For axles, shafts, wheels, shock resistant tools; water hardening.

JESSOP STEEL "C-1" (S.M.-60).
M-261; 0.6-0.7 C, 0.4-0.6 Mn, bal Fe.
98,600 TS, 51,500 YS; 21 El; 40 RA; 200 Brin.
For blanking, drawing and trimming dies, punches, hobs, gages; abrasive resistance, non-deforming.

JESSOP STEEL "C-2" (S.M.-80).
M-261; 0.75-0.85 C, 0.4-0.6 Mn, bal Fe.
Heat treated: 134,000-156,800 TS; 100,800-123,200 YS; 12-18 El, 40 RA; 320 Brin.
For blanking, drawing and trimming dies, punches, hobs, gages; resists scaling, corrosion and abrasion

JESSOP STEEL "E."
M-261, 0.10-0.15 C, 0.2-0.6 Mn, 3-3.5 Ni, bal Fe.
Case hardened core: 100,800-136,700 TS; 71,700-85,200 YS; 15-20 El; 40 RA; 280-300 Brin
For case-hardened parts, gears; case-hardening steel

JESSOP STEEL "E-1."
M-261, 0.4-0.45 C, 0.4-0.85 Mn, 3-3.5 Ni, bal Fe.
Heat treated 112,000-125,000 TS; 71,700-85,200 YS, 22-27 El; 47 RA; 225 Brin
For gears, pinions, crankshafts, structural parts; high impact strength.

JESSOP STEEL "F."
M-261; 0.5-0.6 C, 0.7-0.8 Mn, 0.6-0.8 Cr, 0.25 V, bal Fe
Heat treated: 132,000 TS; 91,800 YS; 25-30 El; 62 RA; 240 Brin.
For tools, wheels, jaws, clutches, springs; oil hardening

JESSOP STEEL "G."
M-261; 0.28-0.35 C, 0.45-0.60 Mn, 2.5-3.5 Ni, 0.75-1.0 Cr, bal Fe.
Heat treated: 112,000 TS; 78,400 YS; 20-25 El; 50 RA; 240 Brin.
For gears, pinions, shafts; oil hardening.

JESSOP STEEL "G-1."
M-261; 0.28-0.35 C, 4-5 Ni, 1-1.5 Cr, 0.2 Mo, bal Fe.
Heat treated: 123,000 TS; 100,800 YS; 20 El; 45 RA; 260-270 Brin.
For gears, shafts, pinions, clutches, jaws; air hardening.

JESSOP STEEL "H-2."
M-261; 0.95-1.05 C, 0.3 max Si, 0.25-0.40 Mn, 1.3-1.5 Cr, bal Fe.
For balls, shear blades; abrasion resistant.

JESSOP STEEL "H-3."
M-261; 0.55-0.65 C, 1.4-1.6 Si, 0.3-0.6 Mn, 6-7 Cr, bal Fe.
Heat treated: 118,700-130,000 TS; 69,000-80,500 YS; 24-28 El; 50-60 RA; 230 Brin.
For valves, inlet and exhaust; air hardening.

JESSOPS SUPERIOR OIL HARDENING.
M-261; 0.95 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools and dies, punches; non-deforming steel.

JESSOP TOOL.
M-261; 0.7-1.2 C, bal Fe.
For tools, drills, taps; water hardened.

JESSOP TTQ.
M-261; 0.8 C, 5 Cr, 20 W, 1.6 V, 11 Co, bal Fe.
For broaches, reamers, planer and lathe cutters; high speed steel, oil hardened.

JESSOP TYPE R.
M-69; High speed steel with low C steel backing.
For clipper knives, blades, planer knives; composite tool steel.

JESSOP WEX 491.
M-261; 1.0 C, 2 Cr, 2 Mn, 1 Mo, bal Fe.
For tool shanks, punches; air hardened, nondeforming.

JETALLOY 209.
M-1530; 0.02 C, 20 Cr, 10 Ni, 15 W, 2 Ti, 1 Fe, bal Co.
For high temperature applications; high creep resistance, oxidation and wear resistant.

JETALLOY 249.
M-1530; cobalt alloy.
For corrosion resistant applications; resists corrosion and abrasion.

JET FORGE.
M-115; 0.45-0.50 C, 1.3 Mo, 1.4 V, 0.9 Si, 0.3 Mn, 0.25-0.80 Cr, bal Fe.
For forging dies; air hardened, hot work steel.

JETHETE-M.140.
M-430, M-1724; 0.08 C, 13 Cr, 1 Mo, bal Fe.
Annealed: 75,000 TS; 35,000 YS; 30 El; B 92 Rock.
Cold Drawn: 85,000 TS; 70,000 YS; 20 El; 185 Brin.
For springs, table flatware, oil refinery equipment, annealing boxes.
Corrosion resistant, ferritic, non-hardenable.

JETHETE M-151.
M-1724; 0.10 C, 1.5 Mn, 1.25 Ni, 12.0 Cr, 0.6 Mg, 0.3 V, bal Fe.
Heat treated: 134,400 TS; 112,000 YS; 15 El.
For gas turbine discs and blades; creep resistant.

JETHETE M-152.
M-1724; 0.12 C, 0.7 Mn, 2.5 Ni, 12.0 Cr, 1.7 Mo, 0.3 V, bal Fe.
Heat treated: 134,400 TS; 112,000 YS; 20 El.
For gas turbine discs and blades; creep resistant.

JETHETE M 153.
M-430; 0.10 C, 1.5 Mn, 1.5 Ni, 12.0 Cr, 1.25 Mo, bal Fe.
Heat treated. 134,000-190,000 TS; 103,000-146,000 YS; 25-12 El; 64-25 RA.
For high temperature applications; heat resistant.

JETHETE M 154.
M-430, M-1724; 0.08-0.15 C, 0.5-1.0 Mn, 2-3 Ni, 11-13 Cr, 1.5-2.0 Mo, 0.25-0.40 V, 0.05 N, bal Fe.
Hardened: 147,000 TS; 129,000 YS; 10 El.
For turbine blading, bolting, gas turbine components.
Good oxidation resistance and high strength at elevated temperatures.

JETHETE M.160.
M-1724; 0.20 max C, 11-13 Cr, 1.0 max Mo, 1.0 max V, 0.7 max Cb, 1.25 max Ni, bal Fe.
At 70°F: 143,000 TS; 121,000 YS; 22 El; 56 RA.
At 570°F: 124,000 TS; 106,000 YS; 18 El; 51 RA.
At 750°F: 116,000 TS; 97,000 YS; 22 El; 65 RA.
For gas turbine compressor blades, corrosion and heat resistant.

JETHETE M.210.
M-430, M-1724; 0.10 C, 12 Cr, 2.8 Mo, 0.3 V, 0.25 Cb, 7 Co, 0.015 B, bal Fe.
For aircraft and steam turbine blades, jet engine blades and discs.
Heat resistant to 1000°F.

JET-LH 8018-C1.
M-578; 0.12 C, 1.20 Mn, 0.03 P, 0.04 S, 0.60 Si, 2.50 Ni, bal Fe.
Steel arc welding electrode. AWS Class E8018-C1.

JET-LH 8018-C3.
M-578; 0.12 C, 0.4 Mn, 0.03 P, 0.03 S, 0.80 Si, 1.0 Ni, 0.15 Cr, 0.35 Mo, 0.05 V, bal Fe.
Steel arc welding electrode AWS Class E8018-C3.

JET-LH BU-90.
M-578; 0.14 C, 1.15 Mn, 0.60 Si, 1.40 Cr, bal Fe.
Hard surfacing arc welding electrode, for resistance to metal to metal wear.

JETWELD 1.
M-578; C, bal Fe.
Steel arc welding electrode.
AWS Class E7024.

JETWELD 2.
M-578; C, bal Fe.
Steel arc welding electrode.
AWS Class E6027.

JETWELD 2HT.
M-578; C, bal Fe.
Steel arc welding electrode.
AWS Class E7027-A1.

JETWELD 3.
M-578; C, bal Fe
Steel arc welding electrode.
AWS Class E7024.

JETWELD LH70.
M-578; C, bal Fe.
Steel arc welding electrode.
AWS Class E7018.

JETWELD LH-90.
M-578; 0.12 C, 0.90 Mn, 0.03 P, 0.04 S, 0.06 Si, 1.25 Cr, 0.5 Mo, bal Fe.
Steel arc welding electrode.
AWS Class E8018-B2.

JETWELD LH-110.
M-578; 0.10 C, 1.3 Mn, 0.03 P, 0.03 S, 0.60 Si, 2.0 Ni, 0.40 Cr, 0.35 Mo, 0.05 V, bal Fe.
Steel arc welding electrode
AWS Class E 11018-M.

JETWELD LH3800.
M-578; C, bal Fe.
Steel arc welding electrode
AWS Class E7028.

JEWEL CAST IRON.
Eng.; 0.88 combined C, 1.24 graphite, 0.14 Mn, 0.81 Si, bal Fe. Cast.
For castings, gears, housings; cast iron.

JEWELER'S METAL.
Eng.; 91.5-83 Cu, 6.5-17 Zn, 0-2 Sn.
For jewelry; corrosion resistant.

JEWELRY BRONZE.
M-33; 87.5 Cu, 12.5 Zn.
Annealed: 40,000 TS; 13,000 YS; 46 El.
Hard rolled: 66,000 TS; 56,000 YS; 5 El.
For costume jewelry, slide fasteners; containers; red brass.

JEWELRY BRONZE 226.
M-279; 87 Cu, 13 Zn.
Ann: 37,000-45,000 TS; 10,000-21,000 YS; 35-46 El.
Cold rolled: 42,000-86,000 TS; 16,000-75,000 YS; 2-40 El.
For jewelry, buckles, slide fasteners.
Gold color, easily buffed and finished.

"J" HOT WORKING DIE
M-69; 0.4 C, Cr, bal Fe.
For hot working tools and dies; hot work steel ; oil hardened.

JISCON
M-1032; 2.3-2.5 C, 6.0-6.25 Si, 1.25 Cu, 0.5 Cr, bal Fe.
For high temperature castings; resists growth and scaling to 1700°F.

JISCO SILVERY
M-1032; 5-17 Si, 1-2 Mn, 0.8-3.0 C, bal Fe.
For foundry steel and iron castings; pig iron.

JJ HOT WORK see JESSOP JJ.

J.L
M-620, 4.5 Cu, bal Al.
64,000 TS, 5 El, 120 Brin.
For light alloy parts; age-hardenable.

J & L Type 303SM.
M-173, 0.08 C, 1.5 Mn, 0.8 Si, 0.15 min S, 18 Cr, 9 Ni, bal Fe
Annealed: 90,000 TS; 35,000 YS, 50 El, 55 RA; 160 Brin
Cold drawn: 125,000 TS, 90,000 YS; 20 El; 50 RA; 277 Brin
For stainless screw machine products, fasteners, instrument gears, trim
Free-machining, stainless, austenitic, nonmagnetic

J & L Type 304SM.
M-173, 0.08 max C, 2.0 max Mn, 0.045 max P, 0.030 max S, 1.0 max Si, 18-20 Cr, 8-12 Ni, bal Fe.
Annealed 82,000 TS; 35,000 YS; 60 El; 70 RA; B 80 Rock
For beer barrels, chemical equipment, evaporators, milking machines, sanitary fittings, vacuum pump parts
Stainless, austenitic

J & L Type 316SM
M-173; 0.08 max C, 2.0 max Mn, 0.045 max P, 0.030 max S, 1.0 max Si, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El; 70 RA; B 78 Rock.
For chemical and food industries, screens, storage and transportation tanks, digesters.
Stainless, austenitic.

J & L Type 416SM.
M-173; 0.15 max C, 1.25 max Mn, 0.060 max P, 0.15 min S, 1.0 max Si, 12-14 Cr, 0.6 max Mo, bal Fe.
Annealed: 80,000 TS; 45,000 YS; 30 El; B 85 Rock
For stainless screw machine products; bolts, fasteners, pump parts, shafts.
Free machining, corrosion resistant, hardenable.

J & L 1113 Bessemer-Selenium Leaded.
M-173; 0.09 max C, 0.70-1.00 Mn, 0.07-0.12 P, 0.25-0.35 S, 0.15-0.35 Pb, bal Fe.
For screw machine products, fasteners, cams, camshafts
Free machining, case hardening.

J & L-B11L13.
M-173; 0.09 max C, 0.70-1.00 Mn, 0.07-0.12 P, 0.25-0.35 S, 0.15-0.35 Pb, bal Fe.
Cold Drawn: 82,000 TS; 75,000 YS; 16 El; 37 RA; 174 Brin
For automatic screw machine products, bolts, shafts, fasteners.
Free-machining.

J & L—1211.
M-173; 0.08-0.13 C, 0.07-0.12 P, 0.08-0.15 S, 0.6-0.9 Mn, bal Fe.
Cold drawn: 82,000 TS; 80,000 YS; 14 El; 47 RA; 174 Brin.
For screw machine products, bolts, shafts; AISI-C1211, free-cutting.

J & L—1212.
M-173; 0.13 max C, 0.16-0.23 S, 0.07-0.12 P, 0.7-1.0 Mn, bal Fe.
Cold drawn: 82,000 TS; 80,000 YS, 14 El; 47 RA; 174 Brin.
For screw machine products, bolts, shafts, screws; AISI-C1212, free cutting.

J & L—1213.
M-173, 0.09 max C, 0.24-0.33 S, 0.07-0.12 P, 0.7-1.0 Mn, bal Fe.
Cold drawn: 82,000 TS; 80,000 YS; 14 El; 47 RA; 174 Brin.
For screw machine products, bolts, screws, shafts; AISI-C1213, free-cutting

J & L—12L13
M-173; 0.09 max C, 0.70-1.00 Mn, 0.07-0.12 P, 0.25-0.35 S, 0.15-0.35 Pb, bal Fe.
For screw machine products, fasteners, hardware cams, camshafts.
Free machining, case hardening.

J & L 1215
M-173, 0.09 max C, 0.75-1.05 Mn, 0.04-0.09 P, 0.25-0.35 S, bal Fe.
For screw machining products, fasteners, cams, gears, camshafts.
Free-machining, case hardening.

J & L Type A.
M-173, 0.15 max C, 0.80-1.20 Mn, 0.04-0.09 P, 0.25-0.35 S, 0.15-0.35 Pb, bal Fe.
Cold drawn. 83,000 TS; 75,000 YS, 16 El; 37 RA; 174 Brin
For automatic screw machine products, shafts, bolts, fasteners, cams.
Free-machining. AISI C12L14.

J & L Type A-Selenium.
M-173, 0.15 max C, 0.80-1.20 Mn, 0.04-0.09 P, 0.25-0.35 0.15-0.35 Pb, Se, bal Fe
Cold Drawn. 83,000 TS, 75,000 YS; 16 El; 37 RA; 175 Brin.
For automatic screw machine products, bolts, fasteners, cams, shafts. Free machining.

J & L Type B.
M-173; 0.15 max C, 0.85-1.35 Mn, 0.04-0.09 P, 0.40 min S, 0.15-0.35 Pb, bal Fe.
Cold Drawn: 87,000 TS; 79,000 YS; 12.5 El; 36.5 RA; 174 Brin.
For automatic screw machine products, screws, bolts, fasteners, shafts. Free machining.

J. & L. CORRECT BALANCE.
M-173; C, bal Fe.
For forgings.

JLX-36.
M-173; 0.15 max C, 0.90 max Mn, bal Fe.
Sheet: 50,000 TS; 36,000 YS; 28 El (minimum) B 63-75 Rock.
For construction applications, bridges, tanks.
Good formability, weldability and notch toughness.

JLX-42.
M-173; 0.20 max C, 1.2 max Mn, bal Fe.
Plate: 57,000 TS; 42,000 YS; 25 El; 120-150 Brin.
For construction applications, booms, derricks, tanks.
Good formability, weldability and notch toughness.

JLX-45.
M-173; 0.22 max C, 1.2 max Mn, bal Fe.
Plate: 60,000 min TS; 45,000 min YP; 24 min El; 130-150 Brin.
For construction applications, mine cars, derricks, tanks.
Good formability, weldability and notch toughness.

JLX-50.
M-173; 0.24 max C, 1.2 max Mn, S, P, bal Fe.
Rolled. 50,000 min YS; 65,000 min TS; 22 min El; 140-160 Brin.
For construction applications, cars, booms, derricks, bridges.
Small grain size. Good formability and weldability with improved toughness

JLX-50CC.
M-173, 0.12 C, 0.90 max Mn, 0.01 min Cb, bal Fe.
Plate. 50,000 min YP; 26-30 El; 65,000 min TS.
For automotive, truck, railroad, trailer, construction and mining components.
Good formability, weldability and toughness.
High strength, low alloy constructional steel, good weldability

JLX-55
M-173, 0.25 max C, 1.35 max Mn, bal Fe
Rolled: 70,000 min TS, 55,000 min YP; 20 min El; 155-180 Brin
For construction applications, gears, derricks, bridges
Good formability and weldability and notch toughness

JLX-60
M-173; 0.26 max C, 1.5 max Mn, bal Fe.
Rolled· 75,000 min TS, 60,000 min YP; 18 min El; 170-200 Brinell.
For construction applications, bridges.
Good formability and weldability and notch toughness

JLX-65
M-173; 0.26 max C, 1.65 max Mn, bal Fe.
Rolled· 80,000 min TS; 65,000 min YP, 16 min El; 190-225 Brin.
For construction applications, bridges.
Good formability, weldability and notch toughness.

JLX-70.
M-173, 0.26 max C, 1.65 max Mn, bal Fe.
Rolled: 85,000 min TS; 70,000 min YP; 14 min El; 210-240 Brin.
For construction applications, mine cars, bus bodies, derricks.
Good formability, weldability and notch toughness.

JLX-W.
M-173; 0.20 max C, 0.50-1.0 Mn, 0.10 max Si, 0.01 min Cb, bal Fe.
Gr. 45: 60,000 TS; 45,000 YP; 24 El; B 79 Rock.
Gr. 50: 65,000 TS; 50,000 YP; 22 El; B 82 Rock.
Gr. 55: 70,000 TS; 55,000 YP; 20 El; B 83 Rock.
Gr. 60: 75,000 TS; 60,000 YP; 18 El; 8 85 Rock.
For water wheel generators, freight cars, trucks, storage tanks.
Produced to minimum yield points indicated.

JOBBINS 3-6-6 SUPREME.
M-1103; 2.5-3.5 Cu, 5-6 Si, 5-6 Zn, bal Al.
Cast: 26,000 TS; 14,500 YS; 2 El; 65 Brin.
T 6 Temper: 45,000 TS; 38,000 YS; 1 El; 100 Brin.
For sand and permanent mold castings; hardenable.

JOBBINS 3-6 SUPREME.
M-1103; 2.75-3.75 Cu, 5.5-6.5 Si, bal Al.
Cast: 29,000 TS; 17,000 YS; 2.5 El; 75 Brin.
T 6 Temper: 40,000 TS; 28,000 YS; 2 El; 90 Brin.
For sand and permanent mold castings; heat treatable.

JOBBINS 4-8 SUPREME.
M-1103; 3.5-4.5 Cu, 7.5-9.5 Si, bal Al.
Cast: 32,000 TS; 17,000 YS; 2.5 El; 85 Brin.
T 6 Temper: 45,000 TS; 28,000 YS; 3.0 El; 100 Brin.
For permanent mold castings; hardenable.

JOBBINS ALMAG 35.
M-1103; 6-8.5 Mg, 0.1 Ti, 0.05 Be, 0.1 Mn, bal Al.
Cast: 40,000 TS; 20,000 YS; 12 El; 70 Brin.
For castings; sand or die cast.

JOBBINS ALMAG 56.
M-1103; 9.5-10.5 Mg, bal Al.
Cast T 4 Temper: 58,000 TS; 30,000 YS; 18 El; 95 Brin.
For sand castings; heat treatable.

JOHNSON.
9-36 Ni, 10-30 Cr, 1-10 Si, bal Fe.
For heat and corrosion resisting parts; heat and corrosion resistant.

JOHNSON NO. 9 BABBITT ALLOY.
M-172; Pb, Sb, bal Sn.
For automobile bearings; Babbitt metal.

JOHNSON BRONZE NO. 12
M-172; 90 Sn, 7.5 Sb, 2.5 Cu.
For bearings; high speed and high temperature service.

JOHNSON BRONZE NO. 19.
M-172; 70 Cu, 11 Sn, 19 Pb.
17,500 TS; 20,700 YS; 4-12 El; 62 Brin.
For mill bearings, engine bearings, general machinery bearings; heavy duty.

JOHNSON BRONZE NO. 25.
M-172; 75 Cu, 5 Sn, 19 Pb, 1 0 Ni.
22,500 TS; 16,750 YS; 7-15 El; 44 Brin.
For bearings for pumps, cylinder sleeves, electric motors; v. Plastic Bronze.

JOHNSON BRONZE NO. 27.
M-172; 80 Cu, 10 Sn, 10 Pb.
30,000 TS; 19,000 YS; 5-15 El; 58 Brin.
For bearings for locomotive crossbeds, lathes, grinders, motors; v. S.A.E. No. 64.

JOHNSON BRONZE NO. 29.
M-172; 78 Cu, 7 Sn, 15 Pb.
24,000 TS; 16,400 YS; 5-13 El; 52 Brin.
For bearings for acid pumps, mining machinery, rolling mills; v. S.A.E. No. 67.

JOHNSON BRONZE NO. 40.
M-172; 90 Cu, 0.5 Sn, 9.5 Zn.
For bearings; sheet metal.

JOHNSON BRONZE NO. 44.
M-172; 86-90 Cu, 3-4.5 Sn, 3.5-4 Pb, 3-5-4.5 Zn.
For bearings; sheet metal.

JOHNSON BRONZE NO. 51.
M-172; 87 Cu, 10 Sn, 1 Pb, 2 Zn.
36,500 TS; 18,500 YS; 10-20 El; 67 Brin.
For bearings for power shovels, concrete mixers, worm gears; heavy duty.

JOHNSON BRONZE NO. 53.
M-172; 88 Cu, 10 Sn, 2 Zn.
36,000 TS; 19,000 YS; 14-22 El; 69 Brin.
For bridge bearings, gears, gear bushings; v. S.A.E. No. 63.

JOHNSON BRONZE NO. 55.
M-172; 86 Cu, 12 Sn, 2 Zn.
39,200 TS; 21,000 YS; 10-15 El; 74 Brin.
For bearings for heavy machinery, mine pumps, bushings; heavy duty.

JOHNSON BRONZE NO. 66.
M-172; 85 Cu, 5 Sn, 1 Zn, bal Pb.
26,000 TS, 14,500 YS; 7-17 El; 48 Brin.
For bearings for wood turning machinery, bench lathes; heavy duty.

JOHNSON BRONZE NO. 71.
M-172; 85 Cu, 5 Sn, 5 Pb, 5 Zn.
29,000 TS; 16,500 YS; 13-27 El; 49 Brin.
For sliding valve seats, stuffing box glands, cylinder sleeves, bronze backed Babbitt.

JOHNSON BRONZE NO. 72.
M-172; 83 Cu, 7 Sn, 7 Pb, 3 Zn.
29,000 TS; 14,600 YS; 12-22 El; 56 Brin.
For camshaft bearings, gears, bushings; heavy duty.

JOHNSON BRONZE BABBITT NO. 10.
M-172; 90 Sn, 5 Cu, 5 Sb.
For bearings, bronze Babbitt.

JOHNSON BRONZE BABBITT NO. 11.
M-172; 87 Sn, 6 Cu, 7 Sb.
For bearings; bronze Babbitt.

JOHNSON BRONZE BABBITT NO. 97.
M-172; 90 Sn, 2.5 Cu, 7.5 Sb.
For bearings, bronze Babbitt.

JOHNSON BRONZE GRAPHITED BEARINGS.
M-172; graphite, Sn, bal Cu.
For bearings; self lubricating.

JOHNSON BRONZE NO. LX.
M-172; 74.75 Pb, 15 Sb, 10 Sn, 0.25 Cu.
For camshaft bearings, Babbitt.

JOHNSON LM15.
M-200; Ag, Cd, Zn.
Cast: 25,700 TS; 5 El.
For solder; M.P. 280-320°C; high strength.

JOHNSON LOCOMOTIVE BRONZE.
England; 7.8 Sn, 5 Zn, bal Cu.
For railroad hardware, fittings, injectors; high strength.

JOHNSONS (A) STAINLESS STEEL SOLDER.
M-393.
For solder for stainless steel; M.P. 450°F.

JONAS & COLVER.
Eng.; 1.36 C, 0.41 Mn, bal Fe.
For tools, cutters; water hardened.

JOSLYN STAINLESS Type 202.
M-560; 0.15 max C, 7.5-10.0 Mn, 1.0 max Si, 17-19 Cr, 4.0-6.0 Ni, 0.25 max N, bal Fe.
Ann: 90,000 TS; 50,000 YS; 55 El; 170 Brin.
Austenitic; hardenable only by work hardening, corrosion resistant; non-magnetic.
For antennas, bolts and fasteners, dairy equipment, spring wire, transportation equipment.
AISI 202; ASTM A314; SAE 30202.

JOSLYN STAINLESS Type 302B.
M-560; 0 15 max C, 2.0 max Mn, 2.0-3.0 Si, 17-19 Cr, 8.0-10.0 Ni, bal Fe.
Ann: 90,000 TS; 40,000 YS; 50 El; 160 Brin.
Austenitic: hardenable only by cold work; heat resistant; non-magnetic.
For heat treating fixtures, annealing boxes, furnace parts, fittings.
AISI 302; ASTM A580; SAE 30302.

JOSLYN STAINLESS Type 302 Cu.
M-560; 0.10 max C, 2.0 max Mn, 17-19 Cr, 8-10 Ni, 0.5 max Mo, 3 0-4 0 Cu, bal Fe.
Ann: 80,000 T, 40,000 YS; 35 El; 163 Brin.
For fasteners, automotive parts, aircraft and missile components, chemical equipment.
Corrosion resistance, austenitic.

JOSLYN STAINLESS Type 303.
M-560; 0.15 max C, 2 0 max Mn, 1.0 max Si, 0.15 min S, 17-19 Cr, 8.0-10.0 Ni, 0.60 max Mo, bal Fe.
Ann: 90,000 TS; 35,000 YS; 50 El, 160 Brin.
Austenitic, free machining, non-magnetic, hardenable only by cold work, corrosion resistant
For studs, bolts, nuts, gears, hardware fittings, screw machine parts
AISI 303; AMS 5640 Type 1, SAE 30303

JOSLYN STAINLESS Type 303, FORGING QUALITY
M-560; 0.15 max C, 2.0 max Mn, 0.15 min S, 1.0 max Si, 17-19 Cr, 8 0-10 0 Ni, 0 60 max Mo, bal Fe.
Ann: 90,000 TS; 35,000 YS; 50 El; 160 Brin.
Forging grade, austenitic, free machining, hardenable only by cold work, non-magnetic.
For hot headed bolts, aircraft fittings, forged and machined fittings and fasteners
AISI 303, AMS 5640 Type 1, SAE 30303.

JOSLYN STAINLESS Type 303 Pb
M-560; 0 15 max C, 2 0 max Mn, 0 12-0 30 S, 1.0 max Si, 17-19 Cr, 8.0-10 0 Ni, 0.60 max Mo, 0.12-0 30 Pb, bal Fe.
Ann· 90,000 TS; 35,000 YS; 50 El; 160 Brin.
Austenitic, free machining, non-magnetic, hardenable only by cold work, corrosion resistant.
For gears, shafts, studs, bolts, nuts, screw machine parts, Swiss automatic parts
QQ-S-764; AMS 5635, ASTM A581.

JOSLYN STAINLESS Type 303 Se.
M-560; 0.15 max C, 2 0 max Mn, 0.06 max S, 1.0 max Si, 17-19 Cr, 8.0-10.0 Ni, 0 50 max Mo, 0.15 min Se, bal Fe.
Ann: 90,000 TS; 35,000 YS; 50 El; 160 Brin.
Austenitic, free machining, non-magnetic, hardenable only by cold work, corrosion resistant.
For gears, shafts, rivets, screw machine parts, bolts, nuts, studs, ordnance parts.
AISI 303 Se; AMS 5640 Type 2; SAE 30303 Se.

JOSLYN STAINLESS AISI Type 304.
M-560; 0.08 max C, 2.0 max Mn, 1.0 max Si, 18-20 Cr, 8-11 Ni, bal Fe.
Ann: 85,000 TS; 35,000 YS; 60 El; 149 Brin.
Austenitic, non-magnetic, corrosion resistant, hardenable by cold work only.
For shafts, dairy fittings, meat hangers and hooks, food processing equipment.
AISI 304; AMS 5639; ASTM A193.

JOSLYN STAINLESS Type 304L.
M-560; 0.030 max C, 2.0 max Mn, 1.0 max Si, 18-20 Cr, 8-11 Ni, bal Fe.
Ann: 80,000 TS; 30,000 YS; 60 El; 140 Brin.
Austenitic, weldable, non-magnetic, hardenable only by cold work, corrosion resistant.
For weld rod, welded assemblies, food processing equipment.
AISI 304L; AMS 5647; SAE 30304L.

JOSLYN STAINLESS Type 304 MAX. MACHINABILITY.
M-560; 0.08 max C, 2.0 max Mn, 0.03 max S, 1.0 max Si, 18-20 Cr, 8-12 Ni, bal Fe
Ann: 85,000 TS; 35,000 YS; 60 El; 149 Brin.
Austenitic, non-magnetic, corrosion resistant, hardenable by cold work only.
For shafts, dairy fittings, valve parts, food and laundry equipment.
AISI 304; AMS 5639; SAE 30304.

JOSLYN STAINLESS Type 305.
M-560; 0.12 max C, 2.0 max Mn, 1.0 max Si, 17-19 Cr, 11-13 Ni, bal Fe.
Ann: 85,000 TS; 35,000 YS; 55 El; 149 Brin.
Austenitic, non-magnetic, corrosion resistant.
Less tendency to harden by cold work.
For rivets, cold headed parts, extruded parts, cold formed parts
AISI 305, AMS 5685; SAE 30305.

JOSLYN STAINLESS Type 305H.
M-560; 0 12 max C, 2.0 max Mn, 15-17 Cr, 17-19 Ni, bal Fe.
Ann: 75,000 TS; 40,000 YS; 55 El; 156 Brin.
For fasteners, cold headed bolts, screws, nuts.
Low work hardening
Austenitic, corrosion resistant.

JOSLYN STAINLESS Type 305 MH.
M-560, 0.12 max C, 2 max Mn, 11.5-13.0 Cr, 14-16 Ni, bal Fe.
Ann: 78,000 TS; 40,000 YS; 55 El; 163 Brin.
For Phillips head screws, nut forming, spinning, coining, extruded or swaged parts.
Austenitic, corrosion resistant.

JOSLYN STAINLESS Type 308.
M-560; 0 08 max C, 2.0 max Mn, 1.0 max Si, 19-21 Cr, 10-12 Ni, bal Fe.
Ann: 85,000 TS; 30,000 YS; 55 El; 149 Brin
Austenitic, non-magnetic, corrosion resistant.
Less subject to work hardening, weldable.
For weld rod, welded assemblies, heat treat equipment, furnace parts.
AISI 308, ASTM A276; SAE 30308.

JOSLYN STAINLESS Type 308 FM.
M-560; 0.15-0.25 C, 1.0-2.0 Mn, 0.12-0.25 S, 0.75-1 25 Si, 20-22 Cr, 10.5-12 Ni, bal Fe.
Ann: 100,000 TS; 35,000 YS; 40 El; 212 Brin.
Austenitic, free machining grade, good corrosion and oxidation resistance.
For exhaust manifold valve parts, exhaust system shafts and bushings

JOSLYN STAINLESS Type 308L.
M-560; 0.030 max C, 2.0 max Mn, 1.0 max Si, 19-21 Cr, 9-12 Ni, bal Fe.
Ann: 85,000 TS; 35,000 YS; 55 El; 149 Brin.
Austenitic, weldable, corrosion resistant.
Main use is welding rod and parts to be welded.

JOSLYN STAINLESS Type 309.
M-560; 0.20 max C, 2.0 max Mn, 1.0 max Si, 0.030 max S, 22-24 Cr, 12-15 Ni, bal Fe.
Ann: 95,000 TS; 40,000 YS; 45 El; 160 Brin.
Austenitic, corrosion resistant, good resistance to attack at high temperatures to 2000°F.
For furnace parts, heat treating baskets and equipment, weld rod, pump parts.
AISI 309; ASTM A276; SAE 30309.

JOSLYN STAINLESS Type 309S.
M-560; 0.08 max C, 2.0 max Mn, 1.0 max Si, 0.030 max S, 22-24 Cr, 12-15 Ni, bal Fe.
Ann: 95,000 TS; 40,000 YS; 45 El; 160 Brin.
Austenitic, weldable, good high temperature resistance to corrosion and oxidation.
For furnace parts, heat treating equipment, cement kiln chain, weld rod.

JOSLYN STAINLESS Type 310.
M-560; 0.25 max S, 2.0 max Mn, 1.50 max Si, 0.030 max S, 24-26 Cr, 19-22 Ni, bal Fe.
Ann: 95,000 TS; 45,000 YS; 50 El; 185 Brin.
Austenitic, corrosion resistant, weldable, non-magnetic, good heat resistance.
For furnace parts, gas turbine parts, pump parts, welded assemblies, weld rod.
AISI 310; AMS 5694; SAE 30310.

JOSLYN STAINLESS Type 310S
M-560, 0.08 max C, 2.0 max Mn, 1.5 max Si, 0.030 max S, 24-26 Cr, 19-22 Ni, bal Fe.
Ann: 95,000 TS; 45,000 YS; 50 El; 185 Brin
Austenitic, corrosion resistant, weldable, non-magnetic, good heat resistance.
For furnace parts, oil refinery equipment, weld rod, jet engine rings.
AISI 310 S; AMS 5651; SAE 30310 S.

JOSLYN STAINLESS AISI Type 316.
M-560; 0.08 max C, 2.0 max Mn, 1.0 max Si, 0.03 max S, 16-18 Cr, 10-14 Ni, 2.0-3.0 Mo, bal Fe
Ann: 80,000 TS; 30,000 YS, 60 El; 149 Brin.
Austenitic, non-magnetic, weldable, excellent corrosion resistance, hardenable only by cold work
For food equipment, chemical equipment, paper, textile and photographic equipment, weld rod.
AISI 316; AMS 5648; SAE 30316.

JOSLYN STAINLESS Type 316F
M-560; 0.08 max C, 1.0-2.0 Mn, 0.11-0.17 P, 0.10-0.20 S, 1.0 max Si, 17-19 Cr, 12-14 Ni, 1.75-2.50 Mo, bal Fe
Ann: 80,000 TS, 30,000 YS, 55 El; 149 Brin.
Austenitic, non-magnetic, free machining, excellent corrosion resistance.
For automatic screw machine parts requiring good corrosion resistance.

JOSLYN STAINLESS Type 316L
M-560; 0.030 max C, 2.0 max Mn, 1.0 max Si, 0.030 max S, 16-18 Cr, 10-14 Ni, 2.0-3.0 Mo, bal Fe.
Ann: 80,000 TS; 30,000 YS; 60 El; 140 Brin.
Austenitic, non-magnetic, excellent corrosion resistance, weldable.
Parts for special application in food, paper, photographic and chemical processing equipment.
AISI 316 L; AMS 5653; SAE 30316 L.

JOSLYN STAINLESS Type 316 MAX MACHINABILITY.
M-560; 0.080 max C, 2.0 max Mn, 1.0 max Si, 0.030 max S, 16-18 Cr, 10-14 Ni, 2.0-3.0 Mo, bal Fe.
Ann: 80,000 TS; 30,000 YS; 60 El; 149 Brin.
Austenitic, non-magnetic, improved machinability, excellent corrosion resistance, weldable.
For automatic screw machine parts for food, chemical, paper and textile equipment.
AMS 5648; ASTM A276; SAE 30316.

JOSLYN STAINLESS Type 317.
M-560; 0.08 max C, 2.0 max Mn, 1.0 max Si, 0.030 max S, 18-20 Cr, 11-15 Ni, 3-4 Mo, bal Fe.
Ann: 85,000 TS; 40,000 YS; 50 El; 160 Brin.
Austenitic, excellent corrosion resistance, useful to 1700°F, weldable.
For parts for paper, food, chemical, refining, photographic and textile industries.
AISI 317; ASTM A479; SAE 30317.

JOSLYN STAINLESS Type 317L
M-560; 0.030 max C, 2.0 max Mn, 1.0 max Si, 0.030 max S, 18-21 Cr, 11-15 Ni, 3-4 Mo, bal Fe.
Ann: 85,000 TS; 40,000 YS, 50 El; 160 Brin.
Austenitic, excellent corrosion resistance, useful to 1700°F, weldable
For parts for food, paper, chemical, refining, photographic and textile industries.

JOSLYN STAINLESS Type 321.
M-560; 0.08 max C, 2.0 max Mn, 1.0 max Si, 0.030 max S, 17-19 Cr, 9-12 Ni, Ti = 5 × C min, bal Fe
Ann: 85,000 TS, 35,000 YS; 55 El; 149 Brin
Austenitic, non-magnetic, weldable.
For welded assemblies, for parts operated at temperatures up to 1600°F
AISI 321, AMS 5645; SAE 30321.

JOSLYN STAINLESS Type 330
M-560; 0.08 max C, 2.0 max Mn, 0.75-1.50 Si, 17-20 Cr, 34-37 Ni, bal Fe.
Ann: 85,000 TS, 45,000 YS, 35 El, 179 Brin.
Austenitic, non-magnetic, weldable, good at elevated temperatures
For furnace parts, heat treating boxes and baskets, jet engine parts, petroleum plants.
AMS 5716; SAE 30330

JOSLYN STAINLESS Type 347.
M-560, 0.08 max C, 2.0 max Mn, 1.0 max Si, 17-19 Cr, 9-13 Ni, Ta + Cb = 10 × C min, bal Fe
Ann 90,000 TS, 35,000 YS; 50 El, 160 Brin
Austenitic, non-magnetic, weldable
For parts subject to temperatures to 1600°F, welded assemblies, weld rods.
AISI 347; AMS 5646, 5680, SAE 30347

JOSLYN STAINLESS Type 347 FM (Se)
M-560, 0.08 max C, 2.0 max Mn, 0.11-0.17 P, 0.030 max S, 1.5 max Si, 17-19 Cr, 9-12 Ni, Cb + Ta = 10 × C min, 0.15-0.35 Se, 0.50 max Mo, 0.50 max Cu, bal Fe.
Ann 90,000 TS; 35,000 YS; 50 El, 160 Brin.
Austenitic, non-magnetic; welding not recommended
For machined parts for assemblies operating at 800-1500°F.
AMS 5642 Type 2.

JOSLYN STAINLESS Type 348.
M-560; 0.08 max C, 2.0 max Mn, 1.0 max Si, 17-19 Cr, 9-13 Ni, Cb + Ta = 10 × C min, 0.10 max Ta, 0.20 max Co, bal Fe.
Ann: 90,000 TS; 35,000 YS, 50 El, 160 Brin.
Austenitic, non-magnetic, heat resistant, weldable
For welded construction for radio active systems, and operating temperatures 800-1500°F.
AISI 348; SAE 30348, MIL-S-23195

JOSLYN STAINLESS Type 403.
M-560; 0.15 max C, 1.0 max Mn, 0.5 max Si, 11.5-13.0 Cr, bal Fe.

Ann: 75,000 TS; 40,000 YS; 35 El; 155 Brin.
Q&T, 1200°F; 100,000 TS; 85,000 YS; 23 El; 225 Brin.
Magnetic, heat treatable, weldable, corrosion resistant.
For jet engine parts, corrosion resistant hardware, steam and gas turbine blading.
AISI 403; AMS 5614; SAE 51403.

JOSLYN STAINLESS Type 405.
M-560; 0.08 max C, 1.0 max Mn, 1.0 max Si, 11.50-14.50 Cr, 0.10-0.30 Al, bal Fe.
Ann: 70,000 TS; 40,000 YS, 30 El; 149 Brin.
Magnetic, not normally hardenable, oxidation resistant up to 1500°F
For annealing boxes, forged fittings, quench racks.
AISI 405; SAE 51405.

JOSLYN STAINLESS Type 410.
M-560; 0 15 max C, 1 0 max Mn, 1 0 max Si, 11.50-13 50 Cr, bal Fe.
Ann: 75,000 TS; 40,000 YS; 35 El; 155 Brin.
Q&T, 1200°F: 100,000 TS, 85,000 YS; 35 El; 225 Brin
Magnetic, heat treatable, weldable, corrosion resistant.
For cutlery, corrosion resistant hardware, steam and gas turbine parts, pump parts.
AISI 410; AMS 5613, SAE 51410

JOSLYN STAINLESS Type 410 Cb.
M-560; 0 15 max C, 0 60 max Mn, 0 50 max Si, 11 5-13.5 Cr, 0.20 max Cb, bal Fe.
Ann: 75,000 TS; 40,000 YS; 35 El; 155 Brin.
Q&T, 1200°F 124,000 TS; 100,000 YS; 20 El.
Magnetic, hardenable, weldable, corrosion resistant
For steam turbine blades, valve parts, aircraft and missile components
AMS 5609

JOSLYN STAINLESS Type 410 LOW CARBON
M-560, 0 08 max C, 1 0 max Mn, 1 0 max Si, 12 5-14 0 Cr, bal Fe.
Ann 75,000 TS, 40,000 YS, 35 El, 155 Brin
Magnetic, weldable, corrosion resistant, only partially hardenable
For welded assemblies

JOSLYN STAINLESS Type 416 FORGING QUALITY
M-560, 0 15 max C, 1.25 max Mn, 0 06 max P, 0 15 min S, 1 0 max Si, 12-14 Cr, 0.5 max Ni, 0 6 max Mo, bal Fe
Processed to produce good quality forgings.
Hardenable to Rc 35 min
Magnetic, corrosion resistant, free machining
For hot headed bolts, forged and machined parts
AISI 416, AMS 5610, SAE 51416

JOSLYN STAINLESS Type 416 HIGH HARDENABILITY.
M-560, 0.15 max C, 1 25 max Mn, 0 15 min S, 1.0 max Si, 12-14 Cr, 0 50 max Ni, 0 60 max Mo, bal Fe.
Ann, CF 90,000 TS, 80,000 YS; 15 El, 197 Brin.
Guaranteed hardenable to 35 Rc min. (ave 41 Rc).
Magnetic, corrosion resistant, free machining
For fasteners, shafts, impellers, gears
AISI 416; AMS 5610; SAE 51416.

JOSLYN STAINLESS Type 416 Machine Special.
M-560, 0 15 max C, 1 25 max Mn, 0.15 min S, 1 0 max Si, 12-14 Cr, 0.50 max Ni, 0.60 max Mo, bal Fe.
Ann, CF. 90,000 TS; 80,000 YS, 15 El; 197 Brin.
Q & T, 1200°F: 110,000 TS; 85,000 YS; 18 El ; 225 Brin.
Magnetic, hardenable, corrosion resistant, free machining.
For pump shafts, motor shafts, valve trim, valve stems, fasteners, fittings.
AISI 416; AMS 5610; SAE 51416.

JOSLYN STAINLESS Type 416 Se.
M-560; 0.15 max C, 1.25 max Mn, 0.06 max P, 0.06 max S, 1.0 max Si, 12-14 Cr, 0.15 min Se, bal Fe.
Ann, CF. 90,000 TS; 80,000 YS; 15 El, 197 Brin.
Hardenable to Rc 35 min
Magnetic, corrosion resistant, free machining.
For fittings, gears, threaded fasteners, shafts.
AISI 416 Se, AMS 5610; SAE 51416 Se

JOSLYN STAINLESS Type 416 XS
M-560, 0.10 max C, 1.0 max Mn, 0.06 max P, 0 35 min S, 1.0 max Si, 13-15 Cr, 0.50 max Ni, 0.30-0 60 Mo, bal Fe.
Ann, CF; 90,000 TS, 80,000 YS; 15 El, 197 Brin.
Magnetic, corrosion resistant, free machining, not recommended for welding or quench hardening.
For oil burner nozzles, motor shafts, screw machine parts

JOSLYN STAINLESS Type 420.
M-560, over 0 15 C, 1.0 max Mn, 1.0 max Si, 12-14 Cr, bal Fe.
Ann. 95,000 TS, 50,000 YS, 25 El, 195 Brin.
Q&T, 600°F 230,000 TS, 195,000 YS; 8 El, 500 Brin
Magnetic, corrosion resistant
For cutlery, surgical and dental instruments, valves, shafts, gears, knife blades, springs
AISI 420, AMS 5621, SAE 51420.

JOSLYN STAINLESS Type 420 F
M-560, over 0 15 C, 1 25 max Mn, 0 06 max P, 0 15 min S, 1 0 max Si, 12 14 Cr, 0 60 max Mo, bal Fe
Ann 95,000 TS, 50,000 YS; 25 El, 195 Brin
Q&T, 600°F 230,000 TS, 195,000 YS; 8 El; 500 Brin
Magnetic, corrosion resistant, free machining
For gears, shafts, surgical and dental instruments, knife blades
AISI 420, AMS 5620, SAE 51420

JOSLYN STAINLESS Type 430
M-560, 0 12 max C, 1.0 max Mn, 1 0 max Si, 14-18 Cr, bal Fe
Ann 75,000 TS, 45,000 YS, 30 El; 156 Brin
Ferritic type, magnetic, corrosion resistant, not hardenable
For automotive fasteners, kitchen utensils, cold headed parts, food handling equipment
AISI 430, AMS 5627, SAE 51430

JOSLYN STAINLESS Type 430 F
M 560, 0.12 max C, 1 25 max Mn. 0 06 max P, 0 15 min S, 1 0 max Si, 14-18 Cr, 0 6 max Mo, bal Fe
Ann 80,000 TS, 45,000 YS, 25 El, 163 Brin.
Ferritic, magnetic, free machining, corrosion resistant, not hardenable, weldability-poor
For machined parts, bolts and nuts, fasteners, shafts, burner parts.
AISI 430 F; SAE 51430 F

JOSLYN STAINLESS Type 430 F Se.
M 560; 0 12 max C, 1 25 max Mn, 0 06 max P, 0 06 max S, 1 0 max Si, 14-18 Cr, 0.60 max Mo, 0 15 min Se, bal Fe
Ann 80,000 TS, 45,000 YS, 25 El; 163 Brin
Ferritic, magnetic, free machining, corrosion resistant, not hardenable, weldability-poor
For machined parts, bolts and nuts, shafts, fasteners, burner parts
AISI 430F Se; SAE 51430 F Se.

JOSLYN STAINLESS Type 430 F Solenoid Quality.
M-560; 0.06 max C, 0.50 max Mn, 0.25-0.35 S, 0.50 max Si, 17.25-18.25 Cr, 0.30 max Ni, 0.50 max Mo, 0.25 max Cu, bal Fe.
Ann: 80,000 TS; 45,000 YS; 25 El; 163 Brin.
Magnetic, ferritic, free machining.
For solenoid valve plungers.

JOSLYN STAINLESS Type 434.
M-560; 0.12 max C, 1.0 max Mn, 1.0 max Si, 16-18 Cr, 0.75-1.25 Mo, bal Fe.
Ann: 75,000 TS; 45,000 YS; 30 El; 156 Brin.
Ferritic, magnetic, corrosion resistant.
For automotive fasteners, miscellaneous cold headed parts.

JOSLYN STAINLESS Type 434 FM.
M-560; 0.12 max C, 1.0 max Mn, 0.15 min S, 1.0 max Si, 16-18 Cr, 0.75-1.25 Mo, bal Fe.
Ann: 80,000 TS; 45,000 YS; 30 El; 156 Brin.
Ferritic, magnetic, free machining, corrosion resistant, not hardenable.
For automotive fasteners, thermostat parts, machined parts.

JOSLYN STAINLESS Type 615 (Greek Ascoloy).
M-560; 0.15-0.20 C, 0.50 max Mn, 0.50 max Si, 12-14 Cr, 1.8-2.2 Ni, 0.50 max Mo, 2.5-3.5 W, bal Fe.
Ann: 140,000 TS; 130,000 YS; 15 El; 277 Brin
Q&T, 1200°F; 135,000 TS; 108,000 YS; 20 El; 277 Brin.
Martensitic, magnetic, hardenable to Rc 45 min.
For steam turbine parts, gas turbine parts, jet engine parts, compressor blades and wheels.

J.P.S. STEEL.
M-261; 0.90-1.0 C, 1.1-1.3 W, 0.45-0.60 Cr, bal Fe.
For shock tools, threading, taps, reamers, broaches; oil hardening

JS700.
M-69; 0.03 C, 1.7 Mn, 0.5 Si, 21.0 Cr, 25.0 Ni, 4.5 Mo, Cb = 8 × C, bal Fe.
Ann. prop. 85,000 TS, 39,000 YS; 45 El; 50 RA; 170 Brin
Special engineering alloy for superior corrosion resistance; for agitators, piping, mixers, vessels, vaporizers, tanks and stills.

J.S.B.
M-172; bronze on steel.
For bushings, bearings, washers; bronze on steel in finished bearing

J.S. PUNCH.
M-57; 0.55 C, 1.25 Cr, 2.75 W, 0.2 V, bal Fe.
Heat treated: 231,000-315,000 TS; 209,000-275,000 YS; 9-11 El; 27-42 RA; C 48-56 Rock.
For header and swaging dies, chipping chisels, rivet busters, track tools.
Type S1 shock resisting tool steel, good fatigue resistance.

"J" TEMPER RCS.
M-115; 0.50 C, 4 Cr, 1 V, 18 W, bal Fe.
For hot work tools and dies; hot work steel, oil hardened.

JUNKER 951.
M-1347; 0.4 C, 2 Si, 13 Cr, bal Fe.
Heat resistant casting.

JUNKER A 8 M Nb.
M-1347; 0.07 C, 18.0 Cr, 11.0 Ni, 2.2 Mo, Cb, bal Fe.
Corrosion resistant casting.
65,000 min TS; 30,000 min YS; 20 min El.

JUNKER A 8 M S.
M-1347; 0.06 C, 18.0 Cr, 11.0 Ni, 2.2 Mo, bal Fe.
Corrosion resistant casting.
65,000 min TS; 30,000 min YS; 20 min El.
Type CF-8M.

JUNKER A 8 M SS.
M-1347; 0.02, 18.0 Cr, 11.0 Ni, 2.2 Mo, bal Fe.
Corrosion resistant casting.
57,000 min TS; 27,000 min YS; 30 min El.
Type CF-3M.

JUNKER A 8 Nb.
M-1347; 0.07 C, 18.0 Cr, 10.0 Ni, Cb, bal Fe.
Corrosion resistant casting.
65,000 min TS; 28,500 min YS; 20 min El.
Type CF-8C.

JUNKER A 8 Nb TT.
M-1347; 0.07 max C, 18.0 Cr, 10.0 Ni, Cb, bal Fe.
65,000 min TS; 28,500 min YS; 20 min El.
For castings for low temperature, applications to −195°C.

JUNKER A 8 S.
M-1347; 0.06 C, 18.0 Cr, 10.0 Ni, bal Fe.
Corrosion resistant casting.
65,000 min TS; 28,500 min YS; 20 min El
Type CF-8.

JUNKER A 8 SS.
M-1347, 0.02 C, 18.0 Cr, 10.5 Ni, bal Fe
Corrosion resistant casting
57,000 min TS; 25,500 min YS; 30 min El.
Type CF-3.

JUNKER A 8 S TT.
M-1347; 0.6 C, 18.0 Cr, 10.0 Ni, bal Fe.
65,000 min TS, 28,500 min YS; 20 min El
For castings for low temperature applications, to −195°C.

JUNKER A 12 MS.
M-1347; 0.06 C, 17.0 Cr, 13.5 Ni, 4.5 Mo, bal Fe.
Corrosion resistant casting.
57,000 min TS, 28,500 min YS; 15 min El.

JUNKER A 13 MS.
M-1347; 0.06 C, 17.5 Cr, 12.5 Ni, 2.8 Mo, bal Fe.
Corrosion resistant casting
65,000 min TS, 30,000 min YS; 20 min El.

JUNKER A 17 MK Nb.
M-1347; 0.07 C, 17.5 Cr, 20.0 Ni, 2.2 Mo, 2 Cu, Cb, bal Fe.
Corrosion resistant casting.
65,000 min TS, 28,500 min YS, 15 min El.

JUNKER A 25 MK Nb.
M-1347; 0.07 C, 20.0 Cr, 25.0 Ni, 3.0 Mo, 2 Cu, Cb, bal Fe
Corrosion resistant casting.
65,000 min TS, 31,500 min YS; 15 min El.

JUNKER A 25 M Nb.
M-1347; 0.07 C, 25.0 Cr, 25.0 Ni, 2.2 Mo, Cb, bal Fe.
Corrosion resistant casting.
65,000 min TS; 31,500 min YS; 15 min El.

JUNKER A 56 M.
M-1347; 0.10 max C, 16.5 Cr, 60.0 Ni, 17.0 Mo, bal Fe.
Corrosion resistant casting.
78,000 min TS; 50,000 min YS; 5 min El.
Type CW-12 M.

JUNKER A 65 M.
M-1347; 0.10 max C, 65 Ni, 28.0 Mo, bal Fe.
Corrosion resistant casting.
78,000 min TS; 50,000 min YS; 6 min El.
Type N-12 M.

JUNKER A 1101.
M-1347; 0.4 C, 2.0 Si, 28 Cr, 10 Ni, bal Fe.
Heat resistant casting; Type HF.

JUNKER A 1151.
M-1347; 0.4 C, 1.7 Si, 26 Cr, 14 Ni, bal Fe.
Heat resistant casting; Type HI.

JUNKER A 1152.
M-1347; 0.4 C, 1.7 Si, 18 Cr, 38 Ni, bal Fe.
Heat resistant casting; Type HU.

JUNKER A 1201.
M-1347; 0.4 C, 1.7 Si, 25 Cr, 20 Ni, bal Fe.
Heat resistant castings; Type HK.

JUNKER AF 25 N.
M-1347; 0.07 max C, 25.0 Cr, 8.0 Ni, bal Fe.
Corrosion resistant casting.
85,000 min TS; 57,000 min YS; 20 min El.

JUNKER AF 27 NC.
M-1347; 0.40 C, 27.0 Cr, 4.5 Ni, bal Fe.
Corrosion resistant casting.
71,000 min TS.
Type CC-50.

JUNKER AF 1101.
M-1347; 0.4 C, 1.2 Si, 27 Cr, 4.5 Ni, bal Fe.
Heat resistant casting; Type HD.

JUNKER AF 1152
M-1347, 0.3 C, 1.2 Si, 28 Cr, 11 Ni, bal Fe.
Heat resistant casting, Type HE.

JUNKER AUN 9.
M-1347; 0.04 C, 16.5 Cr, 9.0 Ni, N_2, bal Fe.
For non-magnetizable castings.
65,000 min TS, 28,500 min YS; 20 min El.

JUNKER AUN 13 Nb.
M-1347; 0.10 C, 16.5 Cr, 13.0 Ni, Cb, bal Fe.
For non-magnetizable castings
65,000 min TS, 28,500 min YS, 20 min El

JUNKER F 901 S
M-1347; 0.2 C, 7 Cr, bal Fe.
Heat resistant casting

JUNKER F 1001.
M-1347, 0.4 C, 2 Si, 17 Cr, bal Fe
Heat resistant casting

JUNKER F 1002 S
M-1347; 1.6 C, 1.5 Si, 18 Cr, bal Fe.
Heat resistant casting.

JUNKER F 1051.
M-1347; 0.4 C, 2 Si, 23 Cr, bal Fe.
Heat resistant casting.

JUNKER F 1101.
M-1347; 0.4 C, 1.2 Si, 29 Cr, bal Fe.
Heat resistant casting; Type HC.

JUNKER F 1102.
M-1347; 1.3 C, 1.7 Si, 29 Cr, bal Fe
Heat resistant casting.

JUNKER M 13 N.
M-1347; 0.05 C, 12.5 Cr, 4.5 Ni, bal Fe.
Corrosion resistant casting.
113,000 min TS; 92,000 min YS; 15 min El.

JUNKER M 14.
M-1347; 0.20 C, 13.5 Cr, bal Fe.
Corrosion resistant casting
85,000 min TS; 64,000 min YS; 12 min El.
Type CA-40.

JUNKER M 14S.
M-1347; 0.12 C, 13.0 Cr, 0.7 Ni, bal Fe.
Corrosion resistant casting.
85,000 min TS; 57,000 min YS; 15 min El.
Type CA-15.

JUNKER M 18.
M-1347; 0.22 C, 17.0 Cr, 1.5 Ni, bal Fe.
Corrosion resistant casting.
113,000 min TS; 85,000 min YS; 4 min El.

JUNKER NICRO 50.
M-1347; 0.07 C, 50 Cr, 47 Ni.
Casting for heat resisting and elevated temperature corrosion applications.

JUNKER NIMO 59.
M-1347; 0.02 max C, 20.0 Cr, 60.0 Ni, 17.0 Mo.
Corrosion resistant casting.
71,000 min TS; 40,000 min YS; 30 min El.

JUNKER NIMO 69.
M-1347; 0.02 max C, 70.0 Ni, 28.0 Mo.
Corrosion resistant casting.
71,000 min TS, 38,000 min YS; 30 min El.

JUNKER THERMCO 50
M-1347; 0.05 C, 50 Co, 30 Cr, bal Fe.
Casting for heat and thermal shock resistance, and for some elevated temperature corrosion applications.

JUNKER THERMCO 51.
M-1347; 0.25 C, 50 Co, 30 Cr, 2.2 Cb, bal Fe.
Casting for heat and thermal shock resistance, and for some elevated temperature corrosion applications.

JUNKER X.
English, 6 Fe, 0.5 Mg, bal Al.
For bearings; for camshaft.

JUNKER Z
English; 6.5 Ni, 0.5 Ti, bal Al
For bearings; for camshaft.

K-4
Germany: Zn, Mg, bal Al
For bearings

K-9 SPECIAL OIL HARDENING
M-365, 0.90 C, 0.5 W, 0.7 Cr, 1.0 Mn, 0.2 Si, bal Fe.
For tools, cutters; oil hardening.

K 9 STEEL.
M-210; 1.0 C, 0.85 Mn, 0.75 Cr, 0.40 W, bal Fe.
Annealed: 100,000 TS; 54,000 YP, 21 El; 197 Brin.
Ht Tr · 220,000 TS, 155,000 YP, 10 El; 600 Brin.
For dies, milling cutters, plugs, gauges, circular cutters, master tools.
Non-deforming, oil hardening, wear resistant.

K4ONKhM.
M-Russia 0.05-0.12 C, 40 Co, 20 Cr, 15 Ni, 6 Mo + W, 2 Mn, bal Fe.
Heat treated: 368,000 TS; 248,000 YS; C 58 Rock.
For spiral springs in corrosive media and operating up to 400°C.
High elastic properties imparted by cold work and subsequent tempering at 500°C.

K-42-B.
M-118; 42 Ni, 22 Co, 14 Fe, 18 Cr, 2 Ti, 0.6 Al.
At 70°F: 165,000 TS; 19 El; 37 Brin
At 1110°F. 127,100 TS; 21 El; 22 Brin.
Hardened· 185,000 TS; 90,000 YS; 30 El.
For dies, valves, steam fitting and turbine blades, springs, bolts; retains strength at high temperature.

K-390
M-114; 0.25 C, 2.75 Cr, 10 W, 2 Ni, bal Fe.
For brass forging and die casting dies, hot punches; hot work steel.

KABEL OWS.
M-1310; 0.38 C, Si, Cr, V, bal Fe.
For bolts, springs, crankshafts; oil hardened, shock resistant.

KABEL SBN.
M-1310; 1.1 C, 0.20 Si, 0.30 Mn, 0.4 Cr, bal Fe.
For springs, bearings, drills, cutters; water or oil hardened, wear resistant.

KA HO LOY.
M-517, M-131; 0.07-0.10 C, 0.2-0.3 Cu, 0.35-0.50 Mn, bal Fe.
32,000-37,000 TS; 18,000-23,000 YS.
For roofs; resists atmosphere corrosion.

KAISALOY NO. 1 STANDARD.
M-1148; 0.25 max C, 1.5 max Mn, 0.35 max Cu, 0.25 max Cr, 0.15 max Mo, 0.5 max Ni, bal Fe.
Rolled: 70,000 TS; 50,000 YS.
For bus and tractor bodies, railroad and mine cars; good weldability.

KAISALOY NO. 2.
M-1148; 0.12 max C, 0.8 max Mn, 0.35 max Cu, 0.30 max Ni, 0.25 max Cr, 0.15 max Mo, 0.02 min V, bal Fe.
Rolled: 70,000 TS; 50,000 YS; 23 El; 90 Brin.
For auto bumpers, trucks, tractors, cars; high strength, low alloy steel, good weldability.

KAISALOY NO. 3.
M-1148; 0.3 max C, 1.5 max Mn, 0.35 max Cu, 0.3 max Ni, 0.25 max Cr, 0.1 max Mo, V, bal Fe.
Rolled: 70,000 TS; 50,000 YS; 23 El; 90 Brin.
For auto bumpers, trucks, tractors, cars; high strength, low alloy steel, good weldability.

KAISALOY 42-CV.
M-1148; 0.20 C, 0.90 Mn, 0.30 Si, 0.01 min Cb or V, bal Fe.
Plate: 65,000 TS; 42,000 YS; 24 El; 140 Brin.
For bridges, booms, mine and railroad cars, derricks.
High strength-low alloy steels.

KAISALOY 45-CV.
M-1148; 0.20 C, 1.0 Mn, 0.1 Si, 0.01 Min Cb, bal Fe.
Plate: 60,000 TS, 45,000 YS; 22 El; B 80 Rock.
For bridges, booms, truck and bus bodies, derricks, structures.
High strength-low alloy steel.

KAISALOY 50-CV.
M-1148; 0.22 C, 1.1 Mn, 0.1 Si, 0.01 min Cb, bal Fe.
Plate: 65,000 TS; 50,000 YS; 22 El; B 80 Rock.
For booms, bridges, bus and truck bodies, derricks.
High strength-low alloy steel.

KAISALOY 55-CV.
M-1148; 0.24 C, 1.4 Mn, 0.1 Si, 0.01 min Cb, bal Fe.
Plate: 70,000 TS; 55,000 YS; 20 El; 160 Brin.
For bridges, structures, mine cars, booms, bus and truck bodies.
High-strength, low-alloy steel.

KAISALOY 60-CV.
M-1148; 0.26 C, 1.6 Mn, 0.1 Si, 0.01 min Cb, bal Fe.
Plate: 75,000 TS; 60,000 YS; 18 El; B 85 Rock.
For mine cars, bridges, booms, truck and bus bodies, derricks.
High strength, low alloy steel.

KAISER RP-1.
M-1147; 0.12-0.15 Si, 0.5-0.7 Fe, bal Al.
For rotors in large electric motors.
56% min. electrical conductivity. Centrifugally cast.

KAISER RP-S.
M-1147; 0.08-0.10 Si, 0.2 max Fe, bal Al.
For rotors in small electric motors.
59% IACS min elect. cond. Centrifugally cast.

KAISALOY SPECIAL FORMING.
M-1148; 0.12 max C, 0.35 max Cu, 0.30 max Ni, 0.25 max Cr, 0.15 max Mo, 0.02 min V, bal Fe.
For formed parts, welded structures; good formability and weldability.

KAISALOY STRUCTURAL.
M-1148; 0.30 max C, 1.5 Mn, 0.35 max Cu, 0.30 max Ni, 0.25 max Cr, 0.10 max Mo, bal Fe.
For structures; high strength low alloy steel.

KAISER 2 S.
M-1147; 99 min Al.
S 0-temper: 13,000 TS; 5000 YS; 35 El.
H 14-temper: 18,000 TS; 17,000 YS; 9 El.
H 18-temper: 23,000 TS; 21,000 YS; 5 El.
For gaskets, spun products.

KAISER 3 S.
M-1147; 1-2 Mn, bal Al.
S 0-temper: 17,000 TS; 7000 YS; 34 El.
S 14-temper: 23,000 TS; 22,000 YS; 8 El.
S 18-temper: 29,000 TS; 27,000 YS; 4 El.
For cooking utensils, building products; strain hardenable.

KAISER 24 S.
M-1147; 4.5 Cu, 0.6 Mn, 1.5 Mg, bal Al.
O-temper: 26,000 TS, 11,000 YS; 19 El.
T 4-temper: 64,000 TS; 44,000 YS; 18 El.
T 6-temper: 69,000 TS; 54,000 YS; 11 El.
For aircraft structures; heat treatable, high strength.

KAISER 52 S
M-1147; 2.5 Mg, 0.25 Cr, bal Al.
S 0-temper: 28,000 TS; 12,000 YS; 25 El.
S 14-temper 37,000 TS; 31,000 YS; 10 El
S 18-temper: 41,000 TS, 36,000 YS, 7 El
For fan blades, pressure vessels; strain hardenable.

KAISER 61 S
M-1147; 1 Mg, 0.25 Cu, 1 Si, 0.25 Cr, bal Al.
O-temper: 18,000 TS; 8000 YS, 22 El.
T 4-temper: 35,000 TS; 22,000 YS; 20 El
T 6-temper: 47,000 TS; 41,000 YS; 12 El.
For boats, containers, structures; heat treatable, good formability.

KAISER 75 S
M-1147; 5.6 Zn, 2.5 Mg, 1.6 Cu, 0.3 Cr, bal Al
O temper: 33,000 TS; 15,000 YS; 17 El.
T-6 temper: 82,000 TS; 72,000 YS; 11 El
For aircraft structures; heat treatable, high strength

KAISER Mo-B STEEL.
M-1148; 0.15 max C, 0.001 min B, 0.4-0.6 Mo, 0.6 max Mn, bal Fe.
Hot rolled: 75,000 TS; 65,000 YS; 15 El; 50 RA.
For conveyor and crane buckets, jet engine components; low alloy, high strength

KALCHOIDS.
Cu-Sn-Zn.
For bearings

KALIF METAL.
M-42, M-262; 70 Cu, 30 Pb, steel backed Pb-Cu mixture.
10,000 TS; 6 El; 25 Brin.
For bearings, wrist pin bushings; steel backed bearings.

KALKOS.
M-73; 0.3 C, 0.35 Mn, 12 Cr, 12 W, 0.9 V, 0.5 Si, bal Fe
For hot forming and working tools; hot work steel.

"K" ALLOY.
Eng.; 11.3 Cu, 1.1 Mn, 0.5 Mg, 0.79 Si, bal Al.
For light alloy parts; leak-proof castings.

KALOR.
M-111; 0.3 C, 1.25 Cr, 4.25 Ni, 5.5 W, 0.15 V, bal Fe.
For extrusions, dies, rams and liners; hot work steel, oil hardened.

KALOR 2.
M-111; 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For extrusion press dies, liners and rams, punches; oil hardened, tough.

KAMARSCH BEARING.
85 Sn, 5 Sb, 3.6 Cu, 1.6 Bi, 1.4 Zn.
For bearings; anti-friction.

KAMARSCH BEARING
71 Sn, 7.2 Sb, 21 Cu.
For bearings; anti-friction.

KAMARSCH BEARING.
71 Sn, 20 Sb, 9.5 Cu.
For bearings; anti-friction.

KANTHAL "A."
M-70; 23 4 Cr, 6.2 Al, 1.9 Co, 0 06 C, bal Fe.
Annealed: 106,000-114,000 TS; 80,000 YS; 20 El; 65 RA; 230 Brin.
For heating elements, furnaces; resists oxidation to 1300°C.

KANTHAL "A-1."
M-70; 0.06 C, 23 Cr, 2 Co, 5.7 Al, 69 Fe.
Annealed: 114,000 TS, 80,000 YS; 20 El; 65 RA; 230 Brin
For heating elements, furnaces, heat resistant, non-scaling

KANTHAL "D"
M-70; 0 09 C, 22.6 Cr, 2 Co, 4.5 Al, bal Fe
Annealed. 104,000 TS, 80,000 YS; 20 El, 65 RA; 200 Brin.
For heating elements; heat resistant, tough; 1350°C max.

KANTHAL DL
M-1150, 4 5 Al, 22 Cr, 0 5 Co, bal Fe.
For toaster heating elements.
Corrosion and heat resistant.
Max operating temperature 2200°F.

KANTHAL DR
M-70, 20 Cr, 4 5 Al, 0 5 Co, bal Fe
Annealed. 100,000-140,000 TS; 3-12 El.
For resistors, potentiometers, high electrical resistance.

KANTHAL DR
M-1150, 29 Ni, 17 Co, bal Fe.
For heating elements, high heat resistance.

KANTHAL-DS.
M-1150, M-70, 4 5 Al, 22 Cr, 5 Co + Ta, bal Fe
For resistance and heating elements in appliances and furnaces, toasters.
Max. operating temperature 2100°F.

KANTHAL SUPER.
M-1150; Mo Si_2, + SiO_2.
Cermet, 1200 Vickers, for heating and resistance elements.
At 1500°C. TS = 145.

KAPO.
M-335; 2.2 C, 12 Cr, 1 V, bal Fe
Hardened: C 60-66 Rock.
For blanking and forming dies, burnishing tools and rolls, plug gauges, slitting cutters, drawing dies.
Type D3 oil hardening cold work steel, deep hardening, abrasion resistant.

KARABUK.
M-Turkey; 0.12-0.65 C, 0.35-0.85 Mn, 0.15-1.0 Si, bal Fe.
For structures, rails, gears, shafts, machinery parts. Constructional steel.

KARMA.
M-44; 20 Cr, 3 Al, 3 Fe, bal Ni.
Heat treated: 150,000 TS; 35 El.
For resistances, shunts, potentiometers; high specific resistance; vacuum melted.

KARONI 8-18.
M-1310; 0.15 max C, 18 Cr, 8.5 Ni, 0.4 Si, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks, mixers, filters; stainless, austenitic, Type 302.

KARONI 8-18 EXTRA.
M-1310; 0 12 max C, 18 Cr, 19.5 Ni, Ti = 4 × C, bal Fe.
For welded chemical plant equipment; corrosion and heat resistant.

KARONI 8-18 SU.
M-1310; 0 07 max C, 0.4 Si, 18 Cr, 9.5 Ni, bal Fe.
Annealed. 85,000 TS; 35,000 YS, 60 El; 70 RA; 150 Brin
Cold drawn: 180,000 TS, 125,000 YS, 10 El; 330 Brin
For welded chemical plant equipment; Type 304; stainless, austenitic.

KARONI 10-18 Mo.
M-1310, 0 10 max C, 18 Cr, 9.5 Ni, 2 Mo, 2 2 Si, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin
Cold drawn 150,000 TS, 135,000 YS; 6 El, 300 Brin.
For acid resistant chemical plant equipment; Type 316, stainless, austenitic.

KARONI 10-18 MoCu EXTRA
M-1310; 0 07 max C, 0.4 Si, 17 5 Ni, 17.5 Cr, 2 Cu, Ti = 7 × C, 2 Mo, bal Fe.
For valves, pumps, chemical plant equipment; corrosion and heat resistant.

KARONI 10-18 Mo EXTRA.
M 1310, 0 12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed 90,000 TS; 40,000 YS; 45 El, 60 RA; 180 Brin.
For welded chemical plant equipment, Type 316 Ti; corrosion resistant

KARONI 10-18 Mo SU.
M-1310; 0 07 max C, 18 Cr, 10 5 Ni, 2 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

KARONI 12-12 SU.
M-1310; 0 10 max C, 12 5 Cr, 12 Ni, bal Fe.
For valves, pumps, turbine parts; corrosion and heat resistant.

KARONI 13-17 Mo SU.
M-1310; 0.07 max C, 17 Cr, 13 Ni, 4.75 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment; Type 317; stainless, austenitic.

KARONI 17-17 MoCu EXTRA.
M-1310; 0.07 max C, 17.5 Cr, 17.5 Ni, 2 Mo, 2 Cu, Ti = 7 × C, bal Fe.
For valves, pumps, turbine parts; corrosion resistant.

KARONI 20-13.
M-1310; 0.12 max C, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For pumps, valves, turbine and jet parts; Type 310; corrosion resistant.

KARONI 20-13S.
M-1310; 0.12 max C, 13 Cr, 0.2 S, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For screw machine products, shafts, cutlery; Type 410F; corrosion resistant.

KARONI 20-16.
M-1310; 0.08 C, 17 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For furnace parts, heat treating boxes, baffles; Type 430; corrosion resistant.

KARONI 20-16 MoS.
M-1310; 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For screw machine products, shafts; Type 430F; corrosion resistant.

KARONI 40-13.
M-1310; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For turbine blades, cutlery, valves, knives;
Type 420; corrosion resistant.

KARONI 40.13 Mo.
M-1310; 0.20 C, 13 Cr, 1.2 Mo, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; 55 RA; B 92 Rock.
Heat treated: 240,000 TS; 200,000 YS; 9 El; 26 RA; C 50 Rock.
For cutlery, knives, surgical instruments, oil refinery and chemical plant equipment.
Corrosion resistant, hardenable.

KARONI 40-17.
M-1310; 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
Cold drawn: 130,000 TS; 110,000 YS; 15 El; 35 RA; 270 Brin.
For marine hardware, valves, pumps; Type 431; corrosion resistant.

KARONI 70-16 Mo.
M-1310; 0.35 C, 0.4 Si, 16.5 Cr, 1.15 Mo, bal Fe.
For chemical plant equipment, valves, pumps; corrosion resistant.

KARONI 80-13.
M-1310; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, cutlery, valves; Type 420; stainless.

KARONI 80-13 EXTRA.
M-1310; 0.85 C, Cr, V, bal Fe.
For bearings, liners; water hardened.

KARONI 210-15 Mo.
M-1310; 1.1 C, Cr, Mo, S, bal Fe.
For bearings, liners, sleeves; water hardened.

KASLE KA-2.
M-1701; 1.0 C, 0.7 Mn, 0.3 Si, 5.25 Cr, 0.3 V, 1.1 Mo, bal Fe.
(Also available in free-machining grade).
Type A2 air hardening tool steel.

KASLE KA-6.
M-1701; 0.7 C, 2.1 Mn, 0.3 Si, 1.0 Cr, 1.3 Mo, bal Fe.
Type A6 air hardening tool steel.

KASLE KA8-2H.
M-1701; 0.50 C, 0.3 Mn, 1.0 Si, 5.0 Cr, 1.4 V, W (optional), 1.35 Mo, bal Fe.
Type A8 air hardening tool steel.

KASLE KA-9.
M-1701; 0.5 C, 0.35 Mn, 0.3 Si, 5.0 Cr, 1.5 Ni, 1.0 V, 1.4 Mo, bal Fe.
Type A9 air hardening tool steel.

KASLE KD-2.
M-1701; 1.55 C, 0.3 Mn, 0.3 Si, 12.0 Cr, 0.9 V, 0.8 Mo, bal Fe.
Air or oil hardening high carbon, high chromium cold work tool steel. AISI D2.

KASLE KD-3.
M-1701; 2.0 C, 0.3 Mn, 0.4 Si, 12.0 Cr, bal Fe.
Air or oil hardening high carbon, high chromium cold work tool steel. AISI D3.

KASLE KD-5.
M-1701; 1.5 C, 0.4 Mn, 0.4 Si, 12.5 Cr, 0.5 Ni, 0.5 V, 0.85 Mo, 3.3 Co, bal Fe.
Air or oil hardening high carbon, high chromium cold work tool steel. AISI D5.

KASLE KD-6.
M-1701; 2.1 C, 12.5 Cr, 0.15 V, 1.3 W, bal Fe.
Air or oil hardening high carbon, high chromium cold work tool steel; AISI D6.

KASLE KD-7.
M-1701; 2.4 C, 0.4 Mn, 0.4 Si, 12.5 Cr, 4.0 V, 1.1 Mo, bal Fe.
Air or oil hardening high carbon, high chromium cold work tool steel. AISI D7.

KASLE KF-2
M-1701; 1.3 C, 0.28 Mn, 3.5 W, bal Fe.
Special purpose tool steel. AISI F2.

KASLE KH-11
M-1701; 0.35 C, 0.4 Mn, 1.0 Si, 5.0 Cr, 0.4 V, 1.5 Mo, bal Fe.
Air or oil hardening hot work tool steel, chromium type AISI H11.

KASLE KH-12.
M-1701; 0.36 C, 0.4 Mn, 1.1 Si, 5.0 Cr, 0.35 V, 1.3 W, 1.5 Mo, bal Fe.
Air or oil hardening hot work tool steel, chromium type AISI H12.

KASLE KH-13.
M-1701; 0.40 C, 0.4 Mn, 1.1 Si, 5.0 Cr, 1.1 V, 1.3 Mo, bal Fe.
Air or oil hardening hot work tool steel, chromium type. AISI H13.

KASLE KH-19.
M-1701; 0.40 C, 0.3 Mn, 0.3 Si, 4.25 Cr, 2.2 V, 4.25 W, 0.4 Mo, 4.25 Co, bal Fe.
Air or oil hardening hot work tool steel, chromium type (Cr-V-W-Co). AISI H19.

KASLE KH-21.
M-1701; 0.30 C, 0.3 Mn, 0.4 Si, 3.5 Cr, 0.35 V, 9.0 W, bal Fe.
Air or oil hardening hot work tool steel, tungsten type. AISI H21.

KASLE KH-26.
M-1701; 0.55 C, 0.3 Mn, 0.25 Si, 4.0 Cr, 1.1 V, 18.0 W, bal Fe.
Air or oil hardening hot work tool steel, tungsten type. AISI H26.

KASLE KHD.
M-1701; C as desired, 0.25 Mn, 0.25 Si, 0.015 max P, 0.015 max S, bal Fe.
Type W1 water hardening tool steel.

KASLE KM-1.
M-1701; 0.85 C, 4.0 Cr, 1.35 V, 1.9 W, 9.0 Mo, bal Fe.
High speed tool steel, molybdenum type. AISI M1.

KASLE KM-2.
M-1701; 0.85 C, 4.0 Cr, 2.0 V, 6.5 W, 5.0 Mo, bal Fe.
High speed tool steel, Mo-W type. AISI M2.

KASLE KM-2C.
M-1701; 1.0 C, 4.0 Cr, 2.0 V, 6.5 W, 5.0 Mo, bal Fe.
High speed tool steel, Mo-W type. AISI M2.

KASLE KM-3.
M-1701, 1.05 C, 4.0 Cr, 2.6 V, 6.0 W, 5.75 Mo, bal Fe.
High speed tool steel, Mo-W type.
AISI M3 (Class 1).

KASLE KM-3H.
M-1701; 1.2 C, 4.0 Cr, 3.25 V, 6.25 W, 6.25 Mo, bal Fe.
High speed tool steel, Mo-W type.
AISI M3 (Class 2).

KASLE KM-4
M-1701; 1.3 C, 4.0 Cr, 4.0 V, 5.5 W, 4.5 Mo, bal Fe
High speed tool steel, molybdenum type (Mo-Cr-V-W). AISI M4

KASLE KM-7.
M-1701; 1.0 C, 4.0 Cr, 2.0 V, 1.75 W, 8.75 Mo, bal Fe.
High speed tool steel, molybdenum type.
AISI M7.

KASLE KM-10.
M-1701, 0.87 C, 4.0 Cr, 2.0 V, 8.0 Mo, bal Fe.
High speed tool steel, molybdenum type.
AISI M10.

KASLE KM-35.
M-1701; 0.83 C, 4.25 Cr, 1.9 V, 6.4 W, 5.0 Mo, 5.0 Co, bal Fe.
High speed tool steel, molybdenum type, (Mo-Cr-W-Co). AISI M35.

KASLE KM-42.
M-1701; 1.08 C, 4.0 Cr, 1.15 V, 1.55 W, 9.7 Mo, 8.0 Co, bal Fe.
High speed tool steel, Mo-Co type.
AISI M42.

KASLE KM-50.
M-1701; 0.80 C, 4.0 Cr, 1.0 V, 4.5 Mo, bal Fe.
High speed tool steel, molybdenum type.
AISI M50.

KASLE KNL.
M-1701; 1.7 C, 12.0 Cr, 1.0 V, 0.5 W, 0.6 Mo, bal Fe.
Air or oil hardening high carbon, high chromium tool steel.

KASLE KO-1.
M-1701; 0.95 C, 1.20 Mn, 0.3 Si, 0.5 Cr, 0.2 V, 0.5 W, bal Fe.
Type O1 oil hardening tool steel.

KASLE KO-2.
M-1701; 0.90 C, 1.7 Mn, 0.25 Si, 0.4 Cr, 0.15 V, bal Fe.
Type O2 oil hardening tool steel.

KASLE KO-6.
M-1701; 1.45 C, 0.75 Mn, 1.15 Si, 0.25 max Cr, 0.25 Mo, bal Fe.
Type O6 oil hardening tool steel.

KASLE KS-1.
M-1701; 0.50-0.60 C, 0.35 Mn, 0.8 Si, 1.35 Cr, 0.25 V, 2.50 W, bal Fe.
Type S1 shock resisting tool steel.

KASLE KT-1.
M-1701; 0.72 C, 4.3 Cr, 1.1 V, 18.0 W, bal Fe.
High speed tool steel, tungsten type. AISI T1.

KASLE KT-5.
M-1701; 0.76 C, 4.3 Cr, 1.6 V, 18.0 W, 0.9 Mo, 9.5 Co, bal Fe.
High speed tool steel, tungsten-cobalt type. AISI T5.

KASLE KT-15.
M-1701, 1.5 C, 4.0 Cr, 5.0 V, 12.5 W, 5.0 Co, bal Fe
High speed tool steel, tungsten type, (W-Cr-V-Co).
AISI T5.

KASLE KW-1.
M-1701, C as desired, 0.2 Mn, 0.2 Si, 0.020 max P, 0.020 max S, bal Fe.
Type W1 water hardening tool steel.

KASLE KW-2.
M-1701; 1.03 C, 0.25 Mn, 0.23 Si, 0.22 V, bal Fe
Type W2 water hardening tool steel.

KASLE KW-5.
M-1701; 1.1 C, 0.3 Mn, 0.25 Si, 0.5 Cr, bal Fe.
Type W5 water hardening tool steel.

KATADYN SILVER.
German, Ag, Cu.
For jewelry, corrosion resistant.

KAWASAKI-HTP52W.
M-1541; 0.18 max C, 0.8-1.4 Mn, 0.3-0.5 Si, 0.30 max Cu, bal Fe.
Rolled: 74,000 min TS; 47,000 min YP; 16 min El.
For railroad and mine cars, derricks, agricultural equipment, structures.
Constructional steel, tough

KAWASAKI-KO.
M-1541; 0.1-0.2 C, 0.6-1.0 Mn, 0.15-0.50 Cu, 0.7-1.0 Ni, 0.4-0.8 Cr, 0.4-0.6 Mo, 0.03-0.10 V, 0.002-0.006 B, bal Fe
Heat treated. 114,000-135,000 TS; 100,000 min YP; 18 min El.
For railroad and mine cars, derricks, agricultural equipment.
High-strength, low alloy construction steel, good fabricability and weldability.

KAWASAKI NTK-M7.
M-1577; 0.06 max C, 9-11 Cr, 16-18 Ni, 6-8 Mo, bal Fe.
Hot rolled: 105,000 TS; 86,000 YS; 34 El; 44 RA.
Annealed: 78,000 TS; 35,000 YS; 59 El; 61 RA.
For valve and pump parts, impellers.
Corrosion and heat resistant.

KAWASAKI-QT60A.
M-1541; 0.12 max C, 0.6-1.0 Mn, 0.4 max Cu, 0.4-0.7 Ni, 0.4-0.7 Cr, 0.2 max Mo, 0.3-0.6 V, bal Fe.
Heat treated: 85,000 min TS; 68,000 min YP; 16% min El.
For railroad and mine cars, derricks, agricultural equipment.
High-strength low-alloy constructional steel.

KAWASAKI-QT60B.
M-1541; 0.12 max C, 1.1-1.5 Mn, 0.35-0.55 Si, 0.3 max Cu, bal Fe.
Heat treated: 85,000 min TS; 65,000 min YP; 16 min El.
For railroad and mine cars, derricks, agricultural equipment, structures, buildings.
Constructional steel, tough.

KAY-BRUNNER NIRESIST.
M-572; 2.3 T.C., 12-15 Ni, 5-7 Cu, Cr, Mn, Si, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

KAYEM-1.
French; Al, Cu, bal Zn.
For die castings.

KAYEM-2.
French; Al, Cu, bal Zn.
For die castings

K.C.M. NICKEL BRONZE.
M-1518; Ni, Sn, bal Cu.
Cast: 33,600 TS; 10-15 El, 100-120 Brin.
For slip rings for electrical motors; high conductivity.

"K.D" NO. 6.
M-344; C, Co, W, bal Fe.
For high speed lathe tools, twist drills, reamers; high speed steel.

"K.D." NO. 10.
M-344; C, W, Co, bal Fe.
For high speed lathe tools, twist drills, reamers; high speed steel.

K.D. NO 16
M-344; 0 7 C, 4 5 Cr, 10 Co, 2.2 V, 16 W, 1.5 Mo, bal Fe
For reamers, drills, broaches, taps, hobs; high speed steel, oil hardened.

K.E.4L.
M-510; high C, high Cr, bal Fe.
For springs; oil hardened.

K.E.15.
M-510; 0.07-0.10 C, 13 Cr, bal Fe.
Annealed: 78,400 TS; 54,000 YS; 35 El; 70 RA; 152 Brin.
Heat treated: 123,000 TS, 105,000 YS, 25 El; 65 RA; 255 Brin.
For cutlery, stainless parts; stainless, martensitic.

K.E.25.
M-510; 0.25 C, 13 Cr, bal Fe.
Heat treated: 101,000-123,000 TS; 20 El; 201-255 Brin.
For cutlery, stainless parts; stainless, martensitic.

K.E.35.
M-510; 0.35 C, 13 Cr, bal Fe.
Heat treated: 99,000-274,000 TS; 68,000-242,000 YS; 30-9 El; 61-30 RA; 197-532 Brin.
For cutlery, valves, surgical instruments; stainless, martensitic.

K.E.37D.
M-510; C, Ni, Cr, Mo, bal Fe.
Heat treated: 157,000-168,000 TS; 141,000-153,100 YS; 20-18 El; 55-50 RA; 321-351 Brin.
For shafts, gears, bolts; oil or air hardened, tough.

K.E. 40.A.
M-510; 0.10 C, 12.5 Cr, Se, bal Fe.
Free cutting martensitic corrosion resistant steel, hardenable; for pump shafts, hardware, fasteners, gears, axles.

K.E.40AM
M-510; 0 10 C, 12-14 Cr, S, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin
For screw machine products, pinions, shafts; stainless, free-cutting.

K.E 41.
M-510; 0.12 C, 4 5 Ni, 1.35 Cr, 0.2 Mo, bal Fe.
Ht. Tr.: 179,000-202,000 TS, 13-17 El; 40-50 RA; 375-390 Brin
For gears, pinions, shafts, counter-shafts.
Case hardening, shock resistant

K.E 43.
M-510; 0 15 C, 13 Cr, bal Fe.
Heat treated: 123,000-145,000 TS; 15 El, 248-321 Brin
For valves, cutlery, surgical instruments; stainless, hardenable

K E 127.
M-510; 0 12 C, 0.95 Cr, 3 25 Ni, 0 2 Mo, bal Fe.
For molds.
Type P6 case hardening tool steel.

K E 144
M-510; C, alloy, bal Fe
For pneumatic chipping chisels; water hardened.

K E.156.
M-510, C, alloy, bal Fe
For cold drawing and swaging dies; water hardened

K E 160
M-510; 1.05 C, 0 45 Mn, 0 45 Cr, bal Fe
High carbon water hardening steel for collets.
For taps, drills, reamers

K E 169
M 510; 0 14 C, 0.85 Cr, 3.4 Ni, 0 15 Mo, bal Fe.
Nickel-chrome-moly case hardening steel.
Core hardenable to 135,000-157,000 TS
For gears, spline shafts, axles, plastic mold dies

K E. 200
M-510, 1 4 C, 13 0 Cr, 0.60 Mo, 3.5 Co, bal Fe.
Cobalt chrome alloy tool steel; air hardening
For knurling and heading dies, press tools.

K E 226
M-510, 1 05 C, 0 50 Cr, 2.1 W, bal Fe.
Tungsten water hardening tool steel.
For taps, drills, reamers, punches.

K.E.232.
M-510; C, Cr, bal Fe
For valves; stainless, oxidation resistant.

KE-241.
M-510; 0 55 C, 3 Si, 8.5 Cr, 2 W, bal Fe.
For valves for water cooled engines; resists scaling to 1000°C.

K.E. 275.
M-510; 0.4 C, 0.7 Si, 3.0 Cr, 9.5 W, 0.4 Mo, 0.5 V, bal Fe.
For die casting dies, hot work tools.
Oil hardening shock resistant, hot work steel. AISI H21.

K.E.287.
M-510; 0.12 C, 3 Ni, bal Fe.
Heat treated. 100,000-150,000 TS; 25-17 El; 55-45 RA; 235-286 Brin.
For gears, pinions, worms, shafts; case hardened, shock resistant.

K.E.332.
M-510; C, Cr, bal Fe.
Annealed: 98,500 TS; 56,000 YS; 20 El; 35 RA; 196 Brin.
For valves; oxidation resistant.

K.E. 339.
M-510; 0.25 C, 3.0 Cr, 2.2 Ni, 9.5 W, 0.4 Mo, 0.5 V, bal Fe
For die casting dies, hot working tools.
Oil hardened, shock resistant; hot work steel.

K.E.354
M-510; C, Cr, bal Fe.
Normalized: 112,000-135,000 TS, 67,000 YS, 30-20 El; 45-35 RA; 207-272 Brin.
For valves, corrosion resistant parts; heat resistant.

K.E. 355
M-510, 0.32 C, 1.2 Cr, 4.1 Ni, 0.2 Mo, bal Fe.
For plastic mold dies
Oil or air hardening, tough and strong

K.E 396
M-510, 0.63 C, 1.0 Cr, 1.45 Ni, 0.20 Mo, bal Fe
Nickel-chrome-moly oil hardening tool steel. AISI L6
For blanking and forming dies, shear blades

K.E 484
M-510; 0.4 C, Ni, Cr, Mo, bal Fe.
For piercing and stamping dies, shears die bolsters, hot work steel, oil hardened

K.E 581
M-510; C, bal Fe.
Rolled 67,000 TS.
For screw machine products; free-cutting.

K.E. 595
M-510, 1.25 C, 0.85 Mn, 1.2 Cr, 1.3 W, bal Fe.
Oil hardening alloy tool steel, for cold drawing and swaging dies, oil or water hardening.

K.E 621
M-510; 1.0 C, bal Fe.
For press tools, drills, reamers, general tools; water hardened.

K.E. 637.
M-510, 1.05 C, 1.7 Mn, 0.25 W, bal Fe
Ht Tr 250,000 TS, 225,000 YS, 8 El; C 50 Rock
For gages, tools, taps, punches, reamers, forming dies, crimpers, broaches, blanking dies.
Type O1 oil hardening, non-deforming tool steel, shock resistant.

K.E. 660.
M-510; 0.12 C, 5.0 Ni, 0.3 Cr, 0.2 Mo, bal Fe.
Ht Tr. 139,000-162,000 TS; 14-18 El; 40-50 RA; 310-340 Brin.
For gears, fasteners, cam shafts, cams, bolts.
Case hardening, shock resistant.

K.E. 672.
M-510; 0.95 C, 1.2 Mn, 0.55 Cr, 0.65 W, 0.15 V, bal Fe.
Oil hardening alloy tool steel. AISI O1.
For press and blanking tools.

K.E.708.
M-510; C, alloy, bal Fe.
For cold drawing and swaging dies; water hardened.

K.E 753.
M-510; 1 C, 1.25 W, bal Fe
For taps, drills, reamers, threading dies; water hardened.

K.E.795.
M-510; 0.9 C, W, bal Fe.
For high temperature springs; oil or air hardened.

KE798.
M-510; 1.0 C, 0.6 Mn, 1.5 Cr, 0.5 W, bal Fe.
For tools, dies, cutters; oil hardened.

K.E. 805.
M-510; 0.38 C, 1 Cr, 1.5 Ni, 0.2 Mo, bal Fe.
Ht Tr.: 121,000-280,000 TS; 90,000-246,000 YS; 10-26 El; 35-68 RA; 250-515 Brin.
For gears, machinery parts, shafts, machinery tools, fasteners.
Oil hardening, wear resistant.

K.E. 839
M-510; 1.05 C, 0.50 Mn, 1.4 Cr, bal Fe.
Oil hardening alloy tool steel; for ball bearings, cutters, gages, taps, swaging dies, shear blades.
AISI L1.

KE881
M-510; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, drills, taps, hobs, reamers, high speed steel; Type T1.

K.E 896.
M-510, 0.5 C, 0.65 Mn, 1.1 Cr, 0.2 V, bal Fe.
For arbors, axles, boring bars, connecting rods.
Type L2 tool steel, oil hardening, shock resistant.

K.E 897
M-510; 0.3 C, 1.25 Cr, 4.25 Ni, 0.2 Mo, bal Fe.
Ht. Tr. 224,000-270,000 TS; 10-14 El, 30-45 RA; 444-512 Brin
For gears, shafts, bolts, fasteners.
Oil hardening, shock resisting.

K.E 933
M-510; 1.25 C, 1 W, 0.5 Cr, bal Fe
For taps, drills, reamers, punches; water hardened.

K.E.-954
M-510; C, Co, Cr, bal Fe
Air hardened: 600-627 Brin.
For valves for air-cooled engines; air-hardened.

K.E 960
M-510; 0.50 C, 0.65 Si, 1.5 Cr, 2.25 W, 0.20 V, bal Fe
Extra tough alloy oil hardening tool steel.
For shear blades, pneumatic tools, stamping and riveting tools. AISI S1.

K.E.961
M-510; 1.5 C, 12 Cr, bal Fe.
For plastic mold dies, hot and cold shears; oil or air hardened, resists abrasion.

K.E. 965.
M-510; 0.4 C, 13 Cr, 13 Ni, 3 W, 1.5 Si.
Heat treated. 152,000 TS; 27 El; 49 RA; 269 Brin.
For valves, supercharger buckets; non-distorting.

K.E. 970.
M-510, 2.1 C, 13.5 Cr, 0.5 W, bal Fe.
Chrome high duty tool steel; for plug and ring gages, punches, lamination and blanking dies.
AISI D3.

K.E. 1006.
M-510; 1.05 C, 0.20 Si, 0.20 Mn, 0.15 V, bal Fe.
Water hardening tool steel, soft center steel for cold heading dies. AISI W2.

K.E. 1029.
M-510; C, Si, Cr, bal Fe.
For valves; air hardened, heat resistant.

K.E. 1036.
M-510; 0.90 C, 13 Cr, bal Fe.
For sleeves, burners, atomizers, gas turbine parts.
Type 440 B stainless, hardenable, martensitic, wear resistant.

KE-2258.
M-510; 0.7 C, 0.5 Si, 0.4 Mn, 8 Cr, bal Fe.
For valves for internal combustion engines; heat resistant.

K.E.2301.
M-510; 0.12 C, bal Fe.
Heat treated: 72,000-90,000 TS; 35-40 El; 65-55 RA; 156-170 Brin.
For gears, pinions, shafts, worms; case hardened.

K.E.A. 23.
M-510; 0.07 C, 18.0 Cr, 9.0 Ni, Ti, bal Fe.
Weldable austenitic stainless; for welded structures and for operation at elevated temperatures.

K.E.A. 28.
M-510, 0.45 C, 13.25 Cr, 1.0 Ni, bal Fe.
Martensitic corrosion resistant steel, hardenable.
For plastic molds.

K.E.A. 108.
M-510; 1.0 C, 0 55 Mn, bal Fe, plus free cutting agent.
Free cutting water hardening carbon tool steel.

K.E A. 138.
M-510; 0.35 C, 12.0 Cr, 12.0 W, 1.0 V, bal Fe.
Chrome-Tungsten hot work tool steel.
For pressure die casting dies, extrusion dies, punches. AISI H23.

K.E.A. 145.
M-510; 0.38 C, 1.05 Si, 5 25 Cr, 1.35 Mo, 1.0 V, bal Fe
5% Chrome-Vanadium-Moly die casting steel.
For die casting dies, extrusion dies, hot piercing and gripping dies. AISI H13.

K.E.A. 147.
M-510; 1.5 C, 12 Cr, 1 V, bal Fe.
Ht. Tr.. 445,000 CS; C64-66 Rock.
For blanking and forming dies, plug gauges, broaches, hobs
Oil or air hardening, non-deforming. Type D2 tool steel.

K.E.A. 162.
M-510; 1.0 C, 0.65 Mn, 5.25 Cr, 1.0 Mo, 0.20 V, bal Fe.
Air hardening tool steel. AISI A2.

K.E.A. 172.
M-510; 0.70 C, 0 30 Si, 2.0 Mn, 1.0 Cr, 0.45 Mo, bal Fe.
Air hardening tool steel. AISI A6.

K.E.A. 180.
M-510; 1.55 C, 12.0 Cr, 0.85 Mo, 0.30 V, bal Fe.
High duty tool steel, air hardening. AISI D2.

K.E.A. 203.
M-510; 0.85 C, 17.5 Cr, 0.55 Mo, bal Fe.
Heat treated: 280,000 TS; 270,000 YS; 3 El, 555 Brin.
Annealed: 107,000 TS; 62,000 YS; 18 El; 220 Brin.
For dental and surgical instruments, bearings, pivots, cutlery, valve parts.
Type 440 B, hardenable, corrosion and wear resistant.

K.E.A. 205.
M-510; 1.4 C, 0.3 Si, 0.4 Mn, 3.45 V, bal Fe.
Cold heading punch and die steel.
For dies, punches, headers.

K.E.A. 207.
M-510; 1.05 C, 17 Cr, 0.6 Mo, bal Fe.
Annealed: 110,000 TS, 70,000 YS; 15 El; B97 Rock.
Heat treated: 285,000 TS; 275,000 YS; 2 El; 580 Brin.
For bearings, surgical instruments, valve parts, nozzles, pivot pins.
Type 440 C, hardenable, corrosion and wear resistant

K.E.A. 221.
M-510; 0.09 C, 18.5 Cr, 10 5 Ni, 2 7 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 50 El; 165 Brin.
Cold Rolled: 150,000 TS; 135,000 YS, 6 El; C32 Rock.
For chemical and pharmaceutical equipment, digesters, valve trim, tanks.
AISI 316, stainless, austenitic, acid resistant

K.E.A 227
M-510; 0 50 C, 1.2 Mn, 0.65 Cr, 0.20 Mo, bal Fe.
Easy machining bolster steel
For molds, press components.

K E A. 231
M-510, 0 7 C, 18.25 Cr, 8.5 Ni, bal Fe.
Annealed. 85,000 TS; 35,000 YS, 60 El; 150 Brin.
Cold Drawn· 180,000 TS; 125,000 YS; 10 El; C35 Rock
For architectural trim, welded structures, kitchen equipment, chemical and textile plant equipment
Type 304, austenitic, stainless.

K E A 505
M-510, 0 17 C, 17 Cr, 1.75 Ni, Se, bal Fe
Annealed 125,000 TS, 95,000 YS, 20 El, 260 Brin.
Cold Drawn: 130,000 TS, 110,000 YS, 15 El; 270 Brin.
For marine hardware, pump shafts, valve trim, aircraft structural components.
AISI 431 Se, corrosion resistant, free cutting.

K.E.A 507
M-510; 0.09 C, 18 0 Cr, 8.5 Ni, Se, bal Fe
Free cutting austenitic stainless steel.
For stainless parts requiring appreciable machining AISI 303 Se

K.E.A. 508.
M-510, 0.20 C, 13 Cr, Se, bal Fe.
Annealed 95,000 TS; 50,000 YS; 25 El; 196 Brin.
Cold Drawn. 105,000 TS, 85,000 YS, 17 El; 215 Brin.
For cutlery, marine hardware, valve trim, gears, ball bearings, gauges.
AISI 420 Se, corrosion resistant. Heat treatable. Free-cutting.

K.E.A. 521.
M-510; 0.07 C, 18.0 Cr, 11.5 Ni, 2.65 Mo, Se, bal Fe.
Free machining austenitic stainless steel with very good corrosion resistance.
For machined parts in food, beverage, laundry plants. AISI 316 Se.

K.E. CARLISLE
M-510; 1.0 C, bal Fe.
For taps, drills, reamers, general tools; water hardened.

K.E. DIAMOND.
M-510; 1.1 C, bal Fe.
For taps, drills, reamers, general tools; water hardened.

K.E. DIAMOND NO. 10.
M-510; 1.5 C, 0.40 Mn, 0.60 Cr, 5.75 W, bal Fe.
High carbon tungsten alloy tool steel.
For reamer blades, roll turning tools, form cutters; water hardenable.

KEENE'S ALLOY.
75 Cu, 16 Ni, 2.8 Sn, 2 3 Zn, 2 Co, 1.5 Fe, 0.5 Al.
For corrosion resistant and ornamental parts; corrosion resistant.

KEEN-KUT.
M-15; C, alloy, bal Fe
For hollow drills; non-tempering.

KEEWATIN.
M-435; 0.90 C, 1 Mn, 0.5 Cr, 0.5 W, bal Fe.
For dies, cutters, punches, reamers, broaches; Type 01; oil hardened, non-deforming

K.E EXTRA QUALITY.
M-510; 1.1 C, bal Fe.
For taps, drills, reamers, general tools; water hardened.

K.E. H22.
M-510, 0 1 C, 18 Cr, 8 Ni, bal Fe
Rolled· 123,000 TS; 56,000 YS; 52 El; 57 RA; 228 Brin.
Annealed. 101,000 TS; 42,000 YS; 58 El; 65 RA; 163 Brin.
For chemical plant equipment, stainless, austenitic. AISI Type 302

KEINMAYER'S AMALGAM.
50 Hg, 25 Sn, 25 Zn
For amalgam

K.E KHRS
M-510, 0 4 C, bal Fe.
Rolled 90,000 TS.
For screw machine products, free-cutting

KELCALOY.
M-792, C, alloy, bal Fe
For oil refinery equipment; corrosion resistant.

KEL-CAST MM
M-1163, M-900, 3.25 C, 2.5 Si, 0.7 Mn, 0.3 Cr, 0 4 Mo, bal Fe
Cast· 45,000 TS; 200-220 Brin.
For bushings, cams, gears, valves; cast iron.

KEL-CAST XXX.
M-1163, M-900; 3.6 C, 1.25-1.5 Si, 0 7 Mn, 0.3 Cr, bal Fe.
Cast· 45,000 TS, 200-220 Brin
For bearings, gears, valve seats; cast iron.

KELLY-IRON.
M-900; 3.2 C, 2.0 Si, alloy, bal Fe
For bearings, cams, gears, rolls, valves; cast iron.

KELMET.
70.5-68.0 Cu, 22.5-25.5 Pb, 6.4-6.6 Sn, 0.03 S, 0.03 Zn, 0.04 Ni.
For bearings; heavy duty

KELOCK 237.
M-510; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
Hardened: C64-67 Rock.
For die cores, lathe and planer tools, drills, chasers, reamers, broaches.
Type T1 high-speed steel, high red-hardness.

KELOCK 788.
M-510; 0.7 C, 4 Cr, 13 W, 1 V, 2 Mo, bal Fe.
For tools, dies, cutters, reamers, drills; high speed steel, oil hardened.

KELOCK 795.
M-510; 0.7 C, 14 W, 4 Cr, 0.6 V, bal Fe.
Hardened: C64-67 Rock.
For lathe and planer tools, cutters, hot and cold shear blades, drills, reamers, punches.
High-speed steel, high red-hardness.

KELOCK 873.
M-510; 0.7 C, 4.25 Cr, 18.25 W, 0.75 Mo, 1 V, 5 Co, bal Fe.
Hardened: C64-66 Rock.
For lathe and planer tools, cutters, reamers, broaches, drills, form tools.
Type T4 high-speed steel, high red-hardness.

KELOCK 1014.
M-510; 0.7 C, 6 Cr, 14 W, 0.75 Mo, 1.4 V, bal Fe.
Hardened: C64-67 Rock.
For lathe and planer tools, reamers, chasers, broaches, drills, milling cutters.
High-speed steel, high red-hardness.

KELOCK 1021.
M-510, 0 7 C, 18.2 W, 4 Cr, 0.75 Mo, 1.45 V, 10 Co, bal Fe.
Hardened· C64-67 Rock.
For lathe and planer tools, cutters, reamers, broaches, form cutters.
High-speed steel, Type T5, high red-hardness

KELOCK A72
M-510, 0 87 C, 4.25 Cr, 18.75 W, 0.50 Mo, 1 0 V, 5 5 Co, bal Fe
Hardened· C64-66 Rock.
For engraving tools, high duty turning tools, broaches, milling cutters, hobs
High speed steel, good red-hardness, wear and abrasion resistant.

KELOCK A157
M-510, 0.8 C, 6 W, 4 Cr, 2 V, 5 Mo, bal Fe.
Hardened: C64-67 Rock.
For lathe and planer tools, drills, hobs, reamers, taps, milling cutters.
High-speed steel, high red-hardness. AISI M2

KELOCK A229
M-510, 1 05 C, 3 75 Cr, 1.5 W, 9.5 Mo, 1.15 V, 8 25 Co, bal Fe
High speed steel for cutting tools that require extra red hardness AISI M42.

KEMLER
Eng , 76 Zn, 9 Cu, 15 Al.
For ornamental parts

KEMLET
67 Zn, 15 Al, 9 Cu.
For bearings

KEN A-7
M-1700; 2 5 C, 0.7 Mn, 5.0 Cr, 4.5 V, 1 1 Mo, bal Fe.
AISI A7 air hardening tool steel

KEN AIR A-4.
M-1700, 0.95 C, 2.0 Mn, 2.2 Cr, 1.1 Mo (lead added) bal Fe.
AISI A6 air hardening tool steel.

KEN AIR A-6.
M-1700, 0 70 C, 2.0 Mn, 1.0 Cr, 1.3 Mo, bal Fe.
AISI A6 air hardening tool steel.

KEN CHROME D-2
M-1700; 1.5 C, 12.0 Cr, 0.8 V, 0.75 Mo, bal Fe.
Air or oil hardening cold work tool and die steel; AISI D2. High carbon, high chromium type.

KEN CHROME D-3.
M-1700; 2.0 C, 12.0 Cr, bal Fe.
Air or oil hardening cold work tool and die steel; AISI D3. High carbon, high chromium type.

KEN CHROME D-4.
M-1700; 2.25 C, 12.0 Cr, 0.2 V, 1.0 Mo, bal Fe.
Air or oil hardening cold work tool and die steel; AISI D4. High carbon, high chromium type.

KEN-CHROME D-7.
M-1700; 2.4 C, 12.25 Cr, 3.75 V, 1.1 Mo, bal Fe.
Oil or air hardening cold work tool and die steel; AISI D7. High carbon, high chromium type.

KEN DIE A-2.
M-1700; 1.0 C, 0.5 Mn, 0.25 Si, 5.0 Cr, 0.3 V, 1.25 Mo, bal Fe.
Air hardening and cold work tool steel; AISI A2.

KEN F-2.
M-1700; 1.3 C, 0.28 Mn, 3.5 W, bal Fe.
Carbon-tungsten special purpose tool steel; AISI F2.

KEN GRAPH OIL 06.
M-1700; 1.45 C, 0 8 Mn, 1.15 Si, 0.25 Mo, bal Fe
Graphitic type oil hardening cold work tool steel; AISI 06.

KEN H-11.
M-1700; 0 36 C, 0.35 Mn, 4.85 Cr, 0.2 V, 1 5 Mo, bal Fe.
Air or oil hardening hot work tool and die steel, chromium type; AISI H11.

KEN H 12.
M-1700; 0 35 C, 0.35 Mn, 1.0 Si, 5.0 Cr, 0.2 V, 1.15 W, 1.5 Mo, bal Fe.
Air or oil hardening hot work tool and die steel, chromium type; AISI H12.

KEN H 13.
M-1700; 0.40 C, 0 4 Mn, 1.0 Si, 5.0 Cr, 1.0 V, 1.5 Mo, bal Fe.
Air or oil hardening hot work tool and die steel, chromium type; AISI H13.

KEN H 21.
M-1700; 0.30 C, 0.3 Mn, 0 3 Si, 3.0 Cr, 0.3 V, 10.0 W, bal Fe.
Air or oil hardening hot work tool and die steel, tungsten type; AISI H21.

KEN H 24.
M-1700; 0.45 C, 0.3 Mn, 0.3 Si, 3 0 Cr, 0.35 V, 15.0 W, bal Fe.
Air or oil hardening tool and die steel, tungsten type; AISI H24.

KEN H 26.
M-1700; 0.55 C, 4.0 Cr, 1.1 V, 18 0 W, bal Fe.
Air or oil hardening tool and die steel, tungsten type; AISI H26.

KEN H 43.
M-1700; 0.60 C, 3.6 Cr, 1.75 V, 8.5 Mo, bal Fe.
Air or oil hardening tool and die steel, molybdenum type; AISI H43.

KEN L-2.
M-1700; 0.45 C, 0.55 Mn, 0.2 Si, 0.95 Cr, 0.2 V, bal Fe.
Oil hardening special purpose tool steel, low alloy type; AISI L2.

KEN L-6.
M-1700; 0.75 C, 0.75 Mn, 0.90 Cr, 1.75 Ni, 0.35 Mo, bal Fe.
Oil hardening special purpose tool steel, low alloy type; AISI L6.

KEN LUSTRE MOLD.
M-1700; 0.55 C, 1.0 Mn, 0.3 Si, 1.1 Cr, 0.25 Mo, bal Fe.
Oil hardenable tool steel, mainly for molds.

KEN M-1.
M-1700; 0.78 C, 3.8 Cr, 1.15 V, 1.5 W, 8.7 Mo, bal Fe.
High speed tool steel, molybdenum type; AISI M1.

KEN M-2.
M-1700; 0.84 C, 4.2 Cr, 1.95 V, 6.35 W, 5.0 Mo, bal Fe.
High speed tool steel, Mo-W type; AISI M2.

KEN M-3 (Class 1).
M-1700, 1.03 C, 4.0 Cr, 2 5 V, 6.0 W, 5.5 Mo, bal Fe.
High speed tool steel, Mo-W type; AISI M3 Class 1.

KEN M-4.
M-1700; 1.28 C, 4.5 Cr, 4.0 V, 5.5 W, 4.5 Mo, bal Fe.
High speed tool steel, molybdenum type; (Mo-Cr-V-W); AISI M 4

KEN M-41
M-1700; 1 1 C, 4 0 Cr, 6.75 W, 3.75 Mo, 2 0 V, 5 0 Co, bal Fe
High speed tool steel, W-Mo-Co type, AISI M 41.

KENNAMETAL.
M-793, W-Ti-C + Co.
For cutting tools, cemented carbides.

KENNAMETAL 3047.
M-793, WC + Co.
Sintered Rockwell A89.
For large rock bits, drag bits; Tr. Rupture 410,000, sintered carbide.

KENNAMETAL 3109.
M-793, WC, Co, Sintered.
Sintered· 425,000 TrS, A 88 0 Rock
Density· 14 2
For structural wear, impact.

KENNAMETAL 3406.
M-793; WC, Co, sintered
Sintered: 350,000 TrS, A 90.0 Rock.
Density 14.7.
For structural wear, impact.

KENNAMETAL 3411
M-793; WC + Co
Sintered Rockwell A89.
For small rock bits; Tr Rupture 410,000, sintered carbide.

KENNAMETAL K1.
M-793; Sintered carbide tool material.
325,000 TrS, 560,000 C.S
Density 14.1, 90.0 Rock A.
For cutting tools for cast iron, non-ferrous, and non-metallics; edgewear resistant

KENNAMETAL K2S.
M-793; Sintered carbide tool material
275,000 TrS; 680,000 C. S.
Density 12 9; 91 5 Rock A.
For metal cutting, crater and edgeware resistant.

KENNAMETAL K3H.
M-793; 76 WC, 8 Co, 4 TaC, 12 TiC.
Sintered Rockwell A92.
For cutting tools, rock bits, liners; sintered carbides; Tr S.250,000.

KENNAMETAL K4H.
M-793; Sintered carbide tool material.
250,000 TrS; 92.0 Rock A.
640,000 Compressive strength; 12.5 density.
Metal cutting grade, crater and edgewear resistant.

KENNAMETAL K5H.
M-793; Sintered carbide tool material.
Transverse strength: 200,000 psi.

Density: 11.5; Hardness 93 Rock A.
Compressive strength 640,000 psi.
Metal cutting grade, crater resistant.

KENNAMETAL K6.
M-793; Sintered carbide tool material.
250,000 TrS, 670,000 C.S.
Density 14.9; 92.0 Rock A.
For cutting tools for cast iron, wear parts.

KENNAMETAL K7H.
M-793; WC; $W\ Ti\ C_2$, Co.
Sintered: A 93 Rock; 150,000 Tr.S; 560,000 CS.
For cutting tools, dies, lathe and planer tools.
For machining high-speed steels.

KENNAMETAL K8.
M-793; Sintered carbide tool material.
200,000 TrS, 580,000 C.S.
Density 15 1; 92.5 Rock A.
For cutting tools on cast iron and non-metallics; finishing operations, hard and abrasion resistant.

KENNAMETAL K9.
M-793; WC + Co.
Sintered: Rockwell A90.
For coal rotary bits, wood working tools; Tr. Rupture 300,000, sintered carbide

KENNAMETAL K11.
M-793, Sintered carbide tool material
175,000 TrS; 600,000 C.S
Density 15 2, 93 0 Rock A.
For wear parts and metal cutting.

KENNAMETAL K21
M-793, $W\ Ti\ C_2$, TaC, WC, Co
Sintered A91 Rock; 250,000 Tr.S , 670,000 CS
For roughing and finishing cutting tools.
Sintered carbide, shock and wear resistant

KENNAMETAL K45
M-793; WC, Co
Sintered· 250,000 TrS, A 92 5 Rock.
Density· 12 2
For finish cutting operations on steel.

KENNAMETAL K68.
M-793, WC, Co.
Sintered 250,000 TrS; A 92 6 Rock
Density 14 9.
For machining high nickel superalloys

KENNAMETAL K82
M-793; $W\ Ti\ C_2$, WC, Co
Sintered A 90 Rock; 275,000 Tr S, 570,000 CS
For cold drawing dies, burnishing tools.
Sintered carbide. Resists wear and galling.

KENNAMETAL K84.
M-793, $W\ Ti\ C_2$ + WC + Co, sintered material.
300,000 TrS, 650,000 CS, 91.0 Rock A.
For cold drawing dies, wear parts

KENNAMETAL K86.
M-793; $W\ Ti\ C_2$, WC, bal Co.
Sintered· A 91.5 Rock, 250,000 TrS, 610,000 CS.
For cold drawing dies.
Sintered carbides, abrasion resistant.

KENNAMETAL K-90.
M-793; WC + Co.
Rockwell C67.4
For blanking punches, cold heading dies; sintered, shock resistant.

KENNAMETAL K-91.
M-793; WC + Co.
Rockwell C70.
For blanking punches, rivet sets; sintered, shock resistant.

KENNAMETAL K92.
M-793; Sintered carbide tool material.
400,000 TrS; 540,000 C.S.
Density 13.8; 88.5 Rock A.
For lamination dies, forming and blanking dies; wear resistant, moderate shock resistant.

KENNAMETAL K94.
M-793; 12 Co, 60 $W\ Ti\ C_2$, 28 WC.
Sintered· A 91 Rock; 305,000 TrS; 650,000 CS.
For dies, slitting knives, curling rolls.
Sintered carbides, abrasion resistant.

KENNAMETAL K95
M-793; WC + Co, sintered material.
300,000 TrS; 520,000 CS.
Density 14.6; 90.5 Rock A.
For dies, wear parts.

KENNAMETAL K96
M-793, 94 WC, 6 Co.
Sintered. A 92 Rock; 250,000 TrS; 690,000 CS.
For dies, machinery elements, cutters.
Sintered carbide. Wear and abrasion resistant.

KENNAMETAL K151A.
M-793, 20 Ni, bal TiC, TaC, CbC.
Sintered Rockwell A89.
For brass extrusion dies, sintered; C.S. 150,000.

KENNAMETAL K602.
M-793, Sintered carbide tool material.
130,000 TrS, 900,000 C.S.
Density 14 6, 94 3 Rock A.
High hardness, high compression strength and very good wear resistance

KENNAMETAL K701.
M-793, Sintered carbide tool material
150,000 TrS, 680,000 C S.
Density 14 0, 92.0 Rock A.
Cr-Co binder, wear resistant grade

KENNAMETAL K801.
M-793, WC, Ni.
Sintered. 300,000 TrS, A 89.5 Rock.
Density 14 8.
Corrosion and wear resistant

KENNAMETAL KE7
M-793; WC, Co.
For extrusion dies; sintered carbide, wear resistant.

KENNAMETAL KM
M-793; 82 WC; 10 Co, 8 TiC.
Sintered. 300,000 TrS, 640,000 CS,
Density 12 9, 91 0 Rock A.
For cutting tools, crater resistant.

KENNAMETAL KWH.
M-793; $WTiC_2$ + Co
For cutting tools, lathe centers; cemented carbides.

KENNERTIUM W-2.
M-793; Tungsten base heavy metal 97 4 W, 2.6 Ni, Cu, Fe.
110,000 TS; 80,000 YS, 4-8 El, C 27-32 Rock.
Density· 18.5 gm/cc.
For counterweights for aerospace applications; weights for self-winding watches, radar antenna control, radiation shielding, machinable.
Exceeds requirements of MIL-T-21014 Type II Class 4.

KENNERTIUM W-10.
M-793; 7 5 Ni, 2.5 Cu, bal W.
Sintered· 100,000-135,000 TS; 75,000-90,000 YS; 10-25 El; 270-297 Brin.
For radioactive shields, gyroscope rotors, governors, centrifugal clutches; high density, machinable.

KEN OIL O-1.
M-1700; 0.90 C, 1.2 Mn, 0.3 Si, 0.5 Cr, 0.2 V, 0.5 W, bal Fe.
Oil hardening tool steel; AISI O1.

KEN P-2.
M-1700; 0.06 C, 0.3 Mn, 0.15 Si, 0.95 Cr, 0.25 Mo, B, bal Fe.
Low carbon mold steel; to be carburized before hardening; AISI P2.

KEN P-4.
M-1700; 0.07 C, 0.35 Mn, 0.2 Si, 4.5 Cr, 0.5 Mo, bal Fe.
Low carbon mold steel; to be carburized before hardening; AISI P4.

KEN P-6.
M-1700; 0.10 C, 0.5 Mn, 0.25 Si, 1.5 Cr, 3.5 Ni, bal Fe.
Low carbon mold steel; to be carburized before hardening; AISI P6.

KEN P-20.
M-1700; 0.30 C, 0.8 Mn, 0.5 Si, 1.7 Cr, 0.4 Mo, bal Fe.
Oil hardenable mold steel; AISI P20.

KEN PREHARD No. 2.
M-1700; 0.55 C, 1.0 Mn, 0.3 Si, 1.1 Cr, 0.25 Mo, bal Fe.
Oil hardened steel mainly for molds.

KEN S-1.
M-1700; 0.50 C, 0.3 Mn, 1.15 Cr, 0.2 V, 2.4 W, bal Fe.
Oil hardening, shock resisting type tool steel; AISI S1.

KEN S-2.
M-1700; 0.50 C, 0.5 Mn, 0.7 Si, 0.2 V, 0.45 Mo, bal Fe.
Oil or water hardening, shock resisting type tool steel; AISI S2.

KEN S-4.
M-1700; 0.50 C, 0.9 Mn, 0.2 Si, bal Fe.
Water or oil hardening, shock resisting type tool steel; AISI S4.

KEN S-5.
M-1700; 0.52 C, 0.95 Mn, 2.0 Si, 0.15 Cr, 0.2 V, 0.5 Mo, bal Fe.
Water or oil hardening, shock resisting type tool steel; AISI S5.

KENT.
M-1705; 2.15 C, 0.25 Mn, 0.25 Si, 12.0 Cr, 0.8 V, bal Fe.
High carbon, high chromium tool and die steel; air or oil hardening. AISI D3.

KEN T-1.
M-1700; 0.72 C, 4.3 Cr, 1.1 V, 18.0 W, bal Fe.
High speed tool steel, tungsten type;
AISI T1.

KEN T-2.
M-1700; 0.85 C, 4.0 Cr, 2.1 V, 18.5 W, 0.75 Mo, bal Fe.
High speed tool steel, tungsten type.
AISI T2.

KEN T-4.
M-1700; 0.74 C, 4.2 Cr, 1.1 V, 18.5 W, 0.5 max Mo, 5.0 Co, bal Fe.
High speed tool steel, W-Co type; AISI T4.

KEN T-5.
M-1700; 0.78 C, 4.2 Cr, 1.95 V, 18.5 W, 0.70 Mo, 7.9 Co, bal Fe.
High speed tool steel, W-Co type; AISI T5.

KEN T-6.
M-1700; 0.78 C, 4.2 Cr, 1.75 V, 19.5 W, 0.75 Mo, 11.5 Co, bal Fe.
High speed tool steel, tungsten-cobalt type;
AISI T6.

KEN T-8.
M-1700; 0.79 C, 4.0 Cr, 2.0 V, 14.0 W, 0.75 Mo, 5.0 Co, bal Fe.
High speed tool steel, W-Co type; AISI T8.

KEN T-15.
M-1700; 1.55 C, 4.75 Cr, 5.0 V, 12.5 W, 5.0 Co, bal Fe.
High speed tool steel, tungsten type,
(W-Cr-V-Co); AISI T15.

KENTANIUM.
M-793; TiC.
For valve seats, furnace parts, hot extrusion dies, heating elements; resists heat and thermal shock; C.S 550,000.

KENTANIUM K151A.
M-793, 58 Ti, 19 Ni, 7.5 Co, 0.5 Ta, C.
At 1600°F, compressive yield strength: 155,000 psi.
Density 5.8; 89.0 Rock A.
For cutting tools; high temperature operation.

KENTANIUM K162B.
M-793, 52 Ti, 25 Ni, 5 Mo, 4 5 Co, 0 3 Ta, C.
At 1600°F, compressive yield strength: 175,000 psi.
Density 6 0, 89 0 Rock A.
For cutting tools, parts for high temperature applications.

KENTANIUM 165.
M-793, TiC.
For cutters; for high speed precision machining

KEN TOUGH S-7
M-1700; 0.50 C, 0 7 Mn, 3.25 Cr, 1.4 Mo, bal Fe.
Air or oil hardening, shock resisting tool steel,
AISI S7.

KEN TOUGH S-7 MOLD QUALITY.
M-1700, 0 50 C, 0.7 Mn, 3.25 Cr, 1.4 Mo, bal Fe.
Air or oil hardening tool and die steel, mainly for molds

KENTUCKY
M-191; C, Cu, bal Fe.
For construction steel.

KEN W-1
M-1700; 1.0-1.1 C, 0.3 Mn, 0.25 Si, bal Fe
Water hardening tool steel, AISI W1.

KEN W-2.
M-1700; 1 0-1.1 C, 0 15-0.25 V, Mn, Si, bal Fe.
Water hardening tool steel; AISI W2.

KEOKUK ELECTRO-SILVERY.
M-1039, 15 Si, 6 C, bal Fe.
For iron and steel making, addition agent.

KERAU
M-618, 0.7 C, 22 W, 4 Cr, 1 V, bal Fe.
For drills, milling cutters, saws, knives; high speed steel, oil hardened.

KERAU WUNDA.
M-618; C, 18 W, 5 Co, 4 Cr, 1.3 V, bal Fe.
For tools, dies, cutters, high speed steel.

KERCHSTEEL.
0.12-0.18 As, C, bal Fe.
For construction steel.

KERN'S HYDRAULIC BRONZE.
78 Cu, 12 Sn, 10 Zn.
For vessels, pressure castings, valves, fittings; high strength.

KERROFESTAL.
German; 1.0 Si, 0.3 Fe, 0.7 Mn, 0.65 Mg, bal Al.
For architecture, window frames, chemical industry; light alloy.

KERUS.
M-618; 0.7 C, 14 W, bal Fe.
For punches, drills, taps, lathe and boring tools, nail dies; high speed steel.

KETOS.
M-38; 0.90 C, 0.25 Si, 1.3 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies, taps, reamers, broaches, gauges, hobs; non-deforming; oil hardened

KETOS.
M-362; 0.90 C, 0.50 Cr, 1.25 Mn, 0.50 W, bal Fe
For blanking, trimming, and forming dies; non-deforming.

K.E.X.369.
M-510; 0.5 C, 5.5 Cr, W, Mo, bal Fe
For die casting dies; hot work steel, air hardened.

KEY ALLOY-B
65.2 Cu, 20.15 Zn, 12.70 Ni, 0.40 Fe, 1.10 Pb, 0.15 Sn.
For hardware keys; free-cutting.

KEY STOCK-A.
60-65 Cu, 26-22 Zn, 12 Ni, 2-1 Pb
For hardware, keys; free-cutting

KEYSTONE
M-339, 0.90 C, 1 Mn, 0.5 Cr, 0.5 W, bal Fe.
For blanking and forming dies, punches, gauges, Type 01; oil hardened, non-deforming.

KEYSTONE-A
M-357, 0.5 C, 2 W, 1 Cr, 0.2 V, bal Fe
For chisels, die blocks; tough, hot work

KEYSTONE ALLOY CHISEL
M-357, 0.5 C, 1.1 Cr, 2 W, 0.2 V, bal Fe
For chisels, punches, shears; tough

KEYSTONE B.
M-140, 1.2 C, 0.2 Mn, 0.5 Cr, 0.2 V, 1.6 W, bal Fe
For tools, cutters; fast finishing steel, obsolete.

KEYSTONE COPPER STEEL.
M-604; 0.10 max C, 0.5 max Mn, 0.01-0.10 P, 0.05 max S, 0.2 min Cu, bal Fe.
35,000-55,000 TS; 15,000-30,00 YS; 40-25 El
For roofing, siding, railroad car construction; atmosphere corrosion resistance

KEYSTONE DRILL ROD.
M-1703; 0.88-0.93 C, 1.1-1.3 Mn, 0.2-0.35 Si, 0.15-0.20 Cr, 0.15-0.20 V, 0.4-0.6 W, 0.02 max P, 0.02 max S, bal Fe.
Oil hardening drill rod; AISI 01.

KF15
M-459; 0.4 C, 13 Cr, bal Fe.
For bakelite molds; corrosion resistant.

KH 15N25.
Russia; 0.2 C, 15 Cr, 25 Ni, bal Fe.
For furnace parts, heat treating boxes; heat and corrosion resistant.

KH28.
Russia; 1.7-2.5 C, 1.3-1.7 Si, 28-32 Cr, bal Fe.
For chemical plant equipment; corrosion and heat resistant, cast.

KH34.
Russia; 1.5-2.2 C, 1.3-1.7 Si, 32-36 Cr, bal Fe.
For cast rabbles for furnaces, ore roasters; corrosion and heat resistant, cast.

KHG.
Russian; 1.44 C, 0.62 Mn, 1.29 Mn, 0.22 Si, bal Fe.
For cutters, tools, punches; oil hardened.

KHN80.
Russia; 0.25 max C, 1.5 max Mn, 1.2 max Si, 18-22 Cr, bal Ni.
For electrical resistance and heating elements; applications to 1000°C

KICK PLATE BRASS.
Eng.; 84 Cu, 15 Zn, 1 Pb.
For hardware, water pipe, fittings; free-cutting.

KIND EXTRA HART.
M-1352; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For forming and blanking dies, engravers tools; Type W1, water hardened

KIND EXTRA MH.
M-1352, 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed· 110,000 TS, 58,000 YS; 20 El, 40 RA; 210 Brin
For springs, tools, drills, taps, reamers; Type W1; water hardened

KIND EXTRA SCHWEISSBAR.
M-1352, 0.55 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Heat treated 150,000 TS, 110,000 YS, 15 El; 45 RA; 320 Brin.
For gears, bolts, machine tool parts; water hardened.

KIND EXTRA SEHR ZAH.
M-1352, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated· 175,000 TS; 128,000 YS, 12 El, 37 RA, 355 Brin.
For springs, rails, punches, crimpers; Type W1, water hardened

KIND EXTRA ZAH.
M-1352; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated· 190,000 TS; 145,000 YS, 10 El, 30 RA, 400 Brin.
For springs, tools, cutters, taps, drills, hobs; Type W1; water hardened.

KIND EXTRA ZH
M-1352, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 100,000 TS, 53,000 YS, 21 El, 42 RA; 210 Brin
For springs, tools, drills, taps; Type W1, water hardened

KIND KW.
M-1352, 0.85 C, 1.75 Cr, 0.35 Mn, 0.30 Si, bal Fe.
For bearings, cutters, dies, tools; oil or water hardened, wear resistant

KIND KWS
M-1352; 0.85 C, 1.75 Cr, 0.35 Mn, bal Fe
For bearings, piercing dies, cutters; oil or water hardened, wear resistant

KIND PRIMA MH
M-1352, 0.90 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated· 180,000 TS, 115,000 YS; 10 El; 30 RA; 370 Brin
For springs, taps, reamers, broaches, drills; Type W1; water hardened

KIND PRIMA SEHR ZAH
M-1352; 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled. 98,000 TS; 60,000 YS; 24 El; 54 RA; 212 Brin.
For axles, gears, bolts, shafts, crankpins; water hardened.

KIND PRIMA WEICH.
M-1352, 0.35 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 183 Brin.
For gears, plates, shafts, bolts, axles; water hardened.

KIND PRIMA ZAH.
M-1352; 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El; 40-54 RA; 320-230 Brin.
For wheels, die blocks, girders, rails; water hardened.

KIND PRIMA ZH.
M-1352, 0.75 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 180,000 TS; 140,000 YS; 12 El; 35 RA; 375 Brin.
For springs, punches, clutch discs; Type W1; water hardened.

KIND SPEZIAL MH
M-1352; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, reamers, hobs; Type W1; water hardened.

KIND SPEZIAL SEHR ZAH.
M-1352; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 130,000 YS; 12 El, 37 RA; 355 Brin.
For wheels, die blocks, rails, girders, springs; Type W1; water hardened.

KIND SPEZIAL ZAH.
M-1352; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 188,000 TS; 143,000 YS, 12 El; 35 RA; 390 Brin.
For springs, taps, drills, hobs, cutters; Type W1; water hardened.

KIND SPEZIAL ZH.
M-1352; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El, 42 RA; 200 Brin.
For springs, taps, reamers, drills, hobs; Type W1; water hardened.

KINGHORN METAL.
Eng.; 58.5 Cu, 39.3 Zn, 0.96 Sn, 1.14 Fe.
For screws, nuts, hardware; high strength.

KINGSTON BRONZE.
M-282; 83 Cu, 4 Sn, 0.5 Fe, bal Zn.
Drawn: 94,500 TS; 35,000 YS; 10.5 El; 183 Brin.
For condenser tubes; high strength.

KINITE.
M-174, M-345; 0.55 Si, 1.5 C, 12.5-14.5 Cr, 1.1 Mo, 0.7 Co, 0.5 Mn, 0.4 Ni, bal Fe, trace to 0.5 B.
Cast: 100,000 TS.
Rolled: 200,000 TS.
For dies, anvils, cutters, mandrels, press tools, blanking, forming and drawing dies, shear blades; abrasion and compression resistant.

KINNALLOY.
M-546; 3.3 C, 2.5 Si, 1.5 Ni, 0.8 Cr, bal Fe.
40,000 TS; 500 Brin.
For castings; cast iron.

KINNITE.
M-546; 2.5 C, 1.5 Cr, bal Fe.
Cast: 40,000 TS; 500 Brin.
For abrasion resisting castings; wear resistant.

KINSALLOY.
M-68; 21-24 Mo, 7-8 Al, 0.1 max C, bal Ni.
Cast: 100,000-130,000 TS.
For high temperature applications; precision cast, heat resistant.

KINSALOY B.
M-68; 70 Ni, 22 Mo, 8 Al.
For jet engine components, turbine rotor blades; heat resistant

KIN-SHIBU-ICHI.
Jap.; One part "Shaku-do" two parts "Shibu-ichi."
For jewelry, ornaments; corrosion resistant.

KIRKALLOY.
M-794; 3 Al, 8 Cu, 0.04 Be, bal Zn.
(max .007 Pb, .003 Sn, .003 Cd, .10 Fe)
Sand cast: 42,500 TS, 2.0 El, 7.6 impact; 124 Brin.

KIRKSITE A.
M-794, M-88, 3.5 Cu, 4 Al, 0.04 Mg, bal Zn.
Cast: 38,000 TS; 5 El; 107 Brin
Rolled: 62,000 TS; 3 El.
For stamping dies, forming dies; M.P. 717°F.

KISKI
M-140, 0.9-1.0 C, 1.0-1.2 Mn, 0.43-0.57 Cr, 0.15-0.25 V, 0.45-0.75 W, bal Fe
For tools, dies, blanking and forming dies, thread gauges; non-deforming

KISSOCK STEEL
M-139, 0.65-0.75 C, 1.9-2.0 Ni, 1.3-1.6 Cr, 0.35-0.45 Mo, bal Fe
Cast: 301-550 Brin.
For castings, wear plates, wear resisting.

KLOSTER D-C-66.
M-335; 0.35 C, 8.7-9.7 W, 3.0-3.5 Cr, 0.4 V, bal Fe.
Hardened: 243,000 TS; 215,000 YS, 12 El, 37 RA
At 1000°F: 210,000 TS; 163,000 YS; 9 El; 32 RA.
For brass extrusion dies, die casting dies, bolt threading dies, punches, shear blades, hot headers.
Type H21 hot work steel, high toughness.

KLOSTER KLS-44.
M-335; C, Cr, Ni, Mo, bal Fe.
For shear blades, hammer dies, die blocks; cold work steel, oil hardened

KM
M-351; Al, Cu, bal Zn.
For die castings.

KM 80
German, 0.2 C, 14 Cr, 2 Mo, 1 V, bal Fe.
For turbine rotors, heat resistant.

K-Mo.
M-69; C, alloy, bal Fe.
For tools, dies; oil hardening.

KNEISS METAL.
50-40 Zn, 25-42 Pb, 25-15 Sn, 0-3 Cu.
For bearings; aniti-friction.

KNIFE BOLSTERS.
Eng.; 68 Cu, 16.5 Zn, 15 Ni, 0.5 P.
For knife bolsters; corrosion resistant.

KNIFE BOLSTERS
Eng.; 56 Cu, 28 Zn, 16 Ni.
For ornamental parts; nickel silver.

K-O.
M-1541; 0.10-0.20 C, 0.60-1.0 Mn, 0.15-0.30 Si, 0.002-0.006 B, 0.4-0.8 Cr, 0.15-0.50 Cu, 0.4-0.6 Mo, 0.7-1.0 Ni, 0.03-0.10 V, bal Fe.

Plate: 114,000-135,000 TS; 100,000 min YS; 18 min El.
For pressure vessels, bridges, mine cars, power shovels, cranes, trucks, trailers.
Shock and wear resistant.

K-O-1.
M-1642, M-279; 4.8 Cu, 0.23 Mg, 0.27 Ti, 0.64 Ag, bal Al.
Sand Cast: 62,000-72,000 TS; 52,000-65,000 YS; 3-9 El.
Permanent Mold: 64,000-70,000 TS; 50,000-60,000 YS; 6-14 El.
For landing gear struts, gear box housings, aircraft and auto/truck components, aerospace equipment.
High strength casting alloy.

KO-1 ALLOY.
M-1719; 4.8 Cu, 0.5 Ag, 0.25 Mg, bal Al.
Heat treatable cast alloy.
T6. 58,000-68,000 TS, 47,000-58,000 YS; 4-10 El.
For high strength castings, aerospace housings, transmission line fittings, cylinder heads and pistons, turbine impellers.
AA X201 0, AMS 4228 (T6) Tentative.

KOBALT.
M-1315; 0 79 C, 4.7 Co, 4.3 C, 0.75 Mo, 1.55 V, 18 W, bal Fe.
For lathe and planer tools, reamers, hobs, taps; high speed steel.

KOBALT see also WITTEN KOBALT.

KOBALT-I
M-1496, 0 85 C, 18 W, 4 Cr, 2 V, 12 Co, 0.8 Mo, bal Fe
Hardened· C 64-66 Rock
For lathe and planer tools, hobs, broaches, reamers, milling cutters.
Type T-6 tool steel, high red-hardness, abrasion resistant

KOBALT-II.
M-1496, 0.70-0 74 C, 18-19 W, 4 0-4.25 Cr, 1.0-1.2 V, 4.5-5 5 Co, 0 5-0 8 Mo, bal Fe.
Hardened· C 64-66 Rock
For boring and forming tools, gear cutters, lathe and planer cutters, taps, drills, reamers
Type T4 high speed steel, high red-hardness.

KOBALT III N.
M-1326, M-1331, 0.80 C, 4.3 Cr, Co, W, V, Mo, bal Fe
For lathe and planer tools, reamers, broaches, taps; high speed steel

KOBALT 30
M-1331, 0 86 C, 2.8 Co, 4 3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe
For lathe and planer tools, hobs, reamers; high speed steel.

KOBALT 32V.
M-1326; 0.86 C, 2.8 Co, 4.3 Cr, 0 8 Mo, 2 1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

KOBALT 50.
M-1331; 0.80 C, Co, 4.3 Cr, V, W, bal Fe.
For lathe and planer tools, reamers, drills, taps, hobs; high speed steel.

KOBALT 98M.
M-1326, 0.90 C, 4.0 Cr, 8.75 Mo, 8.25 Co, 2.0 V, 1.70 W, bal Fe.
For drills and lathe tools operating at high speed; high speed steel with good red hardness, for roughing or finishing. Also used for milling cutters.

KOBALT 100.
M-459, M-1315; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, reamers, hobs, taps; high speed steel.

KOBALT-125.
M-459; 1.0 C, 9 Cr, 6 Co, 1.5 Mo, bal Fe.
Hardened: C 62-65 Rock.
For electrical and magnetic equipment.
Permanent magnet. High permeability.

KOBALT 150.
M-1315; 0.80 C, W, Co, Cr, V, Mo, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

KOBALT-160.
M-459; 1.0 C, 9 Co, 9 Cr, 1.5 Mo, bal Fe.
Hardened: C 62-65 Rock.
For electrical and magnetic equipment.
Permanent magnet. High permeability.

KOBALT-200.
M-459; 1.0 C, 15 Co, 9 Cr, 1.5 Mo, bal Fe.
Hardened: C 62-65 Rock.
For electrical and magnetic equipment.
Permanent magnet. High permeability.

KOBALT-300.
M-459, 0 9 C, 35 Co, 6 Cr, 5 W, bal Fe.
Hardened C 62-65 Rock.
For electrical and magnetic equipment.
Permanent magnet. High permeability.

KOBALT V33
M-1315; 0 86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, taps, drills, hobs; high speed steel.

KOBALT V65.
M-1315; 1.35 C, W, Cr, Co, V, bal Fe.
For engravers' tools, forming and blanking dies; high speed steel

KOBITALIUM.
Eng , 1-5 Cu, 0 2-2 0 Ni, 0 25-2.0 Mn, 1-2 Fe, 0 5-2.0 Si, 0.4-2 0 Mg, 0.08-0.12 Ti, bal Al.
For light alloy castings, also rolled or forged

KOCHLINS BEARING.
90 Cu, 10 Sn
For bearings, Bronze.

KOCH WHITE GOLD.
Eng ; 75 min Au, 3.3-24 75 Ni, 0.25-5.0 Mn.
For jewelry, ornaments, corrosion resistant.

KOERFLEX-20.
M-72; 30 Co, 15 Cr, bal Fe
For electromechanical devices, motors, generators.
Permanent magnet, high permeability.

KOERFLEX-30
M-72, 30 Co, 15 Cr, bal Fe
For electrical and magnetic equipment, generators, motors.
Permanent magnet, high permeability

KOERFLEX-200.
M-72, 52 Co, 10 V, bal Fe.
For hysteresis motors, automation devices, electromechanical equipment.
Permanent magnet, similar to Vicalloy I. High permeability.

KOERFLEX-300.
M-72; 52 Co, 8 Cr, 4 V, bal Fe.
1000 Br, 2 8 (BH) max.
For electromechanical devices, speedometers, recorders, hysteresis motors, computors.
Precipitation hardening, permanent magnet, similar to Vicalloy II.

KOERVER-UMCO50.
M-1583; 0.05-0.12 C, 0.18 Ti, 0.6 Cb, 26-30 Cr, 47-52 Co, bal Fe.
Cast: 135,000 TS; 48,000 YS; 10 El; 10 RA; 250 Brin.
Wrought: 132,000 TS; 61,000 YS; 7 El; 6 RA; 350 Brin.
For furnace baffles, burner tips, sintering grates, quench baskets.
Corrosion, heat, thermal shock resistant.

KOERZIT 250S.
M-72; 8 Al, 19 Ni, 24 Co, 5 Ti, bal Fe.
For electrical and magnetic equipment.
Permanent magnet. High permeability.

KOERZIT 350.
M-72; 15 Ni, 30 Co, 4 Cu, 7 Al, 5 Ti, bal Fe.
8500 Br, 1150 H_c, 3,600,000 (BH) max.
For permanent magnets in electrical and magnetic equipment.
High permeability.

KOERZIT 400K.
M-72; 25 Co, 2.5 Cb, bal Fe.
For permanent magnets in electrical and magnetic equipment.
Alnico type, high permeability.

KOERZIT 450.
M-72; 34 Co, 5 Ti, bal Fe.
For permanent magnets in electrical and magnetic equipment.
Alnico type magnet High permeability.

KOERZIT-HI.
M-72; 52 Co, 7 Cr, 3 V, bal Fe.
For electric and magnetic equipment, hysteresis motors.
Magnetically soft; high permeability.

KOERZIT-H2.
M-72; 52 Co, 38 Fe, 10 V.
For hysteresis motors, automation devices, electro and magnetic devices. Requires cold rolling and tempering to develop the magnetic properties.
Permanent magnet. Similar to Vicalloy I.

KOERZIT-T.
M-72; 52 Co, 8 Cr, 4 V, bal Fe
10,000 Br, 2.8 (BH) max.
For electromechanical devices, speedometers, recorders, hysteresis motors, digital computers.
Precipitation hardening Permanent magnet.
Similar to Vicalloy II.

KOERZIT-VS55.
M-72; 38 Co, 7 Ti, bal Fe, Al, Ni, Cu.
For permanent magnets in electrical and magnetic equipment.
Alnico type magnet, high permeability.

K.O.H.
M-174; C, alloy, bal Fe.
For tools; oil hardening.

KOLASSAL.
M-1338; 2.1 C, 11.5 Cr, 0.3 Mn, bal Fe.
For forming and blanking dies, punches; oil hardened, non-deforming.

KOLASSAL EXTRA.
M-1338; 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For forming and blanking dies, punches; oil hardened, non-deforming.

KOLASSAL SUPRA.
M-1338; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

KOLSTER V-76.
M-335; 0.9 C, 1.2 Mn, 2.0 Si, bal Fe.
For punches, dies, blanking and forming tools; oil hardened, shock resistant.

KOLTCHOUGALUMIN.
Eng.; 91.7-93.9 Al, 6-4 Cu, 0.6 Mn, 0.4 Mg, 0.8 Fe, 0.2 Si, 0.11 Cr.
For light alloy parts, aircraft structures; similar to "Dural"

KOLTSCHUG.
Russian; 4 Cu, 0.3 Ni, bal Al.
For light alloy parts; age-hardenable.

KOMALP 3 HERZ.
M-1314; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For drills, taps, reamers, hobs, cutters; high speed steel.

KOMALP 3 HERZ EXTRA M.
M-1314; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, hobs, taps; high speed steel

KOMALP 3 HERZ M.
M-1314, 0.95 C, Cr, W, Mo, V, bal Fe.
For form cutters, broaches, taps; high speed steel.

KOMALP 300
M-1314; 0.95 C, Cr, W, Mo, bal Fe.
For form cutters, broaches, reamers, taps; high speed steel

KOMALP 400
M-1314, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe
For engravers' tools, blanking and forming dies; high speed steel

KOMALP EXTRA SPEZIAL
M-1314; 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe
For lathe and planer tools, reamers, broaches; high speed steel.

KOMALP WM
M-1314, 0.85 C, 4.1 Cr, Mo, W, V, bal Fe
For lathe and planer tools, reamers, broaches, hobs; high speed steel

KOMET FRS27.
M-1312; 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, reamers, hobs, taps, drills; high speed steel.

KOMO 205
M-1496, 0.80 C, 4 Cr, 5 Mo, 6 W, 2 V, 5 Co, bal Fe.
Hardened: 63-66 Rock C.
For reamers, hobs, lathe and planer tools, drills, broaches.
Type M35, high speed steel, good red-hardness. Wear resistant

KOMO 310.
M-1496, M-459, 1.25 C, 9.5 W, 4.2 Cr, 3.2 V, 3.15 Mo, 10 Co, bal Fe.
Hardened: 64-68 Rock C.
For reamers, broaches, chasers, hobs, lathe and planer tools, milling cutters.
High-speed steel, high red-hardness.

KONCOR.
M-73; 1.1 C, 1.0 Si, 5.25 Cr, 4.0 V, 1.1 Mo, bal Fe.
Hardened: 64-67 Rock C.
For upsetter and forging dies, extrusion and pointing dies, chipping chisels, punches, die casting inserts.
Air hardening, non-deforming, abrasion resistant, tough, heat resistant.

KONEL.
M-118; 73.07 Ni, 17.16 Co, 8.8 Ti, 0.55 Si, 0.26 Al, 0.16 Mn.
100,000 TS; 40,000 YS; 35 El; 55 RA; 140 Brin.
For lamp filaments, valves, valve stems; substitute for platinum; heat and corrosion resisting; hot short above 1250°C.

KONIK.
M-631; 0.15-0.25 C, 0.2 Cu, 0.4 Ni, 0 3 Cr, bal Fe.
Cold drawn: 81,000 TS; 79,000 YS; 3 El; 5 RA.
For cross chains, culvert sheets; case hardening steel.

KONSTANT.
M-1331, 0.90 C, 1.9 Mn, 0.1 V, 0.25 Si, bal Fe.
For dies, punches, upsetters, crimpers; oil hardened, non-deforming.

KONSTANTAN.
M-297; 54 Cu, 45 Ni, 1 Mn.
Annealed: 83,000 TS; 30 El.
Hard. 120,000 TS; 1 El.
For precision resistances, reducing rheostats, shunts, electrical instruments; maximum operating temperature 600°C, M P. 1276°C.

KOPPER B-18.
M-399, 78-82 Cu, 18-19 5 Sn, 0 5 max Pb, 0.5 max Fe, 0.5 max Zn
Cast: 45,000-55,000 TS; 165-195 Brin.
For oil sealing rings, piston and pump rings; corrosion and acid resisting.

KOPPER B-19.
M-399; 78-82 Cu, 12-14 Sn, 4-6 Pb, 0.75-1.25 Ni.
Cast. 30,000 TS, 100 Brin.
For locomotive main cylinder packing and segmental rings; pressure tight.

KOPPER B-23.
M-399, 78-82 Cu, 15-17 Sn, 4-6 Pb, 0.5 max Fe, 0.5 max Zn
Cast 30,000 TS, 130-156 Brin
For hydraulic sealing rings, piston rings, pressure tight

KOPPERS B48.
M-399; 64 Cu, 6 Al, 4 Mn, 3 Fe, bal Zn
Cast: 110,000 TS, 60,000 YS, 12 El; 225 Brin
For propellers, strong and corrosion resistant.

KOPPER F-17.
M-399, 3 5 T.C., 2 5 Si, 2.25 Ni, 1 Mo, bal Fe.
Cast. 46,000 TS, 200 Brin
For piston rings, diesel rings; castings.

KOPPERS F-37
M-399, 3.5 T.C., 2 8 Si, 0.6 Mn, 0.9 Ni, 1.1 Mo, 0 2 Cr, bal Fe.
Heat treated: 65,000-75,000 TS; 250-270 Brin.
For piston rings; alloy cast iron, wear resistant.

KOPPERS F-88.
M-399; 3.2 C, 0.5 Mo, 1.4 Si, 0.5 Mo, 0.5 Cu, bal Fe.
Heat treated: 88,000 TS; 265 Brin.
For piston rings; high strength cast iron.

KOPPERS F-95.
M-399; 3.2 T C., 1.6 Si, 0.7 Mn, 1 Ni, 0.5 Mo, 0.25 Cr, bal Fe.
Heat treated: 108,000 TS; 330 Brin.
For piston rings, alloy cast iron, wear resistant.

KOPPER K-6.
M-399; 3.7 C, 2.9 Si, 1.0 Mn, 0 5 Cr, 1.2 Ni, bal Fe.
Cast: 30,000 TS; 220-180 Brin.
For piston rings, parts to resist corrosive gases and liquids, packing; alloy cast iron.

KOPPERS K-6B.
M-399; 2.8 C, 2 Si, 1.3 Mn, 15 Ni, 6.5 Cu, 1.9 Cr, bal Fe.
Annealed: 25,000 TS; 145 Brin.
For cylindrical shapes; austenitic, centrifugally cast iron

KOPPERS K-6E.
M-399; 3.8 C, 2.9 Si, 0.6 Mn, 0.3 Cr, 0.45 Mg, bal Fe.
Cast. 30,000 TS; 193 Brin.
For piston rings; centrifugally cast gray iron.

KOPPERS K-8.
M-399; 3.3 C, 2.3 Si, 0.65 Mn, 1.5 max Ni, 0.4 max Cr, bal Fe.
Cast: 27,000 TS; 180 Brin.
For piston ring inserts; centrifugally cast gray iron.

KOPPERS K-10.
M-399; 2.6 C, 2 Si, 1 2 Mn, 15 Ni, 6.5 Cu, 2.1 Cr, bal Fe.
Cast· 32,000 TS; 137 Brin.
For corrosion resistant castings; Type 1, Ni-Resist, AMS 5392

KOPPERS K-13.
M-399, 1.75 C, 1.75 Si, 0 9 Ni, 14 Cr, 0.4 Mo, bal Fe.
Annealed. 90,000 TS; 270 Brin.
For heat resistant castings, heat and abrasion resistant.

KOPPERS K-14.
M-399, 3.6 C, 2.3 Si, 0.6 Mn, 1.1 Ni, 1 1 Mo, 0 3 Cr, bal Fe
Heat treated. 45,000 TS, 270 Brin.
For heavy duty piston ring, cast iron.

KOPPERS K-15
M-399; 3 4 C, 2 75 Si, 0 5 Mn, bal Fe.
Annealed: 60,000 TS; 45,000 YS; 10 El; 140 Brin.
For general castings, gears, housings; ductile iron, ferritic.

KOPPERS K-16.
M-399; 3 4 C, 2.2 Si, 0 5 Mn, bal Fe.
Heat treated 90,000 TS; 65,000 YS; 2 El; 240 Brin.
For gears, shafts, housings; pearlitic ductile iron.

KOPPERS K-25.
M-399; 3.25 C, 2.25 Si, 0.5 Mn, 0 75 Ni, bal Fe.
Annealed: 60,000 TS; 40,000 YS; 15 El; 185 Brin.
For gears, shafts, housings, ferritic ductile iron.

KOPPERS K-26
M-399, 3.1 C, 1.3 Si, 0.75 Mn, 0 5 Mo, 0.5 Cu, bal Fe.
Heat treated· 95,000 TS; 400 Brin.
For aircraft piston rings; cast iron.

KOPPERS K-27.
M-399; 3.3 C, 2.2 Si, 0.5 Mn, 0 5 Mo, 0.5 Cu, bal Fe.
Heat treated: 110,000 TS; 80,000 YS; 1 El; 265 Brin.
For cylindrical shapes; alloy ductile iron.

KOPPERS K-28.
M-399; 3.3 C, 2.2 Si, 0.5 Mn, 0.5 Mo, 0.5 Cu, bal Fe.
Heat treated: 120,000 TS; 100,000 YS; 1 El; 400 Brin
For cylindrical shapes; alloy ductile iron.

KOPPERS K-35.
M-399; 2.3 C, 1.2 Si, 0.5 Mn, 30 Ni, 3 Cr, bal Fe.
Cast: 55,000 TS; 33,000 YS; 7 El; 140 Brin.
For corrosion and abrasion resistant castings; Ni-Resist Type 3.

KOPPERS K-53.
M-399; 3 C, 2.1 Si, 0.7 Mn, 0.6 Ni, 0.5 Mo, 0.5 Cr, 0.75 Cu, bal Fe.
Cast: 40,000 TS; 229 Brin.
For cylinder liners; centrifugally cast gray iron.

KOPPERS K-60.
M-399; 0.07 max C, 16.5 Cr, 4 Ni, 0.45 Cb, 4 Cu, 0.05 N, bal Fe.
Heat treated: 150,000 TS; 140,000 YS; 6 El; 350 Brin.
For corrosion resistant hard castings; Armco 17-4PH, stainless, age hardened.

KOPPERS K-61.
M-399; 0.15 max C, 12.5 Cr, 0 75 Ni, 0.5 Mo, 0.5 Cu, bal Fe.
Cast: 125,000 TS; 110,000 YS; 10 El; 310 Brin.
For corrosion resistant castings; Type 410; stainless.

KOPPERS K-66.
M-399; 0.5 C, 25 5 Cr, 10.5 Ni, 2 max Fe, 54.5 Co.
Cast: 110,000 TS; 95,000 YS; 2 El; 370 Brin.
For chemical plant equipment, high temperature castings; Haynes Stellite No. 31, heat and corrosion resistant

KOPPERS K-IRON.
M-399; 3.7 C, 2.85 Si, 0 6 Mn, bal Fe.
Cast: 25,000 TS; 180 Brin
For piston rings; cast iron.

KOPPERS XLS.
M-399; 3 5 C, 1.75 Si, 0 7 Mn, 0.35 Cr, bal Fe
Cast 20,000 TS; 150 Brin
For large engine piston rings; gray cast iron

KORA.
M-618; 0 15-0 18 C, 0.10-0 15 Si, 0.7-0 9 Mn, bal Fe.
Hot rolled 83,000 TS; 67,000 YS, 37 El, 55 RA; 163 Brin
Heat treated· 95,000 TS; 67,000 YS; 28 El; 60 RA; 180 Brin.
For gears, camshafts, machinery parts, case hardening steel

KORROFESTAL.
M-1376, 0 6-1 4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, 0.3 max Cr, bal Al.
Annealed· 21,000 TS, 8000 YS; 24 El
For window frames, gutters, fan blades, boats; good forming and welding properties.

KORRONIT 17.
M-1340, 0.08 C, 17 Cr, bal Fe
Annealed: 80,000 TS, 50,000 YS, 25 El; 50 RA; 150 Brin
For oil refinery and food processing equipment, sinks, Type 430, corrosion resistant, ferritic.

KORRONIT 17E.
M-1340, 0 1 max C, 17 5 Cr, Ti = 7 × C, bal Fe.
Annealed: 85,000 TS; 55,000 YS, 20 El; 45 RA; 180 Brin.
For oil refinery and food processing equipment, weldments; Type 430 Ti; corrosion resistant.

KORRONIT 17S.
M-1340; 0.12 C, 16 5 Cr, 0.25 Mo, 0 2 S, bal Fe
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 160 Brin.
For screw machine products, fasteners; Type 430F; stainless, free-cutting.

KORRONIT 18M.
M-1340; 0.15 C, 18 Cr, 0.4 Si, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 160 Brin.
For oil refinery equipment, food processing equipment; Type 430; stainless, ferritic.

KORRONIT 188.
M-1340; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks; Type 302; stainless, austenitic.

KORRONIT 188E.
M-1340; 0.12 max C, 18 Cr, 8 5 Ni, Ti = 4 × C, bal Fe.
Annealed· 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
Cold drawn: 95,000 TS; 60,000 YS; 40 El; 60 RA, 185 Brin
For welded chemical plant equipment, tanks, mixers; Type 321; stainless, austenitic.

KORRONIT 188P.
M-1340; 0 07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA, 150 Brin
Cold drawn· 180,000 TS; 125,000 YS; 10 El, 330 Brin.
For chemical plant equipment, tanks, mixers; Type 304, stainless, austenitic

KORRONIT 189
M-1340, 0 1 max C, 2.2 Si, 18 Cr, 2 Mo, 9.5 Ni, bal Fe
Annealed. 85,000 TS; 35,000 YS; 50 El; 65 RA, 160 Brin
Cold drawn. 150,000 TS, 135,000 YS; 6 El; 300 Brin
For acid resistant chemical plant equipment; Type 316, stainless, austenitic.

KORRONIT 189E
M-1340, 0.12 max C, 18 Cr, 2 Mo, 10 5 Ni, Ti = 4 × C, bal Fe.
Annealed. 85,000 TS, 40,000 YS, 50 El, 65 RA; 160 Brin
For welded chemical plant equipment, tanks, Type 316 Ti, stainless, austenitic

KORRONIT 189P.
M-1340, 0.07 max C, 18 Cr, 2 Mo, 10 5 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin
For acid resistant chemical plant equipment, tanks; Type 316, stainless, austenitic

KORRONIT 1212 T
M-1340, 0 10 max C, 12 5 Cr, 12 Ni, bal Fe.
For valves, pumps, oil refinery equipment, corrosion and heat resistant

KORRONIT 1717
M-1340· 0 07 max C, 17 5 Cr, 2 Mo, 17.5 Ni, 2 Cu, Ti = 7 × C, bal Fe
For valves, pumps, chemical plant equipment; corrosion resistant.

KORRONIT-C
M-1340; 0 90 C, 18 Cr, 1.15 Mo, 1.0 V, bal Fe
Annealed: 105,000 TS, 60,000 YS; 18 El, 35 RA; 220 Brin
Heat treated 280,000 TS, 270,000 YS; 3 El; 15 RA; 555 Brin
For cutlery, valves, ball bearings, surgical instruments; Type 440 B; corrosion resistant

KORRONIT-H.
M-1340; 0 4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For cutlery, valves, surgical instruments; Type 420; stainless, hardenable.

KORRONIT-M.
M-1340; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For valves, cutlery, oil refinery equipment; Type 420; corrosion resistant.

KORRONIT-S.
M-1340; 0.22 C, 0.4 Si, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For marine hardware, pumps, valves; Type 431; corrosion and heat resistant.

KORRONIT-W.
M-1340; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
For turbine blades, valves, cutlery, surgical instruments; Type 410; stainless

KORROSIL 1.
M-1323; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS, 17 El, 60 RA; 205 Brin.
For turbine blades, surgical instruments; Type 410; stainless.

KORROSIL 2.
M-1323, 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed 95,000 TS; 50,000 YS, 25 El; 55 RA; 195 Brin.
Cold drawn. 100,000 TS; 85,000 YS; 17 El, 50 RA; 215 Brin.
For cutlery, valves, turbine blades, knives; Type 420, stainless.

KORROSIL 2M
M-1650, 0.20 C, 13 Cr, 1.2 Mo, bal Fe.
Annealed· 95,000 TS, 40,000 YS, 25 El, 55 RA, B 92 Rock
Heat Treated 240,000 TS; 210,000 YS, 8 El; 25 RA; C 50 Rock
For cutlery, knives, surgical instruments, shafts, gears.
Corrosion resistant, hardenable.

KORROSIL 4
M-1323, 0.4 C, 0.4 Si, 13 Cr, bal Fe
Annealed. 100,000 TS, 50,000 YS; 23 El; 52 RA; 200 Brin.
For cutlery, valves, surgical and dental instruments, Type 420; stainless

KORROSIL 6A
M-1323, 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe
Annealed: 80,000 TS, 50,000 YS, 25 El; 50 RA; 150 Brin.
For screw machine products, shafts, fasteners; Type 430F, stainless, free cutting

KORROSIL 6U
M-1323, 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed· 80,000 TS, 50,000 YS, 25 El; 50 RA; 150 Brin.
For welded furnace parts and heat treating boxes; Type 430 Ti; corrosion resistant.

KORROSIL 60.
M-1323; 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS, 95,000 YS; 20 El; 55 RA; 260 Brin.
For marine hardware, pumps, valves; Type 431.

KOSMOS.
M-912; 0.82-0.90 C, 4.5 Cr, 12 W, 0.7 Mo, 2.5 V, bal Fe.
For tools, dies, cutters; high speed steel.

KOSSIL.
M-618; 0.9 C, 1.3-1.6 Si, 0.6-0.9 Cr, bal Fe.
Heat treated: 224,000 TS.
For springs; tough, resilient.

KOULTCHOOG-ALUMINUM (KAULTCHAAG).
4-6 Cu, Mn, Mg, Si, bal Al.
For light alloy parts; similar to Duralumin, age-hardenable

KOVAL.
M-928, 72 Ni, 17 Co, 2.2 Ti, 6.25 Fe.
For internal combustion valves, molds and machine parts; high temperature resistance.

KOVAR.
M-928; 29 Ni, 17 Co, 0.2 Mn, bal Fe.
Annealed: 77,500 TS; 59,500 YS; 25 El.
For electronic tubes, radio and X-ray tubes; same coefficient of expansion as glass; M P. 100°C.

KOVAR A.
M-118; 29 Ni, 17 Co, 0.3 Mn, bal Fe
Annealed 77,000 TS, 59,000 YS; 25 El; 882 Brin.
For low expansion alloy for hard glass to metal seals, mean expansivity (25-400°C) 0.0000045.

KP-1.
M-Russia, 0.13 C, 0.7 Mn, 0.2 Si, 12.2 Cr, 0.7 Mo, bal Fe.
Annealed: 75,000 TS; 35,000 YS; 25 El; B 92 Rock.
For springs, table flatware, oil refinery equipment.
Corrosion resistant

"K P." STYRIAN
Eng; 1.15 C, 0.24 Mn, 0.04 Cr, 4.67 W, bal Fe.
For tools, dies; oil hardened.

KRAFFTS ALLOY
Swedish; 8 Sn, 26 Pb, 66 Bi, M P 100°C

KRAMER 12% NICKEL SILVER.
M-346; 12 Ni, 22 Zn, 10 Pb, 3 Sn, 53 Cu
Cast 38,000 TS; 20,000 YS, 18 El, 65 Brin
Corrosion resistant, for hardware, plumbing, fixtures, valves, ornamental castings.

KRAMER 15% NICKEL DIE CAST ALLOY.
M-346; 15 Ni, Zn, bal Cu.
Sand Cast: 80,000 TS, 45,000 YS, 8 El, 175 Brin
For ornamental castings, railroad car fittings.

KRAMER ALLOY NO 66.
M-346; Mg, Mn, Ca, P, bal Cu.
For use as a deoxidizer and degassifier for Cu-Ni alloys

KRAMER 68-1-3-28 ALLOY.
M-346; 68 Cu, 1 Sn, 3 Pb, 28 Zn
Cast· 34,000 TS, 12,500 YS; 40 El, 55 Brin.
General purpose yellow brass, good machinability; for furniture, hardware, ornamental castings.

KRAMER 76-2½-6½-15 ALLOY.
M-346, 76 Cu, 2.5 Sn, 6.5 Pb, 15 Zn.
Cast: 36,000 TS; 14,500 YS, 36 El; 58 Brin
For plumbing fixtures, faucets, good machinability.

KRAMER ALLOY NO 77
M-346; Mg, Mn, Ca, Si, Ti, Al, bal Cu.
For use as an aluminum bronze degasifier and to improve humidity.

KRAMER 78-7-15 ALLOY.
M-346, 78 Cu, 7 Sn, 15 Pb.
Cast: 34,000 TS, 17,500 YS, 30 El; 61 Brin.
Anti-acid metal, corrosion resistant, for chemical pumps, mining equipment, bearings and bushings.

KRAMER 80-10-10 ALLOY.
M-346; 80 Cu, 10 Sn, 10 Pb.
Cast: 41,000 TS; 18,500 YS; 38 El; 65 Brin.
For bushings, bearings, pump bodies, and impellers, heavy duty; corrosion resistant.

KRAMER 81-2-2-15.
M-346; 81 Cu, 2 Sn, 2 Pb, 15 Zn.
Cast: 37,000 TS; 15,500 YS; 37 El; 50 Brin.
For ornamental castings; good machinability.

KRAMER 81-3-7-9 ALLOY.
M-346; 81 Cu, 3 Sn, 7 Pb, 9 Zn.
Cast: 34,000 TS; 17,000 YS; 27 El; 55 Brin.
For low pressure valves and fittings; good machinability.

KRAMER 83-3-3-11 ALLOY.
M-346; 83 Cu, 3 Sn, 3 Pb, 11 Zn.
Cast: 37,000 TS; 15,500 YS; 38 El; 53 Brin.
Expendable fire hose couplings and fittings; good machinability.

KRAMER 83-7-7-3 ALLOY.
M-346; 83 Cu, 7 Sn, 7 Pb, 3 Zn
Cast: 40,000 TS; 18,000 YS; 39 El; 67 Brin.
General purpose bearing alloy, corrosion resistant, for bushings, bearings, heavy duty auto fittings.

KRAMER 85-5-5-5 ALLOY.
M-346; 85 Cu, 5 Sn, 5 Pb, 5 Zn.
Cast. 37,000 TS; 16,500 YS, 34 El; 65 Brin.
Red brass, good machinability; for low pressure valves and fittings.

KRAMER 87-8-1-4 ALLOY.
M-346; 8 Sn, 1 Pb, 4 Zn, bal Cu.
Cast: 45,000 TS; 19,000 YS; 40 El; 70 Brin.
Corrosion resistant; for valves, steam pressure castings; resists high pressure.

KRAMER 88-3-2-7 ALLOY.
M-346; 88 Cu, 3 Sn, 2 Pb, 7 Zn.
Cast: 38,000 TS; 16,000 YS; 37 El; 60 Brin.
For ornamental and statuary castings.

KRAMER 88-6-1½-4½ ALLOY.
M-346; 88 Cu, 6 Sn, 1.5 Pb, 4.5 Zn.
Cast: 42,000 TS; 18,000 YS; 43 El; 70 Brin.
Corrosion resistant; for valves, fittings, flanges, gears, for high temperatures and pressures.

KRAMER 88-8-0-4 ALLOY.
M-346, 88 Cu, 8 Sn, 4 Zn.
Cast: 47,000 TS; 20,000 YS; 39 El; 70 Brin.
Corrosion resistant, for valves, pumps.

KRAMER "8812" ALUMINUM BRONZE.
M-346; Al, bal Cu.
Cast: 55,000 TS; 40,000 YS; 1 El; 230 Brin.
For welding fixtures, 20% IACS

KRAMER "A" MANGANESE BRONZE.
M-346; 58 Cu, 1 Fe, 0.5 Mn, 1 Al, bal Zn.
Cast: 70,000-75,000 TS; 28,000-35,000 YS; 22-35 El; 120-140 Brin.
For piston rods, valve stems, worm gears, propellers, structural castings, marine fittings.
Corrosion resistant; substitute for steel and malleable iron where corrosion resistance is required.

KRAMER "AX" MANGANESE BRONZE.
M-346; 58 Cu, 1 Mn, 1.5 Fe, 1.5 Al, bal Zn.
Cast: 80,000-88,000 TS; 38,000-40,000 YS; 18-24 El; 160-165 Br.
Corrosion resistant, for structural castings, valve stems, propellers, marine castings.

KRAMER "C" ALUMINUM BRONZE.
M-346; 10 Al, 4 Fe, 2 Ni, bal Cu.
Cast: 88,000-96,000 TS; 33,000-36,000 YS; 25-10 El; 30-7 RA; 150-175 Brin.
Heat treated: 105,000-125,000 TS; 45,000-75,000 YS; 22-2 El; 20-3 RA; 180-300 Brin
For gears, worm wheels, bushings; corrosion resistant.

KRAMER CONTACT METAL.
M-346; Sn, Pb, Zn, bal Cu.
Cast: 32,000 TS; 9500 YS, 30 El; 50 Brin.
For electrical fittings; 32% IACS.

KRAMER DIE CAST YELLOW BRASS.
M-346; 1 Sn, 1 Pb, 35 Zn, Al, bal Cu.
Cast: 55,000 TS; 30,000 YS; 15-20 El; 120-130 Brin.
For plumbing fixtures, ornamental castings; permanent mold castings.

KRAMER DIE MOLD BRONZE.
M-346; Ni, Al, Zn, bal Cu
Sand cast: 90,000 TS; 60,000 YS, 2.5 El; 200 Brin.
For glass molds and high temperature applications; sand cast.

KRAMER "G" ALUMINUM BRONZE.
M-346; Al, Fe, bal Cu.
Cast. 69,000 TS, 49,000 YS; 1 El, 265 Brin
For wear plates and guides.

KRAMER "I" ALUMINUM BRONZE
M-346; 1 0 Fe, 10 0 Al, bal Cu.
As cast: 67,000-77,000 TS, 26,000-34,000 YS, 12-26 El, 10-24 RA; 130-150 Brin.
Heat treated 90,000-95,000 TS, 40,000-55,000 YS; 10-25 El, 160-220 Brin
Heat treatable aluminum bronze, corrosion resistant, for structual castings, gears, machine parts, steel mill nuts.

KRAMER "L" ALUMINUM BRONZE.
M-346, 4 max Fe, 10 min Al, 0 5 max Mn, bal Cu.
As cast 82,000-93,000 TS, 29,000-38,000 YS; 12-32 El; 140-165 Brin
Heat treated: 100,000-110,000 TS, 35,000-55,000 YS; 10-30 El, 160-210 Brin.
Heat treatable aluminum bronze, corrosion resistant; for structural castings, gears, worm wheels

KRAMER "M" ALUMINUM BRONZE.
M-346; 3-4 Fe, 9 0-9 5 Al, bal Cu
Cast. 75,000-85,000 TS; 23,000-33,000 YS, 25-45 El; 26-47 RA, 125-140 Brin
General utility aluminum bronze, corrosion resistant, for structural castings, valves, gears, nuts, pumps

KRAMER "N" ALUMINUM BRONZE.
M-346; 4-5 Fe, 10-11 Al, 4-5 Ni, 1 max Mn, bal Cu.
As cast: 100,000-108,000 TS; 40,000-50,000 YS; 5-18 El; 6-20 RA, 180-210 Brin
Heat treated: 110,000-125,000 TS; 60,000-80,000 YS; 5-12 El; 220-260 Brin.
Heat treatable aluminum bronze, corrosion resistant; for structural castings, pump and valve parts, gears, aircraft parts, marine castings.

KRAMER NICKEL ALUMINUM BRONZE.
M-346; Fe, Al, Ni, Mn, bal Cu.
Cast: 90,000 TS; 40,000 YS; 20 El; 160 Brin.
Corrosion resistant; for marine propellers.

KRAMER "R" ALUMINUM BRONZE.
M-346; 4 Fe, 10 Al, bal Cu.
As cast: 85,000 TS; 35,000 YS; 15 El; 160 Brin.

Heat treated: 105,000 TS; 50,000 YS; 10 El; 200 Brin.
Heat treatable aluminum bronze; corrosion resistant; for structural castings, valves, gears, bushings.

KRAMER SILICON-ALUMINUM BRONZE.
M-346; Al, Si, bal Cu.
Sand cast: 70,000 TS; 30,000 YS; 25 El; 130 Brin.
For valve stems, structural castings; corrosion resistant.

KRAMER SILICON BRONZE.
M-346; Si, Zn or Mn, bal Cu.
Cast: 60,000 TS; 25,000 YS; 40 El; 88 Brin.
Corrosion resistant; for valves, pumps

KRAMER "S" MANGANESE BRONZE.
M-346; 60 Cu, 1 Fe, 0.5 Mn, 0.75 Al, 1 Sn, 1 Pb, bal Zn.
Cast: 60,000-65,000 TS; 25,000-30,000 YS; 15-20 El; 100-120 Brin.
Corrosion resistant, free machining.
For piston rods, valve stems, worm gears, propellers, valve bodies, fittings, structural castings, marine fittings

KRAMER SPECIAL 20% NICKEL SILVER.
M-346; 20 Ni, Zn, bal Cu.
Sand cast. 50,000 TS, 25,000 YS, 20 El; 80 Brin.
For valves, dairy and laundry castings, ornamental parts; corrosion resistant.

KRAMER SPECIAL 25% NICKEL SILVER.
M-346, 25 Ni, Zn, bal Cu.
Sand Cast 60,000 TS, 36,000 YS; 14 El, 135 Brin.
For valve seats, corrosion resistant

KRAMER "SX" MANGANESE BRONZE
M 346, Zn, Mn, Al, Fe, bal Cu
Cast 95,000-104,000 TS, 45,000-55,000 YS, 22-18 El, 22-18 RA; 180-195 Brin.
For marine and aircraft castings; corrosion resistant

KRAMER "X" MANGANESE BRONZE
M-346, 60 Cu, 1.5 Fe, 1.5 Mn, 3 Al, bal Zn.
Cast 85,000-95,000 TS, 45,000 YS, 18-20 El; 175 Brin
Corrosion resistant, for hubcaps, piston rods, valve stems, propellers, marine fittings, structural castings.

KRAMER "XX" MANGANESE BRONZE.
M-346, 63 Cu, 2 Fe, 2.5 Mn, 5 Al, bal Zn.
Cast. 110,000-115,000 TS, 60,000-72,000 YS; 13-18 El, 225 Brin
Heavy duty high strength alloy
For gears, cams, bridge bearings, screw down nuts, structural castings.

KREIDLERS BRASS "MS 58."
M-324, 58 Cu, 2.5 Pb, bal Zn
Annealed 54,000 TS, 25 El.
Hard. 89,000 TS, 13 El.
For screws, instruments, structural parts, armatures, knives, locks; free-cutting.

KREIDLERS BRASS "MS 63."
M-324; 63 Cu, 37 Zn.
Annealed 41,000 TS, 45 El.
Hard: 59,000 TS; 18 El.
For tubes, apparatus, high strength.

KROKOLOY.
M-157, C-Cr-Co, bal Fe.
For dies for forming, blanking, drawing and coining, shear blades; cast to shape, air hardening.

KROMAIR see REPUBLIC A2.

KROMAL NO. 1.
M-750; 0.9 C, 1.2 Mn, 0.5 Cr, bal Fe.
For punches, taps, dies, crimpers; non-deforming, oil hardened.

KROMAL NO. 2.
M-750; 0.9 C, 1.5 Mn, 0.4 Cr, 0.3 V, bal Fe.
For tools, punches; non-deforming

KROMAL NO. 3.
M-750; 0.5 C, 0.9 Mn, 0.9 Cr, 0.2 Mo, bal Fe.
For maintenance and repair; oil hardening.

KROMAL NO. 4.
M-750; 0.48 C, 1.85 Cr, 0.4 Mo, 1.25 Ni, bal Fe.
For maintenance and repair; oil hardening.

KROM-ALOY.
M-147; Cr, Sn, Pb, Al, Mn, Ni, Zn, bal Cu.
77,210 TS; 54,600 YS, 10 El; 9 RA; 153 Brin.
For marine hardware, propellers, pump valves and seats, trimmings, corrosion resistant.

KROMARC 55
M-118, 0.04 C, 16 Cr, 20 Ni, 9.5 Mn, 2 Mo, bal Fe.
For cast nozzle chambers, welding electrodes; austenitic, stainless, good weldability, resists hot tearing.

KROMARC-58.
M-118, 15.5 Cr, 21.0 Ni, 10.0 Mn, 2.25 Mo, 0.12 Si, 0.17 N, 0.25 V, 0.008 B, 0.015 Zr, 0.03 C, bal Fe.
At 400°F. 100,000 TS, 65,000 YS; 36 El; 65 RA.
At 1200°F 80,000 TS, 45,000 YS, 25 El; 50 RA
At 2000°F 15,000 TS; 15,000 YS; 25 El; 25 RA.
For welded components in steam turbines
High temperature tensile, creep and rupture strength; austenitic, stainless, and heat resistant

KROMAR D70.
M-1724, 0.03 max C, 0.1 Si, 0.1 Mn, 4.0-5.0 Ni, 11.5-12.5 Cr, 4.0-5.0 Mo, 12.0-14.0 Co, 0.2-0.5 Ti, 0.05-0.15 Al, bal Fe
Precipitation hardening stainless, hardened 180,000 TS, 170,000 YS; 16.5 El, 37-39 Izod
For aircraft components, pressure vessels, turbine blading.

KROMAX
80 Ni, 20 Cr.
For resistance alloy; heat resistant.

KROMITE NO 2
M-15, C, alloy, bal Fe
For chain links, mandrels, springs, tongs, shock resistant.

KROMITE NO. 3
M-15; C, alloy, bal Fe
Heat treated: 156,000 TS, 130,000 YS; 17 El, 56 RA; 270 Brin.
For shafts, gears, bolts, tie rods; preheat treated.

KROMITE NO. 4.
M-15; C, alloy, bal Fe.
Heat treated. 211,000-304,000 TS; 450-560 Brin.
For punches, picks, swages, vice jaws, bolts; tough, shock resistant.

KROMITE BRAKE DIE.
M-15; C, alloy, bal Fe
For brake dies, bead-forming dies; preheat treated, tough and wear resistant.

KROMORE.
M-44; 85 Ni, 15 Cr.
For heating elements, electrical resistances; heat resistant.

KRONA.
M-1705; 0.90 C, 1.2 Mn, 0.5 Cr, 0.2 V, 0.5 W, bal Fe.
Oil hardening tool steel.
AISI O1.

KROPP 23.
M-1135; 0.30 C, 0.70 Mn, 0.35 Si, 0.96 Cr, 0.2 Mo, bal Fe.
For plastic mold dies; water hardened.

KROPP 23C.
M-1135; 0.32 C, 0.75 Mn, 0.35 Si, 0.9 Cr, 0.2 Mo, bal Fe.
For zinc die casting dies; water hardened

KROPP 56.
M-1135; 0.60 C, 0.65 Mn, 1.8 Ni, 1.6 Cr, 0.35 Mo, bal Fe.
For forging dies, shear blades, high pressure cylinders; oil hardening

KROPP 61.
M-1135; 0.10 C, 0.5 Mn, 3.5 Ni, 1.5 Cr, bal Fe.
For gears, pinions, spindels, cams, bearing rolls; tough.

KROPP 93.
M-1135; 0.35 C, 1.0 Si, 5 Cr, 1 Mo, 0.15 V, 1 W, bal Fe.
For shear blades, extrusion and upsetting dies, mandrels; hot work steel

KROPUNCH.
M-750; 0.4 C, 2.5 W, Cr, 0.3 V, 2.0 Mo, 1.1 Si, bal Fe.
For shear blades, punches, trim dies, mandrels; hot and cold work steel, air hardening.

KROSIL.
M-38; 0.5 C, 0.9 Mn, 1.5 Si, 0.35 Mo, bal Fe
For rivet shearing tools, cold tie plate punches; shock and fatigue resistant.

KROSIL CHISEL.
M-362; 0.5 C, 0.9 Mn, 0.35 Mo, 1.5 Si, bal Fe
For cold chisels, upsetters, dies, crimpers; oil hardened, shock resistant

KROTUNG.
M-750; 0.3 C, 5 Cr, 1.5 Mo, 1.3 W, 0.3 V, bal Fe
For hot forging dies and tools, nut crowners, high red hardness, tough

KROVAN.
M-38, M-260; 0.95 C, 1 Cr, 0.2 V, bal Fe.
Water hardened
For jewelers' dies, heavy blanking dies, rolls; deep hardening, resists wear and impact, tough.

KRUPP 150
M-72; 0.2 C, 0.35 Si, 1.0 Mn, 0.2 Ti, bal Fe.
For hard facing electrodes; tough.

KRUPP 204.
M-72; 1.05 C, 1.0 Cr, 0.30 Mn, bal Fe.
For bearings, liners, sleeves, bushings; water hardened, wear resistant

KRUPP 206.
M-72; 1.05 C, 0.35 Mn, 1.2 Cr, bal Fe.
For bearings, liners, sleeves, bushings; water hardened, wear resistant

KRUPP 250.
M-72; 0.25 C, 0.35 Si, 1.6 Mn, 0.2 Ti, bal Fe.
For hard facing electrodes; tough.

KRUPP 303.
M-72; 1.4 C, 0.1 V, 0.3 Cr, bal Fe
For engravers' tools, cutters, bearings, form dies; water hardened, wear resistant.

KRUPP A3P.
M-72; 0.15 C, 0.40 Mn, 0.25 Si, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin
For gears, cams, camshafts, bolts, fasteners; case hardening steel.

KRUPP A3PO.
M-72; 0.15 C, 0.25 Si, 0.35 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El, 60 RA; 145 Brin
For gears, cams, camshafts, machine tool parts; case hardening steel.

KRUPP A11K.
M-72, 0.52-0.58 C, 0.5 Mn, bal Fe
For forging die blocks, water hardened.

KRUPP A12 0
M-72, 0.6 C, 0.4 Si, 0.6 Mn, bal Fe.
Heat treated. 160,000 TS; 113,000 YS; 12 El; 40 RA; 321 Brin
For punches, rails, crimpers, water hardened.

KRUPP A12-14P.
M-72, 0.7 C, 0.25 Si, 0.25 Mn, bal Fe.
Heat treated 174,000 TS, 128,000 YS; 12 El; 37 RA, 355 Brin
For rails, crimpers, punches, springs, water hardened.

KRUPP A14K
M-72; 0.60 C, 0.40 Si, 0.60 Mn, bal Fe
Heat treated 160,000-115,000 TS, 113,000 77,000 YS, 12-13 El, 40-54 RA, 321-230 Brin
For punches, rails, crimpers, water hardened

KRUPP A15-17P.
M-72, 0.85 C, 0.25 Si, 0.25 Mn, bal Fe
Heat treated. 190,000 TS, 145,000 YS; 10 El, 30 RA; 400 Brin
For lathe and planer tools, drills, taps, hobs, Type W1, water hardened.

KRUPP A16K
M-72, 0.75-0.83 C, 0.5 Mn, bal Fe
For forging die blocks, water hardened

KRUPP A17 G.
M-72; 0.8-0.9 C, 0.25-0.4 Si, 0.45-0.6 Mn, bal Fe
For tools, drills, springs, water hardening

KRUPP A18-20P
M-72, 1.0 C, 0.25 Mn, 0.25 Si, bal Fe
Annealed 100,000 TS; 53,000 YS, 21 El, 42 RA; 200 Brin
For drills, taps, reamers, tools, dies; Type W1, water hardened

KRUPP A22P/A23P
M-72; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 110,000 TS, 60,000 YS, 18 El, 38 RA, 210 Brin
For reamers, drills, taps, broaches, hobs, tools; Type W1, water hardened

KRUPP A24P.
M-72, 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe
For engravers tools, form cutters, milling cutters; Type W1; water hardened.

KRUPP A26P.
M-72, 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers tools, form and milling cutters, Type W1; water hardened.

KRUPP A30
M-72, 0.15 C, 0.25 Si, 0.40 Mn, bal Fe
Cold drawn: 72,000 TS; 60,000 YS; 22 El; 58 RA; 145 Brin
For gears, cams, camshafts, fasteners; carburizing steel.

KRUPP A50.
M-72; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed· 73,000 TS, 41,000 YS; 22 El; 58 RA; 150 Brin.
For gears, cams, bolts, fasteners, camshafts; case hardening steel.

KRUPP A70.
M-72; 0.35 C, 0.25 Si, 0.45 Mn, bal Fe.
Hot rolled; 85,000 TS; 54,000 YS; 30 El; 53 RA; 185 Brin
For gears, pinions, shafts, bolts, fasteners; water hardened.

KRUPP A90.,
M-72; 0.45 C, 0.25 Si, 0.45 Mn, bal Fe.
Hot rolled 98,000 TS; 59,000 YS, 24 El; 45 RA; 212 Brin.
For gears, pinions, shafts, bolts, fasteners; water hardened.

KRUPP ANALYSIS
M-72, M-68; 0.08-0.16 C, 1.2-1.7 Cr, 3.8-4.3 Ni, bal Fe
For armor plate, gears, tough case-hardening alloy steel

KRUPP B126 P.
M-72, 0.62-0.68 C, 1.7 Si, 0.6 Mn, bal Fe
For tools, springs, punches; shock resistant.

KRUPP B136M
M-72, 0.7 C, 1.7 Si, 0.7 Mn, bal Fe
For punches, crimpers, upsetters, springs; oil hardened, shock resistant

KRUPP BC40
M-72, 0.37 C, 1.25 Si, 1.25 Mn, bal Fe
For punches, crimpers, upsetters, oil hardened.

KRUPP BC1044
M-72, 0.53 C, 0.8 Si, 1.05 Mn, bal Fe
For springs, punches, upsetters, oil hardened.

KRUPP BC1244
M-72, 0.57-0.63 C, 0.9-1.1 Si, 0.9-1.1 Mn, bal Fe.
For tools, springs, punches; shock resistant

KRUPP BDF30
M-72, 0.30-0.36 C, 0.8-1.0 Si, 0.3 Mn, 0.9-1.1 Cr, 0.20 V, 1.7-2.0 W, bal Fe
For tools, dies, hot work tools; hot work steel.

KRUPP BDF50
M-72, 0.40-0.46 C, 0.8-1.0 Si, 0.9-1.1 Cr, 1.7-2.0 W, bal Fe.
For tools, hot work dies; hot work steel.

KRUPP BDFD.
M-72; 0.5 C, 1.5 Cr, 2.25 W, 0.2 V, bal Fe
For tools, dies, punches, oil hardened.

KRUPP BDF SPEZIAL.
M-72, 0.54-0.60 C, 0.8-1.1 Si, 1.7-2.0 W, bal Fe.
For tools, hot work dies; hot work steel.

KRUPP BEARING.
M-72, 87 Al, 8 Cu, 5 Sn.
For bearings

KRUPP BF1552.
M-72; 0.67 C, 1.3 Si, 0.5 Cr, 0.5 Mn, bal Fe
For springs; oil hardened, tough.

KRUPP BF2555.
M-72; 1.2-1.3 C, 1.05-1.2 Si, 0.7 Mn, 1.1-1.3 Cr, bal Fe.
For tools, dies, bearings, oil hardening.

KRUPP BFD-50G.
M-72; C, alloy, bal Fe.
For tools.

KRUPP BFG
M-72; 0.95 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies; non-deforming.

KRUPP BFM755.
M-72; 0.30-0.38 C, 1.4-1.6 Si, 1.2-1.5 Cr, 0.1-0.2 V, bal Fe.
For tools, punches, dies, shock resistant.

KRUPP BFM SPEZIAL.
M-72, 0.45 C, 1.4 Si, 1.2 Cr, 0.1 V, bal Fe.
For tools, punches, chisels; shock resistant

KRUPP BFV.
M-72; 0.65-0.70 C, 0.15-0.25 Si, 0.5-0.6 Mn, bal Fe.
For tools, springs, punches; water hardening

KRUPP BMH
M-72; 0.42-0.48 C, 1.5-1.7 Si, 0.6 Mn, bal Fe.
For tools, springs, punches; shock resistant.

KRUPP BS1
M-72, 0.95 C, bal Fe.
For tools, drills, taps; water hardened.

KRUPP BS2.
M-72, 0.95 C, bal Fe
For tools, drills, taps, water hardened.

KRUPP BS3
M-72, 1.1 C, 0.25 Si, 0.25 Mn, bal Fe.
For drills, taps, reamers, cutters; Type W1; water hardened

KRUPP BS4
M-72, 1.0 C, 0.25 Si, 0.25 Mn, bal Fe
For springs, drills, taps, punches, reamers; Type W1, water hardened.

KRUPP BS5.
M-72, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated. 190,000 TS; 145,000 YS, 10 El; 30 RA; 400 Brin.
For drills, taps, reamers, punches, cutters; Type W1; water hardened.

KRUPP BS6.
M-72; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated 175,000 TS, 128,000 YS, 12 El, 37 RA, 355 Brin
For rails, punches, hammers, axes; Type W1; water hardened.

KRUPP C7E
M-72, 0.15 C, 0.65 Cr, 0.5 Mn, 0.25 Si, bal Fe.
For gears, pinions, machine tool parts; case hardening steel.

KRUPP C66.
M-72, 0.30 C, 1.35 Mn, 0.25 Si, bal Fe.
For gears, shafts, machine tool parts, water hardened, tough.

KRUPP CARBON.
M-371, 0.7-1.0 C, bal Fe.
For tools, drills, taps, water hardened.

KRUPP CMV SPECIAL.
M-72; C, 18 Mn, 12.5 Cr, 1 V, 0.2 Ni, bal Fe.
For blading for gas turbine on jet engine; corrosion and heat resistant

KRUPP DF35
M-72; 0.9 C, 0.45 Cr, bal Fe.
For tools, drills, taps, water hardening.

KRUPP DF51.
M-72; 1.05 C, 0.9 Mn, 1.0 Cr, 1.15 W, bal Fe.
For cutters, bearings, dies, tools; water hardened.

KRUPP DF-108C.
M-72; 1.5 C, 11.5 Cr, 0.75 Mo, bal Fe.
For tools, dies; non-deforming.

KRUPP DF-109-CN.
M-72; 0.8 C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe.
For hot work tools and dies; hot work steel.

KRUPP DF109CW.
M-72; 0.3 C, 2.65 Cr, 0.35 V, 8.5 W, 0.3 Mn, bal Fe.
For extrusion rams and liners, punches; hot work steel, oil hardened.

KRUPP DF168.
M-72; 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For blanking and forming dies, oil hardened, non-deforming.

KRUPP DFM.
M-72; 0.7 C, 18 W, 5 Co, 4 Cr, 1.3 V, bal Fe.
For tools, dies, cutters, high speed steel.

KRUPP DFMC.
M-72; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, dies, cutters; high speed steel.

KRUPP DFM EXTRA SPECIAL.
M-72; 0.7 C, 18 W, 9 Co, 1 Mo, 4 Cr, 2 V, bal Fe.
For tools, dies, cutters; high speed steel.

KRUPP DFMN E-SPEZIAL.
M-72; 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

KRUPP DFMN SUPRA
M-72; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel

KRUPP DFMN ZWEIKARRO.
M-72, 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, broaches; high speed steel.

KRUPP DFM SUPRA.
M-72; 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, reamers, hobs, taps, drills; high speed steel, heavy duty.

KRUPP DFM SUPRA SPEZIAL.
M-72; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

KRUPP DFMV3.
M-72; 0.86 C, 4.1 Cr, Mo, W, V, bal Fe.
For lathe and planer tools, reamers, drills, hobs; high speed steel

KRUPP DFMV 5.
M-72; 1.35 Co, 0.3 Si, 0.3 Mn, 4.25 Cr, 10.5 W, 4.35 V, bal Fe.
For hard facing electrodes; wear resistant.

KRUPP DFM ZWEIKARRO.
M-72; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe
For lathe and planer tools, drills, taps, hobs; high speed steel.

KRUPP E33E.
M-72; 0.2 C, 1.5 Ni, bal Fe.
For gears, pinions, machine tool parts; case hardening steel.

KRUPP E67.
M-72; 0.18 C, 1 Cr, 2 Ni, bal Fe.
For gears, cams, camshafts; case hardened.

KRUPP EB7.
M-72; 0.55 C, 0.50-0.70 Mn, 0.10-0.40 Si, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 320 Brin.
For gears, bolts, machine tool parts; water hardened.

KRUPP EF23V.
M-72; 0.28 C, 1.5 Ni, 0.5 Cr, bal Fe.
For bolts, gears, machine tool parts; oil hardened, shock resistant.

KRUPP EF24V.
M-72; 0.35 C, 0.5 Cr, 1.5 Ni, bal Fe.
For bolts, gears, machine tool parts; oil hardened, shock resistant.

KRUPP EF29V.
M-72, 0.28 C, 0.7 Cr, 2.5 Ni, bal Fe.
For bolts, gears, machine tool parts; oil hardened, shock resistant.

KRUPP EF30V
M-72; 0.35 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, crankshafts, oil hardened, shock resistant

KRUPP EF35E.
M-72, 0.13 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel, shock resistant.

KRUPP EF48V
M-72; 0.22 C, 0.7 Cr, 3.5 Ni, 0.6 Mn, bal Fe
For gears, cams, camshafts, fasteners; case hardening steel, shock resistant

KRUPP EF49V.
M-72; 0.30 C, 0.7 Cr, 3.5 Ni, bal Fe
For gears, bolts, crankshafts, fasteners, oil hardened, shock resistant.

KRUPP EF58E
M-72, 0.13 C, 0.7 Cr, 3.5 Ni, bal Fe
For gears, cams, camshafts, machine tool parts, case hardening steel, shock resistant

KRUPP EF59F
M-72, 0.13 C, 1.1 Cr, 4.5 Ni, bal Fe
For gears, pinions, camshafts, fasteners, case hardened, shock resistant.

KRUPP EF62V
M-72; 0.35 C, 1.3 Cr, 4.5 Ni, bal Fe.
For gears, bolts, crankshafts, machine tool parts, oil hardened, shock resistant.

KRUPP EF1514
M-72; 0.8 C, 0.7 Mn, 1-1.2 Cr, 0.5 Ni, bal Fe.
For tools, dies, tough

KRUPP EFS
M-72, 0.45 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, crankshafts, fasteners, oil hardened, shock resistant

KRUPP EFS SPECIAL S.
M-72, 0.45-0.50 C, 0.5-0.8 Mn, 1.2-1.5 Cr, 1.1-1.4 Ni, bal Fe.
For tools, gears, shafts, oil hardening.

KRUPP EFWP.
M-72, 0.50-0.55 C, 0.9-1.2 Cr, 3-3.5 Ni, bal Fe.
For tools, gears, shafts; oil hardening.

KRUPP EV420.
M-72; 0.08 C, 1-1.25 Mn, bal Fe.
Welded: 55,000 TS; 45,000 YS; 33-40 El; 60-80 RA.
For welding rod.

KRUPP EXTRA.
M-72; 0.35 C, 2.5 Cr, 0.65 V, 4.5 W, bal Fe.
For tools, hot work dies; hot work steel.

KRUPP EXTRA SPEZIAL P.
M-72; 0.5 C, 0.85 Mn, 1.5 Cr, 0.65 Mo, 0.3 V, bal Fe.
For tools, gears, shafts; oil hardening.

KRUPP F13.
M-72; 0.12 max C, 2.2 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For valves, cutlery, surgical instruments, knives; Type 410; stainless.

KRUPP F20S.
M-72; 1.6 C, 0.9 Si, 0.2 Mn, 20 Cr, bal Fe.
For hard facing electrodes; corrosion resistant.

KRUPP F20SH.
M-72; 2.5 C, 0.9 Si, 0.2 Mn, 20 Cr, bal Fe.
For hard facing electrodes; corrosion resistant.

KRUPP F22.
M-72; 0.13 C, 0.5 Cr, 0.3 Mn, 0.2 Si, bal Fe.
For gears, bolts, machine tool parts; case hardened.

KRUPP F28S.
M-72, 1.6 C, 0.9 Si, 0.55 Mn, 28 Cr, bal Fe.
For hard facing electrodes; corrosion resistant.

KRUPP F28SH.
M-72; 2.1 C, 0.9 Si, 0.55 Mn, 28 Cr, bal Fe
For hard facing electrodes; corrosion resistant.

KRUPP F33
M-72, 0.15 C, 0.65 Cr, 0.25 Si, 0.5 Mn, bal Fe.
For gears, bolts, machine tool parts; case hardened.

KRUPP F74
M-72, 0.41 C, 0.25 Si, 0.65 Mn, 1.0 Cr, bal Fe.
For gears, bolts, machine tool parts; water hardened.

KRUPP F153.
M-72; 1.4 C, 0.30 Cr, 0.30 Mn, 0.25 Si, 0.1 V, bal Fe
For bearings, cutters, tools, dies; water hardened, wear resistant.

KRUPP F168.
M-72, 0.82-0.87 C, 1.7-1.9 Cr, bal Fe.
For tools, bearings, water hardening

KRUPP F182
M-72, 0.9 C, 0.45 Cr, bal Fe
For tools, drills, taps, water hardening

KRUPP F193.
M-72, 0.9-1.0 C, 0.7-0.9 Cr, bal Fe.
For tools, drills, taps, water hardening.

KRUPP F202
M-72, 1.1 C, 0.30 Mn, 0.4 Cr, 0.20 Si, bal Fe.
For cutters, tools, bearings, drills; water hardened, wear resistant.

KRUPP F206 G
M-72, 0.95-1.05 C, 1.25-1.5 Cr, bal Fe.
For tools, bearings; wear resistant

KRUPP F261
M-72; 1.26-1.32 C, 0.2-0.3 Cr, 0.03 S, bal Fe.
For tools, cutters, drills; water hardening.

KRUPP F261 P.
M-72, 1.26-1.32 C, 0.025 S, 0.025 P, 0.2-0.3 Cr, bal Fe.
For tools, cutters, drills; water hardening.

KRUPP F283
M-72; 1.35-1.45 C, 0.6-0.8 Cr, bal Fe.
For tools, cutters, hobs; water hardening.

KRUPP F306.
M-72; 1.4-1.5 C, 1.3-1.5 Cr, bal Fe.
For tools, bearings; wear resistant.

KRUPP F306 G
M-72; 1.4-1.5 C, 1.3-1.5 Cr, bal Fe.
For tools, bearings; wear resistant.

KRUPP F1248C.
M-72; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

KRUPP F1448C.
M-72; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

KRUPP F-2048.
M-72; 2.25 C, 13 Cr, bal Fe.
For tools, dies; non-deforming

KRUPP F3014-LCS.
M-72; 1.4-1.5 C, 1.4-1.6 Si, 3.5 Cr, bal Fe.
For tools, dies; tough.

KRUPP F4048.
M-72; 2.0-2.2 C, 11-12 Cr, bal Fe.
For tools, dies; non-deforming.

KRUPP FC29.
M-72; 0.20 C, 1.15 Cr, 1.25 Mn, bal Fe.
For gears, cams, camshafts; case hardening steel.

KRUPP FF6.
M-72; 0.12 max C, 2.3 Si, 6 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

KRUPP FF6N.
M-72; 0.3 C, 2.2 Si, 6 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

KRUPP FF13.
M-72; 0.12 max C, 2.2 Si, 13 Cr, bal Fe.
For turbine blades, cutlery, valves, surgical instruments, corrosion and heat resistant.

KRUPP FF18.
M-72; 0.12 max C, 18 Cr, 2 Si, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery parts, soot blowers, bolts; Type 430, corrosion resistant

KRUPP FF25.
M-72; 0.35 C, 23-27 Cr, bal Fe.
Annealed: 90,000 TS; 60,000 YS; 20 El; 45 RA; 180 Brin.
For furnace parts, preheaters, heat treating boxes; Type 446, corrosion resistant.

KRUPP FF30.
M-72; 0.35 C, 23-27 Cr, bal Fe.
Annealed. 90,000 TS; 60,000 YS; 20 El; 45 RA; 180 Brin.
For furnace parts, preheaters, heat treating boxes; Type 446; corrosion resistant.

KRUPP FF112.
M-72; 0.3 C, 2.2 Si, 6 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant.

KRUPP FF120.
M-72; 0.6 C, 1.5 Si, 22 Cr, bal Fe.
For furnace grates, wear plates, rabble arms; heat and creep resistant.

KRUPP FF128.
M-72; 0.6 C, 1.5 Si, 29 Cr, bal Fe.
For furnace grates, wear plates, rabble arms; heat resistant.

KRUPP FF228.
M-72; 1.3 C, 1.5 Si, 29 Cr, bal Fe.
For wear blades, scrapers, crushers, rollers; heat and abrasion resistant.

KRUPP FFE25.
M-72; 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe.
Cast: 90,000 TS; 65,000 YS; 2 El; 212 Brin.
For cylinder liners, bushings, valves, corrosion and heat resistant.

KRUPP FFE28.
M-72; 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe.
Cast: 90,000 TS; 65,000 YS; 2 El; 212 Brin.
For cylinder liners, bushings, valve seats and bodies; corrosion and heat resistant.

KRUPP FFP6.
M-72; 0.12 C, 0.8 Si, 0.5 Cr, 0.8 Al, bal Fe.
For oil refinery equipment, heat and creep resistant.

KRUPP FFP13
M-72; 0.12 max C, 1.2 Si, 1 Al, 13 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant

KRUPP FFP18.
M-72; 0.12 max C, 1 Al, 18 Cr, bal Fe.
Annealed: 120,000 TS; 90,000 YS; 20 El; 55 RA; 250 Brin.
For oil refinery equipment, heat and creep resistant.

KRUPP FFP24.
M-72; 0.12 max C, 1.5 Si, 1.5 Al, 24 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant.

KRUPP FK15.
M-72; 0.15 C, Cr, Mo, bal Fe.
For gears, shafts, machine tool parts, case hardening steel, tough.

KRUPP FK24.
M-72; 0.20 C, Cr, Mo, bal Fe.
For machine tool parts, gears, shafts; case hardening steel, tough.

KRUPP FK30
M-72, 0.25 C, 0.65 Mn, 1 Cr, 0.2 Mo, bal Fe
For machine tool parts, gears, oil hardened, tough.

KRUPP FK34.
M-72; 0.33 C, 1 Cr, 0.65 Mn, 0.2 Mo, bal Fe.
For machine tool parts, gears, fasteners, oil hardened, tough.

KRUPP FK44.
M-72, 0.42 C, 1 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, fasteners, shafts, studs, oil hardened, tough

KRUPP FKM45
M-72; 0.42 C, Cr, Mo, bal Fe
For gears, bolts, fasteners, shafts; oil hardened, tough

KRUPP FKM54.
M-72, 0.30 C, Cr, Mo, V, bal Fe
For gears, bolts, machine tool parts; oil hardened, tough

KRUPP FM21.
M-72; 0.50 C, 1.0 Cr, 0.09 V, bal Fe.
For springs, gears, bolts, shafts; oil hardened, shock resistant.

KRUPP FM881.
M-72; 0.34-0.39 C, 1.6-1.9 Cr, 0.15 V, bal Fe
For gears, springs, tough.

KRUPP FM1041.
M-72; 0.50 C, 1.0 Cr, 0.09 V, bal Fe
For gears, bolts, springs, shafts; oil hardened, shock resistant.

KRUPP FM1251.
M-72; 0.6-0.68 C, 0.7-1.0 Si, 0.7-1.0 Mn, 1.1-1.3 Cr, 0.1-0.18 V, bal Fe.
For tools, gears, springs; tough.

KRUPP FM2432.
M-72; 1.15-1.25 C, 0.6-0.8 Cr, 0.15 V, bal Fe.
For tools, bearings; water hardening.

KRUPP FMC 24.
M-72; 0.27 C, Cr, V, Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

KRUPP FP12.
M-72; 0.34 C, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

KRUPP FP15.
M-72, 0.27 C, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant

KRUPP FPE23
M-72, 0.33 C, 1.1 Al, 1.7 Cr, 1.0 Ni, bal Fe.
For oil refinery equipment; creep and heat resistant

KRUPP FPK13.
M-72, 0.32 C, 1.1 Al, 1.1 Cr, 0.18 Mo, bal Fe.
For oil refinery equipment, heat and creep resistant

KRUPP GA 350.
M-72, 0.45 C, 0.35 Si, 2.1 Mn, 1.15 Cr, 0.2 Ti, bal Fe
For hard facing electrodes, wear resistant.

KRUPP GA 500
M-72, 0.9 C, 0.35 Si, 2.1 Mn, 1.3 Cr, 0.2 Ti, bal Fe
For hard facing electrodes, wear resistant.

KRUPP HCT1
M-72, 0.2 max C, 22-24 Cr, 12-15 Ni, 2 max Mn, 3.5 max Si, bal Fe
Annealed 85,000-95,000 TS, 40,000-50,000 YS, 45-55 El, 150-185 Brin
For heat treating boxes, oil refinery and chemical plant equipment; Type 309; austenitic, heat resistant

KRUPP HCT3
M-72, 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe
Annealed. 95,000 TS; 45,000 YS, 50 El, 65 RA, 180 Brin
At 1200°F 57,000 TS, 22,000 YS; 32 El, 45 RA
For furnace parts and equipment, heat treating boxes, Type 310, austenitic, heat resistant

KRUPP HGS.
M-72, 0.55-0.60 C, 0.6-0.8 Cr, 1.5-1.8 Ni, 0.15-0.20 Mo, bal Fe
For forging die blocks, oil hardened, tough

KRUPP HGSE
M-72, 0.55 C, 0.7 Mn, 0.8 Cr, 1.8 Ni, 0.5 Mo, bal Fe
For forging die blocks; oil hardening

KRUPP HGS SPEZIAL
M-72, 0.34 C, 0.68 Cr, 0.15 Mo, bal Fe
For tools, gears, shafts; oil hardening.

KRUPP HIGH SPEED.
M-371; C, W, alloy, bal Fe.
For high speed tools and cutters, high speed steel

KRUPP HM1
M-72; C, bal Fe.
For tools.

KRUPP HM2.
M-72; C, bal Fe.
For tools.

KRUPP HM3.
M-72; 1.1 C, bal Fe.
For tools, drills, taps; water hardened.

KRUPP HM 4.
M-72; 1.1 C, bal Fe.
For tools, drills, taps; water hardened.

KRUPP HM4 G.
M-72; 0.9-1.0 C, 0.5 Cr, bal Fe.
For tools, bearings, drills; water hardening.

KRUPP HSK.
M-72; 0.90 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For drills, taps, springs, tools, reamers; Type W1; water hardened.

KRUPPIN.
M-72; 28 Ni, C, bal Fe.
For resistance alloy; heat resistant.

KRUPP K.A.-2.
M-72; 7-10 Ni, 16-20 Cr, 0.75 Si, 0.15 C, bal Fe.
For heat and corrosion resisting parts, for high temperature use; heat and corrosion resistant.

KRUPP KFM.
M-72; 0.95 C, 0.3 Si, 0.3 Mn, 3.75 Cr, 1.3 W, 0.12 Ti, 2.8 V, 2.35 Mo, bal Fe.
For hard facing electrodes; wear resistant.

KRUPP KFM EXTRA.
M-72; 0.85 C, W, Mo, bal Fe.
For cutters, dies; oil or water hardened

KRUPP KFM ZWEISTERN.
M-72; 0.95 C, W, Mo, bal Fe
For cutters, dies, oil or water hardened.

KRUPP M202
M-72; 0.9-1.0 C, 0.3 V, bal Fe
For tools, drills, taps, water hardening

KRUPP N48.
M-72; 0.30 C, Cr, V, bal Fe.
For gears, bolts, machine tool parts, oil hardened, tough

KRUPP N54
M-72, 0.31 C, 2.35 Cr, 0.18 Mo, 0.13 V, bal Fe.
For gears, bolts, machine tool parts, oil hardened, tough.

KRUPP NCT1A.
M-72; 0.15 C, 2 Si, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 302, stainless, austenitic.

KRUPP NCT1A GUSS.
M-72, 0.4 C, 22 Cr, 9.5 Ni, bal Fe.
Cast: 85,000 TS; 45,000 YS; 35 El; 165 Brin.
For heat treat boxes, furnace parts, conveyors; Type HF, corrosion and heat resistant.

KRUPP NCT2 GUSS.
M-72; 0.4 C, Cr, Ni, Si, bal Fe.
For furnace parts, heat treat boxes; corrosion and heat resistant

KRUPP NCT3.
M-72; 0.15 C, 24 Cr, 19 Ni, bal Fe.
Annealed: 100,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin.
For valves, pumps, turbine and jet parts; Type 310; stainless, austenitic.

KRUPP NCT3/133.
M-72; 20 Cr, 25 Ni, bal Fe.
For welding electrodes; stainless, austenitic.

KRUPP NCT3 GUSS.
M-72; 0.4 C, 25 Cr, 19 Ni, bal Fe.
Cast: 75,000 TS; 50,000 YS; 17 El; 170 Brin.
Aged: 85,000 TS; 50,000 YS; 10 El; 190 Brin.
For heat treat boxes, burner tips, hearth plates; Type HK; austenitic, stainless.

KRUPP NCT3A GUSS.
M-72; 0.4 C, 26 Cr, 14 Ni, bal Fe.
Cast: 75,000 TS; 50,000 YS; 15 El; 170 Brin.
For heat treat boxes, furnace parts, hearth plates; Type HI; austenitic, heat resistant.

KRUPP NCT6.
M-72; 0.15 C, Ni, Cr, bal Fe.
For chemical plant equipment; stainless.

KRUPP NCT8.
M-72; 0.15 C, Ni, Cr, bal Fe
For chemical plant equipment; stainless.

KRUPP NCT30
M-72; 0.15 C, Ni, Cr, bal Fe.
For chemical plant equipment; stainless.

KRUPP NFKC.
M-72; 1.4 C, 0.2 Si, 0.3 Mn, 0.45 Cr, 3.25 W, 0.2 V, bal Fe
For hard facing electrodes, wear resistant.

KRUPP NIROSTAGUSS 1.
M-72; 1-2 C, 24 min Cr, bal Fe.
Cast. 58,000 TS; 250 Brin.
For chemical equipment, HNO_3 and pulp industries; corrosion resistant.

KRUPP NIROSTAGUSS 2.
M-72, 1-2 C, 24 min Cr, bal Fe
Cast: 65,000 TS; 300 Brin
For chemical equipment, HNO_3 and pulp industries; corrosion resistant

KRUPP NIROSTAGUSS 3.
M-72; 1-2 C, 24 min Cr, bal Fe.
Cast: 72,000-114,000 TS, 400-500 Brin
For paper drying cylinders, chemical equipment; corrosion resistant

KRUPP NITROPLAT.
M-72; composite sheet Krupp V2A on C steel.
For corrosion resistant parts; corrosion resistant.

KRUPP NON-DEFORMING.
M-371, C, alloy, bal Fe
For tools, dies, non-deforming.

KRUPP P77.
M-72, 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, dies, shears, upsetters; oil hardened, non-deforming.

KRUPP P141.
M-72; 0.85 C, W, Mo, Cr, V, bal Fe.
For tools, dies, cutters; oil hardened.

KRUPP P193
M-72; C, Ni, Cr, bal Fe.
For jet engine components, turbine rotor blades; austenitic, heat resistant.

KRUPP P427
M-72; 1.65 C, Cr, Co, bal Fe.
For blanking and forming dies; oil hardened, wear resistant.

KRUPP PFM.
M-72; 0.95-1.05 C, 0.3 Cr, 0.15 V, bal Fe.
For tools, drills, taps; water hardening.

KRUPP REZ EXTRA.
M-72; 0.35 C, 0.8 Cr, 0.55 Mo, bal Fe.
For tools, gears, shafts; oil hardening.

KRUPP SC2448.
M-72; 1.3 C, 12 Mn, bal Fe.
For tools, wear resistant parts; non-deforming, austenitic.

KRUPP SPECIAL.
M-371; C, alloy, bal Fe.
For tools; oil hardened.

KRUPP SPEZIAL S.
M-72; 0.45 C, Cr, Ni, bal Fe.
For machine tool parts; oil hardened.

KRUPP TYPE METAL.
Germ.; 60 Pb, 18 Sb, 12 Sn, 4.7 Cu, 4.7 Ni, 1 Bi.
For type metal.

KRUPP UK17F EXTRA.
M-72; 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe.
For welded oil refinery and chemical plant equipment; corrosion resistant.

KRUPP V-1M.
M-72; 0.15 C, 2 Ni, 15 Cr, 0.4 Mn, 0.5 Si, bal Fe.
Annealed: 85,000 TS; 55,000 YS; 30 El; 150 Brin.
Heat treated: 213,000 TS; 160,000 YS; 450 Brin.
For furnace equipment, cutlery, turbine parts; Type 431; corrosion resistant.

KRUPP-V-2 A.
M-72; 23 Cr, 9.5 Ni, 0.4 C, bal Fe.
85,000-105,000 TS; 35,000 YS; 50 El; 150-200 Brin.
For heat and corrosion resisting parts, chemical equipment; heat and corrosion resistant; austenitic.

KRUPP V2AB SUPRA.
M-72; 0.1 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

KRUPP V2AE.
M-72; 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe.
Normalized: 93,000 TS; 36,000 YS; 45 El; 60 RA; 165 Brin.
Annealed: 87,000 TS; 33,000 YS; 57 El; 73 RA; 155 Brin.
For chemical plant equipment, muffles, welded parts; Type 321; stainless, austenitic.

KRUPP V2A EXTRA.
M-72; 0.1 C, 18 Cr, 8-9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 83,000 TS; 29,000 YS; 45 El; 55 RA.
For crucibles, autoclaves, chemical plant equipment; Type 321; stainless, austenitic.

KRUPP-V2AFH.
M-72; 0.10 C, 16-18 Cr, 6-8 Ni, bal Fe.
Annealed: 110,000 TS; 40,000 YS; 60 El; B 85 Rock.
For aircraft structural members, railroad cars, household utensils, diaphragms, springs.
Type 301 stainless steel, austenitic, non-hardenable.

KRUPP V-2A NIROSTA.
M-72; 0.2 C, 20 Cr, 7 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Rolled: 125,000 TS; 95,000 YS; 25 El; 55 RA; 277 Brin.
For oil refinery and chemical plant equipment; Type 302; stainless, austenitic.

KRUPP V2A NORMAL.
M-72; 0.11-0.16 C, 18 Cr, 8 Ni, bal Fe.
For chemical plant equipment, mixers, Type 302; stainless, austenitic.

KRUPP V2AS.
M-72; 0.08 max C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe.
Annealed: 80,000 TS; 45,000 YS; 60 El; 135 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 330 Brin.
For chemical plant equipment, welded structures; Type 304; stainless, austenitic.

KRUPP V2A SPECIAL.
M-72; 0.08 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 40 El; 60 RA; 160 Brin.
For chemical plant equipment, architectural trim; Type 304; stainless, austenitic.

KRUPP V2A SUPRA.
M-72; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 78,000 TS; 31,000 YS; 45 El; 60 RA; 145 Brin.
For chemical and nitric acid plant equipment; Type 304; stainless, austenitic.

KRUPP V2AX EXTRA.
M-72; 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
For welded chemical plant equipment; Type 347; stainless, austenitic.

KRUPP V-3M.
M-72; 0.4 C, 14 Cr, 0.5 Ni, bal Fe.
Heat treated: 256,000 TS; 190,000 YS; 6 El; 10 RA; 540 Brin.
For cutlery, razors, knives; Type 420; corrosion resistant.

KRUPP V3ME.
M-72; 0.75-0.95 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Annealed: 107,000 TS; 62,000 YS, 18 El; 35 RA; 220 Brin.
Heat treated: 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin.
For cutlery, valves, bearings, instruments; Type 440B; corrosion resistant.

KRUPP V-3M EXTRA
M-72; 1.0 C, 12-18 Cr, bal Fe.
Annealed: 210 Brin.
Heat treated: 620 Brin.
For ball and roller bearings, disks for meat grinders; corrosion resistant.

KRUPP V3MS.
M-72; 0.15 max C, 12-14 Cr, 1.25-2.5 Ni, 0.07 min P, S, or Se, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 30 El; 60 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 13 El; 50 RA; 205 Brin.
For screw machine products, valve trim. pump shafts; Type 416; free-cutting, stainless.

KRUPP V-4A.
M-72; 0.07 max C, 10.5 Ni, 18 Cr, 2.5 Mo, bal Fe.
Rolled: 85,000-108,000 TS; 36,000-70,000 YS; 50-45 El; 150-185 Brin.
For chemical and textile plant equipment; Type 316; stainless, austenitic.

KRUPP V4AB SUPRA.
M-72; 0.1 C, 18 Cr, 9.5 Ni, 2 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

KRUPP V4 AE-TI.
M-72; 0.10 max C, 16-18 Cr, 10-14 Ni, 1.7-2.7 Mo, Cb = 10 × C, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 60-50 El; 75-60 RA; 150-190 Brin.
For acid resistant chemical plant equipment; Type 316 Cb; stainless, austenitic.

KRUPP V4A EXTRA.
M-72; 0.12 max C, 18 Cr, 10 Ni, 2 Mo, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 39,000 YS; 50 El; 60 RA; 160 Brin.
For sulphide, paper and pulp and textile industries; stainless, austenitic; Type 316 Ti.

KRUPP V4AS.
M-72; 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 85,000-95,000 TS, 35,000-45,000 YS; 60-50 El; 75-60 RA; 150-190 Brin.
For chemical plant equipment, mixers, agitators, filters, Type 316; austenitic, stainless.

KRUPP V4A SUPRA
M-72; 0.12 max C, 18 Cr, 8 Ni, 2.5 Mo, bal Fe.
Annealed: 78,000 TS, 32,000 YS; 50 El, 60 RA; 140 Brin.
For sulphide, paper and pulp industries, textile equipment, Type 316, stainless, austenitic.

KRUPP V4AX EXTRA.
M-72, 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Cb = 8 × C, bal Fe
Annealed: 85,000 TS, 35,000 YS, 45 El, 60 RA, 165 Brin.
For welded acid resistant chemical plant equipment, Type 318, stainless, austenitic.

KRUPP V5M
M-72, 0.2 C, 13 Cr, bal Fe
Annealed: 95,000 TS; 50,000 YS, 25 El, 55 RA; 195 Brin
For turbine blades, valves, cutlery, surgical instruments, Type 420; corrosion resistant

KRUPP V-6 A STEEL
M-72, 20 Cr, 7 Ni, 0.2 C, 2.5 Cu, bal Fe
For chemical equipment, corrosion resistant, resists NH_4Cl.

KRUPP V8A EXTRA.
M-72, 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Ti = 4 × C, bal Fe
Annealed: 85,000 TS, 35,000 YS; 45 El, 60 RA; 165 Brin
For welded acid resistant chemical plant equipment, Type 316 Ti, stainless, austenitic

KRUPP V-10-A
M-72; 0.12 C, 8 Mn, 0.8 Si, 19.5 Cr, 9 Ni, bal Fe
Welded: 85,000 TS; 45,000 YS, 45 El; 45 RA.
For welding rod; stainless, austenitic

KRUPP V12A NORMAL.
M-72; 0.10 max C, 12.5 Cr, 12 Ni, bal Fe
For valves, cutlery; corrosion resistant.

KRUPP V12A SUPRA.
M-72; 0.08 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 78,000 TS; 31,000 YS; 50 El; 60 RA; 140 Brin.
For architectural trim, tanks, vessels, stainless, austenitic.

KRUPP V13F.
M-72; 0.12 C, 13 Cr, 0.2 Ni, bal Fe.
Heat treated: 150,000 TS; 20 El; 250 Brin.
For tableware, instruments; Type 403; corrosion resistant.

KRUPP-V13FA1.
M-72; 0.05 C, 11.5-14.5 Cr, 0.1-0.3 Al, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 30 El; 160 Brin.
For annealing boxes, quenching racks, furnace parts, oil refinery equipment.
Type 405 stainless steel, heat and corrosion resistant.

KRUPP V14AS.
M-72; 0.10 max C, 18-20 Cr, 11-14 Ni, 3-4 Mo, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 60-50 El; 75-60 RA; 150-190 Brin
For acid resistant chemical plant equipment; Type 317; stainless, austenitic.

KRUPP V14A SUPRA.
M-72, 0.10 max C, 18-20 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Annealed: 85,000 TS; 31,000 YS, 50 El; 60 RA; 140 Brin
For hypochlorite plant equipment, stainless, austenitic; Type 316.

KRUPP V15F.
M-72, 0.08 C, Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

KRUPP V16A EXTRA
M-72, 0.07 max C, 17.5 Cr, 17.5 Ni, 2 Mo, Ti = 7 × C, bal Fe
For valves, acid resistant equipment, pumps; stainless, austenitic.

KRUPP V16A SUPRA
M-72, 0.10 max C, 18-20 Cr, 10-14 Ni, 3-4 Mo, bal Fe
Annealed: 90,000 TS; 35,000 YS; 50 El, 60 RA; 160 Brin
For chemical plant equipment, Type 317, stainless, austenitic

KRUPP V-16 SUPRA
M-72, 0.15 C, 18 Cr, 8 Ni, bal Fe.
Rolled: 78,000-101,000 TS, 55-65 El; 140-175 Brin
For stainless parts, chemical plant equipment; austenitic, stainless

KRUPP V17F
M-72, 0.1 C, 17 Cr, 0.2 Ni, 0.2 Ti, bal Fe.
Annealed: 78,000-93,000 TS, 50,000-55,000 YS; 20-18 El; 137-150 Brin
For chemical plant equipment, Type 430; corrosion resistant.

KRUPP V17F EXTRA.
M-72, 0.1 C, 17.5 Cr, Ti = 7 × C, bal Fe
Annealed: 95,000 TS; 50,000 YS; 25 El, 55 RA; 200 Brin
For welded corrosion resistant parts, Type 430 Ti; corrosion resistant.

KRUPP V17FS
M-72; 0.12 max C, 14-18 Cr, 0.07 min S or Se, bal Fe.
Annealed: 75,000-85,000 TS; 40,000-55,000 YS; 30-25 El, 137-150 Brin.
For chemical plant equipment, screw machine products; Type 430F; stainless, free-cutting.

KRUPP-V17FX EXTRA.
M-72; 0.08 C, 17 Cr, 8 Ni, 0.6 Cb, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 50 El; B 82 Brin.
For welded structures, agitators, evaporators, tanks, digesters, chemical plant equipment.
Type 17-8 Cb stainless steel, austenitic, stabilized.

KRUPP-V44A SUPRA.
M-72; 0.06 C, 17 Cr, 12 Ni, 2-3 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YP; 50 El; B 80 Rock.
For chemical plant equipment, tanks, evaporators, digesters.
Type 316 stainless steel, austenitic.

KRUPP VK3M EXTRA.
M-72; 0.90 C, Mo, Cr, V, W, bal Fe.
For lathe and planer tools, reamers; high speed steel.

KRUPP VK5M.
M-72; 0.20 C, 13 Cr, 1.15 Mo, bal Fe.
For valves, cutlery, surgical and dental instruments; Type 420 Mo; stainless.

KRUPP V. M. STEEL.
M-72; 11-15 Cr, low Ni, bal Fe.
For chemical equipment; corrosion resistant.

KRUPP WA.
M-72; 0.4 C, 1.2 Cr, 0.4 Mo, 0.75 V, 0.4 W, bal Fe.
For tools, gears, shafts; water hardening.

KRUPP WA5 M.
M-72; 0.17-0.22 C, 12.5-13.5 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

KRUPP WA100.
M-72; 0.43 C, 2.3 Si, 1.0 Mn, 17.5 Cr, 8.5 Ni, 0.9 Ti, bal Fe.
For stainless parts; corrosion resistant, austenitic.

KRUPP WA 342.
M-72; 0.45 C, 1.0 Mn, 1.7-2.0 Cr, 0.2 Mo, bal Fe.
For forging die blocks; oil hardened.

KRUPP WA402.
M-72; 0.45-0.50 C, 0.9-1.1 Mn, 1.1-1.3 Cr, 0.2 Mo, bal Fe.
For forging die blocks; oil hardened.

KRUPP WA594.
M-72; 0.36-0.32 C, 0.8-1.0 Si, 2.2-2.5 Cr, 0.4 V, bal Fe.
For dies, punches; shock resistant.

KRUPP WA650.
M-72; 0.30-0.38 C, 1.4-1.6 Si, 1.2-1.5 Cr, 0.1-0.2 V, bal Fe.
For tools, punches, dies; shock resistant.

KRUPP WA904.
M-72; 0.25-0.30 C, 1.0-1.2 Cr, 0.2 V, 3.5-4.0 W, bal Fe.
For tools, hot work dies; hot work steel.

KRUPP WA904 EXTRA.
M-72; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For pneumatic tools, upsetters, shear blades; oil hardened, tough.

KRUPP WAGS.
M-72; 0.36 C, 0.95 Si, 0.45 Mn, 0.025 P, 0.019 S, 5 Cr, 1.37 Mo, 0.33 V, bal Fe.
For extrusion press dies; tough, heat resistant.

KRUPP WAMo3.
M-72; 0.29 C, 0.33 Si, 0.36 Mn, 2.91 Cr, 3.05 Mo, 0.53 V, bal Fe.
For extrusion press dies; tough, heat resistant.

KRUPP WB97 M.
M-72; 0.42-0.48 C, 1.0-1.3 Si, 0.5-0.7 Mn, bal Fe.
For tools, springs, punches; shock resistant.

KRUPP WB136 M.
M-72; 0.62-0.68 C, 1.6 Si, 0.6 Mn, bal Fe.
For tools, springs, punches; shock resistant.

KRUPP WBC1255.
M-72; 0.6-0.7 C, 1.0-1.3 Si, 0.9-1.2 Mn, bal Fe.
For tools, springs, punches; shock resistant.

KRUPP WBF1552.
M-72; 0.67-0.73 C, 1.2-1.4 Si, 0.4-0.55 Cr, bal Fe.
For tools, punches, dies; oil hardening.

KRUPP WC 128.
M-72, 0.7 C, 1.9 Si, 0.07 S, bal Fe.
For tools, chisels, dies; tough.

KRUPP WF33.
M-72; 0.12-0.18 C, 0.4-0.6 Mn, 0.6-0.8 Cr, bal Fe.
For gears, shafts; case hardening.

KRUPP WF50
M-72; 0.55 C, Ni, Cr, W, bal Fe.
For forging and heading dies, shear blades; oil hardened, tough.

KRUPP WF100.
M-72, 0.45 C, Cr, Ni, W, bal Fe.
For forging and heading dies, punches; oil hardened, tough.

KRUPP WF-100D
M-72, 0.38 C, 0.52 Mn, 1.84 Si, 14.8 Cr, 12.9 Ni, 0.23 Mo, 2.5 W, bal Fe
For valves; high heat and corrosion resistance

KRUPP WF202.
M-72, 1.05-1.15 C, 0.3-0.5 Cr, bal Fe.
For tools, drills, taps, water hardening.

KRUPP WF204
M-72, 1.0-1.1 C, 0.8-1.0 Cr, bal Fe.
For tools, drills, taps, water hardening

KRUPP WF206
M-72, 0.95-1.05 C, 1.25-1.5 Cr, bal Fe
For tools, bearings; wear resistant.

KRUPP WFC27
M-72; 0.14-0.19 C, 1-1.3 Mn, 0.8-1.1 Cr, bal Fe.
For tools, gears, shafts, case hardening

KRUPP WFC29.
M-72, 0.17-0.22 C, 1.1-1.4 Mn, 1-1.3 Cr, bal Fe.
For tools, dies, bearings; case hardening.

KRUPP WFC31
M-72, 0.20-0.25 C, 1.3-1.6 Mn, 1.2-1.5 Cr, bal Fe.
For tools, bearings; case hardening.

KRUPP WFF24
M-72, 0.15 C, 1.0-1.3 Si, 23-25 Cr, 2 Al, bal Fe.
For corrosion resistant parts, corrosion resistant.

KRUPP WFM48.
M-72; 0.28-0.32 C, 2.2-2.5 Cr, 0.2 V, bal Fe.
For tools, dies.

KRUPP WFM961.
M-72, 0.43-0.48 C, 1.3-1.5 Cr, 0.2 V, bal Fe.
For tools, gears, springs; tough.

KRUPP WFM1041.
M-72, 0.47-0.55 C, 0.8-1.0 Mn, 1.2 Cr, 0.18 V, bal Fe.
For tools, springs, gears; shock resistant.

KRUPP WFM1141.
M-72, 0.55-0.62 C, 0.9-1.1 Mn, 1.2 Cr, 0.18 V, bal Fe.
For tools, gears, springs, shock resistant.

KRUPP WFP12.
M-72; 0.30-0.35 C, 1.3-1.5 Cr, 1-1.2 Al, bal Fe.
For tools, gears, shafts; oil hardening.

KRUPP WN48.
M-72; 0.28-0.33 C, 2.2-2.5 Cr, 0.2 V, bal Fe.
For tools, dies.

KRUPP WT10.
M-72; C, Si, Mn, bal Fe.

KRUPP WW.
M-72; 0.4 C, 0.01 Si, 0.14 Mn, 0.05 Cr, 0.15 Ni, bal Fe.
For tools, hubbing dies; case hardened.

KRUPP ZF.
M-72; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, taps, hobs, reamers, broaches; Type W1; water hardened.

KS 13.
English, 6-8 Sb, bal Al.
For bearings.

KS NO 83A.
M-196; Al alloy.
For light alloy parts.

K.S. NO. 245.
M-196; 14 Si, 4.5 Cu, 1.5 Ni, 0.7 Mg, 1.0 Mn, bal Al.
29,000 TS; 25,000 YS; 0.2 El, 130 Brin.
For pistons for small diesel motors and motorcycles, high wear resistance; coefficient of expansion 0.00002.

K.S NO 280.
M-196, 21 Si, 1.5 Cu, 0.7 Mn, 1.5 Ni, 0.5 Mg, 1.2 Co, bal Al
27,000 TS; 26,000 YS; 0.25 El; 120 Brin.
For pistons for air-cooled motors; coefficient of expansions 0.000018.

KS NO 280B.
M-196; Si, bal Al.
For light alloy parts; corrosion resistant

KS NO 282
M-196; 23-25 Si, 0.8-1.3 Cu, 0.8-1.3 Ni, 0.2 Ti, 0.2 Mn, 0.3-0.5 Co, 0.7 Fe, 0.2 Zn, 0.8-1.3 Mg, bal Al
For pistons in internal combustion engines
Medium thermal stressing, corrosion resistant

KS NO 283
M-196, 17-19 Si, 4.7-5.3 Cu, 3.8-4.2 Ni, 0.1 Ti, 0.6-0.8 Mn, 0.5-0.7 Co, 0.7 Fe, 0.2 Zn, 0.4-0.6 Mg, bal Al
For pistons in internal combustion engines.
High thermal stressing, corrosion resistant.

KS NO. 411B
M-196, Si, bal Al
For light alloy parts, corrosion resistant

KS NO 837
M-196, Si, bal Al
For light alloy parts, corrosion resistant.

KS NO 1275.
M-196; Si, Cu, Ni, bal Al.
For light alloy parts; corrosion resistant

K.S. 1275 KOLBENLEG.
English; 1 Mg, bal Al.
For light alloy parts; corrosion resistant.

K.S. ALUSIL.
M-196; 20 Si, 1.5-2.0 Cu, 0.5 Ni, bal Al.
23,000 TS; 21,000 YS; 0.25 El; 100 Brin.
For pistons for general use; low temperature coefficient; coefficient of expansion 0.000018.

K.S MAGNET STEEL.
Japan; 30-40 Co, 1.5-3.0 Cr, 5-9 W, 0.35 Mn, 0.12 Si, 0.4-0.8 C, bal Fe.
Hardened: 444-652 Brin.
For tools, magnets; corrosion and heat resistant; Br 10000-10500: Hc-200-240.

K.S. MAGNET STEEL.
Japan; 0.7-1.0 C, 6-8 W, 1-2 Co, bal Fe.
For magnets, magnetos; high permeability.

K-SPUN.
M-399; 2.85-3.50 T.C., 0.95-1.45 Si, 0.4-0.8 Mn, bal Fe.
Heat treated: 70,000 TS; 285 Brin.
For piston rings, cylinder liners; wear resistant cast iron.

K.S. RED.
English; 16.5 Cu, 0.8 Ni, 0.5 Fe, 0.5 Si, bal Al.
For pistons; cast.

K.S. SEEWASSER.
M-196, M-116; 1.3 Mn, 2.2 Mg, 0.2 Sb, 0.7 Si, bal Al.
Sand cast: 26,000 TS; 12,800 YS; 2.5 El; 5 RA; 60 Brin.
Die cast: 32,720 TS; 12,800 YS; 1.6 El; 81 Brin.
Rolled: 45,500 TS; 36,000 YS; 2 El; 35 RA; 83 Brin.
For furniture, interior light fixtures, wire castings, ship parts, chemical industry; light alloy; resists sea water corrosion

K.S. SEEWASSER JUB.
Japan; Al alloy.
For light alloy parts.

K.S. SPECIAL PISTON ALLOY.
M-196; 15 Cu, 0.6 Si, 0.6 Fe, 0.6 Ni, 0.3 Mg, bal Al.
26,000 TS; 0.2 El; 120 Brin.
For pistons for Zeppelin motors and diesel engines; coefficient of expansion 0.000024.

KSS SUPRA
M-459; 0.95-1.05 C, 0.20-0.35 Si, 0.10-0.30 Mn, bal Fe
Water hardened: 215,000 TS; 187,000 YS; 9 El; 24 RA; 400 Brin
Annealed: 88,000 TS; 53,000 YS; 19 El; 187 Brin.
For cold heading and forming dies, pneumatic hammers, drills, reamers.
Type W3, water hardening

KSS SUPRA.
M-459, 0.95 C, 0.4 V, bal Fe.
For punches, taps, cutting tools, drills; Type W2, water hardened.

K.S "Y" ALLOY.
M-196, 4 Cu, 0.4 Si, 2 Ni, 0.4 Fe, 1.5 Mg, bal Al
35,000 TS; 28,500 YS, 1.0 El; 90 Brin
For pistons for steam engines; coefficient of expansion 0.0000245.

K-TEN 60.
M-1604, 0.14 C, 0.38 Si, 1.26 Mn, 0.015 P, 0.010 S, 0.20 Ni, 0.05 Mo, 0.04 V, bal Fe
32 mm thick plate: 94,000 TS; 78,000 YS; 45 El.
High strength low alloy steel for structural purposes

K-TEN 70
M-1604, 0.12 C, 0.31 Si, 1.03 Mn, 0.013 P, 0.010 S, 0.21 Cu, 0.62 Ni, 0.31 Cr, 0.33 Mo, 0.24 V, bal Fe
50 mm thick plate: 110,000 TS; 99,000 YS; 27 El.
High strength low alloy steel for structural purposes.

K-TEN 80.
M-1604; 0.13 C, 0.32 Si, 0.86 Mn, 0.009 P, 0.010 S, 0.24 Cu, 0.92 Ni, 0.45 Cr, 0.40 Mo, 0.03 V, 0.002 B, bal Fe.
50 mm thick plate: 118,000 TS; 110,000 YS; 44 El.
High strength low alloy steel for structural purposes

KU-112.
M-1517; 90 W, bal Ni-Cu.
Density 17; 110,000 TS; 70,000 YS; 5 El; C 25 Rock.
High density alloy for counterweights, balancing and shielding applications.

KU-112-18.
M-1517; 95 W, bal Ni-Cu.
Density 18; 105,000 TS; 90,000 YS; 3 El; C 28 Rock.
High density alloy for counterweights, balancing and shielding applications.

KU A-5.
M-1517; 95 W, bal Ni-Fe.
Density 18; 120,000 TS; 92,000 YS; 12 El; C 30 Rock.
High density alloy for counterweights, balancing and shielding applications.

KU A-10.
M-1517; 90 W, bal Ni-Fe.
Density 17; 125,000 TS; 90,000 YS; 15 El; C 27 Rock.
High density alloy for counterweights, balancing and shielding applications.

KUBAX.
M-912; 1.2-1.3 C, 0.1-0.2 Cr, 0.15-0.25 V, bal Fe.
For tools, dies, drills; oil hardening.

KUFIL.
M-282; 99 Cu, 1 Ag.
Welded: 29,000 TS
For welding rod for Cu; free flowing

KUHBIER A12.
M-1327; 0.10 max C, 12.5 Cr, 12 Ni, bal Fe
For chemical plant equipment, valves; heat and corrosion resistant.

KUHBIER A18.
M-1327; 0.15 max C, 18 Cr, 9 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El, 75 RA, 150 Brin.
For chemical plant equipment, tanks; Type 302, stainless, austenitic

KUHBIER F13.
M-1327; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS, 40,000 YS, 35 El; 70 RA; 155 Brin.
For valves, cutlery, surgical instruments; Type 410; stainless.

KUHBIER F17.
M-1327; 0.8 C, 17 Cr, bal Fe.
Annealed: 107,000 TS; 62,000 YS, 18 El, 35 RA; 220 Brin.
For bearings, instrument pivots, liners; corrosion resistant, hardenable.

KUHBIER F17A.
M-1327; 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 20 El, 40 RA; 150 Brin.
For screw machine products, shafts; free-cutting; Type 430 Mo; corrosion resistant.

KUHBIER F17T.
M-1327; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, welded structures; corrosion and creep resistant.

KUHBIER F19T.
M-1327; 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For oil refinery equipment, welded structures; corrosion and creep resistant

KUHBIER I
M-1327; 0.15 C, 24 Cr, 19 Ni, bal Fe.
Annealed: 100,000 TS; 45,000 YS, 50 El; 65 RA; 185 Brin.
For furnace parts, heat treat boxes; heat resistant, austenitic.

KUHBIER IA.
M-1327; 0.15 C, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin
For chemical plant equipment, tanks, vessels; Type 302; stainless, austenitic.

KUHBIER M13
M-1327; 0.2 C, 0.4 Si, 13 Cr, bal Fe
Annealed: 95,000 TS, 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, valves, cutlery, surgical instruments, Type 420, stainless.

KUHBIER M13.4
M-1327; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 100,000 TS, 55,000 YS; 20 El; 50 RA; 210 Brin.
For surgical instruments, valves, cutlery, knives, Type 420; stainless

KUHBIER M15
M-1327, 0.20 C, 0.4 Si, 13 Cr, 1.15 Mo, bal Fe
Annealed: 100,000 TS, 55,000 YS; 20 El; 50 RA, 210 Brin
For turbine blades, valves, cutlery, knives, Type 420 Mo, stainless

KUHBIER M18.
M-1327, 0.22 C, 0.4 Si, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS, 95,000 YS, 20 El, 55 RA; 260 Brin
For pumps, marine hardware, valves, gauges; Type 431, corrosion and heat resistant

KUHBIER M18.9
M-1327, 0.90 C, 18 Cr, 1.15 Mo, 1.0 V, bal Fe
Annealed: 110,000 TS, 65,000 YS; 17 El, 32 RA, 230 Brin.
For cutlery, valves, bearings, surgical instruments; corrosion and wear resistant

KUHBIER M19
M-1327, 0.35 C, 16.5 Cr, 1.15 Mo, bal Fe.
For chemical plant and oil refinery equipment, corrosion and heat resistant.

KUHNE PHOSPHOR BRONZE
Eng., 78 Cu, 11 Sn, 10 Pb, 0.3 Ni, 0.6 P.
For hard bearings, heavy duty

KUKI EXTRA MH
M-1320, 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed: 100,000 TS, 53,000 YS; 21 El, 42 RA; 200 Brin
For drills, hobs, taps, springs; Type W1, water hardened.

KUKI EXTRA ZAH.
M-1320; 0.85 C, 0.25 max Mn, 0.25 max Si, bal Fe.
Heat treated: 190,000 TS; 145,000 YS, 12 El; 35 RA, 320 Brin
For drills, punches, cutters, springs; Type W1; water hardened.

KUKI EXTRA ZH.
M-1320; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, reamers, cutting tools; Type W1; water hardened.

KUKI PRIMA H.
M-1320; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For cutters, reamers, broaches; Type W1; water hardened.

KUKI PRIMA MH.
M-1320; 1.15 C, 0.25 max Mn, 0.25 max Si, bal Fe.
Annealed: 110,000 TS; 55,000 YS; 20 El; 40 RA; 210 Brin.
For cutters, hobs, reamers, broaches; Type W1; water hardened.

KUKI PRIMA ZAH.
M-1320; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For cutters, hobs, reamers, broaches; Type W1; water hardened.

KUKI PRIMA ZH.
M-1320, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 12 El; 45 RA; 330 Brin.
For cutters, tools, springs, punches, drills; Type W1; water hardened.

KUKI PRIMA ZW.
M-1320; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin
For punches, crimpers, springs; Type W1; water hardened.

KUKI SPEZIAL H.
M-1320; 0.90 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated 190,000 TS; 145,000 YS; 10 El; 30 RA, 400 Brin.
For punches, crimpers, drills, springs; Type W1; water hardened

KUKI SPEZIAL MH.
M-1320; 0.75 C, 0.4 Si, 0.6 Mn, bal Fe.
Heat treated: 175,000 TS, 130,000 YS; 12 El; 36 RA; 355 Brin.
For punches, drills, springs, crimpers; Type W1; water hardened.

KUKI SPEZIAL ZAH.
M-1320, 0.67 C, 0.4 Si, 0.6 Mn, bal Fe.
Heat treated 170,000 TS, 125,000 YS; 15 El; 38 RA; 350 Brin.
For punches, springs, crimpers; Type W1; water hardened

KUKI SPEZIAL ZH.
M-1320; 0.6 C, 0.3-0.5 Si, 0.5-0.8 Mn, bal Fe.
Heat treated: 160,000 TS, 113,000 YS; 12 El; 40 RA; 325 Brin.
For punches, crimpers; water hardened.

KUKI SPEZIAL ZW.
M-1320; 0.45 C, 0.4 Si, 0.6 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For gears, shafts, crankshafts; water hardened.

KULGRID 28.
M-963.
For high temperature wire; heat resistant to 1100°F.

KULGRID "C."
M-856, M-796; Ni clad Cu.
For lead-in wires for vacuum tubes; resists high temperatures.

KULITE KLT-115.
M-1517; Pb, W.
Sintered: 18,000-20,000 TS; 200-280 Brin.
For shielding for nuclear materials; high density.

KUMANAL.
M-282; 88 Cu, 10 Mn, 2 Al.
Annealed: 50,000 TS; 30 El; 73 Brin.
For resistance wire, instrument shunts; low temperature coefficient.

KUMANIC.
M-282; 60 Cu, 20 Mn, 20 Ni.
Annealed: 70,000 TS; 21,000 YS; 35 El; 97 Brin.
Heat treated: 155,000 TS; 130,000 YS; 2 El; 320 Brin.
For springs, contacts; corrosion resistant.

KUMIUM.
M-282; 99.5 Cu, 0.5 Cr.
Annealed: 33,600 TS; 6700 YS; 60 El; 59 Brin.
Heat treated. 70,000 TS; 60,000 YS; 14 El; 127 Brin.
For welding tips, electrical contacts; hardenable, high conductivity.

KUNHEIM METAL.
Germ.; hydrides of Misch metal, 36 Ce, 49 La, 10 Di, 1 Mg
For cigarette lighters; pyrophoric.

KUNHEIM METAL.
Germ.; 86 rare earths, 12 Mg, 2 Al.
For cigarette lighters.

KUNIAL ALLOYS.
M-282, Cu-Zn alloys.
For engineering applications; can be heat treated.

KUNIAL BRASS.
M-282a; 72.5 Cu, 6 Ni, 1.5 Al, bal Zn.
Heat treated: 108,000 TS, 81,000 YS; 11 El; 240 Brin.
For nuts, bolts, valves, primers, fuse bodies, keys, springs; hardened and strengthened by heat treatment.

KUNIAL BRONZE.
M-282; Sn, bal Cu.
For hardware, plumbing, pipes; tough.

KUNIAL COPPER.
M-282, 90 Cu, Ni, Al.
For general use, tubes, wire, plate, sheets; temper hardening.

KUNIAL NICKEL SILVER.
M-282; Ni, Zn, bal Cu.
For hardware, utensils; corrosion resistant.

KUNIFER 5.
M-282; 5 Ni, 1 Fe, bal Cu.
Annealed 40,000-45,000 TS; 20,000-25,000 YS; 50-40 El; 68-80 Brin.
For marine equipment, hardware, fasteners; corrosion resistant.

KUNIFER 10.
M-282; 10 Ni, 90 Cu.
Annealed: 45,000 TS; 22,400 YS; 55 El; 90 Brin.
½ Hard: 62,000 TS; 45,000 YS; 25 El; 110 Brin.
Hard: 83,000 TS; 81,000 YS; 15 El; 190 Brin.
For condenser tubes; corrosion resistant, no season cracking.

KUNIFER 30.
M-282; 30 Ni, 1 Mn, 1 Fe, bal Cu.
Annealed: 63,000 TS; 25,000 YS; 55 El; 100 Brin.
½ Hard: 75,000 TS; 42,000 YS; 25 El; 150 Brin.
Hard: 100,000 TS; 94,000 YS; 10 El; 210 Brin.
For condenser tubes; corrosion resistant, no season cracking.

KUNIFER 30A.
M-282; 66 Cu, 30 Ni, 2 Mn, 2 Fe.
For condenser tubes; corrosion resistant.

KUPFER-NICKEL 54/45.
M-297; 54 Cu, 45 Ni.
For electrical resistances; constantan.

KUPFER-NICKEL 67/30/3.
M-297; 67 Cu, 30 Ni, 3 Mn.
For electrical resistances.

KUPFERNICKEL 75/25.
M-297; 25 Ni, 75 Cu.
Annealed: 45,000 TS, 18,500 YS; 42 El; 62 Brin.
For coinage; corrosion resistant.

KUPFERNICKEL 80/20.
M-297, 80 Cu, 20 Ni.
Rolled: 62,500 TS; 59,700 YS; 12 El; 120 Brin.
Annealed: 45,500 TS, 17,100 YS; 41 El; 64 Brin.
For condenser tubes; corrosion resistant.

KUPFER-SILUMIN.
M-299; 12 Si, 0.8 Cu, 0.3 Mn, bal Al.
Sand cast. 25,000 TS; 14,000 YS; 2-4 El; 60 Brin.
For wheels, rolls, engine blocks, motor housing; high fluidity.

KUPRODUR
Germ.; 0.5 Si, 0.7 Ni, bal Cu.
For staybolts, propeller parts; age-hardenable, corrosion resistant.

KUROMI.
Jap., Cu + Sn + Co. Japanese alloy.

KUTERN.
M-282; 99.5 Cu, 0.5 Te
Annealed: 33,600 TS, 5500 YS, 50 El; 48 Brin.
For machined parts; free-cutting.

KUTHERM see IMI 575 KUTHERM.

KUT KAST.
M-797; 0.7 C, 1.5 B, 18 W, 4 Cr, 1 V, bal Fe.
For tools, dies, tipped tools, high speed steel.

KUT KOST.
M-797; C, W, Cr, V, bal Fe.
For tipped tools and cutters; high speed steel

KUT KOST GRADE V.
M-797; C, W-Co-1.5 B, bal Fe.
For tools, cutters; for heavy cuts.

KUT KOST GRADE X
M-797; C, W-Co-1.5 B, bal Fe
For tools, cutters, centrifugally cast

KUT KOST GRADE XV.
M-797; C, W, Co, 1.5 B, bal Fe
For tools, cutters; centrifugally cast.

KUT KOST GRADE XX.
M-797; W, Co, 1.5 B, bal Fe.
For tools, cutters; light cuts.

KUTKWIK.
M-357; 0.8 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutting tools, broaches; high speed steel.

K-V7.
M-Russia; 0.10-0.15 C, 10.5-12.5 Cr, 0.6-0.8 Mo, 0.8 max Ni, 0.2-0.3 V, 3.7-4.3 W, bal Fe.
Annealed: 85,000 TS; 45,000 YS; 20 El. B 95 Rock.
For cutlery, surgical instruments, chemical plant equipment. Corrosion resistant.

KWIK-KUT.
M-207; 1.1 C, 0.5 Cr, bal Fe.
For hollow drills; fatigue resistant.

KXA STEEL.
M-1525; C, Cr, Mo, bal Fe.
For die casting machine parts, plungers; oil hardened.

KYNAL C65.
M-282, 4 Cu, 0.6 Mn, 0.7 Fe, 0.5 Si, bal Al.
Heat treated: 56,000-60,500 TS; 40,500-49,000 YS; 10-6 El; 100 Brin.
For aircraft construction; age-hardened, high strength

KYNAL C66.
M-282, 4 Cu, 0.85 Si, 0.85 Mg, 1.2 Mn, bal Al.
Heat treated: 56,000-62,700 TS; 33,600-51,500 YS; 15-8 El; 120-150 Brin
For aircraft construction, age-hardened, high strength

KYNAL C 67
M-282, 4 Cu, Mn, Si, Mg, bal Al.
H T Temper 63,840 TS, 39,200 YS, 15 El; 138 Brin
For high strength applications, hardenable.

KYNAL C69
M-282, 1-2 Cu, 0.5-1.25 Mg, 1 Si, 1 Mn, bal Al.
Heat treated 38,100-52,000 TS, 29,100-41,000 YS; 15-6 El, 105 Brin
For aircraft construction, age-hardened, high strength

KYNAL C70
M-282, 2.5-4.0 Cu, 0.25-0.75 Mg, 0.3-1.0 Sb, bal Al
Rolled 36,000 TS, 15,700 YS, 10 El
For fuel caps, structures, free-cutting

KYNAL C71
M-282, 1.3-3.0 Cu, 0.2-0.5 Mg, 0.1-0.5 Sn, bal Al
Heat treated 38,000 TS
For rivets, structural members, heat treatable

KYNALCORE C65A.
M-282, 3.5-5.0 Cu, 0.4-1.2 Mg, 0.4-1.2 Mn, 0.3 Ti, 0.7 Fe, bal Al
Heat treated 54,000 TS, 31,500 YS, 15 El
For structural members, heat treatable, Al-clad.

KYNALCORE C66A
M-282; 3.5-4.8 Cu, 0.8 Mg, 0.9 Si, 1 Fe, 1.2 Mn, 0.3 Ti, bal Al
W-temper 53,800 TS, 31,400 YS, 15 El.
WP-temper: 58,200 TS, 44,800 YS, 8 El
For structural members, age-hardened, Al-clad.

KYNALCORE C68A.
M-282, 4.4 Cu, 0.6 Mg, 0.7 Si, 0.6 Mn, bal Al.
T4-temper: 56,000 TS, 33,000 YS; 15 El.
T6-temper 60,100 TS, 47,000 YS; 8 El.
For aircraft structures; Al-coated.

KYNALCORE Z93A
M-282, 1.5 max Cu, 2.0-3.5 Mg, 4.5-6.5 Zn, 0.8 Mn, bal Al.
Heat treated. 74,000 TS; 62,700 YS; 9 El; 170 Brin
For structural members; heat treatable, Al-clad.

KYNALCORE Z93C.
M-282; 1.5 Cu, 2.0-3.5 Mg, 0.5 Si, 0.5 Fe, 4.5-6.5 Zn, 0.2 Ti, bal Al.
WP-temper: 72,000 TS; 60,000 YS; 8 El.
For structural members; age-hardened, high strength.

KYNAL M33.
M-282; 0.9-1.1 Mg, 0.05 max Cu, 0.05 max Mn, bal Al.
Soft: 17,000 TS; 7500 YS; 22 El.
½ H-temper: 25,000 TS; 20,000 YS; 4 El.
H-temper: 29,200 TS; 29,200 YS; 2 El.
For medium strength structures; good ductility and drawability.

KYNAL M 35/1.
M-282; 2 Mg, 0.5 Mn, bal Al.
Annealed: 24,650 TS; 13,400 YS; 18 El; 45 Brin.
Hard: 33,600 TS; 26,880 YS, 5 El; 67 Brin.
For medium strength applications; good ductility and corrosion resistance.

KYNAL M 35/2.
M-282; 3 Mg, 1 Mn, bal Al
Annealed. 31,360 TS, 15,680 YS; 18 El; 50 Brin.
Hard: 40,320 TS; 33,600 YS; 5 El, 75 Brin.
For medium strength applications; good ductility and corrosion resistance.

KYNAL M35/3.
M-282; 3.75-4.25 Mg, 0.6 max Si, 0.7 max Fe, 0.2 max Ti, bal Al.
Soft. 38,000 TS, 15,700 YS.
For marine applications; corrosion resistant.

KYNAL M 36.
M-282; 5 Mg, 1 Mn, bal Al.
Annealed 38,000 TS; 17,920 YS, 18 El; 55 Brin.
Hard. 44,800 TS; 38,080 YS; 5 El; 80 Brin
For marine parts, good corrosion resistance.

KYNAL M 37
M-282, 7 Mg, 1 Mn, bal Al
Annealed 49,300 TS, 20,200 YS, 20 El, 60 Brin.
For marine parts, corrosion resistant.

KYNAL M39.
M-282, 0.7-1.0 Si, 0.5-1.0 Mg, bal Al
Soft 16,000 TS, 25 El
Heat treated. 38,000 TS, 31,000 YS, 10 El.
For brazing alloy, heat treatable

KYNAL M39/1
M-282, 0.4-1.5 Mg, 0.3-0.7 Si, bal Al.
Heat treated 33,600-38,100 TS; 20,400-31,600 YS, 22-14 El, 65-80 Brin.
For aircraft construction, corrosion resistant, age-hardened.

KYNAL M39/2
M-282, 0.5-1.0 Mg, 0.7-1.3 Si, 1.0 Mn, 0.6 Fe, 0.2 Ti, bal Al
Heat treated 33,600-44,800 TS; 20,200-41,500 YS, 22-10 El; 64-95 Brin.
For aircraft construction; corrosion resistant, age-hardened

KYNAL M40.
M-282, 0.15-0.40 Cu, 0.2-0.8 Mn, 0.8-1.2 Mg, 0.4-0.8 Si, 0.7 max Fe, bal Al.
Heat treated. 36,000-41,000 TS; 30,000-34,000 YS, 14-7 El.
For structural members, heat treatable, corrosion resistant.

KYNAL M41.
M-282; 0.4-1.5 Mg, 0.6-1.3 Si, 0.2 max Ti, 0.5 max Cr, bal Al.
Heat treated: 36,000-41,000 TS; 30,000-34,000 YS; 14-7 El.
For light alloy parts; heat treatable, corrosion resistant.

KYNAL P1.
M-282; 99.99 Al.
Soft: 8950 TS; 45 El.
½ H-temper: 13,000 TS; 12 El.
H-temper: 14,500 TS; 6 El.
For heat and light reflectors; corrosion resistant and ductile.

KYNAL P3.
M-282; 99.8 Al, 0.02 max Cu, 0.15 max Si, 0.15 max Fe.
Soft: 10,000 TS.
½ H-temper: 16,000 TS.
H-temper: 18,000 TS.
For heat and light reflectors; corrosion resistant and ductile.

KYNAL P 5.
M-282; 99.6 min Al.
Annealed: 11,200 TS; 40 El, 21 Brin.
Hard: 19,000 TS, 7 El, 38 Brin.
For chemical plant equipment; high resistance to corrosion.

KYNAL P10.
M-282, 0.1 Cu, 0.5 Si, 0.7 Fe, 0.1 Mn, bal Al.
Soft. 12,300 TS; 7500 YS; 35 El; 21 Brin.
Hard: 20,100 TS, 16,000 YS, 5 El; 38 Brin.
For trim, architectural applications; good ductility.

KYNAL-PA15.
M-282; 9-14 Si, 0.1 Cu, 0.6 Fe, 0.5 Mn, bal Al.
O-Temper: 18,000 TS, 30 El.
H-Temper 27,000 TS; 7 El.
For low and medium strength parts Good formability and weldability.

KYNAL PA16.
M-282, 4.0-5.5 Si, 0.1 Cu, 0.6 Fe, 0.5 Mn, bal Al.
Sand cast 18,000 TS; 9000 YS, 6 El; 40 Brin.
Permanent mold: 24,000 TS, 9000 YS, 9 El; 45 Brin.
For instrument housings, intricate castings; corrosion resistant, weldable.

KYNAL PA17.
M-282; 7-8 Si, 0.6 max Fe, bal Al.
For welding rod; corrosion resistant.

KYNAL PA 19
M-282; 1.25 Mn, bal Al.
Annealed: 15,680 TS; 25 El; 28 Brin.
Hard: 24,700 TS, 5 El; 47 Brin.
For cold formed and welded parts; corrosion resistant parts.

KYNAL PA20
M-282, 0.9-1.1 Zn, bal Al
For cladding sheet for Z93A alloy.

KYNAL S57
M-282, 0.7-1.3 Cu, 0.8-1.5 Mg, 10.5-13.5 Si, 0.7-1.3 Ni, bal Al.
Heat treated. 40,000 TS; 3 El.
For medium strength applications; heat treatable, corrosion resistant.

KYNAL Y88.
M-282, 1.5-4.0 Cu, 0.3-1.5 Mg, 0.5-1.3 Si, 0.6-1.5 Fe, 2 Ni, 0.3 Ce, 0.3 Ti, bal Al.
Heat treated: 60,500 TS; 47,100 YS; 10 El; 130 Brin.
For aircraft construction, pistons, cylinder heads; age-hardenable.

KYNAL Y89.
M-282; 1.5-3.0 Cu, 1.2-1.8 Mg, 0.55-1.25 Si, 0.5-1.5 Ni, 0.2 Ti, bal Al.
WP-temper: 58,000-60,500 TS; 44,800-47,500 YS; 10-8 El.
Forgings for high temp. applications; age-hardened, high strength.

KYNAL Y90.
M-282; 1.8-2.8 Cu, 0.6-1.2 Mg, 0.5-1.3 Si, 0.6-1.2 Fe, 0.6-1.4 Ni, bal Al.
Heat treated: 61,000 TS; 47,000 YS; 10 El.
For rivets, forgings; age hardenable.

KYNAL Y92.
M-282; 3.5-4.5 Cu, 1.2 Mg, 0.6 Si, 0.6 Fe, 2.1 Ni, 0.3 Ti, bal Al.
Heat treated: 51,500 TS; 31,400 YS; 8-15 El; 115 Brin.
For pistons, cylinder heads; age-hardenable.

KYNAL Z93.
M-282; 1.5 max Cu, 3 Mg, 0.6 Si, 0.6 Fe, 0.8 Mn, 4.5-6.5 Zn, bal Al.
Heat treated: 74,000 TS; 62,700 YS; 9 El; 170 Brin.
For aircraft construction; age-hardenable.

KYNAL Z93/1.
M-282; 3 max Cu, 4 max Mg, 4.0-8.5 Zn, bal Al.
Heat treated: 78,500 TS; 67,200 YS; 5 El.
For structural members; heat treatable.

L2 ALLOY.
M-Russia; 89.2 WC, 8 Co, 2 TaC, 0.8 Cr_2O_3.
Sintered: Tr.S. 165,000; Rock A 90.
For cutting tools to machine cast iron, high alloy steels, hard plastics.
Sintered carbide, wear resistant.

L 5.
M-137; 12.5-14.5 Zn, 2.5-3.0 Cu, 0.8 max Fe, 0.7 max Si, 0.2 max Ti, bal Al.
Cast: 20,000 TS; 11,000 YS; 4 El; 65 Brin.
For crankcases, gear boxes, fans, brackets; sand or permanent mold casting.

L 8.
M-137; 11-13 Cu, 0.8 max Fe, 0.7 max Si, 0.2 max Ti, bal Al.
Cast: 22,000 TS; 16,000 YS; 1.5 El; 80 Brin.
For carburetors, automobile pistons; high pressure castings.

L 11.
M-137; 6-8 Cu, 1.0 max Sn, 0.8 max Fe, 0.2 max Ti, bal Al.
Cast: 22,000 TS; 16,000 YS; 4 El; 60 Brin.
For gear boxes, cylinder heads; sand or permanent mold castings.

L-35.
M-40; 0.9 C, 0.4 Mn, 0.35 V, bal Fe.
For cold heading dies; water hardened.

LA 21.
Swiss; 6 Cu + Ni, Mn, Mg, Si, bal Al.
Cast: 60,000-89,000 TS; 56,000-80,000 YS; 3-1 El; 100-120 Brin.
Wrought: 63,000-76,000 TS; 44,000-60,000 YS; 4-2 El; 80-100 Brin.
For bearings.

LA 31.
Swiss; 8 Sn, Cu, Ni, Mg, bal Al.
Cast: 44,000-60,000 TS; 22,000-31,000 YS; 8-3 El; 40-55 Brin.
Wrought: 50,000-63,000 TS; 28,000-41,000 YS; 12-6 El; 45-60 Brin.
For bearings.

LA-685.
M-1520; Ni, bal Fe.
Rolled: 70,000 TS; 24,000 YS; 36 El; 68 RA.
For wave meter cavities, gauges, instruments, optical structures; low temperature coefficient.

LA BELLE 2-70.
M-38; 0.6 C, 2 Si, 0.8 Mn, bal Fe.
For punches, chisels, stamps; tough.

LA BELLE NO. 89 DIE.
M-38; 0.5 C, 4 Cr, 1 V, 0.5 Mo, bal Fe.
For forging mandrels, bolt and rivet dies; hot work steel.

LA BELLE NO. 211 DIE.
M-38; 0.5 C, 2.2 Ni, 0.7 Cr, 0.5 Mo, bal Fe.
For tools, hot work dies; oil hardened.

LA BELLE 1089.
M-38; 0.30 C, 2.25 Ni, 3 Cr, 10 W, bal Fe.
For hot work tools, gripper dies; hot work steel.

LA BELLE CCV.
M-38; 1.0 C, 0.2 V, 0.2 Cr, bal Fe.
For dies for plow bolts, square shoulder bolts; cold heading dies.

LA BELLE "C" & "H."
M-38; 0.5-0.8 C, 0.4 Ni, 0.2 Cr, 0.1 V, bal Fe.
For chipper knives; water hardening.

LA BELLE CHROMONIC.
M-38; 0.5 C, 1.25 Mn, 7 Cr, 1.5 Ni, Ni, 0.75 Mo, bal Fe.
For flying shears, billet shears; oil hardening.

LA BELLE COLD HEADER DIE.
M-38; 0.95 C, bal Fe.
For cold header dies; water hardening.

LA BELLE COLD STRIKING DIE.
M-38, 0.95 C, bal Fe.
For cold forging dies; water hardening.

LA BELLE CSD.
M-38; 0.95 C, bal Fe.
For dies for wheel bolts and single extrusion applications; cold heading dies.

LA BELLE EAGLE.
M-38; C, bal Fe.
For tools, cutters, drills, dies, hammers; water hardening.

LA BELLE EXTRA.
M-38, 0.95 C, bal Fe.
For cold work dies, cold forming dies; water hardened.

LA BELLE EXTRA 2½.
M-38; 0.95 C, bal Fe.
For dies for small rivets and non-ferrous specialties; cold heading dies.

LA BELLE EXTRA 3A.
M-38; 0.95 C, bal Fe
For small screw and bolt dies; cold heading dies.

LA BELLE EXTRA 3½.
M-38; 0.95 C, bal Fe
For dies for bolts; cold heading dies.

LABELLE HT.
M-38; 0.43 C, 1.3 Mn, 2.25 Si, 1.3 Cr, 0.3 V, 0.4 Mo, bal Fe.
Heat treated: 314,000 TS; 255,000 YS; 9 El; 29 RA; 560 Brin.
For shear blades, chisels, punches; oil hardened, shock resistant.

LA BELLE NICKEL MOLY.
M-38; 1.1 C, 0.5 Ni, 1.25 Mo, bal Fe.
For tools, dies; oil hardening.

LA BELLE SELFTEM.
M-38; 0.35 C, 0.8 Mn, 0.9 Cr, 0.5 Mo, bal Fe.
For chisels, shock tools; oil hardening.

LA BELLE SILICON 2.
M-38; 0.6 C, 0.8 Mn, 1.9 Si, 0.3 Mo, 0.25 Cr, bal Fe.
For punches, chisels, rivet sets; tough.

LA BELLE SPECIAL HOT DIE.
M-38; 0.4 C, 2.25 Cr, 2.5 Ni, bal Fe.
For hot heading dies; hot work steel.

LA BELLE STAMP.
M-38; 0.75 C, 0.95 Mn, 0.35 Mo, bal Fe.
For steel stamps; water hardening.

LA BELLE STRIKING DIE.
M-38; 0.95 C, bal Fe.
For cold forging dies; water hardening.

LA BELLE TNU.
M-38; 1.15 C, 0.65 Ni, 2 W, bal Fe.
For tools; oil hardening.

LA BOUR R-55.
M-263; 4 Si, 23 Cr, 6 Cu, 4 Mo, 2 W, 0.2-0.3 C, 52 Ni, 8 Fe.
For pump parts; modification of "R-50."

LAC 10.
M-137; 9.0-10.5 Cu, 0.15-0.35 Mg, 0.3-1.0 Fe, 0.6 max. Si, bal Al.
30,000-44,000 TS; 28,000-40,000 YS; 110-130 Brin.
For light alloy parts for high temperature service; hardenable.

LAC 10.
British; 0.15-0.35 Mg, 0.6 Si, 9-10.5 Cu, 0.6 Mn, 0.3-1.0 Fe, bal Al
For pistons, non-hardenable

LAC 112.
British; 0.3 Mg, 7-13 Si, 2-3 Cu, 0.5 Mn, 1.5 Ni, 1.2 Zn, bal Al
For die castings; high fluidity.

LAC 112A.
M-137; 0.75-2.5 Cu, 9-11.5 Si, bal Al.
For die castings

LAC 113A
British, 1.3 Si, 2.5-4.5 Cu, 1.0 Fe, 9-13 Zn, bal Al.
For sand castings; non-hardenable

LACOLITE.
M-1480, 3 C, Si, Mn, alloy, bal Fe.
For gears, shafts, machine tool parts; cast iron

LACTOVAC.
M-679, 0.2-0.5 C, bal Fe
For machinery parts, water hardening

LANDERIG'S SPECULUM
70 Cu, 30 Sn
For mirrors, reflectors; bronze.

LADISH D-6.
M-38; 0.42-0.48 C, 0.9-1.2 Cr, 0.4-0.7 Ni, 0.9-1.1 Mo, 0.05-0.10 V, bal Fe.
For solid fuel rocket motor cases; tough, shock resistant.

LADISH-D6AC
M-1527; 0.42-0.50 C, 0.6-0.9 Mn, 0.15-0.30 Si, 0.4-0.7 Ni, 0.9-1.2 Cr, 0.9-1.1 Mo, 0.05-0.15 V, bal Fe.
Vacuum melted.
High strength, good hardenability, tough.
For aircraft structural components, stone crusher bearings, shafts, gears, power shovel parts.

LADISH D-11.
M-1527; 0.42-0.50 C, 0.6-0.9 Mn, 0.25-0.45 Si, 0.4-0.7 Ni, 0.9-1.2 Cr, 1.9-2.15 Mo, 0.45-0.6 V, bal Fe.
Air or oil hardening; good high temp. strength.
For hot work tool and die applications.

LAFOND'S AXLE BEARING.
80 Cu, 18 Sn, 2 Zn.
For axle bearings; heavy duty

LAFOND'S HEAVY BEARING.
83 Cu, 15 Sn, 1.5 Zn, 0.5 Pb.
For heavy duty bearings; high strength.

LAFONDS MALLEABLE BRONZE.
France; 2 Sn, bal Cu.
For electrical equipment; corrosion resistant.

LAFONDS PUMP BRONZE.
France; 10 Sn, 2 Zn, bal Cu.
For pump parts, gears, worm wheels, shafts; tough, corrosion resistant.

LAGAL.
Germany, Al alloy.
For bearings; Zn-free.

LAGERBRONZE.
M-557; 4-5 Sn, 3.5-5.0 Zn, 3.5-4.5 Pb, bal Cu.
Cast: 50,000-58,000 TS; 50 El; 70-85 Brin.
For machine and engine parts; corrosion resistant bronze.

LAITON YELLOW BRASS.
Eng.; 70-60 Cu, 27-40 Zn, 5.3 Pb, 0-1 Sn.
For plumbing, hardware, bolts, nuts; free-cutting.

LAKE'S METAL.
87 Pb, 6 Sn, 7 Sb
For bearings for heavy loads; anti-friction.

LA-LED.
M-669; 0.08-0.13 C, 0.8-1.1 Mn, 0.2-0.3 Si, 0.15-0.35 Pb, bal Fe.
Drawn: 70,000 TS; 60,000 YS; 15 El; 45 RA; 140 Brin
For screw machine products; free-cutting, carburizing steel

LA-LED"X"
M-669; 0.15 C, 0.8-1.2 Mn, 0.04-0.09 P, 0.25 S, 0.15-0.35 Pb, Te, bal Fe.
Bar: 70,000 TS; 60,000 YS; 15 El; 45 RA; 140 Brin.
For screw machine products, fasteners, hardware
Free machining

LALL.
Swiss, Mg, Zn, bal Al.
Cast: 44,000-56,000 TS; 19,000-34,000 YS; 12-4 El; 35-45 Brin.
Wrought 44,000-60,000 TS; 19,000-28,000 YS; 22-14 El; 35 RA; 50 Brin
For bearings.

LANARK
M-73; 0.55 C, 0.2 Cr, 0.90 Mn, 0.3 V, 1.2 Mo, 1.9 Si, bal Fe
For chisels, punches, shear blades, stamps; shock resistant.

LANCASTER SILEXITE 55.
M-1165, C, Cr, Ni, bal Fe.
For pump shafts, valve parts; heat and corrosion resistant.

LAN-CER-AMP.
M-1213; 45-50 Ce, 30 min La, 20-24 Nd + Pr.
For alloying ferrous and nonferrous alloys.

LANGALLOY 1R.
M-1169; 0.5 max C, 14 Cr, 75 Ni, 8 Fe, 2.5 max Si, 0.7 max Mn.
For furnace equipment, salt pots, heat treating boxes; high heat resistance, good strength.

LANGALLOY 1 V.
M-1169; 0.2 C, 17.5-19.5 Cr, 10-12 Ni, Cb = 10 × C, bal Fe.
Sand cast: 70,000 TS; 30,000 YS; 20 El; 200 Brin.
For valves, pump parts, welded structures; stainless, austenitic, stabilized

LANGALLOY 2V.
M-1169; 0.12 max C, 10-12 Ni, 17.5-19 Cr, 2.75-4 Mo, 0.15-0.35 S, bal Fe.
For chemical equipment, welded acid resistant units; stainless, free-cutting.

LANGALLOY 3 V.
M-1169; 17.5-19.0 Cr, 10-12 Ni, 2.5-3.0 Mo, 0.2 C, bal Fe.
Sand cast: 70,000 TS; 30,000 YS; 15 El; 200 Brin.
For valves, pump parts, chemical plant equipment; Type 317, stainless, austenitic.

LANGALLOY 4R.
M-1169; 0.12 max C, 5 Fe, 0.75 Mn, 0.75 Si, 25-35 Mo, bal Ni.
Cast: 72,000-80,000 TS, 45,000-56,000 YS; 10-5 El; 200-250 Brin.
For chemical plant equipment, pumps, valves; corrosion resistant.

LANGALLOY 4V.
M-1169, 0.2-0.3 C, 10.5-12.5 Ni, 21.0-24.0 Cr, 2.0-3.0 W, bal Fe.
Cast: 78,500 TS; 33,000 YS; 20 El; 165-185 Brin.
For oil refinery cracking plant, gas turbine parts; stainless steel casting, heat and creep resistant.

LANGALLOY 5R.
M-1169; 5 Fe, 0.75 Mn, 0.75 Si, 15-18 Cr, 17 Mo, 5 W, bal Ni.
Cast: 72,000-80,000 TS; 45,000-56,000 YS; 12-8 El; 180-220 Brin.
For chemical plant equipment, pumps, valves; corrosion resistant.

LANGALLOY 5V.
M-1169; 0.12 C, 18 Cr, 14 Ni, 3 Mo, bal Fe.
Cast.
For specialized instrumentation applications; stainless, non-magnetic.

LANGALLOY 6R.
M-1169; 10 Si, 3 Cu, bal Ni.
Sand cast: 56,000-78,000 TS; 56,000-78,000 YS; 3-0 El; 350-400 Brin.
For valve cones and seats, pump parts; resists corrosion and erosion.

LANGALLOY-6V.
M-1169; 0.2 C, 13 Cr, bal Fe.
Cast: 80,000 TS; 54,000 YS; 20 El; 152-400 Brin.
For pump parts, valve bodies, trim, surgical instruments, bearings, bushings
Hardenable. Resistant to mild corrosives.

LANGALLOY 7R.
M-1169; 23 Cr, 6 Mo, 6 Cu, 5 Fe, 2 W, bal Ni.
Sand cast: 56,000 TS; 40,000 YS; 6 El; 180 Brin.
For valves, valve seats, pump parts; resists H_2SO_4 acids.

LANGALLOY 7V.
M-1169; 0.15 max C, 8 Ni, 18 Cr, 3 Mo, bal Fe.
For chemical plant equipment; acid resistant.

LANGALLOY 8R.
M-1169; 0.75 max C, 60 Ni, 15 Cr, 2 max Si,
For heat treating equipment, salt pots; high thermal fatigue and hot gas resistance.

LANGALLOY 8V.
M-1169; 0.15 max C, 8 Ni, 18 Cr, 3 Mo, S, bal Fe. 2 max Mn, bal Fe.
For chemical plant equipment; acid resistant, free-cutting.

LANGALLOY 9R.
M-1169; 0.5 max C, 37 Ni, 18 Cr, 3 max Si, 2 max Mn, bal Fe.
For heat treating equipment, furnace parts; good for cyclic heating up to 1100°C.

LANGALLOY 10V.
M-1169; 0.12 max C, 10 Ni, 18 Cr, bal Fe.
For chemical plant equipment at low temperature operation; stainless.

LANGALLOY 12V.
M-1169; 0.08 max C, 11 Ni, 18 Cr, 3.5 Mo, S, bal Fe.
For chemical plant equipment; acid resistant, free-cutting.

LANGALLOY 13V.
M-1169; 0.08 max C, 11 Ni, 18 Cr, 3.5 Mo, bal Fe.
For chemical plant equipment; acid resistant.

LANGALLOY 16V.
M-1169, 0.08 max C, 8 Ni, 18 Cr, 3 Mo, bal Fe.
For chemical plant equipment; acid resistant.

LANGALLOY 18V
M-1169; 0.08 max C, 8 Ni, 18 Cr, 3 Mo, S, bal Fe
For chemical plant equipment; acid resistant, free-cutting.

LANGALLOY 20V.
M-1169; 0.07 max C, 20 Cr, 29 Ni, 3 Mo, 1 Cb, bal Fe
For sulphuric acid equipment; stainless casting for H_2SO_4.

LANGALLOY 25V.
M-1169, 0.5 max C, 12 Ni, 25 Cr, 2 max Si, 2 max Mn, bal Fe
For superheaters in oil refineries, furnace parts, heat treating equipment; oxidation resistant to 1100°C, good hot strength

LANGALLOY 26V
M-1169, 0.35 max C, 12 Ni, 25 Cr, 1.75 max Si, 2 max Mn, bal Fe
For superheaters in oil refineries, furnace parts, heat treating equipment, oxidation resistant to 1100°C, good hot strength

LANZ CAST IRON
M-527, 3.4 C, 2.8 Si, 0.7 Mn, bal Fe.
56,500 TS, 26 El.
For housings, frames, gears, castings, high strength castings

LAPALLOY
M-114, 0.30 C, 1 Mn, 0.5 Si, 11.5 Cr, 2.75 Mo, 0.25 V, bal Fe.
At 70°F 155,000 TS, 140,000 YS; 17 El; 35 RA
At 1200°F 60,000 TS, 50,000 YS, 35 El, 85 RA.
For high temp. bolts, steam turbine buckets and blades, scale and oxidation resistant to 1400°F.

LAPCO
M-1481; Al alloy
For light alloy parts.

LAPELLOY
M-32, 0.25-0.35 C, 11-12 Cr, 2.5-3.0 Mo, 0.3 V, 0.5 max Ni, bal Fe.
At 20°F: 155,000 TS; 140,000 YS; 17 El; 35 RA.
At 1000°F 60,000 TS, 50,000 YS; 35 El; 85 RA.
For high temperature bolts, valve stems, turbine buckets and blades; scale and oxidation resistant to 1400°F.

LAPELLOY "C."
M-32; 0.20-0.25 C, 11-12 Cr, 2.5-3.0 Mo, 1.75-2.25 Cu, 0.1 N, bal Fe.
Heat treated: 135,000-203,000 TS; 105,000-170,000 YS; 18-17 El; 55-47 RA.
For turbine shafts, compression wheels and buckets; heat and oxidation resistant to 1400°F.

LARPORT.
M-1411; 0.3 C, 1.25 Cr, 0.3 Mo, 4.25 Ni, bal Fe.
For plastic mold dies; oil or air hardened, tough.

LA SALLE E.T.D. 150.
M-669; 0.4 C, Si, Mn, 1 Cr, 0.2 Mo, bal Fe.
Heat treated. 150,000 TS; 130,000 YS; 10-20 El; 35-45 RA; 302 Brin.
For gears, pinions, shafts, fasteners; preheat treated alloy steel.

LATROBE AGT.
M-73; 0.08-0.13 C, 3.0-3.5 Ni, 1.0-1.4 Cr, 0.08-0.15 Mo, bal Fe.
Rolled: 131,000 TS; 88,000 YS; 19 El; 61 RA; 269 Brin.
Normalized: 131,000 TS; 83,000 YS; 19 El; 58 RA; 269 Brin.
For gears, pinions, camshafts, crankshafts; case hardening, tough, shock resistant.

LATROBE BR-3.
M-73, 2.8 C, 5.2 Cr, 4.5 V, bal Fe.
For cold working dies; for cold working applications

LATROBE BR-4
M-73, 2.4 C, 12.75 Cr, 0.4 Mn, 4 V, 1.1 Mo, bal Fe
For shaving, stamping and deep draw dies; abrasion resistant.

LATROBE BR-4FM
M-73; 2.4 C, 12.75 Cr, 1.1 Mo, 4 V, 0.4 Mn, 0.15 S, bal Fe.
For stamping and deep drawing dies; oil hardened, non-deforming

LATROBE CI W NO 1.
M-73, 0.3 C, 9 W, 3.3 Cr, 0.5 V, bal Fe.
For hot headers, punches, extrusion rams and dies, oil hardened, hot work steel

LATROBE "EXTRA."
M-73, C, 0.2-0.35 Mn, bal Fe.
For taps, reamers, twist drills, shear blades, springs, tools; water hardening.

LATROBE GSN-FM
M-73; 2.2 C, 13 Cr, S, bal Fe.
For stamping and forming dies; oil hardened, non-deforming.

LATROBE MCH
M-73, 0.50 C, 1.0 W, 6.25 Mo, 3.75 Cr, 0.75 V, bal Fe
For hot shears and punches, extrusion dies and rams, hot work steel, oil hardened.

LATROBE MCL
M-73, 0.30 C, 1.0 W, 6.25 Mo, 3.75 Cr, 0.75 V, bal Fe
For extrusion dies and mandrels, hot punches, shears; hot work steel, oil hardened.

LATROBE SPECIAL
M-73; 0.7-1.2 C, bal Fe.
For general tools, drills, taps; water hardened, Type W1.

LATROBE VDC.
M-73, 0.4 C, 5 Cr, 1 Mo, 1 Si, 1 V, bal Fe.
For die casting dies and cores for Al and Zn; resists wash and heat checking.

LATROBE VDC-MF.
M-73; 0.4 C, 5 Cr, 1 Mo, 1 Si, 1 V, S, bal Fe.
For hot work tools, die casting dies; Type H13; resists heat checking.

LATTEN (Laiton)-1.
Eng; 70-60 Cu, 27-40 Zn, 5.3-0 Pb, 0-1 Sn.
For hardware, fixtures; yellow brass.

LATTEN (Laiton)-2.
Eng; 71 Cu, 28.53 Zn, 0.25 Pb, 0.02 Sn, 0.20 Fe.
Annealed: 56,000 TS; 45,000 YS; 35 El; 65 RA.
For hardware, fixtures; yellow brass.

LAUTAL-1.
M-116; 4.5-5.5 Cu, 0.2-0.5 Si, bal Al.
Wrought: 35,000-63,000 TS; 18,000-40,000 YS; 25-20 El; 65-110 Brin.
For aircraft construction; age-hardening.

LAUTAL-2.
M-116; 4.5 Cu, 0.75 Si, 0.75 Mn, bal Al.
Annealed: 23,000-35,000 TS; 7,000-12,000 YS; 20-12 El; 45-55 Brin.
For electric cables, light alloy.

LAVELSSIERE BRONZE.
61 Cu, 38 Zn, 1 Sn.
For condenser tubing, marine parts; corrosion resistant.

LAVIN 7A MANGANESE BRONZE.
M-801; 59 Cu, 0.75 Sn, 0.75 Pb, 1 Fe, 0.3 Mn, 1 Al, bal Zn.
Cast: 60,000 TS; 20,000 YS; 15 El; 80-95 Brin.
For valve stems, propellers, worm gears; corrosion resistant.

LAVIN 8A MANGANESE BRONZE.
M-801; 57 Cu, 1 Fe, 1 Al, 0.25 Mn, bal Zn.
Cast. 65,000 TS, 25,000 YS; 20 El; 90-120 Brin.
For valves, propellers, worm gears, valve stems; corrosion resistant

LAVIN 8C MANGANESE BRONZE.
M-801; 64 Cu, 3 Fe, 5 Al, 4 Mn, bal Zn.
Cast. 110,000 TS; 60,000 YS; 12 El; 190-235 Brin.
For screwdown nuts, gears, bridge parts; corrosion resistant.

LAVIN 9A ALUMINUM BRONZE.
M-801; 87.5 Cu, 3.5 Fe, 9 Al.
Cast: 65,000 TS, 25,000 YS; 20 El; 110-140 Brin.
For worm wheels, bearings, bushings; corrosion resistant

LAVIN 9B ALUMINUM BRONZE.
M-801; 89 Cu, 1 Fe, 10 Al.
Cast: 65,000 TS; 25,000 YS, 20 El, 110 Brin.
Heat treated. 80,000 TS; 40,000 YS; 12 El; 160 Brin
For valve seats, stripper nuts, gears; corrosion resistant, heat treatable.

LAVIN 9C ALUMINUM BRONZE.
M-801, 85 Cu, 4 Fe, 11 Al.
Cast: 75,000 TS; 30,000 YS, 12 El; 150 Brin.
Heat treated: 90,000 TS, 45,000 YS, 6 El; 190 Brin.
For worm wheels, pump parts, bushings; corrosion resistant, heat treatable

LAVIN 9D ALUMINUM BRONZE.
M-801; 81 Cu, 4 Ni, 4 Fe, 11 Al.
Cast 90,000 TS; 40,000 YS; 6 El; 190 Brin.
Heat treated: 110,000 TS; 60,000 YS; 5 El; 200 Brin
For worm wheels, pump parts, bushings; corrosion resistant, heat treatable.

LAVIN 10A NICKEL SILVER
M-801, 12 Ni, 20 Zn, 9 Pb, 2 Sn, 57 Cu.
Cast: 30,000 TS, 15,000 YS, 8 El, 50-60 Brin.
For hardware fittings, valves, plumbing; corrosion resistant.

LAVIN 10B NICKEL SILVER.
M-801; 16 Ni, 16 Zn, 5 Pb, 3 Sn, 60 Cu.
Cast: 35,000 TS; 17,000 YS; 15 El; 65-80 Brin.
For plumbers fittings, statuary, bolts; corrosion resistant.

LAVIN 11A NICKEL SILVER.
M-801; 20 Ni, 8 Zn, 4 Pb, 4 Sn, 64 Cu.
Cast: 30,000 TS; 17,000 YS; 8 El; 76-120 Brin.
For hardware, fittings, plumbing, valves; corrosion resistant.

LAVIN 11B NICKEL SILVER.
M-801; 25 Ni, 2 Zn, 1.5 Pb, 5 Sn, 66.5 Cu.
Cast: 45,000 TS; 22,000 YS; 15 El; 120-150 Brin.
For hardware and plumbing fixtures; corrosion resistant.

LAVIN CF NO. 4.
M-801; Cu alloy.
Deoxidizer for copper alloys; densifier.

LAVIN-NDZ BRONZE.
M-801; 5 max Zn, 5.5 max Ni, 5.5 max Fe, 2 max Al, 2 max Si, 0.25 max Pb, bal Cu.
Cast: 65,000-69,000 TS; 30,000-35,000 YS; 20-34 El; 17-31 RA, 123-134 Brin.
Heat treated: 78,900 TS; 63,400 YS; 5 El, 179 Brin.
For valve stems and bodies, valve bonnets, propeller wheels, marine outboard gears.
High corrosion resistance with good strength.

LAVIN NDZ-S BRONZE.
M-801; 5 max Zn, 5.5 max Ni, 5.5 max Fe, 2 max Al, 2 max Si, 0.25 max Pb, bal Cu.
Cast: 69,000-75,000 TS; 40,000-45,000 YS; 13-23 El; 10-20 RA; 143-149 Brin
Heat treated. 86,400 TS; 62,400 YS, 8 El; 196 Brin.
For valve stems and bodies, valve bonnets, propeller wheels, marine outboard gears.
High corrosion and dezincification resistance.
High yield strength.

LAVIN NSF NO. 5.
M-801; Cu alloy.
Degasifier for nickel-silver castings; densifier.

LAVIN SPECIAL.
M-801; Cu, Ni, Al, bal Zn.
Cast: 70,000-102,000 TS; 40,000-68,000 YS, 6-1 El; 165-227 Brin.
For neck rings and plungers for glass molding machines; high thermal conductivity.

LAWN MOWER.
M-357, 1.0 C, 1.15 Cr, bal Fe.
For lawn mower blades, oil hardening

LAWS PHOSPHOR BRONZE.
England; 9.5-11 Sn, 0.7-1.0 P, bal Cu.
For bearings, gears, bushings; heavy duty.

L. C. ELECTRITE DOUBLE SIX M-2.
M-73; 0.68 C, 4.1 Cr, 6.4 W, 5 Mo, 1.9 V, bal Fe.
For cold forming and working tools; oil hardening, high speed steel.

L.C.H.S. CHISEL.
M-261; C, alloy, bal Fe.
For tools, chisels, punches; tough.

"L.C." IRON.
M-664; 3.5 T.C., alloy, bal Fe.
Cast: 40,000 TS, 255 Brin.
For castings for high temperature service; Tr.S. 2800; Tr.D 210.

L.C.N.-155.
M-114; 0.08-0.16 C, 1-2 Mn, 20.0-22.5 Cr, 19-21 Ni, 18.5-21.0 Co, 2.5-3.5 Mo, 2-3 W, 0.75-1.25 Cb + Ta, 0.10-0.20 N_2, bal Fe.
Heat treated: 80,000-150,000 TS; 40,000-110,000 YS; 50-15 El; 55-20 RA.
For rotors, blades, bolts, buckets for gas engine and jet engines; high oxidation and heat resistance.

LCT.
M-38; 0.45 C, 3.0 Cr, 0.4 V, 15 W, bal Fe.
For hot swaging dies, extrusion dies, shear blades; hot work steel.

LCT NO 2.
M-38; 0.45 C, 3 Cr, 0.4 V, 11.5 W, bal Fe.
For brass forging dies, punches, forming rolls; hot work steel; Peerless LCT 2.

LEAD NO. 1 HARD.
M-88; 90 Pb, 10 Sb.
8,220 TS; 17 El; 17 Brin.
For type metal; M.P. 486°F.

LEAD NO. 1 HARD.
M-558; 99.25 Pb, 0.25 Cd, 0.5 Sb.
For valves, cocks, cable sheathing.

LEAD NO 2 HARD.
M-88, 85 Pb, 15 Sb.
9,000 TS, 11.7 El, 17 Brin.
For type metal; M.P. 476°F.

LEAD NO. 2 HARD
M-558, 98.25 Pb, 0.25 Cd, 1.5 Sn.
For valves, cocks, tank lining.

LEAD ALLOY
75 Sn, 20 Sb, 5 Pb.
For bearings, anti-friction

LEADBEATER BR.
M-1408; high C, med Cr, bal Fe.
For dies, oil hardened.

LEADBEATER L S.11
M-1408, 2.0 C, 12 Cr, bal Fe.
For blanking and wire drawing dies, press tools; oil hardened, non-deforming.

LEADBEATER L S 25
M-1408, C, W, bal Fe.
For hot heading, swaging and piercing dies; hot die steel, shock and abrasion resistant.

LEADBEATER L S 54.
M-1408, high C, Cr, Mn, bal Fe
For taps, reamers, chasers, dies; oil hardened.

LEADBEATER L S 3000.
M-1408, C, 7 W, bal Fe.
For drawing dies; oil hardened

LEADBEATER N.S O.H
M-1408, high C, Mn, bal Fe.
For punches, dies, oil hardened, non-deforming.

LEADBEATER P B.
M-1408, 0.6 C, Cr, bal Fe.
For taps, reamers, threading dies, punches, chasers; oil hardened

LEADBEATER S.P C.
M-1408, high C, alloy, bal Fe.
For chisels, punches, marking dies; shock resistant, oil hardened.

LEAD BRONZE NO 1.
M-1518; 9 Sn, 15 Pb, bal Cu
Cast: 22,400 TS; 4 El; 50-70 Brin.
For soft shaft bearings; for poor lubrication.

LEAD BRONZE NO. 2.
M-1518; 10 Sn, 10 Pb, bal Cu.
Cast. 24,600 TS, 4 El, 60-75 Brin.
For bearings for medium hard shafts and heavy loads; good anti-friction properties.

LEAD BRONZE NO. 3.
M-1518; 10 Sn, 5 Pb, bal Cu.
Cast: 26,900 TS, 5 El; 65-75 Brin.
For bearings; good corrosion resistance, high strength.

LEAD-CALCIUM.
97 Pb, 0.79 Ca, 0.66 Ba.
For bearings; anti-friction.

LEADED BEARING BRONZE 544.
M-279; 89 Cu, 4 Sn, 4 Pb, 3 Zn.
Ann: 42,000-52,000 TS; 14,000-27,000 YS; 40-50 El.
Cold rolled: 47,000-103,000 TS; 20,000-92,000 YS; 2-40 El.
For bearings, bushing, thrust washers.
Excellent bearing properties.

LEADED BRASS 244.
M-8; 37 Zn, 1 Pb, bal Cu.
Hard: 73,000 TS; 60,000 YS; 8 El; 150 Brin.
Soft: 45,000 TS; 17,000 YS; 50 El; 60 Brin.
For hardware, screw machine parts; free-cutting.

LEADED BRONZE.
U.S.; 10-35 Zn, 1.5-2.5 Pb, bal Cu.
For hardware, screws, fittings, bolts; free-cutting.

LEADED COMMERCIAL BRONZE.
M-33; 89 Cu, 9 Zn, 2 Pb.
Drawn: 52,000 TS; 45,000 YS; 18 El; 60 Brin.
For hardware, screw machine parts; free cutting.

LEADED COMMERCIAL BRONZE-201.
M-8; 9.5 Zn, 0.5 Pb, bal Cu.
Soft: 37,000 TS; 12,000 YS; 40 El.
Hard: 62,000 TS; 47,000 YS; 6 El
For percussion caps, gilding; good workability.

LEADED COMMERCIAL BRONZE 202.
M-8; 88 5 Cu, 9.25 Zn, 2.25 Pb.
Hard: 54,000 TS; 45,000 YS; 15 El; B58 Rock.
Soft: 37,000 TS; 12,000 YS; 40 El; B1 Rock.
For screw machine parts, hardware; free cutting.

LEADED COPPER-187.
M-8; 99 00 Cu, 1.0 Pb.
Hard: 48,000 TS; 40,000 YS; 12 El; B 50 Rock
Soft· 32,000 TS; 10,000 YS, 45 El; F 45 Rock.
For current carrying studs, nuts, bolts, fasteners.
Free-cutting, 98% electrical conductivity.

EADED FLANGING BRASS.
M-33; 62 5 Cu, 35.6 Zn, 1.9 Pb.
For screw machine products; flange grade.

EADED GUN METAL.
Eng., gun metal + 1 0 Pb.
For corrosion resistant parts; improved machinability

EADED HIGH BRASS.
M-8, M-33; 65-78 Cu, 0.3-0.8 Pb, bal Zn.
For tanks, vessels, containers; good ductility and strength.

EADED MONEL METAL.
Eng., 60 Ni, 32 Cu, 2 2 Pb, 2.2 Fe, 2.0 Mn, 0 9 Si, 0.2 C.
For corrosion resistant parts; improved machinability.

ADED MUNTZ METAL-365.
M-8; 60 Cu, 39.35 Zn, 0.65 Pb.
Soft: 54,000 TS; 20,000 YS; 45 El; B 45 Rock.
For industrial condensers.
Strong, stiff and elastic, free-cutting.

ADED NAVAL BRASS.
M-33; 60 Cu, 37.25 Zn, 0.75 Sn, 2 Pb.
Annealed: 60,000 TS; 30,000 YS; 35 El.
Drawn: 72,000 TS; 53,000 YS; 22 El.
or nuts, valve stems, hardware; corrosion resisting.

ADED NAVAL BRASS 29.
M-141; 60 Cu, 1.75 Pb, 0.75 Sn, bal Zn.
lard: 75,000 TS; 53,000 YS; 15 El.
oft: 57,000 TS; 25,000 YS; 40 El.
or hardware; free-cutting, corrosion resistant.

LEADED NAVAL BRASS 482.
M-8; 38.55 Zn, 0.75 Sn, 0.70 Pb, bal Cu.
Hard: 63,000 TS; 35,000 YS; 28 El; 116 Brin.
Soft: 56,000 TS; 25,000 YS; 38 El; 83 Brin.
For marine hardware, screw machine products; free-cutting, forgeable.

LEADED NAVAL BRASS-485.
M-8; 60 Cu, 37.5 Zn, 1.75 Pb, 0.75 Sn.
Hard: 63,000 TS; 35,000 YS; 25 El; B 65 Rock.
Soft: 56,000 TS; 25,000 YS; 35 El; B 50 Rock.
For marine hardware, valve stems, screw machine products.
Free-machining, high strength.

LEADED NICKEL COMMERCIAL BRONZE
Copper Alloy No. 316.
M-33; 90.25 Cu, 6.9 Zn, 1.0 Ni, 0.10 P, 1.75 Pb.
Hard: 70,000 TS; 60,000 YS; 10 El; 78 Rock B.
For bolts, fasteners, nuts, pole line hardware.
ASTM B140 Alloy B.

LEADED NICKEL COPPER-831.
M-8; 1 Pb, 1 Ni, 0.2 P, bal Cu.
Heat treated: 80,000 TS; 70,000 YS; 7 El.
For screw machine products, fasteners; free-cutting, corrosion resistant.

LEADED NICKEL COPPER 7021.
M-8; 97.8 Cu, 1.0 Pb, 1.0 Ni, 0.20 P.
Rod: 85,000 TS; 75,000 YS; 5 El; 55% elec. cond.; 80% machinability.
For electrical contacts, connectors, control elements for power tubes.

LEADED NICKEL SILVER 10%-796.
M-8; 42 Zn, 1 Pb, 10 Ni, 2 Mn, bal Cu.
Hard: 70,000 TS; 40,000 YS; 15 El; 137 Brin.
Soft: 60,000 TS; 20 El.
For screw machine products, architectural parts; free-cutting, corrosion resistant.

LEADED NICKEL SILVER 10%-823.
M-8; 2.75 Pb, 10 Ni, 40.6 Zn, 0.15 Mn, bal Cu.
For architectural trim, forgings; extruded.

LEADED PHOSPHOR BRONZE.
M-58; 80 Cu, 10 Sn, 10 Pb.
Cast: 30,000-37,000 TS; 16,000-23,000 YS; 18-5 El; 16-6 RA; 55-60 Brin.
Chilled: 30,000-33,000 TS; 19,000-21,000 YS; 7-4 El; 10-7 RA.
For bearings for high speeds and heavy pressures; resists shock and vibrations.

LEADED PHOSPHOR BRONZE GR. B.
M-33; 94 Cu, 4.75 Sn, 1 Pb, 0.25 P.
Drawn (20%): 70,000 TS; 58,000 YS; 25 El.
For screw machine products; free-cutting.

LEADED PHOSPHOR BRONZE (B) 379.
M-8; 5 Sn, 1 Pb, 0 10 P, bal Cu.
Hard: 65,000 TS; 55,000 YS; 25 El.
For tubes, bushings, perforated sheets, clutch plate; resists fatigue and corrosion.

LEADED RED BRASS.
M-33; 85 Cu, 1.75 Pb, bal Zn.
½ Hard temper: 60,000 TS; 50,000 YS; 15 El.
For hardware, bolts, screws; free-cutting.

LEADED TS4140 MODIFIED.
M-669; 0.40 C, 1 Cr, 0.2 Mo, 0.2 Pb, bal Fe.
For screw machine products; free-cutting.

LEADED TUBE BRASS 331.
M-8; 33 Zn, 1 Pb, bal Cu.
Hard: 73,000 TS; 60,000 YS; 10 El; 150 Brin.
Soft: 45,000 TS; 17,000 YS; 55 El; 60 Brin.
For screw machine parts; free-cutting tubes.

LEADED TUBE BRASS 3301.
M-8; 33.25 Zn, 0.25 Pb, bal Cu.
Hard: 73,000 TS; 60,000 YS; 10 El; 150 Brin.
Soft. 45,000 TS; 17,000 YS; 45 El; 60 Brin.
For plumbing goods, tubes; yellow brass.

LEAD FOIL.
86 Pb, 6.9 Fe, 5.5 Al, 1.9 Sn.
For lead foil.

LEAD FOIL (CALIN).
86 Pb, 13 Sn, 1 Cu.
For leade foil; corrosion resistant.

LEAD SHOT.
99.8 Pb, 0.2 As.
For lead shot.

LEAD TAPE.
95 Pb, 4.5 Sb, 0.5 Sn
For lead tape; hard.

LEAKPRUF.
M-1073; 40-60 Pb, bal Sn.
For soft solder for Ni, Monel and stainless steels; acid flux filled.

LEBANON 15.5.
M-74; 0.06 max C, 14-15.5 Cr, 4.1-5.1 Ni, 0.15-0.25 Cb, 2.5-3.5 Cu, bal Fe.
Precipitation hardenable stainless steel casting.
As heat treated. 180,000 TS, 150,000 YS; 6 El.
For pumps, impellers, fuel controls.
(Armco 15-5 PH).

LEBANON 17-4.
M-74; 0.06 max C, 15.5-16.7 Cr, 3.6-4.6 Ni, 0.10-0.35 Cb, 2.5-3.2 Cu, bal Fe
Precipitation hardenable stainless steel casting.
As heat treated 180,000 TS; 150,000 YS; 6 El.
For pumps, impellers, fuel controls
ACI CB-7 Cu (Armco 17-4 PH)

LEBANON 17-22
M-74; 0.25-0.35 C, 0.3-0.6 Si, 0.45-0.70 Mn, 1.0-1.5 Cr, 0.4-0.6 Ni, bal Fe
Low carbon, low alloy steel casting.
Nor + T 125,000 TS, 100,000 YS; 12 El; 262-306 Brin
For aircraft brake components
Reference. Timken 17-22 A

LEBANON GRADE 22
M-74, C, 19.5 Cr, 9 Ni, bal Fe
For pressure storage equipment for liquid O_2, austenitic

LEBANON 33
M-74, 0.07 C, 18-21 Cr, 22-25 Ni, 2.5-3.0 Mo, 1.5-2.0 Cu, bal Fe
Non-magnetic stainless steel casting.
Not hardenable by heat treatment
For paper pulp machinery, food machinery
ACI CN-7M.

LEBANON 431.
M-74, 0.16-0.22 C, 15.0-16.5 Cr, 1.5-2.5 Ni, bal Fe.
Corrosion resistant steel casting; oil or air hardenable.
For special purpose hardenable components as impellors, pumps, fuel controls
AISI 431, SAE 51431.

LEBANON 440 C
M-74; 0.95-1.20 C; 16-18 Cr, 0.75 max Mo, bal Fe
Corrosion resistant steel casting.
Oil or air hardenable to above 55 Rock C.
For stainless ball bearings, races.
AISI 440 C; SAE 51440 C.

LEBANON 442.
M-74; 0.20-0.30 C, 18-22 Cr, 2.0 max Ni, bal Fe.
Corrosion resistant steel casting.
For pumps, chemical equipment, valves; good resistance to nitric acid, alkalies, organics.
AISI 442; ACI CB-30.

LEBANON 1005.
M-74, 0.05 max C, 0.7 max Si, 0.10 max Mn, bal Fe
Very low carbon steel casting.
Nor. + T.: 48,000 TS, 25,000 YS; 35 El.
For electro magnet components.

LEBANON 1040
M-74; 0.35-0.45 C, 0.6 max Si, 0.6-0.8 Mn, bal Fe.
Medium carbon steel casting.
Nor + T 80,000 TS, 40,000 YS, 18 El
ASTM 148-60 Gr 80-40.

LEBANON 4140
M-74, 0.35-0.45 C, 0.60 max Si, 0.6-0.8 Mn, 0.8-1.2 Cr, 0.2-0.3 Mo, bal Fe.
Medium carbon low alloy steel casting.
Nor + T 100,000 TS, 80,000 YS, 15 El
Can be oil hardened to about 200,000 psi TS.
Structural parts, AISI 4140

LEBANON 4330
M-74, 0.25-0.35 C 0.60 max Si, 0.6-0.8 Mn, 0.6-1.25 Cr, 1.25-2.50 Ni, 0.25-0.50 Mo, bal Fe
Medium carbon low alloy steel casting
Oil hardenable to 140,000-180,000 TS
For structural parts, gears, dies, wheels, housings.
AISI 4330

LEBANON 4335
M-74, 0.30-0.35 C, 0.60 max Si, 0.6-0.8 Mn, 0.60-1.25 Cr, 1.25-2.50 Ni, 0.25-0.50 Mo, bal Fe
Medium carbon low alloy steel casting
Oil hardenable to 180,000-240,000 psi TS.
For structural parts requiring good strength and toughness AISI 4335

LEBANON 4340
M-74, 0.35-0.45 C, 0.60 max Si, 0.6-0.8 Mn, 0.60-1.25 Cr, 1.25-2.50 Ni, 0.25-0.50 Mo, bal Fe
Medium carbon low alloy steel casting.
Oil hardenable in fairly heavy sections to 200,000-260,000 psi TS
For heavily loaded structural parts AISI 4340.

LEBANON 8615
M-74, 0.10-0.20 C, 0.60 max Si, 0.6-0.9 Mn, 0.4-0.9 Cr, 0.4-1.1 Ni, 0.15-0.25 Mo, bal Fe
Low carbon low alloy steel casting
For structural and carburized parts AISI 8615

LEBANON 8630
M-74, 0.25-0.35 C, 0.60 max Si, 0.60-0.95 Mn, 0.4-0.9 Cr, 0.4-1.1 Ni, 0.15-0.25 Mo, bal Fe.
Medium carbon low alloy steel casting
Nor. + Tem: 90,000 TS; 60,000 YS, 20 El
Weldable, water or oil quench. Structural parts
ASTM A148-60 Gr 90-60

LEBANON 8630/1
M-74, 0.25-0.35 C, 0.60 max Si, 0.60-0.95 Mn, 0.4-0.9 Cr, 0.4-1.1 Ni, 0.15-0.25 Mo, bal Fe
Medium carbon low alloy steel casting
Quench and Temper condition. 105,000 TS, 85,000 YS; 17 El; 220-227 Brin
Structural parts; can be re-heat treated; water or oil quench. ASTM A148-60 Gr 105-85.

LEBANON 8630/2
M-74; 0.25-0.35 C, 0.60 max Si, 0.60-0.95 Mn, 0.4-0.9 Cr, 0.4-1.1 Ni, 0.15-0.25 Mo, bal Fe
Medium carbon low alloy steel castings

Quench and Temper Condition: 120,000 TS; 95,000 YS; 14 El; 250-311 Brin.
Structural parts; can be re-heat treated; water or oil quench. ASTM A148-60 Gr 120-95.

LEBANON 8630/3.
M-74; 0.25-0.35 C, 0.60 max Si, 0.60-0.95 Mn, 0.4-0.9 Cr, 0.4-1 1 Ni, 0.15-0.25 Mo, bal Fe.
Medium carbon low alloy steel castings.
Quench and Temper Condition: 150,000 TS; 125,000 YS; 9 El; 310-375 Brin.
For structural parts, gears, rollers, sprockets, rollers, housings. ASTM A148-60 Gr 150-125.

LEBANON C5.
M-74, 0.20 max C, 0.75 max Si, 0.4-0.7 Mn, 4.0-6.5 Cr, 0.45-0.65 Mo, bal Fe.
Low carbon alloy steel casting.
Nor. + T.; 90,000 TS; 60,000 YS; 18 El. Air hardenable.
For valves, bonnets, fittings, yokes, flanges, to 1200°F. ASTM A217-64 Gr C5.

LEBANON C12.
M-74; 0.20 max C, 1.0 max Si, 0.35-0.65 Mn, 8.0-10.0 Cr, 0.9-1 2 Mo, bal Fe.
Low carbon, chromium steel castings
Nor. + T; 90,000 TS, 60,000 YS; 18 El. Air hardenable.
For valves, fittings for moderate corrosion
ASTM A217-64 Gr C12.

LEBANON CA15.
M-74, 0 15 max C, 11 5-14.0 Cr, 1.0 max Ni, bal Fe
Corrosion resistant steel casting.
Oil or air hardenable, weldable
For valves, pump parts, oil refinery equipment.
ACI CA-15, AISI 410

LEBANON CA15M
M-74; 0 15 max C, 11 5-14 0 Cr, 1.0 max Ni, 0 40-0 80 Mo, 0 20-0 35 Se, bal Fe
Free machining, corrosion resistant steel casting
Oil or air hardenable
For valve and pump parts requiring considerable machining Similar to AISI 416 Se.

LEBANON CA40
M-74; 0 20-0 30 C, 11.5-14.0 Cr, 1.0 max Ni, bal Fe
Corrosion resistant steel castings.
Oil or air hardenable to 180,000-240,000 psi.
For cylinder liners, valves, cutter blades.
ACI CA-40, AISI 420

LEBANON CA40A.
M-74, 0 30-0 40 C, 12.0-14.5 Cr, bal Fe
Corrosion resistant steel casting.
Oil or air hardenable to above 48 Rock C.
For glass molds and plungers of mirror quality finish.

LEBANON CC50.
M-74, 0 50 max C, 26-30 Cr, 4 0 max Ni, bal Fe
Corrosion resistant steel casting.
Excellent resistance to dilute sulphuric acid, in mine waters, and other dilute acids.
For mine pumps, chemical plants.
AISI CC-50, AISI 446.

LEBANON CD.
M-74; 0 04 max C, 26.0 Cr, 5.5 Ni, 2.0 Mo, 3.0 Cu, bal Fe.
Corrosion resistant steel casting
Precipitation hardening alloy; very good corrosion resistance. ACI CD-4MCu.

LEBANON CE30.
M-74; 0.30 max C, 26-30 Cr, 8-11 Ni, bal Fe.
Stainless steel casting; resistant to sulphurous acid.
For pulp and paper mill equipment, mine equipment, pumps and valves. ACI CE-30.

LEBANON CF3.
M-74; 0.03 max C, 18-21 Cr, 8-11 Ni, bal Fe.
Non-magnetic stainless steel casting.
Weldable, not hardenable by heat treatment.
For valves, pumps, headers for chemical plants.
ACI CF3; AISI 304L.

LEBANON CF3A.
M-74; 0.03 max C, 17-21 Cr, 8-12 Ni, bal Fe.
Non-magnetic stainless steel casting; solution treated. Weldable, not hardenable by heat treatment. Good resistance to stress corrosion cracking.
For valves, pumps, in chemical plants.
ASTM A351-64 Gr CF-3A.

LEBANON CF3M.
M-74; 0.03 max C, 18-21 Cr, 9-12 Ni, 2.0-3.0 Mo, bal Fe.
Non-magnetic stainless steel casting
Weldable, not hardenable by heat treating.
Exceptional corrosion resistance, pumps, valves, impellers, fittings. ACI CF-3M; AISI 316L.

LEBANON CF8.
M-74, 0.08 max C, 18-21 Cr, 8.0-11.0 Ni, bal Fe
Non-magnetic stainless steel casting; quenched. Not hardenable by heat treatment
General purpose stainless casting. ACI CF-8; AISI 304.

LEBANON CF8A.
M-74; 0 08 C, 18-21 Cr, 8-11 Ni, bal Fe
Non-magnetic stainless steel casting, Solution treated
Not hardenable by heat treatment
Sol. treat increases ferrite content to improve resistance to stress corrosion cracking.
ASTM A351-64 Gr CF-8A

LEBANON CF8C.
M-74; 0.08 max C, 18-21 Cr, 9-12 Ni, Cb/Ta = 8 × %C min, bal Fe
Non-magnetic stainless steel casting, stabilized, Weldable without reheat treatment
For welded stainless assemblies AISI 347; ACI CF-8C

LEBANON CF8F.
M-74, 0.08 max C, 18-21 Cr, 9-12 Ni, 1.5 max Mo, 0 20-0.35 Se, 0.15 max P, bal Fe.
Non-magnetic stainless steel casting, free machining type, not hardenable by heat treatment; not recommended for welding.
For castings requiring much machining AISI 303 Se.

LEBANON CF8M.
M-74; 0.08 max C, 18-21 Cr, 9-12 Ni, 2.0-3.0 Mo, bal Fe.
Non-magnetic stainless steel casting. Not hardenable by heat treatment Exceptional resistance to corrosion.
For chemical plant equipment. ACI CF-8M; AISI 316.

LEBANON CF 20.
M-74; 0.20 max C, 18-21 Cr, 8-11 Ni, bal Fe.
Non-magnetic stainless steel casting. Not hardenable by heat treatment.
General purpose stainless cast components.
ACI CF-20; AISI 302.

LEBANON CG8M.
M-74; 0.08 max C, 18-21 Cr, 9-12 Ni, 3.0-3.5 Mo, bal Fe.
Non-magnetic stainless steel casting. Not hardenable by heat treatment. Excellent corrosion resistance, especially in reducing environment. AISI 317.

LEBANON CH20.
M-74; 0.20 max C, 22-26 Cr, 12-15 Ni, bal Fe.
Non-magnetic stainless steel casting. Not hardenable by heat treatment. Improved corrosion resistance in hot dilute sulphuric acid.
For digester parts, pumps, strainers.
ACI CH-20; AISI 309.

LEBANON CHW.
M-74; 0.15-0.30 C, 22-25 Cr, 11-14 Ni, 2.5-3.5 W, bal Fe.
Non-magnetic stainless steel casting. Not hardenable by heat treatment.
For flanged rings and tail cone rings requiring both corrosion and heat resistance.

LEBANON CK20.
M-74; 0.25 max C, 23-27 Cr, 19-22 Ni, bal Fe.
Non-magnetic stainless steel casting. Not hardenable by heat treatment. Improved resistance to corrosion and high temperatures; weldable.
For jet engine parts, pumps, valves.
ACI CK-20; AISI 310.

LEBANON CK45.
M-74; 0.35-0.45 C, 23-27 Cr, 19-22 Ni, bal Fe.
Non-magnetic stainless steel casting. Not hardenable by heat treatment.
Heat resistant alloy for use in valves and fittings for chemical and refinery parts.

LEBANON CN3M.
M-74; 0.03 max C, 19-22 Cr, 27.5-30.5 Ni, 2.0-3.0 Mo, 3.0-4.0 Cu, bal Fe.
Non-magnetic stainless steel casting. Weldable; not hardenable by heat treatment. Good resistance to hot sulphuric acid.
For paper pulp machinery, food machinery.

LEBANON CN7M.
M-74; 0.07 max C, 19-22 Cr, 27.5-30.5 Ni, 2.0-3.0 Mo, 3.0-4.0 Cu, bal Fe
Non-magnetic stainless steel casting. Not hardenable by heat treatment Good resistance to hot sulphuric acid.
For paper pulp machinery, food machinery.
ACI CN-7M; ASTM A296-64T Gr CN-7M.

LEBANON CU-NI.
M-74; 0.15 max C, 28-32 Ni, 0.25-1.0 Fe, 1.5 max Cb, bal Cu.
Corrosion resistant alloy casting for marine pumps, valves, fittings. ASTM B369-61T.

LEBANON H810 (Incoloy).
M-74; 20.0 Cr, 32.0 Ni, bal Fe.
Heat resistant steel casting Maximum operating temperature 2000°F.

LEBANON HAB.
M-74; 0.12 max C, 26-30 Mo, 4-7 Fe, 0.6 max V, 2.5 max Co, 1.0 max Cr, bal Ni.
Corrosion resistant alloy casting; for valves, pump parts, fittings in hydrocloric acid environment.
Similar to Hastelloy B; ASTM A494-62.

LEBANON HAC.
M-74; 0.12 max C, 15.5-17.5 Cr, 16-18 Mo, 4.5-7.0 Fe, 3.75-5.25 W, 0.2-0.4 V, 2.5 max Co, bal Ni.
Corrosion resistant alloy casting, for use with wet chlorine gas, hypochloric acid and other acids as valves and fittings.
ASTM A494-62; Hastelloy C.

LEBANON HE.
M-74; 20.0 Cr, 9.0 Ni, bal Fe.
Heat resistant steel casting. Maximum operating temperature 2000°F
ACI HE; SAE 70312; ASTM A297-63 Gr HE.

LEBANON HH.
M-74; 25.0 Cr, 12.5 Ni, bal Fe.
Heat resistant steel casting. Maximum operating temperature 2000°F.
ACI HH; SAE 70309; ASTM A297-63 Gr HH.

LEBANON HK.
M-74; 26.0 Cr, 20.0 Ni, bal Fe.
Heat resistant steel casting. Maximum operating temperature 2100°F.
ACI HK; SAE 70310; ASTM A297-63 Gr HK.

LEBANON HR.
M-74; 23.0 Cr, 11.5 Ni, bal Fe.
Heat resistant steel casting.

LEBANON HR-A.
M-74; 21.0 Cr, 14.0 Ni, bal Fe.
Heat resistant steel casting.

LEBANON HT.
M-74, 15.0 Cr, 35.0 Ni, bal Fe.
Heat resistant steel casting. Maximum operating temperature 2000°F.
ACI HT; SAE 70330, ASTM A297-63 Gr HT.

LEBANON HY-80.
M-74, 0.20 max C, 0.5 max Si, 0.55-0.75 Mn, 1.35-1.65 Cr, 2.50-3.25 Ni, 0.3-0.6 Mo, bal Fe.
Low carbon alloy steel casting. Oil hardenable to 100,000-160,000 TS.
For valves, fittings, good strength with high impact energy MIL-S-23008 B HY-80.

LEBANON HY-100.
M-74, 0.22 max C, 0.5 max Si, 0.55-0.75 Mn, 1.35-1.85 Cr, 2.75-3.50 Ni, 0.3-0.6 Mo, bal Fe.
Low carbon alloy steel casting; 100,000-120,000 yield. Oil hardenable.
For valves, fittings; good strength with good impact values; low notch sensitivity.
MIL-S-23008 B HY-100.

LEBANON INC.
M-74; 0.10 max C, 14-17 Cr, 6-10 Fe, 1.0-2.0 Cb/Ta, bal Ni
Corrosion resistant alloy casting, resistant to alkalies, oxidizing and organic acids
For food processing and textile processing equipment, high temperature service. ACI CY-40; (Inconel).

LEBANON LC2.
M-74; 0.25 max C, 0.6 max Si, 0.5-0.8 Mn, 2.0-3.0 Ni, bal Fe
Low carbon, nickel alloy steel casting.
Nor., Q & T.: 65,000 TS; 40,000 YS; 24 El.
For valves for cyrogenic service to −100°F.
ASTM A352-64 Gr LC2.

LEBANON LC3
M-74, 0.15 max C, 0.6 max Si, 0.5-0.8 Mn, 3.0-4.0 Ni, bal Fe.
Low carbon, nickel alloy steel casting.
Nor., Q & T.: 65,000 TS; 40,000 YS; 24 El.
Valves for cyrogenic service to −150°F.
ASTM A352-64 Gr LC3.

LEBANON LCB.
M-74; 0.30 max C, 0.6 max Si, 1.0 max Mn, bal Fe
Low carbon steel casting.
Nor. & T.: 65,000 TS; 35,000 YS; 24 El.
General purpose cast housings.
ASTM A352-64 Gr LCB; AISI 1025.

LEBANON ME.
M-74; 0.30 max C, 60 min Ni, 26-33 Cu, 1.5-3.5 Fe, 1.0-3.0 Cb/Ta.
Corrosion resistant alloy casting, resistant to mineral and organic acids, sea water, caustic solutions.
For valves and fittings for marine service.
Fed: QQ-N-288-Comp E; (Monel).

LEBANON NI.
M-74; 1.0 max C, 1.25 max Cu, 1.25 max Fe, bal Ni.
Nickel casting As cast: 45,000 TS; 20,000 YS, 15 El.
Resistant to many industrial chemicals.
For equipment for food processing, pharmaceuticals.
ACI CZ-100.

LEBANON WC1.
M-74; 0.25 max C, 0.6 max Si, 0.5-0.8 Mn, 0.45-0.65 Mo, bal Fe.
Low carbon, low alloy steel casting.
For valves, fittings, turbines and other pressure castings to 1100°F.
ASTM A217-64 Gr WC1; A352-64 Gr LC1.

LEBANON WC6.
M-74; 0.20 max C, 0.6 max Si, 0.5-0.8 Mn, 1.0-1.5 Cr, 0.45-0.65 Mo, bal Fe.
Low carbon, low alloy steel casting
Nor & T: 70,000 TS; 40,000 YS; 20 El.
For valves, fittings, turbines and other pressure castings for service to 1200°F.
ASTM A217-64 Gr WC6

LEBANON WC6A
M-74, 0.25 max C, 0.6 max Si, 0.7 max Mn, 0.4-0.7 Cr, 0.4-0.6 Mo, bal Fe.
Low carbon, low alloy steel casting
Nor. & T.: 70,000 TS; 40,000 YS; 22 El
For valves, fittings, turbines and other pressure castings for service below 1200°F.
ASTM A356-60T Gr 5.

LEBANON WC6B
M-74; 0.30 max C, 0.75 max Si, 1.0 max Mn, 1.5-2.25 Cr, 0.45-0.65 Mo, bal Fe.
Medium carbon low alloy steel casting.
Nor., Q & T: 105,000 TS; 85,000 YS; 15 El.
For valves, fittings, turbines and other pressure castings for service below 1200°F.

LEBANON WC9
M-74; 0.18 max C, 0.6 max Si, 0.4-0.7 Mn, 2.0-2.75 Cr, 0.9-1.2 Mo, bal Fe
Low carbon alloy steel casting. Nor. & T.: 70,000 TS, 40,000 YS; 20 El
For valves, fittings, turbines, and other pressure castings for service below 1200°F.
ASTM A217-64 Gr WC9.

LEBANON WCA.
M-74, 0.25 max C, 0.6 max Si, 0.7 max Mn, bal Fe.
Low carbon steel casting. Nor & T.: 60,000 TS; 30,000 YS, 24 El.
ASTM A216-63T Gr WCA; AISI 1020.

LEBANON WCB/1
M-74; 0.30 max C, 0.8 max Si, 0.7 max Mn, bal Fe.
Low carbon steel casting
Nor. & T.: 65,000 TS; 35,000 YS; 24 El.
ASTM A27-62 Gr 65-35.

LEBANON WCB/2.
M-74; 0.30 max C, 0.6 max Si, 1.0 max Mn, bal Fe.
Low carbon steel casting.
Nor. & T.: 70,000 TS; 36,000 YS; 22 El.
ASTM A216-63T Gr WCB; AISI 1025.

LECHESNE.
90-60 Cu, 10-40 Ni, 0.2-0.05 Al.
For chemical engineering equipment; corrosion resistant.

LECO.
M-688; 0.33 C, 0.75 Cr, 0.30 Ni, 0.75 Mo, 0.75 Cu, 0.15 Ti, bal Fe.
For chisels, dies, punches, pneumatic tools; oil hardened, shock resistant.

LECO EXTRA.
M-688; 0.44 C, 0.75 Cr, 0.35 Ni, 0.4 Mn, 0.75 Mo, 0.65 Si, 0.75 Cu, 0.15 Ti, bal Fe.
For dies, rivet sets, chisels, punches, cutters; fatigue and abrasion resistant.

LECO NON-TEMPERING.
M-57; C, alloy, bal Fe.
For dies, tools; water hardened, non-tempering.

LECTRI-LED 4140.
M-176, 0.41 C, 0.9 Mn, 0.28 Si, 0.93 Cr, 0.19 Mo, 0.15 Pb, bal Fe.
Heat treated: 176,000 TS; 158,000 YP, 16 El; 45 RA, C 38 Rock
For rubber molds, plastic molds, steam platens, gears, machine tool parts, high pressure valve bodies
Free machining, tough.

LEDA.
M-56; 0.7 C, Cr, W, V, bal Fe
For lathe and planer tools, reamers, taps, hobs; high speed steel.

LEDALOYL.
M-172, 10 Sn, 5 Pb, 1 graphite, bal Cu
For self-lubricating bearings; sintered type, oil impregnated.

LEDDEL ALLOY.
90 Zn, 5 Cu, 5 Al
For die castings

LEDDEL BEARING.
87.5 Zn, 6.26 Cu, 6.25 Al.
For bearings; anti-friction

LEDEBUR'S BEARING-1
85 Zn, 10 Sb, 5 Cu.
For bearings; anti-friction.

LEDEBUR'S BEARING-2.
77 Zn, 5.5 Cu, 18 Sn
For bearings; anti-friction.

LEDLOY.
M-240; 0.2 C, 0.2 Pb, 1.0 Mn, 0.25 S, bal Fe.
For screw machine products, fasteners, shafts, gears, cams, camshafts.
Free-machining

LEDLOY 170
M-240, C, 0.15-0.35 Pb, bal Fe.
For machine tool parts, gears; free-cutting.

LEDLOY-300.
M-67, 0.15 max C, 0.85-1.15 Mn, 0.04-0.09 P, 0.26-0.35 S, 0.15-0.35 Pb, bal Fe.
Cold Rolled: 79,000 TS; 71,000 YP, 16 El; 52 RA; 163 Brinell
For shafts, fasteners, hydraulic manifold blocks, screw machine products.
Free-machining AISI C12L14.

LEDLOY 375.
M-240; C, Pb, bal Fe.
For machine tool parts, gears; free-cutting.

LEDLOY 4140.
M-67; 0.39 C, 0.80 Mn, 0.03 S, 0.24 Si, 0.84 Cr, 0.09 Ni, 0.18 Mo, 0.15-0.35 Pb, bal Fe.
Heat treated: 158,000 TS; 144,000 YS; 16 El; 56 RA; 321 Brin.
For fasteners, gears, camshafts, housings, machine tools, crankshafts.
Free-cutting. Oil hardening.

LEDLOY 5120.
M-682; 0.17-0.23 C, 0.60-1.00 Mn, 0.60-1.00 Cr, 0.15-0.25 Pb, bal Fe.
For fuel valve burner tubes; free-cutting.

LEDLOY 8620.
M-67; 0.18-0.23 C, 0.70-0.90 Mn, 0.15-0.25 Pb, 0.25-0.35 Si, 0.40-0.70 Ni, 0.40-0.60 Cr, 0.15-0.25 Mo, bal Fe.
Cold Drawn: 110,000 TS; 101,000 YS; 15 El; 55 RA; 223 Brin.
Heat treated: 192,000 TS; 150,000 YS; 12 El; 49 RA; 388 Brin.
For gears, cams, camshafts, fasteners, chuck jaws, pneumatic chucks.
Free-cutting. Case hardening.

LEDLOY-A.
M-682; 0.08 C, 1.08 Mn, 0.075 P, 0.21 Pb, 0.34 S, bal Fe.
Cold Drawn: 65,000 TS; 58,000 YS; 20 El; 155 Brin.
For valve spools, gears, pinions, cams, camshafts, fasteners.
Free-cutting. Case hardening.

LEDLOY-AX.
M-516, M-67; 0.08 C, 1.07 Mn, 0.075 P, 0.32 S, 0.02 Si, 0.003 Ni, 0.21 Pb, 0.048 Te, bal Fe.
Bar: 75,600 TS; 71,900 YS, 13 El; 37 RA; B 91 Rock.
For screw machine products, fasteners, screws, bolts, spark wheels. Free machining

LEDLOY C-1045.
M-67; 0.40-0.50 C, 0.15-0.35 Pb, bal Fe
Rolled: 98,000 TS; 65,000 YS, 28 El; 52 RA
For machinery parts; water hardening; free-cutting

LEDLOY C-1120.
M-67; 0.15-0.25 C, 0.15-0.35 Pb, 0.30 S, bal Fe
Rolled: 63,000 TS; 44,000 YS; 36 El, 63 RA, 130 Brin.
For bolts, shafts, fasteners, screw machine products. Free-cutting

LEDO.
M-38; 0.4 C, 0.2 Mo, bal Fe.
Heat treated: 118,000-134,000 TS; 83,000-94,000 YS; 20-15 El; 53-43 RA; 248-320 Brin.
For crankshafts, gears, bolts, spindles, shafts; oil or water hardened.

LED-O-LOY.
M-1579; 87 Cu, 2 Sn, 2 Pb, bal Zn.
Half Hard: 58,000 TS; 49,000 YS; 14 El; Rock B 70.
Hard: 76,000 TS; 70,000 YS; 10 El; Rock B 80.
Extra Hard: 86,000 TS; 75,000 YS; 3 El, Rock B 86.
For meter and gauge components, bearings, thrust washers, valve parts.
Free-cutting, corrosion resistant.

LEDRITE 2.
M-141; 61 Cu, 1.8 Pb, bal Zn.
Hard: 55,000 TS; 42,000 YS; 30 El.
For screw machine parts, hardware; free-cutting.

LEDRITE 6.
M-141; 61 Cu, 3.4 Pb, bal Zn.
Hard: 58,000 TS; 45,000 YS; 25 El.
For screw machine parts, hardware; free-cutting.

LEDRITE BRASS.
M-141; 61 Cu, 3.25 Pb, bal Zn.
Soft: 45,000 TS; 35 El.
Hard: 80,000 TS; 10 El.
For screw machine parts; free cutting.

LEDURIT Z IV.
M-459; 2.5 C, 0.8 Mn, 4.3 Cr, bal Fe.
For hard facing electrode; wear resistant.

LEGAL.
M-199; 0.5-2.0 Mg, 0.3-1.5 Si, 0-1.5 Mn, bal Al.
For light alloy parts; corrosion resistant, hardenable

LEGA-Y.
M-1176; 3.8-4.2 Cu, 1.3-1.7 Mg, 1.8-2.3 Ni, bal Al.
Heat treated. 36,000-47,000 TS, 32,000-43,000 YS, 0.5-0.3 El, 95-115 Brin.
For light alloy parts, age-hardened.

LEGIERUNG 503
M-324, 2-4 Mg, 0.4 max Cr, 0.4 max Mn, bal Al.
Soft: 30,000 TS, 15,000 YS; 28 El, 50 Brin
For marine and aircraft parts, resists sea water corrosion

LEGIERUNG 505
M-324, 4.0-5.5 Mg, 0.8 max Mn, 0.3 max Cr, bal Al.
Soft: 42,000 TS; 22,000 YS, 35 El, 65 Brin
Hard 60,000 TS; 50,000 YS, 15 El, 100 Brin.
For marine hardware, aircraft parts, corrosion resistant.

LEGIERUNG 507
M-324; 5.5-7.5 Mg, 0.8 max Mn, 0.3 max Cr, bal Al
For light alloy parts, corrosion resistant

LEGIERUNG 600
M-324, 1.5-3.0 Mg, 0.5-1.5 Mn, 0.3 max Cr, bal Al.
Soft. 28,000 TS, 13,000 YS, 30 El, 47 Brin.
Hard. 42,000 TS, 37,000 YS, 8 El; 77 Brin
For marine products, aircraft structures, resists sea water corrosion

LEGIERUNG 800
M-324, 1.0-1.5 Mn, 0.3 max Cr, bal Al
Soft 16,000 TS, 6000 YS, 40 El, 28 Brin
Hard 29,000 TS, 27,000 YS; 10 El, 55 Brin.
For aircraft and engineering structures, good formability and weldability

LEHIGH DD1
M-688; C, alloy, bal Fe
For machine parts, gears, shafts, mandrels, oil hardened.

LEHIGH H.
M-24, 1.6 C, 11.5 Cr, 0.8 Mo, 0.4 V, bal Fe
For gages, punches, master hobs; Type D2; oil hardened.

LEHIGH I
M-24, 0.85 C, 11.5 Cr, 1.05 Ni, 0.3 V, 0.45 Mo, bal Fe
For dies, shear blades, punches; abrasion resistant, non-deforming

LEHIGH N C.
M 688; 0.70 C, 1 Cr, 1.6 Ni, 0.35 Cu, 0.4 Mn, 0.2 Si, bal Fe.
For shear blades, rivet sets, punches, dies; oil hardened, shock resistant

LEHIGH S
M-24; 2 C, 11.7 Cr, 0.6 V, bal Fe.
For dies and shear blades, gauges; abrasion resistant, non-deforming.

LEHIGH SPECIAL NO. 3.
M-688; 0.7-1.2 C, bal Fe.
For tools and dies; general use.

LEHIGH SPECIAL NO. 5.
M-688; 0.7-1.4 C, bal Fe.
For tools and dies; abrasion resistant.

LEHIGH SS.
M-688; 0.75 C, 4.5 Cr, 12 Co, 2 V, 20 W, bal Fe.
For lathe and planer tools, reamers, taps, broaches, hobs; high speed steel, oil hardened.

LEHIGH XXX.
M-688; 0.7 C, 4 Cr, 1 V, 18 W, bal Fe.
For lathe and planer tools, drills, taps, reamers; high speed steel; Type T2

LEICHTMETALL MN 20.
M-457, 1-2 Mn, bal Al
Soft: 13,000 TS, 6000 YS; 35 El; 35 Brin.
Hard. 43,000 TS, 36,000 YS, 4 El, 70 Brin
For light alloy parts, corrosion resistant

LEICHMETALLWERKE M115.
M-116, 1.0-1.5 Mn, 0.3 Cr, bal Al.
Soft 16,000 TS, 6000 YS; 40 El
Hard: 29,000 TS, 27,000 YS, 10 El.
For cooking utensils, tanks, furniture; good forming and welding properties.

LEICHTMETALLWERKE MZB.
M-116, 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, 0.5-2.5 Pb, Sn, Cd, Bi, bal Al.
For screw machine products; free-cutting.

LEKTROCAST
M-157; 3.0-3.4 C, 2 Si, 1.5-2.5 Ni, bal Fe
Cast 50,000 TS, 225-280 Brin
For castings, draw dies for metal stamping; wear resistant

LEMARQUAND'S ALLOY
39 Cu 7 Ni, 37 Zn, 9 Sn, 8 Co
For cheap jewelry, corrosion resistant

LE MAT'S METAL
80 Cu, 5 Zn, 16 Ni, 5 Fe, 2 Sn, 1 Co
For cheap jewelry, v "Lutecin"

LE MOYNE ALCOCAN
M-1196, 0.7 C, Ni, Cr, bal Fe
For hand tools, chisels, oil or air hardened

LE MOYNE BEST
M-1196, 1.2 C, 0.3 Cr, 1.2 W, bal Fe.
For broaches, reamers, dies, cutters, water hardened.

LE MOYNE EXTRA
M-1196, 0.7-1.0 C, bal Fe
For tools, drills, punches, water hardened

LE MOYNE FINISHING.
M-1196; 1.3 C, 4 W, 4 Mo, bal Fe
For finishing tools and cutters, water or oil hardened

LE MOYNE HAK
M-1196; 0.90-1.05 C, 3.7-4.1 Cr, bal Fe.
Annealed: 90,000 TS; 78,000 YS. 28 El; 57 RA, 195 Brin
Heat treated 205,000 TS; 168,000 YS; 2 El; 12 RA, 412 Brin.
For riveters, gripper dies, compression dies; wear and heat resistant

LE MOYNE HS.
M-1196; 0.56-0.75 C, 18 W, 4 Cr, 1 V, bal Fe.
Annealed: 105,000 TS; 75,000 YS, 14 El; 17 RA; 255 Brin.
For chasers, taps, reamers, drills, broaches; high speed steel, oil hardened.

LE MOYNE K760.
M-1196; 0.72 C, 17.5 W, 4 Cr, 4.5 Co, 1 V, 0.5 Mo, bal Fe.
For reamers, taps, hobs, drills, lathe tools; high speed steel, oil hardened.

LE MOYNE NON-SHRINK.
M-1196; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For punches, tools, crimpers, cutters; oil hardened, nondeforming.

LE MOYNE PYRO.
M-1196; 0.33 C, 10.2 W, 3.5 Cr, 0.45 V, bal Fe.
For punches, shears, hot dies; hot work steel, oil hardened.

LE MOYNE SPECIAL.
M-1196; 0.8-1.1 C, bal Fe.
For tools, drills, punches, cutters; water hardened.

LE MOYNE SUPREME.
M-1196; 0.7 C, W, Co, Mo, bal Fe.
For tools, dies, cutters; high speed steel.

LEMS 1.
M-459; 1.1 C, 1.2 Cr, 0.2 V, 1.3 W, bal Fe.
For cold wark punching tools; oil or water hardened

LENIN-T58.
M-651; 0.16-0.20 C, 11.5-12.5 Cr, 0.5 Mo, 0.5-1.0 Ni, 0.15-0.25 V, 2.0-2.5 W, bal Fe.
Annealed. 80,000 TS, 40,000 YS, 24 El; B 95 Rock.
Hardened 230,000 TS; 195,000 YS; 12 El; C 48 Rock.
For valves, bearings, cutlery, surgical instruments, gears, corrosion resistant, hardenable

LENNALSIL.
M-1375, 0.6-1.4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, 0.3 max Cr, bal Al.
Annealed 21,000 TS, 8000 YS, 24 El
For window frames, fan blades, gutters, boats; good forming and welding properties

LENNEDUR
M-1375; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al
Annealed 27,000 TS, 11,000 YS; 22 El; 47 Brin.
Heat treated 72,000 TS, 57,000 YS, 130 Brin.
For aircraft structures and fittings, fasteners; age hardenable

LENOX.
M-39, 0.9 C, 1.5 Mn, 0.3 Mo, 0.3 Si, bal Fe.
Annealed. 200 Brin
For tools, dies, punches, knives, ground flat stock

LEONARD.
M-261, 0.9-1.0 C, bal Fe.
For tools, drills, punches; water hardened.

LEPPESTAHL
M-1306, 2.1 C, 11.5 Cr, bal Fe
For blanking and forming dies, punches; oil hardened, non-deforming.

LEPPESTAHL EXTRA 6.
M-1306, 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For blanking and forming dies, punches; non-deforming, oil hardened.

LEPPESTAHL X
M-1306, 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming

LE PROVINOX.
French; C, alloy, bal Fe.
50,000-57,000 TS, 35,000-45,000 YS; 36 El.
For general engineering applications; semi-non-oxidizing steel.

LESCALLOY 300 M.
M-73; 0.42 S, 0.75 Mn, 1.65 Si, 1.8 Ni, 0.8 Cr, 0.4 Mo, 0.07 V, bal Fe.
Heat treated: 285,000-290,000 TS; 238,000-243,000 YS; 10-13 El; 32-47 RA.
For landing gears, air frames, missile cases, pressure vessels.
High strength structural steel, tough, shock resistant.

LESCALLOY 422 STAINLESS.
M-73; 0.22 C, 0.75 Mn, 0.3 Si, 12.0 Cr, 1.0 W, 1.0 Mo, 0.75 Ni, 0.25 V, bal Fe.
Oil quenched: C 50-55 Rock.
Tempered at 1150°F: 150,000 TS; 130,000 YS; 14-17 El.
Magnetic, good strength, corrosion resistant.
For steam turbine blades, and components, valves, gas turbine and jet engine parts.

LESCALLOY 600.
M-73; 0.07 C, 0.30 Mn, 0.20 Si, 15 Cr, 7 Fe, bal Ni.
Heat treated: 112,000 TS; 49,000 YS; 41 El, 180 Vickers.
For nuclear reactor parts, turbine components.
High creep and stress-rupture strength
Resists corrosion at elevated temperatures and stress corrosion cracking

LESCALLOY 718.
M-73; 0.03-0.10 C, 17-21 Cr, 50-55 Ni, 1.0 max Co, 5.0-5.5 Cb + Ta, 2.8-3.3 Ti, 0.8 max Al, 3 Mo, 0.006 max B, 0.10 max Cu, bal Fe
Aged: 215,000 TS; 180,000 YS; 18 El.
For aircraft structural parts, space ship components, missiles, gas turbine and jet engine parts.
Age hardenable. High tensile, creep and rupture strength.

LESCALLOY 901.
M-73; 0.05 C, 12.8 Cr, 5.7 Mo, 2.4 Ti, 35.0 Fe, 1 Co, 0.5 max Cu, 0.35 max Al, 0.01-0.02 B, bal Ni.
At 70°F: 180,000 TS, 125,000 YS, 15 El, 20 RA
At 1200°F: 148,000 TS; 106,000 YS; 17 El, 24 RA.
For aircraft and industrial gas turbines, rotors, and compressor discs, structural parts
High creep and rupture strength to 1400°F.
Precipitation hardening, high strength alloy

LESCALLOY 4330 + V.
M-73; 0.30 C, 0.85 Mn, 0.3 Si, 0.35 Cr, 1.8 Ni, 0.4 Mo, 0.07 V, bal Fe.
Vacuum arc structural steel.
Hardened: Up to 235,000 TS; 195,000 YS; 11 El; 47-50 Rock C.
For highly stressed structural parts.

LESCALLOY 4335 + V.
M-73; 0.35 C, 0.75 Mn, 0.5 Si, 0.8 Cr, 1.85 Ni, 0.35 Mo, 0.2 V, bal Fe.
Vacuum arc melted structural steel.
Hardened: Up to 275,000 TS; 240,000 YS; 10 El.
Deep hardening; for highly stressed structural parts.

LESCALLOY 4340 + V.
M-73; 0.40 C, 0.75 Mn, 0.3 Si, 0.8 Cr, 1.8 Ni, 0.2 V, 0.25 Mo, bal Fe.
Vacuum arc melted structural steel.
Hardened: Up to 276,000 TS; 222,000 YS; 11 El in 3½ inch round sections.
Very deep hardening; for highly stressed structural parts.

LESCALLOY 5616.
M-73; 0.18 C, 0.35 Mn, 0.35 Si, 13.0 Cr, 3.0 W, 2.0 Ni, bal Fe.
Heat treated: 145,000 TS; 114,000 YS; 17 El; 53 RA; 302 Brinell.
For jet engine and gas turbine compressor wheels, blades and auxiliary parts.
Heat resistant, creep strength.

LESCALLOY 8620.
M-73; 0.18-0.23 C, 0.40-0.70 Ni, 0.40-0.60 Cr, 0.15-0.25 Mo, bal Fe.
Low alloy steel for case hardening for gears, cam shafts. AISI 8620

LESCALLOY 9310 (AGT).
M-73, 0.10 C, 0.5 Mn, 0.25 Si, 3.25 Ni, 1.2 Cr, 0.12 Mo, bal Fe.
Vacuum arc melted, wrought.
Ht. Tr: 331-363 Brin.
To be carburized for aircraft engine gears and pinions, oil quench.
ASM 6265 A.

LESCALLOY 52100 VAC ARC.
M-73, 1.0 C, 0.35 Mn, 0.3 Si, 1.5 Cr, bal Fe.
Vacuum arc melted, wrought
Hardenable to 60-66 Rc, oil or water quench.
For aircraft engine bearings and instrument bearings for use below 400-450°F.
AMS 6444.

LESCALLOY A-286.
M-73, 0.05 C, 1.5 Mn, 0.75 Si, 15 Cr, 0.3 V, 26 Ni, 1.25 Mo, 2.2 Ti, 0.2 Al, bal Fe.
Heat treated: 160,000 TS, 110,000 YS; 24 El; 43 RA, 302 Brin
For jet engine and supercharger component parts, turbine wheels and blades, nozzles.
High strength and good corrosion at elevated temperatures. Age-hardenable.

LESCALLOY BG66
M-73, 0.85 C, 4.15 Cr, 6.3 W, 1.85 V, 5.0 Mo, bal Fe
This is Type M-2 high speed tool steel, specially melted and processed for very critical high temperature bearings

LESCALLOY D6AC
M 73, 0.46 C, 0.75 Mn, 0.25 Si, 1.10 Cr, 0.60 Ni, 1.0 Mo, 0.12 V, bal Fe.
Heat treated: 228,000-280,000 TS; 195,000-250,000 YS, 7 El, 23-25 RA, C 46-53 Rock.
For solid fuel rocket motor cases, gears, crankshafts
High strength structural steel, tough, shock resistant

LESCALLOY D-979
M-73, 0.04 C, 15 Cr, 45 Ni, 4 Mo, 4 W, 3 Ti, 1 Al, 0.01 B, bal Fe
Bar Heat Treated. 204,000 TS; 146,000 YS, 14 El; 23 RA
For jet engine components, turbine discs
Precipitation hardening. Good strength, oxidation and creep resistant

LESCALLOY EXPANDAL.
M-73, 0.60 C, 5.75 Mn, 0.2 Si, 10.0 Ni, bal Fe.
High thermal expansion alloy; co-efficient of thermal expansion 72° –600°F: 11.5-12.5 × 10^{6} in/in/°F
Austenitic, cold drawn: 140,000 TS.

LESCALLOY JETHETE M-152.
M-73; 0.12 C, 0.7 Mn, 0.12 Si, 11.25 Cr, 2.9 Ni, 1.6 Mo, 0.3 V, 0.035 N, bal Fe.
Nitrogen bearing, vacuum melted, hardenable stainless.

Oil Q & Temp. 900°F: C 45 Rock.
For gas turbine compressor wheels and structural members.

LESCALLOY LINCO.
M-73; 0.30 C, 1.1 Mn, 0.35 Si, 11.5 Cr, 2.75 Mo, 0.25 V, 0.35 Ni, bal Fe.
Oil quenched: C 50-56 Rock.
Tempered at 1150°F: 160,000 TS; 130,000 YS; 15 El.
Magnetic, good strength, corrosion resistant.
For jet engine and gas turbine compressor wheels and auxiliary parts.

LESCALLOY MARVAC 250.
M-73; 0.01 C, 18.25 Ni, 8.0 Co, 5.0 Mo, 0.40 Ti, 0.10 Al, bal Fe.
Vacuum induction melt plus vacuum consumable electrode, maraging steel.
Ann: 290 Brin, Sol. tr. & age: 250,000-265,000 TS; 240,000-255,000 YS; 9-13 El.
For high strength missile and aircraft components; high fatigue properties; weldable.

LESCALLOY MARVAC 300
M-73, 0.01 C, 18.25 Ni, 9.0 Co, 5.0 Mo, 0.65 Ti, 0.10 Al, bal Fe
Double vacuum melted maraging steel.
Ann: 300 Brin, Sol. tr & age: 290,000-300,000 TS, 280,000-290,000 YS; 6-9 El.
For high strength missile and aircraft components; high fatigue properties, weldable.

LESCALLOY MP35N.
M-73, 35 Ni, 35 Co, 20 Cr, 10 Mo
Annealed. 132,000 TS.
Work strengthened and aged: 200,000-300,000 TS; 160,000-290,000 YS, 9-18 El, 17-95 Ft.lbs Charpy.
Good high temp strength and corrosion resistance

LESCALLOY NITRALLOY 135 M.
M-73; 0.40 C, 0.6 Mn, 0.3 Si, 1.6 Cr, 1.2 Al, 0.2 Mo, bal Fe
Vacuum arc melted nitriding steel
Oil Q & Temp. 1200°F: 135,000 TS; 100,000 YS, 16 El; 280-340 Brin.
High case hardness develops when nitrided.
For aircraft gears and shafts

LESCALLOY NITRALLOY N.
M-73, 0.24 C, 0.3 Si, 0.6 Mn, 1.15 Cr, 1.25 Al, 3.5 Ni, 0.25 Mo, bal Fe.
Vacuum arc melted, age hardenable, nitriding steel.
Oil Q & Temp 1200°F C 29 Rc
Nitride (and age) 975°F. Case: C 60 Rock min.
Core. C 38-43 Rock.
For aircraft gears and shafts.

LESCALLOY RENE 95
M-73; 0.15 C, 14.0 Cr, 3.5 W, 3.5 Mo, 8.0 Co, 3.5 Cb, 3.5 Al, 2.5 Ti, 0.05 Zr, 0.010 B, bal Ni.
Properties after sol. tr. and age
Room temp. 230,000 TS; 190,000 YS; 10 El.
1200°F: 210,000 TS; 175,000 YS, 10 El.
Good high temperature creep properties.
For jet engine, gas turbine components.

LESCALLOY SUPER NITRALLOY.
M-73; 0.23 C, 0.25 Si, 0.35 Mn, 0.50 Cr, 2.0 Al, 5.0 Ni, 0.25 Mo, 0.1 V, bal Fe.
Vacuum arc melted, age hardenable, nitriding steel.
Oil Q & Temp. 1275°F: C 30-35 Rock.
Nitride (and age) 1050°F. Case: above C 60 Rock.
Core: 200,000-212,000 TS; 180,000-190,000 YS.
For aircraft gears and shafts.

LESCALLOY-UT18.
M-73; 0.40 C, 0.60 Mn, 0.25 Si, 0.95 Mo, 0.2 Ni, 0.20 V, 3.25 Cr, bal Fe.
Ht. Tr.: 209,000 TS, 173,000 YS; 16 El; 60 RA; 388-429 Brin.
For turbine and compressor rotor shafts.
High strength and good impact resistance up to 1000°F. Heat resistant.

LESCALLOY-UT19.
M-73; 0.16 C, 0.45 Mn, 0.23 Si, 1.25 Cr, 4.25 Ni, 0.25 Mo, bal Fe.
Ht Tr.: 212,000 TS, 145,000 YS; 18 El; 67 RA; 388-444 Brin. (core).
For gears, pinions, shafts, cams, aircraft components.
Carburizing steel, tough and shock resistance.

LESCALLOY V-57.
M-73; 0.08 max C, 0.75 max Si, 0.35 max Mn, 13.5-16.0 Cr, 25.5-28.5 Ni, 1.0-1.5 Mo, 2.7-3.2 Ti, 0.5 max V, 0.1-0.35 Al, 0.005-0.025 B, bal Fe.
At R.T.: 178,000 TS; 128,000 YS, 21 El; 35 RA.
At 1200°F: 140,000 TS; 110,000 YS; 20 El; 30 RA.
For jet engine and missile components, gas turbines, fuel nozzles.
High temperature alloy steel, precipitation hardening, austenitic

LESCALLOY WASPALLOY.
M-73; 0.06 C, 19.5 Cr, 4.0 Mo, 13.5 Co, 1.3 Al, 3.0 Ti, 2.0 max Fe, bal Ni.
Vacuum arc melted high temp. alloy.
Sol tr and age Room temp. prop: 190,000-200,000 TS; 140,000-145,000 YS; 18-20 El
Test at 1000°F 180,000-185,000 TS; 125,000-130,000 YS, 17 El.
Weldable, for structural parts to be used up to 1000°F.

LESCALLOY X-750.
M-73, 0.04 C, 15.5 Cr, 73 Ni, 0.9 Cb + Ta, 2.5 Ti, 0.8 Al, 7.0 Fe
Age Hardened: 170,000 TS; 115,000 YS; 18 El; 25 RA
For turbine wheels, springs, bolts, vanes.
Precipitation hardening, creep resistant to 1500°F.

LESCO BG41.
M-73; 1.05 C, 14.5 Cr, 4.0 Mo, 0.12 V, 0.3 S, bal Fe
For highly stressed bearings for high temperature operation, stainless, retains hot hardness

LESCO BG42.
M-73; 1.15 C, 14.5 Cr, 4.0 Mo, 1.0 V, bal Fe.
For bearings operating in corrosive environment and at high tempearture; stainless, retains hot hardness.

LESCO E.H.W.
M-73; 0.25 C, 15 W, 4 Cr, 0.5 V, bal Fe.
For header, gripper and extrusion dies; hot work steel, oil hardened.

LESCO E.S.A.
M-73; C, W, Cr, bal Fe.
For cutting tools, taps, threading dies, reamers; fast machining, will not resist shock.

LESCO EXTRA.
M-73, C, 0.20-0.35 Mn, bal Fe.
For taps, reamers, twist drills, shear blades; springs, tools; water hardening steel.

LESCO NINETEEN.
M-73; 0.40 C, 0.3 Si, 0.3 Mn, 4.25 Cr, 4.25 W, 2.0 V, 4.25 Co, bal Fe
Hot work die steel; retains 50 Rock C, hardness to 1100°F.
For forging dies, brass extrusion tooling, hot punches, brass die casting dies.
AISI Type H19 Hot work steel.

LESCO SPECIAL.
M-73; C, 0.20-0.35 Mn, bal Fe.
For lathe and planer tools, threading dies, taps, reamers, punches; water hardening.

LESCO STANDARD.
M-73; C, 0.20-0.35 Mn, bal Fe.
For blacksmith tools, cold chisels; cheap grade water hardening tool steel.

LESJOFORS GLA.
M-1459; 0.45 C, 1 Si, 1 Mn, bal Fe
For springs; oil hardened.

LESJOFORS LB8Mn.
M-1459; 0.40 C, 1.5 Mn, bal Fe.
For springs; water hardened, tough.

LESJOFORS LB11.
M-1459; 0.55 C, 0.5 Mn, bal Fe.
For wire ropes; water or oil hardened.

LESJOFORS LB12.
M-1459; 0.60 C, 0.5 Mn, bal Fe.
For wire ropes; water or oil hardened.

LESJOFORS LB13 "LEWI."
M-1459; 0.65 C, 0.6 Mn, bal Fe.
Heat treated: 160,000 TS; 114,000 YS; 12 El, 40 RA; 325 Brin.
For springs; water or oil hardened.

LESJOFORS LB13Mn.
M-1459; 0.65 C, 1.5 Mn, bal Fe.
For springs; oil hardened, tough.

LESJOFORS LB14.
M-1459, 0.70 C, 0.6 Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA, 355 Brin.
For springs, oil hardened.

LESJOFORS LB15.
M-1459; 0.75 C, 0.5 Mn, bal Fe.
Heat treated: 180,000 TS; 130,000 YS; 10 El; 35 RA; 375 Brin
For springs; oil hardened.

LESJOFORS LB16.
M-1459; 0.80 C, 0.4 Mn, bal Fe.
Heat treated: 188,000 TS; 145,000 YS; 12 El; 35 RA; 390 Brin.
For tools, drills, taps, hobs, reamers; Type W1; water hardened.

LESJOFORS LB50.
M-1459; 0.50 C, 0.8 Mn, 0.1 V, Cr, bal Fe
For springs; oil hardened, tough.

LESJOFORS LB85.
M-1459; 0.40 C, 0.8 Mn, 0.8 Cr, 1.25 Ni, bal Fe.
For gears, shafts, machine tool parts, oil hardened.

LESJOFORS LB145.
M-1459; 0.65 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For springs, punches; oil hardened, tough.

LESJOFORS LERO.
M-1459; 0.1 C, 18 Cr, 8 Ni, bal Fe.
For springs; Type 302; stainless.

LESJOFORS LSMn.
M-1459; 0.55 C, 1.75 Si, 1.5 Ni, 0.85 Mn, bal Fe.
For springs; oil hardened, tough.

LESJOFORS LSMO.
M-1459; 0.55 C, 1.75 Si, 0.8 Mn, 0.2 Cr, bal Fe.
For springs; oil hardened, tough.

LESTEM.
M-688; C, alloy, bal Fe.
For dies, tools; water hardened, non-tempering.

L.F.M. 4-6 Cr-Mo.
M-573; 0.13-0.20 C, 4-7 Cr, Mo, bal Fe.
For corrosion resistant parts; corrosion resistant.

LFM GR.A.
M-573; 0.15-0.22 C, 0.65-0.85 Mn, 0.35-0.50 Si, bal Fe.
Annealed: 73,000 TS; 41,000 YS; 22 El; 58 RA; 140 Brin.
For nails, rivets, gears, fasteners, fan blades; Type 1020; case hardened.

LFM GR.B.
M-573; 0.20-0.26 C, 0.65-0.85 Mn, 0.35-0.50 Si, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 20 El; 55 RA; 160 Brin.
For rivets, gears, fan blades, fasteners; Type 1022; water hardened.

LFM GR.C.
M-573; 0.25-0.35 C, 0.65-0.80 Mn, 0.35-0.50 Si, bal Fe
Hot rolled: 80,000 TS; 50,000 YS; 30 El; 56 RA; 165 Brin.
For gears, bolts, crankshafts, brackets; Type 1030; water hardened.

LFM GR D
M-573, 0.30-0.40 C, 0.65-0.80 Mn, 0.35-0.50 Si, bal Fe.
Hot rolled: 85,000 TS, 72,000 YS; 26 El, 51 RA; 180 Brin.
For armature shafts, gears, axles, bolts; screws; Type 1035, water hardened

LFM GR E.
M-573; 0.40-0.50 C, 0.65-0.80 Mn, 0.35-0.50 Si, bal Fe.
Hot rolled. 98,000 TS, 59,000 YS; 24 El, 45 RA, 212 Brin.
For axles, gears, bolts, tie rods, rails; Type 1045; water hardened.

LFM GR G
M-573, 0.26-0.32 C, 1.1-1.3 Mn, 0.35-0.50 Si, 0.2-0.3 Mo, bal Fe
For gears, bolts, crankshafts; oil hardened, tough.

LFM GR H.
M-573, 0.4-0.5 C, 0.9-1.2 Mn, 0.3-0.4 Mo, bal Fe
For gears, bolts, crankshafts; oil hardened, tough.

LFM GR.I
M-573, 0.2-0.3 C, 0.65-0.80 Mn, 2.0-2.25 Ni, bal Fe.
For gears, bolts, shafts, machine tool parts; oil hardened, tough.

LFM GR.J
M-573, 0.22-0.33 C, 0.15-0.20 Mo, 0.65-0.80 Mn, bal Fe.
For gears, bolts, machine tool parts; Type 4027; water hardened.

LFM GR K.
M-573, 0.13-0.20 C, 0.4-0.7 Mn, 4.0-6.5 Cr, 0.45-0.65 Mo, bal Fe
For oil refinery equipment; Type 502; creep resistant

LFM GR.L.
M-573; 0.28-0.33 C, 1.0-1.5 Cr, 0.15-0.25 Mo, bal Fe.
For gears, bolts, machine tool parts; Type 4130; oil hardened.

LFM GR.M.
M-573; 0.35-0.45 C, 1.0-1.5 Cr, 0.15-0.25 Mo, bal Fe.
For gears, bolts, crankshafts, machinery parts; Type 4140; oil hardened.

LFM GR.N.
M-573; 0.13-0.20 C, 1.0-1.5 Cr, 0.45-0.65 Mo, bal Fe.
For gears, bolts, camshafts, cams; Type 4115; case hardened.

LFM GR.O.
M-573; 0.15-0.20 C, 1.25-1.75 Cr, 2.25-2.75 Ni, 0.2-0.4 Mo, bal Fe.
For gears, bolts, camshafts, cams; case hardened, tough.

LFM GR P.
M-573; 0.25-0.35 C, 1.2-1.7 Cr, 2.2-2.7 Ni, 0.2-0.4 Mo, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

LFM GR.R.
M-573; 0.55-0.65 C, 2.0-2.5 Cr, 0.35-0.40 Mo, bal Fe
For dies, crimpers, upsetters; oil hardened, tough.

LFM GR.S.
M-573; 0.28-0.35 C, 2.75-3.25 Cr, 0.20-0.30 Mo, bal Fe.
For oil refinery equipment, creep resistant.

LFM GR.T.
M-573; 0.16-0.25 C, 0.45-0.65 Mo, 0.65-0.80 Mn, bal Fe
For housings, machine tool parts; Type WC1; water hardened

LIBERTY.
M-260, M-38, 1.2 C, 0.3 Cr, 1.2 W, bal Fe.
For broaches, reamers, dies, water hardening; tough.

LIBERTY PISTONS
77 Al, 21 Zn, 1.1 Cu, 0.5 Fe
For pistons, non-heat treatable

LICHTENBERG FUSIBLE ALLOY.
Germany; 50 Bi, 20 Sn, 30 Pb.
For boiler saftey plugs, fire extinguishers, M.P 75°C.

LICO
M-802, 0.3 C, bal Fe
For castings, water hardening

LIDDEL'S ALLOY
90-88 Zn, 6.5-5.0 Cu, 6.5 Al
For die castings.

LIDEOX
M-1521, Hg, Be, S, Li, bal Cu
For condensers, anti-biofouling.

LIEBKNECHT WHITE GOLD.
80 Au, 13.9 Ni, 5 Zn, 1 Cu, 0.1 Pd.
For jewelry; corrosion resistant

LIGHT DUTY BEARINGS-1.
90-80 Pb, 10-17 Sb, 10-0 Sn, 0-1 Cu
For bearings; light duty.

LIGHT DUTY BEARINGS-2.
83.3 Pb, 9.8 Sb, 6.9 Sn.
For light duty bearings; anti-friction.

LIGMALLOY.
M-1159
For molded bearings

LILY BRAND NO. 1
M-405; 10 Sn, 2 Zn, 0.5 max Pb, 1.0 max Ni, bal Cu.
Cast: 44,800 TS; 20,200 YS; 40 El; 75 Brin.
For bearings, hardware, machine tool parts; Gun Metal BS1400G1C.

LILY BRAND NO. 2.
M-405; 10 min Sn, 0.05 min Zn, 0.5 min P, bal Cu.
Cast: 40,400 TS; 22,400 YS; 14 El; 95 Brin.
For bearings, hardware; Bronze BS1400PB1C.

LILY BRAND NO. 3.
M-405; 8 Sn, 4 Zn, 0.5 max Pb, 1.0 max Ni, bal Cu.
Cast: 44,800 TS; 20,200 YS, 38 El; 70 Brin.
For bearings, hardware, machine tool parts; Gun Metal BS1400G2C.

LILY BRAND NO. 4.
M-405; 5 Sn, 5 Zn, 5 Pb, 1 max Ni, bal Cu.
Cast. 36,000 TS; 15,700 YS; 25 El; 60 Brin.
For hardware, machine tool parts; Gun Metal BS1400LG2C.

LILY BRAND NO 5.
M-405; 7 Sn, 5 Zn, 2 Pb, 1.0 max Ni, bal Cu.
Cast: 40,400 TS, 18,000 YS; 35 El, 60 Brin.
For hardware, plumbing; Gun Metal BS1400LG3C.

LILY BRAND NO. 7.
M-405; 10 min Sn, 0.05 min Zn, 0.5 min P, bal Cu.
Cast 49,300 TS; 26,900 YS, 3 El, 110 Brin.
For bearings, hardware; Bronze BS1400PB1C

LILY BRAND NO 8
M-405, 12 Sn, 0.3 max Zn, 0.5 max Pb, 0.5 max Ni, 0.15 min P, bal Cu.
Cast. 40,400 TS; 20,200 YS, 10 El, 100 Brin.
For bearings, hardware; Bronze BS1400PB2C.

LILY BRAND NO 9.
M-405, 12 Sn, 0.3 max Zn, 0.5 max Pb, 0.15 min P, bal Cu
Cast 44,800 TS; 22,400 YS; 4 El, 120 Brin
For bearings, hardware, Bronze BS1400PB2C.

LILY BRAND NO 10
M-405; Sn, P, Ni, bal Cu.
Cast 42,600 TS, 25,700 YS; 8 El, 115 Brin
For bearings, hardware; P-Bronze.

LILY BRAND NO. 12.
M-405, 10 Sn, 10 Pb, 1.5 max Ni, 0.3 max P, bal Cu
Cast 35,900 TS; 13,500 YS, 8 El, 85 Brin.
For bearings, hardware; free-cutting, Leaded Bronze BS1400LB2C

LILY BRAND NO. 13.
M-405, 10 Sn, 10 Pb, 1.5 max Ni, 0.3 max P, bal Cu.
Cast. 40,400 TS, 4 El; 100 Brin.
For bearings, hardware; Leaded Bronze BS1400LB1C

LILY BRAND NO 15
M-405, 10 Al, 5 Ni, 4 Fe, 1.5 max Mn, bal Cu.
Cast 94,100 TS, 38,100 YS, 15 El, 170 Brin.
For bearings, propellers, hardware, machine tool parts; Al-Bronze BS1400AB2C.

LILY BRAND NO. 16
M-405; Al, bal Cu
Cast: 92,000 TS; 74,000 YS, 6 El; 300 Brin
For non-sparking tools; Al-Bronze, corrosion resistant.

LILY BRAND NO 17.
M-405; 1.5 max Sn, 0.5 max Pb, 2.5 max Al, 1.2 Fe, 3 max Mn, 55 min Cu, bal Zn
Cast: 76,200 TS; 36,000 YS; 24 El, 130 Brin.
For propellers, hardware, marine parts; Mn-Bronze BS1400HTB1C.

LILY BRAND NO 18.
M-405; 1 max Sn, 1-5 Pb, 66-73 Cu, bal Zn.
Cast: 33,600 TS; 35 El.
For hardware, Commercial Brass BS1400B2.

LILY BRAND NO. 19.
M-405; Zn, bal Cu.
Cast: 33,600 TS; 35 El.
For hardware; Commercial Brass BS1400B3.

LILY PHOSPHOR BRONZE.
M-576; 5 Sn, 0.05 P, bal Cu.
For bushings, bearings; chill cast.

LINCO see **LESCALLOY LINCO**

LINCOLNWELD L-50.
M-578; C, bal Fe.
Submerged arc welding electrode. AWS Class EM13K.

LINCOLNWELD L-60.
M-578; C, bal Fe.
Submerged arc welding electrode.
AWS Class EL 12.

LINCOLNWELD L-61.
M-578; C, bal Fe.
Submerged arc welding electrode.
AWS Class EM 12K.

LINCOLNWELD L-70
M-578; C, bal Fe
Submerged arc welding electrode.

LINDENBERG 55SWC.
M-1319; 0.55 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For cold work tools and dies; oil hardened

LINDENBERG A3V.
M-1319; 1.4 C, W, V, bal Fe.
For fast finishing cutters, tools; water hardened.

LINDENBERG A18V80.
M-1319; 0.74 C, 4 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, hobs, taps, high speed steel.

LINDENBERG A18V150Co
M-1319; 0.79 C, 4.7 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, reamers, hobs, taps; high speed steel.

LINDENBERG A300.
M-1319, 1.65 C, Cr, Co, bal Fe.
For blanking and forming dies, air hardened, non-deforming.

LINDENBERG A600
M-1319; 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe
For bearings, liners, sleeves; water hardened

LINDENBERG BFH
M-1319; 0.55 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For cold work tools, header dies, punches; oil hardened, tough.

LINDENBERG BLA702.
M-1319, 0.5 C, 1.05 Cr, 3.25 Ni, bal Fe
For gears, pinions, crankshafts, bolts, fasteners; oil hardened, shock resistant.

LINDENBERG C615.
M-1319; 1.0 C, 1.1 Cr, 0.07 Mn, bal Fe.
For bearings, liners, sleeves, cutters; water hardened, wear resistant.

LINDENBERG CCN.
M-1319; 2.1 C, 11.5 Cr, 0.3 Mn, bal Fe.
For forming and blanking dies, punches; oil hardened, nondeforming.

LINDENBERG CCNW.
M-1319; 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For forming and blanking dies, punches; oil hardened, nondeforming.

LINDENBERG EXTRA 2.
M-1319; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers tools, form cutters, reamers; Type W1; water hardened.

LINDENBERG EXTRA 3.
M-1319; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 55,000 YS; 20 El; 40 RA; 210 Brin
For drills, taps, reamers, milling cutters; Type W1; water hardened.

LINDENBERG EXTRA 4.
M 1319; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, reamers, springs, hobs; Type W1; water hardened.

LINDENBERG EXTRA 5
M-1319, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 190,000 TS; 145,000 YS, 10 El; 30 RA, 400 Brin.
For drills, springs, tools, cutters, taps, hobs; Type W1, water hardened

LINDENBERG EXTRA 6.
M-1319, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 175,000 TS, 130,000 YS, 12 El; 37 RA; 355 Brin
For springs, rails, hammers, tools, Type W1; water hardened

LINDENBERG HSO
M-1319, 1.0 C, 1.1 Cr, 0.07 Mn, bal Fe.
For bearings, bushings, liners, water hardened, wear resistant.

LINDENBERG HW3MH
M-1319, 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 110,000 TS, 58,000 YS, 18 El, 40 RA; 210 Brin
For springs taps, cutters, drills, reamers; Type W1; water hardened.

LINDENBERG HW4ZH
M-1319; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 185,000-130,000 TS, 120,000-80,000 YS, 10-20 El, 30-45 RA; 380-270 Brin
For springs, taps, drills, reamers, hobs; Type W1; water hardened

LINDENBERG HW5Z
M 1319, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 190,000-130,000 TS; 145,000-88,000 YS, 12-20 El; 35-50 RA, 390-255 Brin
For drills, taps, reamers, springs; Type W1, water hardened.

LINDENBERG IL15
M-1319, 0.80 C, 4.1 Cr, 0.85 Mo, 1.5 V, 8.7 W, bal Fe
For lathe and planer tools, reamers, broaches, taps, high speed steel.

LINDENBERG IL25
M-1319; 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel.

LINDENBERG IL35.
M-1319, 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

LINDENBERG IL45.
M-1319; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For engravers tools, blanking and forming dies; high speed steel.

LINDENBERG IL45Co.
M-1319; 1.35 C, Co, 4 Cr, V, Mo, W, bal Fe.
For forming and blanking dies, engravers tools; high speed steel.

LINDENBERG IL232.
M-1319; 0.95 C, W, Mo, Cr, V, bal Fe.
For reamers, hobs, broaches, taps; high speed steel.

LINDENBERG K.
M-1319; 0.55 C, 0.90 Si, 0.30 Mn, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For heading dies, punches, upsetters; oil hardened, tough.

LINDENBERG NWNH2.
M-1319; 1.65 C, Cr, Co, bal Fe.
For blanking and punching dies; oil hardened, tough.

LINDENBERG RS
M-1319; 1.65 C, 11.5 Cr, 0.10 V, bal Fe
For blanking and forming dies, punches; air hardened, non-deforming.

LINDENBERG T18V.
M-1319, 1.05 C, 1.15 W, 1.0 Cr, 0.90 Mn, bal Fe.
For cold work tools, heading dies; oil hardened, tough

LINDENBERG WLH
M-1319, 0.56 C, Ni, Cr, Mo, V, bal Fe
For upsetting and forging dies; oil hardened, tough

LINEAR METAL.
M-494, 3.3 C, 1 Si, 0.2 P, bal Fe
Cast 180-220 Brin
For castings, cylinder liners; cast iron

LINOTYPE
85 Pb, 11 Sb, 3.5 Sn
11,700 TS, 9 El, 21 Brin
For type metal, cheap alloy, M P 476°F

LION
M-69; 0.6-1.4 C, bal Fe
For tools general tools, broaches, chisels, dies, knives, files; water hardened

LION
M-389; 0.7-0.9 C, bal Fe
For tools, drills, taps; water hardening.

LION
M-1415; 0.70 C, 14 W, 3.5 Cr, 0.6 V, bal Fe.
For tools, reamers, hobs, drills, broaches, high speed steel

LION 22%.
M-1415, 0.75 C, 22 W, 4.5 Cr, 1.2 V, bal Fe.
For lathe and planer tools, hobs, reamers, drills; high speed steel.

LION BRAND ANTIFRICTION METAL.
M-413; 5-15 Sn, 10-15 Sb, bal Pb
For bearings for rolling mills and stone crushers; for heavy pressures and high speeds.

LION BRAND PLASTIC WHITE METAL.
M-413, 3-10 Sb, 1-3 Cu, 10-17 Pb, bal Sn.
For main bearings for marine engines; Babbitt.

LION EXTRA.
M-69; 0.6-1.3 C, 0.25 Si, 0.3 Mn, bal Fe.
For drills, hobs, reamers, taps, broaches; Type W1, water hardened.

LION G.19.F.
M-1415; 0.90 C, 2 Mn, bal Fe.
For taps, dies, reamers, forming dies; oil hardened, non-deforming.

LION G.19.H.
M-1415; 0.90 C, 0.45 Si, 1.25 Mn, 0.5 W, 0.5 Cr, bal Fe.
For taps, dies, reamers, forming dies; oil hardened, non-deforming.

LION H 18.V.
M-1415, 1.0 C, 1.5 Cr, 0.2 V, bal Fe.
For taps, dies, forming rolls, broaches, reamers; oil hardened, wear resistant.

LION K.15.
M-1415, 0.30 C, 13 Cr, S, bal Fe.
Annealed 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin
For stainless screw machine products, free-cutting, corrosion resistant.

LION P 16.
M-1415; 1.0 C, 1.0 Mn, 0.75 W, 0.75 Cr, bal Fe.
For blanking and forming dies, reamers, broaches; oil hardened, non-deforming.

LION PEG STEEL 5.5.0
M-1415, 0.5 C, 14 W, 3 Cr, 0.5 V, bal Fe.
For hot punches, core and die inserts; hot work steel, oil hardened

LION R 19.
M-1415, 0.25 C, 13 Cr, bal Fe.
Annealed. 95,000 TS, 50,000 YS, 25 El; 55 RA, 196 Brin
For dies, cutlery, valves, Type 420; corrosion resistant.

LION REGENT.
M-1415, 0.8 C, 20 W, 5 Cr, 1.25 V, 18 Co, 0.75 Mo, bal Fe
For cutting tools, broaches, milling cutters; high speed steel.

LION SPECIAL
M-1415, 0.75 C, 19 W, 4.25 Cr, 1.25 V, 8 Co, 0.75 Mo, bal Fe
For lathe and planer tools, hobs, drills, high speed steel

LISCO
M-802, 0.35 C, bal Fe.
For castings; water hardening

LITHALOYS
M-1050; Li-Cu.
For master alloy for Cu castings, for sound castings.

LITHIUM-CALCIUM
M 315, 50 Li, 50 Ca
For deoxidizer, metallurgical applications.

LITHIUM-CONDUCTIVITY BRONZE.
M-315, 98 min Cu, 2 max Cd, Sn, Si.
For high strength conductors, bronze treated with Li with increased conductivity.

LITHIUM-COPPER.
M-315, Li, bal Cu.
Annealed. 31,500-36,500 TS, 72-60 El
For electrical conductors; high conductivity, oxygen free.

LITHOBRAZE 720 (BT).
M-63; 71.3-72.3 Ag, 0.15-0.30 Li, bal Cu.
For brazing alloy for stainless steels; M.P. 1435°F; eutectic alloy. AWS BAg-8a.

LITHOBRAZE 925.
M-63; 92.5 Ag, 7.3 Cu, 0.2 Li.
For high temperature brazing; M.P. 1435-1635°F; for short time operation to 900°F, continuous to 500°F. AWS BAg-19.

LITINUM BRONZE.
Eng.; 90 Cu, 4.7 Sn, 3.86 Zn, 1.6 Pb.
For nuts, bushings, bearings, screw machine parts; free-cutting.

LITTITE.
M-1479; 3 C, Si, Mn, alloy, bal Fe.
For gears, shafts, machine tool housings; cast iron.

LITTLES SPECULUM.
65 Al, 31 Sn, 2.3 Zn, 1.9 As.
For mirrors, reflectors; high polish.

L-IV.
M-116; 4 Cu, 2 Si, bal Al.
Heat treated: 43,000 TS; 36,000 YS; 4 El.
For light alloy parts; same as "Lautal."

L.L.C.T.
M-260, M-38; 0.2 C, 4 Cr, 0.5 V, 15 W, bal Fe.
For hot work dies and tools, shear blades, crowning tools; tough and heat resistant.

L.M.
M-620; 0.75 Si, 4.75 Cu, 0.75 Mn, bal Al.
58,000-65,000 TS; 20-18 El.
For light alloy parts; age-hardenable.

L.M.-0.
M-302; 4 Si, 1.5 Cu, bal Al
23,000-28,000 TS; 4-3 El.
For light alloys, food handling machinery; age-hardenable.

LM 1.
M-28; 7 Cu, 3 Si, 3 Zn, bal Al.
Sand cast. 19,000 TS; 12,300 YS, 73 Brin
Permanent mold: 24,600 TS; 15,700 YS; 1 El; 80 Brin.
For general purpose castings; Brit. DTD428.

LM 2 TYPE 1.
M-28; 1.1 Cu, 10.3 Si, bal Al.
Sand cast: 21,300 TS; 9,800 YS; 2 El; 70 Brin.
For pressure tight castings; corrosion resistant

LM 2 TYPE 2.
M-28; 2.1 Cu, 10.3 Si, 0.9 Zn, bal Al.
Permanent mold. 25,500 TS, 12,000 YS; 2 El; 78 Brin.
For pressure tight castings, corrosion resistant

LM 4.
M-28; 3 Cu, 5 Si, 0.5 Mn, bal Al.
Sand cast: 22,400 TS; 12,300 YS; 2.5 El; 65 Brin.
Permanent mold: 23,500 TS; 12,300 YS; 2.5 El, 70 Brin.
For pressure tight castings; Brit. DTD424, age hardenable.

LM 6.
M-28; 11.3 Si, bal Al.
Sand cast: 25,700 TS; 9000 YS; 7 El; 55 Brin.
Die cast: 34,000 TS; 10,200 YS; 10 El; 60 Brin.
For pressure tight thin wall castings; Brit. BS3L[illegible], corrosion resistant

LM 20.
M-28; 11.5 Si, bal Al.
Sand cast: 25,200 TS; 8900 YS; 5.0 El; 55 Brin.
Die cast: 31,400 TS; 9500 YS; 7.5 El; 60 Brin.
For pressure tight castings; Brit. LM20M, corrosion resistant.

LM 21.
M-28; 3 Cu, 5 Si, 0.5 Mn, bal Al.
Sand cast: 20,200 TS; 1.5 El.
Permanent mold: 22,400 TS, 1.5 El.
For general engineering castings; Brit. LM21M, corrosion resistant.

LM 24
M-28; 3.5 Cu, 8.5 Si, bal Al
Permanent mold: 25,700 TS, 1.5 El.
For general engineering castings; Brit LM24M, corrosion resistant.

LM 630
M-1031; 6 Al, 3 Zn, 0.2 Mn, bal Mg
Cast: 27,000 TS, 5 El, 50 Brin.
Heat treated. 38,000 TS; 5 El; 73 Brin
For light alloy castings, heat treatable.

LM 920
M-1031, 9 Al, 2 Zn, 0.1 Mn, bal Mg.
Cast: 24,000 TS, 2 El, 65 Brin.
Heat treated 40,000 TS, 2 El, 87 Brin
For light alloy castings, heat treatable

L M S
Eng, Pb-Sn-Sb.
For bearings, anti-friction.

LMW.
M-1, 0.7 C, 3.25-4.25 Cr, 1.25-2 W, 0.75-1.5 V, 7.5-9.5 Mo, (Co), bal Fe
For reamers, lathe tools, drills, broaches, dies, hot work dies, cutting tools, high speed steel

LMW V
M-1, 1.0 C, 3.75 Cr, 2.0 V, 1.75 W, 8.75 Mo, bal Fe
High speed steel for cutting tools, molybdenum type, AISI M7

L-NICKEL
M-68, 99.4 Ni, 0.1 Cu, 0.15 Fe, 0.2 Mn, 0.05 Si, 0.02 max C
Annealed 55,000-75,000 TS, 15,000-25,000 YS, 55-35 El, 75-60 RA, 80-100 Brin
For immersion heaters, corrosion and heat resisting

LOADED IRON
M-494, 3.3 C, 2.2 Si, 1 Cr, 0.4 P, bal Fe
320 Brin
For cylinder liners, cast iron

LO-AIR
M-114, 0.7 C, 2.25 Mn, 1.0 Cr, 1.35 Mo, bal Fe
Ht Tr: 293,000 TS, 264,000 YS, 560 Brin.
For blanking, piercing and embossing dies
Type A6 Air hardening, wear resistant.

LOCKALLOY
M-646; 38 Al, 62 Be
Sheet: 56,000 TS, 44,000 YS, 8 El
At 400°F 44,000 TS, 40,000 YS, 11 El
For nuclear fuel canning, gyro cages, aircraft brakes, computer memory drums and discs, spacecraft parts, missiles, satellite launch vehicles.
High modulus, low density alloy.

LOCKPORT SPECIAL
M-373; 0.7 C, 18 W, 4 Cr, 2 V, bal Fe.
For tools, cutters; high speed steel

LOCOMOTIVE TUBE.
Eng; 97 Cu, 3 Ni
For tubes for locomotives; corrosion resistant

LO CRO 4-6.
M-38; 0.20 C, 4-6 Cr, bal Fe
For corrosion resisting parts; corrosion resistant

LO CRO 4-6 MO
M-38; 0.20 max C, 4-6 Cr, 0.4-0.6 Mo, bal Fe.
For corrosion resisting parts; corrosion resistant.

LO CRO 4-6 W.
M-38, M-260; 0.20 max C, 4-6 Cr, 0.75-1.25 W, bal Fe.
For high temperature studs, bolts; corrosion resistant

LO-CRO TYPE 501.
M-38; 0.10 min C, 4-6 Cr, bal Fe
For oil refineries; corrosion resistant.

LO-CRO TYPE 502
M-38; 0.1 max C, 4-6 Cr, bal Fe
For oil refineries, corrosion resistant

LODED CENTRICAST.
M-494, 3.2 C, 2.8 Si, 0.8 Cr, bal Fe
Cast. 36,000 TS, 240-300 Brin
For cylinder liners, centrifugal

LODEX.
M 60, Fe, Co single domain particle
Permanent magnet material
Anisotropic or isotropic
Pressed or extruded shapes
Uniform magnetic and physical properties

LO-EX
M-299, 0.5-1.3 Cu, 0.8-1.5 Mg, 11-13 Si, 2-3 Ni, bal Al
Sand cast 37,000 TS, 35,900 YS, 0 El, 125 Brin
Permanent mold 44,800 TS, 42,600 YS, 0 El, 130 Brin
For pistons, age hardenable

LO-EX
M-1220, M 541; 0.5-1.0 Cu, 12.8 Si, 0.8 Mg, 2.2 Ni, bal Al
Cast 36,000-47,000 TS, 36,000-46,000 YS; 0.2-0.5 El, 120-135 Brin
For pistons, sleeves, bushings, low thermal expansion

LO-EX ALLOY
M-137, 11-13 Si, 1.0-2.5 Ni, 1.0 Mg, 0.7 Cu, bal Al
Cast 26,000 TS, 23,000 YS, 0.5 El, 75 Brin.
Heat treated 38,000 TS, 33,000 YS, 0.5 El; 140 Brin
For pistons, low thermal expansion

LOFLEX.
M-237; bimetal
For thermostatic bimetal, maximum temperature 800°F.

LO-FLO NO. S-0
M-1243
For silver solder; M P. 1500°F

LO-FLO NO S-1.
M-1243
For silver solder; M P 1300-1400°F

LO-FLO NO. S-4
M-1243
For silver solder, M P. 1150°F.

LOGAN.
M-802; 0.4 C, bal Fe
For castings; water hardening.

LOGAN FORGING BRASS
M-122; 58.5 Cu, 2 Pb, bal Zn.
Extruding: 61,000 TS; 32,000 YS; 40 El; 104 Brin.
For brass forgings, hot pressings.

LOGAN (W2 Grade 4).
M-1705; 1.0 C, 0.25 Mn, 0.25 Si, bal Fe.
Water hardening tool steel; AISI W2.

LOHETE
M-345. For thermostats; heat resistant thermostatic metal.

LOHM.
M-44; 7.0-7.5 Ni, bal Cu.
Wrought. 50,000-100,000 TS
For electrical equipment, radio rheostats.
Low electrical resistance, maximum operating temperature 200°C.

LOHMANIT.
W + Mo carbides (chiefly W_2C.).
For hard cutting tools and dies; cast alloy.

LOHMANN 120
M-1311, 1.2 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed 115,000 TS, 60,000 YS; 18 El; 38 RA; 225 Brin
For springs, taps, drills, cutters, broaches, Type W1, water hardened.

LOHMANN A37
M-1311; 0.85 C, Cr, bal Fe
For tools, sprmgs, bearings, dies; water hardened

LOHMANN BCNi.
M-1311, 0.55 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, fasteners, crankshafts; oil hardened, shock resistant

LOHMANN C112/50
M-1311, 1.05 C, Cr, bal Fe
For bearings, liners, cutters; water hardened, wear resistant.

LOHMANN Co 3
M-1311, 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe
For lathe and planer tools, reamers, broaches, high speed steel

LOHMANN Co 5
M 1311, 0.79 C, 4.7 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe
For lathe and planer tools, reamers, broaches, drills, taps; high speed steel.

LOHMANN Co 10
M-1311, 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe
For lathe and planer tools, reamers, drills, cutters; high speed steel.

LOHMANN E75
M-1311, 0.75 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 175,000 TS, 130,000 YS; 12 El; 35 RA; 355 Brin.
For springs, rails, punches, tools, water hardened.

LOHMANN E85.
M-1311; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated. 190,000 TS, 145,000 YS; 10 El; 30 RA; 400 Brin
For springs, tools, punches, drills, taps; Type W1, water hardened

LOHMANN E95
M-1311; 0.95 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 195,000 TS; 150,000 YS; 8 El, 28 RA; 420 Brin.
For drills, taps, reamers, broaches; Type W1; water hardened.

LOHMANN E120
M-1311, 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 55,000 YS; 20 El; 40 RA; 210 Brin.
For springs, taps, drills, hobs, reamers; Type W1; water hardened.

LOHMANN GP35.
M-111; 1.5 C, Cr, Si, bal Fe.
For engravers' tools, forming and blanking dies; water or oil hardened.

LOHMANN GS125
M-111; 1.2 C, 0.20 Cr, 0.10 V, 1.0 W, bal Fe.
For fast finishing cutters, bushings; water or oil hardened.

LOHMANN GSNi.
M-111, 0.56 C, Ni, Cr, Mo, V, bal Fe.
For gears, bolts, crankshafts, machine tool parts; oil hardened, shock resistant

LOHMANN HCS.
M-1311, 1.25 C, 1.15 Si, 0.7 Mn, 1.2 Cr, bal Fe
For header dies, punches, bushings; water or oil hardened.

LOHMANN HKL.
M-1311, 0.58 C, 0.95 Mn, 1.0 Cr, 0.09 V, bal Fe.
For gears, springs, crankshafts, oil hardened, shock resistant.

LOHMANN HKM.
M-1311, 1.0 C, 0.1 V, 0.25 Mn, bal Fe
For header dies, punches, bearings, Type W2, water or oil hardened

LOHMANN HPW.
M-1311; 0.38 C, Si, Cr, V, bal Fe
For machine tool parts, oil hardened, tough

LOHMANN HPW EXTRA
M-1311, 0.45 C, Si, Cr, V, bal Fe
For springs, gears, crankshafts, oil hardened, tough

LOHMANN HPWH
M-1311, 0.55 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe
For header dies, shears, grippers, oil hardened, tough.

LOHMANN HPWW
M-1311; 0.35 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe
For header dies, shears, grippers, oil hardened, tough

LOHMANN HSL
M-1311, 2.1 C, 11.5 Cr, 0.30 Mn, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming

LOHMANN HSL EXTRA
M-1311; 1.65 C, 11.5 Cr, 0.1 V, 0.3 Mn, bal Fe
For blanking and forming dies, punches; air hardened, non-deforming

LOHMANN HSL SPEZIAL
M-1311, 2.1 C, 11.5 Cr, 0.3 Mn, bal Fe.
For blanking and forming dies, punches, oil hardened, non-deforming.

LOHMANN HSO-111
M-1311; 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For bearings, punches, bushings; water hardened, wear resistant.

LOHMANN HSO-121.
M-1311, 1.05 C, 1.0 Cr, 1.15 W, 0.9 Mn, bal Fe
For header dies, cutters, upsetters, oil or water hardened, tough.

LOHMANN HSO EXTRA.
M-1311; 1.15 C, 0.1 V, 0.65 Cr, 0.3 Mn, bal Fe
For dies, cutters, punches, oil hardened, tough.

LOHMANN HSO SPEZIAL.
M-1311; 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, dies, shears, crimpers; oil hardened, non-deforming.

LOHMANN HWR.
M-1311; 1.42 C, W, V, bal Fe.
For header dies, cutters; oil or water hardened.

LOHMANN HWS.
M-1311; 0.30 C, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For extrusion rams and liners, punches, riveters; oil hardened, tough

LOHMANN HWS EXTRA.
M-1311, 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For extrusion rams and liners, punches; oil hardened, tough.

LOHMANN HWS SPEZIAL
M-1311; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe
For extrusion rams and liners, punches; oil hardened, tough

LOHMANN K12
M 1311, 2.1 C, 11.5 Cr, 0.30 Mn, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

LOHMANN K11
M 1311, 1.0 C, 1.55 Cr, 0.35 Mn, 0.35 Si, bal Fe
For bearings, cutters, forming dies; oil or water hardened, wear resistant

LOHMANN KM12
M 1311, 1.65 C, 11.5 Cr, 0.1 V, bal Fe
For blanking and forming dies, punches, air hardened, non-deforming

LOHMANN KS15V
M-1311, 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe
For bearings, liners, bushings, water hardened, wear resistant

LOHMANN KS85
M-1311, 1.15 C, 0.65 Cr, 0.10 V bal Fe
For cutters, header dies, blanking dies; oil hardened, tough

LOHMANN KST
M 1311, 0.58 C, 1.0 Cr, 0.1 V, bal Fe
For springs, gears, forging dies, crankshafts; oil hardened, shock resistant.

LOHMANN KWS45
M-1311, 0.45 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe
For header dies, upsetters, shears, punches; oil hardened, tough

LOHMANN KWS55
M-1311; 0.55 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe
For header dies, punches, tools, shears; oil hardened, tough

LOHMANN KWS75
M-1311, 0.35 C, 1.05 Cr, 1.85 W, 0.18 V, bal Fe
For heading dies, upsetters, piercers, tools; oil hardened, tough

LOHMANN KZV30
M 1311, 0.80 C, W, Cr, V, bal Fe.
For tools, cutters, oil hardened.

LOHMANN L161.
M-1311, 1.65 C, 11.5 Cr, 0.3 V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

LOHMANN LC SPEZIAL.
M-1311; 2.1 C, 11.5 Cr, 0.7 W, 0.3 Mn, bal Fe
For blanking and forming dies; oil hardened, non-deforming.

LOHMANN LMS125.
M-1311; 1.2 C, W, bal Fe.
For cutters, forming rolls, header dies; oil hardened.

LOHMANN LMS200.
M-1311; 1.15 C, W, bal Fe.
For header dies, forming rolls, cutters; oil hardened.

LOHMANN MC 100.
M-1311; 1.05 C, Mn, Cr, bal Fe.
For bearings, liners, bushings; water hardened, wear resistant.

LOHMANN MSV4.
M-1311; 0.7 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, rails, tools, hammers, axes; Type W1; water hardened.

LOHMANN MSVE.
M-1311; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, tools, cutters, drills, taps, reamers; Type W1; water hardened.

LOHMANN N2.
M-1311; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, drills, hobs, broaches; high speed steel

LOHMANN N3
M-1311, 0.95 C, 4.1 Cr, Mo, W, V, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

LOHMANN N4
M-1311; 0.85 C, 4.1 Cr, Mo, W, V, bal Fe.
For lathe and planer tools, reamers, high speed steel.

LOHMANN NE
M-1311, 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, drills, taps, hobs, broaches; high speed steel

LOHMANN NR
M-1311, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For blanking and forming dies, cutters, reamers; high speed steel.

LOHMANN NR5
M-1311; 1.35 C, W, Co, Mo, V, Cr, bal Fe
For engravers tools, blanking and forming dies, high speed steel.

LOHMANN NSP.
M-1311, 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe
For lathe and planer tools, reamers, broaches, taps; high speed steel.

LOHMANN P75.
M-1311, 0.70 Cr, 0.25 max Si, 0.25 Mn, bal Fe.
Heat treated: 174,000 TS, 128,000 YS; 12 El, 37 RA, 355 Brin
For springs, rails, clutch discs; Type W1, water hardened

LOHMANN P85.
M-1311; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS, 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, tools, cutters, drills, taps; Type W1; water hardened.

LOHMANN P95.
M-1311, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed. 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, drills, hobs, cutters; Type W1; water hardened.

LOHMANN PM90.
M-1311; 0.90 C, 1.9 Mn, 0.1 V, 0.25 Si, bal Fe.
For punches, dies, crimpers, upsetters, cutters; oil hardened, nondeforming.

LOHMANN PM150.
M-1311, 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For cutters; water hardened.

LOHMANN PV15.
M-1311; 0.61 C, 1.18 Cr, 0.1 V, 0.75 Mn, 0.85 Si, bal Fe.
For springs, gears, bolts, crimpers, punches; oil hardened, shock resistant.

LOHMANN PZ105.
M-1311; 1.05 C, 1.0 Cr, 0.30 Mn, bal Fe
For bearings, sleeves, liners, bushings; water hardened, wear resistant

LOHMANN RF.
M-1311; 0.40 C, 13 Cr, 0.30 Mn, bal Fe.
Annealed: 100,000 TS; 55,000 YS, 20 El; 50 RA; 200 Brin
For valves, cutlery, surgical and dental instruments; Type 420; stainless.

LOHMANN-RFK.
M-1311, 0.20 C, 13 Cr, 1 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; B 92 Rock.
Heat treated 250,000 TS; 215,000 YS; 8 El, C 52 Rock.
For cutlery, surgical instruments, gears, shafts, needle valves, gauges.
Corrosion resistant, hardenable.

LOHMANN RFW.
M-1311, 0.20 C, 13 Cr, 0.3 Mn, bal Fe.
Annealed: 95,000 TS, 50,000 YS; 25 El, 55 RA, 195 Brin
For valves, cutlery, turbine blades, Type 420, stainless

LOHMANN S39
M-1311, 0.85 C, 0.10-0.40 Si, 0.5-0.7 Mn, bal Fe.
Heat treated 190,000 TS, 145,000 YS; 10 El, 30 RA, 400 Brin.
For springs, tools, cutters, drills, taps; Type W1, water hardened.

LOHMANN SCV14.
M-1311, 0.38 C, Cr, V, Si, bal Fe
For gears, bolts, machine tool parts, oil hardened, tough

LOHMANN SM4
M-1311, 0.35 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled: 85,000 TS, 54,000 YS, 30 El; 53 RA, 183 Brin
For gears, bolts, machine tool parts; water hardened.

LOHMANN SM4F.
M-1311, 0.45 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin
For gears, bolts, machine tool parts, water hardened

LOHMANN SM5.
M-1311, 0.60 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA, 325 Brin.
For machine tool parts, punches, springs; water hardened.

LOHMANN SM7.
M-1311; 0.75 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated: 180,000 TS; 130,000 YS, 10 El; 35 RA, 360 Brin.
For springs, rails, punches, hammers; Type W1; water hardened.

LOHMANN SM9.
M-1311; 0.90 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Annealed: 100,000 TS, 53,000 YS; 20 El; 40 RA; 200 Brin.
For springs, dies, tools, cutters, punches; Type W1; water hardened.

LOHMANN SNi.
M-1311; 0.45 C, Cr, Ni, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

LOHMANN SV.
M-1311; 0.80 C, Cr, V, bal Fe.
For bearings, cutters, form dies, punches, oil or water hardened, wear resistant

LOHMANN T130.
M-1311; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers tools, cutters, taps, reamers; Type W1; water hardened.

LOHMANN WM4.
M-1311; 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For header dies, upsetters, crimpers, oil hardened, tough.

LOHMANN WM5.
M-1311; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For extrusion press rams and liners, upsetters, punches; oil hardened, tough

LOHMANN WM10.
M-1311; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion press rams and liners, punches, shears; hot work steel, oil hardened.

LOHMANN WMCo3.
M-1311; 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion press rams and liners, punches, shears; hot work steel, oil hardened

LOHMANN WORI EXTRA
M-1311, 1.42 C, W, V, bal Fe
For cutters, engravers' tools, water hardened.

LOHMANN WSCr60.
M-1311, 0.45 C, 1.15 Si, 1.2 Cr, 0.1 V, bal Fe
For springs, gears, bolts; oil hardened.

LOHMANN WSP.
M-1311, 1.25 C, 1.15 Si, 1.2 Cr, 0.7 Mn, bal Fe
For liners, bushings, oil hardened.

LOHMANN WWMV.
M-1311; 0.45 C, 1.35 Cr, 0.45 Mo, 0.80 V, 0.45 W, bal Fe.
For punches, crimpers, oil hardened.

LOHMANN Z90.
M-1311, 1.0 C, 0.25 Mn, 0.1 V, bal Fe
For springs, cutters, drills, reamers, taps; Type W2; water hardened.

LOHMANN ZCR.
M-1311; 1.4 C, Cr, V, bal Fe.
For blanking and forming dies, cutters, bearers, oil or water hardened, abrasion resistant.

LOIRE-ALC6.
M-1546, 0.08 max C, 23.0 Cr, 5.2 Al, bal Fe.
For heating elements, industrial furnaces, parabolic radiators.
High heat resistant to 1100°C.

LOIRE-AMCR.
M-1546, 0.30 C, 10.0 Cr, 18.0 Mn, 1.0 Ni, bal Fe
Forged: 106,700 TS; 49,800 YS; 45 El.
Cast: 92,500 TS; 42,700 YS; 28 El.
For marine hardware, diesel engine motor frames.
Nonmagnetic, corrosion resistant steel.

LOIRE-AMCRN.
M-1546; 0.65 C, 8 Ni, 8 Mn, 4 Cr, bal Fe.
Rolled: 154,000 TS; 114,000 YS; 20 El.
For electrical construction.
Non-magnetic, corrosion resistant steel.

LOIRE A.S.
M-1546; 0.50 C, bal Fe.
Ht. Tr.. 120,000 TS; 77,200 YP; 22 El; 245 Brin.
For cutting tools, chisels, hammers, gears, punches, shafts, axles.
Water hardening.

LOIRE CMY6
M-1546; 0.15 C, 0.5 Cr, 0.5 Mo, bal Fe.
Heat treated: 71,000 TS; 42,700 YS; 20 El.
For furnace tubes, oil refineries, boilers.
Resists heat to 600°C.

LOIRE-CMY16.
M-1546; 0.12 C, 5.5 Cr, 0.6 Mo, bal Fe
Heat treated: 78,000-107,000 TS; 35,600-92,500 YS; 14-23 El.
For oil refining and hot hydrogenization equipment
Corrosion resistant to sour crude oils.

LOIRE-CMY17
M-1546, 0.13 C, 2.3 Cr, 1.0 Mo, bal Fe.
Heat treated 71,000-135,000 TS, 34,000-121,000 YS, 15-25 El.
For oil refining equipment, hydrogenization equipment, gas turbine housings.
Max operating temperature 600°C.

LOIRE-CMY18
M-1546, 0.13 C, 1.0 Cr, 0.5 Mo, bal Fe
Heat treated: 85,000-128,000 TS, 57,000-92,500 YS; 12-20 El,
For rotors, blades and arbors in steam and gas turbines.
Resists oxidation to 550°C.

LOIRE CMY22
M-1546, 0.30 C, 3.0 Cr, 0.5 Mo, bal Fe
Heat treated: 135,000 TS, 121,000 YS, 15 El.
For alternator and turbine parts, rotors
Resists oxidation to 600°C

LOIRE-CMYV
M-1546, 0.15 C, 1.0 Cr, 1.0 Mo, 0.2 V, bal Fe
Heat treated: 88,000 TS; 58,000 YS; 16 El.
For steam and gas turbine rotors and blades, superheated steam units.
Resists oxidation to 600°C.

LOIRE-COQ2
M-1546, 1.0 C, bal Fe.
Annealed 100,000 TS, 54,000 YP, 20 El, 190 Brin
Ht Tr: 216,000 TS; 152,000 YP, 11 El; 601 Brin.
For chisels, rivet sets, fixtures, bearings
Water hardening, wear resistant.

LOIRE-HKMV.
M-1546. 0.14 C, 0.55 Cr, 0.55 Mo, 0.12 V, bal Fe
Annealed 78,200 TS; 57,000 YS; 22 El.
For flanges for condensers, steam turbine discs and arbors, superheater tubes.
Free from temper embrittlement.

LOIRE-HR200.
M-1546, 0.38 C, 5.0 Cr, 1.3 Mo, 1.0 Si, 0.5 V, bal Fe
Ht Tr: 300,000 TS; 250,000 YS; 6 El; C 55 Rock.
Annealed. 102,000 TS, 66,000 YS; 28 El; B 94 Rock
For aircraft landing gears, rocket motors, bolts, missile structures, cylinder liners, dies
Martensitic steel. Hardenable.

LOIRE-ICN 001.
M-1546; 0.10 C, 18.0 Cr, 9.0 Ni, bal Fe.
Annealed: 92,500 TS; 31,300 YS; 50 El.
Rolled: 170,000 TS, 149,000 YS; 20 El.
For decorations, trim, cooking utensils, chemical plant and food processing equipment.
Corrosion resistant. Austenitic, nonhardenable by heat treatments.

LOIRE-ICN 162T.
M-1546; 0.08 max C, 17.0 Cr, 11.5 Ni, 2.2 Mo, 0.4 Ti, bal Fe.
Annealed: 85,300 TS; 35,600 YS; 40 El.
For chemical plant equipment, acid mixing tanks, vessels, agitators.
Austenitic, stainless, welding grade.

LOIRE-ICN 164
M-1546; 0.07 max C, 17.0 Cr, 11.5 Ni, 2.2 Mo, bal Fe.
Annealed: 192,500 TS; 35,600 YS, 45 El
For chemical plant equipment, acid mixing tanks, agitators, vessels. Austenitic stainless, Type 316.

LOIRE-ICN 164BC
M-1546; 0.03 max C, 16.5 Cr, 13.5 Ni, 2.2 Mo, bal Fe
Annealed: 85,300 TS; 28,400 YS, 50 El.
For chemical plant equipment, acid mixing tanks, agitators, vessels.
Austenitic, stainless, non heat-treatable.

LOIRE-ICN 164BCN
M-1546; 0.03 max C, 17.5 Cr, 13.5 Ni, 2.8 Mo, bal Fe
Annealed: 78,200 TS, 31,300 YS; 40 El.
For chemical plant equipment, acid mixing tanks, agitators, vessels
Austenitic, stainless, not heat treatable.

LOIRE-ICN 164BCS.
M-1546; 0.03 max C, 18.5 Cr, 14.0 Ni, 3.3 Mo, bal Fe
Annealed 78,200 TS, 32,700 YS, 38 El
For chemical plant equipment, acid mixing tanks, agitators, vessels
Austenitic, stainless, Type 317

LOIRE ICN 164K
M-1546, 0.04 max C, 17.0 Cr, 11.5 Ni, 2.2 Mo, bal Fe
Annealed: 85,300 TS; 31,300 YS, 45 El.
For chemical plant equipment, acid mixing tanks, agitators
Austenitic, stainless, Type 316

LOIRE ICN 164T
M 1546; 0.07 max C, 17.0 Cr, 11.5 Ni, 2.8 Mo, 0.4 Ti, bal Fe
Annealed 85,300 TS; 35,600 YS, 40 El
For chemical plant equipment, acid mixing tanks, vessels, agitators.
Austenitic, stainless, welding grade.

LOIRE-ICN 212
M-1546; 0.10 max C, 12.5 Cr, 12.0 Ni, bal Fe
Rolled 36%: 135,100 TS, 128,000 YS; 15 El.
Annealed: 78,200 TS, 35,600 YS, 50 El.
For trim, watch cases, instrument housings, jewelry, decorations
Corrosion resistant

LOIRE-ICN 472
M-1546, 0.07 max C, 18.0 Cr, 9.5 Ni, bal Fe.
Annealed: 82,500 TS; 35,600 YS; 48 El, B 80 Rock
Cold Drawn: 150,000 TS, 100,000 YS; 25 El; C 25 Rock.
For chemical plant equipment, tanks, vessels, mixers, agitators.
Stainless Type 304 Austenitic.

LOIRE-ICN 472BC.
M-1546; 0.03 max C, 18.5 Cr, 11.5 Ni, bal Fe
Annealed: 78,200 TS; 29,900 YS; 48 El; B 72 Rock.
Cold Drawn: 125,000 TS; 80,000 YS; 30 El; C 20 Rock
For chemical plant equipment, tanks, agitators, mixers, welded structures.
Stainless Type 304L, austenitic.

LOIRE-ICN 472K.
M-1546; 0.04 max C, 18.0 Cr, 10.5 Ni, bal Fe.
Annealed: 78,200 TS; 29,900 YS; 48 El.
Cold Drawn: 130,000 TS; 85,000 YS; 28 El; C 20 Rock.
For chemical plant equipment, tanks, vessels, welded structures.
Stainless, Type 304L. Austenitic

LOIRE-ICN 472NB.
M-1546; 0.06 max C, 17.5 Cr, 12.5 Ni, 1.0 Cb, bal Fe.
Annealed 82,500 TS; 35,600 YS; 48 El; B 80 Rock.
At 1000°F: 55,000 TS, 35,000 YS; 36 El; 68 RA.
For chemical plant equipment, tanks, agitators, mixers, vessels, welded structures.
Type 347 stainless steel Austenitic.
Welding grade. Stabilized

LOIRE-ICN 472T
M-1546; 0.07 max C, 18.0 Cr, 10.5 Ni, 0.4 Ti, bal Fe
Annealed. 78,200 TS; 29,900 YS; 48 El, B 80 Rock.
Cold Drawn: 95,000 TS, 60,000 YS; 40 El; 185 Brin.
For chemical plant equipment, cold headed parts, tanks, vessels, agitators.
Corrosion resistant Welding grade
Type 321 Austenitic

LOIRE-IMC 201
M-1546, 0.10 C, 17.0 Cr, 8.0 Mn, 4.0 Ni, 0.2 N_2, bal Fe
Annealed 102,000 TS, 54,000 YS, 45 El.
For food and chemical processing equipment, trim, decorations.
Stainless, austenitic Low work hardenability

LOIRE-IMC 202.
M-1546, 0.05 C, 18.0 Cr, 9.0 Mn, 5.0 Ni, 0.2 N_2, bal Fe
Annealed 78,200 TS, 45,500 YS, 45 El
Fod food and chemical processing equipment, trim, decorations
Austenitic, stainless Weldable grade

LOIRE-NYS
M-1546, 0.10 max C, 78.0 Ni, 20.0 Cr, 1.0 max Fe.
Annealed 106,000 TS; 50,000 YS
For heating elements, furnace parts, combustion chambers of gas and turbine reactors
High heat resistance to 1200°C

LOIRE-NYSR.
M-1546, 0.1 max C, 45.0 Ni, 23.0 Cr, 1.2 Si, 1.2 Mn, bal Fe
For radiators, industrial furnaces, heating elements.
High heat resistant to 1050°C

LOIRE-RBL
M-1546, 1.4 C, 0.7 Cr, bal Fe
Harden C 62-64 Rock
For files.
Water hardening, wear and abrasion resistant.

LOIRE-RM3
M-1546, 0.20 C, 27.0 Cr, 3.0 Ni, bal Fe
Annealed 85,300 TS, 64,000 YS; 12 El
For furnace parts, heat treat boxes, retorts, salt pots, lead pots, burners.
Cast heat resistant steel.

LOIRE-RM6.
M-1546; 0.32 C, 26.0 Cr, 5.5 Ni, 1.8 Si, bal Fe.
Annealed: 99,600 TS; 78,200 YS; 18 El.
For furnace parts, salt and lead pots, oil burners.
Austenitic-ferritic cast steel.
Corrosion and heat resistant to 1100°C.

LOIRE-RM12.
M-1546; 0.30 C, 25.0 Cr, 12.0 Ni, 1.5 Si, 1.2 Mn, bal Fe.
Ht. Tr.: 110,000 TS; 60,000 YS; 50 El; B 90 Rock.
For furnaces, heat treat boxes, rails, furnace hearths, salt and lead pots.
Austenitic, heat and corrosion resistant.

LOIRE-RM20.
M-1546; 0.30 C, 25.0 Cr, 20.0 Ni, 1.8 Si, 1.3 Mn, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El; B 90 Rock.
For furnace parts, heat treat boxes, salt and lead pots, glass industry molds.
Austenitic, heat and corrosion resistant.

LOIRE-RM35.
M-1546; 0.45 C, 35.0 Ni, 15.0 Cr, 2.2 Si, 1.2 Mn, bal Fe.
Cast: 70,000 TS; 40,000 YS; 10 El; 180 Brin.
At 1600°F: 18,800 TS; 15,000 YS; 26 El.
For furnace parts, salt and lead pots, heat treat boxes, pyrometer tubes, grids, glass making equipment.
Austenitic, corrosion and heat resistant to 1150°C. ACI Type HT.

LOIRE-RM60.
M-1546; 0.45 C, 60.0 Ni, 12.0 Cr, 2.2 Si, 1.2 Mn, bal Fe.
Annealed: 80,000 TS; 35,600 YS; 4 El.
For cyanide and salt baths, furnace parts, heat treat boxes, glass furnace parts.
Corrosion and heat resistant.

LOIRE-SCH4.
M-1546; 0.40 C, 9.5 Cr, 0.8 Mo, 2.4 Si, bal Fe
Heat treated: 114,000-135,000 TS; 71,000-99,600 YS; 16 El.
For inlet and exhaust valves for internal combustion engines
Martensitic, heat resistant to 900°C.

LOIRE S.I.C.
M-1546; 0.98 C, 0.5 Cr, bal Fe.
Ht. Tr.: 200,000 TS, 180,000 YS; 3 El; 390 Brin
For bearings, rollers, bushings, gauges, mandrels.
Cold heading tool steel, oil or water hardening.

LOIRE-SP20.
M-1546, 0.77 C, 19.5 Cr, 1.5 Ni, 2.0 Si, bal Fe.
Heat treated: 121,000-143,000 TS; 71,100-114,000 YS; 12-14 El
For exhaust valves, jet engine components.
Martensitic, corrosion and heat resistant to 1000°C.

LO-LUMINIUM.
Eng.; 55 Sn, 33 Zn, 11 Al, 1 Cu.
For aluminum solder.

LOMINIUM STEEL.
M-210; 0.47 C, 0.6 Mn, 1.75 Cr, 0.2 V, bal Fe.
For die casting die steel; oil hardened.

LOMU.
M-32; 6-10 Ni, 8-12 Mn, 1.0 max Cr, bal Fe.
Rolled: 94,000 TS, 36,000 YS; 58 El; 62 RA.
For springs; non-magnetic.

LOPHOS.
M-289; C, V, bal Fe.
For cold heading dies.

LORRAINE A48S.
M-1495; 0.25 max C, 0.64-1.06 Mn, bal Fe.
Annealed: 54,000 TS; 30,000 YS; 35 El; 163 Brin.
For low temperature tubing; Afnor A48S, minimum operating temperature —45°C.

LORRAINE EM2.
M-1495; 0.17 max C, 2.13-2.67 Ni, 0.13-0.32 Si, bal Fe.
Annealed: 65,000-76,000 TS; 37,000 YS; 25 El.
For low temperature tubing; Afnor 9N10, minimum operating temperature —60°C.

LORRAINE EM5.
M-1495; 0.15 max C, 6-8 Cr, 0.45-0.65 Mo, bal Fe.
Annealed: 60,000 TS; 24,000 YS; 30 El; 179 Brin.
For oil refinery tubes and equipment; ASTM-A-335, Afnor Z8CD7.

LORRAINE EM6
M-1495; 0.15 max C, 1.0-2.0 Si, 4-6 Cr, 0.45-0.65 Mo, bal Fe.
Annealed: 60,000 TS; 24,000 YS; 30 El; 179 Brin.
For oil refinery tubes and equipment; ASTM-A-213.

LORRAINE EM7.
M-1495; 0.15 max C, 4-6 Cr, 0.50 max Mn, 0.45-0.65 Mo, bal Fe.
Annealed. 60,000 TS; 24,000 YS, 30 El; 163 Brin.
For oil refinery tubes; ASTM-A-199.

LORRAINE EM8
M-1495, 0.15 max C, 1.6 max Si, 4-6 Cr, 0.40-0.65 Mo, 1.0 max Al, bal Fe
Annealed 70,000-88,000 TS, 33,000 YS; 18 El; 179 Brin
For oil refinery tubes and equipment, Afnor Z7CSAD5

LORRAINE EM9
M-1495, 0.15-0.20 C, 5-7 Cr, 0.5-0.6 Mo, 0.35-0.45 V, bal Fe.
Rolled 92,000-114,000 TS; 65,000 YS; 18 El.
For oil refinery tubes and equipment; Afnor Z17CDV6

LORRAINE EM10
M-1495, 0.15 max C, 0.25-1.0 Si, 8-10 Cr, 0.8-1.2 Mo, bal Fe.
Annealed 60,000 TS; 30,000 YS; 30 El; 179 Brin.
For oil refinery tubes and equipment; ASTM-A-212; Afnor Z10CD9

LORRAINE EM11
M-1495, 0.15 max C, 1.0-1.5 Cr, 0.44-0.65 Mo, bal Fe
Annealed 60,000 TS, 30,000 YS, 30 El; 163 Brin.
For oil refinery tubes and equipment; ASTM-A-199

LORRAINE EM35
M-1495, 0.19 max C, 3.18-3.82 Ni, bal Fe.
Annealed: 65,000 TS, 35,000 YS; 30 El, 190 Brin.
For low temperature tubing; Afnor 10N14, minimum operating temperature —100°C.

LOSTA
M-1311, 0.90 C, 1.9 Mn, 0.1 V, bal Fe
For punches, dies, upsetters, cutters; oil hardened, non-deforming.

LO-TEMP.
M-1044; 40 Zn, bal Cu.
For repairing castings; brass.

LO-TIN SILVER FUSE
M-1243.
For solder.

LOTMESSING 60.
M-297; 38 Zn, 2 Si, bal Cu.
Soft: 52,000 TS, 48 El; 75 Brin.
½ H-temper: 65,000 TS; 30 El; 105 Brin.
For hardware, bolts, fasteners; corrosion resistant.

LOTUN.
M-357; C, alloy, bal Fe.
For tools, dies; oil hardening.

LOTUNG.
M-289, 0.30 C, 3 Cr, 9 W, 0.45 V, bal Fe.
For Al die casting dies, brass extrusion dies;
hot work steel, oil hardened.

LOTUS.
M-77; 10 Sn, 15 Sb, 75 Pb.
For bearings; Babbitt; medium bearing loads.

LOW BRASS.
M-33, M-8; 80 Cu, 20 Zn.
Annealed: 44,000 TS; 10,000 YS; 60 El
Rolled 65,000 TS; 45,000 YS; 12 El
For formed and drawn parts requiring high finish, high ductility.

LOW BRASS 5
M-141; 80 Cu, 20 Zn.
Hard: 74,000 TS; 59,000 YS, 7 El, 156 Brin.
Soft 44,000 TS, 14,000 YS; 50 El; 56 Brin.
For hardware, diaphragms; corrosion resistant.

LOW BRASS-32
M-8, 80 Cu, 20 Zn.
Soft 43,000 TS, 16,000 YS; 50 El.
Hard 73,000 TS, 60,000 YS; 8 El.
For formed and drawn parts; high ductility

LOW BRASS 240
M-279, 80 Cu, 20 Zn.
Ann 44,000-54,000 TS; 12,000-29,000 YS; 42-58 El.
Cold rolled 48,000-97,000 TS; 18,000-84,000 YS; 1-35 El
Low zinc brass with good corrosion resistance, for bellows, flexible hose, water meters.

LOW CARBON GFS.
M-370; 0.20 C, bal Fe.
Low carbon ground flat stock steel.
For jigs and fixtures

LOW CARBON NICKEL replaced by NICKEL 201.

LOW CARBON ONTARIO
M-1, 0.87 C, 0.5 Mn, 0.5 Si, 12.0 Cr, 0.35 Ni, 0.15 V, 0.8 Mo, bal Fe.
Air or oil hardening cold work tool steel, chromium type, AISI D1

LOW CHROME-NICKEL
M-200, 0.35-0.45 C, 0.25-0.50 Cr, 0.80-1.00 Mn, 0.50-0.75 Ni, 0.30-0.40 Si, bal Fe.
Annealed. 100,000 TS; 60,000 YS, 20 El, 18 RA; 200 Brin.
Heat treated· 120,000-200,00 TS; 100,000-175,000 YS; 35-10 El, 20-5 RA.
For gears, shafts, pinions; tough

LOW LEADED BRASS.
M-33; 66.5 Cu, 33 Zn, 0.5 Pb.
For drain tubes, plumbing goods, pump liners; free-cutting.

LOW LEADED BRASS-226
M-8, 35 Zn, 0.5 Pb, bal Cu.
Soft 45,000 TS, 17,000 YS, 55 El.
Hard· 73,000 TS; 60,000 YS; 9 El.
For hardware; good formability.

LOW LEADED TUBE BRASS.
M-33; 66.5 Cu, 33 Zn, 0.5 Pb.
Annealed: 52,000 TS; 20,000 YS; 50 El
For pump liners, plumbing.

LOW LEADED TUBE BRASS-330.
M-8; 66.5 Cu, 33.0 Zn, 0.5 Pb.
Hard: 73,000 TS; 60,000 YS; 10 El; B 80 Rock.
Soft: 45,000 TS; 17,000 YS; 55 El; B 15 Rock.
For pump and power cylinders and liners, plumbing parts, munitions.
Free-cutting yellow brass.

LOWMOOR IRON.
M-803; 3.2 C, 2.6 Si, bal Fe.
For castings; cast iron

LOW PHOSPHORUS COPPER.
M-33, 99.9 + Cu, 0.007 P.
For electrical conductors, waveguides;
high conductivity, deoxidized copper.

LOWROFF PHOSPHOR BRONZE.
England; 5 16 Pb, 4-13 Sn, 0.5-1.0 P, bal Cu
For bearings, bushings; heavy duty

LOWSCORE
M-472, 0.12 max C, 18-22 Cr, bal Fe.
Annealed. 68,000-80,000 TS, 30 El, 130-153 Brin.
For heat resisting equipment, furnace parts, pots, Type 442, corrosion resistant

LOW TEMPERATURE AIR HARDENING.
M-1424; 0.7 C, 2.1 Mn, 0.3 Si, 1.0 Cr, 1.3 Mo, 0.12 S, bal Fe.
Free machining grade
AISI Type A6 air hardening tool steel.

LOW-TIN COMMERCIAL BRONZE.
M-33, 90 Cu, 9.5 Zn. 0.5 Sn
½ Hard temper 53,000 TS; 46,000 YS; 10 El; 108 Brin
For bearings, bushings, thrust washers, bushing bronze.

LOXLEY
M-618; 0.7-0.8 C, bal Fe
For tools, taps, punches, water hardened.

L.P.D.
M-73, 0.35 C, 5 Cr, 1.5 W, 1.5 Mo, 1 Si, bal Fe.
For hot forging dies, punches, mandrels;
hot work steel.

LS
M-459, C, Mn, bal Fe
For rock press plates

L.S.D STEEL
M-1, 1.0 C, 0.30 Mo, 1.25 Cr, bal Fe.
Oil hardened
For tools, dies, rollers; water hardened.

LT-75HS
M-176, 0.22 max C, 1.1-1.6 Mn, 0.2-0.6 Si, bal Fe.
Plate 75,000 min YS, 95,000-115,000 TS.
For heavy construction equipment, off-shore drilling platforms, rail tankcars, cold storage tanks, bridges
Good low temperature toughness, quenched and tempered steel plate.

LT-75N
M-176, 0.20 max C, 0.70 1.35 Mn, 0.15-0.30 Si, bal Fe
Plate. 65,000-90,000 TS, 46,000-50,000 YS; 23-24 El.
For low temperature applications, cold storage tanks, rail tank cars
Good low temperature notch toughness

LT-75QT
M-176, 0.20 max C, 0.70-1.35 Mn, 0.15-0.30 Si, bal Fe
Plate: 75,000-100,000 TS, 56,000-60,000 YS; 23-24 El.
For low temperature applications, cold storage tanks, rail tank cars
Good low temperature notch toughness.

LTC-65% Gold.
M-1295; 65 Au, bal mostly Ni, Cr.
Wire for potentiometer winding.
High corrosion resistance combined with low temperature coefficient of resistance.

LUBALOY 411.
M-297, 90 Cu, 9.5 Zn, 0.5 Sn.
Ann: 38,000-44,000 TS; 9000-18,000 YS; 40-44 El.
Cold rolled: 42,000-87,000 TS, 17,000-78,000 YS; 1-40 El.
For bushings, washers, clutch plates, fuse clips; wear resistant and good corrosion resistance.

LUBALLOY X ALLOY 80.
M-279; 1.75 Sn, 8.25 Zn, bal Cu.
Hard: 70,000 TS; 4 El.
Soft: 45,000 TS; 50 El.
For contact springs, radio tube sockets, fuse clips; corrosion resistant

LUBALOY X425.
M-279; 88 Cu, 10 Zn, 2 S.
Ann: 40,000-50,000 TS; 12,000-24,000 YS; 44-55 El.
Cold rolled: 45,000-106,000 TS, 20,000-88,000 YS; 1-40 El
For electrical springs, connectors, terminals
High strength, fatigue-corrosion resistant.

LUBRAL
M-1397; 6.5 Sn, 1.07 Cu, 1 Ni, 0.14 Si, 0.19 Fe, bal Al.
Cast: 14,000 TS; 6.8 El; 37 Brin.
For bearings.

LUBRAL SN6.
M-1445; 1 Cu, 1.2 Si, 0.12 Ti, 1 Ni, 6 Sn, bal Al.
Rolled. 21,000-27,000 TS, 9,000-12,000 YS, 12-6 El; 45-55 Brin.
For light alloy parts.

LUBRICO NO. 1.
M-256, 75-70 Cu, 20-22 Pb, 5-10 Sn.
For bearings and bushings; heavy duty.

LUBRICO NO. 2.
M-256; 70-75 Cu, 20-22 Pb, 5-10 Sn, Ni
For bearings and bushings; heavy duty.

LUBRICO NO. 3.
M-256; 70-75 Cu, 20-22 Pb, 5-10 Sn, Ni.
For bearings and bushings; heavy duty

LUBRI-DIE.
M-289; 1.45 C, 0.8 Mn, 1.15 Si, 0.25 Mo, bal Fe.
Annealed: 84,500 TS, 49,500 YS, 25 El; 197 Brin.
Heat treated: 164,000 TS; 136,000 YS, 13 El; 302 Brin.
Heat treated 218,000 TS, 177,000 YS; 8 El, 388 Brin.
For blanking and forming dies, punches, gauges, hobs, cams, taps, pneumatic hammers, piercing dies.
Type 06, oil hardening, cold work tool steel

LUBRONZE 422.
M-279; 87 Cu, 12 Zn, 1 Sn.
Ann: 40,000-50,000 TS, 10,000-20,000 YS; 44-50 El.
Cold rolled: 47,000-94,000 TS; 20,000-83,000 YS; 1-40 El.
For electrical terminals, connectors, clips, chains; strength, stress corrosion resistance.

LUCALOX.
U.S.; Al_2O_3.
For cutting tools; sintered.

LUCAS NIFAL.
25 Ni, 12 Al, 63 Fe.
For permanent magnets.

LUCERNO.
68-65 Ni, 27-30 Cu, 0-2.4 Fe, 2.2-5.0 Mn.
For resistance alloy; heat resistant.

LUCKY 7.
M-1215, C, V, bal Fe. For tools; water hardened.

LUDENSCHEIDT BUTTON METAL.
Germany, 20 Cu, bal Zn.
For ornamental parts; die castings.

LUDITE
M-1; 12 Cr Silcrome backing on steel.
For tools, dies; wear resistant.

LUDLOY.
M-1422, C, alloy bal Fe.
Heat treated 265,000 TS, 13 El; 53 Rock C.
For chisels, sledges, arbors, dies, punches; shock resistant, water hardening

LUDLUM.
13-17 Cr, 1 Si, 1 Mo, 0.4 C, bal Fe.
For corrosion resisting parts, cutlery, corrosion resistant

LUDLUM 602
M-1, 0.50 C, 0.40 Mo, 1.5 Si, 0.12 V, bal Fe.
Hardened 330,000 TS, 270,000 YS, 9 El, 28 RA, 578 Brin.
For chisels, punches, shock resistant

LUDLUM 609
M-1; 0.6 C, 0.85 Mn, 2.0 Si, 0.25 Cr, 0.2 Mo, 0.2 V, bal Fe
For shear blades, punches, pneumatic tools, shock resistant

LUDLUM DBL 2-FZ
M-1, 0.8 C, 4 Cr, 2 V, 6 W, 5 Mo, bal Fe.
For lathe and planer tools, reamers, drills, taps, high speed steel, oil hardened

LUDLUM DBL-3
M-1, C, Cr, V, W, bal Fe.
For lathe and planer tools, reamers, broaches, high speed steel

LUDLUM 1 MW-FZ
M-1, 0.7 C, 3.25-4.25 Cr, 1.2-2.0 W, 0.75-1.0 V, 7.5-9.5 Mo, bal Fe.
For reamers, lathe tools, drills, broaches, high speed steel, oil hardened

LUDLUM VLM-FZ
M-1, 0.85 C, 8 Mo, 4 Cr, 2 V, bal Fe
For reamers, drills, hobs, taps, lathe cutters; high speed steel, oil hardened

LUDLUM XCM
M-1, 1.2 C, 1.4 Cr, 0.45 Mo, bal Fe.
For tools, taps, gauges, lathe centers, oil hardened

LUETECIN
France, 80 Cu, 16-6 Ni, 5 Zn, 5 Fe, 2 Sn, 1 Co
For cheap jewelry, corrosion resistant

LUKENS 2% NICKEL
M-176; 0.20 max C, 2 Ni, bal Fe

LUKENS 101 45
M-176, 0.42-0.50 C, 0.6-0.9 Mn, 0.1-0.3 Si, 0.10 0.35 Pb, bal Fe
Plate 93,000 103,000 TS, 53,000-56,000 YP; 20-23 El, 39-42 RA; 190-216 Brin
For rubber and fiberglass molds, dies, platens, sprockets, gears, cams, wheels
Tough, wear resistant, free cutting

LUKENS 45
M-176, 0.2-0.25 C, 1.2-1.35 Mn, 0.15-0.3 Si, bal Fe.
Plate: 65,000 TS, 45,000 min YS, 24 min El.
For bridges, barges, field-erected tanks, heavy industrial equipment
High strength carbon steel plate

LUKENS 50.
M-176; 0.2-0.25 C, 1.35 Mn, 0.2 Si, bal Fe.
Plate; 70,000 min TS; 50,000 min YS; 24 min El.
For bridges, barges, field-erected tanks, heavy industrial equipment.
High strength carbon steel plate.

LUKENS 55.
M-176; 0.23 C, 0.25 Si, 1.3-1.6 Mn, bal Fe.
Plate: 75,000 min TS; 55,000 min YS; 23 min El.
For bridges, barges, field-erected tanks, heavy industrial equipment.
High strength carbon steel plate.

LUKENS 60.
M-176; 0.23 C, 1.6 Mn, 0.25 Si, bal Fe.
Plate: 80,000 min TS; 60,000 min YS; 23 min El.
For bridges, barges, field erected tanks, heavy industrial equipment.
High strength carbon steel plate.

LUKENS 80.
M-176, 0.20-0.25 C, 1.1-1.6 Mn, 0.2-0.6 Si, bal Fe.
Heat treated: 95,000-120,000 TS, 75,000-80,000 YS; 19 El (min).
For welded structures, heavy industrial equipment, bridges
Good low temperature notch toughness

LUKENS A440
M-176; 0.28 C, 1.1-1.6 Mn, 0.20 min Cu, bal Fe.
Plate: 70,000 TS, 50,000 YS; 18 El.
For derricks, booms, bridges, mine cars, bus and truck bodies.
High strength low alloy steel

LUKENS A441
M-176, 0.22 C, 1.25 Mn, 0.20 min Cu, 0.02 min V, bal Fe
Plate. 70,000 TS; 50,000 YS; 22 El.
For bridges, booms, derricks, mine cars, bus and truck bodies
High strength low alloy steel

LUKENS AAR-M128 Gr A
M-176; 0.25 max C, 1.35-1.50 Mn, 0.04 max P, 0.05 max S, 0.3-0.5 Si, 0.02 max V, bal Fe.
Plate 81,000-101,000 TS; 50,000 YP, 19 El
For rail tank cars, pressure vessels, bridges, mine cars, derricks
High strength low-alloy structural steel.

LUKENS AAR-M128 Gr.B
M-176, 0.25 max C, 1.35-1.5 Mn, 0.04 max P, 0.05 max S, 0.3-0.5 Si, 0.08 max Mo, 0.25 max Cr, 0.25 max Ni, 0.35 max Cu, bal Fe.
Plate 81,000 101,000 TS, 50,000 YP; 19 El.
For rail tank cars, pressure vessels, bridges, mine cars, derricks
High-strength low alloy construction and structural steel.

LUKENS AR-300
M-176, 0.28 C, 1.4 Mn, 0.2-0.5 Si, 0.2 Cu, bal Fe.
Hardened 285-321 Brin; 137,000-158,000 TS; 123,000-148,000 YS, 10-11 El
For materials handling equipment, reactor vessels, floor wear plates
Quenched and tempered carbon steel plate.
Wear and abrasion resistant

LUKENS AR-350.
M-176; 0.3 C, 1.0-1.6 Mn, 0.4 Si, 0.20 Cu, bal Fe
Ht. Tr: 171,000 TS, 165,000 YS; 13 El; 320-380 Brin.
For materials handling equipment, reactor vessels, floor wear plates.
Quenched and tempered carbon steel plate.
Wear and abrasion resistant.

LUKENS CARBON-MOLYBDENUM STEEL.
M-176; 0.25 max C, 0.9 max Mn, 0.25-0.60 Mo, bal Fe.
Rolled: 65,000-87,000 TS; 33,000-41,000 YS.
For shell and vessel work, general fabrication; good creep values at elevated temperature.

LUKENS CHROME-NICKEL STEEL
M-176; 0.35-0.45 C, 0.3-0.6 Mn, 3.25-3.75 Ni, 1.25-1.75 Cr, bal Fe.
Heat treated: 200-300 Brin.
For hot rolled steel plates, wear and abrasion resistant parts; resists abrasion.

LUKENS CROMANSIL (GRADE A).
M-176; 0.17 max C, 1.05-1.40 Mn, 0.3-0.6 Cr, 0.6-0.9 Si, bal Fe.
Rolled: 75,000-90,000 TS, 45,000-54,000 YS.
For high tensile plate work; tough.

LUKENS CROMANSIL STEEL (GRADE B).
M-176; 0.25 max C, 1.05-1.40 Mn, 0.3-0.6 Cr, 0.6-0.9 Si, bal Fe.
Rolled: 85,000-100,000 TS; 47,000-55,000 YS.
For high tensile plate work; tough.

LUKENS HP.
M-176; 0.06 C, 0.35 Mn, 0.05 Si, 0.025 S, 0.025 P, bal Fe.
Plate: 35,000 TS; 25,000 YS; 28 El
For magnet cores in linear accelerators, cyclotrons, synchrotrons, bubble chambers
Soft magnet steel, high permeability, high flux density, low hysteresis loss.

LUKENS INCONEL-CLAD STEEL.
M-176, Inconel bonded to steel base
55,000 TS; 27,000 YS
For corrosion resistant parts; 10% Inconel of total plate thickness.

LUKENS LT-75
M-176; 0.20 max C, 0.70-1.35 Mn, 0.15-0.30 Si, bal Fe
LT-75 N. 65,000-90,000 TS, 46,000-50,000 YS; 23-24 El
LT 75 QT 75,000-100,000 TS, 56,000-60,000 YS; 23 24 El.
For low temperature applications, cold storage tanks, rail tank cars
Supplied in two grades LT-75N and LT-75 QT.
Low temperature steel, good notch toughness

LUKENS LT-75HS
M-176, 0.22 max C, 1.1-1.6 Mn, 0.2-0.6 Si, bal Fe.
Plate: 75,000 min YS; 95,000-115,000 TS
For heavy construction equipment, off shore drilling platforms, rail tank-cars, cold storage tanks, bridges Good notch toughness at −75°F, quenched and tempered steel plate.

LUKENS L-XX.
M-176, 0.20-0.25 C, 1.2-1.6 Mn, 0.15-0.30 Si, bal Fe
Plate: 65,000 min TS, 45,000 min YS; 23 min El.
For bridges, barges, booms derricks, heavy industrial equipment
High strength low alloy steel plate.

LUKENS M7.
M-176, 0.15 C, 0.6 Mn, 0.15 Si, 0.05 max S, 0.20 min Cu, bal Fe.
Plate. 66,000-86,000 TS, 38,000 min YP.
For bridges, buildings, hoppers, shafts, decks and hull plates, hatch covers, crushers
ASTM-A7.

LUKENS M36.
M-176; 0.25 C, 0.8-1.2 Mn, 0.15 Si, bal Fe.
Plate· 60,000-80,000 TS; 42,000 min YP; 23 El.
For bridges, buildings, hoppers, shafts, deck and hull plates, hatch covers, crushers, backing plates. ASTM-A36.

LUKENS M113.
M-176; 0.15 C, 0.60 Mn, 0.20 Si, 0.05 max S, 0.06 max P, 0.20 min Cu, bal Fe.
Gr. A 66,000-86,000 TS; 38,000 min YP.
Gr. B· 55,000-75,000 TS; 31,000 min YP.
Gr C: 53,000-73,000 TS; 30,000 min YP.
For bridges, buildings, hoppers, shafts, deck plates, hatch covers, crushers, locomotives and cars.
ASTM-A113 Gr. A, B, C.; High strength.

LUKENS M-131
M-176, 0.25 max C, 0.56-0.94 Mn, 0.30 max Si, bal Fe
Grades A, B, C: 64,000-84,000 TS; 37,000 min YP
For bridges, buildings, hoppers, shafts, deck and hull plates, crushers, hatch covers
ASTM-A131 Gr. A, B, C.

LUKENS M283
M-176; 0.20 C, 0.8 Mn, 0.2 Si, 0.2 min Cu, bal Fe.
Gr. A 50,000-70,000 TS, 28,000 min YP
Gr B 55,000-75,000 TS, 32,000 min YP.
Gr. C 61,000-81,000 TS, 35,000 min YP
Gr. D: 66,000-86,000 TS; 38,000 min YP.
For bridges, buildings, hoppers, shafts, deck and hull plates, hatch covers, crushers
ASTM-A283 Gr. A, B, C, D.

LUKENS M284.
M-176, 0.42 max C, 0.94 max Mn, 0.10-0.30 Si, bal Fe.
Gr A. 55,000 min TS; 29,000 min YP
Gr B 61,000 min TS; 32,000 min YP
Gr C· 66,000 min TS, 35,000 min YP
Gr. D: 66,000 min TS, 38,000 min YP
For bridges, buildings, hoppers, shafts, ship deck and hull plates, hatch covers, crushers
Good fabricability and weldability.
ASTM-A284 Gr A, B, C, D

LUKENS M573 Gr 65
M-176, 0.24-0.26 C, 0.85-1.2 Mn, 0.04 max P, 0.05 max S, 0.15-0.30 Si, bal Fe
Plate· 65,000 77,000 TS, 35,000 min YP, 20 El (in 8")
For mine cars, derricks, booms, bridges, general structures Improved toughness

LUKENS M573 Gr 70
M-176, 0.27 C, 0.85-1.2 Mn, 0.04 max P, 0.05 max S, 0.15-0.30 Si, bal Fe
Plate 70,000-85,000 TS, 38,000 min YS, 18 El (in 8")
For mine cars, bus bodies, booms, derricks, bridges
Improved toughness

LUKENS MANGANESE-VANADIUM STEEL
M-176, 0.18 max C, 1.0-1.45 Mn, 0.08-0.18 V, bal Fe
Rolled 80,000-95,000 TS; 50,000 YS.
For structural purposes, welds satisfactorily.

LUKENS MP
M-176; 0.10 C, 0.5 Mn, 0.2 Si, 0.03 S, 0.03 P, bal Fe.
Plate: 30,000 YS, 45,000 TS; 28 El.
For magnet cores in linear accelerators, cyclotrons, synchrotrons, bubble chambers
Soft magnet steel, medium permeability, high flux density, low hysteresis loss.

LUKENS NICKEL STEEL.
M-176; 0.22 max C, 0.4-0.8 Mn, 2.0-2.5 Ni, 0.15-0.25 Si, bal Fe
Rolled· 70,000 TS; 35,000 YS.
For vessels, boiler shells, dewaxing equipment, oil refinery; resists low temperature embrittlement.

LUKENS NINE NICKEL
M-176, 0.13 max C, 9 Ni, 0.80 max Mn, bal Fe.
Normalized: 90,000 TS, 60,000 YS; 22 El.
For storage and process vessels for handling liquid N_2 and O_2, for low temperature service.

LUKENS "T-1" Type B.
M-176, 0.12-0.21 C, 0.95-1.3 Mn, 0-0.4 Cu, 0.2-0.3 Mo, 0.4-0.65 Cr, 0.3-0.7 Ni, bal Fe.
Plate. 115,000-135,000 TS; 100,000 min YS; 18 El; 321 min or 360 min Brin
For structures, bridges, earth moving equipment
Good low temperature impact properties, good weldability

LUKENS T-1 A-360
M-176, 0.12-0.21 C, 0.7-1.0 Mn, 0.35 Si, 0.4-0.65 Cr, 0.15-0.25 Mo, 0.0005 B, 0.03 V, bal Fe.
Ht Tr Plate: 180,000 TS, 145,000 YS; 360 Brin.
For deck plates, pressure vessels, derricks, booms, earth moving equipment components
Quenched and tempered steel plates.
Wear resistant

LUMDIE.
M-73, 0.4 C, 1.0 Si, 0.2-0.4 Mn, 4.5 W, 5 Cr, 0.5 Co, bal Fe
For dies for Al die casting, header gripper dies on bolt machines, hot work steel

LUMEN 00-A
M-77, 80 Cu, 20 Sn
Cast 33,000 TS, 21,000 YS, 0.5 El, 0.4 RA, 143 Brin
For bells and bearings, alloy deoxidized with P

LUMEN 00-C
M-77, 84 Cu, 16 Sn
Cast. 32,000 TS, 27,000 YS, 1-1.5 El, 0.8-1.2 RA, 70-80 Brin
For bearing metal, washers, dies, trunnions, alloy deoxidized with P

LUMEN 1
M-77, 88 Cu, 8-10 Sn, 2-4 Zn
Cast 40,000 TS, 20,000 YS, 15-25 El, 14 23 RA; 57-74 Brin
For machine parts, spur and bevel gears, air valves, pumps, alloy deoxidized with Zn

LUMEN 1A
M 77, 88 Cu, 8 Sn, 4 Zn
Cast 40,000 TS, 18,000 YS, 20 El, 18 RA, 57 Brin
For bearings, bushings, liners
Corrosion resistant.

LUMEN 2
M-77, 86 Cu, 9.5 Sn, 2.5 Pb, 2.0 Zn
Cast 40,000 TS, 19,000 YS, 15 25 El, 12-23 RA, 52 65 Brin
For bearing bronze, worm gears, tough

LUMEN 4
M-77, 80 Cu, 10 Sn, 10 Pb.
Cast· 36,000 TS, 20,000 YS; 6-8 El; 5-7.5 RA; 46-70 Brin
For bearings, bushings, feed nuts; for high speeds.

LUMEN 5
M-77, 85 Cu, 5 Sn, 5 Pb, 5 Zn
Cast 37,000 TS; 18,600 YS, 15-20 El, 15-20 RA; 45-50 Brin
For medium and low pressure valve bodies, carburetors, general brass castings; Iz-6-7

LUMEN 6.
M-77; 78 Cu, 8 Sn, 14 Pb.
Chill cast: 32,000 TS; 18,000 YS; 10-15 El; 8-15 RA; 48-65 Brin.
For bushings, pumps, mine and acid machines; high speed heavy duty bushings; Iz-4-5.

LUMEN 9.
M-77; 57.5 Cu, 0.77 Sn, 40 Zn, 1.0 Fe, 1 0 Al, 0.25 Mn.
Cast: 65,000 TS; 25,000 YS; 10-35 El; 9-30 RA; 109-120 Brin.
For propeller blades and hubs, valves, pump bodies; known as Manganese Bronze; Iz-20-40.

LUMEN 11 C.
M-77; 89 Cu, 1 Fe, 10 Al.
Cast 75,000 TS; 30,000 YS; 15-25 El; 15-25 RA; 140-114 Brin
For gears, stripper nuts; shock resisting Al Bronze; Iz-30-36.

LUMEN 14.
M-77; 90 Cu, 6.5 Sn, 2.0 Zn, 1.5 Pb.
Cast: 40,000 TS, 18,000 YS; 15-33 El; 14-33 RA; 44-48 Brin.
For valve bodies, carburetors; oil pump; known as Valve or Steam Bronze; Iz-11-15.

LUMEN 15
M-77; 88 75 Cu, 11 Sn, 0.25 Pb.
Sand cast: 40,000 TS; 23,000 YS, 5-10 El; 5-10 RA, 63 70 Brin.
For worm wheels, heavy duty bearings, spur gears, deoxidized with P.

LUMEN 15A.
M-77; 11 Sn, 1 5 Pb, bal Cu.
Sand cast. 36,000 TS, 20,400 YS, 12 El; 10 RA; 54 Brin.
Permanent mold. 45,000 TS, 23,000 YS, 10 El; 8 RA, 72 Brin
For gears, worms, bearings; P-deoxidizer.

LUMEN 19
M-77, 62 5 Cu, 28 Zn, 2.5 Fe, 3 Mn, 4 Al.
Cast 90,000 TS; 45,000 YS; 18 El, 17 RA; 179 Brin
For propellers, shafts, gears, Mn-bronze.

LUMEN 20
M-77, 63 75 Cu, 23 Zn, 2.75 Fe, 3 75 Mn, 6.75 Al.
Cast 120,000 TS; 75,000 YS, 5-10 El, 4-8 RA; 240-270 Brin
For spur gears, gibs, cams, known as Super Mn Bronze; Iz-7-11.

LUMEN 31
M-77; 70 Cu, 9 Sn, 21 Pb
Cast. 27,000-29,000 TS, 17,000-19,000 YS, 17-14 El, 59-63 Brin
For bearings; heavy duty.

LUMEN 33.
M-77; 70 Cu, 4 Sn, 26 Pb.
Cast. 18,000-23,000 TS; 12,000-16,000 YS; 20-12 El, 41-45 Brin.
For bearings, heavy duty.

LUMEN 43.
M-77, 10 5 Sn, 1.5 Ni, bal Cu.
Cast: 50,000 TS; 27,000 YS; 15 El; 13 RA; 74 Brin.
For bearings, worm gears, nuts; corrosion resistant.

LUMEN 48.
M-77, 84 Cu, 10 Sn, 2.5 Pb, 3.5 Ni
Chill cast: 45,000 TS; 26,000 YS; 7 El, 8 RA; 83 Brin.
For bearings, worms, gears, nuts; deoxidized with P.

LUMEN 54.
M-77; 85 Cu, 10 Sn, 5 Pb.
Sand cast: 34,000 TS; 22,000 YS; 12 El; 10 RA; 50 Brin.
Permanent mold: 40,000 TS; 20,000 YS; 8 El; 7 RA; 70 Brin.
For elevator worm gears, feed nuts, tool bearings; IZ 4-7.

LUMEN 90.
M-77; 81 Cu, 14 Al, 5 Fe.
Cast. 302 Brin.
For die blocks; Al-bronze, wear resistant.

LUMEN 91.
M-77; 80 Cu, 15 Al, 5 Fe.
Cast. 340 Brin
For die blocks, Al-bronze, wear resistant.

LUMEN 96.
M-77; 8 5 Al, 3 5 Fe, bal Cu.
Cast. 73,000 TS; 25,000 YS; 120 Brin.
For gears, bolts, hardware, bearings; Al-bronze, corrosion resistant

LUMEN 97.
M-77, 85 Cu, 11 Al, 4 Fe.
Cast: 80,000 TS, 35,000 YS, 8 El; 6 RA; 163 Brin.
Heat treated: 90,000 TS; 45,000 YS; 3 El; 3 RA; 200 Brin.
For gears, feed nuts, shifter forks, Al-bronze, hardenable.

LUMEN 98
M-77, 84 Cu, 12 Al, 4 Fe
Cast 80,000 TS, 37,000 YS, 2 El, 1 RA; 212 Brin
For feed shoes, gibs, cams, gears, forming dies; Al bronze Wear resistant

LUMEN BRONZE.
M-77; 10 Cu, 86 Zn, 4 Al.
Cast: 36,000 TS; 36,000 YS; 0 El, 0 RA; 119 Brin.
For bearings for electric motors and lathes; will not resist excessive heat or live steam.

LUMINARC 2-S
M-811, 99 min Al.
For Al welding rod

LUNDIE B
M-73, 0.4 C, 1 Si, 5 W, 5 Cr, 0 25 Mn, bal Fe.
For die casting dies; oil hardened, wear resistant.

LUNDENHEIMER A-7-S.
M-264; 0 08 max C, 18-20 Cr, 8-10 Ni, bal Fe
Annealed: 80,000-95,000 TS; 30,000-45,000 YS; 60-55 El; 70-60 RA, 160-180 Brin.
For valves and valve parts, Type 304, stainless, austenitic.

LUNKENHEIMER NO. 25 IRON
M-264, 2 6 C, 1 0-1.5 Ni, bal Fe.
Cast 29,000 TS.
For valves, flanges, pipe fittings, cast iron.

LUNKENHEIMER NO 28 IRON
M-264, 2 6 C, 1 0-1 5 Ni, bal Fe.
Cast 39,000 TS.
For valves, flanges, pipe fittings; cast iron.

LUNKENHEIMER NO. 30 IRON
M-264, 2 6 C, 1.0-1.5 Ni, bal Fe.
Cast: 43,000 TS.
For valves, flanges, pipe fittings; cast iron.

LUNKENHEIMER NO. 50 IRON.
M-264; 2 6 C, 1.5 Ni, 0 3 Cr, 0.7 Mo, bal Fe.
Cast: 56,000 TS.
For valves, flanges, pipe fittings; alloy cast iron.

LUNKENHEIMER H-1.
M-264; Sn, alloy, bal Fe.
For bonnets, bushings, valves; valve bronze.

LUNKENHEIMER HB-1.
M-264; Sn, alloy, bal Fe.
For key cocks, valves; valve bronze.

LUNKENHEIMER ML-3.
M-264, 60 min Ni, 23 min Cu, 3.5 max Fe, 2 max C and Si.
Cast: 65,000-90,000 TS; 32,000-40,000 YS; 45-25 El, 125-150 Brin
For valve parts, discs, stems, seat rings, corrosion resistant.

LUNKENHEIMER ML-5.
M-264, 60 min Ni, 23 min Cu, 3.5 max Fe, 0.5 max Al, 2.0 max C + Si
Cast. 65,000-90,000 TS; 32,000-40,000 YS; 45-25 El
For valve parts, seat rings, disks, stems; corrosion resistant, cast Monel.

LUNKENHEIMER S-1
M-264; 6 Sn, 1.7 Pb, 3.7 Zn, 0.47 Ni, bal Cu.
Cast: 42,500 TS, 18,900 YS; 50 El
For valves; corrosion resistant, free-cutting

LUNKENHEIMER T-1.
M-264, 5 Sn, 4.6 Pb, 4.6 Zn, 0.75 Ni, bal Cu.
Cast 38,200 TS; 18,300 YS, 35 El.
For valves; corrosion resistant, free-cutting.

LUNKENHEIMER WC1
M-264; 0.19 C, 0.47 Si, 0.66 Mn, 0.56 Mo, bal Fe.
At 70°F 77,800 TS; 52,200 YS; 29.9 El; 48.5 RA.
At 950°F 63,000 TS, 37,000 YS; 30 El; 65 RA.
For castings, body bonnets.

LUNKENHEIMER WC4
M-688, 0.15 C, 0.5 Mo, 0.7 Cr, 0.9 Ni, bal Fe
Cast 86,000 TS, 60,000 YS, 29 El, 54 RA.
For valves, castings, resists graphitization

LUNKENHEIM WC 5.
M-264; 0.14 C, 0.93 Mo, 0.79 Cr, 0.88 Ni, bal Fe
Cast 88,000 TS; 61,000 YS; 27 El, 54 RA
For castings, valves, resists graphitization

LUNKENHEIMER WCB.
M-264; 0.27 C, 0.68 Mn, 0.43 Si, bal Fe
At 70°F 75,600 TS, 49,100 YS, 30 El, 47.2 RA
At 750°F. 64,000 TS, 27,000 YS, 35 El; 54 RA.
For castings, good weldability

LUNORIUM.
14.9 Cr, 0.9 Co, 55.6 Ni, 18.5 Mo, 4 W, 5 Fe, 0.2 Mn, 0.4 Si, 0.2 C.
Cast. 69,000 TS; 32,000 YS, 1.4 El.

LUNZ IRON
M-534; 1.5 C, 13 Cr, bal Fe
For glass molds, non-warping

LURGIMETALL.
M-299; 96.5 Pb, 2.8 Ba, 0.4 Ca, 0.3 Na
For bearing metals, anti-friction

LURIUM 107B.
M-1285, 0.5-1.0 Mg, 0.2-1.0 Si, bal Al
Heat treated. 28,500-42,700 TS; 21,400-35,600 YS; 15-5 El, 80-100 Brin.
For jewelry, reflectors, auto trim, lighting fixtures; takes good polishing and bright anodizing.

LURIUM L.
M-1285, 99.99 Al.
O. 6000 TS; 2100 YS; 60 El; 13 Brin.
½ H: 13,000 TS; 10,000 YS, 8 El; 25 Brin.
H: 20,000 TS; 18,500 YS; 4 El; 35 Brin.
For reflectors, domestic appliances; high reflectivity.

LURIUM L5.
M-1285; 0.4-0.6 Mg, bal Al.
Soft: 10,000 TS; 2800 YS, 40 El; 22 Brin.
½ H-temper: 21,400 TS, 20,000 YS; 6 El; 45 Brin.
H-temper: 27,000 TS; 25,800 YS; 2 El; 50 Brin.
For reflectors, ordnance and domestic appliances; high reflectivity.

LURIUM L10.
M-1285, 0.08-1.2 Mg, bal Al
Soft 14,200 TS; 4200 YS; 20 El; 30 Brin.
½ H-temper: 24,200 TS; 21,400 YS; 8 El; 50 Brin.
H-temper. 35,500 TS; 30,000 YS, 2 El, 60 Brin.
For reflectors, ornamental trim, domestic appliances, high reflectivity

LURIUM L20.
M-1285, 1.5-2.5 Mg, bal Al.
Soft: 21,400 TS; 7000 YS, 35 El, 40 Brin.
½ H-temper: 35,000 TS; 32,600 YS; 6 El; 75 Brin.
H-temper 50,000 TS, 45,500 YS; 2 El; 80 Brin.
For reflectors, ornamental trim, domestic appliances, high reflectivity.

LUSCO.
M-1422, C, alloy, bal Fe.
For pneumatic tools, wear and shock resisting tools and dies, oil hardened.

LUSTER
M-812, C, Cr, Ni, bal Fe.
For stainless parts, corrosion resistant

LUSTERITE-440 B
M-73, 0.8 C, 16.5-18 Cr, 0.5 Mo, bal Fe.
For surgical and dental instruments, knives, stainless, capable of extreme hardness

LUSTERITE 440C.
M-73, 1.1 C, 17 Cr, 0.5 Mo, bal Fe
Annealed 110,000 TS, 65,000 YS, 15 El; 30 RA; 210 Brin
Heat treated: 280,000 TS, 270,000 YS, 3 El; 15 RA, 555 Brin
For bearings, knives, cutlery, Type 440C, stainless, hardenable

LUSTRE-DIE.
M-24, M-341; 0.5 C, 1.0 Mn, 0.3 Si, 0.25 Mo, 1.1 Cr, bal Fe
302-352 Brin, for plastic mold dies; good weldability

LUXAL 63/25
M-116, 2-4 Mg, 0.4 max Mn, 0.3 max Cr, bal Al
Soft 28,000 TS, 13,000 YS, 30 El, 47 Brin
Hard. 40,000 TS, 35,000 YS; 10 El; 73 Brin.
For aircraft tanks and fittings, fuel lines, marine parts; resists sea water corrosion

L-VICTRIX
M-96, 0.26 C, 2.3 Cr, 1.3 Ni, 0.15 Mo, 0.1 V, bal Fe
For gears, shafts; case hardening.

L-VICTRIX EXTRA
M-96, 0.26 C, 2.45 Cr, 1.75 Ni, 0.23 Mo, bal Fe.
For gears, shafts, case hardening

L-VICTRIX SPECIAL.
M-96, 0.15 C, 1 Cr, 3.65 Ni, 0.35 Mo, bal Fe.
For gears, shafts, case hardening.

L-VICTRIX SPECIAL 32.
M-96; 0.26 C, 0.75 Cr, 0.65 W, 3.4 Ni, 0.3 Mo, bal Fe.
For gears, shafts; case hardening.

LW 2325.
M-Germany; 0.10 C, 0.42 Si, 0.26 Mn, 15.68 Cr, 5.25 W, 1.38 Mo, 2.14 Al, 1.58 Ti, 1.68 Fe, bal Ni.
For hot extrusion dies.
Good high temperature properties and wear resistance.

LW 2326.
M-Germany; 0.18 C, 0.34 Si, 0.39 Mn, 14.91 Cr, 1.39 W, 4.35 Al, 1.68 Fe, bal Ni.
For hot extrusion dies.
Good high temperature properties and wear resistance.

LXX see ALLEGHENY-LUDLUM LXX.

LXX-5T.
M-1, 0 4 C, 18 W, bal Fe.
For hot work, tools and dies; hot work steel.

LYNCAST
M-523; High C, Mn, Si, bal Fe
For chemical engineering equipment; cast iron.

LYNITE.
M-92; 9-13.5 Cu, bal Al.
For castings, pistons, connecting rods; piston alloy.

LYNITE.
M-92, 2 Cu, 1.5 Mg, 0.8 Fe, 0 02 Si, bal Al.
For pistons; age hardenable.

LYNITE 43
M-4, M-92; 95 Al, 5 Si.
Sand cast: 19,000 TS; 9,000 YS; 4 El, 50 Brin.
For light alloy automotive and airplane bodies, see Alcoa 43

LYNITE 109
M-92; 11 5-13 5 Cu, 1.7 Fe + Mn + Mg + Si, bal Al
19,000-28,500 TS, 15,000 YS; 0 5-1.0 El; 70 Brin.
For pressure castings, pistons, chill castings, pressure castings, registered name

LYNITE 112.
M-4, M-192, 90 Al, 7-8 Cu, 1.5 Zn, 1 3 Fe.
Sand cast· 22,000 TS, 14,000 YS; 2 El, 70 Brin
For crankcase, see Alcoa 112

LYNITE 122
M 92, 9 25-10 75 Cu, 2 Fe + Mn + Mg + Si, bal Al
28,000-40,000 TS; 20,000 YS, 1.5-0 5 El; 115 Brin.
For castings to be used at high temperatures, pistons; registered name

LYNITE NO 145
M-92, 87 7 Al, 3 Cu, 8 Zn, 1 25 Fe.
27,500 TS; 4 5 El; 65 Brin
For light alloy castings; casting, shock resistant.

LYNITE NO 146
M-92, 91-93 Al, 7-8 5 Cu, 1 3 Fe, 0 1-1 7 other elements
26,000 TS; 1 4 El
For light alloy castings; casting.

LYNUX BRONZE.
Eng ; 89 Cu, 7 2 Fe, 3.8 Al.
For corrosion resisting hardware and fittings.

LYONORE.
M-456, 0.2 C, 0.2 Cu, 0.5 Cr, 0 8 Ni, bal Fe.
For structural parts; copper open hearth steel.

LYON'S GOLD.
Eng.; 27 Zn, 72 Cu.
For cartridge cases, condenser tubes, brazing; "Tombac."

M1-CARBIDE.
M-Germany; 84 WC, 10 TiC + TaC, 6 Co.
For hard tools, cutters, dies.
Sintered carbides, wear and abrasion resistant.

M2A.
M-118, Mo alloy.
For spot welding tips.

M-2A STEEL.
M-1191; 0 25-0.30 C, 1.15-1.25 Ni, bal Fe.
Cast: 80,000-95,000 TS; 53,000-58,000 YS; 30-24 El, 50-35 RA; 175-200 Brin.
For sheave wheels, gears; oil hardened, shock resistant

M2-CARBIDE.
M-Germany; 82 WC, 10 5 TiC + TaC, 7.5 Co.
For hard tools, cutters, dies.
Sintered carbides, wear and abrasion resistant.

M-2 DREADNAUGHT
M-362, 0 80 C, 4 Cr, 2 V, 6 W, 5 Mo, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel; Type M2

M-2 STEEL.
M-1191, 0.30 C, 1 15 Mn, 1.25-1.5 Ni, bal Fe
Cast· 90,000-110,000 TS; 55,000-65,000 YS; 30-20 El, 50-40 RA; 200-250 Brin
For lifting forks for trucks, oil hardening, shock resistant.

M-3 DREADNAUGHT.
M-362, 1 C, 4 Cr, 2 7 V, 6 W, 5 Mo, bal Fe.
For lathe and planer tools, reamers, broaches, taps, Type M3, high speed steel.

M-3 SILECTRON
M-1, 3 Si, bal Fe
Core loss 0 49 watts/lb max
For transformers, laminations.
Electrical steel, high permeability

M-10 AIR HARDENING
M-81, 1 C, 5 Cr, 1 Mo, 0 25 V, bal Fe
For gauges, punches, cold work dies; air hardening AISI A2

M-11
M-1105, 0 7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For taps, threading tools; high speed steel.

M22VC.
M-86, 0 08-0 16 C, 5 0-6 5 Cr, 5 9-6 6 Al, 1.5-2 5 Mo, 10 5-11.5 W, 2 6-3 4 Ta, 0.4-0 8 Zr, 1 Q max Fe, bal Ni
Cast 106,700 TS, 99,000 YS, 5 6 El, 14 RA
At 600°C· 117,000 TS, 109,000 YS, 4.5 El, 13.8 RA.
For aircraft gas turbines, spinners for glass fibre production
High temperature vacuum casting alloy, Creep and oxidation resistant.

M115
M-1548; 1.5 Mn, bal Al
Half Hard· 22,000 TS, 16,000 YS; 7-14 El; 40-45 Brin
Hard 35,000 TS, 31,000 YS; 3-6 El, 60 Brin
For roofing, structures, commercial vehicles.
Corrosion resistant, non-hardenable

M-252
M-1, M-114, M-73; 0.15 C, 0 5 Mn, 0 5 Si, 20 Cr, 10 Co, 10 Mo, 2 6 Ti, 1 0 Al, 0 005 B, bal Ni.
Bar 180,000 TS; 122,000 YS; 16 El
At 1400°F: 137,000 TS; 104,000 YS, 10 El.
For high temperature service, bolts, jet engine and gas turbine parts.
Heat and corrosion resistant.

M331.
M-365; 0.32 C, 3.4 Cr, 0.4 V, 2.5 Mo, bal Fe.
Air or oil hardening hot work tool steel.

M333.
M-365; 0.30 C, 3.0 Cr, 0.6 V, 3.0 Mo, 2.25 Co, bal Fe.
Air or oil hardening hot work tool steel.

MA-18NiCoMo.
M-68, C, 18 Ni, Co, Mo, bal Fe.
Heat treated: 220,000-305,000 TS; 215,000-300,000 YS, 64-60 RA.
Ductile and weldable.

MACADAMITE.
M-92; 74 Al, 3 Cu, 23 Zn.
34,500 TS; 1.0 El
For pistons; sand castings.

MACCO 33.
M-80; 0 4 C, 5.5 Cr, 1 4 Mo, 1 V, 1 Si, bal Fe.
For die casting dies; air hardening

MACCO 35.
M-80; C, alloy, bal Fe
For tools, air-hardened.

MACCO 35 AIR HARD.
M-80; 1 C, 0.6 Mn, 5.25 Cr, 1.15 Mo, 0.25 V, bal Fe.
For punch and cold work dies; air hardening.

MACCO 99.
M-80; 0.35 C, 0 8 Mn, 0 85 Cr, 0.35 Mo, 0.6 Si, bal Fe
For die casting dies; water or oil hardening.

MACCO ALLOY RAZOR BLADE.
M-80; 0.7 C, 1 2 Cr, bal Fe.
For razor blades; water hardened.

MACCO B-29.
M-80; 0.98 C, 0.26 Mn, 0.2 V, bal Fe.
For cold heading and forming dies, water hardening.

MACCO BELT KNIFE.
M-80; C, Cr, Ni, V, Si, Mn, bal Fe.
For knives, leather splitting belt knives, oil hardened

MACCO BRAKE DIE.
M-80, 0 50 C, 0.90 Mn, 1.02 Cr, 0.22 Mo, bal Fe.
For brake dies; oil hardened

MACCO BRAND SWEDISH.
M-80; C, bal Fe.
For tools; special grade of tool steel.

MACCO CARBON.
M-80; 1 0 C, 0.20 Mn, 0 16 Si, bal Fe.
Annealed: 100,000 TS; 53,000 YS, 21 El, 42 RA; 200 Brin.
For drills, taps, chasers, lathe and planer tools; Type W1; water hardened.

MACCO CERTIFIED.
M-80; C, bal Fe.
For general purpose tools; water hardening.

MACCO ENORMOUS.
M-80; 0.8 C, 5 Cr, 17 W, 1.5 V, 5 Co, bal Fe.
For taps, dies, twist drills, cutters; high speed steel.

MACCO FOOLPROOF O.H.
M-80; 0.55 C, 1.25 Cr, 2.75 W, 0.2 V, bal Fe.
Heat treated: 244,000-315,000 TS; 209,000-275,000 YS; 9-11 El; 27-42 RA; C 48-56 Rock.
For header and swaging dies, chipping chisels, rivet busters, track tools.
Type S1 shock resisting tool steel, good fatigue resistance.

MACCO HARDTUF.
M-80; 0.6 C, 0.45 Mo, 0.20 V, 1.85 Si, bal Fe.
For plastic mold dies; oil hardened.

MACCO HOBOMOLD A.
M-80; 0.07 C, 4.5 Cr, 0.45 Mo, 0.4 Mn, bal Fe.
For plastic mold dies; Type P4; air hardened, hobbing steel.

MACCO HOBOMOLD B.
M-80; 0.06 C, 0.03 Mn, 1 Cr, 0 20 Si, bal Fe.
For plastic mold dies, Type P5; oil hardened, hobbing steel.

MACCO HOBOMOLD C.
M-80, 0 04 C, 0.2 Mn, 0 16 Si, bal Fe.
For plastic mold dies; case-hardening.

MACCO HOLLOW-DRILL.
M-80; C, bal Fe.
For hollow drills, tools, rock drills; water hardened.

MACCO KROMAX.
M-80, 2 5 C, 0.6 Si, 0 5 Ni, 12-14 Cr, bal Fe.
For dies, tools; does not possess red hardness.

MACCO KROMAX 1
M-80; 1 5 C, 11.9 Cr, 0 7 V, bal Fe
For blanking, forming and punching dies; air hardened, non-deforming.

MACCO KROMAX 2.
M-80; 1.4 C, 12 5 Cr, 0 85 Mo, 3 25 Co, 0.4 Si, bal Fe.
For blanking, punching, forming dies; air hardening, cold forming.

MACCO KROMAX SPECIAL
M-80, 1 6 C, 12 4 Cr, 0 72 Mo, bal Fe
For tools, dies; non-deforming

MACCO LENS MOLD.
M 80, 0.4 C, 5 25 Cr, 4 65 W, 1 Si, bal Fe
For die casting lens mold, oil hardening

MACCOMAX
M-80, 0 7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, cutters; high speed steel.

MACCO MI
M-80, 0 35 C, 5 Cr, 1.5 W, 1 65 Mo, 1 Si, bal Fe.
For hot work dies, hot work steels.

MACCO M L V.
M-80, 0 35 C, 1 05 Si, 1.55 W, 1 65 Mo, 5 15 Cr, bal Fe
Hardened. 216,000 TS, 185,000 YS, 14 El, 53 RA.
At 1000°F 144,000 TS; 110,000 YS; 19 El, 64 RA.
For die casting dies, hot shear blades, forging and heading dies, punches
Type H12 hot work tool steel, tough and shock resistant.

MACCO NLS.
M-80, 0 9 C, 0 6 Mn, 5 2 Cr, 1 2 Mo, 0.3 V, bal Fe.
For plastic molding dies; oil hardening

MACCO NON-TEMP.
M-80; 0.35 C, 0 30 Cu, 0 45 Si, 0.70 Mn, 0 80 Cr, 0 30 Mo, bal Fe.
For general purpose tools, dies, punches; oil or water hardened, shock resistant.

MACCO P-125.
M-80; 0.25 C, 4.2 Cr, 14.5 W, 0.5 V, bal Fe.
For hot work dies; hot work steels.

MACCO P-150.
M-80; 0.5 C, 2 9 Cr, 15.3 W, 0.6 V, bal Fe.
For hot work dies; high speed steel.

MACCO P-175.
M-80; 0.3 C, 3.3 Cr, 9.5 W, 0.5 V, 0.4 Si, bal Fe.
For hot work dies; hot work steel.

MACCO RADIO.
M-80; 0.8 C, 4 Cr, 6 W, 5.5 Mo, 1.8 V, bal Fe.
For tools, cutters; high speed steel.

MACCO ROYAL CROWN.
M-80; 1.0 C, 1.0 Cr, 0.5 W, 0.5 Mn, bal Fe.
For dies, punches, taps, drills, reamers, drawing dies; non-deforming steel.

MACCO SILICON MANGANESE.
M-80; 0.63 C, 0.78 Mn, 2 Si, bal Fe.
For punches, chisels, crimpers; Type S4; oil hardened, shock resistant

MACCO SILVER DIE.
M-80, 0.52 C, 1 Mn, 1.1 Cr, 0.25 Mo, bal Fe.
For dies for plastic molds, oil hardened.

MACCO SPECIAL.
M 80, 1 0-1 1 C, bal Fe.
For tools, drips, taps; water hardening.

MACCO SUPERIOR HIGH SPEED.
M-80, 0 72 C, 4 Cr, 1 V, 18 5 W, bal Fe.
For tools, cutters, drills; high speed steel.

MACCO SUPERIOR SWEDISH.
M-80; C, bal Fe
For tools, special punches, dies, oil hardened.

MACCO SUPER MOLY.
M-80; 0 8 C, 3 9 Cr, 1 7 W, 8.8 Mo, 1 1 V, bal Fe
For cutting tools, reamers, high speed steel.

MACCO SWEDISH CHROME TUNGSTEN.
M-80, C, Cr, W, bal Fe
For tools, special taps, dies, water hardened.

MACCO SWEDISH MAGNETIC IRON
M-80, 0 2 C, 0 02 Si, bal Fe.
For magnetic parts for all kinds of electrical instruments, high permeability.

MACCO WJF
M 80, 1 4 C, 4 W, 0 35 V, 0 6 Cr, bal Fe.
For cutters, taps, reamers, water hardened, fast finishing

MAC HEMPITE GRADE A
M-229, 1.5-3 5 Ni, 0 7 4 Mn, 0-1 25 Cr, 0-0 75 Mo, 0 4-3.0 C, bal Fe.
Soft 100,000 TS, 65,000 YS; 25 El, 45 RA.
Hard. 600 Brin.
For jaws, rollers, tires, balls, liners, impellers, heavy crusher grade, resists wear and spalling.

MAC HEMPITE GRADE B
M-229, 1 5 3 5 Ni, 0 7-4 Mn, 0-1 25 Cr, 0-0 75 Mo, 0 4-3 0 C, bal Fe
Soft 90,000 TS, 65,000 YS, 25 El, 45 RA; 200 Brin
For heavy duty gears, pinions, medium hardened grade, shock resistant

MAC HEMPITE GRADE C
M-229; 1 5-3 5 Ni, 0.7-4 Mn, 0-1 25 Cr, 0-0.75 Mo, 0 4-3.0 C, bal Fe.
For gears, pinions, hammers, beaters, conveyor parts, brake-drums; hardened grade.

MACHINE BRONZE.
M-77; 50 Cu, 25 Ni, 25 Sn.
For bearings; wear resisting

MACHINERY #30.
M-435; 0.3 C, 0.8 Mn, 0.2 Si, bal Fe.
For machinery parts; construction steel.

MACHINERY #40.
M-435; 0.4 C, 0.8 Mn, 0.2 Si, bal Fe.
For machinery parts; construction steel.

MACHINERY BRASS.
England; 16 Zn, 1 Sn, bal Cu.
For machinery parts; corrosion resistant.

MACH'S ALLOY
98-90 Al, 2-10 Mg.
For light alloy parts.

MACH'S SPECULUM.
69 Al, 31 Mg.
For light alloy parts.

MACHTS METAL.
57 Cu, 43 Zn.
For brazing metal, hardware

MACHT'S YELLOW METAL.
57 Cu, 43 Zn.
For hardware, bolts, nuts; high strength.

MAC-IT.
M-1081, 0 4 C, 0 8 Cr, 1.5 Ni, bal Fe
For screws, threaded fasteners; oil hardening

MACKENITE METAL
M-177; 0.2 C, 20 Cr, 12 Ni, bal Fe
For annealing pots, furnace pots; heat resistant

MacKENZIE METAL.
70-68 Pb, 17-16 Sb, 13-16 Sn.
For bearings, anti-friction.

MACLOY B.
M 521, 0 27 C, 0.3 Si, 1 25 Mn, 11 Cr, 36 Ni, bal Fe.
Heat treated· 90,000 TS; 64,000 YS; 30 El; 55 RA, 200 Brin.
For corrosion and heat resistant parts; austenitic, stainless

MACLOY G.
M-521, 0 5 C, 1.8 Si, 0.6 Mn, 17 Cr, 37 Ni, bal Fe.
94,000 TS, 54,000 YS, 30 El, 40 RA; 200 Brin
For heat and corrosion resistant parts, austenitic, heat and corrosion resistant

MACOLOY TYPE E.
M-1107, P, bal Cu
For brazing, M P. 1150°F

MACOLOY TYPE F
M-1107; P, bal Cu
For brazing, M P. 1180°F.

MACOLOY TYPE G
M-1107; P, bal Cu
For brazing, M P. 1600-1900°F

MACROMAL
M-625, 0 2 C, 12-13 Mn, bal Fe
Rolled 100,000-135,000 TS, 35,600 YS; 30 El.
For compass housings, deck superstructures, transformer shields, austenitic, nonmagnetic

MACROMAL S.
M-625; 0.2 C, 17-18 Mn, bal Fe
Rolled· 100,000-135,000 TS, 35,600 YS; 30 El.
For compass housings, deck superstructures, transformer shields; austenitic, nonmagnetic.

MACROSIL
M-297, 0.15 max C, 11-13 Cr, 1.5-2.5 Ni, 0.3-0.6 Mo, 17-19 Mn, bal Fe.
For chemical plant equipment; corrosion resistant.

MADISON-KIPP NO. 400.
M-1051; 8 Si, bal Al.
For die castings; corrosion resistant

MAERKER IRRUBIGO 1.
M-1305; 0.10 C, 13.0 Cr, bal Fe.
Air or oil hardenable; corrosion resistant.
Ht. Tr.: 85,000-107,000 TS; 18 min El; 140-210 Brin.
Yield strength at 750°F: 44,100 psi min.
For jet engine parts, steam turbine parts; parts subject to corrosion by water and steam.
DIN X10Cr13; AISI 410; VDEh spec 4006.

MAERKER IRRUBIGO 1 Mo.
M-1305; 0.15 C, 13.0 Cr, 1.15 Mo, bal Fe.
Air or oil hardenable; corrosion resistant.
Ht. Tr.: 107,000-128,000 TS; 14 min El; 220-260 Brin.
Yield strength at 750°F. 51,000 psi.
For fittings, brackets, hardware for increased strength and oxidation resistance at elevated temperatures.
DIN XCrMo13; VDEh Spec 4119

MAERKER IRRUBIGO 1S.
M-1305; 0.13 C, 13.0 Cr, 0.35 Mo, 1.60 Ni, bal Fe
Oil or air hardenable, corrosion resistant
Ht. Tr: 114,000-135,000 TS, 14 min El; 225-275 Brin
For highly stressed machine parts subject to corrosion by water and steam
DIN X13CrNiMo13

MAERKER IRRUBIGO 2.
M-1305; 0.20 C, 13.0 Cr, bal Fe.
Air or oil hardenable.
Ht. Tr: 114,000-135,000 TS; 14 min El; 225-275 Brin.
For higher stressed parts subject to corrosion by water and steam.
DIN X20Cr13; (AISI 420); VDEh Spec 4021.

MAERKER IRRUBIGO 2 Mo.
M-1305; 0.20 C, 13.0 Cr, 1.15 Mo, 1.0 max Ni, bal Fe.
Air or oil hardenable; corrosion resistant.
Ht. Tr.: 107,000-128,000 TS; 14 min El; 220-260 Brin.
Yield strength at 750°F: 51,000 psi.
For fittings, brackets, hardware for increased strength and oxidation resistance at elevated temperature.
DIN X20CrMo13, VDEh Spec 4120.

MAERKER IRRUBIGO 3.
M-1305; 0.45 C, 13.0 Cr, bal Fe.
Air or oil hardenable to about C 54 Rock.
Ann: 92,000-114,000 TS, 180-225 Brin.
For corrosion resistant cutting appliances; parts subject to wear and tear, shears, cutlery.
DIN X40Cr13, VDEh Spec 4034.

MAERKER IRRUBIGO 6M.
M-1305, 0.05 C, 25.0 Cr, 1.55 Mo, 7.0 Ni, Nb = 10 × C, bal Fe
Quenched: 92,000-114,000 TS, 25 min El, 190-230 Brin.
For machine parts highly stressed, but which must resist rust and corrosion
DIN X5CrNiMo257, VDEh Spec 4582.

MAERKER IRRUBIGO 12.
M-1305; 0.05 C, 17.5 Cr, 4.75 Mo, 13.5 Ni, bal Fe.
Quenched: 71,000-107,000 TS; 35,500 YS; 45 min El, 130-190 Brin.
Resistant to corrosion by halogen salt solutions.
Indifferent to localized corrosion.
DIN X5CrNiMo1713; VDEh Spec 4449;
Similar to AISI 317.

MAERKER IRRUBIGO 17h.
M-1305; 0.22 C, 17.0 Cr, 2.0 Ni, bal Fe.
Air or oil hardenable, corrosion resistant.
Ht. Tr: 114,000-135,000 TS; 14 min El; 225-275 Brin
Yield strength at 750° F: 54,000 psi.
For machine parts subject to high mechanical stress with increased resistance to weak acids, salt solutions, resistant to sea water.
DIN X22CrNi17; VDEh Spec 4057.

MAERKER IRRUBIGO 25.
M-1305, 0.05 C, 25.0 Cr, 2.25 Mo, 25.0 Ni, Nb = 8 × %C, bal Fe.
Quenched: 71,000-107,000 TS, 35,500 YS; 35 min El, 130-190 Brin.
Good resistance to non-oxidizing acids, for use in the manufacture of viscose products, coking plants, chemical industry.
DIN X5CrNiMoNb2525; VDEh Spec 4578.

MAERKER IRRUBIGO 42.
M-1305, 0.06 C, 20.0 Cr, 5.0 Mo, 42.0 Ni, 2.25 Cu, Nb = 10 × %C, bal Fe.
Quenched: 78,000-114,000 TS, 28,400 YS; 30 min El, 140-200 Brin
Resistant to sulphuric acid, phosphoric acid, organic acids and their salt solutions
DIN X5CrNiMoCuNb2042

MAERKER IRRUBIGO 188
M-1305, 0.10 C, 18.0 Cr, 9.0 Ni, bal Fe
Quenched 71,000-100,000 TS, 31,300 YS; 50 min El, 130-180 Brin
Basic type of corrosion resistant austenitic stainless steel, general use
DIN X12CrNi188, VDEh Spec 4300; AISI 302

MAERKER IRRUBIGO 188A
M-1305, 0.12 C, 18.0 Cr, 9.0 Ni, 0.15 S, bal Fe
Quenched 71,000-100,000 TS, 31,300 YS; 50 min El; 130-180 Brin.
Good machinability, for stainless parts requiring much machining
DIN X12CrNiS188; VDEh Spec 4305; AISI 303

MAERKER IRRUBIGO 188 El
M-1305, 0.02 C, 18.5 Cr, 11.5 Ni, bal Fe
Quenched 64,000-100,000 TS, 25,600 YS, 50 min El, 130-180 Brin
Welding grade austenitic stainless, not necessary to heat treat after welding
DIN X2CrNi189, VDEh Spec 4306; AISI 304L.

MAERKER IRRUBIGO 188N
M-1305, 0.08 C, 18.0 Cr, 10.50 Ni, Nb = 8 × %C, bal Fe
Quenched 71,000-107,000 TS; 29,800 YS; 40 min El, 130-190 Brin.
Welding grade austenitic stainless, also used for parts operating at elevated temperatures.
DIN X10CrNiNb189; VDEh Spec 4550, AISI 347.

MAERKER IRRUBIGO 188 S.
M-1305; 0.08, 18.0 Cr, 10.5 Ni, Ti = 5 × %C, bal Fe.
Quenched 71,000-107,000 TS; 29,800 YS, 40 min El, 130-190 Brin.
Welding grade austenitic stainless; also used for parts operating at elevated temperatures.
DIN X10CrNiTi189; VDEh Spec 4541; AISI 321.

MAERKER IRRUBIGO 188 SS.
M-1305, 0.05 C, 18.5 Cr, 11.5 Ni, bal Fe.
Quenched: 71,000-100,000 TS, 27,000 YS; 50 min El, 130-180 Brin.
Improved quality austenitic stainless; weldable without following heat treatment.
DIN X5CrNi189; VDEh Spec 4301; AISI 304.

MAERKER IRRUBIGO 199.
M-1305; 0.10 C, 18.0 Cr, 2.25 Mo, 10.0 Ni, bal Fe.
Quenched: 71,000-107,000 TS; 31,300 YS; 40 min El; 130-190 Brin.
Excellent corrosion resistance; resistant to sulphites, phosphoric acid, organic acids, etc.
DIN X12CrNiMo1810.

MAERKER IRRUBIGO 199 EL.
M-1305, 0.02 C, 17.5 Cr, 2.25 Mo, 12.0 Ni, bal Fe.
Quenched: 64,000-100,000 TS, 28,400 YS, 45 min El, 130-180 Brin
Excellent corrosion resistance; resistant to sulphites, phosphoric acid, organic acids, etc.; weldable without subsequent heat treat.
DIN X2CrNiMo1810; VDEh Spec 4404; AISI 316 L

MAERKER IRRUBIGO 199 N.
M-1305, 0.08 C, 17.5 Cr, 2.25 Mo, 12.0 Ni, Nb = 8 × %C, bal Fe.
Quenched. 71,000 107,000 TS, 32,700 YS; 40 min El; 130-190 Brin
Excellent corrosion resistance; resistant to sulphites, phosphoric acid, organic acids, etc.; weldable without subsequent heat treat.
DIN X10CrNiMoNb1810, VDEh Spec 4580.

MAERKER IRRUBIGO 199 S
M-1305, 0.08 C, 17.5 Cr, 2.25 Mo, 12.0 Ni, Ti = 5 × %C, bal Fe.
Quenched 71,000-107,000 TS, 32,700 YS, 40 min El, 130-190 Brin
Excellent corrosion resistance; resistant to sulphites, phosphoric acid, organic acids, etc.; weldable without subsequent heat treat
DIN 10CrNiMoTi1810; VDEh Spec 4571

MAERKER IRRUBIGO 199 SS
M-1305, 0.05 C, 17.6 Cr, 2.25 Mo, 12.0 Ni, bal Fe.
Quenched 71,000 100,000 TS, 29,900 YS; 45 min El, 130-180 Brin
Excellent corrosion resistance; resistant to sulphites, phosphoric acid, organic acids, etc, weldable without subsequent heat treat
DIN 5CrNiMo1810; VDEh Spec 4401, AISI 316

MAERKER IRRUBIGO 200 EL
M-1305, 0.02 C, 17.5 Cr, 2.75 Mo, 13.5 Ni, bal Fe
Quenched: 64,000-100,000 TS, 28,400 YS; 45 min El, 130-180 Brin.
Increased resistance to sulphites and organic acids, weldable without subsequent heat treat.
DIN X2NiCrMo1812, VDEh Spec 4435; AISI 316L

MAERKER IRRUBIGO 200 N.
M-1305, 0.08 C, 17.5 Cr, 2.75 Mo, 13.5 Ni, Nb = 8 × %C, bal Fe
Quenched: 71,000-107,000 TS; 32,700 YS, 40 min El; 140-190 Brin.
Increased resistance to sulphites and organic acids, weldable without subsequent heat treat.
DIN X10CrNiMoNb1812; VDEh Spec 4583; AISI 316 Cb

MAERKER IRRUBIGO 200 SS.
M-1305; 0.05 C, 17.5 Cr, 2.75 Mo, 13.5 Ni, bal Fe
Quenched: 71,000-100,000 TS; 29,800 YS; 45 min El; 140-180 Brin.
Increased resistance to sulphites and organic acids; weldable without subsequent heat treat.
DIN X5CrNiMo1812; VDEh Spec 4436; AISI 316.

MAERKER IRRUBIGO 1818.
M-1305; 0.05 C, 17.5 Cr, 2.25 Mo, 20.0 Ni, 2.0 Cu, Nb = 8 × %C, bal Fe.
Quenched: 71,000-107,000 TS; 31,300 YS; 40 min El; 130-190 Brin.
Resistant to sulphuric acid.
DIN X5CrNiMoCuNb1818; VDEh Spec 4505.

MAERKER IRRUBIGO EXTRA M.
M-1305, 0.38 C, 16.5 Cr, 1.15 Mo, 1.0 max Ni, bal Fe.
Air or oil hardenable; corrosion resistant.
Ht Tr.. 114,000-135,000 TS; 14 min El; 225-275 Brin.
Yield strength at 750°F: 56,000 psi.
For shafts, valves, spindles, fittings resistant to corrosion by sea water, organic acids, halogen salts; good at elevated temperature.
DIN X35CrMo17; VDEh Spec 4122

MAERKER IRRUBIGO MC 18 w.
M-1305; 0.90 C, 18.0 Cr, 1.15 Mo, 0.10 V, bal Fe.
Air or oil hardenable; corrosion resistant.
Ann: 128,000 max TS; 260 max Brin
For cutting appliances and parts with a high resistance to wear and tear.
DIN X90CrMoV18; VDEh Spec 4112;
Similar to AISI 440B.

MAFFRITE 6.
M-1509; 0.1 C, 6 Cr, bal Fe.
Rolled. 200 Brin.
For oil refinery equipment; scale resistant to 750°C.

MAFERITE 14.
M-1509, C, 14 Cr, bal Fe.
200 Brin
For oil refinery equipment; scale resistant to 850°C.

MAFERITE 20.
M-1509, C, 20 Cr, bal Fe
230 Brin
For oil refinery equipment, furnace parts, scale resistant to 1000°C

MAFERITE 25
M-1509, C, 25 Cr, bal Fe
230 Brin
For furnace parts, scale resistant to 1050°C

MAFERITE 28N
M-1509, C, 28 Cr, 4 Ni, bal Fe.
260 Brin
For furnace parts, scale resistant to 1150°C.

MAFERITE 30.
M-1509, C, 30 Cr, bal Fe
250 Brin.
For furnace parts, scale resistant to 1150°C.

MAFERITE 30P
M-1509, C, 30 Cr, Mo, bal Fe.
260 Brin.
For furnace parts, scale resistant to 1150°C.

MAGAI
M-275; 0.38 C, 5 Cr, 1.35 Mo, 0.3 V, bal Fe.
Heat treated 215,000 TS; 184,000 YS; 13 El; 40 RA.
For punch inserts, gripper and header dies, punches; hot work steel; Type H11.

MAGALOY.
M-1241; 3.2 C, 2 Si, 0.5 Mg, 0.7 Mn, bal Fe.
For rolls; ductile cast iron.

MAGALUMA.
M-622, 3.4 Mg, 0.15 Mn, bal Al.
Soft: 29,000-36,000 TS; 10,000-14,500 YS; 20-15 El; 50-60 Brin.
Hard: 42,500-50,000 TS; 36,000-42,500 YS; 6-2 El; 85-100 Brin.
For light alloy parts; heat treatable, corrosion resistant.

MAGAN-NICKEL AlNi.
M-303; 4 Al, 94 min Ni.
For spark plug electrodes; corrosion and heat resistant.

MAGAN-NICKEL NiC 1.5.
M-303, 1.5-2.0 Mn, 97.5 min Ni.
For spark plug electrodes; corrosion and heat resistant

MAGAN-NICKEL NiC 4.
M-303; 4 Mn, 95 min Ni
For spark plug electrodes, corrosion and heat resistant

MAGAN-NICKEL NiC 5
M-303; 5 Mn, 94 min Ni.
For spark plug electrodes, corrosion and heat resistant.

MAGAN-NICKEL ZKNi
M 303; 2 Mn, 2 Cu, 95 min Ni
For spark plug electrodes, corrosion and heat resistant

MAGDAL
M-871; 1 Mg, 1.25 Mn, bal Al.
Soft 21,000 TS, 16 El
Hard rolled· 34,000 TS, 8 El.
For light alloy parts, wrought

MAGEX A.
M-1432, C, alloy, bal Fe
Heat treated· 155,000 TS
For pump shafts, gears, drive shafts, preheat treated.

MAGEX B.
M-1432; C, alloy, bal Fe
For cams, chucks, reamers; oil hardened

MAGIC
M-69, 0.53 C, 0.9 Mn, 2.0 Si, 0.15 V, 1.1 Mo, bal Fe.
Annealed. 207 Brin
For chisels, track tools, punches, cement breakers
Type S5 shock resistant tool steel

MAG METAL.
M-870, Cu, Ni
Rolled 55 Brin
For jewelry, Pt substitute

MAGNADURE
M-1232, BaO + Fe_2O_3
For TV ring magnets; permanent magnets

MAGNADUR-3
M-England, $BaFe_{12}0_{10}$
For permanent magnets in metering devices, magnetic and electrical equipment
Permanent magnet High permeability
Barium and iron oxides

MAGNALITE
M-227, 94.2 Al, 2.5 Cu, 1.5 Ni, 0.5 Zn, 1.3 Mg
26,000 TS; 2.5 El
For airplane construction and engine pistons, casting alloy

MAGNALIUM
Eng.; 0-2.5 Cu, 1-5.5 Mg, 0-1.2 Ni, 85-95 Al, 0-3 Sn, 0.2-0.6 Si, 0-0.9 Fe, 0-0.03 Mn.
41,800 TS; 34 El, 29 RA
14,900 TS; 31 El; 69 RA.
For light castings, ornamental, commercial shapes; very brittle, M P. 1110-1280°F

MAGNALIUM (ORIGINAL).
Eng., 95-70 Al, 5-30 Mg
For light alloy castings

MAGNALIUM (CAST).
Eng.; 85 Al; 15 Mg.
For light alloy castings.

MAGNALIUM (CAST X).
Eng., 95 Al, 1.8 Cu, 1.6 Mg, 1.2 Ni.
For light alloy castings.

MAGNALIUM (CAST Y).
Eng ; 97 Al, 1.8 Cu, 1.5 Mg, Sn + Pb.
For light alloy castings.

MAGNALIUM (CAST Z).
Eng ; 95 Al, 3.2 Sn, 1.6 Mg, 0.2 Cu, 0.7 Pb.
For light alloy castings

MAGNALIUM (SHEET).
Eng ; 95 Al, 5 Mg
For pistons

MAGNALIUM ALLOY NO 1
Eng , 95.5 Al, 1.75 Mg, 1.75 Cu, 1.0 Ni
For light alloy parts, cast alloy

MAGNALIUM ALLOY NO 2
Eng , 95.5 Al, 1.75 Mg, 1.75 Cu, 1.0 Pb.
For light alloy parts, cast alloy

MAGNA METAL.
Mg alloy
For light alloy parts, same as "Electron"

MAGNE 1
M-111, 0.9 C, 3.25 Cr, bal Fe.
For permanent magnets

MAGNE 2
M-111, 0.9 C, 6.25 Cr, bal Fe
For permanent magnets

MAGNEI
M-89, 3 C, 1.5 Si, bal Fe
Annealed 52,000 TS, 33,000 YS; 13 El, 120 Brin
For electrical and electromagnetic instruments, magnet cores, high permeability, low hysteresis loss

MAGNESIUM A10
England, 10 Al 0.10 Mn, bal Mg
Cast 12,000 TS, 12,000 YS, 2 El, 53 Brin
T4-temper 40,000 TS, 13,000 YS, 10 El 52 Brin
T6-temper· 40,000 TS, 19,000 YS, 1 El, 69 Brin
For high strenngth castings, age hardened

MAGNESIUM AM100A
M 43, 8.3-9.7 Al, 0.3 max Zn, 0.10 min Mn, bal Mg
Cast 22,000 TS, 12,000 YS, 2 El
T6-Temper 40,000 TS, 16,000 YS, 4 El, 69 Brin
For bearing housings, cylinder heads, valve and pump bodies, supercharger parts
Heat treatable, casting alloy Good fatigue strength

MAGNESIUM AZ31B
M 43, 2.5-3.5 Al, 0.7-1.3 Zn, 0.2 min Mn, bal Mg
Extruded 38,000 TS, 29,000 YS, 15 El
Sheet O-temper 37,000 TS, 22,000 YS, 21 El.
Sheet H24-temper 42,000 TS, 32,000 YS, 15 El
For sheet and extrusion alloy parts, for temperatures up to 300°F

MAGNESIUM AZ31C
M-43, 9 Al, 1 Zn, bal Mg
Die cast 27,000 TS, 17,000 YS, 4 El, 50 Brin.
Extruded· 37,000 TS, 28,000 YS, 12 El, 49 Brin
O-temper 37,000 TS, 22,000 YS, 21 El; 56 Brin.
For truck bodies, dock boards, aircraft frames; formerly Dowmetal FS; good formability.

MAGNESIUM AZ31X.
M-1239, 2.5-3.5 Al, 0.6-1.4 Zn, 0.20 min Mn, bal Mg.
Rolled. 32,000-40,000 TS, 16,000-29,000 YS; 12-4 El.
For light alloy parts.

MAGNESIUM AZ51.
Eng; 4.8 Al, 0.8 Zn, 0.25 Mn, bal Mg.
Soft: 40,000 TS; 21,000 YS; 19 El; 57 Brin.
Hard: 45,000 TS; 34,000 YS; 10 El; 71 Brin.
For light alloy structures; sheet and plate.

MAGNESIUM AZ53.
M-43; Mg alloy.
For light alloy parts

MAGNESIUM-AZ61A.
M-1130, 6.5 Al, 1.0 Zn, 0.20 Mn, bal Mg.
Tubes: 40,000 TS; 22,000 YS; 15 El; 55 Brin.
Bars. 45,000 TS, 32,000 YS; 15 El; 56 Brin.
For light alloy structures, extrusion and forgings.

MAGNESIUM-AZ63A.
M-1130; 6 Al, 3 Zn, 0.2 Mn, bal Mg
Cast: 29,000 TS; 14,000 YS; 6 El; 50 Brin.
T6-Temper: 40,000 TS; 19,000 YS; 5 El, 73 Brin.
For airplane wheels and brakes, oil pumps, crankcases.
Age hardenable casting alloy.

MAGNESIUM AZ80
England; 8.5 Al, 0.5 Zn, 0.15 Mn, bal Mg
Forged 46,000 TS; 31,000 YS; 8 El, 69 Brin.
Aged: 50,000 TS, 34,000 YS; 6 El; 72 Brin.
For high-strength forgings, aircraft parts, age-hardened.

MAGNESIUM AZ80A
M-43; 8.5 Al, 0.5 Zn, bal Mg
Extruded: 48,000 TS; 32,000 YS; 12 El; 60 Brin.
T5-temper 52,000 TS; 36,000 YS; 5 El; 82 Brin.
For aircraft engine parts, bearing housings, valves, formerly Dowmetal O; age-hardenable.

MAGNESIUM AZ81A
M-43, 7.0-8.1 Al, 0.4-1.0 Zn, 0.13 min Mn, bal Mg
F-temper 28,000 TS, 13,000 YS, 6 El
T4-temper 40,000 TS, 30,000 YS, 12 El; 55 Brin
For aircraft parts, structural members, heat treatable

MAGNESIUM AZ91A
M-43; 9 Al, 0.7 Zn, 0.2 Mn, bal Mg
Die cast 33,000 TS, 22,000 YS, 3 El, 60 Brin
For instrument housings, portable tools; general die castings

MAGNESIUM AZ91A.
M-43, 9 Al, 0.5 Zn, bal Mg
Sand cast 24,000 TS, 14,000 YS, 2 El; 52 Brin
T4-temper 40,000 TS; 14,000 YS, 11 El, 53 Brin
T6-temper 40,000 TS, 19,000 YS; 4 El, 66 Brin.
For portable tools, instrument housings; formerly Dowmetal R; age-hardenable.

MAGNESIUM AZ91C
M-43, 8.7 Cu, 0.7 Zn, 0.15 Mn, bal Mg.
F-temper: 24,000 TS, 14,000 YS, 2 El, 53 Brin
T4 temper: 40,000 TS; 14,000 YS, 11 El; 53 Brin.
T6-temper: 40,000 TS, 19,000 YS; 4 El; 66 Brin.
For aircraft engine parts, brake castings, pressure tight castings, age-hardenable.

MAGNESIUM AZ92.
England; 9 Al, 2 Zn, 0.1 Mn, bal Mg.
Cast. 25,000 TS, 14,000 YS; 2 El; 65 Brin.
T5-temper: 25,000 TS; 17,000 YS; 1 El; 69 Brin.
T4-temper: 40,000 TS; 14,000 YS; 10 El; 63 Brin.
T6-temper. 40,000 TS; 22,000 YS; 3 El, 81 Brin.
For high-strength castings; age-hardened.

MAGNESIUM AZ92A
M-43; 9 Al, 2 Zn, bal Mg.
F-temper. 24,000 TS; 14,000 YS; 2 El; 65 RA.
T4-temper: 40,000 TS; 14,000 YS; 10 El; 63 RA.
T6-temper: 40,000 TS; 23,000 YS; 2 El; 84 RA.
For aircraft engine castings, crankcases, housings; formerly Dowmetal C; age-hardenable.

MAGNESIUM AZ916.
England; Mg alloy.
T6-temper: 19,000 TS.
For aircraft and general purpose castings, age-hardenable

MAGNESIUM EK-30.
M-43; 3 Misch-metal, 0.2 Zn, bal Mg.
At 70°F 22,900 TS; 16,500 YS; 2.4 El.
At 400°F: 20,000 TS, 14,000 YS; 13.1 El.
At 600°F: 11,800 TS; 7800 YS; 69.6 El.
For high temperature applications, aircraft components, heat treatable.

MAGNESIUM EK30A
M-43, 2.5-4.6 rare earths, 0.2 min Zr, 0.3 max Zn, bal Mg
T6-temper: 23,000 TS; 16,000 YS; 3 El.
For aircraft engine components; age hardenable, used up to 500°F.

MAGNESIUM EK31A
M-43; 0.55 Zr, 3.0 mischmetal, bal Mg.
T5-temper: 22,000 TS, 17,000 YS; 2 El.
T6-temper: 25,000 TS; 19,000 YS; 4 El.
For aircraft engine components; age hardenable, high temperature service

MAGNESIUM EK31D.
M-43; 0.55 Zr, 2.0 Di, bal Mg
T6-temper: 38,000 TS; 21,000 YS; 7 El .
For aircraft engine components; age hardenable, high temperature service

MAGNESIUM-EK41A
M-43; 3-5 rare earth metals, 0.4-1.0 Zr, 0.3 max Zn, bal Mg
T5 Temper: 23,000 TS; 16,000 YS, 2 El.
T6 Temper: 25,000 TS; 20,000 YS; 3 El.
For aircraft engine components, missiles, high temperature parts
Age hardenable Useful to 500°F Good creep resistance.

MAGNESIUM EM22.
Germany, 2.6 rare earths, 1.5-2.0 Mn, bal Mg
For aircraft engine components; high temp. use.

MAGNESIUM EM42.
Germany; 2-6 rare earths, 1.5-2.0 Mn, bal Mg.
For aircraft engine components, high temp use.

MAGNESIUM ES33A
M-43, 2.5-4.0 rare earths, 0.5-1.0 Zr, 2.0-3.5 Zn, bal Mg.
T5-temper. 24,000 TS, 16,000 YS; 3 El
For aircraft engine components, age hardenable, used up to 500°F.

MAGNESIUM-EX31A
M-43, 2.5-4.0 Rare earths, 0.4-1.0 Zr, bal Mg.
T6 Temper: 35,000 TS, 22,000 YS, 5 El; 64 Brin.
At 600°F. 15,000 TS, 13,000 YS.
For aircraft and missile components up to 550°F; airframe and engine components for 1000 hours at 450°F.
Sand castings Age hardenable

MAGNESIUM HK31A.
M-43; 0.5-1.0 Zr, 2.5-4.0 Th, bal Mg
T6-temper 37,000 TS; 18,000 YS; 8 El.
For aircraft engine components; age hardenable, used up to 700°F.

MAGNESIUM HM11A.
M-43; 1 Th, 1 Mn, bal Mg
At 70°F: 30,200 TS.
At 400°F. 16,800 TS.
At 800°F: 7800 TS.
For aircraft and missile components; die castings for high temperature use.

MAGNESIUM HM21A.
M-43; 1.5-2.5 Th, 0.35-0.80 Mn, bal Mg.
At 70°F: 34,000 TS, 27,500 YS; 5 El.
At 700°F: 13,000 TS; 12,500 YS; 15 El.
For structural airframes; heat resistant to 700°F, good creep resistance.

MAGNESIUM HM31A.
M-43; 3 Th, 1.2 min Mn, bal Mg
T5-temper: 43,000 TS; 34,000 YS; 13 El.
At 400°F: 24,000 TS; 22,000 YS; 32 El .
For missile and aircraft extrusions, for use up to 800°F.

MAGNESIUM HZ32A.
M-43; 0.5-1.0 Zr, 1.7-2.5 Zn, 3.0 Th, bal Mg
T5-temper: 32,000 TS; 15,000 YS; 10 El.
For aircraft engine components; age hardenable, used up to 700°F.

MAGNESIUM-IA6.
9 Li, 3 Th, 2 Zn, 4 Al, 4 Ag, 1 Mn, bal Mg
Heat treated: 45,000 min TS, 35,000 min YS; 15 min El.
For cryogenic applications.
Good low temperature properties to −423°F

MAGNESIUM-II4
7 Li, 1 Zr, 3 Th, 6 Zn, 5 Cd, 6 Ag, bal Mg
Rolled: 45,000 min TS; 35,000 min YS; 15 min El.
At −452°F: 8 min El.
For cryogenic applications
Good low temperature properties to −423°F.

MAGNESIUM JK31A.
M-43; 0.7 Zr, 3.0 Th, bal Mg.
T6-temper: 29,000 TS, 18,000 YS, 4 El.
For aircraft engine components; age hardenable, high temperature service

MAGNESIUM K1A.
M-43; 0.7 Zr, bal Mg
Cast 26,000 TS; 80,000 YS, 19 El
For light alloy parts, missiles, fine grained

MAGNESIUM KH31
England; 2.5-4.0 Th, 0.5-0.7 Zr, bal Mg
H24-temper: 38,900 TS; 29,800 YS; 6 El
T6-temper: 37,100 TS, 19,900 YS, 17 El
For airframes, rockets, missile components; high creep resistance to 700°F.

MAGNESIUM K1XI.
M-43; 0.4-1.0 Zr, bal Mg
For missile and aircraft components, good damping capacity, weldable

MAGNESIUM LA91
M-1395; 9 Li, 1 Al, bal Mg
Rolled: 22,000 TS, 16,500 YS; 30-35 El, 52 Brin.
For satellite and spacecraft construction; light weight

MAGNESIUM-LA91A.
M-1395; 9 Li, 1 Al, bal Mg
Sheet: 22,000 TS; 16,500 YS, 30-35 El.
Forged. 23,500 TS, 20,800 YS; 39 El, 62 RA.
For space craft construction, pressure vessels
Good formability and weldability.

MAGNESIUM LA141.
M-1395; 14.1 Li, 1.5 Al, bal Mg
Rolled: 21,000 TS; 17,000 YS; 25-30 El; 58 Brin.
For satellite and spacecraft construction, light weight.

MAGNESIUM-LA141A.
M-1395; 13.0-15.0 Li, 0.75-1.25 Al, 0.05 max Mn, 0.003 max Na, 0.005 max Fe, bal Mg.
At R.T.: 21,000 TS; 18,000 YS; 28 El.
Forged: 31,500 TS; 30,000 YS; 12 El; 25 RA.
For space vehicles, satellites, pressure vessels, bulkheads, micrometeorite shielding.
Good formability and weldability.

MAGNESIUM-LA142.
M-1395; 13.0-15.0 Li, 1.0-2.0 Al, 0.08-0.15 Mn, bal Mg.
Rolled Sheet: 28,800 TS; 27,000 YS; 18 El.
At 200°F. 15,300 TS; 13,800 YS; 16 El
For armoured ordnance vehicles.
Good formability and weldability

MAGNESIUM-LAZ933A
M-1395, 9 Li, 3 Al, 3 Zn, bal Mg
Sheet: 30,000 TS, 21,000 YS; 30 El; E 79 Rock.
For aerospace equipment operating at cryogenic temperatures
Good low temperature properties

MAGNESIUM M-1.
England, 1.5 Mn, bal Mg
Soft 33,000 TS; 18,000 YS; 17 El.
Hard. 35,000 TS, 26,000 YS, 7 El
Extruded 38,000 TS, 28,000 YS, 10 El.
For structural members, aircraft parts, corrosion resistant

MAGNESIUM MSR.
2 rare earths, 2.5 Ag, 0.7 Zr, bal Mg
Heat treated 40,000 TS, 30,000 YS, 4 El; 70-85 Brin
For high temperature applications, missile components, good creep strength, heat treatable

MAGNESIUM MSR-A
M-1130, 2.5 Ag, 0.7 Zr, 1.7 rare earths, bal Mg
Heat treated: 78,400 TS, 50,400 YS, 4 El, 70-90 Brin
For high strength castings for high temperature, age-hardenable, cast alloy

MAGNESIUM MSR B
M-1130, 2.5 Ag, 0.7 Zr, 2.5 rare earths, bal Mg
Heat treated 78,400 TS, 54,900 YS, 2 El, 70-90 Brin
For high strength castings for high temperature, age-hardenable, cast alloy

MAGNESIUM MTZ
England, 3 Th, 0.7 Zr, bal Mg
Heat treated 65,000 TS, 24,600 YS, 5 El; 50-60 Brin
For aircraft parts, high creep resistance

MAGNESIUM QE22A
M-43, 0.7 Zr, bal Mg
T6-temper: 40,000 TS, 30,000 YS; 4 El
At 400°F 28,000 TS, 25,000 YS; 22 El
For aircraft, jet engine and missile components; highest cast yield strength, age-hardenable

MAGNESIUM ZE10A
M-43, 1.0-1.5 Zn, 0.2 Ce, bal Mg
H24-temper 38,000 TS, 28,000 YS; 12 El.
For missile shipping and storage containers; requires no stress relief after welding.

MAGNESIUM ZE41A
M-43, 0.75-1.75 rare earths; 3.5-5.0 Zn, 0.4-1.0 Zr, bal Mg.
Heat treated: 30,000-32,500 TS; 20,000-22,000 YS; 5-3 El; 65-75 Brin
For structures up to 400°F service; age-hardenable, pressure tight

MAGNESIUM-ZE63A.
M-1130, 5.5-6.0 Zn, 2.0-3.0 R.E. 0.4 min Zr, bal Mg.
86 Temper: 42,000-45,000 TS; 29,000-32,000 YS; 5-10 El.
At 257°F: 30,000 TS; 19,000 YS; 34 El.

At 347°F: 21,000 TS; 16,000 YS; 32 El .
For helicopter structural and transmission castings, gearboxes, aircraft landing wheels.
Castings, operating up to 300°F. High fatigue strength.

MAGNESIUM-ZE63B.
M-1130; 5.5-6.0 Zn, 2.0-3.0 R.E , 0.75-1.25 Ag, 0.4 min Zr, bal Mg.
T6 Temper: 43,000-46,000 TS, 30,000-34,000 YS; 4-8 El.
For helicopter structural and transmission castings, gearboxes, aircraft landing wheels.
Cast alloy. High fatigue strength.

MAGNESIUM ZH62A.
M-43, 1.4-2 2 Th, 4 8-6 2 Zn, 0.5 min Zr, bal Mg.
Aged: 43,500 TS, 26,500 YS; 4 El, 75 Brin.
At 500°F 14,000 TS; 10,000 YS, 30 El
For airframe castings, gear boxes, engine components; fatigue resistant to 400°F

MAGNESIUM ZK21A.
M-43, 2 3 Zn, 0 62 Zr, bal Mg
Bar 38,000 TS, 28,000 YS, 4 El
Tube. 34,000 TS, 26,000 YS, 4 min El.
For storage hoppers, aircraft hangers, shipping boxes; good weldability, no stress relief required

MAGNESIUM ZK51A
M-43, 3 6 5 5 Zn, 0 55 min Zr, 0 15 max Mn, bal Mg.
Cast: 33,000 TS, 19,000 YS; 11 El, 60 Brin
T5-temper 40,000 TS, 26,000 YS; 8 El, 65 Brin.
For airframe structures, landing wheels, high yield strength casting alloy

MAGNESIUM ZK60
M 43, 6 Zn, 0 6 Zr, bal Mg
Extruded 43,000 45,000 TS, 28,000-30,000 YS; 11-9 El
For aircraft structures, extrusions, tough and strong

MAGNESIUM ZK60A
M-43, M-4, 4 8-6 2 Zn, 0 45 min Zr, bal Mg
F-temper 49,000 TS, 38,000 YS, 12 El
T5-temper. 51,000 TS, 42,000 YS; 10 El
T6-temper· 53,000 TS, 48,000 YS
For brake housings, fuel meter bodies, bulkheads, heat treatable, extrusions, high strength and tough

MAGNESIUM ZK60B
M-43, 4 6-6 8 Zn, 0 45 min Zr, bal Mg
T5-temper 45,000 TS, 35,000 YS; 4 El.
For aircraft loading ramps, heat treatable, extrusions.

MAGNESIUM ZK61.
M-1239, 6 Zn, 0 8 Zr, bal Mg
Cast 21,700 TS; 10,900 YS; 12 El.
Heat treated 228,000 TS, 14,100 YS, 8 El.
Aged· 255,000 TS; 16,400 YS; 10 El
For engine components; age hardenable

MAGNESIUM-ZK61A
M-1130, 6 Zn, 0 6 Zr, bal Mg.
T6 Temper· 45,000 TS, 28,000 YS, 8 El; 75 Brin
T5 Temper. 40,000 TS; 26,000 YS; 8 El; 65 Brin
For ordnance vehicles, missiles, aircraft components Heat treatable castings.

MAGNESIUM ZK62.
England; 6 Zn, 2 Misch Metal, 0.5 Zr, bal Mg.
Extruded· 50,000 TS, 45,000 YS; 12 El.
For aircraft components.

MAGNESIUM-ZLH972
7 Li, 9 Zn, 2 Th, bal Mg
For cryogenic applications.
Good low temperature properties to —423°F.

MAGNESIUM ZM41.
M-43; 4 Zn, Mn, 0.7 rare earths, bal Mg.
For light alloy parts; sheets.

MAGNESIUM-ZTY
M-1130; 0.5 Zn, 0 75 Th, 0.6 Zr, bal Mg.
Forging: 43,000 TS; 26,000 YS, 18 El.
Sheet· 38,000 TS; 24,000 YS; 12 El.
For compressor cases, valve covers, pistons.
Good creep and thermal properties.
Hot formable, weldable.

MAGNET C.
M-96, 0.95 C, 1.35 Si, 4 Cr, bal Fe.
For permanent magnets; high coercive force.

MAGNET C
M-459; 1.0 C, 3 3 Cr, bal Fe.
For magnet steel

MAGNET CM
M-459; 0 95 C, 1.1 Mn, 5 Cr, bal Fe.
For permanent magnets

MAGNETOFLEX
M-1631, 41 Cu, 24 Ni, 35 Co.
For electrical and magnetic equipment
Permanent magnet, age-hardenable
High permeability

MAGNETOFLEX-12
M Germany, 68 Cu, 20 Ni, bal Co.
For permanent magnets in electrical and magnetic equipment
Age hardenable, high permeability

MAGNETOFLEX 20
M 1630; 20 Fe, 20 Ni, 60 Cu.
Wire 100,000-120,000 TS; 200 Brin.
For magnets in electrical and electronic equipment; age-hardenable, permanent magnet, same as Cunife

MAGNET W
M 459, C, W, bal Fe
For magnet steel

MAGNET WH
M-459, C, alloy, bal Fe
For magnets, high permeability.

MAGNEWIN
M-869; Al. bal Mg
For light alloy parts

MAGNEWIN 3515
German, 7 3 Al, 0 75 Zn, 0 12 Mn, bal Mg
For light alloy parts; heat treatable

MAGNICO
U S , 12 Co, 6 Cu, 10 Al, 18 Ni, bal Fe
For permanent magnets

MAGNICO.
Russia, 50 Fe, 24 Co, 14 Ni, 9 Al, 3 Cu
For electrical and magnetic equipment, magnet.

MAGNIKO
M-Russia, 25 3 Co, 14 6 Ni, 2 8 Cu, 8.5 Al, bal Fe.
For electrical and magnetic equipment
Permanent magnet, high magnetic permeability.

MAGNIL
M-1595, 0 10 C, 15 5 Mn, 0 75 max Ni, 18.0 Cr, bal Fe.
Cold Rolled. 219,400 TS; 187,400 YS, 6 El.
Heat treated. 296,000 TS; 268,000 YS.
For electronics, computer, instrument and control industries, high modulus diaphragms, bellows, springs, wear plates. Austenitic, nonmagnetic, stainless.

MAGNO.
M-44; 96 Ni, 4 Mn.
For spark plug electrodes, lamp and electronic leads; heat resistant.

MAGNO.
M-89; 0.05 C, bal Fe.
Annealed: 60,000 TS; 22 El.
For magnet cores; high permeability, low hysteresis loss.

MAGNO (ALALCO).
Eng.; 95 Ni, 5 Mn.
Hard drawn: 140,000 TS.
Soft: 65,000 TS; 22 El.
For electrical resistance wire, electromagnetic uses; resistance alloy.

MAGNOLIA 120 BRONZE.
M-178; 75 Cu, 20 Pb, 5 Sn.
Cast: 25,500-28,000 TS; 12,000-18,000 YS; 10-9 El; 55-67 Brin.
For bearings for light loads; resists many acid solutions.

MAGNOLIA AA BRONZE.
M-178; 88 Cu, 10 Sn, 2 Zn.
Cast: 34,000-40,000 TS; 26,000-30,000 YS; 8 El; 85 Brin.
For bearings for underate loads; resists brine solutions.

MAGNOLIA ANTIFRICTION METAL.
M-178; 10-15 Sb, 2-7 Sn, bal Pb.
Cast: 18,000 TS; 8400 YS; 23 Brin.
For high speed and heavy pressure bearings; antifriction metal; 825-900°F.

MAGNOLIA CADMIUM NICKEL.
M-436; Cd, bal Ni.
For bearings, liners; high loads.

MAGNOLIA CONTINUOUS CAST BRONZE.
M-178; 80 Cu, 6-8 Sn, 11-13 Pb, Zn less than 1.
As cast: 44,000 TS; 26,000 YS; 17 El; 80 Brin.
For bearings, bushings.

MAGNOLIA ISOTROPIC BRONZE.
M-178; 10 Sn, 10 Pb, 80 Cu.
Cast: 31,250 TS; 26,000 YS; 8.5 El; 70 Brin.
For die cast bronze bearings; die cast.

MAGNOLIA METAL.
M-178; 84-78 Pb, 15-16 Sb, 0.03 Fe, 0-7 Sn.
Cast: 15,000 TS; 3400 YS; 21 Brin.
For antifriction bearing metal; for bearings subjected to moderate loads.

MAGNO-NICKEL.
M-68; 2-6 Mn, bal Ni.
50,900-69,600 TS; 28,400-34,100 YS; 50-39 El.
For tools.

MAGNOWIN.
M-869; Mg alloy.
For light alloy parts.

MAGNOX-A12.
M-321; 0.7-0.9 Al, 0.002-0.03 Be, 0.008 max Ca, 0.006 max Fe, bal Mg.
For nuclear reactors; low creep ductility at 200°C.

MAGNOX-C.
M-1130; 0.7-0.9 Al, 0.005 Be, bal Mg.
At 212°F: 12,800 TS; 8 El.
At 575°F: 3000 TS; 53 El.
At 750°F: 1000 TS; 88 El.
For light alloy parts; structural members.

MAGNOX ZA.
M-321; 0.6 Zr, bal Mg.
For light alloy parts; good creep ductility.

MAGNUMINUM 127.
M-426; 9 Al, 1 Zn, 0.2 Mn, bal Mg.
Sand cast: 20,200 TS; 9000 YS; 2 El.
Permanent mold: 26,900 TS; 9000 YS; 4 El.
For aircraft parts, crankcases, pressure tight castings and housings; heat treatable.

MAGNUMINIUM 133.
M-556; 0.2 Al, 0.2 Zn, 2.5 Mn, 0.4 Si, 0.2 Cu, bal Mg.
30,000 TS; 16,000 YS; 10 El; 50 Brin.
For light alloy parts, fuel tanks, structures; weldable

MAGNUMINIUM 155.
M-556; 9 max Al, 1.5 max Zn, 1 max Mn, 0.3 max Cu, bal Mg.
40,000 TS; 20,000 YS; 10 El; 55 Brin.
For light alloy parts; non-hardenable.

MAGNUMINIUM 166.
M-556; 5-11 Al, 1.5 max Zn, 1.0 max Mn, bal Mg.
40,000-45,000 TS; 16,000-28,000 YS; 14-10 El; 50-60 Brin.
For light alloy forgings and stampings; heat treatable.

MAGNUMINIUM 177.
M-556; 8.5 max Al, 3.5 Zn, bal Mg.
Sand cast: 20,000 TS; 9000 YS; 2-8 El; 50 Brin.
For die castings; M.P. 610°C.

MAGNUMINIUM 181.
M-556; 8.5 max Al, 3.5 max Zn, 0 5 max Mn, bal Mg.
Cast: 23,000 TS; 10,000 YS; 8 El; 45 Brin.
Heat treated: 32,000 TS; 10,000 YS; 12 El; 55 Brin.
For light castings; heat treatable.

MAGNUMINIUM 199.
M-556, 8.5 Al, 3.5 Zn, 0.4 Si, 0.4 Mn, bal Mg.
Cast: 25,000-30,000 TS; 8-4 El; 45-55 Brin.
For sand and die light alloy castings; heat treatable.

MAGNUMINIUM 220.
M-556, 9-11 Al, 3 5 max Zn, 0.5 max Mn, 1.5 max impurities, bal Mg.
Sand cast. 24,000 TS; 12,000 YS; 2-4 El; 50-60 Brin.
Die cast: 26,000 TS; 2-5 El; 50-60 Brin.
For sand and die light alloy castings; casting alloy, heat treatable.

MAGNUMINIUM 266
M-556; 11 max Al, 1 5 max Zn, 1 max Mn, bal Mg.
45,000-50,000 TS; 20,000-30,000 YS; 10-14 El; 50-60 Brin
For light alloy extruded bars and shapes; for structures.

MAGNUMINIUM 288 A.
M-556; 11 max Al, 2 max Zn, 1 max Mn, bal Mg.
35,000-48,000 TS; 20,000-33,000 YS; 12-5 El; 80-90 Brin.
For aircraft parts; heat treatable.

MAGNUMINIUM 299.
M-137, M-556; 2.5-6 0 Al, 4.5-7.5 Sn, 0.2-2 Ag, 0.1-0.4 Mn, bal Mg.
Cast: 22,000 TS; 10,000 YS; 5-9 El; 45 Brin.
Aged: 31,400 TS; 10,000 YS; 4-14 El; 50 Brin.
For airplane wheels, motor and instrument housings; pressure tight castings.

MAGNUMINIUM 299.
M-556; 2.0-6.0 Al, 3-10 Sn, 0.25-4.00 Ag, bal Mg.
Cast: 18,000-26,000 TS; 10,000-12,000 YS; 4-5 El; 40-50 Brin.
For light castings, meter parts; heat treatable.

MAGOTTEAUX-UM Co50.
M-1581; 0.05-0.12 C, 0.18 Ti, 0.6 Cb, 26-30 Cr, 47-52 Co, bal Fe.
Cast: 135,000 TS; 48,000 YS; 10 El; 10 RA; 250 Brin.
Wrought 132,000 TS; 61,000 YS; 7 El; 6 RA; 350 Brin.
For furnace baffles, burner tips, sintering grates, quench baskets.
Corrosion, heat, thermal shock resistant.

MAHLE 124.
M-1365; Si, Cu, Ni, bal Al.
For light alloy parts, engine components; good machinability, heat resistant.

MAHLE 136.
M-1365; Si, Cu, Ni, bal Al.
For light alloy parts, engine components, high temperature use

MAHLE 244.
M-1365, Si, Cu, Ni, bal Al.
For light alloy parts, engine components; high temperature use.

MAHLE Y.
M-1365, 3.8-4.2 Cu, 1.7-2.2 Ni, 1.5 Mg, 0.3 Si, 0.7 Fe, bal Al
For pistons, cylinder heads; high temperature use.

MAILLECHORT.
67-65 Cu, 13.5 Zn, 13-19 Ni, 0.5-3.2 Fe, Sn + Pb.
For ornamental white metal parts, nickel silver.

MAILLECHORT, GERMAN
Germany, 65.4 Cu, 13.4 Zn, 16.8 Ni, 3.4 Fe
For hardware, fittings, corrosion resistant.

MAILLECHORT, PARIS
France, 66.24 Cu, 13.42 Zn, 16.42 Ni, 3.2 Fe.
For hardware, fittings, corrosion resistant

MAILLECHORT, VIENNA.
Austria; 66.6 Cu, 13.6 Zn, 19.3 Ni, 0.48 Fe.
For hardware, fittings, corrosion resistant.

MAIN METAL
M 5, 50 Zn, 48 Al, 2 Cu.
Cast 49,000 TS; 38,000 YS.
For bearings; sand and permanent mold castings.

MAINTENAL
M-1432; C, alloy, bal Fe
Heat treated 155,000 TS; 132,000 YS, 17 El, 57 RA, 280 Brin
For wrenches, drills, gears, pump shafts, bolts, preheat treated, fatigue resistant.

MAJOR
M-365, 0.7 C, 21 W, 4 Cr, 1.5 V, 13 Co, 0.5 Mo, bal Fe.
For tools, cutters, high speed steel

MAJOR METAL.
3 Cu, 2 Fe, 0.4 Zn, 0.4 Ni, bal Al.
For light alloy parts; hardenable.

MAL-ARC.
M-265; Cr-Mo-Co.
For hard facing welding rod; abrasion resistant.

MALAX A.
M-750; 0.83 C, 5 Mo, 4 Cr, 1.9 V, 6.4 W, bal Fe.
For drills, taps, lathe and planer tools; oil hardening.

MALAX AA.
M-750; 0.75 C, 4.25 Cr, 19 W, 1 V, bal Fe.
For tools, cutters, reamers; high speed steel.

MALAX AAA.
M-750; 0.75 C, 4.25 Cr, 19 W, 2 V, 5 Co, bal Fe.
For tools, cutters, lathe and planer tools; high speed steel.

MALAX AAAA.
M-750; 0.8 C, 4.2 Cr, 19 W, 2 V, 1 Mo, 7.5 Co, bal Fe.
For cutters, forming tools; high speed steel.

MAL COLLOY.
M-Japan; 15 Al, 19.8 Ni, bal Co.
Coercive force 1500. Residual induction 3200. max energy product 1,450,000.
For electrical and magnet equipment and instruments.
Permanent magnet after heat treatment.

MALCROME.
M-750, C, Cr, Mo, W, bal Fe.
For tools, dies; oil hardened.

MAL-DIE.
M-750; 1 C, 5 Cr, 1.1 Mo, bal Fe.
For blanking and forming dies; air-hardened.

MALGA.
M-750, C, Cr, Mo, W, bal Fe.
For tools, dies; oil hardened.

MALGA ELEKTRO SPECIAL
M-750; C, Cr, W, bal Fe.
For tools, dies, water or oil hardened

MALGALOY.
M-750; Si, Cr, Mo, V, W, C, bal Fe.
For shear blades; shock resistant.

MALGA MRO SPECIAL.
M-750, C, Mo, W, Cr, bal Fe.
For tools, dies; wear and shock resistant.

MALGA SPECIAL NON-TEMPERING.
M 750; C, W, Mo, Cr, bal Fe.
For tools, dies; no tempering after quenching.

MALLEABLE CAST IRON "BLACK HEART."
Eng; 1.5-2.5 Carbon, 0.1-0.35 Mn, 0.1 S, 0.2 P, 0.5-1.2 Si, bal Fe
35,000-45,000 TS, 10-5 El.
For railway and automotive castings; machines easily

MALLEABLE CAST IRON "WHITE HEART."
Eng., < 0.4 combined C, < 0.8 total C, 0.1-0.4 Mn, 0.25 S, 0.1 P, 0.5-1.1 Si, bal Fe.
40,000-55,000 TS, 5-3 El.
For railway and automotive castings; machines easily

MALLEABLE IRON 35018.
M-775, 2.2 T.C., 1.0 Si, 0.4 Mn, bal Fe.
Cast 53,000 TS, 35,000 YS; 18 El; 115-135 Brin.
For hardware, agriculture and auto parts; tough, shock resistant

MALLEABLE IRON 32510
M-775; 2.5 T.C., 1.0 Si, 0.4 Mn, bal Fe.
Cast: 50,000 TS; 32,500 YS; 10 El; 115-135 Brin.
For hardware, agriculture and auto parts; tough, shock resistant.

MALLEABLE IRON GM11M
M-609; 2.55 C, 1.4 Si, 0.45 Mn, 0.12 S, 0.05 P, bal Fe.
Malleable Iron.
50,000 TS; 32,500 YS; 10 El; 156 max Brin.
For lightly stressed parts; e.g. steering gear housings.
SAE & ASTM Grade 32510.

MALLET ALLOY.
75 Zn, 25 Cu.
For bearings.

MALLIX.
M-89; 1.8 C, 1.0 Si, 0.5 Mn, bal Fe.
Cast· 78,000 TS; 55,000 YS; 5 El; 180 Brin.
For grate bars, elevator buckets; pearlitic malleable iron.

MALLORY-3.
M-265; 0.4-1.2 Cr, bal Cu.
Sand Cast: 50,000 TS; 46,000 YS; 20 El; 45 RA; 110 Brin.
Bars: 75,000 TS; 70,000 YS; 15 El; 60 RA; 150 Brin.
For resistance electrodes for welding steel, spot welding tips.
Elect. cond. 85%. Corrosion resistance.

MALLORY 8CC.
M-265; Cu-Co-Cd-Si.
Cast: 50,000 TS; 2 El.
For electrical contacts; 50% cond.

MALLORY 22.
M-265; Cd, Zr, bal Cu.
Wrought: 78,000 TS; 72,000 YS; 10 El; 50 RA; 144 Brin.
For resistance welding electrodes; high conductivity.

MALLORY 28
M-265; Zr, bal Cu.
For resistance welding electrode; high electrical and thermal conductivity with high hardness.

MALLORY 44 STRIP.
M-265; Cu, Cr, Cd.
Rolled: 75,000 TS; 70,000 YS; 5 El; 80 Rock B.
Elec. cond. 80%.
For circuit breaker current carrying structural parts, current carrying spring clips, high strength heat sinks

MALLORY 53B.
M-265; Ni, Be, bal Cu.
Cast: 85,000 TS; 70,000 YS, 10 El, 20 RA; 185 Brin.
Wrought: 100,000 TS, 85,000 YS; 20 El; 20 RA; 200 Brin.
For flash welding dies, bearings; 45% conductivity

MALLORY 53-Z.
M-265; Ni, Zr, Si, bal Cu.
Cast: 60,000 TS; 8 El; 165 Brin
For electrode holders; high conductivity 40%.

MALLORY 73.
M-265; Be, Co, Si, bal Cu.
Wrought. 180,000 TS; 150,000 YS; 4 El; 6 RA; 375 Brin
Cast: 110,000 TS; 100,000 YS; 2 El; 4 RA; 375 Brin.
For inertia member, radioactive shields; 20% electrical conductivity.

MALLORY 100.
M-265; 2.5 Co, 0.5 Be, bal Cu.
Rolled: 110,000 TS; 10 El; 230 Brin.
Cast: 95,000 TS; 6 El; 230 Brin.
For welding electrodes, rods, springs; age-hardenable.

MALLORY 125.
M-265; Co, Ni, Be, bal Cu.
Cold drawn: 110,000 TS; 12 El; 240 Brin.
For spot and seam welding stainless steel; 48% conductivity.

MALLORY 150.
M-265; Co, Ag, Be, bal Cu.
Cold drawn: 110,000 TS; 10 El; 240 Brin.
For spot and seam welding stainless steel; 52% conductivity

MALLORY 333.
M-265; Li, Cr, bal Cu.
Cast: 50,000 TS; 27,000 YS; 20 El; 125 Brin.
Rolled: 75,000 TS; 35,000 YS; 15 El; 150 Brin.
For welding dies, brush holders, terminal studs; high electrical conductivity and strength.

MALLORY 1000.
M-265; 4 Cu, 6 Ni, bal W.
Sintered: 112,000 TS; 75,000 YS; 6 El, 120 Brin, Density 17.
For counter balances; governor weights.

MALLORY 1000 GYROMET.
M-265; Cu, Ni, bal W.
For gyroscopes, counter weights; sintered heavy metal

MALLORY 2000.
M-265; 3.5 Ni, 1.5 Cu, bal W.
Sintered: 110,000 TS, 85,000 YS; 5 El; 270 Brin.
For counterweights, gyros, radiation shielding. High density

MALLORY 2960.
M-265, 96.1 W, 2.8 Ni, 1.1 Cu.
Sintered 110,000 min TS; 29 Rock C
Density: 18.3.
For counterweights, gyroscopic rotors
High density, high strength

MALLORY 2985.
M-265; 98.5 W, 1.12 Ni, 0.38 Cu.
Sintered· 80,000 min TS
Density· 18.9
High density, high strength.

MALLORY 3000
M-265, 7 Ni, 3 Fe, bal W
Sintered: 120,000 TS, 88,000 YS, 15 El, 240 Brin.
Worked 195,000 TS; 190,000 YS;
For counterweights, radiation shielding.
Sintered heavy metal
High density Can be cold worked and formed

MALLORY 3950.
M-265, 95 W, 3.5 Ni, 1.5 Fe
Sintered 130,000 TS; 90,000 YS, 15 El 3.5 V notched Charpy, 40 unnotched Charpy density· 18; hardness 28 Rock C
For governor counterweights, radiation shielding, gyroscope rotors

MALLORY D-50
M-265, Ag-Ni
Sintered 30,000 TS
For electrical contacts, 70% cond.

MALLORY D-50F
M-265, 85 Ag, 15 Ni
Ann: 27,000 TS, 40 Rock F
Cold worked. 93 Rock F
Elec cond: 80%
For electrical contacts

MALLORY D-51
M-265, Ag-Ni.
For electric contacts; sintered, 43% cond

MALLORY D-52.
M-265; Ag-CdO
Sintered: 24,000 TS
For electrical contacts; 90% cond.

MALLORY D-53.
M-265; Ag-CdO
Sintered. 21,000 TS.
For electrical contacts; 85% cond.

MALLORY D53X.
M 265; Ag, CdO.
Annealed· 26,000 TS; 20 El; 30 Brin.
For electrical contacts; 90% electrical conductivity.

MALLORY D-54.
M-265; Ag-CdO.
Sintered: 18,000 TS.
For electrical contacts; 80% cond.

MALLORY D-54F.
M-265; 90 Ag, 10 CdO.
Ann: 39,300 TS; 21,500 YS; 24 El; 70 Rock F.
Cold rolled: 45,800-52,000 TS; 43,600-48,600 YS; 9.3-6.6 El; 88-93 Rock F.
Elec. cond.: 82-86%.
For electrical contacts, industrial contactors.

MALLORY D-54-X.
M-265; Ag-CdO.
Annealed: 24,000 TS.
For electrical contacts; elec. cond. 80%.

MALLORY D-55F.
M-265; 85 Ag, 15 CdO.
Ann: 40,100 TS; 22,200 YS; 19 El; 74 Rock F.
Cold rolled: 47,400-53,800 TS; 44,600-50,700 YS; 6.7-4.6 El; 89-93 Rock F.
Elec. cond.: 72-77%.
For electrical contacts, industrial contactors.

MALLORY D55X.
M-265; Ag-CdO.
Annealed: 30,000 TS; 20 El; 52 Brin.
For electrical contacts; 75% electrical conductivity.

MALLORY D-56.
M-265; Ag-Ni
For electrical contacts; elec. cond. 70%.

MALLORY D-57F.
M-265; 90 Ag, 10 Fe
Ann: 31,000 TS; 48 Rock F.
Cold worked: 39,500 TS; 81 Rock F.
Elec. cond.: 90%.
For electrical contacts

MALLORY D-58
M-265, Ag-graphite.
For electrical contacts; elec. cond. 75%.

MALLORY D-58F.
M-265, 95 Ag, 5.0 C.
Cold worked: 40 Rock F.
Elec. cond.: 75%
For electrical contacts

MALLORY D-59.
M-265, Ag-Ni graphite.
For electrical contacts, elec. cond. 70%.

MALLORY D-63X.
M-265, 99.34 Ag, 0.41 MgO, 0.25 NiO.
Air hardened: 70,000 TS, 97 Rock F.
Elec. cond.: 70%.
For electrical contacts

MALLORY D-64F
M-265, Silver base
Ann: 24,600 TS, 14 Rock F.
Cold worked: 40,500 TS; 82 Rock F
Elec. cond.: 101%
For electrical contacts.

MALLORY D-154X
M-265; 86.7 Ag, 13.3 CdO.
Ann: 29,000 TS; 48 Rock F.
Cold worked: 84 Rock F.
Elec. cond.: 68%.
For electrical contacts.

MALLORY D-157.
M-265, 50.0 Fe, 25.0 Cu, 25.0 Ag.
Ann: 84 Rock F; cold rolled: 94 Rock F.
Elec. cond.: 21%. For electrical contacts.

MALLORY D-158F.
M-265; 99.0 Ag, 1.0 C.
Ann: 23,500 TS; 36 Rock F.
Cold worked: 35,000 TS; 69 Rock F.
Elec. cond.: 99%.
For electrical contacts.

MALLORY D-258F.
M-265; 98.0 Ag, 2.0 C.
Elec. cond.: 77%.
For electrical contacts.

MALLORY D-505F.
M-265; 95 Ag, 5 Ni.
Ann: 24,000 TS; 32 Rock F.
Cold worked: 84 Rock F.
Elec. cond.: 95%.
For electrical contacts.

MALLORY D-510F.
M-265; 90 Ag, 10 Ni.
Ann: 25,000 TS; 35 Rock F.
Cold worked: 89 Rock F.
Elec. cond.: 87%.
For electrical contacts.

MALLORY D-511.
M-265; 40 Ag, 60 Ni.
Ann: 42 Rock F; cold worked: 97 Rock F.
Elec. cond.: 25%.
For electrical contacts.

MALLORY D-558F.
M-265; 98.5 Ag, 1.5 C.
Ann: 22,000 TS; 33 Rock F.
Cold worked: 33,500 TS; 66 Rock F.
Elec. cond.: 97%.
For electrical contacts.

MALLORY D581.
M-265; Ag, graphite.
Sintered: 1 El, 58 Brin.
For electrical contacts; 90% electrical conductivity.

MALLORY D-581F.
M-265; 99.5 Ag, 0.50 C.
Ann: 24,500 TS; 44 Rock F.
Cold worked: 36,500 TS; 72 Rock F.
Elec. cond.: 102%.
For electrical contacts.

MALLORY D582.
M-265; Ag, graphite.
Drawn: 42,000 TS, 1 El.
For electrical contacts; sintered, 98% electrical conductivity.

MALLORY D-582F.
M-265; 99.75 Ag, 0.25 C.
Ann: 25,000 TS; 45 Rock F.
Cold worked: 37,000 TS; 73 Rock F.
Elec. cond.: 103%
For electrical contacts.

MALLORY D-583F.
M-265; 99.25 Ag, 0.75 C.
Ann: 24,000 TS, 39 Rock F.
Cold worked: 35,800 TS; 70 Rock F.
Elec. cond.: 100%.
For electrical contacts.

MALLORY D-1058.
M-265; 90 Ag, 10 C.
Cold worked: 3 Rock F.
Elec. cond. 35%.
For electrical contacts.

MALLORY HA TUNGSTEN.
M-265; W-alloy.
Wrought: 120,000 TS.
For electrical contacts; 32% electrical conductivity.

MALLORY K-TUNGSTEN.
M-265; W.
Wrought: 300,000 TS.
For contacts for ignition system; 32% conductivity.

MALLORY L-2748.
M-1229, 5 Al, 5 Cr, bal Ti.
Rolled: 165,000 TS; 153,000 YS; 10 El;
Rockwell A71.
For high temperature applications, corrosion and heat resistant.

MALLORY L-2749.
M-1229, Al, Cr, bal Ti.
Rolled: 90,000 TS; 75,000 YS; 18 El;
Rockwell A62
For high temperature applications; corrosion and heat resistant.

MALLORY MANGANESE ALUMINUM BRONZE
M-265; 63-68 Cu, 3 Fe, 2.5-5.0 Mn, 3-6 Al, bal Zn.
Rolled. 60,000-125,000 TS; 30,000-70,000 YS, 30-8 El; 120-275 Brin.
For propeller blades, worm gears, valve stems; corrosion resistant

MALLORY MANGANESE BRONZE.
M 265, 57-60 Cu, 1 Sn, 0.5 Mn, bal Zn.
Forged 60,000-125,000 TS; 30,000-70,000 YS, 30-8 El, 120-275 Brin.
For propeller blades, gears, valve stems; corrosion resistant

MALLORY MK-TUNGSTEN.
M-265; W
Wrought. 300,000 TS.
For magneto contacts; 32% conductivity.

M-ALLOY
M-575, C, alloy, bal Fe
For aircraft forgings and parts; corrosion resistant.

M-ALLOY
M-575; Cu alloy
For forged parts in aero engines; corrosion resistant.

M-ALLOY.
M-1258, C, alloy, bal Fe.
For foundry sling liners; wear resistant

M-ALLOY
M-1405, 0.58 C, 0.35 Mn, 0.95 Cr, 0.95 Si, 0.2 Mo, bal Fe
For plastic mold dies, hot and cold punches, form tools; oil hardened, tough

MALLOYDIUM
60 Cu, 23 Ni, 13 Zn, 0.9 Fe
For tableware; acid resisting

MALUMINUM.
German, 87 Al, 6.4 Cu, 4.8 Zn, 1.4 Fe, 0.2 Si, 0.1 Mn, 0.2 Pb
21,000 TS, 1.5 El
For light alloy parts

MAMMUT.
M-1114, 0.7 C, 18 W, 5 Co, 4 Cr, 1.3 V, bal Fe
For lathe and planer tools, drills, taps, reamers, hobs; high speed steel, oil hardened

MAMMUT.
M-1291, 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, drills, reamers, hobs, high speed steel

MAMMUT SPECIAL.
M-1291; 0.74 C, 4.1 Cr, 1.2 V, 18.5 W, bal Fe
High speed steel; for lathe and planer tools, drills, reamers, hobs.

MAMMUT SPECIAL KN
M-1291, 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 9.0 W, bal Fe.
For high speed steel, for lathe and planer tools, reamers, drills, taps.

MAMMUT SPEZIAL XX.
M-1291, 0.7 C, 4 Cr, Mo, V, W, bal Fe.
For lathe and planer tools, broaches, reamers; high speed steel.

MAMMUTT SPECIAL.
M-1114; C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, dies, cutters; high speed steel

MAN
M-1291, 0.3 C, 0.25 Si, 1.35 Mn, bal Fe
For gears, shafts, machine tool parts; water hardened

MANAURITE 8S
M-1509, 0.2 C, 8 Ni, 18 Cr, bal Fe
Annealed 72,000 TS; 39,000 YS; 20 El.
For chemical plant equipment; resists scaling to 900°C, stainless, austenitic

MANAURITE 10
M-1509; 0.2 C, 10 Ni, 22 Cr, bal Fe
Annealed 72,000 TS, 37,000 YS, 18 El.
For chemical plant and oil refinery equipment; resists scaling to 1050°C, stainless

MANAURITE 12.
M-884, 0.30 C, 25 Cr, 12 Ni, bal Fe
For furnace parts, heat treat boxes; austenitic, corrosion and heat resistant

MANAURITE 12.
M-1509, C, 12 Ni, 25 Cr, bal Fe
Annealed 77,000 TS; 40,000 YS, 20 El
For furnace parts, heat treating equipment, resists scaling to 1080°C, heat resistant

MANAURITE 20
M 1509, C, 20 Ni, 25 Cr, bal Fe
Annealed 80,000 TS, 36,000 YS, 22 El
For furnace parts, heat treating equipment, resists scaling to 1150°C, heat resistant

MANAURITE 35
M-1509, C, 35 Ni, 15 Cr, bal Fe
Annealed: 72,000 TS, 39,000 YS, 22 El.
For heat treating boxes, salt pots, resists scaling to 1200°C, heat resistant

MANAURITE 50W
M-884, 0.50 C, 50 Ni, 27 Cr, 5 W, bal Fe
Cast 64,500 TS, 3.5 El, 2.7 RA
For gas generator retorts, hearth plates, furnace parts.
High heat resistance to 2200°F

MANAURITE 60
M-1509, C, 60 Ni, 15 Cr, bal Fe
Annealed 64,000 TS, 39,000 YS, 22 El.
For salt pots, heat treating equipment, resists scaling to 1200°C, heat resistant

MANCRO
M-111a, 0.15 C, 0.25 Si, 0.50 Mn, 0.75 Cr, bal Fe
For gears, shafts, case hardening.

MANCRO 4
M-111a, 0.20 C, 1.35 Cr, 1.35 Mn, bal Fe
For gears, shafts, case hardening

MANCRO 8.
M-111, 0.38 C, 0.65 Si, 1.15 Mn, 1.15 Cr, bal Fe
For gears, shafts; tough.

MANCRO 32
M-111a; 0.15 C, 1.2 Mn, 1.0 Cr, bal Fe.
For gears, shafts; case hardening

MANCRO 71.
M-111; 0.34 C, 1.05 Mn, 1.05 Cr, bal Fe.
For gears, shafts; oil hardening.

MANCRO 72.
M-111; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, shafts, machine tool parts; water hardened.

M AND A NO. 1.
M-1065; 88.5 Cu, 6 Sn, 1.5 Pb, 4 Zn.
Cast: 38,000 TS; 20,000 YS; 40 El; 35 Brin.
For pressure valves, pump housing; pressure-tight.

M AND A NO. 2.
M-1065, 85 Cu, 5 Sn, 5 Pb, 5 Zn.
Cast: 34,000 TS; 19,000 YS; 20 El; 43-50 Brin.
For valves, fittings; "Red Brass."

M AND A NO. 3.
M-1065; 80 Cu, 10 Sn, 10 Pb.
Cast: 28,000 TS; 19,000 YS; 8 El; 40-52 Brin.
For bearings; for poor lubrication.

M AND A NO 4.
M-1065; 88 Cu, 10 Sn, 2 Zn.
Cast: 40,000 TS; 22,000 YS; 20 El; 65-75 Brin.
For pressure castings; "Gun Metal."

M AND A NO. 5.
M-1065; 88 Cu, 8 Sn, 4 Zn.
Cast 40,000 TS; 21,000 YS; 20 El, 55-65 Brin.
For gears, pump impellers, machine parts; resists salt water corrosion.

M AND A NO. 6
M-1065, 87 Cu, 8 Sn, 1 Pb, 4 Zn.
Cast: 40,000 TS; 20,000 YS, 30 El; 50-63 Brin.
For gears, pump impellers, machine parts; resists salt water corrosion.

M AND A NO 7.
M-1065, 83.5 Cu, 8 Sn, 8 Pb, 0.5 P
Cast 25,000 TS, 20,000 YS; 8 El, 50-60 Brin
For bearings, heavy duty.

M AND A NO 8.
M-1065, 78 Cu, 6 Sn, 16 Pb
Cast: 20,000 TS, 15,000 YS, 10 El; 50-60 Brin.
For bearings, heavy duty

M AND A NO. 10.
M-1065; 90 Cu, 10 Sn.
Cast: 40,000 TS, 20,000 YS, 10 El, 86 Brin.
For worm gears, tough.

M AND A NO 11
M-1065, 85 Cu, 15 Zn.
Cast
For castings to be brazed; red brass

M AND A NO. 14
M-1065, 60 Cu, 30 Zn, Mn, Fe, bal Al.
Cast: 110,000 TS, 75,000 YS, 5 El; 220 Brin.
For gears, shafts; wear and corrosion resistant.

M AND A NO 15.
M-1065, 55 Cu, 40 Zn, bal Al, Mn, Fe.
Cast: 95,000 TS; 50,000 YS; 15 El; 160 Brin.
For cams, gears, cylinders; wear and corrosion resistant.

M AND A NO. 16
M-1065; 57 Cu, 1 Al, 1 Fe, 0.5 Mn, 40.5 Zn.
Cast. 65,000 TS; 35,000 YS; 20 El; 110 Brin.
For worms, gears, valve stems, propellers; corrosion and wear resistant.

M AND A NO. 17.
M-1065, 57 Cu, 0.5 Sn, 0.5 Pb, 1 Fe, 0.5 Al, 0.25 Mn, bal Zn.
Cast: 60,000 TS; 30,000 YS; 15 El; 85 Brin.
For valve stems, gears; free machining.

M AND A NO. 18.
M-1065; 62 Cu, 1 Sn, 1 Pb, 0.15 Al, bal Zn.
Cast: 40,000 TS; 14,000 YS; 30 El; 50 Brin.
For fittings, ship trimmings, commercial castings; free-cutting.

M AND A NO. 19.
M-1065; 66 Cu, 1 Sn, 3 Pb, bal Zn.
Cast: 30,000 TS, 10,000 YS; 40 El; 45 Brin.
For fittings, ship trimmings, commercial castings; free-cutting.

M AND A NO. 20.
M-1065; 60-70 Cu, bal Zn.
Cast: 22,000 TS.
For castings; yellow brass.

M AND A NO. 21.
M-1065; 88.5 Cu, 3.5 Fe, 8 Al.
Cast: 75,000 TS; 35,000 YS; 30 El; 110 Brin.
For worm gears, propellers, cams, pump parts; corrosion resistant, tough.

M AND A NO. 22.
M-1065; 89 Cu, 1 Fe, 10 Al.
Cast: 80,000 TS; 30,000 YS; 35 El; 130 Brin.
For worm gears, propellers, cams, pump parts, heat treatable, corrosion resistant.

M AND A NO. 23.
M-1065; 96 Cu, 4 Si, 1 Mn.
Cast: 45,000 TS; 30 El.
For castings; non-sparking, corrosion resistant.

M AND A NO. 25.
M-1065; 50-64 Cu, 2-6 Sn, 4-6 Pb, 20-30 Ni, 6-12 Zn.
Cast: 40,000 TS; 15 El.
For valves, trim; nickel silver.

M AND A NO. 26
M-1065; 50-64 Cu, 2-6 Sn, 4-6 Pb, 20-30 Ni, 6-12 Zn.
Cast. 40,000 TS; 15 El
For valves, trim; nickel silver.

M AND A NO. 28.
M-1065; 23 Cu, 3.5 Fe, 60 Ni, bal C, Si, Mn.
Cast: 65,000 TS; 32,500 YS; 25 El.
For trim, dairy equipment; Monel.

M AND A NO. 32.
M-1065, 5 Si, 1 max Fe, bal Al
Cast: 17,000 TS; 8000 YS; 1-3 El; 40 Brin.
For light alloy castings; corrosion resistant; obsolete.

M AND A NO. 34.
M-1065; 10 Cu, 1.2 Fe, 0.2 Mg, bal Al.
Cast: 23,000 TS; 21,000 YS; 0 El; 80 Brin.
For pistons, cylinder heads, non-hardenable.

M AND A NO. 35.
M-1065, 5 Si, bal Al
Cast 17,000 TS; 9000 YS; 3 El; 40 Brin.
For castings, corrosion resistant.

M AND A NO. 36.
M-1065; 1 Cu, 0.7 Fe, 1 Mn, bal Al.
Cast: 16,000 TS, 9000 YS; 10 El; 35 Brin.
For castings; non-hardenable.

M AND A NO. 37
M-1065; 8 Cu, 1 Fe, 1.2 Si, bal Al.
Cast: 19,000 TS; 14,000 YS; 2 El; 65 Brin.
For castings; non-hardenable.

M & A NO. 38.
M-1065; 4.5 Cu, 0.75 Si, 0.5 Fe, 0.2 Zn, bal Al.
T4-temper: 32,000 TS; 16,500 YS; 8.5 El; 60 Brin.
T6-temper: 36,000 TS, 24,000 YS; 0.5 El; 75 Brin.
For crankcases, general purpose; age-hardened.

M & A NO. 40.
M 1065; 5 Si, 1.3 Cu, 0.5 Mg, bal Al.
T7-temper: 38,000 TS; 36,000 YS; 0.5 El; 85 Brin.
T6-temper: 35,000 TS; 25,000 YS; 2.5 El; 80 Brin.
For liquid cooled engine parts; age-hardened.

M & A NO. 42.
M-1065; 0.2 Cu, 7 Si, 0.3 Mg, bal Al
T7-temper: 34,000 TS; 30,000 YS; 2.0 El; 75 Brin.
T6-temper: 32,000 TS; 24,000 YS; 3.5 El; 70 Brin.
For leak proof castings; age-hardened.

M & A NO. 45.
M-1065; 3.0-4.5 Cu, 5.5-7.0 Si, 0.2 Ti, bal Fe.
F-temper: 27,000 TS; 18,000 YS; 2 El; 70 Brin.
T6-temper: 36,000 TS; 24,000 YS; 2 El; 80 Brin.
For general utility castings; age-hardened.

MANDUR.
M-1548; 3.5-5.5 Cu, 0.3-1.0 Si, 0.5-1.0 Mn, 0.5-1.2 Mg, bal Al.
Heat treated: 78,000-85,000 TS; 64,000-71,000 YS; 10-15 El; 130-150 Brin.
For oil pans, crankcases, housings, engine cylinder heads
Age-hardenable. High strength.

MANELEC.
M-691; 1 Si, bal Fe.
For electrical equipment, motors; high permeability.

MANGABRAZE.
M-1510; 0.35 C, 1.92 Mn, 0.32 Mo, 0.28 Si, 0.42 Cu, bal Fe.
Heat treated: 157,000 TS; 146,000 YS; 16 El; 58 RA, 360-385 Brin
For chutes, hoppers, conveyors, screens, liners, scrapers, buckets; wear and impact resistant, mill heat treated.

MANGA-KOTE.
M-507; 0.80 C, 0.8 Si, 14.0 Mn, 4.7 Cr, 3.24 Mo, 3.5 Ni, 0.10 B, bal Fe.
Coated hardfacing electrode.
For overlay or buildup of bucket teeth, grading buckets, tractor rollers, crusher parts.

MANGAL.
M-116, 1.5 Mn, bal Al.
Annealed: 17,000 TS; 20 El
For light alloy parts; corrosion resistant

MANGAL.
M-1548; 1.5 Mn, bal Al
Soft: 14,000 TS; 20-30 El; 20-25 Brin
Hard: 36,000 TS, 28,000 YS, 2 El, 60 Brin
For commercial vehicles, roofing, structures.
Non-hardening, corrosion resistant.

MANGALOY.
Eng.; Ni, Mn, bal Fe.
For electrical resistor; heat resistant.

MANGALOY.
M-964; C, bal Fe.

MANGALOY
M-1128; C, Mn, Ni, Cr, bal Fe.
For hard surfacing electrodes; for manganese steel.

MANGAN.
M-72; 1.05-1.25 C, 13.5-14.5 Mn, bal Fe.
For hard surfacing electrodes; wear resistant.

MANGANAL.
M-374; 0.60-0.90 C, 11-14 Mn, 2.5-3.5 Ni, bal Fe
155,000-140,000 TS; 60,000-55,000 YS; 55-72 El; 35-54 RA; 180-500 Brin
For welding rod, and for resurfacing broken and worn high Mn steel parts; abrasion resistant.

MANGANEND 1 M.
M-677; C, Mo, bal Fe.
Welded: 90,000-100,000 TS; 70,000-85,000 YS; 30-20 El; 70-40 RA.
For welding electrodes; for steel, low H_2.

MANGANEND 2M.
M-677; 0.10 C, 1.6 Mn, 0.35 Mo, bal Fe.
Welded: 125,000 TS; 105,000 YS, 10 El; 15 RA.
For welding electrodes for steel; low H_2.

MANGANEND 13A.
M-677; 0.85 C, 0.8 Si, 13.5 Mn, 1.0 Mo, bal Fe.
Welded: 16 Rc; work hardened: 48 RC.
For hardfacing electrodes; austenitic 13.5% manganese steel.

MANGANESE ANTIFRICTION.
M-565; Mn, Sb, Sn, Pb.
5,670 TS
For machinery bearings, Babbitt metal; C.S. 19450; self-lubricating.

MANGANESE BRASS 73.
M-141; 70 Cu, 1.25 Mn, bal Zn
Annealed. 50,000 TS, 55 El.
Drawn. 90,000 TS; 6 El
For resistance seam and spot welding.

MANGANESE BRASS 510
M-8; 29 Zn, 1 Mn, bal Cu
Hard. 76,000 TS; 62,000 YS; 10 El; 160 Brin.
Soft 47,000 TS, 16,000 YS, 65 El, 60 Brin.
For strip for resistance spot and seam welded products

MANGANESE BRONZE
86-82 Cu, 6-17 Sn, 0.2-2.7 Mn, 0-5 Zn, 0-3 Pb
For gears, general castings, tough

MANGANESE BRONZE
M-129, 56-60 Cu, 0.4-1.5 Fe, 0.5-1.0 Al, 0.4 max Pb, bal Zn
Cast: 65,000 TS; 30,000 YS, 28 El, 25 RA, 100 Brin
For propellers, hubs, valves, pump bodies; corrosion resistant

MANGANESE BRONZE 19
M 141, 58.5 Cu, 0.3 Mn, 0.7 Sn, 1 Fe, bal Zn.
Hard 83,000 TS, 55,000 YS, 25 El
Soft 72,000 TS; 30,000 YS, 45 El.
For bolts, valve parts, tie rods, corrosion resistant

MANGANESE BRONZE 667
M-279, 70 Cu, 28.8 Zn, 1.2 Mn
Ann 47,000-67,000 TS, 13,000-37,000 YS; 30-60 El
Cold rolled. 51,000-105,000 TS, 2-40 El.
Seam and spot welding brass,
for communication equipment,
welded assemblies

MANGANESE BRONZE 937
M-8; 57-62 Cu, 36-40 Zn, 0.5-1.5 Sn, 0.5-1.0 Fe, 0.5 Mn
Soft 60,000 TS, 30,000 YS; 30 El, 30 RA.
Hard: 80,000 TS, 45,000 YS; 20 El; 15 RA
For valve stem forgings, slotted and perforated screens, high strength and toughness;
resists action of salt water

MANGANESE BRONZE 984
M-8, 38 Zn, 1 Sn, 0.5 Fe, 0.5 Mn, bal Cu.
For welding rod; for steel, cast iron, Cu and Ni alloys, M.P. 1598°F.

MANGANESE BRONZE A 675.
M-8; 58.5 Cu, 39.25 Zn, 1.0 Sn, 0.25 Mn, 1.0 Fe.
Hard Rod: 75,000 TS, 45,000 YS, 20 El; B 85 Rock
Soft Rod: 65,000 TS, 30,000 YS; 30 El; B 65 Rock.
For clutch discs, pump rods, shafts, balls, valve stems and bodies.
Readily machined and welded.

MANGANESE BRONZE (A)
Copper Alloy No. 675.
M-33; 58.5 Cu, 39.25 Zn, 1.0 Sn, 1.0 Fe, 0.25 Mn.
Half hard: 72,000 TS; 40,000 YS; 35 El; 70 Rock B.
For balls, forgings, valve stems, welding rod.
ASTM B124 Alloy 4; CDA 675.

MANGANESE BRONZE, CAST.
Eng., 58 Cu, 2 Mn, 40 Zn.
For marine propellers; corrosion resistant.

MANGANESE BRONZE E-77.
M-1191; 57-60 Cu, 0.5-1.5 Sn, 0.25 max Al, 0.5 max Mn, bal Zn.
Forged: 75,000-85,000 TS; 40,000-45,000 YS; 20-15 El; 120-142 Brin.
For marine parts, hardware, propellers; corrosion resistant, high strength.

MANGANESE BRONZE, ROLLED.
Eng., 59 Cu, 1 Sn, 0.3 Mn, 31 Zn.
For marine parts, nuts, bolts; corrosion resistant.

MANGANESE CASTING BRASS.
M 165; 58.5 Cu, 40 Zn, 0.85 Sn, 0.5 Al, 1.5 max. Pb, 0.15 Mn.
70,000 TS; 20 El.
A substitute for malleable iron, high strength.

MANGANESE COPPER "A."
Eng.; 29.2 Cu, 51.65 Mn, 9.68 Fe, 6.25 Al, 3.23 C.
For resistances, heat and corrosion resistant parts; heat and corrosion resistant.

MANGANESE COPPER "B."
Eng., 56.3 Cu, 40.9 Mn, 1.5 Fe, 1.1 Si
For resistances, heat and corrosion resistant parts; heat and corrosion resistant

MANGANESE COPPER "C."
Eng., 75 Cu, 25 Mn
For resistances, heat and corrosion resistant parts; heat and corrosion resistant.

MANGANESE COPPER "D."
Eng.; 75.3 Cu, 22.4 Mn, 2.15 Fe.
For resistances, heat and corrosion resistant parts; heat and corrosion resistant

MANGANESE COPPER "E."
Eng., 85 Cu, 10.92 Mn, 1.83 Fe, 2.0 Zn
For resistances, heat and corrosion resistant parts, heat and corrosion resistant

MANGANESE COPPER "F."
Eng.; 89.7 Cu, 8.72 Mn, 1.54 Fe
For resistances, heat resisting parts; heat resistant.

MANGANESE COPPER "G."
Eng.; 85.55 Cu, 10.66 Mn, 2.66 Fe, 0.39 Sn, 0.45 Pb
For resistances, heat resistant

MANGANESE COPPER "H."
Eng.; 84.33 Cu, 10.61 Mn, 2.31 Fe, 2.1 Zn, 0.4 Sn, 0.3 Pb
For resistances; heat resistant.

MANGANESE M1.
M-1017; C, Mn, Ni, bal Fe.
Welded: 350 Brin.
For arc welding electrodes, hard facing; forgeable, wear resistant.

MANGANESE MOLYBDENUM STEEL.
M-176; 0.25 max C, 1.65 max Mn, 0.75 max Mo, bal Fe.
Rolled: 95,000 TS; 60,000 YS; 25 El; 200 Brin.
For shaft gears; tough.

MANGANESE NICKEL.
M-68; 98.5-95 Ni, 1.5-5 Mn.
52,100-59,000 TS; 16,500-23,100 YS; 51-36 El.
For fittings; corrosion resistant.

MANGANESE NICKEL.
Eng.; 82-52 Cu, 14-31 Mn, 3-16 Ni.
For heat resistant parts; heat resistant

MANGANESE NICKEL-2%.
M-61; 3 Mn, bal Ni.
Annealed: 75,000 TS, 35,000 YS; 40 El; 140 Brin.
For lead wires for electrical appliances; heat resistant.

MANGANESE NICKEL 5%.
M-61; 5 Mn, 95 Ni.
Annealed: 75,000 TS, 35,000 YS, 40 El; 140 Brin.
For lead wires for electrical appliances; heat resistant.

MANGANESE NICKEL NO. 484 ALLOY.
M-65; 98.5 Ni, 1.5 Mn.
For spark plug electrodes; heat resistant.

MANGANESE NICKEL SILVER.
German, 73-60 Cu, 2.4-20 Mn, 10-17 Ni, 0-10 Sn, 0-8.8 Zn
For white metal parts; corrosion resistant.

MANGANESE RED BRASS 507.
M-8, 14 Zn, 1 Mn, bal Cu.
Hard. 69,000 TS, 55,000 YS; 7 El, 140 Brin.
Soft. 40,000 TS, 15,000 YS; 45 El; 55 Brin
For strip for resistance spot and seam welded products

MANGANESE S3
M-1017, C, Mn, Ni, bal Fe
Welded 180 Brin.
Work hardened 450 Brin.
For hard facing electrodes, wear resistant.

MANGANESE STEEL MEDIUM
M-24, 0.1 C, 1.2 Mn, bal Fe.
Rolled 50,000 TS
For structures, bridges, high tensile steel.

MANGANESE STEEL PEARLITIC.
Eng.; 1.4-3.5 Mn, 0.2-0.3 Si, 0.2-0.6 C, bal Fe.
For gears, shafts; British Patent 131980.

MANGANIN
M-44, 10.5-13.5 Mn, 1-2 Ni, bal Cu
Annealed: 70,000 TS
For instrument resistors and shunts, low thermal EMF.

MANGANIN
M-61; M-897, 4 Ni, 12-14 Mn, bal Cu.
Annealed: 80,000 TS, 45,000 YS, 50 El.
For resistors, thermocouples, low temperature coefficient of resistance.

MANGAN-NEUSILBER.
German; 73-59 Cu, 10-18 Ni, 2.4-20 Mn, 5-20 Zn.
For white metal parts, corrosion resistant.

MANGANNICKEL 1.
M-297; 1.5 Mn, 0.25 C, bal Ni.
Annealed: 74,000 TS, 36 El; 95 Brin.
Drawn: 132,000 TS; 1 El; 250 Brin.
For German silver, candlesticks, water meter parts; corrosion resistant.

MANGANNICKEL 2.
M-297; 1.5 Mn, bal Ni.
Rolled: 135,000 TS; 1 El; 270 Brin.
Annealed: 76,800 TS; 35 El; 100 Brin.
For thermocouples; corrosion resistant.

MANGANNICKEL 4.
M-297; 4 Mn, bal Ni.
Rolled: 142,200 TS; 1 El; 280 Brin.
Annealed: 81,000 TS; 34 El; 110 Brin.
For thermocouples, spark plugs; corrosion resistant.

MANGANNICKEL 5.
M-297; 4.5-5.5 Mn, bal Ni.
For spark plug electrodes; heat resistant.

MANGANO.
M-73; 0.95 C, 1.65 Mn, 0.25 Si, bal Fe.
For dies, gages, tools, blanking dies; non-deforming, oil hardening.

MANGA-TONE.
M-507; 1.7 C, 10 Ni, 30 Mn, 2 V, bal Fe.
Welded: 70,000 TS; 500 Brin.
For hard facing electrode; wear resistant.

MANGA-TONE N.M.
M-507; 2.0 C, 0.8 Si, 26.2 Mn, 8.3 Ni, bal Fe.
Filler rod for repair or buildup of austenitic manganese steel parts as shovel teeth, railroad frogs, crossovers, pump impellers, tractor bottom rollers, crusher plates.

MANGCRAFT A.
M-1201; 0.5-0.8 C, 11-14 Mn, bal Fe.
For welding rod for 14% Mn steel; austenitic, wear resistant.

MANGCRAFT B.
M-1201; 0.5-0.8 C, 11-14 Mn, 4.5-5 5 Ni, bal Fe.
For welding rod for 14% Mn-Ni steel; austenitic, abrasion resistant

MANGDIE.
M-1724; 0.95 C, 1.25 Mn, 0.50 Cr, 0.20 V, 0 50 W, bal Fe.
Oil hardening non-distorting alloy tool steel; for brake-press tools, taps, threading dies, plug gages.

MANGJET.
M-578; 0.65 C, 14.5 Mn, 0.14 Si, 1.15 Mo, bal Fe.
Hardsurfacing arc welding electrodes for resistance to severe impact.

MANGONIC 2.
M-121; 2 Mn, 0.1 Cu, 0.4 Fe, 0.05 C, 0 1 Si, bal Ni.
Annealed: 84,000 TS; 24,000 YS; 56 El; 76 RA; 140 Brin.
For spark plug electrodes, heating element connectors, readily spun, ductile.

MANGONIC 3.
M-121; 3 Mn, bal Ni.
For radio valve and grid supports, lamp wire supports; heat resistant.

MANGONIC 5.
M-121; 5 Mn, bal Ni.
For radio valve and grid supports, lamp wire supports; heat resistant.

MANGO-PLATE.
M-1432; C, alloy, bal Fe.
Heat treated: 153,000 TS; 141,000 YS; 14 El; 54 RA; 390 Brin.
For coal chutes, conveyor lines, scraper blades; work hardens, abrasion resistant.

MANGRID D.
M-61; 4.5 Mn, bal Ni.
Annealed: 75,000 TS; 35,000 YS; 40 El; 140 Brin.
For vacuum tube grid wire; magnetic.

MANGRID E.
M-61; 20 Mn, bal Ni.
Annealed: 79,000 TS.
For furnace lead wire, grid wire; magnetic.

MANG-ROD NO. 250.
M-1096; 0.9-1.05 C, 0.9-1.2 Cr, 0.4 Si, 14 Mn, bal Fe.
Welded: 250 Brin.
For hard facing electrode; for Mn steels.

MANG-TRODE.
M-13; Zn, Mn, bal Cu.
For welding electrode for Mn-bronze; arc welding.

MANHARDT'S ALLOY.
Eng.; 83 Al, 10 Sn, 6.2 Cu, 0.1 Mg, P.
For light alloy parts; non-hardenable.

MANIFLEX.
M-32; 0 20 C, 1.25 Mn, 0 80 Si, 0.02 P, 0.20 S, 21 0 Cr, 11 5 Ni, bal Fe.
At R.T.: 103,000 TS; 58,000 YS; 42 El; 58 RA; 212 Brin
At 1600°F: 22,000 TS, 15,000 YS, 67 El; 72 RA; 60 Brin
For shafts and bushings in manifold exhaust control valves in automotive engines
Free-cutting, corrosion and heat resistant.

MANNESMANNSTAHL-F12.
M-1381; 0 20 C, 12 Cr, 1 Mo, 0.4 Ni, 0.3 V, bal Fe
Annealed· 90,000 TS; 38,000 YS, 26 El; B 92 Rock
Hardened 230,000 TS; 190,000 YS; 11 El; C 46 Rock.
For valves, bearings, cutlery, surgical instruments. Corrosion resistant, hardenable.

MANNHEIM GOLD.
M-314, 83 Cu, 10 Zn, 7 Sn
25,200 TS, 25 El, 69 Brin.
For cheap jewelry, moderately corrosion resistant.

MANNHEIM GOLD
M-314; 89-80 Cu, 7-20 Zn, 0-9 Sn
25,200 TS; 25 El, 69 Brin
For cheap jewelry, moderately corrosion resistant.

MANOFORT 160.
M-1509, 0.30 C, 2 0 Ni, 1 0 Cr, 0.40 Mo, bal Fe.
Heat treated· 212,000-242,000 TS, 163,000-200,000 YS, 9-7 El
For gears, shafts, crankshafts; oil hardened, shock resistant

MANOFORT 180.
M-1509; 0 40 C, 3 5 Ni, 1 4 Cr, 0 4 Mo, bal Fe.
Heat treated. 228,000-275,000 TS; 185,000-214,000 YS; 6-4 El
For gears, shafts, countershafts, oil hardened, shock resistant.

MANOIR ABRADUR 220
M-1509, 0 70 C, 1 0 Mn, bal Fe.
Heat treated: 100,000-115,000 TS; 65,000-78,000 YS; 8-6 El; 220-260 Brin.
For rails, tools, hammers, water or oil hardened.

MANOIR ABRADUR 240.
M-1509; 0.50 C, 1 0 Mn, 1 0 Cr, bal Fe
Heat treated: 100,000-114,000 TS; 65,000-78,000 YS; 8-6 El; 220 260 Brin.
For camshafts, countershafts, gears, shafts; wear resistant, oil hardened.

MANOIR ABRADUR 400.
M-1509; 0.30 C, 1.8 Ni, 1.0 Cr, 0.35 Mo, bal Fe.
Heat treated· 186,000-228,000 TS; 156,000-186,000 YS; 6-4 El; 400-480 Brin.
For gears, shafts, countershafts; oil hardened, tough, shock resistant.

MANOIR ABRADUR 500.
M-1509; 0.40 C, 3.5 Ni, 1.4 Cr, 0.40 Mo, bal Fe.
Heat treated: 144,000-156,000 TS; 92,000-114,000 YS; 12-10 El; 280-320 Brin.
For gears, shafts, countershafts, mining equipment; oil hardened, tough, shock resistant.

MANOIR ABRADUR 600.
M-1509; C, Cr, W, V, bal Fe.
600 Brin.
For abrasion resistant parts, sand blasting nozzles; wear and abrasion resistant.

MANOIR ABRADUR M14.
M-1509; 1.2 C, 13 Mn, bal Fe.
Rolled: 120,000-157,000 TS, 50,000-65,000 YS; 35-30 El.
For shovels, dippers, frogs, cross tracks; wear resistant.

MANOIR ABRADUR M14K.
M-1509, 1.2 C, 13 Mn, Cr, bal Fe
For dippers, shovels, cross tracks; wear and abrasion resistant.

MANOIR APS10
M-1509, 0.12 C, 2 Cr, 0.4-0.9 Al, Mo, bal Fe.
Normalized 69,000-92,000 TS, 42,000-54,000 YS, 16-12 El
For oil refinry equipment; corrosion resistant.

MANOIR APS20
M-1509; 0.12 C, 4 Cr, 0.4-0.9 Al, Mo, bal Fe
Normalized: 69,000-92,000 TS, 42,000-54,000 YS, 16-12 El.
For oil refinery equipment, corrosion resistant.

MANOIR APS25
M-1509, 0.12 C, 4 Cr, 0.9 Al, 0.9 Ni, bal Fe.
Normalized 114,000-135,000 TS, 85,000-107,000 YS, 11-7 El
For oil refinery equipment, corrosion resistant

MANOIR EL38M
M-1509; low C, Mn, bal Fe.
Annealed 55,000 TS, 26,000 YS; 22 El, 120 Brin.
For motors, electrical equipment, high magnetic permeability

MANOIR EL40
M-1509, low C, Mn, bal Fe
Annealed. 58,000 TS, 30,000 YS, 22 El, 120 Brin

MANOIR EL45
M-1509; C, Mn, bal Fe
Annealed 65,000 TS, 32,000 YS, 20 El, 140 Brin

MANOIR EL50
M-1509; C, Mn, bal Fe.
Annealed: 72,000 TS, 36,000 YS, 18 El, 155 Brin

MANOIR EL55
M-1509, C, Mn, bal Fe.
Annealed: 79,000 TS; 40,000 YS; 15 El; 170 Brin.
For bed plates

MANOIR EL65.
M-1509, C, Mn, bal Fe.
Annealed 92,000 TS, 50,000 YS, 10 El; 210 Brin.

MANOIR P17.
M-1509; 0.12 C, Mn, Mo, V, bal Fe.
Rolled: 76,000-92,000 TS; 58,000-65,000 YS; 22-18 El.
For gears, cams, camshafts; case hardened, tough.

MANOIR PF-0.
M-1509; 0.15 max C, 0.50 Mo, bal Fe.
Annealed: 65,000 TS; 37,000 YS; 24 El.
For oil refinery equipment.

MANOIR PF-1.
M-1509; 0.15 max C, 0.50 Cr, 0.50 Mo, bal Fe.
Annealed: 78,000 TS; 40,000 YS; 18 El.
For oil refinery equipment.

MANOIR PF-2.
M-1509; 0.20 max C, 1.0 Cr, 0.50 Mo, 0.15 V, bal Fe.
Annealed: 78,000 TS; 46,000 YS; 16 El.
For oil refinery equipment.

MANOIR PF-5
M-1509, 0.15 max C, 5.0 Cr, 0.50 Mo, bal Fe.
Annealed 78,000 TS; 36,000 YS; 18 El.
For oil refinery equipment, stills; corrosion resistant

MANOIR PF-6.
M-1509, 0.15 max C, 2.2 Cr, 1.0 Mo, bal Fe.
Annealed: 85,000 TS; 36,000 YS; 15 El.
For oil refinery equipment; corrosion resistant.

MANOIR PF-15.
M-1509; 0.20 max C, 0.80 Cr, 0.50 Mo, bal Fe.
Annealed: 92,000 TS, 58,000 YS; 16 El.
For oil refinery equipment

MANOIR PFV-55.
M-1509, 0.15 max C, 2.0 Cr, 0.35 Mo, V, Al, bal Fe
Annealed: 78,000 TS, 36,000 YS; 15 El.
For oil refinery equipment; corrosion resistant.

MANOIR PM35
M-1509, 0.17 C, Mn, Cr, Mo, V, bal Fe.
Normalized 143,000-170,000 TS; 107,000-121,000 YS, 10-7 El.
For gears, cams, camshafts; case hardened, tough

MANOIR RS1
M-1509, 0.45 C, 0.70 Mn, 1.8 Si, bal Fe.
Heat treated 177,000-200,000 TS, 156,000-177,000 YS, 4 El
For punches, air hammers, chisels, shock resistant, oil hardened

MANSIL
M-275, 0.90 C, 1 Mn, 0.5 Cr, 0.5 W, bal Fe.
For punches, cutters, dies, mandrels; Type O1, oil hardened, non-deforming.

MANSIL
M-357, 0.9 C, 1.1 Mn, 0.5 Cr, 0.5 W, bal Fe
Heat treated 661 Brin
For dies, non-deforming.

MANSIL-O1
M-357; 0.90 Cr, 1 Mn, 0.5 Cr, 0.5 W, bal Fe.
For punches, cutters, dies, mandrels, form tools; Type O1; oil hardened, non-deforming.

MANSILOY
M-48, 60-63 Mn, 28-31 Si, 0.07 max C, 0.05 max P.
For production of stainless steels; reduces metal oxides from the slag.

MAN-VAN
U S; 0.95 C, 0.15 Mo, 0.10 V, bal Fe.
For cutting tools, dies, water hardening

MAPLE LEAF.
M-435, 0.8-1.2 C, 0.25 Si, 0.25 Mn, bal Fe.
Water hardened. 165,000-215,000 TS; 110,000-150,000 YS, 11-15 El, 32-37 RA; 330-600 Brin.
For stamps, knurls, drills, taps, mandrels, reamers, cutters.
Type W1, water hardening.

MAPLE LEAF 8
M-435; 0.80 C, bal Fe.
For blacksmith tools; water hardened.

MARADAMIT.
Al alloy.
For light alloy parts.

MARATHON.
M-45; C, alloy, bal Fe.
For machine tool parts; oil hardened.

MARATHON.
M-260, M-38; 2.2 C, 12 Cr, bal Fe.
For dies, swedges, punches, drawing, shearing and riveting dies; resists wear and abrasion.

MARATHON-000 EXTRA.
M-1496; 0.80 C, 4 Cr, 18 W, 2 V, bal Fe.
Hardened: C 64-66 Rock.
For lathe and planer tools, drills, hobs, reamers, chasers, form cutters.
Type T-2 tool steel, high red-hardness.

MARATHON CRM SPEZIAL.
M-1496; 1.0 C, 1 0 Mn, 1 0 Cr, 0.25 Mo, bal Fe.
Ht. Tr.: 288,000 TS; 278,000 YS; 540 Brin.
For precision and plug gauges, bearings, liners, arbors.
High toughness and wear resistance.
Type L-5 tool steel.

MARATHON-CRS.
M-1496; 1.05 C, 1.4 Cr, bal Fe
Ht. Tr.: 200,000 TS; 185,000 YS; 3 El; 390 Brin.
For gauges, bushings, knurls, taps, dies, arbors, rolls, bearings
Oil hardening, tough and wear resistant.
Type L-1 tool steel.

MARATHON-E38 Mo
M-1496; 0 35 C, 1 Si, 5 Cr, 1 V, 1 5 Mo, bal Fe.
Ht. Tr : 290,000 TS, 227,000 YS; 3 El; C 55 Rock.
For forging and drawing dies, die casting dies, hot piercing and forming dies, swaging and gripping dies
Type H13 tool steel, air hardening.
High resistance to heat checking.

MARATHON-E38V.
M-1496; 0.35 C, 5 Cr, 1 V, 1 2 Mo, bal Fe
Ht. Tr.: 290,000 TS; 225,000 YS; 3 El; C 55 Rock.
For die casting dies, swaging and gripping dies, forging and extrusion dies
Type H-13 tool steel, air hardening.
High resistance to heat checking.

MARATHON-E38W
M-1496, 0.36 C, 5 Cr, 1 4 Mo, 1 4 W, 0.5 V, bal Fe.
Ht. Tr. 290,000 TS, 235,000 YS; 8 El, C 54 Rock.
For die casting dies, hot punches and heading dies, shear blades.
Type H12 tool steel, hot work steel, high toughness and wear resistance.

MARATHON E612.
M-1496; 0.40 C, 1 15 Si, 5.25 Cr, 4.25 W, bal Fe.
Hardened: 269,000 TS; 207,000 YS; 5 El, 9 RA.
At 900°F: 217,000 TS; 172,000 YS; 10 El; 31 RA.
For die casting dies, forging and extrusion tools, upsetters, dummy blocks.
Type H14 hot work steel, deep hardening.

MARATHON Mo10.
M-1496; 0.80 C, 4 Cr, 8 Mo, 1.5 W, 1 V, bal Fe.
Hardened: C 64-66 Rock
For lathe and planer tools, hobs, drills, reamers, broaches, form cutters.
Type M1 high speed steel, high red-hardness, wear resistant.

MARATHON Mo19.
M-1496; 1.0 C, 4 Cr, 8.75 Mo, 1.75 W, 2 V, bal Fe.
Hardened: C 64-67 Rock.
For reamers, hobs, chasers, lathe and planer tools.
Type M7 high-speed steel, high red-hardness. Abrasion resistant.

MARATHON Mo20.
M-1496; 0.82 C, 5 Mo, 6.5 W, 4 Cr, 2 V, bal Fe.
Hardened: C 64-66 Rock.
For lathe and planer tools, drills, taps, chasers, drawing dies, punches, hobs, form cutters.
Type M2 high speed steel, high red-hardness, tough.

MARATHON Mo20S.
M-1496; 0 62-0.68 C, 3.8-4.4 Cr, 1.8-2.1 V, 6.5-6 7 W, 4.7-5.2 Mo, bal Fe.
Hardened. C 58-62 Rock.
For hot extrusion dies, punches, shear blades, forging mandrels
Type H42 high speed steel for hot working

MARATHON PW16.
M-1496; 0 50 C, 4 Cr, 18 W, 1 V, bal Fe.
Hardened· C 60-65 Rock
Ht. Tr 130,000 TS; 95,000 YS; 4 El; C 52 Rock.
For punches, hot work tools and dies, extrusion and die casting dies
Type H26 hot work steel, tough, good high temperature strength.

MARATHON-SA
M-1496, 0 55 C, 0 9 Mn, 2 0 Si, 0.3 Cr, 0.2 V, bal Fe
Hardened 338,000 TS, 281,000 YS; 5 El; 600 Brin.
For punches, shear blades, pneumatic tools, rivet busters, knurling tools
Type S-4 tool steel, deep hardening, shock and wear resistant

MARATHON SA200
M-1496, 0 75 C, 4 Cr, 14 W, 2 V, bal Fe
Hardened· C 64-66 Rock
For drills, reamers, taps, punches, lathe and planer tools
Type T7 high speed steel, high red-hardness.

MARATHON SA900
M-1496, 1 5 C, 13 W, 4 5 Cr, 5 V, 5 Co, bal Fe
Hardened C 64-66 Rock.
For cutting tools, broaches, drills, hobs, lathe and planer cutters, reamers.
Type T15 high speed steel, high-red-hardness, abrasion resistant.

MARATHON SS4
M-501, 1 05 1 15 C, bal Fe
For tools, taps, drills, water hardened

MAR-CON 660.
M-1671, 7 Sn, 7 Pb, 3 Zn, bal Cu
Cast 44,000 TS, 27,000 YS, 16 El, 14 RA, 73 Brin.
For bearings, bushings, liners.
Continuous cast bronze

MARINE ALLOY
U. S., 2 Cu, 40 Sn, 48 Pb, 10 Sb.
For bearings; submerged bearings.

MARINE BABBITT.
72 Pb, 21 Sn, 7 Sb
For marine bearings; anti-friction

MARINE BRONZE.
U S.; 57.5 Cu, 0.8 Ni, 0.15 Sn, 0 50 Al, bal Zn, 83,500 TS; 15 El
For marine parts.

MARINE BRONZE NO. 8
M-481, Mn, Zn, Sn, Al, bal Cu.
Cast: 65,000 TS; 20-25 El; 29 RA; 150 Brin.
For marine propellers, ship parts, etc, subjected to salt water corrosions; resists corrosion.

MARINE GLYCO.
M-240; Sn, Sb, bal Pb.
For marine bearings; Babbitt.

MARINE NICKEL.
M-540; Pb, Ni, bal Sn.
For bearings; Babbitt metal.

MARK 12KH14A.
Russia; 0.12 C, 14 Cr, bal Fe
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA;
155 Brin.
For valves, cutlery, valve turbines;
Type 410; stainless.

MARK 18KH14A.
Russia; 0.18 C, 14 Cr, bal Fe
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA;
195 Brin.
For valves, cutlery, surgical and dental instruments;
Type 420; stainless.

MARK 50
Russia; 0.50 C, bal Fe.
Annealed: 96,000 TS; 52,000 YS; 16 El; 23 RA;
170 Brin
For gears, bolts, fasteners; water hardened.

MARKANA METAL.
M-303; 58-60 Cu, 40-38 Zn, 1.5-2.0 Mn + Fe.
For sheets for spinning, lavatories, wash basins,
sinks; corrosion resistant; M.P. 880°C.

MARK E169
Russia; 14 Cr, 14 Ni, 2 W, bal Fe.
For valves, cutlery; corrosion resistant.

MARKER 2X COLUMBUS.
M-1305, 0.85 C, bal Fe.
Water hardening carbon tool steel;
for hand and pneumatic chisels,
stone splitting hammers and wedges.
Werkstoff Nr. 1.1631.

MARKER 2X COLUMBUS-HART.
M-1305; 1.15 C, bal Fe
Water hardening carbon tool steel;
special tools largely for stone industry.

MARKER 3X ROSE
M-1305, 0.55 C, 0.08 Si, 0.40 Mn, bal Fe
Water hardening carbon tool steel, for pliers,
hatchets, axes, anvils,
wood and stone working tools
Werkstoff Nr. 1.1820.

MARKER 8A
M-1305, 0.15-0.35 C, 1.0-2.5 Si, 1.5 max Mn,
17.0-19.0 Cr, 0.5 max Mo, 8.0-10.0 Ni, bal Fe
Cast, ann: 64,000-92,000 TS; 15 min El;
130-200 Brin
Austenitic stainless casting,
for use in air up to 1550°F.
DIN G-X25CrNiSi189; VDEh 4525.

MARKER 10AX
M-1305; 0.25 C, 20 Cr, 14 Ni, bal Fe.
Cast. 71,000-100,000 TS; 35,000 YS; 15 El,
200 Brin.
Austenitic, corrosion resistant, weldable;
good strength at elevated temperature.
For parts operating at 550-1000°C.
DIN G-X25CrNiSi2014.

MARKER 11AXS
M-1305; 0.20-0.50 C, 1.0-2.5 Si, 1.5 max Mn,
24.0-26.0 Cr, 0.5 max Mo, 11.0-14.0 Ni, bal Fe.
Cast, ann: 64,000-92,000 TS; 10 min El,
130-200 Brin.
For furnace parts; useable in air to 2000°F.
Austenitic stainless.
DIN G-X35CrNiSi2512; VDEh Spec 4837;
ACI HH; AISI 309 cast.

MARKER 11F.
M-1305; 0.40 C, 22 Cr, 1.8 Ni, bal Fe.
Cast: 57,000-85,000 TS; 50,000 YS; 1 El; 280 Brin.
For furnace castings for use at 1650-1920°F.
DIN G-X40CrSi22.

MARKER 12A30.
M-1305; 0.20-0.40 C, 1.0-2.0 Si, 1.5 max Mn,
29.0-31.0 Cr, 0.5 max Mo, 19.0-21.0 Ni, bal Fe.
Cast, ann: 64,000-92,000 TS; 6 min El;
150-220 Brin.
Austenitic stainless casting; useable in air
to 2160°F.
DIN G-X30CrNiSi3020; ACI HL.

MARKER 12 AC 15.
M-1305; 0.10-0.20 C, 1.0-2.0 Si, 1.5 max Mn,
24.0-27.0 Cr, 0.5 max Mo, 19.0-21.0 Ni, bal Fe.
Cast, ann: 64,000-92,000 TS; 25 min El.
130-200 Brin.
Austenitic stainless casting; for parts operating at
temperatures up to 1920°F.
DIN G-X15CrNiSi2520; VDEh Spec 4849;
ACI CK-20; AISI 310 cast.

MARKER 12 AXN.
M-1305; 0.15-0.30 C, 0.5-1.5 Si, 1.5 max Mn,
16-19.0 Cr, 0.5 max Mo, 34.0-36.0 Ni, 1.0-1.5 Nb,
bal Fe.
Cast, ann: 57,000-85,000 TS; 8 min El;
150-220 Brin.
Austenitic stainless steel casting;
good in most atmospheres at
elevated temperatures.
DIN G-X20NiCrNb3515.

MARKER 12 AXS.
M-1305, 0.20-0.40 C, 1.0-2.0 Si, 1.5 max Mn,
13.0-16.0 Cr, 0.5 Mo, 34.0-36.0 Ni, bal Fe.
Cast, ann: 57,000-85,000 TS; 12 min El;
130-200 Brin.
Austenitic stainless steel casting;
for parts in carburizing atmosphere
at temperatures up to 1920°F.
DIN G-X25NiCrSi3515; ACI HT.

MARKER 210 M.
M-1305; 0.35 C, 0.9 Si, 0.3 Mn, 1.05 Cr,
0.2 V, 1.85 W, bal Fe.
Cold work tool and die steel;
oil or water hardenable to 53-56 Rock C
For pneumatic tools, cold shear blades,
header chisels.
Werkstoff Nr. 1.2541.

MARKER 215 M
M-1305; 0.45 C, 0.9 Si, 0.3 Mn, 1.05 Cr,
0.2 V, 1.85 W, bal Fe.
Cold work tool and die steel; oil hardenable to
54-58 Rock C.
For pneumatic hammers, chisels, riveting tools.
Werkstoff Nr. 1.2542.

MARKER 220 M.
M-1305; 0.60 C, 0.9 Si, 0.3 Mn, 1.05 Cr, 0.2 Vi,
1.85 W, bal Fe
Cold work tool and die steel;
oil or water hardenable to 57-61 Rock C.
Punching and trimming dies, shear knives to
9 mm thick, wood working tools.
Werkstoff Nr. 1.2550.

MARKER 465 M.
M-1305; 0.90 C, 1.90 Mn, 0.1 V, bal Fe.
Cold work tool and die steel; oil hardenable
to 63-64 Rock C.
For cutting dies of complicated shapes
for thin metal to 3 mm thick, threading dies.
Werkstoff Nr. 1.2842.

MARKER 476 M.
M-1305; 2.10 C, 1.20 Cr, 0.70 W, bal Fe.
Cold work tool and die steel;
air or oil hardenable to 63-65 Rock C.
For cold forming and stamping dies, especially for precision parts as saws and laminations; for precision parts as gages; some corrosion resistance.
Werkstoff Nr. 1.2436.

MARKER 476 M EXTRA.
M-1305; 1.65 C, 12.0 Cr, 0.6 Mo, 0.1 V, 0.5 W, bal Fe.
Cold work tool and die steel;
air or oil hardenable to 63-65 Rock C.
For cold forming and stamping laminations, saw blades, for precision parts as gages;
some corrosion resistance
Werkstoff Nr. 1.2601.

MARKER 476 M EXTRA B
M-1305, 1.65 C, 12.0 Cr, 0.65 Mo, 0.5 V, 0.5 W, bal Fe.
Cold work tool and die steel; air or oil hardenable to 63-65 Rock C.
For cold forming and stamping dies, shear blades.
Werkstoff Nr. 1.2602.

MARKER 476 M SPEZIAL
M-1305; 2.00 C, 12.0 Cr, 0.5 Mo, 0.5 V, 1.0 W, bal Fe.
Cold work tool and die steel; air or oil hardenable to 63-65 Rock C.
For cold forming and stamping dies, broaches, thread rolling dies, gages.

MARKER 477 M
M-1305, 1.05 C, 0.9 Mn, 1.0 Cr, 1.15 W, bal Fe.
Cold work tool and die steel;
oil hardenable to 63-66 Rock C.
For punching and trimming dies for thin sheet and strip up to 4 mm thick, shears.
Werkstoff Nr. 1.2419.

MARKER AW50.
M-1305; 0.45 C, 1.65 Cr, 0.50 Mo, 0.90 V, 0.60 W, bal Fe.
Hot work tool and die steel,
oil or water hardenable to 250,000-270,000 TS.
Pressing dies for hot forming of screws, hot shears
Werkstoff No 1.2603.

MARKER C 3.
M-1305; 1.40 C, 0.25 Si, 0.30 Mn, 0.30 Cr, 0.10 V, bal Fe.
Water hardening tool steel, high surface hardness possible; for drawing dies and tools
Werkstoff Nr. 1.2206.

MARKER C 73
M-1305; 1.45 C, 0.25 Si, 0.60 Mn, 1.40 Cr, bal Fe.
Oil hardening tool steel; for woodworking tools, files, rubber cutting knives.
Werkstoff Nr. 1.2063.

MARKER CDD.
M-1305; 0.90 C, 0.25 Si, 0.30 Mn, 0.80 Cr, bal Fe.
Water or oil hardening tool steel; for drawing dies, embossing tools, cold forming press and bend rollers.
Werkstoff Nr. 1.2056.

MARKER CVC.
M-1305; 0.90 C, 0.30 Si, 0.30 Mn, 3.25 Cr, 0.25 Mo, 0.15 V, bal Fe.
Oil hardening tool steel;
also used for large roller bearings and races;
hardenable to 64-66 Rock C

MARKER D 606 G.
M-1305; 0.10 max C, 1.0 max Si, 1.5 max Mn, 15.0-17.0 Cr, 12.0-14.0 Ni, Nb = 10 × % C min, bal Fe.
Austenitic stainless casting.
Good elevated temperature strength and creep properties to about 1100°F.
DIN G-X8CrNiNb1613; VDEh Spec 4961.

MARKER D 607 G.
M-1305; 0.10 max C, 1.0 max Si, 1.5 max Mn, 15.5-17.5 Cr, 1.5-2.0 Mo, 15.5-17.5 Ni, Nb = 10 × % C min, bal Fe.
Austenitic stainless casting.
Good elevated temperature strength and creep properties to about 1100°F.
DIN G-8CrNiMoNb1616: VDEh Spec 4981.

MARKER DC 10.
M-1305, 0.23 C, 1.25 Si, 10.0 Cr, 1.2 Mo, 0.75 Ni, 1.0 V, 0.45 W, 0.10 N, bal Fe.
Hot work tool and die steel;
oil or water hardenable to 250,000-265,000 TS.
For hot working of zinc, aluminum and other light metals.

MARKER DCM
M-1305; 0.35 C, 1.0 Si, 5.15 Cr, 1.45 Mo, 0.50 V, bal Fe
Hot work tool and die steel; oil, water or air hardenable to 256,000-274,000 TS
For forging dies, pressure casting molds.
Werkstoff Nr. 1.2343, AISI H 11.

MARKER DCMC
M-1305, 0.36 C, 1.0 Si, 0.4 Mn, 2.0 Co, 5.15 Cr, 1.45 Mo, 0.5 V, bal Fe.
Hot work tool and die steel, oil or air hardenable to 250,000 270,000 TS.
For forging dies, pressure casting molds.

MARKER DCMX.
M-1305; 0.27 C, 1.0 Si, 5.15 Cr, 1.45 Mo, 0.50 V, bal Fe.
Hot work tool and die steel;
air or oil hardenable to 240,000-270,000 TS
For pressure casting molds, forging dies;
better toughness than Marker DCM.

MARKER DCS.
M-1305; 0.40 C, 1.0 Si, 0.4 Mn, 5.15 Cr, 1.2 Mo, 1.05 V, 0.15 S, bal Fe.
Hot work tool and die steel
Free machining grade similar to Marker DCV.

MARKER DCV
M-1305, 0.40 C, 1.0 Si, 5.15 Cr, 1.35 Mo, 1.0 V, bal Fe
Hot work tool and die steel; oil or water hardenable to 256,000-276,000 TS.
For hot pressing dies for light metals, pressure casting molds, forging dies
Werkstoff Nr. 1.2344; AISI H 13.

MARKER DCW.
M-1305; 0.37 C, 1.0 Si, 5.15 Cr, 1.45 Mo, 0.30 V, 1.50 W, bal Fe
Hot work tool and die steel;
oil or water hardenable to 280,000-300,000 TS.
For hot shears, punches, forming tools for screws, rivets, hot tools for welding machines, forging dies.
Werkstoff Nr. 1.2606; AISI H 12.

MARKER ED 5 SG
M-1305, 0.15 max C, 0.8 max Si, 0.4-0.7 Mn, 4.0-6.5 Cr, 0.45-0.65 Mo, bal Fe.
Casting, air or oil hardenable.
Good elevated temperature yield strength and creep strength up to about 932°F.
DIN GS-12CrMo195: VDEh Spec. 7362;
AISI 501 cast.

MARKER-ED12.
M-1335; 0.20 C, 11.5 Cr, 1 Mo, 0.3 V, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened: 240,000 TS; 200,000 YS; 10 El; C 50 Rock.
For valves, bearings, cutlery, surgical instruments.
Corrosion resistant, hardenable.

MARKER ED 12 G.
M-1305; 0.15-0.23 C, 1.0 max Si, 0.4-0.8 Mn, 10.0-12.0 Cr, 0.9-1.2 Mo, 0.6-0.9 Ni, 0.25-0.35 V, bal Fe.
Casting, air or oil hardenable.
Good elevated temperature yield strength and creep strength up to about 1022°F.
DIN G-X20CrMoV121; VDEh Spec 4937.

MARKER-ED12G.
M-1335; 0.18 max C, 11 Cr, 1.05 Mo, 0.75 Ni, 0.3 V, bal Fe.
Annealed: 90,000 TS; 38,000 YS; 26 El; B 92 Rock.
Hardened: 235,000 TS; 200,000 YS; 10 El; C 48 Rock.
For valves, bearings, cutlery, surgical instruments.
Corrosion resistant, hardenable.

MARKER-ED12W.
M-1335; 0.20 C, 12 Cr, 1 Mo, 0.3 V, 0.5 W, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened: 240,000 TS; 205,000 YS; 9 El; C 50 Rock.
For cutlery, valves, bearings, surgical instruments.
Corrosion resistant, hardenable.

MARKER EUZONIT 60
M-1305, 0.05 max C, 15.5-18.0 Cr, 16.0-19.0 Mo, 1.0 max Fe, bal Ni.
Cast, quenched: 71,000 100,000 TS; 42,600 YS; 6 min El; 170-230 Brin
Yield strength at 752°F: 28,400 psi.
Resistant to chemical attack, good oxidizing resistance at elevated temperature.
DIN G-X3NiMoCr6418, VDEh Spec 4472.

MAERKER EUZONIT 60 S.
M-1305; 0.02 C, 17.5 Cr, 16.0 Mo, 1.0 max Fe, bal Ni
Quenched. 107,000-135,000 TS; 49,800 YS; 35 min El, 170-220 Brin
Resistant to oxidizing corroding media, free chlorine, acid solutions of ferric and copper salts, phosphoric and sulphuric acids.
DIN X2NiCrMo6017.

MARKER EUZONIT 70.
M-1305, 0.05 max C, 26.0-29.0 Mo, 1.0 max Fe, bal Ni.
Cast, quenched: 71,000-100,000 TS; 42,600 YS; 6 min El; 170-230 Brin.
Cast stainless nickel base alloy; resistant to boiling hydrochloric acid, humid hydrochloric gas, sulphuric and phosphoric acids.
DIN G-X3NiMo7028; VDEh Spec 4482.

MAERKER EUZONIT 70 S.
M-1305; 0.03 C, 1.0 max Cr, 28.0 Mo, 1.0 max Fe, bal Ni.
Quenched: 114,000-142,000 TS; 54,000 YS; 35 min El; 180-230 Brin.
Resistant to boiling hydrochloric acid, humid hydrochloric gas, sulphuric acid, increased resistance to boiling, concentrated phosphoric acid (85%).
DIN X3NiMo7028.

MARKER EXTRA-HART.
M-1305; 1.30 C, bal Fe.
Water hardening carbon tool steel; for engraving and watchmaking tools, sculpturing tools.
Werkstoff Nr. 1.1660.

MARKER EXTRA-MITTELHART.
M-1305; 1.15 C, bal Fe.
Water hardening carbon tool steel; for drills, knives, chisels, knife sharpening steels.
Werkstoff Nr. 1.1650.

MARKER EXTRA-SEHR ZAH.
M-1305; 0.70 C, bal Fe.
Water hardening carbon tool steel; for blacksmith tools; very tough.
Werkstoff Nr. 1.1620.

MARKER EXTRA-ZAH.
M-1305; 0.85 C, bal Fe.
Water hardening carbon tool steel; for chisels, punches, forming tools, hammers, anvils, rollers for mechanical handling; tough.
Werkstoff Nr. 1.1630.

MARKER EXTRA-ZAHHART.
M-1305; 1.00 C, bal Fe.
Water hardening carbon tool steel; for scythes, sickles, hand stamping dies.
Werkstoff Nr. 1.1640.

MARKER FS.
M-1305; 0.70 C, 1.65 Si, 0.70 Mn, bal Fe.
Water or oil hardening steel; for wrenches, pliers, screw drivers.
Werkstoff Nr. 1.2823.

MARKER H8A.
M-1305; 0.15 C, 18 Cr, 10 Ni, bal Fe.
Wrought, ann: 78,000-106,000 TS; 52,500 YS; 40 El; 160 Brin.
Austenitic general purpose stainless and heat resisting steel; for parts operating at 550-850°C.

MARKER H18F.
M-1309; 0.10 C, 18 Cr, 2.2 Ni, bal Fe.
Wrought, ann: 78,000-100,000 TS; 50,000 YS; 15 El; 200 Brin.
Ferritic, corrosion resistant, good high temperature properties; for parts operating at 900-1050°C.

MARKER H24 FS.
M-1305; 0.10 C, 24 Cr, 1.5 Ni, bal Fe.
Wrought, ann: 71,000-92,000 TS; 43,000 YS; 10 El; 200 Brin.
Ferritic, corrosion resistant, good high temperature strength, for parts operating at 950-1200°C.

MARKER H40A.
M-1305; 0.12 C, 16 Cr, 36 Ni, bal Fe.
Wrought, ann: 78,000-106,000 TS; 38,000 YS; 60 El; 180 Brin.
Austenitic, for carburizing and annealing boxes, furnace parts operating at 550-1150°C.

MARKER HM 3.
M-1305; 0.31 C, 0.30 Si, 0.60 Mn, 2.50 Cr, 0.20 Mo, 0.15 V, bal Fe.
For case hardening by nitriding.
Case hardness expected: 750 VDH.
Core strength: 128,000-156,000 psi. TS.

MARKER HOV D.
M-1305; 0.35 C, 0.25 Si, 0.60 Mn, 1.60 Cr, 0.20 Mo, 1.0 Ni, 0.90 Al, bal Fe.
For case hardening by nitriding.
Case hardness expected: 900 VDH.
Core strength: 112,000-142,000 psi TS.

MARKERITE.
German; carbide.
For tool tips, cutters; hard metal.

MARKER K 6 R.
M-1305; 0.60 C, 0.85 Si, 0.75 Mn, 1.20 Cr, 0.10 V, bal Fe.
Cold work tool steel; oil hardenable to 59-62 Rock C.
For hole punching tools in heavy metal up to 4 mm thick, wood working tools as planes, saws.
Werkstoff Nr. 1.2243.

MARKER K 8 R.
M-1305; 0.85 C, 1.15 Si, 0.70 Mn, 1.20 Cr, bal Fe.
Cold work tool steel; oil hardenable to 63-65 Rock C.
For punches, chisels, woodworking tools, milling cutters.
Werkstoff Nr. 1.2108.

MARKER K 97.
M-1305; 0.06 C, 0.20 Si, 0.25 Mn, 3.75 Cr, 0.50 Mo, 0.10 V, bal Fe.
Case hardening steel;
Case hardness expected: C 62-65 Rock.
Core strength: 112,000-142,000 psi TS.

MARKER KEW.
M-1305; 0.60 C, 3.75 Cr, 0 85 Mo, 0.70 V, 9.0 W, bal Fe.
Hot work tool steel, oil or air hardenable to 60-62 Rock C.
For hot punching, stamping and cutting, tube pressing mandrels.
Werkstoff Nr. 1 2622

MARKER KL 9.
M-1305; 1.00 C, 0.25 Si, 0 40 Mn, 1.55 Cr, bal Fe
Oil hardening tool steel; used for cutters for meat grinders, for ball and roller bearings and races.
Werkstoff Nr. 1.2067.

MARKER KO 11.
M-1305; 0 78 C, 9.50 Co, 4.15 Cr, 0 65 Mo, 1.55 V; 18 0 W, bal Fe.
High speed steel for turning, planing, and drilling steel and cast iron.
(AISI T5); W. Nr 1.3265.

MARKER KO 12.
M-1305; 1 32 C, 10.50 Co, 4 50 Cr, 4 00 Mo, 3 25 V, 10 0 W, bal Fe
High speed steel for finishing tools, for inserted cutters, for cold flow press tools.
W. Nr. 1.3207.

MARKER KO 13.
M-1305; 1.10 C, 8 0 Co, 3.8 Cr, 9 5 Mo, 1.2 V, 1.5 W, bal Fe
High speed steel for lathe tools, form cutters, planing tools, drills, reamers.
Good high temperature hardness
AISI M42; W. Nr. 1.3247.

MARKER KO 15
M-1305; 1.50 C, 4 75 Co, 4.15 Cr, 3.75 Mo, 5.0 V, 6.60 W, bal Fe.
High speed steel for lathe tools, gear cutters counterbores, drills, taps.
AISI M15.

MARKER KO 55.
M-1305, 1.32 C, 4.75 Co, 4.15 Cr, 0 85 Mo, 3.75 V, 12.0 W, bal Fe.
High speed steel for finishing tools for turning, reaming, form cutting, for inserted cutters.
W. Nr. 1.3202.

MARKER KO 109.
M-1305; 0.80 C, 4.75 Co, 4.15 Cr, 0.65 Mo, 1.55 V, 18.0 W, bal Fe.
High speed steel for turning and punching tools for steel and cast iron; for deep hole drills.
AISI T4; W. Nr. 1.3255.

MARKER KSP.
M-1305; 0.50 C, 0.30 Si, 0.65 Mn, 0.80 Cr, 0 30 Mo, 1.80 Ni, 0 10 V, bal Fe.
Oil hardening steel, to 56-58 Rock C.
For forming tools, can also be nitrided for 600-650 Vickers hardness; smooth finish possible.

MARKER LW 10.
M-1305; 1.20 C, 0.25 Si, 0.30 Mn, 0.20 Cr, 0.10 V, 1.00 W, bal Fe.
Water hardening tool steel, high surface hardness possible; for drills, drawing tools, knives for pipe cutting.
Werkstoff Nr. 1.2516.

MARKER MEW EXTRA
M-1305; 0 30 C, 2.35 Cr, 0.60 V, 4.25 W, bal Fe.
Hot work tool and die steel, air or oil hardenable to 240,000-265,000 TS
For hot forming and thread rolling of screws, nuts, rivets, for hot shears; for pressure casting molds
Werkstoff Nr 1 2567.

MARKER MHM.
M-1305; 0 35 C, 0 30 Si, 0 50 Mn, 0 90 Cr, 1 15 Mo, 3.50 Ni, 0 12 V, bal Fe
Hot work tool steel, oil hardenable to 228,000-242,000 TS;
For deep impression forging dies

MARKER MO 5
M-1305, 0 85 C, 4.15 Cr, 5 10 Mo, 1 85 V, 6 35 W, bal Fe
High speed steel for tools for general purpose cutting, lathe turning, milling, drilling of steel and non ferrous metals, tough
W. Nr 1.3343, AISI M2.

MARKER MO 5 Co
M-1305, 0 85 C, 4 75 Co, 4 15 Cr, 5.10 Mo, 1 85 V, 6 35 W, bal Fe
High speed steel for turning tools, threading tools, deep hole drills, cutting tough iron and steel.
W Nr 1 3243, AISI M35.

MARKER MO 5 Co H
M-1305, 1 10 C, 5 0 Co, 4 25 Cr, 3.75 Mo, 2 0 V, 6 75 W, bal Fe
High speed steel for fast finishing tools for turning, planing, deep hole drilling
W Nr 1 3246; AISI M41.

MARKER MO 5 H
M-1305; 1 00 C, 4 15 Cr, 5.10 Mo, 1.85 V, 6.35 W, bal Fe
High speed steel for finish cutting lathe, milling and drilling tools.
W Nr 1 3342

MARKER MO 9 Co 8
M-1305, 0.94 C, 8 0 Co, 4 0 Cr, 8 5 Mo, 2 0 V, 2 0 W, bal Fe
High speed steel for turning and planing steel and cast iron under difficult conditions.
AISI M34, W Nr. 1.3249

MARKER MO 9 V
M-1305; 1 05 C, 3 80 Cr, 9 0 Mo, 2.0 V, 1 75 W, bal Fe.
High speed steel for turning, milling, drilling steel and non-ferrous metals
W. Nr. 1 3348, AISI M7.

MARKER MOV 4.
M-1305; 1.23 C, 4.15 Cr, 5.10 Mo, 2.90 V, 6.35 W, bal Fe.
High speed steel for turning, reaming, gear cutting of steel and non-ferrous metals; high hardness.
W. Nr. 1.3344; AISI M3(2).

MARKER MSV.
M-1305; 1.00 C, 0.20 Si, 0.25 Mn, 0.15 V, bal Fe.
Water hardening tool steel;
for small cold forming dies for making screws, rivets, coins; for drawing dies.

MARKER MW 3.
M-1305; 1.42 C, 0.25 Si, 0.30 Mn, 0.30 Cr, 0.25 V, 3.25 W, bal Fe.
Water hardening tool steel; for lathe and planer tools, precision tools for watch making, engraving tools.
Werkstoff Nr. 1.2562

MARKER MW 5
M-1305, 1.30 C, 0.25 Si, 0.30 Mn, 0.30 Cr, 4.75 W, bal Fe.
Water hardening tool steel
For drawing dies, mandrels for drawing pipe.
Werkstoff Nr. 1.2453.

MARKER PHM
M-1305, 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe.
Hot work tool steel, oil or water hardenable to 300,000 TS.
For centrifugal casting molds for zinc alloys, hot forming tools.
Werkstoff Nr. 1.2323

MARKER POLYTEN
M-1305, 1.00 C, 0.30 Si, 0.50 Mn, 5.20 Cr, 1.0 Mo, 0.20 V, bal Fe.
Air or oil hardening tool steel; for cold forming dies, shears, knives, slotting saws,
nail making tools
Werkstoff Nr. 1.2363, AISI A2.

MARKER PSH.
M-1305, 0.50 C, 0.25 Si, 0.50 Mn, 1.05 Cr, 3.50 Ni, bal Fe
Oil hardening tool steel, to 55-58 Rock C
For dies for forming emblems, plaques, buttons, commemorative coins, cutlery
Werkstoff Nr. 1.2721.

MARKER PSHB.
M-1305, 0.45 C, 0.25 Si, 0.50 Mn, 1.25 Cr, 0.20 Mo or 0.50 W, 3.75 Ni, bal Fe.
Oil hardening tool steel, to 53-56 Rock C.
For pressing dies requiring deep impressions, thread rolling dies, embossing tools.
Werkstoff Nr. 1.2767.

MARKER PWC
M-1305, 0.45 C, 4.25 Cr, 0.50 Mo, 2.25 V, 4.25 W, 4.25 Co, bal Fe
Hot work tool steel, air or oil hardenable to 240,000-265,000 TS.
For hot punching and stamping operations
Werkstoff Nr. 1.2678; AISI H 19.

MARKER R 17.
M-1305; 0.38 C, 0.40 Si, 0.80 Mn, 17.0 Cr, 1.25 Mo, 1.0 Ni, bal Fe.
Air or oil hardenable to 50-55 Rc
For surgical and dental tools, cutlery, kitchen tools; corrosion resistant

MARKER R 18
M-1305; 1.10 C, 0.40 Si, 0.50 Mn, 17.5 Cr, 1.0 Mo, 0.10 V, bal Fe.
Air or oil hardenable to 58-60 Rock C.
Corrosion resisting; for discs for meat grinders, surgical and dental tools.

MARKER REM.
M-1305; 0.45 C, 13.5 Cr, 13.0 Ni, 0.50 V, 2.5 W, bal Fe.
Austenitic, hot work tool steel.
For dies and forming tools for working copper-nickel and nickel alloys that are difficult to work.
Werkstoff Nr. 1.2731.

MARKER RH.
M-1305, 0.40 C, 0.40 Si, 0.30 Mn, 13.0 Cr, bal Fe.
Air or oil hardening high chromium steel;
for synthetic resin molds, cold stamping and punching dies, surgical tools, corrosion resistant.
Werkstoff Nr. 1.2083

MARKER S 7 A.
M-1305; 0.20 C, 0.25 Si, 1.25 Mn, 1.15 Cr, bal Fe
Case hardening steel.
Case hardness expected: C 62-64 Rock.
Core strength 142,000-182,000 psi. TS.
Werkstoff Nr. 1.2162.

MARKER S 7 N
M-1305; 0.30 C, 0.30 Si, 0.60 Mn, 1.35 Cr, 0.25 Mo, 0.50 Ni, 0.12 V, bal Fe.
Case hardening steel
Case hardness expected: C-62-64 Rock.
Core strength: 200,000-240,000 psi TS.

MARKER S & C S 14.
M-1305; 0.15-0.25 C, 12.5-14.5 Cr, 0.10 max Ni, bal Fe
Cast, Ht Tr : 85,000-114,000 TS; 56,900 YS; 12 min El, 180-240 Brin
Ductile, weldable, cast corrosion resistant steel; favorable mechanical properties, pumping parts, mechanical engineering
DIN G-X25Cr14, VDEh Spec 4021

MARKER S & C S 14 S
M-1305; 0.08-0.15 C, 12.5-14.0 Cr, 0.50 max Mo, 0.5-1.5 Ni, bal Fe
Cast, Ht Tr : 85,000-114,000 TS; 56,900 YS, 14 min El, 180-240 Brin
Ductile, weldable, cast corrosion resistant steel; turbine and pump construction.
DIN G-X12Cr14, ACI CA-15, VDEh Spec 4006

MARKER S & C S 15
M-1305, 0.40-0.50 C, 14.0-15.5 Cr, bal Fe
Cast, annealed 240 max Brin.
Corrosion resistant, hardenable, good sliding properties, for pump construction
DIN G-X45Cr15, VDEh Spec 4034

MARKER S & C S 17 M
M-1305, 0.33-0.43 C, 15.5-17.5 Cr, 1.0-1.3 Mo, 1.0 max Ni, bal Fe
Cast, Ht Tr : 107,000-135,000 TS, 65,400 YS, 5 min El; 220-300 Brin.
Yield strength at 752°F 49,800 psi
Hardenable, corrosion resistant, good high temperature strength, resistant to organic acids
DIN G-X35CrMo17; VDEh Spec 4122.

MARKER S & C S 18.
M-1305, 0.15-0.25 C, 15.5-17.5 Cr, 1.0-2.0 Ni, bal Fe.
Cast, Ht Tr : 100,000-128,000 TS, 64,000 YS; 6 min El; 220-290 Brin.
Hardenable, increased corrosion resistance, ship building and marine work.
DIN G-X22CrNi17; VDEh Spec. 4059;
Similar to ACI Cb-30 and AISI-431.

MARKER S & C S 30
M-1305; 0.50-0.90 C, 27.0-30.0 Cr, bal Fe.
Cast, annealed. 210-280 Brin.
Good corrosion resistant casting, resistant to oxidizing acids and salts.
DIN G-X70Cr29; VDEh Spec 4085

MARKER S & C S 30 H.
M-1305; 0.90-1.30 C, 27.0-30.0 Cr, bal Fe.
Cast, annealed: 260-330 Brin.
Corrosion resistant casting, good wear and abrasion resistance.
DIN G-X120Cr29; VDEh Spec 4086.

MARKER S & C S 30 M.
M-1305; 0.50-0.90 C, 27.0-30.0 Cr, 2.0-2.5 Mo, bal Fe.
Cast, annealed: 210-280 Brin.
Corrosion resistant casting; for potash mining equipment, and chemical industry.
DIN G-X70CrMo292; VDEh Spec 4136.

MARKER S & C S 30 MH.
M-1305; 0.90-1.30 C, 27.0-30.0 Cr, 2.0-2.5 Ni, bal Fe.
Cast, annealed: 260-330 Brin.
Corrosion resistant casting; good hardness and very good wear resistance.
DIN G-X120CrMo292; VDEh Spec 4138.

MARKER S & C SG 25.
M-1305; 1.50-1.80 C, 24.0-26.0 Cr, bal Fe.
Cast, annealed: 350 max Brin.
Hardenable chromium corrosion resistant casting; good wear resistance.
DIN G-X170Cr25.

MARKER S & C SG 25 M.
M-1305; 1.50-1.80 C, 24.0-26.0 Cr, 2.0-2.5 Mo, bal Fe.
Cast, annealed: 400 max Brin.
Hardenable chromium corrosion resistant steel casting; good resistance to salt solutions, diluted organic acids; wear resistant.
DIN G-X170CrMo252.

MARKER S & G SN 5.
M-1305; 0.30-0.50 C, 26.0-28.0 Cr, 3.5-5.5 Ni, bal Fe.
Cast, ann: 71,000-114,000 TS; 230-280 Brin.
Chromium corrosion resistant casting; good fluidity for intricate castings.
DIN G-X40CrNi274; VDEh Spec 4340; ACI CC-50.

MARKER S & C SN 5 M.
M-1305; 0.30-0.50 C, 26.0-28.0 Cr, 2.0-2.5 Mo, 4.0-6.0 Ni, bal Fe.
Cast, ann: 240-300 Brin
Corrosion resistant steel casting; for intricate casting.
DIN G-X40CrNiMo275; VDEh Spec 4464.

MARKER S & C SN 6 M
M-1305; 0.10 max C, 24.0-28.0 Cr, 1.3-1.8 Mo, 5.0-7.0 Ni, bal Fe.
Cast, ann: 85,000-107,000 TS; 59,700 YS, 15 min El; 170-220 Brin.
Corrosion resistant steel casting; good mechanical properties and good resistance to oxidizing acids and salts.
DIN G-X8CrNiMo275.

MARKER S & C SN 8.
M-1305; 0.12 max C, 17.0-19.0 Cr, 8.0-10.0 Ni, bal Fe.
Cast, quenched: 64,000-92,000 TS; 28,400 YS; 20 min El; 140-190 Brin.
Basic grade of austenitic stainless steel casting; excellent ductility; universal application.
DIN X10CrNi189; VDEh Spec 4312;
Similar to ACI CF-20.

MARKER S & C SN 8 EL.
M-1305; 0.03 max C, 17.0-19.5 Cr, 10.0-12.0 Ni, bal Fe.
Cast, quenched: 64,000-92,000 TS; 24,200 YS; 25 min El, 130-180 Brin.
Lowest carbon grade of basic 18-8 austenitic stainless steel casting, for welding without subsequent heat treat.
DIN G-X2CrNi1811; VDEh Spec 4306; ACI CF-3.

MARKER S & C SN 8 N.
M-1305; 0.08 max C, 17.5-20.0 Cr, 9.0-11.0 Ni, Nb = 8 × % C, bal Fe
Cast, quenched: 64,000-92,000 TS; 28,400 YS; 20 min El; 140-190 Brin.
Niobium stabilized 18-8 casting, weldable without subsequent heat treat; also used at temperatures above 600°F.
DIN G-X8CrNiNb1810; VDEh Spec 4552; ACI CF-8C.

MARKER S & C SN 8 S
M-1305; 0.07 max C, 17.5-20.0 Cr, 9.0-11.0 Ni, bal Fe.
Cast, quenched: 60,000-88,000 TS; 28,400 YS; 20 min El, 140-190 Brin.
Lower carbon grade of basic 18-8 austenitic cast steel, weldable without subsequent heat treat.
DIN G-X6CrNi1810; VDEh Spec 4308; ACI CF-8

MARKER S & C SN 9.
M-1305, 0.12 max C, 17.0-19.0 Cr, 2.0-2.5 Mo, 9.0-11.0 Ni, bal Fe
Cast, quenched: 64,000-92,000 TS; 29,800 YS; 20 min El; 140-190 Brin.
Austenitic stainless casting; better corrosion resistance than ordinary 18-8 type.
DIN G-X10CrNiMo1810, VDEh Spec 4410.

MARKER S & C SN 9 EL
M-1305, 0.03 max C, 16.5-18.5 Cr, 2.0-2.5 Mo, 11.0-13.0 Ni, bal Fe.
Cast, quenched: 60,000-88,000 TS; 24,200 YS; 25 min El; 130-180 Brin.
Low carbon, improved corrosion resistant austenitic stainless casting; weldable without subsequent heat treat.
DIN G-X2CrNiMo1812; VDEh Spec 4404,
ACI CF-3M; AISI 316L (cast).

MARKER S & C SN 9 N.
M-1305; 0.08 max C, 16.5-18.5 Cr, 2.0-2.5 Mo, 10.5-12.0 Ni, Nb = 8 × % C, bal Fe.
Cast, quenched: 64,000-92,000 TS; 29,800 YS; 20 min El; 140-190 Brin
Niobium stabilized austenitic casting; very good corrosion resistance, weldable without subsequent heat treat; usable above 600°F.
DIN G-X7CrNiMoNb1811; VDEh Spec 4581.

MARKER S & C SN 9 S.
M-1305; 0.07 max C, 17.0-19.5 Cr, 2.0-2.5 Mo, 10.0-12.0 Ni, bal Fe
Cast, quenched: 64,000-92,000 TS; 29,800 YS; 20 min El, 140-190 Brin.
Austenitic stainless casting, very good corrosion resistance; weldable without subsequent heat treat
DIN G-X6CrNiMo1811; VDEh Spec 4408;
ACI CF-8M; AISI 316 (cast).

MARKER S & C SN 10.
M-1305; 0.20-0.30 C, 24.0-26.0 Cr, 8.0-10.0 Ni, bal Fe.
Cast, quenched: 71,000-107,000 TS; 89,800 YS; 10 min El; 180-240 Brin.
Corrosion resistant steel casting; good ductility; for pump components.
DIN G-X25CrNi259; Similar to ACI CE-30.

MARKER S & C SN 10 M.
M-1305; 0.20-0.30 C, 23.5-25.0 Cr, 2.0-2.5 Mo, 8.0-10.0 Ni, bal Fe.
Cast, quenched: 78,000-107,000 TS; 89,800 YS; 10 min El; 180-240 Brin.
Corrosion resistant steel casting; improved resistance to sulphites and chlorides.
DIN G-X25CrNiMo259.

MARKER S & C SN 12.
M-1305; 0.08 max C, 16.0-18.0 Cr, 4.0-5.0 Mo, 12.5-14.5 Ni, Nb = 8 × % C, bal Fe.
Cast, quenched: 57,000-92,000 TS; 28,400 YS; 15 min El; 140-190 Brin.
Austenitic corrosion resistant steel casting; weldable, good at elevated temperatures, indifferent to localized corrosion.
DIN G-X5CrNiMoNb1713; VDEh Spec 4579; Similar to ACI CG-8M, AISI 317 (cast).

MARKER S & C SN 18
M-1305; 0.08 max C, 16.5-18.5 Cr, 2.0-2.5 Mo, 19.0-21.0 Ni, 1.8-2.4 Cu, Nb = 8 × % C, bal Fe
Cast, quenched. 64,000-92,000 TS, 25,600 YS; 15 min El, 130-180 Brin.
Austenitic corrosion resistant steel casting, resistant to sulphuric acid, phosphoric acid, strong organic acids
DIN G-X7CrNiMoCu1818; VDEh Spec 4585.

MARKER S & C SN 25
M-1305, 0.08 max C, 19.0-21.0 Cr, 2.5-3.5 Mo, 24.0-26.0 Ni, 1.5-2.0 Cu, Nb = 10 × %C, bal Fe.
Cast, quenched 64,000-92,000 TS; 28,400 YS; 14 min El, 130-180 Brin
Austenitic corrosion resistant steel casting, resistant to sulphuric acid, phosphoric acid, strong organic acids
DIN G-X7NiCrMoCu2520, VDEh Spec 4500; ACI CN 7M

MARKER S & C SN 26 M
M-1305, 0.08 max C, 24.0-26.0 Cr, 2.0-2.5 Mo, 24.0-26.0 Ni, Nb = 8 × %C, bal Fe
Cast, quenched 64,000-92,000 TS, 28,400 YS, 15 min El, 130-180 Brin
Austenitic corrosion resistant steel casting, resistant to sulphuric acid, phosphoric acid, strong organic acids
DIN G-X7CrNiMoNb2525, VDEh Spec 4588

MARKER S & C SN 42
M-1305, 0.08 max C, 20.0-22.0 Cr, 5.0-6.0 Mo, 42.0-44.0 Ni, Nb = 12 × %C, bal Fe.
Cast, quenched. 71,000-100,000 TS, 31,300 YS; 14 min El, 150-200 Brin
Austenitic stainless alloy, resistant to sulphuric acid, phosphoric acid, strong organic acids, many pickling and galvanizing baths
DIN G-X5NiCrMoNb4422; VDEh Spec 4557.

MARKER S & C SN 99 N
M-1309, 0.08 max C, 18.0-20.0 Cr, 2.8-3.5 Mo, 12.0-14.0 Ni, Nb = 8 × %C, bal Fe.
Cast, quenched· 64,000-92,000 TS; 29,800 YS; 20 min El, 140-190 Brin.
Yield strength at 752°F 18,500 psi
Austenitic stainless casting; good corrosion resistance; for welded assemblies above 600°F.
DIN G-X8CrNiMoNb1812; VDEh Spec 4583.

MARKER S.N.18.
M-1335; 0.08 C, 18 Cr, 18 Ni, 2 Mo, 2 Cu, bal Fe.
For chemical plant equipment, pump and valve parts; corrosion resistant, austenitic

MARKER S.N.25.
M-1335; 0.10 C, 18 Cr, 25 Ni, 4 Mo, 2 Cu, bal Fe.
For chemical plant equipment, pump and valve parts; corrosion resistant, austenitic.

MARKER S N.42.
M-1335; 0.1 C, 18 Cr, 42 Ni, 5 Mo, 2 Cu, bal Fe.
For chemical plant equipment, corrosion and heat resistant.

MARKER SPEZIAL M EXTRA
M-1305; 1.00 C, 0.10 V, bal Fe.
Water hardening carbon tool steel; for small cold working dies, as for rivets, screws, coins, medals.

MARKER SPEZIAL M-MITTELHART.
M-1305; 1.10 C, bal Fe.
Water hardening carbon tool steel; for drills, taps, wood working tools, knife sharpening or whetting steel.
Werkstoff Nr. 1.1550

MARKER SPEZIAL M-SEHR ZAH.
M-1305, 0.70 C, bal Fe.
Water hardening carbon tool steel; for shears, woodworking tools, riveting hammers; very tough.
Werkstoff Nr 1.1520.

MARKER SPEZIAL M-ZAH
M-1305, 0.85 C, bal Fe
Water hardening tool steel; for punches and dies, for chisels, shears, cutlery.
Werkstoff Nr. 1.1530

MARKER SPEZIAL M-ZAHHART.
M-1305; 1.00 C, bal Fe
Water hardening carbon tool steel; for work shop tools as drills, chisels, hand lettering and stamping dies.
Werkstoff Nr. 1.1540.

MARKER SPM
M-1305, 0.30 C, 2.35 Cr, 0.25 V, 9.0 W, 2.05 Co, bal Fe.
Hot work tool steel, oil or air hardenable to 240,000-265,000 TS max
For dies for hot forming bronze, brass and other copper alloys
Werkstoff Nr 1.2662

MARKER SRS
M-1305; 0.55 C, 0.70 Cr, 0.30 Mo, 1.65 Ni, 0.10 V, bal Fe
Hot work tool and die steel, oil hardenable to 300,000 TS.
For drop forge dies, jaws for welding machines, shears
Werkstoff Nr. 1.2713

MARKER SRS EXTRA.
M-1305, 0.55 C, 1.1 Cr, 0.5 Mo, 1.65 Ni, 0.10 V, bal Fe.
Hot work tool and die steel, air, oil or water hardenable to 270,000-300,000 TS.
For casting molds for zinc, tin and lead; hot forming tools
Werkstoff Nr. 1.2714.

MARKER SS 11
M-1305, 0.88 C, 4.15 Cr, 0.85 Mo, 2.45 V, 12.00 W, bal Fe.
High speed steel for turning, milling, drilling and gear cutting steel.
W. Nr. 1.3318.

MARKER SS 13.
M-1305; 1.25 C, 4.15 Cr, 0.85 Mo, 3.75 V, 12.0 W, bal Fe
High speed steel, high hardness for finishing tools as reamers, finish turning and precision boring.
W. Nr. 1.3302

MARKER SS 19.
M-1305; 0.74 C, 4.15 Cr, 1.10 V, 18.0 W, bal Fe.
High speed steel for general purpose tools for turning, planing, milling and drilling steel and non-ferrous metals.
W. Nr. 1.3355; AISI T1.

MARKER TAM.
M-1305; 0.85 C, 0.25 Si, 0.25 Mn, 0.15 Mo, 0.20 Ni, 0.30 V, bal Fe.
Water hardening tool steel; for cold forming screws, nuts, bolts, balls; good resistance to cracking under pressure.

MARKER Vg 508
M-1305; 0.20-0.40 C, 1.0-2.0 Si, 1.5 max Mn, 24.0-26.0 Cr, 0.5 Mo, 34.0-36.0 Ni, bal Fe.
Cast, ann: 64,000-92,000 TS; 8 min El; 150-220 Brin.
Austenitic stainless casting; for use in parts operating at temperatures up to 2100°F.
DIN G-X40NiCrSi3525.

MARKER W5/0.
M-1305; 0.30 C, 0.85 Si, 1.05 Cr, 0.20 V, 3.75 W, bal Fe.
Hot work tool and die steel; oil or water hardenable to 210,000-250,000 TS.
For hot forming rivets; thread rolling screws; mandrels, jaws for electric welders.
Werkstoff Nr 1.2564

MARKER W 11.
M-1305; 0.30 C, 2.65 Cr, 0.35 V, 9.0 W, bal Fe.
Hot work tool steel, air or oil hardenable to 240,000-265,000 TS
For hot stamping dies, punches, shears, hot extrusion dies.
Werkstoff Nr. 1.2581.

MARKER W 18 K
M-1305; 0.58 C, 4.15 Cr, 0.3 Mo, 1.0 V, 18.0 W, bal Fe
Cold work tool and die steel; oil or air hardenable to 57-60 Rock C.
For thread rolling dies for screws, bolts.
Werkstoff Nr. 1.2587

MARKER WAGT.
M-1305; 0.40 C, 1.25 Mn, 1.85 Cr, 0.20 Mo, bal Fe.
Hot work tool and die steel; oil hardenable to 270,000 TS.
For drop hammer forging dies, hot punches, frames for casting molds.
Werkstoff Nr. 1.2311

MARKER WAGT EXTRA.
M-1305, 0.43 C, 1.4 Mn, 2.3 Cr, 0.25 Mo, 0.50 Ni, 0.10 V, bal Fe.
Hot work tool and die steel; oil or air hardenable to 234,000-284,000 TS.
For forging hammers.

MARKER WAGT S
M-1305, 0.40 C, 0.3 Si, 1.25 Mn, 1.85 Cr, 0.20 Mo, 0.10 S, bal Fe.
Hot work tool steel; free machining grade of MARKER WAGT.

MARKER WL 4.
M-1305; 1.00 C, 0.50 Si, 1.10 Mn, 1.55 Cr, bal Fe.
Oil hardening tool steel; used for meat grinders and larger ball and roller bearings.

MARKER WM 28.
M-1305; 0.32 C, 3.0 Cr, 2.80 Mo, 0.60 V, bal Fe.
Hot work tool and die steel; oil or water hardenable to 235,000-250,000 TS.
For hot forming heavy and light metals, hot shears, thread rolling, forming railroad spikes, pressure casting molds.
Werkstoff Nr. 1.2365; AISI H 10.

MARKER WMC.
M-1305; 0.33 C, 2.50 Cr, 2.50 Mo, 0.50 V, 2.50 Co, bal Fe.
Hot work tool and die steel; oil or water hardenable to 235,000-250,000 TS.
For threading dies for screws, hot forming rivets, valve cones.

MARKER WP 0
M-1305, 0.14 C, 0.25 Si, 0.40 Mn, 0.75 Cr, 3.50 Ni, bal Fe.
Case hardening steel, for heavy sections.
Case hardness expected: C 60-64 Rock.
Core strength: 112,000-170,000 psi TS.
For large gears and shafts requiring good strength and high surface hardness.
Werkstoff Nr 1.2735

MARKER WP 1.
M-1305, 0.19 C, 0.25 Si, 0.40 Mn, 1.25 Cr, 0.20 Mo or W, 3.75 Ni, bal Fe
Case hardening steel, for heavy sections.
Case hardness expected: C 60-64 Rock.
Core strength 155,000-200,000 psi TS.
For case hardening heavy drive gears, tractor transmission gears, aircraft gears and shafts.
Werkstoff Nr. 1.2764

MARKER ZES
M-1305, 2.10 C, 12.0 Cr, bal Fe.
Cold work tool and die steel, air or oil hardenable to 63-65 Rock C
For stamping and forming tools on thin metal sheet and strip, for rolls and presses for processing rubber, graphite, artificial resins and iron powder
Werkstoff Nr 1.2080

MARKER ZES EXTRA.
M-1305, 1.65 C, 12.0 Cr, 0.1 V, bal Fe.
Cold work tool and die steel; air or oil hardenable to 63-65 Rock C.
For dies and shears for cutting thin sheet and strip up to 5 mm thick, for broaches.
Werkstoff Nr 1.2201

MARKER ZES SPEZIAL.
M-1305; 2.10 C, 12.0 Cr, 0.35 Mo, 0.15 V, 1.60 Co, bal Fe.
Cold work tool and die steel, air or oil hardenable to 63-65 Rock C
Similar to Marker ZES but with improved toughness

MARKET BRASS
U.S., 65 Cu, 35 Zn
For condenser tubes, hardware; corrosion resistant.

MARK EYA-1T.
Russia, 0.12 C, 18 Cr, 8 Ni, Ti = 7 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin
For welded chemical plant equipment; Type 321; stainless, austenitic.

MARKEY M-1.
M-1671, 83 Cu, 7 Sn, 7 Pb, 3 Zn.
Cast leaded bronze; SAE 660; Copper alloy No 932;
ASTM B144-3B.

MARKEY M-2.
M-1671, 80 Cu, 10 Sn, 10 Pb.
Cast leaded bronze, SAE 64; Copper alloy No. 937;
ASTM B144-3C.

MARKEY M-3.
M-1671; 85 Cu, 5 Sn, 5 Zn, 5 Pb.
Cast leaded red brass; SAE 40; Copper alloy No. 836;
ASTM B145-4A.

MARKEY M-4.
M-1671; 85 Cu, 5 Sn, 9 Pb, 1 Zn.
Cast leaded bronze; SAE 66; Copper alloy No. 935;
ASTM B144-3C.

MARKEY M-6.
M-1671; 88 Cu, 10 Sn, 2 Zn.
Cast bronze; SAE 62; Copper alloy No. 905;
ASTM B143-1A.

MARKEY M-7.
M-1671; 88 Cu, 10 Sn, 2 Pb
Cast low lead bronze; SAE 63; Copper alloy No. 927.

MARKEY M-8.
M-1671; 76 Cu, 6 Sn, 18 Pb Cast bearing bronze; Copper alloy No 941.

MARKEY M-9
M-1691; 9 Sn, 1.2 Pb, 5.2 Ni, bal Cu
Cast nickel bronze.

MARKEY M-11.
M-1671; 83 Cu, 11 Al, 4 Fe.
Cast Aluminum bronze; SAE 68 A-B; Copper alloy No 954.

MARKEY M 12.
M-1671; 77 Cu, 8 Sn, 15 Pb Cast bearing bronze

MARKEY M-13
M-1671; 67 5 Cu, bal Zn Cast yellow brass; SAE 41.

MARKEY M-14
M-1671, 81 Cu, 8 Sn, 11 Pb Cast high leaded bronze

MARKEY M-15.
M-1671, 85 Cu, 14 Sn, 1 Zn.
Cast tin bronze; Copper alloy No. 910

MARKEY M-16.
M 1671, 78 Cu, 6 Sn, 16 Pb
Cast high lead tin bronze, Copper alloy No 939.

MARKEY M 17
M-1671; 87 Cu, 11 Sn, 1 Pb, 1 Ni.
Cast leaded tin bronze; SAE 640; Copper alloy No. 925

MARKEY M-18.
M 1671; 87 Cu, 8 Sn, 1 Pb, 4 Zn
Cast leaded tin bronze; Copper alloy No 923; ASTM B143-2B

MARKEY M-19
M-1671; 70 Cu, 9 Sn, 21 Pb. Cast high leaded tin bronze.

MARKEY M-20
M-1671, 72 Cu, 3 Sn, 25 Pb. Cast high leaded tin bronze.

MARKEY M-21
M-1671; 70 Cu, 5 Sn, 25 Pb.
Cast high leaded tin bronze; Copper alloy No. 943.

MARKEY M-22.
M-1671; Manganese bronze. SAE 43.

MARKEY M-23.
M-1671: 66 Cu. 34 Zn. Cast yellow brass.

MARKEY M-24.
M-1671; 83 Cu, 10 Sn, 5 Pb, 2 Zn. Cast leaded bronze.

MARKEY M-25.
M-1671; 75 Cu, 5 Sn, 20 Pb. Cast high leaded tin bronze.

MARKEY M-29.
M-1671; 81 Cu, 3 Sn, 7 Pb, 9 Zn. Cast leaded semi-red brass; Copper alloy No. 844; ASTM B145-5A.

MARKEY M-31.
M-1671; 73-77 Cu, 4-6 Sn, 18-23 Pb, 3 max Zn.
Cast high leaded tin bronze.

MARKEY M-34.
M-1671; 75 Cu, 5 Sn, 20 Pb, 1 max Ni.
Cast high leaded tin bronze.

MARKEY M-35.
M-1671; 89 Cu, 11 Sn, 0.1-0 3 P.
Cast phosphor gear bronze; SAE 65; Copper alloy No. 907.

MARKEY M-36.
M-1671; 70 Cu, 3.5-5 Sn, 19-23 Pb, 0.50 max P, others 1.0 max. Cast high leaded tin bronze.

MARKEY M-37.
M-1671; 1.5-2.5 Sn, 28-29 Pb, 0.50 max Zn, 0.25-0 75 Ni, bal Cu. Cast copper lead alloy.

MARKEY M-38
M-1671; 82-85 Cu, 7-9 Sn, 0 75 Zn, 1.0 max Ni, 0 50 P, 0.15 max Fe, 0.50 max Sb.
Cast leaded tin bronze.

MARKEY M-40.
M-1671; 72-78 Cu, 4.5-6 Sn, 18-22 Pb, 1 0 max Ni, 0 20 max Fe, 0.05 max P. Cast high leaded bronze.

MARKEY M-41.
M-1671; 68 5-73 5 Cu, 4.5-6 0 Sn, 22-26 Pb.
Cast high leaded bronze; Copper alloy No 943;
ASTM B144-3E

MARKEY M-42
M-1671; 76-78 Cu, 2-4 Sn, 9-11 Pb, 2 0-2 5 Ni, 6-9 Zn. Cast high leaded bronze.

MARKEY M-43.
M-1671, 86-89 Cu, 9-11 Sn, 0.3 max Pb, 1-3 Zn.
Cast tin bronze; SAE 62, Copper alloy No 905.

MARKEY M-44.
M-1671; 84-89 Cu, 9-13 5 Sn, 1.0 max Pb, 1-3 Zn.
Cast tin bronze.

MARKEY M-45
M-1671; 86-89 Cu, 7.5-9 Sn, 0 30 Pb, 3-5 Zn, 1 0 Ni.
Cast tin bronze; Copper alloy No 903; ASTM B143-1B

MARKEY M-46.
M-1671; 86-89 Cu, 5 5-6 5 Sn, 1-2 Pb, 3-5 Zn, 1.0 Ni.
Cast leaded tin bronze, copper alloy No. 922, ASTM B143-2A.

MARKEY M-47.
M-1671; 78-82 Cu, 2-3 Sn, 9-11 Pb, 6 5-8.5 Sn, 1.0 max Ni.
Cast leaded brass

MARKEY M-50.
M-1671; 66 5-73 5 Cu, 8.5-11.5 Sn, 18-22 Pb.
Cast high leaded tin bronze; 48-78 BHN.

MARK I.
M-494; 3.3 C, 1.4 Si, 0.2 P, bal Fe.
Cast: 180-250 Brin.
For medium section castings: cast iron.

MARK III.
M-494; 3.2 C, 1.9 Si, 1.4 Ni, 0.4 Cr, bal Fe.
Cast: 220-280 Brin.
For heat treated castings, gears; cast iron.

MARK VII.
M-494; 3.4 C, 1.4 Si, 0.2 P, bal Fe.
Cast: 170-220 Brin.
For piston rings; cast iron.

MARK U7.
Russia; 0.70 C, 0.25 max Mn, 0.25 max Si, bal Fe.
Heat treated: 174,000 TS; 128,000 YS; 12 El; 37 RA; 352 Brin.
For springs, rails, clutch discs; water hardened.

MARK U8.
Russia; 0.80 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 188,000 TS; 143,000 YS; 12 El; 35 RA; 388 Brin.
For springs, taps, reamers, drills, hobs; water hardened.

MARKUS ALLOY.
Eng.; Cu, Ni, Zn.
For decorative parts; corrosion resistant.

MAR-M ALLOY 200.
M-1536; 0.12-0.17 C, 8-10 Cr, 11.5-13.5 W, 9-11 Co, 0.05 Zr, 0.75-1.25 Co, 4.75-5.25 Al, 1.75-2.25 Ti, 0.015 B, 1.5 max Fe, bal Ni.
As Cast: 135,000 TS; 120,000 YS; 7 El.
At 1400°F: 135,000 TS; 122,500 YS; 3.5 El.
For turbine blades and vanes in aircraft gas turbine engines.
High strength and oxidation resistant to 1900°F.

MAR-M ALLOY 211.
M-1536; 0.15 C, 9 Cr, 10 Co, 2.5 Mo, 5.5 W, 2.7 Cb, 2.0 Ti, 5 Al, 0.015 B, 0.05 Zn, bal Ni.
For integrally cast turbine wheels and blades.
Cast alloy. High stress-rupture strength.
Corrosion and heat resistant.

MAR-M ALLOY 246.
M-1536; 0.15 C, 9 Cr, 10 Co, 10 W, 2.5 Mo, 1.5 Ta, 1.5 Ti, 5.5 Al, 0.015 B, 0.05 Zr, bal Ni.
Cast. 139,000 TS; 122,000 YS; 4.5 El.
At 1600°F: 132,000 TS; 100,000 YS; 4.5 El.
For turbine vanes, nozzles, jet engine components.
Precipitation hardening. For service up to 1900°F. High oxidation resistant.

MAR-M ALLOY 302
M-1536, 0.78-0.93 C, 1.5 max Fe, 0.01 max B, 20-23 Cr, 9-11 W, 8-10 Ta, 0.1-0.3 Zr, bal Co.
Cast: 140,000 TS; 100,000 YS; 2 El, C 40 Rock.
At 1600°F: 56,000-78,000 TS; 40,000-50,000 YS; 7-14 El.
For turbine vanes, nozzle guide vanes and buckets in gas turbines.
High oxidation and thermal shock resistance. For service to 2100°F.

MAR-M ALLOY 322.
M-1536; 0.9-1.1 C, 20-23 Cr, 8-10 W, 4-5 Ta, 2.0-2.5 Zr, 0.65-0.85 Ti, 1.5 max Fe, bal Co.
Cast: 121,000 TS; 91,000 YS; 3 El; 4 RA; C 36 Rock.
At 1500°F: 95,000 TS; 55,000 YS; 10 El; 10 RA.
For turbine vanes and blades, jet engine components.
High temperature strength and ductility. Oxidation resistant to 2000°F.

MAR-M ALLOY 421.
M-1536; 0.15 C, 15.5 Cr, 1.75 Mo, 10 Co, 3.5 W, 1.75 Cb, 1.75 Ti, 4.25 Al, 0.05 Zr, 0.015 B, 1 max Fe, bal Ni.
As Cast: 132,000 TS; 115,000 YS; 6 El; 10 RA.
Heat treated: 150,000 TS; 132,000 YS; 4.4 El; 6.5 RA.
Wrought: 198,000 TS; 136,000 YS; 20 El; 26 RA.
For turbine rotors and discs, jet engine components.
Precipitation hardening, high strength and sulfidation resistant.

MAR-M ALLOY 432.
M-1536; 20 Co, 15.5 Cr, 4.3 Ti, 2.8 Al, 3 W, 2 Ta, 2 Cb, 0.15 B, 0.05 Zr, bal Ni.
Cast: 180,000 TS; 150,000 YS; 5 El; 6.5 RA.
For integrally cast turbine wheels, jet engine components, turbine blades. Sulphidation resistant.
Resists creep rupture and hot corrosion.

MAR-M ALLOY 509.
M-1536; 0.6 C, 21.5 Cr, 10 Ni, 7 W, 3.5 Ta, 0.2 Ti, 0.5 Zr, bal Co.
At 70°F: 113,000 TS; 85,000 YS; 3.5 El; 5.8 RA.
At 1600°F: 68,000 TS; 45,000 YS; 7 El; 13 RA.
For aircraft and industrial turbines.
Cast superalloy, high strength, low creep rate. Resists shock and oxidation.

MAR-M ALLOY 918.
M-1536, 20 Ni, 20 Cr, 7.5 Ta, 0.1 Zr, 0.05 C, bal Co.
Bar: 130,000 TS; 56,000 YS; 48 El.
For burner cans and afterburner liners in gas turbine engines.
High heat, oxidation, and corrosion resistance.

MARQUES AGPV.
M-884; C, S, bal Fe
For screw machine products; free-cutting.

MARQUES D1S.
M-884, C, S, bal Fe.
For screw-machine products; free-cutting.

MARQUES D1SS
M-884; C, S, bal Fe.
For screw machine products; free-cutting.

MARQUES D2S.
M-884; 0.2 C, 0.12-0.18 S, bal Fe
For screw machine products; free-cutting.

MARQUES D2SS
M-884; 0.2 C, 1 Mn, 0.12-0.18 S, bal Fe.
For screw machine products, free-cutting

MARQUES D3S.
M-884, C, 0.08-0.13 S, bal Fe.
For screw machine products; free-cutting

MARQUES D3SS.
M-884; C, Mn, S, bal Fe.
For screw machine products; free-cutting

MARREL 5NS
M-1180; 0.12-0.16 C, 0.2 Cr, 5-5.5 Ni, bal Fe.
Hardened: 170,000-200,000 TS; 108,000 YS; 6 El; 40 RA; 350-420 Brin
For motor valves, boilers, gears; case hardening steel, shock resistant.

MARREL 50SS
M-1180; 0.18-0.25 C, 0.8-1.0 Mn, bal Fe.
Normalized: 74,000-83,000 TS; 53,000 YS; 24 El; 58 RA; 149-166 Brin.
For machinery and welded parts; parts workable at low temperature.

MARREL AMMO.
M-1180; 0.20 max C, 0.9-1.2 Mn, 0.2 Cr, 0.4-0.6 Mo, bal Fe.
Normalized: 84,000-90,000 TS; 50,000 YS; 18 El; 50 RA; 150-180 Brin.
For sheet iron parts for superchargers; for use at temperatures up to 500°C.

MARREL ARM.
M-1180; 1.0-1.15 C, 1.4-1.6 Cr, bal Fe.
Hardened: 630-740 Brin.
For cutlery, stamping dies, cams, tools; oil hardening.

MARREL ASK1.
M-1180; 0.15-0.21 C, 0.6-0.9 Mn, 0.6-1.0 Cr, bal Fe.
Hardened: 135,000-165,000 TS; 86,000 YS; 8 El; 33 RA; 280-340 Brin.
For gears, shafts; case hardening steel.

MARREL ASK2.
M-1180; 0.20-0.25 C, 0.6-0.9 Mn, 0.85-1.00 Cr, bal Fe.
Hardened: 162,000-191,000 TS; 103,000 YS; 5 El; 28 RA.
For gears, shafts; case hardening steel.

MARREL ASK3.
M-1180; 0.30-0.40 C, 0.6-0.9 Mn, 0.85-1.00 Cr, bal Fe.
Hardened: 114,000-128,000 TS; 102,000 YS; 15 El; 62 RA; 230-272 Brin.
For mechanical parts, gears, shafting; oil hardening.

MARREL AKS4.
M-1180; 0.40-0 48 C, 0.6-0.9 Mn, 0.85-1.00 Cr, bal Fe.
Hardened: 128,000-142,000 TS; 115,000 YS; 14 El; 58 RA; 260-310 Brin.
For forged parts, gears; oil hardening.

MARREL ASK5.
M-1180, 0.48-0.58 C, 0.6-0.9 Mn, 0 85-1.15 Cr, bal Fe.
Hardened· 140,000-155,000 TS; 128,000 YS; 13 El; 50 RA; 290-330 Brin
For wear rings, grinding parts; wear resistant.

MARREL ASM3.
M-1180; 0.29-0 36 C, 0 45-0 55 Mn, 0.4-0.6 Cr, 0 4-0.6 Ni, bal Fe.
Hardened: 114,000-128,000 TS, 100,000 YS; 13 El; 60 RA; 235-265 Brin
For connecting rods, center bits, cylinders; oil hardening.

MARREL ASM4.
M-1180; 0.36-0 44 C, 0.5-0.7 Mn, 0.4-0.6 Cr, 0 4-0.6 Ni, bal Fe.
Hardened: 128,000-141,000 TS; 114,000 YS; 12 El; 56 RA; 260-295 Brin.
For mechanical parts, gears, shafts; oil hardening.

MARREL ASM5.
M-1180; 0 44-0 54 C, 0.5-0 7 Mn, 0.4-0.6 Ni, 0 4-0.6 Cr, bal Fe
Hardened: 142,000 TS; 125,000 YS; 11 El; 50 RA; 290-330 Brin.
For gears, shafts; oil hardening.

MARREL ASMY.
M-1180; 0.35-0.40 C, 0.4-0 6 Mn, 0.4-0.6 Cr, 0.4-0.6 Ni, 0.15-0.20 Mo, bal Fe.
Hardened: 121,000-135,000 TS; 114,000 YS; 15 El; 61 RA; 260-298 Brin.
For compressed gas bottles and cylinders; oil hardening.

MARREL AST.
M-1180; 0.32-0.38 C, 0.5-0.7 Mn, 1.6-2.0 Cr, 3.6-4.0 Ni, bal Fe.
Hardened: 240,000-320,000 TS; 158,000 YS; 6 El; 10 RA; 470-560 Brin.
For rollers, gears, connecting rods; oil hardening, tough.

MARREL C2N.
M-1180; 0.045-0.095 C, 0.3-0.5 Mn, 1.7-2.0 Ni, bal Fe.
Rolled: 78,000-95,000 TS; 57,000 YS; 15 El; 62 RA; 150-210 Brin.
For axles, connecting rods; case hardening steel.

MARREL C14A.
M-1180; 0.10-0.15 C, 13 min Cr, bal Fe.
Heat treated: 114,000-128,000 TS; 100,000 YS; 14 El; 50 RA; 230-270 Brin.
For pump shafts, steam turbine parts; corrosion resistant.

MARREL C14B
M-1180; 0.15-0.23 C, 13 min Cr, bal Fe.
Hardened· 136,000-150,000 TS; 121,000 YS; 12 El; 48 RA; 270 320 Brin
For motor valves, steam turbine parts; corrosion resistant.

MARREL C14C.
M-1180; 0.23-0.32 C, 13 min Cr, bal Fe.
Hardened: 140,000-170,000 TS; 128,000 YS; 10 El; 42 RA; 300-360 Brin.
For motor valves, pump parts; corrosion resistant.

MARREL C14M.
M-1180; 0.32-0.40 C, 13 min Cr, bal Fe.
Hardened. 165,000-200,000 TS; 142,000 YS; 8 El; 36 RA; 360-420 Brin.
For cutlery, surgical instruments; corrosion resistant, hardenable.

MARREL CH1.
M-1180; 0 08-0.11 C, 0 6-0.8 Cr, 3.3-3.7 Ni, bal Fe.
Hardened: 135,000-156,000 TS; 108,000 YS; 12 El; 48 RA; 270-340 Brin.
For gears, shafts, pinions; case hardening steel.

MARREL CH2.
M-1180, 0 11-0 15 C, 0 6-0.8 Cr, 3.3-3.7 Ni, bal Fe.
Hardened: 156,000-185,000 TS; 111,000 YS; 9 El; 33 RA, 340-430 Brin
For gears, shafts, pinions, case hardening steel.

MARREL CH2D.
M-1180, 0 15-0 20 C, 0.6-0.8 Cr, 3.3-3.7 Ni, bal Fe.
Hardened. 185,000-210,000 TS, 128,000 YS; 8 El; 30 RA; 390-460 Brin.
For gears, pinions, shafts; case hardening steel.

MARREL CH3
M-1180; 0 21-0 29 C, 0 7-0.9 Cr, 3.3-3.7 Ni, bal Fe.
Hardened: 114,000-129,000 TS; 110,000 YS, 16 El, 60 RA, 230-270 Brin
For spindles, shafts, gears; oil hardening.

MARREL CH4.
M-1180; 0.29-0 38 C, 0.7-0.9 Cr, 3 3-3 7 Ni, bal Fe.
Hardened: 114,000-141,000 TS; 121,000 YS; 15 El; 58 RA; 260-300 Brin.
For spindles, shafts, gears; oil hardening.

MARREL CNCO.
M-1180; 0.06-0.10 C, 0.5-0.6 Cr, 2.6-3.0 Ni, bal Fe.
Hardened: 107,000-135,000 TS; 83,000 YS; 13 El; 50 RA; 210-280 Brin.
For gears, axles, camshafts, connecting rods; *case hardening steel*

MARREL CNC1.
M-1180; 0 10-0 13 C, 0 6-0.8 Cr, 2 6-3 0 Ni, bal Fe.
Hardened· 135,000-165,000 TS; 90,000 YS; 10 El; 45 RA; 270-350 Brin.
For automotive and aircraft parts, gears, shafts; case hardening steel.

MARREL CNC2.
M-1180; 0.13-0.17 C, 0.6-0.8 Cr, 2.6-3.0 Ni, bal Fe.
Hardened: 162,000-185,000 TS; 107,000 YS; 9 El; 33 RA; 340-430 Brin.
For automotive and aircraft parts, gears, shafts; case hardening steel.

MARREL CNC2D
M-1180; 0.17-0.21 C, 0.6-0.8 Cr, 2.6-3.0 Ni, bal Fe.
Hardened: 185,000-210,000 TS; 114,000 YS; 7 El; 30 RA; 390-460 Brin.
For gears, shafts; case hardening steel.

MARREL CNC3.
M-1180, 0.22-0.30 C, 0.6-0.8 Cr, 2.6-3.0 Ni, bal Fe.
Hardened: 114,000-128,000 TS; 109,000 YS; 17 El, 66 RA; 230-270 Brin.
For gears, shafts, axles; oil hardening

MARREL CNC4.
M-1180; 0.30-0.38 C, 0.5-0.7 Cr, 0.5-0.7 Mn, 2.6-3.0 Ni, bal Fe
Hardened: 128,000-141,000 TS, 121,000 YS; 15 El; 60 RA; 260-300 Brin.
For gears, shafts, axles; oil hardening.

MARREL CNC5.
M-1180; 0.38-0.46 C, 0.5-0.7 Mn, 0.5-0.7 Cr, 2.6-3.0 Ni, bal Fe.
Hardened. 142,000-157,000 TS, 128,000 YS; 13 El, 48 RA; 300-350 Brin.
For gears, shafts, axles; oil hardening

MARREL CNPO
M-1180; 0.30-0.35 C, 0.5-0.7 Mn, 0.6-0.8 Cr, 2.5-2.8 Ni, 0.25-0.35 Mo, bal Fe
Hardened· 135,000-150,000 TS; 128,000 YS; 14 El; 60 RA; 270-320 Brin.
For shafts, cranks, gears, tough, oil hardening

MARREL CNY1.
M-1180, 0.13-0.17 C, 0.6-0.9 Mn, 0.5-0.7 Cr, 1.1-1.3 Ni, 0.16-0.20 Cr, bal Fe
Hardened· 135,000-165,000 TS, 92,000 YS; 9 El, 38 RA, 270-340 Brin.
For gears, shafts; case hardening steel.

MARREL CNY2.
M-1180; 0.17-0.20 C, 0.6-0.9 Mn, 1.1-1.3 Ni, 0.5-0.7 Cr, 0.16-0.20 Mo, bal Fe
Hardened. 155,000-185,000 TS, 107,000 YS, 7 El, 30 RA; 340-390 Brin.
For gears, crankshafts, case hardening steel.

MARREL CNY2D.
M-1180; 0.20-0.24 C, 0.6-0.9 Mn, 0.5-0.7 Cr, 1.1-1.3 Ni, 0.16-0.20 Mo, bal Fe.
Hardened· 185,000-225,000 TS; 110,000 YS, 6 El, 28 RA; 390-460 Brin.
For gears, crankshafts; case hardening steel.

MARREL CNY3.
M-1180, 0.22-0.28 C, 0.6-0.9 Mn, 0.5-0.7 Cr, 1.1-1.3 Ni, 0.16-0.20 Mo, bal Fe.
Hardened: 113,000-128,000 TS; 110,000 YS; 16 El; 60 RA; 230-270 Brin.
For center bits, shafts, gears, propellers; oil hardening.

MARREL CNY4.
M-1180; 0.28-0.36 C, 0.6-0.9 Mn, 0.5-0.7 Cr, 1.1-1.3 Ni, 0.16-0.20 Mo, bal Fe.
Hardened: 128,000-142,000 TS, 120,000 YS; 14 El; 63 RA; 260-300 Brin.
For shafts, gears, propellers; oil hardening

MARREL CNY5.
M-1180; 0.36-0.46 C, 0.6-0.9 Mn, 0.5-0.7 Cr, 1.1-1.3 Ni, 0.16-0.20 Mo, bal Fe.
Hardened: 141,000-155,000 TS; 124,000 YS; 13 El; 58 RA; 300-350 Brin.
For shafts, axles, gears; oil hardening.

MARREL CTD.
M-1180; 0.05-0.10 C, 0.4 Mn, bal Fe.
Normalized: 72,000-93,000 TS; 57,000 YS; 28 El; 70 RA; 140-187 Brin.
For gears, cams, crankshafts; case hardening steel.

MARREL M1
M-1180; 0.65-0.75 C, 0.45-0.65 Mn, bal Fe.
Normalized: 104,000 TS; 64,000 YS; 14 El; 29 RA, 207-229 Brin.
For springs, hammers, files, chisels; oil or water hardening.

MARREL M2.
M-1180; 0.55-0.65 C, 0.5-0.7 Mn, bal Fe.
Normalized: 107,000-121,000 TS; 66,000 YS; 14 El, 36 RA, 207-258 Brin.
For hammers, springs, punches; water hardening.

MARREL M3.
M-1180, 0.45-0.55 C, 0.5-0.7 Mn, bal Fe.
Normalized· 93,000 107,000 TS, 60,000 YS; 17 El; 45 RA, 180-224 Brin.
For forgings, axes, shafts; water hardening.

MARREL M3W
M-1180; 0.48-0.55 C, 0.45 Mn, bal Fe.
Normalized 93,000-107,000 TS; 60,000 YS; 17 El; 45 RA, 180 224 Brin
For cutlery, table flatware; water hardening

MARREL M4
M-1180, 0.32-0.38 C, 0.5 0.7 Mn, bal Fe
Normalized· 78,000-93,000 TS, 55,000 YS, 20 El, 51 RA, 156-190 Brin
For gears, pinions, shafts, water hardening.

MARREL M5
M-1180, 0.18 0.23 C, 0.5-0.7 Mn, bal Fe.
Normalized 72,000 TS, 48,500 YS; 23 El; 57 RA, 140-160 Brin.
For axles, cotter pins, bolts, forged parts, water hardening.

MARREL M6
M 1180, 0.10-0.175 C, 0.5-0.7 Mn, bal Fe.
Normalized 64,000-72,000 TS, 43,000 YS, 25 El, 65 RA, 120-146 Brin
For gears, pinions, shafts, case hardening steel.

MARREL M7
M-1180, 0.09-0.125 C, 0.5 0.7 Mn, bal Fe
Normalized: 59,000-64,000 TS, 40,000 YS, 27 El, 72 RA; 112-128 Brin.
For bolts, rivets, stampings, water hardening.

MARREL Mo
M-1180, 0.95-1.05 C, 0.3 Mn, bal Fe.
Hardened. 160,000 114,000 TS, 100,000-72,000 YS; 10 El, 25 RA; 290-265 Brin.
For tools, dies, files, punches, hammers, water hardening.

MARREL MSG.
M-1180; 0.45-0.50 C, 0.4-0.8 Mn, 1.8-2.0 Si, bal Fe.
Hardened. 200,000-220,000 TS, 185,000 YS; 6 El; 28 RA; 420-500 Brin
For springs, oil hardening.

MARREL NK1.
M-1180; 0.07-0.11 C, 0.6-0.9 Mn, 0.9-1.25 Cr, 1.2-1.6 Ni, bal Fe
Hardened: 142,000-180,000 TS; 120,000 YS; 8 El; 42 RA; 290-390 Brin.
For gears, pinions, shafts, camshafts; case hardening steel.

MARREL NK2.
M-1180; 0.12-0.18 C, 0.6-0.9 Mn, 0.9-1.25 Cr, 1.2-1.6 Ni, bal Fe.
Hardened: 180,000-210,000 TS; 142,000 YS; 7 El; 40 RA; 370-450 Brin.
For aircraft gears, pinions, shafts; case hardening steel.

MARREL NK2D.
M-1180; 0.16-0.22 C, 0.6-0.9 Mn, 0.9-1.25 Cr, 1.2-1.6 Ni, bal Fe.
Hardened. 185,000-230,000 TS; 155,000 YS; 13 El; 36 RA; 390-500 Brin.
For aircraft gears, pinions, shafts; case hardening steel.

MARREL NK3.
M-1180; 0.22-0.29 C, 0.6-0.9 Mn, 0.75-1.10 Cr, 1.2-1.6 Ni, bal Fe.
Hardened: 195,000-240,000 TS; 170,000 YS, 6 El; 24 RA; 420-540 Brin
For gears, shafts, machinery parts, oil hardening

MARREL NK4
M-1180; 0.3-0.38 C, 0.6-0.9 Mn, 0.75-1.1 Cr, 1.2-1.6 Ni, bal Fe.
Hardened: 225,000-280,000 TS, 200,000 YS; 5 El; 22 RA, 480-630 Brin
For gears, pinions, axles; oil hardening.

MARREL SKM1.
M-1180, 0.11-0.15 C, 0.65-0.80 Mn, 0.85-1.15 Cr, 0.2-0.3 Mo, bal Fe
Hardened 135,000-170,000 TS; 86,000 YS; 10 El; 35 RA, 220-350 Brin.
For gears, pinions, cams, shafts; case hardening steel

MARREL SKM 2
M-1180; 0.15-0.19 C, 0.65-0.80 Mn, 0.85-1.15 Cr, 0.2-0.3 Mo, bal Fe
Hardened 160,000-185,000 TS; 107,000 YS, 7 El, 31 RA, 340-400 Brin.
For bolts, cylinder liners, gears, case hardening steel

MARREL SKM 2 D.
M-1180; 0.19-0.23 C, 0.65-0.80 Mn, 0.85-1.15 Cr, 0.2-0.3 Mo, bal Fe
Hardened: 182,000-210,000 TS; 111,000 YS; 6 El; 28 RA, 390-460 Brin
For gears, shafts, camshafts, bolts, case hardening steel

MARREL SKM 3
M-1180, 0.23-0.29 C, 0.65-0.80 Mn, 0.85-1.15 Cr, 0.2-0.3 Mo, bal Fe
Hardened 114,000-128,000 TS; 100,000 YS; 15 El, 63 RA; 230-270 Brin.
For shafts, axles, gears, oil hardening

MARREL SKM 3 S
M-1180; 0.21-0.28 C, 0.65-0.80 Mn, 0.85-1.15 Cr, 0.2-0.3 Mo, bal Fe.
Hardened. 128,000-156,000 TS; 99,500 YS; 10 El; 50 RA; 260-340 Brin
For gears, aircraft parts; good weldability.

MARREL SKM 4.
M-1180; 0.32-0.38 C, 0.65-0.80 Mn, 0.85-1.15 Cr, 0.2-0.3 Mo, bal Fe.
Hardened: 128,000-141,000 TS; 118,000 YS; 14 El; 60 RA; 260-300 Brin.
For shafts, pneumatic hammer pistons, torsion bars, oil hardening.

MARREL SKM 5.
M-1180; 0.38-0.48 C, 0.65-0.80 Mn, 0.85-1.15 Cr, 0.2-0.3 Mo, bal Fe
Hardened: 141,000-156,000 TS; 131,000 YS; 13 El; 53 RA; 300-340 Brin
For shafts, torsion bars, pneumatic hammer pistons; oil hardening.

MARREL SKM 5 B.
M-1180; 0.40-0.47 C, 0.7-0.8 Mn, 1-1.3 Cr, 0.4-0.5 Mo, bal Fe
Hardened: 141,000-156,000 TS; 132,000 YS; 13 El; 53 RA; 300-340 Brin.
For cutting pliers, tools, dies, oil hardening, tough

MARREL SKMC.
M-1180, 0.10-0.15 C, 0.65-0.90 Mn, 0.6-0.9 Cr, 0.45-0.60 Mo, bal Fe.
Rolled 68,000-83,000 TS; 43,000 YS; 20 El; 70 RA; 130-170 Brin
For tubes for high temperature and steam pipes; good weldability

MARREL SKMO.
M-1180, 0.08-0.11 C, 0.65-0.80 Mn, 0.85-1.15 Cr, 0.2-0.3 Mo, bal Fe
Hardened: 114,000-135,000 TS; 83,000 YS; 10 El, 40 RA; 235-285 Brin
For gears, pinions, cams, shafts, case hardening steel.

MARSHALL L-CRAT.
M-1149; 0.18 C, 0.50 Mn, 0.20 Si, bal Fe
Annealed. 72,000 TS; 40,000 YS; 22 El, 58 RA; 140 Brin
For jigs, fixtures, patterns, machinery parts; Type 1018 steel, killed

MARSH CH5
M-753, 0.34-0.40 C, 0.9 Si, 5 Cr, 1.25-1.5 Mo, 0.5-0.7 V, bal Fe
For hot forging dies, punches; hot work steel, oil hardened

MARSH CMN
M-753, 0.50-0.55 C, 0.15-0.20 Si, 1.5 Cr, bal Fe.
For drop stamping dies; oil hardened

MARSH CTC 1.
M-753, 0.45 C, 1.25 Cr, 2 W, 0.75 Si, bal Fe
For pneumatic chisels, boiler making tools, oil hardened, shock resistant

MARSH CTH
M-753, 0.43 C, 0.25 Cr, 0.50 W, bal Fe
For hot forging dies and punches; hot work steel, oil hardened.

MARSH CTHV.
M-753, 0.30 C, 3.4 Cr, 0.34 V, 8.4 W, bal Fe
For hot forging dies, punches, hot work steel, oil hardened

MARSH CYC
M-753; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe
For tools, cutters, reamers, hobs, drills; high speed steel.

MARSH CYC 5% COBALT.
M-753, 0.70 C, 4.5 Cr, 1 Mo, 1.5 V, 18 W, 5 Co, bal Fe
For lathe and boring tools, drills, shapers, cutters; high speed steel

MARSH CYC275
M-753, 0.8 C, 20 W, 4.5 Cr, 1.25 Mo, 1.2 V, 10 Co, bal Fe
For lathe and planer tools, hobs, reamers, milling cutters.

MARSH CYC EXTRA.
M-753; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For drills, hobs, reamers, broaches, lathe and planer cutters, high speed steel; Type T4.

MARSH CYC SPECIAL 14%.
M-753; 0.7 C, 14 W, 4 Cr, 2 V, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel.

MARSH H.F.C.
M-753; 2.15 C, 12.5 Cr, 0 6 Si, 0.3 Mn, bal Fe.
For forming and drawing dies, punches, shears; oil hardened, non-deforming.

MARSH M.N.
M-753; 0 9 C, 1 7 Mn, 0.2 Si, 0.25 Cr, bal Fe.
For dies, gauges, precision tools, taps, drills; oil hardened, non-deforming.

MARSH N3.
M-753, 0.4 C, 3.0-3.5 Ni, 0.4 Si, 0.6 Mn, bal Fe.
For chisels, gears, punches, crimpers; oil hardened, shock resistant.

MARSH NC.
M-753; 0.45 C, 3 75 Ni, 1.1 Cr, 0.5 Mn, 0.35 Si, bal Fe.
For chisels, snaps, gears, crimpers, punches; oil hardened, shock resistant

MARSH NC1.
M-753; 0.40 C, 1.5 Ni, 1 Cr, bal Fe.
For spring collets; oil hardened, tough

MARSH'S PATENT.
75 Ni, 25 Cr.
For electrical resistances, heating elements; heat resistant.

MARSH SPECIAL.
M-753; 1.2 C, 0 3 Mn, bal Fe.
For wood working tools, drills, water hardened; Type W1.

MARSH WTS (0 70C).
M-753; 0 70-0.80 C, 0 10-0 20 Si, 0.30-0 40 Mn, bal Fe.
Heat treated: 185,000 TS; 140,000 YS; 13 El, 37 RA; 375 Brin.
For lathe centers, vice jaws, press tools, Type W1; water hardened.

MARSH WTS (0.95C).
M-753, 0 95-1 05 C, 0.30-0.40 Mn, 0.1-0.2 Si, bal Fe.
Annealed 100,000 TS; 53,000 YS; 21 El; 42 RA, 200 Brin.
For blanking tools, punches, shears, press tools; Type W1; water hardened

MARS SUPERIEUR
M-1120; 0 7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, dies, cutters; high speed steel.

MARTIES ALLOY.
18 Zn, 35 Ni, 10 Fe, 10 Sn, bal Cu.
For resistances, heat and corrosion resistant parts; heat and corrosion resistant.

MARTIES' NON-OXIDIZABLE ALLOY.
35 Ni, 18 Zn, 17 Cu, 10 Fe, 10 Sn.
For heat and corrosion resistant parts; also called "Marlies."

MARTIES' NON-OXIDIZABLE ALLOY.
35 Ni, 10 Fe, 10 Zn, 20 Sn, 25 brass.
For heat and corrosion resistant parts; heat and corrosion resistant.

MARTIN.
M-157; 1.4-1.6 C, 12-14 Cr, 0.6-0.8 Co, 0.8-0.9 Mo, 0.35-0.40 V, bal Fe.
For dies, rotary shears, gages, punches, shear blades, liners for dust mills; castings; cast to shape; air hardening.

MARTINEL.
M-348; C, 0.6-0.9 Mn, 2.75 min, Ni, bal Fe.
85,000 TS; 50,000 YS; 20 El; 40 RA.
For shipbuilding purposes in strength members, flat plate keel, bilge, deck and side plates; special method of rolling.

MARTIN STEEL.
Eng ; 0.73 C, 0.4 Si, bal Fe.
For blacksmith tools, dies, hammers; water hardening.

MARWE 13P.
M-1334; 0.15 C, 0 60 Mn, 0.25 Si, 0.3 Mo, bal Fe.
Annealed· 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, cams, camshafts, fasteners; case hardening steel.

MARWE 14D.
M-1334; 0 14 C, 0.25 Si, 0 60 Mn, 0.3 Mo, bal Fe.
Annealed· 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin
For gears, cams, machine tool parts; case hardening steel.

MARWE 171.
M-1334; 0.13 C, 0 85 Cr, 0 45 Mo, bal Fe.
For gears, cams, camshafts, machine tool parts; case hardening, tough.

MARWE 126E
M-1334; 0 15 C, 0 75 Cr, 0 15 Mo, bal Fe
For gears, cams, machine tool parts; case hardening, tough.

MARWE 127M
M-1334, 0 14 C, 1.0 Mn, 0 3 Si, bal Fe.
For gears, cams, camshafts; case hardening steel.

MARWE 134A
M-1334, C, Si, Mn, bal Fe.
For gears, machine tool parts; case hardening steel

MARWE 176M.
M-1334; 0 36 C, 0 30 Si, 1 0 Mn, bal Fe.
For gears, machine tool parts; water hardened.

MARWE 213ESV.
M-1334; 0 10 C, 1 1 Si, 1 8 Cr, 0 3 Mo, 0 3 V, bal Fe
For dies, cams, crankshafts, case hardening steel.

MARWE 215E
M-1334, 0 10 C, 2 25 Cr, 1 1 Mo, bal Fe
For oil refinery equipment; creep and heat resistant

MARWE 215ESV.
M-1334, 0 08 C, 1.25 Si, 2 1 Cr, 0 45 Mo, bal Fe
For oil refinery equipment, creep and heat resistant.

MARWE 220EV
M-1334, 0 13 C, 1 05 Cr, 0 25 Mo, 0.20 V, bal Fe
For gears, cams, camshafts; case hardening steel.

MARWE 220MH.
M-1334; C, Si, Mn, bal Fe
For machine tool parts, fasteners; case hardening steel.

MARWE 221M
M-1334; 0.16 C, Si, 1 0 Mn, bal Fe.
For machine tool parts; case hardening steel.

MARWE 228E
M-1334; 0.12 C, 5 Cr, 0.55 Mo, bal Fe.
For oil refinery equipment; creep and heat resistant.

MARWE 251CBH.
M-1334; 0.3 C, 0.9 Al, 1.2 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

MARWE 251DV.
M-1334; 0.27 C, Cr, V, bal Fe.
For gears, cams, camshafts; case hardening steel.

MARWE 253DV.
M-1334; 0.32 C, Cr, bal Fe
For gears, bolts, crankshafts; oil hardened, shock resistant.

MARWE 262EB.
M-1334; 0.32 C, 1.1 Cr, 1.1 Al, 0.18 Mo, bal Fe.
For oil refinery equipment; creep and heat resistant.

MARWE 291DV.
M-1334, 0.50 C, 0.95 Mn, 1.05 Cr, 0.1 V, bal Fe.
For gears, bolts, springs, shafts; oil hardened, shock resistant.

MARWE 310CW.
M-1334, C, Si, Mn, bal Fe.
For machine tool parts, gears; water hardened.

MARWE 320ES.
M-1334; C, Si, Mn, bal Fe
For machine tool parts; water hardened.

MARWE 321ES.
M 1334; C, Si, Mn, bal Fe.
For machine tool parts, water hardened.

MARWEDUR A61.
M-1334; 0.15 C, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS, 35,000 YS, 55 El, 75 RA; 150 Brin.
Cold drawn. 180,000 TS; 150,000 YS; 10 El; 250 Brin
For chemical plant equipment, tanks, mixers, filters; Type 302, stainless, austenitic.

MARWEDUR A63
M 1334, 0.15 C, 24 Cr, 19 Ni, bal Fe
Annealed: 100,000 TS; 45,000 YS, 50 El; 65 RA; 185 Brin
For furnace parts, valves, pumps, retorts; Type 310; stainless

MARWEDUR AN11
M-1334, 0.08 C, 17 Cr, 13 Ni, Cb, bal Fe
Annealed 90,000 TS, 45,000 YS, 50 El, 65 RA; 160 Brin
For welded chemical plant equipment, Type 347; stainless, austenitic

MARWEDUR AN21
M-1334, 0.08 C, 17 Cr, 2 Mo, 13 Ni, bal Fe.
Annealed: 85,000 TS, 35,000 YS, 50 El, 65 RA; 160 Brin
Cold drawn 150,000 TS, 135,000 YS; 6 El; 300 Brin
For acid resistant chemical plant equipment; Type 316, stainless, austenitic

MARWEDUR-F11.
M-1381; 0.16-0.23 C, 12 Cr, 0.5 Ni, 1.0 Mo, 0.5 W, 0.3 V, 0.6 Mn, 0.3 Si, bal Fe
For furnace parts, oil refinery equipment, cutlery.
Corrosion and heat resistant, hardenable.

MARWEDUR-F-12.
M-1381; 0.20 C, 12 Cr, 1 Mo, 0.4 Ni, 0.3 V, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El, B 92 Rock.
Hardened: 240,000 TS; 195,000 YS; 10 El; C 50 Rock.
For valves, cutlery, bearings, surgical instruments.
Corrosion resistant, hardenable

MARWENIT 12M.
M-1334; 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
Cold drawn: 130,000 TS; 110,000 YS; 15 El, 35 RA, 270 Brin.
For marine hardware, pumps, valves; Type 431; heat resistant.

MARWENIT A10S.
M-1334; 0.12 max C, 18 Cr, 9 Ni, bal Fe
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

MARWENIT A20S.
M-1334; 0.12 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed. 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

MARWENIT AN10.
M-1334; 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe
Annealed 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
Cold drawn: 100,000 TS, 65,000 YS; 45 El; 60 RA; 205 Brin
For welded chemical plant equipment, tanks, mixers, Type 347, stainless, austenitic.

MARWENIT AN20
M-1334, 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Cb = 8 × C, bal Fe
Annealed 90,000 TS; 40,000 YS; 40 El; 60 RA; 170 Brin
For welded acid resistant chemical plant equipment; Type 316 Cb; stainless, austenitic.

MARWENIT AT10
M-1334, 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe
Annealed 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin
For welded chemical plant equipment, tanks, mixers, Type 321; stainless, austenitic.

MARWENIT AT20
M-1334; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe
Annealed 90,000 TS, 40,000 YS, 40 El; 60 RA; 170 Brin
For welded acid resistant equipment; Type 316 Ti; stainless, austenitic

MARWENIT AX10
M-1334, 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS; 60 El; 70 RA; 150 Brin
Cold drawn. 180,000 TS; 125,000 YS; 10 El; 330 Brin
For chemical plant equipment, tanks, mixers; Type 304; stainless, austenitic.

MARWENIT AX20.
M-1334, 0.07 max C, 18 Cr, 2 Mo, 10.5 Ni, bal Fe.
Annealed 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin
Cold drawn: 150,000 TS, 135,000 YS, 6 El; 300 Brin
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

MARWENIT F10
M-1334, 0.12 max C, 13 Cr, 0.4 Si, bal Fe
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For turbine blades, cutlery, valves, surgical instruments; Type 410; corrosion resistant.

MARWENIT F15.
M-1334; 0.12 max C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 160 Brin.
For screw machine products, dairy equipment; Type 430F; corrosion resistant.

MARWENIT F20.
M-1334; 0.10 C, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, valves, pumps, corrosion resistant.

MARWENIT FT13
M-1334; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed: 80,000 TS, 50,000 YS, 25 El; 50 RA; 160 Brin
For welded oil refinery equipment, Type 430 Ti; stainless.

MARWENIT FT23
M-1334; 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe.
Annealed: 80,000 TS, 50,000 YS, 25 El, 50 RA; 160 Brin
For welded oil refinery equipment; corrosion resistant.

MARWENIT M10
M-1334, 0.4 C, 13 Cr, 0.4 Si, bal Fe
Annealed: 95,000 TS, 50,000 YS, 25 El, 50 RA, 160 Brin
For cutlery, valves, surgical instruments; Type 420, stainless

MARWENIT M11.
M-1334, 0.2 C, 0.4 Si, 13 Cr, bal Fe
Annealed: 95,000 TS, 50,000 YS, 25 El, 55 RA; 195 Brin
For cutlery, valves, turbine blades, surgical instruments, Type 420; stainless

MARWENIT M12.
M-1334, 0.22 C, 0.4 Si, 17 Cr, 1.5 Ni, bal Fe
Annealed: 125,000 TS, 95,000 YS; 20 El, 55 RA, 260 Brin
Cold drawn: 130,000 TS, 110,000 YS, 15 El, 35 RA, 270 Brin
For marine hardware, pumps, valves, Type 431, corrosion and heat resistant

MARWETHERM A61
M-1334, 0.15 C, 19.5 Cr, 9.5 Ni, bal Fe
Annealed: 80,000 TS, 35,000 YS; 55 El; 75 RA; 150 Brin
For chemical plant equipment, tanks, mixers, filters, Type 302, stainless, austenitic.

MARWETHERM A63
M-1334, 0.15 C, 24 Cr, 19 Ni, bal Fe
Annealed: 100,000 TS, 45,000 YS, 50 El, 65 RA; 185 Brin
For furnace parts, valves, pumps, turbine blades, Type 310; stainless, austenitic

MARWETHERM F90
M-1334, 0.12 max C, 2.3 Si, 6 Cr, bal Fe
Annealed: 70,000 TS, 30,000 YS; 28 El, 65 RA; 160 Brin
For oil refinery equipment, heat exchangers; Type 502; creep and heat resistant

MARWETHERM F95
M-1334, 0.12 max C, 2.2 Si, 13 Cr, bal Fe
Annealed: 75,000 TS, 40,000 YS, 35 El; 70 RA; 155 Brin
For turbine blades, oil refinery equipment; corrosion and heat resistant.

MARWETHERM F105.
M-1334; 0.12 max C, 2 Si, 18 Cr, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For furnace parts, heat treat boxes; Type 430; corrosion resistant.

MARWETHERM F120.
M-1334, 0.12 max C, 1.5 Al, 24 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant

MARWIN.
M-848, 0.25 C, 0.3 Si, bal Fe
For machinery parts; free machining.

MARWIN SUPASTUFF
M-848; 0.3 C, bal Fe
For machinery parts, bolts, water hardened

MARVEL.
M-115, M-342, 0.33 C, 10 W, 3.5 Cr, 0.45 V, bal Fe
For cutting tools, forming dies, punches, shears; hot die steel

MAS
M-459, 0.55 C, 0.9 Si, 1.2 Mn, bal Fe
For tools, chisels, punches, oil hardening, tough.

MASILOY I TM 669
M-279, 63.5 Cu, 24.5 Zn, 12 Mn
Annealed: 54,000-64,000 TS; 17,000-30,000 YS; 38-46 El
Cold rolled: 58,000-108,000 TS, 27,000-105,000 YS; 1-40 El
Low cost, white colored, brass alloy
For flatware, hollow ware, hardware

MASILOY II TM 672
M-279, 60 Cu, 28 Zn, 7 Mn, 5 Ni
Annealed: 57,000-66,000 TS, 18,000-32,000 YS, 48-56 El
Cold rolled: 65,000-114,000 TS, 30,000-106,000 YS; 1-45 El
A low nickel white brass, for flat ware, hollow ware, hardware

MASSALLOY
M-467, C, Cr, Ni, Mo, bal Fe
Heat treated: 135,000 TS, 110,000 YS, 17 El, 30 RA, 286 Brin
For steel castings, oil hardened

MASSILLON
M-467, C, Mn, bal Fe
Normalized, 100,000 TS, 60,000 YS; 20 El; 35 RA, 207 Brin
For stokerworms, cast steel

MASTALLOY 1011
M-1721, 80 Cu, 5 Sn, 3 Pb, 12 Zn
Cast: 32,000 TS, 16,000 YS; 13 El
Leaded semi red brass
CDA 842

MASTALLOY 1151
M-1721, 85 Cu, 5 Sn, 5 Pb, 5 Zn
Cast: 45,000 TS, 21,400 YS; 28 El; 72 Brin.
Leaded red brass
ASTM B145 (4A), B271 (4A); SAE 40; CDA 836; AMS 4855

MASTALLOY 1152.
M-1721, 85 Cu, 5 Sn, 5 Pb, 5 Zn.
Cast: 55,000 TS; 24,200 YS, 13.2 El

MASTALLOY 1201
M-1721; 82 Cu, 4 Sn, 6 Pb, 7 Zn, 1 Ni
Cast: 33,000 TS; 17,600 YS; 17.6 El.
Leaded red brass
ASTM B145 (4B), B271 (4B), CDA 838.

MASTALLOY 1232.
M-1721; 80 Cu, 3 Sn, 7 Pb, 9 Zn, 1 Ni.
Cast: 34,000 TS; 18,000 YS; 22 El; 62 Brin
Leaded semi-red brass
ASTM B145 (5A), B271 (5A); CDA 844.

MASTALLOY 1941.
M-1721; 81 Cu, 19 Sn.
Cast: 50,600 TS; 46,000 YS; 1.1 El; 160 Brin.
Tin bronze castings
ASTM B22 (A); AMS 7322; CDA 913.

MASTALLOY 1971.
M-1721; 85 Cu, 14 Sn, 1 Zn.
Cast: 35,200 TS; 34,600 YS, 2.0 El
Tin bronze; for bearings, bushings
Fed Std 00153-D2, CDA 910.

MASTALLOY 2001
M-1721, 87 Cu, 11 Sn, 1 Pb, 1 Ni.
Cast· 40,000 TS; 24,000 YS, 10 El; 67 Brin.
Leaded tin bronze casting.
SAE 640, CDA 925

MASTALLOY 2051.
M-1721, 89 Cu, 11 Sn
Cast 51,500 TS; 29,000 YS; 18 El, 95 Brin.
Tin bronze, for bearings, bushings
SAE 65; CDA 907

MASTALLOY 2061
M 1721, 88 Cu, 10 Sn, 2 Pb.
Cast 49,000 TS, 25,000 YS, 18 El; 86 Brin.
Leaded tin bronze casting.
SAE 63, CDA 927

MASTALLOY 2062
M-1721; 84 Cu, 10 Sn, 2 Pb, 4 Ni
Cast 53,000 TS, 31,000 YS; 15 El, 92 Brin
Leaded nickel tin bronze casting

MASTALLOY 2101
M-1721; 88 Cu, 10 Sn, 2 Zn.
Cast 51,500 TS; 29,000 YS, 18 El, 92 Brin
Tin bronze, formerly called gun metal
SAE 62, ASTM B22(D), B143(1A)
AMS 4845, CDA 905

MASTALLOY 2251
M-1721, 88 Cu, 8 Sn, 4 Zn
Cast 49,000 TS, 23,000 YS; 18 El, 77 Brin.
ASTM B143(1B), SAE 620, CDA 903.

MASTALLOY 2351
M 1721, 86 Cu, 8 Sn, 1 Pb, 4 Zn, 1 Ni
Cast 49,000 TS, 23,000 YS, 18 El, 77 Brin
ASTM B143(2B), B271(2B), SAE 621; CDA 923

MASTALLOY 2451
M-1721, 88 Cu, 6 Sn, 1 Pb, 4 Zn, 1 Ni
Cast 45,500 TS, 23,000 YS, 35 El; 76 Brin.
ASTM B143(2A), B271(2A); SAE 622, CDA 922.

MASTALLOY 2961.
M-1721, 71 Cu, 13 Sn, 15 Pb, 1 Ni.
Cast. 26,000 TS, 16,000 YS, 8.5 El, 80 Brin.
High leaded tin bronze.
Fed. Std.00153 E2, CDA 940.
QQ B-1005(13), QQ C-525(13).

MASTALLOY 3051
M-1721; 80 Cu, 10 Sn, 10 Pb
Cast: 41,000 TS; 24,000 YS, 10 El, 80 Brin.
High leaded tin bronze
ASTM B144(3A), B271(3A). SAE 64
AMS 4842; CDA 937.

MASTALLOY 3111.
M-1721; 83 Cu, 8 Sn, 8 Pb, 1 Ni.
Cast. 37,400 TS; 22,000 YS, 19.8 El.
High leaded tin bronze.
Fed. Std. 00153:E8; QQ-B-1005(8); CDA 934.

MASTALLOY 3151.
M-1721, 83 Cu, 7 Sn, 7 Pb, 3 Zn.
Cast: 44,000 TS, 27,000 YS; 16 El; 72 Brin.
ASTM B144(3B); SAE 660; CDA 932.

MASTALLOY 3191.
M-1721; 78 Cu, 6 Sn, 16 Pb.
Cast: 34,200 TS, 23,000 YS; 12 El; 62 Brin.
High leaded tin bronze.
SAE 67; CDA 941(Similar specs).

MASTALLOY 3221.
M-1721, 70 Cu, 5 Sn, 25 Pb
Cast: 23,100 TS; 13,200 YS; 7.7 El.
High leaded tin bronze.
ASTM B144(3E), CDA 943

MASTALLOY 3242.
M-1721; 68 Cu, 2 Sn, 30 Pb
Cast: 19,800 TS, 11,000 YS; 5.5 El

MASTALLOY 3261.
M 1721, 84 Cu, 5 Sn, 9 Pb, 9 Zn.
Cast. 38,000 TS, 21,000 YS; 20 El; 66 Brin

MASTALLOY 3271.
M-1721; 75 Cu, 5 Sn, 19 Pb.
Cast 28,700 TS; 22,800 YS, 8.0 El; 57 Brin.
High leaded tin bronze
SAE 67; CDA 941

MASTALLOY 4151
M-1721, 88 Cu, 3 Fe, 9 Al
Cast 71,500 TS, 27,500 YS; 22 El
Aluminum bronze
ASTM B148(9A), SAE 68A; CDA 952.

MASTALLOY 4152
M-1721; 88 Cu, 1 Fe, 11 Al.
Cast 71,500 TS, 27,500 YS, 22 El
Aluminum bronze
ASTM B148(9B), SAE 68B, CDA 953

MASTALLOY 4153
M 1721, 86 Cu, 4 Fe, 10 Al
Cast 102,700 TS, 45,800 YS, 18.8 El, 190 Brin.
Aluminum bronze
ASTM B148(9C); CDA 954 (Similar)

MASTALLOY 4211
M 1721, 58 Cu, 1 Sn, 38 Zn, 1 Fe, 1 Al, 1 Mn.
Cast 71,500 TS, 27,500 YS, 22 El
ASTM B147(8C), AMS 4860; CDA 865.

MASTALLOY 4231
M-1721, 64 Cu, 26 Zn, 2 Fe, 4 Al, 4 Mn.
Cast· 99,000 TS, 49,500 YS; 22 El
Manganese bronze
ASTM B147(8B), CDA 862.

MASTALLOY 4241
M 1721, 64 Cu, 24 Zn, 2 Fe, 6 Al, 4 Mn.
Cast. 121,000 TS, 66,000 YS; 13.0 El.
Manganese-aluminum bronze
ASTM B147 8 B or 8 C; CDA 862, 863.
AMS 4862

MASTALLOY 4401
M-1721, 88 Cu, 5 Sn, 2 Zn, 5 Ni
Cast. 80,000 TS, 55,000 YS; 10 El.
Nickel tin bronze.
ASTM B292-A; CDA 947

MASTER.
M-358, C, Mn, bal Fe.
For tools and dies; water hardening.

MASTER METAL.
M-565; Sn, Cu, Pb
For machinery bearings; Babbitt.

MATADOR 91.
M-1348; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, hobs, drills; high speed steel.

MATADOR 122.
M-1348; 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel.

MATADOR 181.
M-1348; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, drills, broaches, taps; high speed steel

MATADOR 185.
M-1348; 0.79 C, 4.7 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For drills, taps, reamers, hobs, broaches; high speed steel

MATADOR 333.
M-1348; 0.95 C, 4 Cr, V, W, Mo, bal Fe
For cutters, taps, broaches, reamers, drills, high speed steel.

MATHESIUS METAL.
Pb, 3 Ca, 1-2 alkali earth metals.
For bearings; anti-friction.

MATRELOY.
M-1627, 39 Cr, 4 Mo, 2 Ti, 1 Al, bal Ni.
Bar: 375,000 TS; 200,000-275,000 YS, 8 El.
At 1400°F· 120,000 YS
For furnace parts, springs, chemical processing equipment, electronic components.
Corrosion resistant, heat treatable, nonmagnetic.

MATRIX-II.
M-115; 0.50-0.55 C, 12 W-Mo-Cr-V, bal Fe
Annealed 95,000 TS, 48,000 YS, 25 El; 55 RA; B 90 Rock.
Heat treated· 350,000 TS; 290,000 YS, 8 El, 33 RA; C 60 Rock
Heat treated: 404,000 TS; 363,000 YS; 18 RA, 6 El.
Ror rocket motor cases, high speed rotors, gears, pressure vessels, engine mounts, nuclear applications, molds
High temperature strength and heat resistance

MATRIX BRASS.
62 Cu, 37 Zn, 1.5 Pb
For engraving, hardware; free-cutting.

MATRIX M-A.
M-115, 0.53 C, 12 W, Mo, Cr, V, bal Fe.
Hardened: 361,000 TS; 292,000 YS; 20 RA; 6 El; 130,000 fatigue strength.
For airframes, fasteners, pressure vessels, gears, engine mounts.
Tough and fatigue resistant.

MAUSTINOX A.
M-1509; 0.12 max C, 18 Cr, 8 Ni, bal Fe.
Annealed: 70,000-85,000 TS; 30,000-37,000 YS; 30 El; 140-190 Brin.
For chemical and textile plant equipment; stainless, austenitic.

MAUSTINOX B.
M-1509; 0.12 max C, 17 Cr, 9 Ni, 2.5 Mo, bal Fe.
Annealed: 71,000-92,000 TS; 30,000-37,000 YS; 30 El; 150-200 Brin.
For acid resistant and chemical plant equipment; stainless, austenitic.

MAUSTINOX C.
M-1509; 0.12 max C, 20 Cr, 8 Ni, 2.5 Mo, bal Fe.
Annealed· 71,000-85,000 TS; 40,000-50,000 YS; 25 El; 150-200 Brin.
For acid resistant chemical plant equipment; stainless, austenitic.

MAUSTINOX D.
M-1509; 0.20 max C, 25 Cr, 5 Ni, bal Fe.
Annealed: 92,000 TS; 65,000 YS; 16 El; 190-200 Brin.
For chemical plant equipment, furnace parts; corrosion and heat resistant.

MAUSTINOX F.
M-1509; 0.20 max C, 24 Cr, 13 Ni, bal Fe.
Annealed· 78,000-100,000 TS, 30,000-37,000 YS; 30 El; 150-200 Brin.
For furnace parts, salt pots, heat treat boxes; heat and corrosion resistant, austenitic.

MAUSTINOX H
M-1509; 0.20 max C, 25 Cr, 20 Ni, bal Fe
Annealed· 65,000-92,000 TS, 30,000-37,000 YS; 30 El; 140-180 Brin
For oil refinery equipment, furnaces, salt pots, heat treat boxes, austenitic, heat and corrosion resistant

MAUSTINOX SA
M-1509, 0.12 max C, 18 Cr, 8 Ni, Ti, bal Fe.
Annealed: 75,000-85,000 TS, 30,000-37,000 YS; 30 El, 140-190 Brin.
For welded chemical and textile plant equipment, tanks, agitators; stainless, austenitic, stabilized

MAUSTINOX SB.
M-1509, 0.12 max C, 17 Cr, 9 Ni, 2.5 Mo, Ti, bal Fe
Annealed 71,000-92,000 TS, 30,000-37,000 YS; 30 El, 150-200 Brin
For welded acid resistant and chemical plant equipment, stainless, austenitic, stabilized

MAUSTINOX Y
M-1509; 0.12 max C, 20 Cr, 20 Ni, 4.5 Mo, bal Fe.
Annealed. 65,000-78,000 TS, 30,000-40,000 YS; 32 El
For heat and corrosion resistant parts; austenitic.

MAUSTINOX X
M-1509, 0.12 max C, 15 Cr, 30 Ni, 4.5 Mo, bal Fe.
Annealed 65,000-74,000 TS; 29,000-36,000 YS; 35 El.
For heat and corrosion resistant parts; austenitic.

MAX. 4
M-210, 0.15 C, 20 Ni, 25 Cr, 0.6 Mn, 1 Si, bal Fe.
Annealed 95,000 TS; 45,000 YS, 50 El, B 90 Rock.
For furnace and heat treating equipment, furnace linings, heat exchangers, retorts.
Type 310 stainless; austenitic, corrosion and heat resistant

MAXAL CO.
M-Italy; 24 Co, 14 Ni, 8 Al, 3 Cu.
For permanent magnet, magnetic and electrical equipment.
High permeability.

MAXCHIP NO. 1.
M-210; C, Ni, Cr, bal Fe.
For hand tools, chisels, punches; air hardened, tough, shock resistant.

MAXCHIP NO. 2.
M-210; C, Cr, bal Fe.
For chisels, punches; oil hardened, tough, shock resistant

MAXEL 1.
M-38; 0.2 C, 1-1.2 Mn, bal Fe.
Rolled: 75,000-80,000 TS; 45,000-55,000 YS; 30-40 El; 55-65 RA; 156 Brin.
Heat treated: 185,000 TS; 150,000 YS; 7 El; 24 RA; 392 Brin.
For shafts, gears, pinions, bolts, studs; water hardening.

MAX-EL 1-B.
M-38; 0.2 C, 1 Mn, 0.2 Mo, bal Fe.
Rolled: 70,000 TS; 50,000 YS; 30 El; 55 RA; 156 Brin.
Heat treated: 135,300 TS; 114,000 YS, 18 El; 54 RA; 332 Brin.
For shafts, gears, pinions, bolts, studs; case hardening.

MAXEL 2.
M-38; 0.4 C, 1 1.2 Mn, bal Fe.
Rolled: 90,000-110,000 TS; 50,000-65,000 YS, 35-23 El; 60 50 RA.
For shafts, gears; tough

MAX-EL 2-B.
M-38; 0.4 C, 1 Mn, 0.2 Mo, bal Fe
Rolled: 90,000 TS, 55,000 YS, 20 El; 45 RA.
Heat treated: 119,500 TS; 85,000 YS, 20 El; 53 RA; 251 Brin
For shafts, spindles, worms, racks, gears, pinions; oil hardening.

MAXEL 3.
M-38; 0.45 C, 1-1.2 Mn, 0.4-0.6 Cr, bal Fe.
Rolled: 130,000 TS; 100,000 YS; 22 El; 62 RA; 260 Brin.
Heat treated: 280,000 TS; 190,000 YS; 7.5 El; 29 RA; 550 Brin.
For screws, racks, shafts, gears; tough

MAX-EL 3½
M-38; 0.5 C, 1.25 Mn, 0.6 Cr, 0.15 Mo, bal Fe.
Heat treated 230,000 TS; 225,000 YS; 9.5 El; 36 RA; 514 Brin.
For screws, racks, shafts, gears, pinions, spindels; oil hardening

MAXEL NO 4 COLLET.
M-38, 0.75 C, Cr, Mn, bal Fe.
For collets, feed fingers, spindles; oil hardened.

MAXEL 7
M-38, 0.6-0.7 C, 0.75-1.0 Mn, 0.7-0.9 Mo, bal Fe.
For machine tool parts; water hardening

MAX-EL BRAKE DIE.
M-38; 0.5 C, 1.5 Mn, 0.18 Mo, 0.65 Cr, 0.08 S, bal Fe.
For press brake dies, vee dies, bending and flanging dies; free-cutting, wear and impact resistant.

MAXELOY.
M-38; 0.15 max C, 0.9-1.1 Mn, 0.3-0.5 Ni, 0.25 max Cr, 0.20 min Cu, bal Fe.
Rolled: 70,000 TS; 50,000 YS; 22 El; 140 Brin.
For truck frames, mine and railroad cars, pumps, dredges, coal chutes, ships; high strength low alloy steel.

MAXEL SHANK STEEL.
M-38; 0.50 C, Cr, Mn, bal Fe.
For shanks for tipped tools; oil hardened.

MAXHETE NO. 1.
M-210; 0.35 C, 18.5 Cr, 8.5 Ni, 2.5 W, bal Fe.
Cast: 137,000 TS; 35 El.
At 900°C; 38,000 TS; 47 El.
For burner tubes, pipe unions; austenitic, heat resistant to 1000°C.

MAXHETE NO. 1A.
M-210; 0.4 max C, 13.5 Cr, 13.5 Ni, 2.2 W, 1.5 Si, 0.6 Mn, bal Fe.
At 20°C: 106,000 TS; 27 El; 44 RA.
At 900°C; 61,000 TS; 45 El; 54 RA.
For furnace parts, heat treating boxes, nozzles; heat resistant, austenitic

MAXHETE NO. 2.
M-210, 0.25 max C, 25.0 Cr, 12.0 Ni, 0.6 Mn, 0.85 Si, bal Fe
For furnace parts, heat treat equipment, conveyers; resists heat and scaling to 1100°C.

MAXHETE-3
M-617, M-210, C, high Cr, bal Fe.
For rabble arms and blades in roasting furnaces; heat resistant to 1150°C.

MAXHETE NO 4.
M-210; 0.10 max C, 25.0 Cr, 33.5 Ni, 0.4 Mn, 0.75 Si, bal Fe.
For furnace parts, hearth plates, grids, austenitic, high temperature strength.

MAXHETE NO. 5.
M-210, 0.2 max C, 65 Ni, 15 Cr, 0.85 Mn, bal Fe.
For carburizing boxes, retorts, oil burner parts; high corrosion and cyclic heat resistance

MAXHETE-6.
M-617, M 210; C, Ni, Cr, bal Fe
For furnace skids, superheater supports, heat resistant, austenitic.

MAXHETE NO 7
M-210, 0.12 C, 20 Cr, 0.5 Si, bal Fe.
For furnace parts and equipment, heat treating boxes
Heat resistant Maximum operating temperature 1150°C.

MAXHETE NO 8.
M-210; 0.10 max C, 79 Ni, 19.5 Cr, 0.85 Mn, bal Fe
For electric resistances; high heat resistance.

MAXILVRY
M-210, 0.12 C, 18.5 Cr, 8.5 Ni, bal Fe.
Annealed· 83,000 TS; 38,000 YS; 48 El; 60 RA; 143 Brin
Cold drawn. 140,000 TS, 100,000 YS; 21 El; 45 RA; 190 Brin
For fittings, cutlery, valve plates, chemical retorts; Type 302; stainless, austenitic.

MAXILVRY ADS.
M-210, 0.1 C, 12 Cr, 12 Ni, 0.5 Cu, bal Fe.
Annealed: 90,000 TS; 38,000 YS; 40 El; 45 RA; 160 Brin
For deep drawn parts, chemical plant equipment; stainless, austenitic.

MAXILVRY AM.
M-210; 0.07 C, 18 Cr, 13 Ni, 0.2 Cu, 3 Mo, bal Fe.
Annealed· 100,000 TS; 40,000 YS; 40 El; 45 RA; 190 Brin
For chemical equipment to resist H_2SO_4, mixers, tanks; Type 316; stainless, austenitic.

MAXILVRY AT.
M-210; 0.2 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 100,000 TS; 40,000 YS; 40 El; 45 RA; 190 Brin.
For chemical plant equipment; Type 302; stainless, austenitic

MAXILVRY AWP.
M-210; 0.10 max C, 18 Cr, 8.5 Ni, 0.5 Ti, bal Fe.
Annealed: 100,000 TS; 40,000 YS; 40 El; 45 RA; 190 Brin.
For chemical plant equipment; Type 321; stainless, austenitic.

MAXILVRY C.B.
M-210; 0.10 C, 18.5 Cr, 8.5 Ni, 1 Cb, bal Fe.
Annealed: 78,000-100,000 TS; 33,000-40,000 YS; 40-60 El; 45-65 RA; 160-195 Brin.
For impellers, tanks, chemical plant equipment; Type 347; stainless, austenitic.

MAXILVRY M.B T.
M-210; 0.04 C, 17.5 Cr, 12 Ni, 2.75 Mo, 0.75 Cb, bal Fe.
Annealed: 78,000-100,000 TS; 45,000-67,000 YS; 60-40 El; 75-60 RA; 170-200 Brin.
For chemical plant equipment, welded structures; stainless, austenitic.

MAXILVRY ML.
M-210; M-617; C, Ni, Cr, bal Fe.
For cutlery, valves; stainless.

MAXILVRY SPECIAL.
M-210, 0 06 C, 18.5 Cr, 8 5 Ni, bal Fe.
Annealed: 78,000-100,000 TS; 33,000-40,000 YS; 60-40 El; 65-45 RA, 160-190 Brin.
For chemical plant equipment, mixers, agitators, tanks; austenitic, stainless; Type 304.

MAXIMOLD.
M-289; 0 4 C, 5 2 Cr, 1.0 Si, 1.0 V, 1 2 Mo, bal Fe.
For Al and Zn die casting dies, resists heat checks, air hardened.

MAXIMUM
M-1322; 0.74 C, 4 1 Cr, 1 1 V, 18 5 W, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel

MAXIMUM SPEZIAL 30
M-1322, 0 86 C, 2 8 Co, 4.3 Cr, 0 85 Mo, 2 1 V, 12 W, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel

MAXIMUM SPEZIAL 55.
M-1322, 0 76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe
For lathe and planer tools, taps, broaches, drills; high speed steel.

MAXIMUM SPEZIAL 55G
M-1332; 0.80 C, Co, Cr, W, Mo, V, bal Fe.
For lathe and planer tools, reamers, broaches, high speed steel.

MAXIMUM SPEZIAL G
M-1322, 0.82 C, 4.1 Cr, 0.85 Mo, 1 6 V, 8 7 W, bal Fe
For lathe and planer tools, reamers, broaches, taps; high speed steel.

MAXIMUM SPEZIAL G EXTRA.
M-1322, 0.86 C, 4 1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel.

MAXIMUM SPEZIAL Mo
M-1322; 0.85 C, Cr, W, Mo, V, bal Fe.
For lathe and planer tools, drills; high speed steel.

MAXINIUM STEEL.
M-210; 0.32 C; 1.2 Si, 5.25 Cr, 5 0 W, 0.5 Mo, bal Fe.
For die casting dies, molds. Oil hardening.

MAXITE.
M-35; 0.8 C, 14 W, 4 Cr, 2 V, 5.2 Co, 0.6 Mo, bal Fe.
Annealed: 228 Brin.
For cutting tools, drills, reamers, boring and shaping tools.
Type T8 high-speed steel. High red hardness.

MAXITE 15.
M-35; 1.57 C, 12 65 W, 0.65 Mo, 4.75 Cr, 5.0 V, 5.0 Co, bal Fe.
For milling cutters, lathe tools, shaper tools, broaches.
Type T15 high speed tool steel.

MAXMITH.
M-210; 0 40 C, 0 60 max Mn, 3.25 Ni, bal Fe.
For chisels, riveting tools, caulking and beading tools; requires no tempering, tough.

MAXNAP.
M-210; 0 30 C, 0.60 Mn, 1.05 Cr, 0.2 V, bal Fe.
For pneumatic hammers, riverters, nut piercers; tough and fatigue resistant.

MAXTACK
M-365; 2 25 C, 10 W, 2 Cr, 2 5 Mn, 1.0 Si, bal Fe
For tools, cutters; oil or air hardened.

MAXTACK
M-210, C, Cr, W, Mn, bal Fe.
For nail and tack dies, wood working tools, air hardened

MAXTENSILE.
M-163, 3 3 C, 2 4 Si, 1 5 Ni, 0 8 Cr, bal Fe
For hydraulic castings, sliding parts, spindles, couplings, sprockets, mill rolls; discontinued; alloy cast iron

MAXTUFF
M-289, 0 50 C, 0 3 Mn, 0 75 Si, 1 15 Cr, 0.2 V, 2 50 W, bal Fe
Type S1 shock resisting tool steel

MAX-WEAR
M-38, 0 8 C, 13 Mn, 0.75 Si, 1.5 Ni, 0 5 Mo, bal Fe
Heat treated 550 Brin.
For dredge buckets, rock crushers, chute liners; work hardens, abrasion resistant

MAYARI A
M-24; C, 1 25 Ni, 0 6 Cr, bal Fe
Rolled 130,000 TS, 110,000 YS, 20 El; 61 RA.
For oil well and refinery equipment, auto parts; ductile, tough

MAYARI B.
M 24, 0 34 C, 0 6 Mn, 0 8 Ni, 0 3 Cr, bal Fe
For bolts and studs for reactor chambers and superheaters; for service up to 800°F.

MAYARI ENGINE BOLT STEEL.
M-24; 0 1 C, 1 5 Ni, 0 2 Cr, bal Fe.
Rolled: 65,000 TS, 40,000 YS; 25 El; 50 RA; 130 Brin.
For engine bolts, structures, tough

MAYARI IRON
M-24; 4.0-4 5 C, 1 Mn, 0 5-3.0 Si, 2 Ni, 2 Cr, bal Fe.
For heat, acid, wear, or hard castings; pig iron

MAYARI PIG IRON
M-24; 4-4.5 C, 2 Ni, 2 Cr, 0.5-3 Si, 1 Mn, 0 15 Ti, 0 2 V, bal Fe.
For heat and wear resistant castings; heat and wear resistant.

MAYARI R.
M-24; 0.12 max C, 0.5-1.0 Mn, 0.5-0.7 Cu, 0.25-0.75 Ni, 0.2-1.0 Cr, 0.08-0.12 P, bal Fe.
Rolled: 70,000 TS; 50,000 YS; 22 El; 150 Brin.
For transportation equipment, structures; good weldability.

MAYARI R-50
M-24; 0.10-0.20 C, 0.75-1.25 Mn, 0.2-0.4 Cu, 0.4-0.7 Cr, 0.25-0.50 Ni, 0.01-0.10 V, bal Fe.
Plate: 50,000 min YS; 70,000 min TS; 21 min El
For structural, architectural, railroad and general manufacturing applications.
Low alloy-high tensile structural steel.

MAYARI R-60
M-24; 0.1-0.2 C, 0.75-1.35 Mn, 0.2-0.4 Cu, 0.4-0.7 Cr, 0.25-0.50 Ni, 0.01-0.10 V, bal Fe.
Plate: 60,000 min YS; 80,000 min TS; 16 min El.
For structural, architectural, railroad and general manufacturing applications.
Low alloy-high strength structural steel

MAYARI STAYBOLT STEEL
M-24; 0.08 C, 1.5 Ni, bal Fe
Rolled 55,000 TS, 35,000 YS, 32 El; 62 RA; 112 Brin.
For staybolts, high fatigue resistant

MAYARI SUPERHEATER BOLT STEEL.
M-24, 0.25-0.35 C, 1.25-1.75 Ni, 0.6-0.9 Cr, bal Fe
Water quenched: 115,000 TS; 100,000 YS, 19 El; 55 RA, 229 Brin
For engine and superheater bolts; heat treated.

MAYOR
M-616, 0.75 C, bal Fe
For tools, drills, punches, springs, water hardened.

MAZAK.
M-351, Al, Cu, bal Zn
For die castings

MAZAK 2
M-414, M-87, M-91, 4.1 Al, 2.7 Cu, 0.03 Mg, bal Zn
Die cast 47,300 TS, 83 Brin.
For die castings, free from hot shortness, Iz-15, C U S 93100

MAZAK 3.
M-137, 3.9-4.3 Al, 0.03-0.06 Mg, bal Zn
Die cast 42,000 TS, 15 El; 80 Brin
For instrument cases, housings, ornamental grills, impact strength and dimensional stability.

MAZAK 3
M-414; 4 Al, 0.04 Mg, bal Zn
Die cast 37,000 TS, 4 El; 60 Brin
For gears, frames, hardware, die castings

MAZAK 5.
M-414; 4 Al, 1 Cu, 0.3 Mg, bal Zn
Die cast 42,000 TS; 3 El, 65 Brin
For gears, die castings.

MAZAK 5.
M-137; 3.9-4.3 Al, 0.75-1.25 Cu, 0.03-0.06 Mg, bal Zn
Die cast 42,000 TS, 3 El, 65 Brin.
For motor frames, gears, instrument cases; corrosion resistant to atmosphere.

MAZAK 6
M-414; 4 Al, 1.25 Cu, bal Zn
Die cast: 42,000 TS, 5 El; 65 Brin
For die castings; maximum fluidity.

MC III V.
M-459; 0.2 C, 2.5-2.7 Cr, 0.4 Mo, 8 V, 0.4 W, bal Fe
For case hardened parts; carburizing steel.

MC 40.
M-459; C, Cr, Mo, bal Fe.
16 El.
For machinery parts, oil hardened.

MC 100.
M-459; C, Cr, Ni, Mo, bal Fe.
16 El.
For machinery parts; oil hardened.

MC-102.
M-86; 0.02-0.06 C, 0.1-0.4 Si, 0.1-0.5 Mn, 4.0 max Fe, 19.0-20.5 Cr, 5.0 max Co, 5.5-6.5 Mo, 6.2-6.7 Cb, 2.0-3.0 W, bal Ni.
Heat treated. 103,000 TS; 85,000 YS; 10 El; 340 DPN
For gas turbine stator blades, diesel hot plugs, turbine rotors.
Good oxidation resistance and strength to 900°C. High temperature casting alloy Age-hardenable.

McADAMITE.
12-18 Zn, 3.1 Cu, 0.2 Mg, bal Al.
For strong light alloy parts; non-hardenable.

McADAMS ALLOY "A."
60 Al, 11-55 Cu, 10-43 Cr, 20 Zn.
For light alloy parts; non-hardenable

McADAMS ALLOY "B."
69 Al, 7.7 Cu, 0.6 Ni, 23 Zn
For light alloy parts; non-hardenable

McADAMS ALLOY "C."
70 Al, 3 Cu, 22 Zn, 5 Sb
For light alloy parts, non-hardenable.

McADAMS ALLOY "D"
80 Al, 8 Cd, 4 Ag, 8 Sn
For light alloy parts, non-hardenable

McADAMS ALLOY "E"
82 Al, 12 Cu, 5 Cd, 1 Ag.
For light alloy parts, non-hardenable

McADAMS ALLOYS
82-60 Al, 0-55 Cu, 0-8 Cd, 0-4 Ag, 0-8 Sn, 0-43 Cr, 0-23 Zn, 0-5 Sb
For light alloy parts.

M C C
English, 10 Cu, 1.3 Mg, 2.0 Ni, 0.5 Fe, 0.5 Si, 2.5 Cr, bal Al
For pistons, self aging

McFARLAND & HARDER ALLOY "A"
10 Cr, 48 Ni, 43 Cu
For heat and corrosion resistant parts, stainless and corrosion resistant

McFARLAND & HARDER ALLOY "B"
16 Cr, 29 Ni, 55 Cu.
For heat and corrosion resistant parts, stainless and corrosion resistant

McFARLAND & HARDER ALLOY "C."
30 Cr, 59 Ni, 11 Cu
For heat and corrosion resistant parts; stainless and corrosion resistant

McFARLAND & HARDER ALLOY "D"
43 Cr, 46 Ni, 11 Cu
For heat and corrosion resistant parts; stainless and corrosion resistant

McFARLAND & HARDER ALLOYS.
59-29 Ni, 11-55 Cu, 10-43 Cr.
For corrosion and heat resistant parts; stainless and corrosion resistant.

MC GILL NO 1.
M-181, 10 Al, 1 Fe, bal Cu.
For pump liners, gears, castings; corrosion resisting.

MC GILL NO. 2.
M-181; Si, bal Fe.
95,000 TS; 160 Brin.
For machinery parts; corrosion and abrasion resistant.

MC GILL NO. 3.
M-181; 10 Sn, 0.5 Zn, 2 Pb, bal Cu.
For hydraulic pressure castings.

McGILL NO. 4.
M-181; 67-62 Cu, 38-41 Zn, 1.5 Pb, 0.8 Sn.
For hardware; free cutting.

MC GILL BRASS PRESSURE CASTING ALLOY.
M-181; 57-62 Cu, 38-41 Zn, 0.5 Sn, 1.5 Pb.
60,000 TS; 30,000 YS; 20 El.
For pressure die castings; structural parts; tough.

MC GILL METAL.
M-181; 89 Cu, 9 Al, 2 Fe.
70,000-80,000 TS; 30,000-40,000 YS; 20-10 El; 180 Brin.
For gears, bushings, bearings; resists corrosion and wear.

M-CHROME.
M-73; 1.0 C, 1.5 Cr, bal Fe.
For tools, dies, gauges; deep hardening.

McINNES FOLDER DIE.
M-81; 0.90-1.05 C, 0.25-0.35 Mn, bal Fe.
Heat treated: 190,000 TS; 120,000 YS; 10 El; 30 RA; 380 Brin.
For brake dies, forming dies; water or oil hardened.

MC INNES HC-HC.
M-81; 2 C, 13 Cr, 1 V, bal Fe
For dies, punches, reamers, gauges; very tough.

McINNES HIGH CARBON HIGH CHROME.
M-81; 2.1 C, 13 Cr, 1 V, 0.5 Ni, bal Fe.
For broaches, drawing dies; oil or air hardening.

McINNES MACHINE.
M-81, 0.35-0.45 C, 0.4 Mn, 0.3 Si, bal Fe.
Hot rolled: 90,000 TS; 58,000 YS; 27 El; 50 RA; 200 Brin.
For spindles, lead screws, piston rods, gears; water hardened.

McINNES RECORD A.
M-81; 0.3-0.5 C, 12-14 W, 2-4 Cr, 1 V, bal Fe.
For piercers, punches, heading and trimming dies; hot work steel, oil hardened

McINNES SPECIAL Cr-Ni STEEL.
M-81; 0.5 Cr, 1.5 Ni, 0.6 Mn, 0.7 C, bal Fe
For hot work tools, bolt heading and forming dies, gripper dies, shear blades, hot punching dies; heat resisting, high strength and toughness.

McINNES SPECIAL TOOL STEEL.
M-81; 0.95-1.10 C, bal Fe
For hard wearing surface and extreme depth hardness; deep hardening

McINNES VANADIUM CRUCIBLE.
M-81; 0.75-1.0 C, 0.3 Mn, 0.2 V, bal Fe.
For cold forming dies, punches, chisels, shear blades, dies, rivet sets; water hardening.

McK-ALLOY.
M-849; 0.20 C, 0.5 Ni, 0.5 Cr, 0.2 Mo, bal Fe.
125,000 TS; 15 El; 260 Brin.
For chains.

McKAY 15-60
M-849; 0.20 C, 1.60 Mn, 0.35 Si, 14.3 Cr, 61.0 Ni, bal Fe.
Bare wire for welding

McKAY 16-8-2.
M-849; 0.06 C, 1.80 Mn, 0.25 Si, 15.8 Cr, 8.2 Ni, 1.6 Mo, bal Fe.
Bare wire for welding.

McKAY 16-8-2.
M-849; Coated stainless steel weld rod.
Typical deposit analysis: 0.08 C, 2.25 Mn, 0.35 Si, 15.3 Cr, 8.2 Ni, 1.5 Mo.
Welded: 94,000 TS; 70,500 YS; 40 El.
For welding Types 316, 317 & 347 stainless steels for high temperature operation.
AWS E 16-8-2; ASTM A298.

McKAY 16-25-6.
M-849; 0.12 max C, 15-17 Cr, 24-27 Ni, 5.5-7.0 Mo, bal Fe.
Welded: 95,000 TS; 65,000 YS; 43 El.
For welding electrodes; shielded arc, high heat resistant.

McKAY 17-4 PH.
M-849; 0.04 C, 0.60 Mn, 0.50 Si, 16.7 Cr, 4.5 Ni, 0.40 Cb, 3.5 Cu, bal Fe.
Bare wire for welding

McKAY 17-4 PH.
M-849; Coated stainless steel weld rod
Typical deposit analysis: 0.035 C, 0.48 Mn, 0.40 Si, 16.35 Cr, 4.9 Ni, 0.24 Cb, 3.6 Cu.
Weld metal strength depends on heat treatment.
AMS 5827.

McKAY 17-7 PH
M-849, 0.07 C, 0.80 Mn, 0.70 Si, 17.0 Cr, 7.2 Ni, 1.0 Al, bal Fe
Bare wire for welding

McKAY 17-14 Cu Mo
M-849; 0.12 C, 1.40 Mn, 0.40 Si, 16.1 Cr, 14.4 Ni, 2.4 Mo, 0.75 Cb, 3.0 Cu, bal Fe
Bare wire for welding.

McKAY 18-8 Mo-ELC.
M-849; 0.038 max C, 17-19 Cr, 12-14 Ni, 2.5 Mo, bal Fe.
Weld· 80,000 TS, 55,000 YS; 40 El.
For welding rod, shielded arc

McKAY 20 (320).
M-849; 0.05 C, 1.25 Mn, 0.35 Si, 20.5 Cr, 33.5 Ni, 2.5 Mo, 0.75 Cb, 3.4 Cu, bal Fe.
Bare wire for welding

McKAY 20-80
M-849, 0.1 max C, 18.0-19.5 Cr, 1.3 max Si, bal Ni.
For welding electrodes; Nichrome V; shielded arc, heat resistant

McKAY 308
M-849; Coated stainless steel weld rod.
Typical deposit analysis. 0.06 C, 1.8 Mn, 0.50 Si, 19.8 Cr, 10.0 Ni.
Welded: 86,000 TS, 62,000 YS; 45 El.
For welding or build-up on austenitic 18-8 stainless steel AWS E308.

McKAY 308 HC.
M-849; Coated stainless steel weld rod.
Typical deposit analysis: 0.09 C, 1.8 Mn, 0.50 Si, 19.5 Cr, 10.2 Ni.
Welded· 93,500 TS; 68,000 YS; 40 El.
For welding or build-up on austenitic 18-8 stainless steel.

McKAY 308 Hi Sil
M-849; 0.04 C, 1.75 Mn, 0.80 Si, 20.8 Cr, 10.0 Ni, bal Fe.
Bare wire for welding

McKAY 308 L.
M-849; 0.02 C, 1.75 Mn, 0.45 Si, 20.8 Cr, 10.0 Ni, bal Fe.
Bare wire for welding.

McKAY 308 L.
M-849; Coated stainless steel weld rod.
Typical deposit analysis: 0.030 C, 1.2 Mn, 0.50 Si, 20.0 Cr, 10.0 Ni.
Welded: 79,000 TS; 59,000 YS; 45 El.
For welding Type 308L stainless. AWS E308L.

McKAY 308 L Hi Sil.
M-849; 0.02 C, 1.75 Mn, 0.80 Si, 20.8 Cr, 10.0 Ni, bal Fe.
Bare wire for welding.

McKAY 309.
M-849; Coated stainless steel weld rod.
Typical deposit analysis: 0.09 C, 1.8 Mn, 0.45 Si, 23.8 Cr, 13.0 Ni.
Welded: 81,000 TS; 65,000 YS; 40 El.
For welding and build-up on Type 309 stainless. AWS E-309

McKAY 309 Cb
M-849; 0.06 C, 1.60 Mn, 0.40 Si, 24.5 Cr, 13.0 Ni, 0.60 Cb, bal Fe
Bare wire for welding

McKAY 309 Cb.
M-849, Coated stainless steel weld rod.
Typical deposit analysis. 0.08 C, 1.80 Mn, 0.40 Si, 23.5 Cr, 13.0 Ni, 0.85 Cb.
Welded 85,000 TS, 65,000 YS; 35 El
For welding and build-up on Type 309 stainless steel AWS E309 Cb.

McKAY 309 L
M-849, 0.021 C, 1.70 Mn, 0.40 Si, 24.0 Cr, 13.0 Ni, bal Fe
Bare wire for welding

McKAY 309 Mo
M-849, Coated stainless steel weld rod
Typical deposit analysis· 0.08 C, 1.8 Mn, 0.45 Si, 23.5 Cr, 13.0 Ni, 2.25 Mo
Welded 93,000 TS, 70,000 YS; 36 El
For improved weld strength when welding Type 309 stainless steel.

McKAY 310
M-849, Coated stainless steel weld rod
Typical deposit analysis. 0.11 C, 2.25 Mn, 0.45 Si, 26.0 Cr, 21.0 Ni.
Welded: 85,000 TS, 60,000 YS, 40 El
For welding and build-up on Type 310 and similar metals. AWS E310

McKAY 310 Cb.
M-849; Coated stainless steel weld rod.
Typical deposit analysis· 0.11 C, 2.25 Mn, 0.45 Si, 26.0 Cr, 21.0 Ni, 0.85 Cb
Welded 90,000 TS; 65,000 YS; 35 El.
Improved quality welds in Type 310 stainless steel. AWS 310 Cb.

McKAY 310 Mo.
M-849; Coated stainless steel weld rod
Typical deposit analysis· 0.11 C, 2.25 Mn, 0.45 Si, 26.0 Cr, 21.0 Ni, 2.25 Mo
Welded. 90,000 TS, 60,000 YS, 40 El.
Improved quality welds in Type 310 stainless steel. AWS E310 Mo

McKAY 312
M-849; 0.10 C, 1.60 Mn, 0.40 Si, 30.0 Cr, 9.0 Ni, bal Fe.
Bare wire for welding. AMS 5784.

McKAY 312.
M-849; Coated stainless steel weld rod.
Typical deposit analysis: 0.12 C, 1.70 Mn, 0.60 Si, 29.0 Cr, 9.0 Ni.
Welded: 112,000 TS; 90,000 YS; 32 El.
For welding Type 312 materials and some dissimilar metal joining AWS E312.

McKAY 312 Mo.
M-849; Coated stainless steel weld rod.
Typical deposit analysis: 0.12 C, 1.7 Mn, 0.60 Si, 29.0 Cr, 9.5 Ni, 2.0 Mo.
Welded: 120,000 TS; 95,000 YS; 29 El.
Improved weld quality on Type 312 stainless steel.

McKAY 316.
M-849; Coated stainless steel weld rod.
Typical deposit analysis: 0.06 C; 2.25 Mn, 0.38 Si, 18.0 Cr, 13.0 Ni, 2.15 Mo.
Welded: 80,000 TS; 68,000 YS; 45 El.
For welding Type 316 stainless steel. AWS 316.

McKAY 316 L.
M-849; Coated stainless steel weld rod
Typical deposit analysis· 0.030 C, 2.1 Mn, 0.38 Si, 18.0 Cr, 13.0 Ni, 2.15 Mo
Welded. 78,000 TS; 60,000 YS; 40 El.
For welding Type 316L stainless steel. AWS E316L.

McKAY 316 L Hi Sil.
M-849; 0.020 C, 1.75 Mn, 0.85 Si, 19.0 Cr, 13.0 Ni, 2.3 Mo, bal Fe
Bare wire for welding

McKAY 317
M-849, Coated stainless steel weld rod.
Typical deposit analysis 0.06 C, 2.0 Mn, 0.40 Si, 18.5 Cr, 13.3 Ni, 3.65 Mo
Welded. 95,000 TS, 70,000 YS, 35 El.
Higher Mo improves weld quality over Type 316. AWS E317

McKAY 317 L.
M-849, 0.020 C, 1.75 Mn, 0.45 Si, 19.3 Cr, 14.0 Ni, 3.6 Mo, bal Fe
Bare wire for welding

McKAY 317 L
M-849, Coated stainless steel weld rod.
Typical deposit analysis: 0.035 C, 2.0 Mn, 0.40 Si, 18.5 Cr, 13.3 Ni, 3.65 Mo.
Welded 95,000 TS, 70,000 YS; 33 El
For welding types 316, 316L, 317, 317L stainless steel

McKAY 318
M-849; Coated stainless steel weld rod
Typical deposit analysis 0.05 C, 1.75 Mn, 0.40 Si 19.5 Cr, 12.5 Ni, 2.3 Mo, 0.55 Cb
Welded 85,000 TS, 65,000 YS; 35 El
Use similar to 316 but Cb addition improves weld quality AWS E318

McKAY 330
M-849, 0.20 C, 1.75 Mn, 0.35 Si, 16.0 Cr, 35.0 Ni, bal Fe
Bare wire for welding

McKAY 330
M-849; Coated stainless steel weld rod
Typical deposit analysis· 0.20 C, 2.25 Mn, 0.50 Si, 14.5 Cr, 34.0 Ni
Welded: 86,000 TS; 58,000 YS, 40 El
For welding Type 330 stainless steel for heat and creep resisting applications. AWS E330.

McKAY 347.
M-849, Coated stainless steel weld rod.
Typical deposit analysis: 0.05 C, 1.8 Mn, 0.50 Si, 19.5 Cr, 10.0 Ni, 0.65 Cb.
Welded: 96,000 TS; 64,000 YS; 36 El.
For welding types 321 and 347 stainless. AWS E347.

McKAY 347 HC.
M-849; Coated stainless steel weld rod.
Typical deposit analysis: 0.09 C, 1.85 Mn, 0.45 Si, 19.5 Cr, 10.2 Ni, 0.95 Cb.
Welded: 90,500 TS; 72,500 YS; 36 El.
For welding types 321 and 347 for elevated temperature operation MIL-E-22200/2.

McKAY 349.
M-849; 0.09 C, 1.50 Mn, 0.35 Si, 20.5 Cr, 8.5 Ni, 0.50 Mo, 1.25 Cb, 1.50 W, 0.20 Ti, bal Fe.
Bare wire for welding; AMS 5782

McKAY 349
M-849; Coated stainless steel weld rod.
Typical deposit analysis: 0.10 C, 1.75 Mn, 0.25 Si, 19.5 Cr, 9.0 Ni, 0.50 Mo, 1.0 Cb, 1.5 W, 0.10 Ti.
Welded. 110,000 TS; 84,000 YS, 30 El
For welds for high temperature applications such as the jet-aircraft industry. AWS E349.

McKAY 350.
M-849; 0.10 C, 0.80 Mn, 0.35 Si, 17.25 Cr, 4.5 Ni, 2.9 Mo, 0.08 N, bal Fe.
Bare wire for welding.

McKAY 360
M-849; Coated stainless alloy weld rod.
Typical deposit analysis: 0.20 C, 1.25 Mn, 0.50 Si, 15.0 Cr, 61.5 Ni
For welding Nichrome type alloys for high temperature service MIL-E-17496.

McKAY 380.
M-849; Coated stainless alloy weld rod.
Typical deposit analysis: 0.12, 0.40 Mn, 0.50 Si, 19.0 Cr, 79.0 Ni
For welding 80 Ni-20 Cr type alloys for high temperature applications (Nichrome V) MIL-E-6844A.

McKAY 410.
M-849; Coated stainless steel weld rod.
Typical deposit analysis: 0.08 C, 0.50 Mn, 0.45 Si, 12.0 Cr.
Welded, stress rel. at 1350°F. 77,000 TS, 58,000 YS; 34 El.
For welding type 410 stainless steel, weld and base metal hardenable. AWS E410

McKAY 430
M-849, Coated stainless steel weld rod.
Typical deposit analysis. 0.08 C, 0.50 Mn, 0.60 Si, 15.5 Cr.
Welded, stress rel 1400°F: 85,000 TS; 60,000 YS; 28 El
For welding Type 430 and other 16% Cr materials

McKAY 442.
M-849, Coated stainless steel weld rod
Typical deposit analysis: 0.08 C, 0.60 Mn, 0.40 Si, 19.50 Cr.
Welded, stress rel 1400°F 79,000 TS, 57,000 YS; 27 El.
For welding 18% chromium materials.

McKAY 446.
M-849; Coated stainless steel weld rod.
Typical deposit analysis: 0.10 C, 0.75 Mn, 0.60 Si, 27.0 Cr.
Welded: 90,000 TS, 65,000 YS, 8 El
For welding 28% chromium materials.

McKAY 502.
M-849; Coated stainless steel weld rod
Typical deposit analysis 0.07 C, 0.55 Mn, 0.38 Si, 5.25 Cr, 0.50 Mo.
Welded, stress rel. 1350°F: 75,000 TS; 50,000 YS; 30 El.
For welded assemblies subject to high temperature conditions, AWS E502.

McKAY 502-18.
M-849; Low carbon chrome alloy, coated weld rod.
Typical deposit analysis: 0.06 C, 0.60 Mn, 0.60 Si, 5.25 Cr, 0.50 Mo.
Welded and stress relieved at 1350°F: 100,000 TS; 88,000 YS; 23 El
For welding Cr-Mo steels for elevated service conditions AWS E502.

McKAY 505-18.
M-849, Low carbon chrome alloy, coated weld rod
Typical deposit analysis 0.06 C, 0.55 Mn, 0.50 Si, 9.25 Cr, 1.05 Mo
Welded and stress relieved at 1575°F 71,000 TS; 47,500 YS, 40 El.
For welding Cr-Mo steels for high temperature service conditions; AWS 505-18

McKAY 6010
M-849, Low C, bal Fe, Weld rod, DC.
Welded. 68,000 TS; 58,000 YS; 26 El.
For mild steel welding AWS E6010

McKAY 6010 IP
M-849, Low C, bal Fe, Iron powder modified E6010 electrode For DC welding.
Welded· 69,000 TS, 58,000 YS, 30 El
For mild steel welding AWS E6010

McKAY 6011
M-849; Low C, bal Fe, weld rod, AC
Welded 67,000 TS, 58,000 YS, 29 El
For welding mild steel AWS E6011

McKAY 6011 IP
M-849, Low C, bal Fe, Iron powder modified E6011 electrode For AC welding
Welded 69,000 TS, 61,000 YS, 30 El
For mild steel welding, AWS E6011

McKAY 6012
M-849, Low C, bal Fe, Weld rod.
Welded 72,000 TS, 60,000 YS, 20 El
For general purpose low carbon steel welding, particularly for DC with poor fit-up
AWS E6012

McKAY 6013
M-849, Low C, bal Fe, weld rod
Welded 82,000 TS; 73,000 YS; 20 El
General purpose welding low carbon steel, AC or DC, AWS E6013

McKAY 6020
M-849, Low C, bal Fe, Weld rod
Welded· 70,000 TS, 62,000 YS; 27 El
AC or DC welding of heavy plate AWS E6020

McKAY 7014
M-849, Low C, bal Fe, weld rod
Welded 71,000 TS, 64,000 YS, 26 El
General purpose iron powder electrode AWS E7014

McKAY 7018
M-849, Mild steel weld rod
Typical deposit analysis· 0.06 C, 1.05 Mn, 0.65 Si
Welded· 78,000 TS, 70,000 YS, 32 El.
For mild steel welding, AC or DC. AWS E7018.

McKAY 7018-Al.
M-849, Mild steel weld rod.
Typical deposit analysis 0.07 C, 0.75 Mn, 0.60 Si, 0.50 Mo.
Welded· 84,000 TS; 69,000 YS; 30 El.
For welding carbon-molybdenum high temperature piping AWS E7018-Al

McKAY 7018-HC.
M-849; Higher carbon mild steel electrode
Typical deposit analysis: 0.21 C; 1.0 Mn, 0.60 Si.
Welded: 88,250 TS; 74,750 YS; 30 El.

McKAY 7024.
M-849; Mild steel weld rod.
Welded: 87,000 TS; 76,500 YS; 18 El
For horizonetal or flat fillet welds. AWS E7024.

McKAY 8016-C3.
M-849; Low carbon, low alloy weld rod
Typical deposit analysis. 0.09 C, 0.85 Mn, 0.40 Si, 0.95 Ni.
Welded· 91,000 TS; 77,000 YS; 27 El.
For welding 1% nickel alloy steels for low temperature service AWS E8016-C3.

McKAY 8018-B2.
M-849, Low C, alloy steel weld rod.
Typical deposit analysis 0.045 C, 0.70 Mn, 0.60 Si, 1.25 Cr, 0.50 Mo
Welded· 99,500 TS, 83,500 YS, 26 El
Primarily for welding chromium molybdenum piping; AWS E8018 B2.

McKAY 8018 C1
M-849, Low C, nickel alloy steel weld rod
Typical deposit analysis 0.05 C, 0.80 Mn, 0.45 Si, 2.50 Ni.
Welded 84,000 TS, 71,000 YS; 32 El
For welding 2½% nickel steels AWS E8018-C1

McKAY 8018-C2
M-849, Low C, nickel alloy steel weld rod
Typical deposit analysis. 0.055 C, 0.80 Mn, 0.45 Si, 3.20 Ni
Welded 91,000 TS, 75,000 YS, 29 El
For welding 3½% nickel steels AWS E8018-C2

McKAY 8018-C3
M-849, Low C, low alloy steel weld rod
Typical deposit analysis 0.55 C, 0.80 Mn, 0.45 Si, 1.0 Ni
Welded 83,000 TS, 70,000 YS, 32 El
For welding low alloy, high strength steels requiring tough welds for sub-zero operation
AWS L8018-C3

McKAY 8018-G.
M-849, Low C, low alloy steel weld rod
Typical deposit analysis. 0.085 C, 1.3 Mn, 0.60 Si
Welded 86,200 TS, 73,250 YS, 32 El
For welding low alloy steels in the 80,000-85,000 tensile range AWS 8018-G

McKAY 9018
M-849, Low carbon alloy steel weld rod
Typical deposit analysis 0.07 C, 1.0 Mn, 0.40 Si, 1.6 Ni, 0.15 Mo
Welded· 94,000 TS, 84,000 YS, 29 El.
For welding low alloy high strength steels in the 90,000 tensile strength range
For MIL 9018 military requirements
AWS E9018-M

McKAY 9018-B3.
M-849; Low carbon alloy steel weld rod
Typical deposit analysis 0.045 C, 0.70 Mn, 0.60 Si, 2.25 Cr, 1.05 Mo
Welded 124,500 TS, 96,000 YS, 22 El.
Use for welding Cr-Mo piping of similar composition.
AWS E9018-B3.

McKAY 10016.
M-849; Low carbon alloy steel weld rod.
Typical deposit analysis: 0.09 C, 0.90 Mn, 0.45 Si, 1.75 Ni, 0.30 Mo, 0.08 V.
Welded: 108,000 TS; 99,000 YS; 23 El.
For welding low alloy, high strength steels in the 100,000 psi tensile strength range.
AWS E10016-G.

McKAY 10018
M-849; Low carbon alloy weld rod.
Typical deposit analysis: 0.06 C, 1.05 Mn, 0.45 Si, 0.12 Cr, 1.55 Ni, 0.25 Mo.
Welded: 104,000 TS; 95,000 YS; 24 El.
For welding low alloy, high strength steels in the 100,000 psi tensile strength range. For MIL 10018 military requirements AWS E10018-M.

McKAY 10018-D2
M-849, Low carbon alloy steel weld rod.
Typical deposit analysis. 0.11 C, 1.85 Mn, 0.45 Si, 0.35 Mo
Welded 110,000 TS, 98,000 YS; 26 El
For welding low alloy, high strength steels in the 100,000 psi tensile strength range
AWS E10018-D2

McKAY 11016
M-849, Low carbon alloy steel weld rod
Typical deposit analysis. 0.08 C, 1.25 Mn, 0.45 Si, 1.20 Cr, 2.0 Ni, 0.30 Mo.
Welded 117,000 TS, 106,000 YS, 23 El.
For welding low alloy, high strength steels in the 110,000 psi tensile strength range
AWS E11016-G.

McKAY 11018
M-849; Low carbon alloy steel weld rod.
Typical deposit analysis 0.05 C, 1.6 Mn, 0.40 Si, 1.6 Ni, 0.4 Mo
Welded 115,000 TS, 104,000 YS, 24 El.
For welding low alloy, high strength steels in the 110,000 psi tensile strength range.
AWS E11018-M

McKAY 12018
M-849, Low carbon alloy steel weld rod
Typical deposit analysis 0.05 C, 1.70 Mn, 0.45 Si, 0.35 Cr, 2.0 Ni, 0.45 Mo.
Welded 130,000 TS, 117,000 YS, 22 El
For welding low alloy high strength steel in the 120,000 psi tensile strength range.
For MIL 12018 military requirements
AWS E12018-M

McKAY 13018
M 849, Low carbon alloy steel weld rod
Typical deposit analysis 0.085 C, 1.63 Mn, 0.42 Si, 0.73 Cr, 1.64 Ni, 0.24 Mo
Welded 134,000 TS, 124,000 YS, 21 El.
For welding high yield strength steels

McKAY 14018
M-849, Low carbon alloy steel weld rod
Typical deposit analysis 0.08 C, 1.0 Mn, 0.40 Si, 0.50 Cr, 3.50 Ni, 0.75 Mo.
Welded 147,000 TS, 141,000 YS, 18 El
For welding high yield strength steels.

McKAY AM 363
M-849, 0.03 C, 0.30 Mn, 0.24 Si, 11.5 Cr, 4.2 Ni, 0.40 Al, 0.05 Co, bal Fe.
Bare wire for welding

McKAY AM 363.
M-849, Coated stainless steel weld rod
Typical deposit analysis· 0.075 C, 0.25 Mn, 0.40 Si, 11.8 Cr, 4.4 Ni, 0.5 Ti
Welded· 135,000 TS; 130,000 YS; 10 El.
For welding AM 363 material and for repair of large type 410 castings.

McKAY ARMORLOY A-8.
M-849; Stainless steel weld rod.
Typical deposit analysis: 0.10 C, 4.3 Mn, 0.45 Si, 19.3 Cr, 9.9 Ni.
Welded: 90,000 TS; 67,000 YS; 44 El.
For welding armor plate, dissimilar metals, and "difficult-to-weld" steel; Weld metal has excellent toughness and crack resistance.
MIL-E-13080; U.S. Army 57-203-3 Grade V.

McKAY ARMORLOY A-9.
M-849; Stainless steel weld rod.
Typical deposit analysis: 0.11 C, 1.9 Mn, 0.60 Si, 18.9 Cr, 9.4 Ni, 2.2 Mo.
Welded: 100,000 TS; 73,000 YS; 37 El.
For welding armor plate, dissimilar metals and "difficult-to-weld" steels; Weld metal has excellent toughness and crack resistance.
U.S. Army 57-203-3 Grade VI.

McKAY BARE STAINLESS STEEL WELD WIRE.
M-849; 12 grades conforming to AISI
Specs: 308, 309, 310, 316, 316L, 321, 347-348, 410, 430, 442, 446 and 502.
(Non-AISI grades have individual listing).

McKAY CHROME MANG
M-849; Hard facing electrode, AC or DC.
For joining or build-up; deposit has strength of about 141,000 psi TS, is work hardenable, and crack resistant. For shovel tracks, jaw crusher plates.

McKAY FROGALLOY M & C.
M-849; Hard facing electrode; DC reverse
For build-up and hard facing; deposit is high carbon, high strength austenitic stainless; for surfacing bucket teeth, railroad frogs and switches

McKAY HARDALLOY 1.
M-849; Non-ferrous Co-Cr-W hard facing electrode.
For deposits to resist heat and corrosion as turbine valves, steam valves.

McKAY HARDALLOY 6.
M-849; Cobalt base hard facing electrode.
For build-up; deposits have high resistance to thermal shock and impact; for gasoline exhaust valves, shear blades, needle valves

McKAY HARDALLOY 32.
M-849; Hard surfacing electrode, AC or DC.
For build up carbon steel and cast iron; hardness 17-30 Rock C; machinable.

McKAY HARDALLOY 40 TiC
M-849; Hard surfacing electrode, AC or DC.
Titanium bearing, for building up hard surface on carbon steels and also austenitic manganese steels for hardness 45-50 Rock C Not machinable;
For dipper teeth, screw conveyors, hammer mill hammers.

McKAY HARDALLOY 44.
M-849; Hard surfacing electrode, coated rod
For overlaying carbon steel and austenite manganese steel for wear resistant surface.
Work hardens to 40-55 Rock C; for crusher screens, dredge pump impellers.

McKAY HARDALLOY 48.
M-849; Hard surfacing electrode.
For overlaying carbon steel with wear resistant surface of 38-40 Rock C; for shafts, dies, friction clutches, sand chutes, conveyor screws.

McKAY HARDALLOY 52.
M-849; Hard surfacing electrode, AC or DC.
For overlaying carbon steel with hard, impact resisting surface up to 57-62 Rock C.
For gear teeth, roll ends, mine car wheels, mine rails, cams.

McKAY HARDALLOY 55, 55G.
M-849; Hard surfacing electrode, AC or DC.
For overlaying carbon steel or austenitic manganese steel with hard surface up to 55 Rock C, resistant to gouging type of wear.
For bucket teeth, pusher shoes, muller tires, mower shoes, plow shares.

McKAY HARDALLOY 55 TiC.
M-849, Hard surfacing electrode
For overlaying carbon steel and austenitic manganese steel with hard surface with extreme resistance to abrasion
For crusher rolls, brick dies, coke pusher shoes, and scraper blades.

McKAY HARDALLOY 58
M-849; Hard surfacing electrode, AC or DC.
For overlaying carbon steel with hard (55-60 Rock C) surface to resist abrasion and impact.
For drag line bucket tips, dipper lips, crane hooks, coupling boxes and spindles

McKAY HARDALLOY 58 TiC
M-849, Hard surfacing electrode.
For over laying carbon steel with hard (59-61 Rock C) surface for resistance to severe abrasion and impact
For cement conveyor screws, augers, scraper blades

McKAY HARDALLOY 61
M-849; Hard surfacing electrode.
For depositing hardenable (up to 61 Rock C) alloy on steel for wear and abrasion resistance up to 1000°F.
For mandrels, shear blades, scraper knives, shaper and planer tools AWS-E Fe5-B

McKAY HARDALLOY 118
M-849; Hard surfacing electrode.
For depositing austenitic manganese steel on carbon and manganese steel
For crusher rolls, dipper teeth, railroad frogs and crossovers, work hardens rapidly

McKAY HARDALLOY 120.
M-849; Welding electrode, AC & DC.
For joining dissimilar metals and hard-to-weld steels; and for build-up Deposits have good corrosion resistance and strength of about 125,000 psi TS

McKAY IN-FLUX STEEL TUBULAR WELDING WIRES
M-849; 7 grades for inert gas welding; MIG. 308 L-G, 309 L-G, 316 L-G, 347-G, 309-G, 310-G, 430-G See similar AISI numbers for compositions
Note: Suffix "S" in place of "G" are designed for submerged arc.

McKAY MON-ALLOY.
M-849; Monel base weld rod.
Typical deposit analysis: 0.12 C, 1.8 Mn, 0.8 Si, 65.0 Ni, 1.8 Fe, bal Cu.
Welded: 96,000 TS, 49,000 YS; 37 El; 150 Brin.
For welding Monel and Ni-Cu alloys to steel, or for surfacing steel. AWS E NiCu-1.

McKAY N-155.
M-849; 0.1-0.2 C, 20-22 Cr, 19-21 Ni, 0.75-1.25 Cb, 2.75-3.75 Mo, 2-3 W, 0.1-0.2 N, 18.5-21.0 Co.
Welded: 106,000 TS; 75,000 YS; 24 El.

For welding electrodes for high temperature service; shielded arc, high heat resistant.

McKAY NICKALLOY.
M-849; Pure nickel weld rod.
Welded: 45,000 TS; 2 El.
For machinable welds on cast iron.
AWS E Ni-C1.

McKAY NICKALLOY 60
M-849; Nickel-Iron weld rod.
Typical deposit analysis: 59 Ni, 41 Fe.
Welded: 77,000 TS; 61,000 YS; 8 El.
For machinable welds on cast iron.
AWS E NiFe-C1.

McKAY NICKEL MANGANESE.
M-849; Hard facing electrode, DC reverse.
For build-up on carbon steels or manganese austenitic steels where severe impact is expected For railroad car castings, crusher screens, railroad frogs and switches.

McKAY PLURALLOY 70 AC.
M-849; Mild steel weld rod.
Typical deposit analysis· 0.08 C, 0 80 Mn, 0.30 Si.
Welded 78,000 TS, 71,000 YS; 32 El.
For welding mild steel and free machining steel.
AWS E7016.

McKAY STAINLESS 20.
M-849, Coated stainless steel weld rod
Typical deposit analysis: 0 06 C, 1 75 Mn, 0 60 Si, 19 5 Cr, 33 0 Ni, 2.2 Mo, 0.65 Cb, 3.3 Cu.
Welded 84,000 TS, 54,000 YS; 39 El.
For fabricating Carpenter 20 stainless steel
AWS E320.

McKAY TOOL-ALLOY "822."
M-849; Coated Ni-C alloy steel electrode, AC or DC
For build-up or repair of forming and drawing dies, large drive gears.

McKAY TOOL-ALLOY "A"
M-849, Air hardening weld rod and wire
Typical weld metal comp (rod), 0 85 C, 1 0 Mn, 0.5 Si, 5 2 Cr, 1 5 Mo, 0.35 V. (deposit from wire is slightly different)
For repair and build-up air hardening tools and dies.

McKAY TOOL-ALLOY "FH-30"
M-849; Coated steel electrodes, AC or DC.
As welded hardness: 34 Rc, flame hardenable to 53 Rc
For repair of plastic molds, SAE 4130, 6145 steel casting and for build-up of soft material

McKAY TOOL-ALLOY "FH-45."
M-849; Coated steel electrodes, AC or DC.
As welded hardness; 44 Rc, flame hardenable to 60 Rc.
For repair of plastic molds, build-up and surface harden of softer material.

McKAY TOOL-ALLOY "GP."
M-849; Coated stainless steel electrode.
As welded: 120,000 TS; 90,000 YS, 27 El.
For welding, build-up or repair of many types of dies or tools.

McKAY TOOL-ALLOY "HS."
M-849; High speed steel rod and wire.
Typical weld metal comp. (rod): 0 65 C, 0.8 Mn, 0 45 Si, 3.95 Cr, 8.75 Mo, 0.9 V, 1.8 W. (deposit from wire is slightly different).
For repair and build-up of parts made of AISI M1 tool steel, or to deposit such material on carbon steel parts.

McKAY TOOL-ALLOY "HW."
M-849; Alloy steel welding rod and wire.
Typical weld metal comp. (rod); 0.30 C, 0.5 Mn, 0.5 Si, 4.75 Cr, 1.75 Mo, 0.25 V, 1.3 W (deposit from wire is slightly different).
For repair and build-up of AISI H-12 and similar hot work tool and die materials.

McKAY TOOL-ALLOY "HW-2."
M-849; Alloy steel coated electrode for DC reverse; and bare wire for TIG and MIG welding.
For repair or build-up of various hot-work tool steel dies or tools.

McKAY TOOL-ALLOY "HW-2FC."
M-849, Flux cored open arc wire.
For repair or build-up of various hot-work tool steel dies or tools.

McKAY TOOL-ALLOY "O."
M-849, Oil hardening weld rod and wire.
Typical weld metal comp (rod)· 0.65 C, 1.12 Mn, 0 4 Si, 1 35 Cr, 1 12 Mo, 0 5 W, 0.35 V (wire is slightly different).
For repair and build-up of oil-hardening tools and dies.

McKAY TOOL-ALLOY "W."
M-849; Water hardening weld rod and wire.
Typical weld metal comp (rod): 0.8 C, 0.6 Mn, 0 45 Si, 0.4 Cr, 0.4 Mo, 0.28 V. (wire is slightly different)
For repair and build-up of water-hardening tools and dies

McKAY TOOL-FAB.
M-849, Low alloy coated electrode.
As welded 96,000 TS; 85,500 YS, 30 El
For repairing broken or cracked tool steel dies and for build-up

McKAY TOOL-FORGE
M-849, Cr-Mo-V steel flux cored wire.
For repairing sow blocks, rams, etc ; as welded hardness 35-45 Rock C

McKAY TOOL-MAR "300"
M-849, Ni-Co-Mo-Fe bare wire for TIG welding or build-up of maraging steel, or of H11, H12, H13 hot work tool steels.

McKAY TUBE-ALLOY 218-O
M-849, low phos austenitic manganese 19.5% alloy steel wire
For work-hardenable build-up and surfacing of shovel teeth, crusher jaws, breaker bars, railroad frogs

McKAY TUBE-ALLOY 218-S.
M-849, Low phos austenitic manganese 19 5% alloy steel wire.
For work-hardenable build-up and surfacing of shovel buckets, crusher rolls, hammer mill hammers, railroad frogs and switches

McKAY TUBE-ALLOY 219-O
M-849, C-Cr austenitic manganese steel; total alloy content over 26%
For welding or hard facing as on drag line teeth or dredge pump shells.

McKAY TUBE-ALLOY 236-S.
M-849; 5 Ni, 5 Mo, hard facing wire.
For build-up and hard facing carbon steels.

McKAY TUBE-ALLOY 240-O.
M-849; High chromium cast iron alloy wire.
For weld or build-up of hammer mill hammers, shovel teeth, grader blades.

McKAY TUBE-ALLOY 240 TiC-O.
M-849; High chromium cast iron alloy wire. Contains TiC; for hard facing hammer mill hammers, crusher rolls.

McKAY TUBE-ALLOY 242-O.
M-849; Low carbon, 5% alloy wire.
For hard surfacing tractor rollers and idlers, mine car wheels, crane wheels

McKAY TUBE-ALLOY 242-S.
M-849; Low carbon, 5% alloy wire.
For hard surfacing crane wheels, mine car wheels, steel shafts.

McKAY TUBE-ALLOY 244-O.
M-849; High carbon, chromium, 10.5% alloy wire; for hard facing and reclamation of dredge pump shell. Will stand moderate to heavy impact

McKAY TUBE-ALLOY 250-S
M-849, 13.5% Cr-C alloy steel wire.
For heat treatable surfacing of crane wheels, coiler rolls, plungers, pinch rolls

McKAY TUBE-ALLOY 252-O.
M-849, 6.5% alloy steel hard-facing wire.
For surfacing tractor track rollers and idlers, shovel rollers, brake drums, ditcher rolls, mine car wheels

McKAY TUBE-ALLOY 252-S
M-849; 6.5% alloy steel hard-facing wire
For surfacing skip and crane wheels, charging car wheels, brake drums, tractor rollers and idlers

McKAY TUBE-ALLOY 255-O.
M-849; High carbon chrome cast iron 34% alloy hard facing wire
For surfacing dredge pump impellers, dredge cutters, bucket teeth and lips, non-machinable

McKAY TUBE-ALLOY 258-O
M-849, Cr-Mo-W heat treatable 11.5% alloy steel wire
For hard surfacing pinch rolls, scrap press plungers, table rolls, cable sheaves

McKAY TUBE-ALLOY 258-S.
M-849, Cr-Mo-W heat treatable 11.5% alloy steel wire.
For hard surfacing dredge ladder rolls, blocker rolls, cable sheaves.

McKAY TUBE-ALLOY 258 TiC-O
M-849, 17% Cr-C alloy with 11% TiC (by volume) wire
For hard surfacing augers, dredge pump parts, bucket teeth and lips, fan blades

McKAY TUBE-ALLOY 828-S
M-849, Medium carbon 3.5% alloy steel wire.
For medium hardness deposits on gears, sheaves, steel shafting, conveyor rolls

McKAY TUBE-ALLOY 829-O.
M-849; 18% Hadfield manganese alloy with 10% TiC (by volume) wire
For non-machinable, work-hardening deposits of high wear resistance, for bucket lips and teeth, breaker bars, shovel pads.

McKAY TUBE-ALLOY AP-O.
M-849; High strength Cr-Mn work-hardenable austenitic stainless steel wire
For surfacing rail frogs and crossovers, shovel buckets, shovel teeth, impeller bars.

McKAY TUBE-ALLOY BU-O.
M-849; Low carbon, 3% alloy steel wire.
For build-up on weldable steels as on tractor rails, rollers and idlers, cable drums, gears, mixer blades, rail ends.

McKAY TUBE-ALLOY BU-S
M-849; Low carbon, 3% alloy steel wire.
For build up on weldable steels, as on cable drums, steel shafts, trunnions, gears, mixer blades, rail ends

McKECHNIE'S BRONZE.
Eng; 57 Cu, 41 Zn, 1 Sn, 0.5 Pb, 1 Fe
For rods, nuts, bolts; high strength

MC KENNA K4
M-793; WC + CO
For tools, cutters; for cutting cast iron, glass, porcelain.

McKINNEY ALLOYS
Eng, 95-97 Al, 2-3 Cu, 1-2 Mn.
For light alloy parts exposed to sea water, resists sea water corrosion

McLOUTH ML-50
M-1592, 0.13 C, 0.48 Mn, 0.01 P, 0.015 S, 0.17 Si, 0.01 Cb, 0.22 Cu, 0.01 Mo, 0.40 Cr, 0.61 Ni, bal Fe
Bars 70,000 min TS, 50,000 min YS; 22 El
For chutes, crane booms, derricks, dump bodies, marine parts, pressure tanks.
Good formability and weldability
Low alloy high-strength steel

McLOUTH ML-60
M-1592, 0.13 C, 0.90 Mn, 0.01 P, 0.016 S, 0.20 Si, 0.29 Cu, 0.01 Mo, 0.51 Cr, 0.68 Ni, 0.014 Cb, bal Fe
Bars. 75,000 min TS, 60,000 min YP, 22 min El
For chutes, crane booms, derricks, dump bodies, marine parts, pressure tanks.
Good formability and weldability
Low alloy high-strength steel

McLOUTH ML-70
M-1592, 0.16 C, 0.95 Mn, 0.01 P, 0.021 S, 0.17 Si, 0.30 Cu, 0.01 Mo, 0.73 Ni, 0.029 Cb, bal Fe
Bar 85,000 min TS, 70,000 min YP, 20 min El
For chutes, pressure tanks, crane booms, derricks, dump bodies, marine parts
Good formability and weldability Low-alloy high strength steel

McLOUTH ML-F
M-1592, 0.22 max C, 1.25 max Mn, 0.2 min Cu, 0.02 min V, 0.012 Cb, bal Fe
Plate 70,000 TS, 50,000 YS, 22 El
For automobile parts, buckets, chutes, dump bodies, truck frames, wheels, transmission towers, derricks
Good formability and weldability
Low alloy-high strength steel

McLOUTH-MLX
M-1592, 0.26 max C, 1.5 max Mn, 0.005 min Cb, 0.02 min V, bal Fe
Gr. 45. 60,000 TS, 45,000 YS, 22 El
Gr 50 65,000 TS, 50,000 YS, 22 El.
Gr 55. 70,000 TS; 55,000 YS, 22 El
Gr 60 75,000 TS, 60,000 YS, 20 El
For derricks, transmission towers, chutes, crane booms, buckets, dump bodies
Good formability and weldability
High strength-low alloy steel

McLURE ALLOY
Eng., 85 Al, 8.2 Cu, 5-6 Sn, 0.9 Fe, 0.3 Si, 0.2 Mn
For light alloy parts; non-hardenable.

M C MOLD AND CAVITY STEEL.
M-115; C, alloy, bal Fe
For dies and molds; deep hardening.

MECO.
50 Cu, 25 Ni, 20 Zn, 5.
For chemical equipment; corrosion resistant.

MEDAL BRONZE-1.
92 Cu, 8 Sn.
For medals, ornaments; corrosion resistant

MEDAL BRONZE-2.
95 Cu, 4 Sn, 1 Zn
For medals, ornaments, corrosion resistant.

MEDAL BRONZE-3
97 Cu, 1 Sn, 2 Zn
For medals, ornaments, corrosion resistant.

MEDAL METAL
84 Cu, 16 Zn
For medals, ornaments, corrosion resistant.

MEDIUM
M-686; 70 Ag, 20 Cu, 10 Zn.
For silversmithing solder for silver, M P. 1335-1390°F

MEDIUM HARD.
M-388; 0.90 C, bal Fe
For tools, dies, fixtures, water hardened

MEDIUM LEADED BRASS
M-33, 65 Cu, 34 Zn, 1 Pb
Annealed 47,000 TS, 15,000 YS, 60 El
Rolled 74,000 TS, 60,000 YS, 7 El
For screws, rivets, nuts, free cutting

MEDIUM LEADED BRASS-229
M 8, 64 Cu, 35 Zn, 1 Pb
Soft 45,000 TS, 17,000 YS, 57 El
Hard 73,000 TS, 60,000 YS, 8 El
For hardware, bolts; moderate cold working, free-cutting

MEDIUM LEADED BRASS-340
M-8, 64.5 Cu, 34.5 Zn, 1.0 Pb
Hard Rod 65,000 TS, 50,000 YS, 15 El; B 75 Rock
Soft Rod 46,000 TS, 17,000 YS, 60 El, B 15 Rock
For plaques hinges, gears, wheels, ratchets, pinions, valve stems, rivets, channel plates
Corrosion resistant Elect cond 26

MEDIUM LEADED BRASS 350.
M-279, 61 Cu, 38 Zn, 1 Pb
Ann 45,000-55,000 TS, 12,000-26,000 YS, 45-60 El
Cold rolled 49,000-99,000 TS, 20,000-79,000 YS; 1-44 El
Good machinability and formability
For hose coupling nuts, sink strainers, bearing cages

MEDIUM LEADED NAVAL BRASS
M-33, 60.5 Cu, 0.75 Sn, 0.7 Pb, bal Zn
Hard temper 75,000 TS, 56,000 YS, 28 El.
For marine hardware, screw machine products; corrosion resistant

MEDIUM SILVER SOLDER
75-70 Ag, 20-23 Cu, 5-7.5 Zn
For silver solder, corrosion resistant

MEDUSA.
M-1431, 0.50 C, 1.5 Cr, 2.5 W, bal Fe
For rivet sets, punches, pneumatic tools, Type S1, shock resistant

MEECHITE
M 1167; 0.2 C, 29 Cr, bal Fe.
For melting pots; nonferrous metals, corrosion resistant

MEEHANITE A.
M-82, M-850, 3.0 C, 1 Si, bal Fe.
Cast. 50,000 TS; 17,000 YS; 196 Brin.
Heat treated: 75,000 TS, 600 Brin.
For castings, gears, shafts; superseded by Meehanite GA

MEEHANITE B
M-82, M-850; 3.0 C, 1 Si, bal Fe
Cast 45,000 TS, 17,000 YS, 196 Brin
Heat treated 60,000 TS; 500 Brin
For castings, gears, shafts; cast iron superseded by Meehanite GB

MEEHANITE C
M 82, M-850, 3.0 C, 1 Si, bal Fe
Cast 40,000 TS, 32,000 YS, 196-450 Brin
For cast iron castings, gears, superseded by Meehanite GC

MEEHANITE CB
M-82, M-850, C, alloy, bal Fe
Cast 45,000 TS, 187 Brin
For acid pans, kettles, pumps, valves, fittings; acid resistant castings.

MEEHANITE CB3
M-82, M-850, C, alloy, bal Fe
Cast 48,000 TS, 187 Brin
For pumps, valves, fittings; acid resistant castings

MEEHANITE CC
M-82, M-850, C, alloy, bal Fe.
Cast 46,000 TS, 187 Brin
For cast iron castings, acid resistant

MEEHANITE D.
M-82, M-850, C, alloy, bal Fe
Cast. 35,000 TS, 175-400 Brin
For cast iron castings, gears, housings, casings, superseded by Meehanite GD

MEEHANITE E
M-82, M 850, 3 C, alloy, bal Fe
Cast 30,000 TS, 27,000 YS; 140-450 Brin
For cast iron castings, gears, shafts, casings; superseded by Meehanite GF

MEEHANITE GA
M-82, M 850, over 3.0 C, over 1.0 Si, bal Fe
Cast 50,000 TS; 36,000 YS, 5 El, 220 Brin
Heat treated 77,000 TS; 380 Brin
For machine tool castings, gears, shafts, housings; close grain iron

MEEHANITE GAH
M-82, M-850, 3 C, alloy, bal Fe
Cast 70,000 TS, 250-600 Brin.
For cast iron castings, gears, strong

MEEHANITE GB
M 82, M-850, over 3.0 C, over 1.0 Si, bal Fe
Cast 45,000 TS, 196 Brin
For machine tool castings, gears, shafts, housings, close grain iron

MEEHANITE GC
M-82, M-850, over 3.0 C, over 1.0 Si, bal Fe.
Cast. 40,000 TS, 192 Brin
For pistons, engine castings, gears, shafts, housings, close grain iron.

MEEHANITE GD
M182, M-850, 3 C, alloy, bal Fe
Cast 33,000-38,000 TS, 193 Brin
For pressure castings, gears; cast iron

MEEHANITE GE
M-82, M-850, over 3.0 C, over 1.0 Si, bal Fe.
Cast 30,000 TS, 27,000 YS; 174 Brin.
For machine tool castings, gears, shafts, housings, lathe beds; close grain iron.

MEEHANITE GM.
M-82, M-850; 3 C, alloy, bal Fe.
Cast: 50,000-60,000 TS; 17,000 YS; 241 Brin.
For castings, gears, shafts; high strength.

MEEHANITE HA.
M-82, M-850; over 3.0 C, over 1.0 Si, alloy, bal Fe.
Cast: 50,000 TS, 220 Brin.
For diesel engine components, valves, liners, superheaters; up to 900°F operating temperature, alloy iron.

MEEHANITE HB.
M-82, M-850; over 3.0 C, over 1.0 Si, Cu, Cr, Mo, bal Fe
Cast: 38,000 TS; 300 Brin
For stoker plates, furnace rolls, skid castings; heat resistant to 1400°F, alloy iron.

MEEHANITE HC
M-82, M-850; C, alloy, bal Fe.
Cast: 38,000 TS, 229 Brin.
For cast iron castings; heat resistant

MEEHANITE HD.
M-82, M-850; C, alloy, bal Fe.
Cast 33,000 TS, 220 Brin min
For heat resisting cast iron castings, ingot molds, sinter grates, slag pots

MEEHANITE-HE.
M-82, M-850, 3.55 max C, 1.9 min Si, Cu, Cr, Mn, bal Fe.
Cast: 30,000 TS; 220 min Brin
For slag pots, furnace castings, ingot molds, sinter grates.
Heat resistant cast iron.

MEEHANITE HR
M-82, M-850, 3.15 min C, 1.0 max Si, Cu, Cr, bal Fe.
Cast 40,000 TS; 300 Brin.
For glass molds, furnace and burner parts, rolls, heat resistant to 1550°F, alloy iron.

MEEHANITE HS.
M-82; 2.8 max C, 5.0 min Si, Mn, others, bal Fe
Cast 60,000 TS, 196 Brin
For oil refinery supports, blast furnace parts, trays, dampers; heat resisting cast iron up to 1700°F.

MEEHANITE HS-100.
M-82; 2.5 C, 5.0 Si, 0.3 Mn, special alloys, bal Fe
Cast. 60,000 TS, 196 Brin
For oil refinery tube supports, hot gas valves, up to 1700°F heat resistant

MEEHANITE KC
M-82, M-850; C, alloy, bal Fe.
Cast.
For pumps, valves, fittings, evaporators; alkali resistant.

MEEHANITE SC
M-82, M-850; 2.5 min C, 4.7 Si, alloy, bal Fe
Cast: 27,000 TS; 300 Brin.
For annealing and carburizing boxes, furnace parts; heat resistant to 1650°F, alloy iron.

MEEHANITE SF-60.
M-82; 3.5 C, 2.7 Si, 0.5 Mn, addition agents, bal Fe.
Cast. 60,000 TS; 161 Brin.
For gears, frames, housings, shafts; cast iron, replacement for malleable iron.

MEEHANITE SH-100.
M-82, 3.5 C, 2.5 Si, 0.5 Mn, addition agents, bal Fe.
Cast: 90,000 TS; 227 Brin.
For heavy duty gears, cams, tires, crankshafts; cast iron.

MEEHANITE SP-80.
M-82; 3.5 min C, 2.5 Si, 0.4 Mn, addition agents, bal Fe.
Cast: 80,000 TS, 207 Brin.
For gears, housings, frames, shafts; cast iron for high pressures

MEEHANITE WA
M-82, M-850, C, alloy, bal Fe.
Cast 50,000 TS, 196-321 Brin
For gears, brake drums, cams, dies, pinions; wear resistant

MEEHANITE WAH.
M-82, M-850; C, alloy, bal Fe
Cast 70,000 TS; 200-600 Brin.
For cast iron castings, wear resistant

MEEHANITE WB
M-82, M-850, C, alloy, bal Fe
Cast. 38,000 TS, 350-550 Brin
For mill liners, crushers, pump impellers; wear resistant.

MEEHANITE WBC
M-82, M-850, C, alloy, bal Fe
Chilled 45,000 TS, 550 Brin
For cement mill gears, rolls, rollers, cams, hard exterior

MEEHANITE WEC
M-82, 3.5 C, 1.0 Si, 0.6 Mn, 0.75 Cr, bal Fe.
Cast 30,000 TS, 444 Brin
For chill cast castings, gears, housing, wear resistant cast iron

MEEHANITE WH
M-82, 3.3 C, 0.75 Si, 0.4 Mn, 0.2-0.3 Cr, bal Fe
Cast 30,000 TS, 575 Brin
For wear resistant castings for mining equipment; wear resistant cast iron

MEGAPERM 4510.
M-296, 45 Ni, 10 Mn, bal Fe
For magnets, high permeability

MEGAPERM 6510
M-296, 65 Ni, 10 Mn,, bal Fe
For magnets, high permeability

MEGAPYR II
German, 30 Cr, 65 Fe, 5 Al
For cast magnets, electrical resistances; heat resistant to 1300°C

MELCHOIR WIRE 1
57.3 Cu, 41.6 Ni, 1.1 Mn
For white metal wire, corrosion resistant.

MELCHOIR WIRE-2
62.7 Cu, 25.9 Zn, 10.8 Ni, 0.6 Mn
For white metal wire; corrosion resistant.

MELCHOR WIRE
57.3 Cu, 41.6 Ni, 1.1 Mn.
For wire, corrosion resistat

MELCLIF A5.
M-1130; 5 Al, 0.5 Zn, 0.4 Mn, bal Mg
Cast: 29,700 TS; 12,000 YS; 11 El; 50 Brin.
For light alloy parts; wrought.

MELKHIOR
Russia; Ni, bal Cu

MELOTTE FUSIBLE ALLOY.
England; 50 Bi, 31 Sn, 19 Pb.
For fire extinguishers; M P. 99.5°C.

MELTRITE.
M-1072, 4 C, bal Fe.
For making steel and cast iron; pig iron.

MEL-TROL HAMDEN.
M-32; 2.1 C, 0.35 Mn, 0.25 Si, 12.5 Cr, 0.5 Ni, bal Fe.
Hardened: C 63-65 Rock.
For spindles, hubs, cold rolls, slitting cutters, master tools, blanking and forming dies, lamination dies.
Type D3 Oil hardening, nondeforming.

MELTRON A8
M-1130; 7.5-9.0 Al, 0.3-1.0 Zn, 0.15-0.40 Mn, bal Mg
Cast 25,000 TS, 13,500 YS, 2 El; 60 Brin
Heat treated. 38,000 TS, 14,000 YS, 6 El, 70 Brin

MELTRON AZ31.
M-1130; 3 Al, 1 Zn, 0.3 Mn, bal Mg
O-temper 37,000 TS, 22,000 YS, 21 El, 56 Brin
H24-temper 42,000 TS, 32,000 YS, 16 El; 73 Brin.
F-temper 37,000 TS, 22,000 YS, 21 El
For truck bodies, aircraft cowling and frames, good formability

MELTRON AZ855
M-1130, 5.5-8.5 Al, 1.5 max Zn, 0.15-0.40 Mn, bal Mg
Forged. 44,800 TS, 29,200 YS; 10 El, 70 Brin
For bearing housings, cylinder heads, control levers, age hardenable, forgings and extrusions.

MELTRON ZIX
M 487, 2.5 Th, 1 Zn, 0.6 Zr, bal Mg
Sheet 16,200 TS, 8000 YS, 18 El
At 300°C 5200 TS, 4200 YS; 43 El
For aircraft and missile components, creep resistant and good properties to 600°F.

MERAL
Swiss, 3.2 Cu, 0.8 Mg, 0.3 Mn, 1 Ni, bal Al
56,000 TS, 36,000 YS, 18 El; 110 Brin
For light alloy parts, age-hardenable

MERCOLOY
M-519, Cu alloy
For valves, corrosion resistant

MERICO-1
M-1436; 0.35 C, 0.77 Cr, 0.5 Co, 0.75 Mo, 0.73 Cu, bal Fe
For blacksmith tools, chisels, punches; water hardened, non-tempering

MERICO 2
M-1436, 0.40 C, 0.77 Cr, 0.75 Mo, 0.75 Cu, 0.6 Si, 0.4 Mn, bal Fe
For shear blades, rivet sets, pneumatic tools, oil hardened, non-tempering.

MERIDIAN AR STEEL
M-1436, 0.60-1.4 C, 0.25 V, bal Fe.
For drills, reamers, lathe and planer tools, hobs, Type W2, water hardened

MERIDIAN CARBIDE HIGH SPEED.
M-1436, 0.65 C, 4.5 Cr, 18 W, 2 V, 0.75 Mo, 12 Co, bal Fe
For cutting tools, drills, reamers, hobs; high speed steel

MERIDIAN DIE STEEL
M-1436; 1 C, 5 Cr, 1 Mo, bal Fe
For dies, rolls, spindles, punches; Type A2; oil hardened, non-deforming.

MERIDIAN DIE "O" STEEL.
M-1436, 0.90 C, 1 Mn, 0.5 W, bal Fe.
For cold work tools, header and blanking dies, Type O1, oil hardened, non-deforming.

MERIDIAN HS STEEL
M-1436, 0.80 C, 4 Cr, 2 V, 18 W, bal Fe.
For drills, taps, hobs, reamers, lathe cutters; Type T2; high speed steel.

MERIT METAL.
M-815; Sb, Sn, bal Pb.
For bearings; Babbitt.

MERTEN
M-1436; C, alloy, bal Fe
For machine tool parts; fatigue and wear resistant

MESMERIC
M-56, 0.2 C, 0.3 Si, 0.4-1.0 Mn, bal Fe
72,000 TS, 39,600 YS, 25 El; 50 RA
For general engineering purposes, case-hardening steel; "Firth Brown F 100," "Atlas C C. H."

MESOLOY.
M-1523, 72 Ni, 23 Cr, 5 Al.
Resistance wire: 825 ohms per cir mil ft.
Low temp coefficient of resistance
Annealed. 100,000 psi, hard drawn: 140,000 psi
For elec resistors

MESSING 63.
M-297, 37 Zn, bal Cu.
Soft 48,000 TS, 55 El, 70 Brin
½H-temper 58,000 TS; 32 El, 100 Brin
Hard 69,000 TS; 20 El, 135 Brin
For hardware, corrosion resistant, brass

MESSING 63Pb
M-297; 37 Zn, 2 Pb, bal Cu.
Soft 48,000 TS, 55 El, 70 Brin.
½Hard 58,000 TS, 32 El, 100 Brin.
Hard. 69,000 TS, 20 El, 136 Brin
For hardware, screw machine products; free-cutting, leaded brass

MESSING 72
M-297, 28 Zn, bal Cu
Soft 47,000 TS, 54 El, 70 Brin.
½H-temper 58,000 TS, 30 El, 100 Brin.
Hard 65,000 TS, 16 El, 130 Brin.
For hardware, corrosion resistant, brass.

MESSING 75
M-297, 25 Zn, bal Cu
Soft 47,000 TS, 54 El, 70 Brin
½H-temper 58,000 TS, 29 El; 100 Brin
Hard 66,000 TS; 15 El; 125 Brin
For hardware, corrosion resistant, brass

MESSING 80
M-297, 20 Zn, bal Cu
Soft 44,000 TS, 63 El, 65 Brin.
½H-temper 52,000 TS; 28 El, 95 Brin
Hard 62,000 TS, 15 El, 120 Brin
For hardware, ornamental parts; corrosion resistant, brass

MESSING 85
M-297, 15 Zn, bal Cu
Soft 42,000 TS, 50 El; 65 Brin
½H-temper 52,000 TS; 26 El, 95 Brin
Hard: 61,000 TS, 12 El; 115 Brin
For ornamental and decorative parts, corrosion resistant, brass

MESSING 90
M-297, 10 Zn, bal Cu
Soft 40,000 TS, 48 El, 60 Brin.
½H-temper 48,000 TS; 24 El, 90 Brin.
Hard 56,000 TS, 10 El, 110 Brin.
For ornamental and decorative parts; corrosion resistant, brass

MESTA SPECIAL.
M-852; 0.4 C, 1.5 Ni, 0.8 Cr, bal Fe.
For rolls; cast steel.

METAL BAND SAW
M-38; 1.35 C, 0.3 Cr, bal Fe
For band saws; oil hardening.

METALINE.
M-990; 10 Sn, bal Cu.
For oil-less bronze bearings; sintered.

METALJOINER.
M-744; Pb-Sn-Cd.
For solder; M.P. 650°F.

METALLIC PACKING.
U.S.; 82.25 Pb, 4.75 Sn, 13 Sb.
For metallic packing

METALLINE.
U.S.; 35 Co, 10 Fe, 30 Cu, 25 Al
For tools; heat and corrosion resistant.

METAMIC 247
M-1519, 75 Ni, 25 mullite.
Sintered: 200-300 Brin
For bearings for 500-900°C operating temperature; cermet

METAMIC LT-1
M-1519; 70 Cr, 30 Al_2O_3
Sintered: 350 Brin.
For gas turbine blades; sintered, refractory.

METCO-15F.
M-853; 17 Cr, 4 Fe, 4 Si, 3.5 B, 1 C, bal Ni
Cast Rockwell C 60.
For hard facing applications.
Self fluxing metal spray.
M.P 1875°F., wear resistant.

METCOLOY No 1
M-853, C, Cr, Ni, bal Fe.
For metal spraying; stainless steel wire

METCOLOY NO. 2
M-853; C, Cr, Ni, bal Fe.
For metal spraying, stainless steel wire.

METCO MONEL METAL.
M-853; 67 Ni, 23 Cu.
For metal spraying, Monel metal wire.

METEOR.
M-57, 1.25 C, 0.25 Cr, 0.15 V, 1.5 W, bal Fe.
For taps, punches, dental burrs; oil hardening

METEOR MAJIC (EO)
M-69; 0.53 C, 0.9 Mn, 2 Si, 1.1 Mo, bal Fe.
For punches, upsetters, rivet sets; shock and impact resistant.

METILLURE
France, 14-15 Si, 0.7 Mn, bal Fe.
For drains, anodes, evaporators, acid resistant, brittle

METORITE
98-94 Al, 1-4 P, 1-2 Zn.
For light alloy parts; non-hardenable.

METROL NO. 610-FM
M-32; 1.5 C, 0.5 Mn, 0.3 Si, 12 Cr, 0.8 Mo, 0.9 V, bal Fe (plus sulphides)
Hardened: C 60-66 Rock.
Ht. Tr.. 278,000 TS, 214,000 YS; 1 El; C 56 Rock
For blanking drawing and forming dies, gages, punches, mandrels, broaches, hobs, shear blades.
Type D2 tool steel. Wear and abrasion resistant. Free-machining.

Mg-9Y-1 Zn-0.5 Zr.
M-43; 9 Y, 1 Zn, 0.5 Zr, bal Mg.
Heat treated: 59,000-61,000 TS; 46,000-52,000 YS; 6-8 El; 48,000-52,000 CYS, 21,000 Fatigue S.
For aircraft and missile components.
Heat treatable. Good elevated temperature properties.

MGN.
M-104; C, Si, Mn, 5 W, bal Fe.
For permanent magnets, electrical equipment; retains magnetization

M.G R
M-73, 0.55 C, 1 Si, 0.3 Mn, 1.25 W, 5 Cr, 1.25 Mo, bal Fe
Air hardening tool steel, tough and wear resistant; for punches, rivet sets, tools and dies.
AISI A8

M.H. ALLOY NO 6
M-212; 77.5 Cu, 7 Sn, 14 Pb, 1.5 Ni
30,000-36,000 TS, 17,000-19,000 YS; 20-28 El; 21-25 RA, 64 Brin
For machinery bearings for high speed and medium pressures, "Bar Alloy No. 6", acid resistant

M H ALLOYS see BARR ALLOYS.

M-H COMPOSITE.
M-229; C, alloy, bal Fe
For heavy duty rollers; in sheet mills

M-H SPECIAL ALLOY STEEL
M-229, C, alloy, bal Fe.
For rolls for slabbing mill; water hardened

MIAMI FAST CUT.
U.S., 1-2-1.3 C, bal Fe.
For cutters, broaches; fast finishing

MIAMI NO CHARGE
U.S.; 0.9 C, 1.2 Mn, bal Fe.
For tools, dies, broaches, punches, shears; non-deforming

MICHALLOY
U.S., C, Ni, Cr, bal Fe
For grinding balls, mill liners, pumps; high abrasion resistance; Ni-Hard

MICHIANA NO 48.
M-184, 28 Cr, 8 Ni, 0.50 max C, bal Fe.
Cast 75,000 TS, 55,000 YS, 1 El, 1 RA, 220 Brin
For resistance to sulfurous gases at elevated temperatures, corrosion and heat resisting

MICHIANA 49
M-184, 18 Cr, 8 Ni, 0.2 C, bal Fe
For chemical engineering equipment; stainless.

MICHIANA NO 49 A
M-184, 0.2 C, 1.5 max Mn, 2.0 max Si, 18-21 Cr, 8-11 Ni, bal Fe
Cast 70,000 TS, 30,000 YS; 30 El
For castings, stainless

MICHIANA NO 49 Cb
M-184, 0.08 C, 1.5 max Mn, 2.0 max Si, 18-21 Cr, 9-12 Ni, C = 8 × Cb, bal Fe
Cast 70,000 TS, 30,000 YS; 35 El.
For welded castings, stainless, stabilized.

MICHIANA NO 49 Mo.
M-184; 0.08 C, 1.5 max Mn, 1.5 max Si, 18-21 Cr, 9-12 Ni, 2-3 Mo, bal Fe.
Cast. 70,000 TS, 30,000 YS, 30 El.
For castings, stainless

MICHIANA 55
M-184, 0.5 C, 30 Cr, 2 Ni, bal Fe.
Cast: 45,000 TS, 30,000 YS; 1 El, 2 RA; 250 Brin.
For parts in contact with brass and copper at rolling temperature, heat and corrosion resistant

MICHIANA NO 63.
M-184; C, 28 Cr, 15 Ni, bal Fe
Cast.
For resistance to sulfurous gases at high temperatures and also molten salts; heat and corrosion resistant.

MICHIANA NO. 100.
M-184; 25 Cr, 12 Ni, 0.50 max C, bal Fe.
Cast. 63,000-65,000 TS; 40,000-45,000 YS;
2.5-3.5 El; 3-5 RA, 210 Brin.
For grids, furnace parts; corrosion and
heat resisting.

MICHIANA NO 100S
M-184; 0.21-0.35 C, 24-30 Cr, 0.25 S, 12-15 Ni,
bal Fe.
For heat and corrosion resistant parts;
heat and corrosion resistant.

MICHIANA 111
M-184, 25 Cr, 12 Ni, 3.5 Mo, 0.2 C, bal Fe.
For chemical engineering equipment; stainless,
heat resistant

MICHIANA NO. 119
M-184, 25 Cr, 20 Ni, 1.25 Si, 1.5 Mn, 0.2 C,
bal Fe.
Cast
For heat and corrosion resisting parts;
heat and corrosion resisting

MICHIANA NO 122.
M-184, 0.2 C, 18 Cr, 8 Ni, 3.5 Mo, bal Fe
For use in sulfite paper industry; corrosion and
heat resistant

MICHIANA NO 147
M-184, 0.15 max C, 1 max Mn, 1.5 max Si,
11-14 Cr, 1 max Ni, bal Fe.
Cast 90,000 TS; 65,000 YS; 18 El
For castings, corrosion resistant.

MICHIANA NO 233
M-184, 20 Ni, 3 Cr, 1.5 Si, 1.5 Mn, 2.2-2.4 C,
bal Fe
For chemical handling equipment,
corrosion resisting

MICHIANA NO 241
M-184, 2.6-2.8 C, 28 Cr, 1.25 Si, 1.0 Mn, bal Fe.
For coal coke handling equipment,
abrasion resisting

MICHIGAN NO 90
M-545, 90 Cu, 10 Al.
Cast 77,000 TS, 30,000 YS, 30 El, 120 Brin.
Heat treated 90,000 TS, 55,000 YS, 5 El,
160 Brin.
For castings, gears, Al bronze.

MICHIGAN NO 90H
M-545, 84.5 Cu, 3.5 Fe, 12 Al.
Cast 85,000 TS, 40,000 YS, 10 El, 160 Brin.
Heat treated· 95,000 TS, 50,000 YS, 5 El, 200 Brin.
For castings, Al bronze.

MICHIGAN NO 90M
M-545, 85.5 Cu, 3.5 Fe, 11 Al
Cast 80,000 TS, 40,000 YS; 10 El, 166 Brin.
Heat treated 90,000 TS, 50,000 YS, 7 El;
200 Brin
For castings, Al bronze

MICHIGAN NO 90S
M-545; 88 Cu, 3.5 Fe, 8.5 Al
Cast 65,000-85,000 TS, 22,000-30,000 YS;
20-30 El, 115-135 Brin.
For castings, gears, Al bronze.

MICHIGAN NO. 90V.
M-545; 79 Cu, 5 Fe, 5 Ni, 11 Al.
Cast 90,000-105,000 TS, 45,000-60,000 YS,
3-7 El; 190-215 Brin.
For castings; Al bronze.

MICHIGAN APEX.
M-545; 86.5 Cu, 3.5 Fe, 10 Al.
Cast: 85,000 TS; 35,000 YS; 20 El; 160 Brin.
For castings, gears; Al bronze.

MICHIGAN GRADE A.
M-545, 56 Cu, 3 hardener, bal Zn.
Cast· 70,000-80,000 TS; 30,000-35,000 YS;
25-40 El, 25-34 RA, 114-140 Brin.
For castings; Mn bronze.

MICHIGAN GRADE AX.
M-545; 57 Cu, 4 hardened, bal Zn
Cast 80,000-90,000 TS; 40,000-46,000 YS;
25-40 El; 20-30 RA, 120-130 Brin.
For castings, Mn bronze.

MICHIGAN GRADE C.
M-545; 56 Cu, 2.5 hardened, bal Zn.
Cast 6,000-70,000 TS; 25,000-40,000 YS;
15-25 El, 30-40 RA, 80-95 Brin.
For castings; Mn bronze.

MICHIGAN GRADE X.
M-545, 56 Cu, 6 hardened, bal Zn
Cast 85,000-95,000 TS; 40,000-45,000 YS;
20-30 El; 20-25 RA, 135-155 Brin.
For castings; Mn bronze

MICHIGAN GRADE XX.
M-545, 57 Cu, 9 hardened, bal Zn.
Cast 95,000-110,000 TS, 45,000-55,000 YS;
20-30 El, 18-25 RA, 150-175 Brin.
For castings, Mn bronze.

MICHIGAN GRADE XXX
M-545, 62 Cu, 13 hardened, bal Zn.
Cast 110,000-125,000 TS; 75,000-90,000 YS;
12-18 El, 12-17 RA, 200-240 Brin.
For castings, Mn bronze

MICRO
M-282, 98 Cu, 2 Ni
Cold worked 37,500 TS; 23,500 YS, 39 El;
80 Brin
Extruded 33,600 TS; 6000 YS, 55 El; 59 Brin.
For locomotive boiler tubes and plates;
corrosion resistant

MICRO-MACH
M-1484, 0.08-0.12 C, 17.3 Cr, 6.2 Ni, bal Fe
Long 200,000 TS, 180,000 YS; 12 El.
Trans 209,000 TS, 175,000 YS; 13 El
For aircraft and missile wing and skin surfaces;
austenitic, stainless

MIDFLEX
M-237, bimetal.
For thermo-metal; bimetal element.

MIDLING HARD 115
M-182, 1.1 C, 0.25 Si, bal Fe
For tools, drill rod

MIDOHM
M-44, 22-23 Ni, bal Cu
Wrought 100,000-50,000 TS
For resistances, rheostats, heat resistant;
max operating temperature 200°C.

MIDVAC-422.
M-85, 0.25 C, 12 Cr, 0.9 Mo, 0.9 Ni, 0.2 V,
0.9 W, bal Fe
Annealed· 85,000 TS, 42,000 YS; 22 El, B 95 Rock.
Hardened· 240,000 TS; 205,000 YS; 9 El;
C 50 Rock
For cutlery, surgical instruments, hardware,
bearings, valves.
Corrosion resistant, hardenable

MIDVALOY NO 11.
M-85, 0.35-0.50 C, 0.6-0.9 Cr, 3.0 Ni, bal Fe.
Heat treated· 275,000-135,000 TS;
245,000-110,000 YS; 10-25 El; 38-58 RA;
500-275 Brin.
For airplane crankshafts, gears, splines, transmission
units; shock resistant; (0.45-0.50 C alloy).

MIDVALOY NO. 11-Mo.
M-85; 0.4 C, 0.6-0.9 Cr, 2.6-3.2 Ni, 0.2-0.3 Mo, bal Fe.
Heat treated: 125,000-160,000 TS; 100,000-140,000 YS; 22-15 El, 55-45 RA; 250-325 Brin.
For shafts, gears; tough

MIDVALOY 20.
M-85; 0.07 max C, 29 Ni, 20 Cr, 2-3 Mo, 4 Cu, bal Fe.
Cast: 65,000-75,000 TS; 28,000-38,000 YS; 50-35 El; 50-40 RA; 120-150 Brin.
For chemical plant equipment, tanks; resists mixed acids, austenitic

MIDVALOY 1300.
M-85, 0.07-0.40 C, 13 Cr, bal Fe.
Wrought: 70,000-200,000 TS; 40,000-165,000 YS; 28-13 El, 70-53 RA; 130-400 Brin.
For corrosion resisting parts; engineering construction; corrosion and abrasion resisting.

MIDVALOY 1808
M-85; 0.07-0.20 C, 18 Cr, 8 Ni, bal Fe.
For stainless parts, chemical plant equipment; stainless, austenitic

MIDVALOY 1808 M
M-85; 0.07 C, 18 Cr, 8 Ni, 2.1-3.5 Mo, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 40 El; 60 RA; 160 Brin.
For corrosion resistant parts, chemical plant equipment; stainless, austenitic.

MIDVALOY 2512-7.
M-85, 0.07 C, 23-26 Cr, 11-13 Ni, bal Fe.
Rolled: 70,000-115,000 TS; 40,000-60,000 YS; 9-45 El; 240-230 Brin.
For heat and corrosion resisting parts, heat and corrosion resistant.

MIDVALOY 2512-10.
M-85; 0.10 C, 12 Ni, 25 Cr, bal Fe.
Forged: 75,000-115,000 TS; 45,000-65,000 YS; 25-45 El; 30-50 RA; 150-240 Brin.
Cast: 65,000-85,000 TS; 40,000-50,000 YS; 30-35 El; 30-40 RA, 130-195 Brin.
Annealed 113,000 TS; 62,700 YS, 43 El, 49 RA; 196 Brin
For apparatus to resist nitric and acetic acids, sulfite liquors and sulfurous acids, corrosion and heat resisting.

MIDVALOY 2512-16
M-85; 0.16 C, 25 Cr, 12 Ni, bal Fe.
For automatic furnaces, skid rails, walking beams; heat resistant to 1850°F.

MIDVALOY 2520.
M-85; 25 Cr, 0.25 max. C, 20 Ni, 0.18 Mo, bal Fe.
Cast: 70,000-80,000 TS; 30,000-36,000 YS; 25-50 El; 20-50 RA; 145 Brin
Wrought: 75,000-165,000 TS; 30,000-120,000 YS; 48-5 El; 55-30 RA; 160 Brin.
For corrosion resisting apparatus; corrosion resisting, austenitic.

MIDVALOY ATV-3.
M-85, 26 Ni, 14.5 Cr, 1.2 Mn, 0.45 C, 4 W, bal Fe.
Cast: 80,000 TS; 43,000 YS; 20 El; 20 RA.
Wrought: 100,000 TS; 50,000 YS; 33 El; 45 RA; 185 Brin.
For exhaust valves, gas turbine rotors; austenitic; heat resisting.

MIGRA IRON NO. 1.
M-383, M-403; 1-3 Si, 0.4-0.9 Mn, 3.8-4.1 C, bal Fe.
Cast.
For pistons and cylinders; cast iron.

MIGRA IRON NO. 2.
M-383, M-403, 1-3 Si, 0.4-0.9 Mn, 3.8-4.1 C, bal Fe.
For pistons and cylinders; cast iron.

MIGRA IRON NO 3.
M-383, M-403; 1-3 Si, 3.8-4.1 C, 1-2 Ni, 0.5-1.0 Cr, 1.0-1.5 Mn, bal Fe.
For pistons and cylinders; cast iron.

MIKADO.
M-1306, 1.45 C, 1.4 Cr, 0.6 Mn, 0.25 Si, bal Fe.
For bearings, bushings, liners, sleeves; water hardened, wear resistant

MIL-48
M-365, 0.55 C, 2.0 Si, 0.25 Cr, 0.25 V, bal Fe.
Water hardening tool steel, shock resisting type; AISI S4.

MILBRITE.
M-365, 0.50 C, 1.0 Mn, 0.3 Si, 1.1 Cr, 0.25 Mo, bal Fe.
Oil hardening steel designed for molds; similar to AISI 4150

MILCO 9
M 365; 0.73 C, 0.28 Mn, 4 Cr, 1.75 V, 18.25 W, 8.5 Co, bal Fe
For tools, cutters, reamers; high speed steel.

MILD SELF HARDENING
M-38, 1.7 C, 3.35 Cr, 5.25 W, bal Fe.
For dies, oil hardening

MILLALOY
M-855, 0.4 C, 4 Ni, 1.5 Cr, bal Fe
Heat treated 312,000 TS, 272,000 YS; 11 El; 35 RA, 532 Brin
For shear blades; oil hardened

MILL BRASS MIX
M-741, Sn, Pb, bal Cu
For bearings, bushings, tough

MILLENITE
M-857, 0.3 C, 1-5 Ni, 0.8 Cr, bal Fe
For high duty castings, oil hardened

MILLER 200-PLUS
M-1144, 4.8-9.8 Sn, 0.15 P, bal Cu
Rolled: 96,000-118,000 TS, 70,000-85,000 YS; 24-20 El, 210-240 Brin
For clips, springs, bellows, diaphragms; phosphor bronze

MILLER 200-PLUS GR.A
M-1144, 4.82 Sn, 0.18 P, 95 Cu
Spring: 96,000 TS, 70,000 YS, 22 El, 210 Brin.
For diaphragms, bellows, springs, clips, fasteners; high ductility, corrosion resistant.

MILLER 200-PLUS GR C.
M-1144, 7.82 Sn, 0.18 P, 92 Cu
Spring: 110,000 TS, 80,000 YS, 24 El, 235 Brin.
For diaphragms, bellows, springs, clips, fasteners; high ductility, corrosion resistant.

MILLER 200-PLUS GR D.
M-1144, 9.85 Sn, 0.15 P, 90 Cu.
Spring: 118,000 TS, 85,000 YS; 20 El; 240 Brin.
For diaphragms, bellows, springs, clips, fasteners; high ductility, corrosion resistant.

MILLING.
Eng.; 54-56 Cu, 27.5-31 Zn, 15-18 Ni, 0.5-1.0 Pb.
For white metal parts; easy to machine.

MILLING SILVER-1.
Eng.; 56 Cu, 31 Zn, 12 Ni, 1 Pb.
For white metal parts; easy to machine.

MILLING SILVER-2.
Eng.; 56 Cu, 27.5 Zn, 16 Ni, 0.50 Pb.
For white metal parts; easy to machine.

MILLS-LM1M.
M-187; 6-8 Cu, 0.15 Mg, 2-4 Si, 2-4 Zn, bal Al.
Cast: 18,000 TS; 11,000 YS; 80 Brin.
For die castings, housings; not subject to shock.

MILLS-LM2M.
M-187; 0.7-2.5 Cu, 9-11.5 Si, 1.2 max Zn, 0.2 Ti, bal Al.
Cast: 18,000 TS.
For permanent mold castings; corrosion resistant.

MILLS-LM4M.
M-187; 2-4 Cu, 4-6 Si, 0.3-0.7 Mn, 0.2 Ti, bal Al.
Cast. 20,000 TS; 9000 YS; 2 El.
For general purpose castings; corrosion resistant.

MILLS-LM7P.
M-187; 0.8-2.0 Cu, 0.05-0.20 Mg, 1.5-2.8 Si, 0.8-1.4 Fe. 0.8-1.7 Ni, 0.2 Ti, bal Al
Cast: 22,400 TS; 15,700 YS; 2 El; 65 Brin.
For general engineering castings; high ductility.

MILLS-LM10W
M-187; 9.5-11 Si, 0.1 Ti, 0.1 max Cu, bal Al.
Cast: 40,500 TS; 23,500 YS; 8 El; 75 Brin.
For high stressed castings; shock and corrosion resistant.

MILLS-LM11W.
M-187; 4-5 Cu, 0.2 Ti, bal Al.
Cast: 31,500 TS, 18,000 YS; 7 El; 65 Brin.
Aged: 40,500 TS; 27,000 YS; 4 El; 100 Brin.
For high stressed castings; age-hardenable.

MILLS-LM20M.
M-187; 0.4 Cu, 10-13 Si, 0.2 Ti, 0.15 max Mg, bal Al.
Cast 23,500 TS; 8000 YS; 3.5 El, 50 Brin.
For intricate design castings, general purpose, corrosion resistant.

MILMOLD.
M-365, 0.30 C, 0.8 Mn, 0.5 Si, 1.7 Cr, 0.4 Mo, bal Fe
Oil hardening tool steel designed for molds, AISI P 20.

MILNAIR
M-365, 0.95 C, 2 Mn, 2 Cr, 1 Mo, bal Fe.
For tools, abrasion resistant.

MILNAIR 4.
M-365, 0.95 C, 2.0 Mn, 0.35 Si, 2.2 Cr, 1.1 Mo, bal Fe
Air or oil hardening cold work tool steel; AISI A4.

MILNAIR 5
M-365, 1.0 C, 5.25 Cr, 0.25 V, 1.1 Mo, bal Fe
For tools, dies; air hardening, nondeforming.

MILNE 3074
M-365; 0.35 C, 4 Cr, 9.25 W, 0.5 V, bal Fe.
For punches, shears, extrusion dies; hot work steel, oil hardened.

MILNE CMV.
M-365; 0.38 C, 5.25 Cr, 1.25 Mo, 1.05 V, bal Fe.
For hot work tools, punches; hot work steel, oil hardened.

MILNE CMW.
M-365; 0.37 C, 5 Cr, 1.5 Mo, 0.3 V, 1.3 W, bal Fe.
For hot work tools, punches; hot work steel, oil hardened.

MILNE DOUBLE SIX.
M-365; 2.25 C, 12 Cr, bal Fe.
For blanking and forming dies; Type D3; oil hardened.

MILNE HOLLOW DIE STEEL.
M-365; 0.8-1.0 C, bal Fe.
For hollow dies; water hardened.

MILNE M-330.
M-365; 0.30 C, 3 Cr, 3 Mo, 0.6 V, bal Fe.
For punches, crimpers, upsetters; hot work steel, resists heat checking.

MILNE M-331.
M-365; 0.40 C, 3.3 Cr, 2.25 Mo, 0.4 V, bal Fe.
For punches, upsetters, dies, shears; hot work steel, resists softening.

MILNE M-333.
M-365; 0.30 C, 3 Cr, 3 Mo, 0.6 V, 2.25 Co, bal Fe.
For heavy duty hot work tools, punches, dies; hot work steel, oil hardened.

MILNE MM6+6.
M-365; 0.85 C, 4.15 Cr, 6.4 W, 5 Mo, 1.9 V, bal Fe.
For tools, cutters, dies; high speed steel.

MILNE MMCO.
M-365; 0.7 C, 5.8 W, 5.2 Mo, 4 Cr, 2 V, 9 Co, bal Fe.
For lathe and planer tools, reamers, hobs, cutters; high speed steel.

MILNE MT-9.
M-365; 1.5 C, 12.5 Cr, bal Fe.
For blanking and drawing dies; oil hardening; non-deforming.

MILNE MX-15.
M-365; 0.50 C, 12 W, 4 Cr, 12 Ni, 1 V, bal Fe.
For extrusion dies and mandrels, punches; hot work steel, oil hardened.

MILNE ORANGE LABEL.
M-365; 1.01-1.05 C, bal Fe.
For tools, drills, taps; water hardening.

MILNE RED LABEL.
M-365; 0.95-1.1 C, 0.3 Mn, 0.25 Si, bal Fe.
For tools, drills, hobs, taps, punches, Type W1; water hardened.

MILNE WHITE LABEL.
M-365, 0.9-1.0 C, bal Fe.
For tools, drills, springs; water hardening.

MILO
M-344; 0.4 C, 1.1 Mn, bal Fe.
For flogging tools, scarifier and fire tools; water hardened.

MILO 35
M-344, 0.7-1.1 C, bal Fe.
For pneumatic tools; water hardening.

MILO 38.
M-344, 0.7-0.9 C, bal Fe.
For pneumatic tools, chisels, punches; water hardened; Type W1.

MILRITE.
M-88, Sn, Sb, Cu, bal Pb.
For bearings; Babbitt

MILTUFF.
M-365; 0.50 C, 0.7 Mn, 0.25 Si, 3.25 Cr, 1.4 Mo. bal Fe.
Air or oil hardening tool steel, shock resisting type; AISI S7.

MILVAN.
M-365; 0.7 C, 19 W, 4.25 Cr, 2.25 V, bal Fe.
For tools, cutters; high speed steel.

MILVAN NO. 1.
M-365; C, 19 W, 4 Cr, 2.25 V, bal Fe.
For tools, cutters; high speed steel.

MILWALOY 1¼ Mn.
M-475; 0.3-0.4 C, 1.1-1.4 Mn, bal Fe.
Cast: 75,000-95,000 TS; 45,000-60,000 YS; 23-30 El; 30-55 RA; 160-196 Brin.
For tractor parts, road machinery, sprockets; water hardened.

MILWALOY 7.
M-475; 0.30-0.40 C, 1.50-1.75 Cr, 0.60-0.70 V, bal Fe.
For nitriding; nitralloy steel.

MILWALOY 13.
M-475; 0.08-0.12 C, 12-14 Cr, bal Fe.
For stainless parts; stainless.

MILWALOY 18.
M-475; 0.30-0.45, 13-15 Ni, 3.9-4.5 Mn, bal Fe.
For circuit breakers, switches; austenitic, non-magnetic.

MILWALOY 18-8.
M-475, 0.08-0.15 C, 8-10 Ni, 17-20 Cr, bal Fe.
Cast: 70,000 TS; 25,000 YS; 40 El; 35 RA; 160 Brin.
Heat treated: 80,000 TS, 40,000 YS; 70 El; 60 RA; 187 Brin
For food machinery, stainless

MILWALOY 26.
M-475; 0.08-0.12 C, 18-20 Cr, 8-10 Ni, bal Fe.
For corrosion resistant parts; A Krupp-Nirosta Steel; 18-8

MILWALOY 29-9.
M-475; 0.10-0.20 C, 8-10 Ni, 27-31 Cr, bal Fe
Cast: 80,000 TS; 40,000 YS; 35 El, 35 RA; 187 Brin
Heat treated: 90,000 TS; 50,000 YS; 50 El, 60 RA; 207 Brin
For paper mill machinery; heat resistant.

MILWALOY 35-15.
M-475; 0.2-0.4 C, 32-38 Ni, 13-17 Cr, bal Fe.
Cast.
For heat resisting castings, heat resistant

MILWALOY 38
M-475, 0.12-0.15 C, 28-30 Cr, 8-10 Ni, bal Fe
For corrosion resistant parts; A Krupp-Nirosta 29-9 steel.

MILWALOY 50
M-475, 0.30-0.40 C, 15-18 Cr, 32-36 Ni, bal Fe.
For furnace parts to resist high temperatures, heat and corrosion resistant.

MILWALOY CC.
M-475; 0.4-0.5 C, 0.5-0.8 Mn, 0.9-1.1 Cr, bal Fe.
Cast. 85,000-100,000 TS, 50,000-70,000 YS; 17-22 El; 25-45 RA; 179-210 Brin.
For crusher machinery, screen plates, wear segments; wear resistant.

MILWALOY COMMERCIAL
M-475; 0.25-0.35 C, 0.5-0.8 Mn, bal Fe
Cast. 65,000-80,000 TS, 38,000-55,000 YS; 25-35 El; 40-55 RA; 140-165 Brin.
For structural and machine castings; water hardened.

MILWALOY Cr Ni.
M-475; 0.35-0.45 C, 0.6-0.9 Mn, 1.25-1.75 Ni, 0.6-0.9 Cr, bal Fe.
Cast: 90,000-110,000 TS; 55,000-75,000 YS; 18-25 El; 30-50 RA; 180-220 Brin.
For gears, cams, rollers; wear resistant.

MILWALOY Cr Ni Mo.
M-475; 0.35-0.45 C, 0.5-0.8 Mn, 1.25-1.75 Ni, 0.6-0.9 Cr, 0.3-0.4 Mo, bal Fe.
Cast: 95,000-155,000 TS; 65,000-135,000 YS; 12-24 El; 25-50 RA; 189-255 Brin.
For castings; wear resistant.

MILWALOY DYNAMO
M-475; 0.05-0.15 C, 0.20 max Mn, bal Fe.
Cast: 50,000-65,000 TS; 25,000-37,000 YS; 30-37 El; 50-70 RA, 130-150 Brin.
For magnet bodies, armature frames, electrical machinery, high magnetic permeability.

MILWALOY HI-CARBON.
M-475; 0.4-0.5 C, 0.5-0.8 Mn, bal Fe.
Cast: 80,000-95,000 TS; 47,000-65,000 YS; 20-30 El; 30-50 RA, 170-196 Brin.
For gears, racks, sprockets, water hardened.

MILWALOY KA2SMO
M-475, 0.4-0.6 C, 8-10 Ni, 18-20 Cr, 2-4 Mo, bal Fe
Cast. 70,000 TS, 30,000 YS; 35 El, 45 RA; 178 Brin
Heat treated 80,000 TS; 40,000 YS; 50 El, 70 RA; 196 Brin.
For corrosion resisting castings, corrosion resistant.

MILWALOY Mn Bo
M-475, 0.3-0.4 C, 1.1-1.4 Mn, 0.003 B, bal Fe.
Cast 80,000-95,000 TS, 50,000-65,000 YS, 20-30 El; 35-55 RA, 174-196 Brin.
For tractors, road machinery, wear resisting

MILWALOY Mn Mo Bo
M-475, 0.3-0.4 C, 1.1-1.4 Mn, 0.15-0.20 Mo, 0.003 B, bal Fe
Cast 90,000-110,000 TS, 70,000-80,000 YS; 20-30 El, 35-55 RA, 179-217 Brin
For tractor parts, road machinery, wear resisting.

MILWALOY NIT
M-475, 0.20-0.30 C, 0.5-0.9 Mn, 2.5-3.0 Cr, 0.35-0.45 Mo, 0.2 V, bal Fe
Cast 80,000-95,000 TS; 70,000-80,000 YS, 20-30 El; 30-55 RA, 170-200 Brin
For pistons, cylinders, valve parts; nitriding alloy

MINARGENT
57-46 Cu, 40-32 Ni, 28-0 W, 0.2-0.5 Al
For silver solder, substitute for silver in silverware

MINEFOR.
M-40; 1.0 C, 5 Cr, 1 Mo, bal Fe
For punches, mandrels, rolls dies, Type A2, air hardened, non-deforming

MINEFOR FM
M-40, 1.0 C, 5 Cr, 1 Mo, 0.2 S, bal Fe
For punches, mandrels, rolls; air hardening, free-cutting

MINERVA CHISEL
M-365, 0.5 C, 1.75 Cr, 1.9-2.0 W, 0.2 V, bal Fe.
For tools, dies; oil hardened.

MINERVA H C
M-210; 0.53 C, 1.8 Cr, 1.9 W, 0.2 V, bal Fe
For chisels, shear blades, extrusion dies; hot work steel, oil hardened.

MINERVA L C.
M-210, 0.43 C, 1.8 Cr, 1.9 W, 0.2 V, bal Fe.
For chisels, bits, screwdrivers, scarfing tools; oil hardened, shock resistant.

MINERVA SPECIAL
M-210; 0.5 C, 1.8 Cr, 2.2 W, 0.25 V, bal Fe.
For pneumatic chisels, cold chisels, rivet busters; shock resistant.

MINE TALABOT SPECIAL.
M-1119; 0.75 C, bal Fe.
For tools, springs, punches; water hardened.

MINIMAX NO. 178.
M-858; Ag-Hg.
For dental amalgams; corrosion resistant.

MINIMUM
M-459; 0.04 C, bal Fe.
For electrical and magnetic equipment; magnetically soft

MINIMUM EXTRA.
M-459; 0.04 C, Al, bal Fe.
For electrical and magnetic equipment; magnetically soft

MINIMUM V SPECIAL.
M-459; 0 04 C, bal Fe.
For vacuum equipment, magnetically soft

MINOFOR.
Eng , 69-66 Sn, 18-20 Sb, 9 10 Zn, 3-4 Cu, 0 1 bal Fe.
For bearings, anti-friction

MINOVAR
M-68, 2.4 max T.C., 1-2 Si, 34-36 Ni, 0.10 max Cr, 0 5 max Mn, bal Fe
Cast: 20,000-25,000 TS; 100-125 Brin.
For electrical equipment, formerly Invar Cast Iron, low coefficient of expansion

MINOX 10
M-1509; 0.10 C, 13 Cr, bal Fe
Annealed. 69,000-85,000 TS; 40,000-48,000 YS; 18 El, 140-160 Brin
For turbine blades, surgical instruments, cutlery; corrosion resistant, hardenable

MINOX 15
M-884, 0 20 C, 13 Cr, 1 Mo, bal Fe
Cast 90,000 TS, 45,000 YS, 15 El; B 95 Rock.
Hardened: 200,000 TS, 180,000 YS; 10 El; C 45 Rock
For valves, cutlery, oil and chemical plant equipment Corrosion resistant castings, hardenable

MINOX 15
M-1509, 0 15 C, 13 Cr, bal Fe
Annealed 74,000-92,000 TS, 42,000-52,000 YS, 14 El, 150 180 Brin
For turbine blades, surgical instruments, cutlery; corrosion resistant, hardenable

MINOX 20
M-1509, 0 20 C, 14 Cr, bal Fe
Annealed: 78,000 107,000 TS, 46,000-54,000 YS; 12 El, 160-200 Brin
For turbine blades, surgical instruments, cutlery corrosion resistant, hardenable

MINOX 30
M-1509, 0 30 C, 14 Cr, bal Fe
Annealed 85,000-114,000 TS; 52,000-68,000 YS; 10 El, 160 200 Brin.
For surgical instruments, cutlery; corrosion resistant, hardenable

MINOX 1820.
M-1509, 0 20 C, 18 Cr, 2 Ni, bal Fe
Annealed 85,000-106,000 TS, 58,000-92,000 YS; 12 El, 200-240 Brin.
For chemical plant equipment; resists nitric acid.

MIN-OX-GRADE 51 C
M-25; 2 5 C, 3 Si, 3 Al, 0 2 V, 2.5 Cr, 0.15 Mn, bal Fe
Natural: 45,000 TS; 320 Brin.
Heat treated. 600 Brin.
For glass molds, dies for tile pressing, oven enameling racks; heat and wear resistant.

MIN-OX-GRADE A.
M-25; 80 Cu, 7 Al, 5 Zn, 3 Fe, 3 Mn.
55,000 TS, 13 El; 12 RA; 96 Brin.
For glass molds, slides, bearings; heat and wear resistant.

MIN-OX-GRADE D-V.
M-25, 62 Cu, 7 Al, 7 Zn, 22 Ni
80,000 TS; 0.5-2 0 El; 0 RA.
For glass molds, cams, machine parts; heat and wear resistant.

MIN-OX GRADE JR3.
M-25; 3 0 C, 3 Si, 3 Al, 2 Ni, 1 Cu, 1 Cr, 0 9 Mn, bal Fe
Natural: 48,000 TS, 200 Brin
Heat treated: 95,000 TS, 450 Brin.
For glass molds, heat and wear resistant.

MINT DIE STEEL.
M-261; M-486; C, bal Fe
For coining, cold-heading and embossing dies; water hardening.

MIRACULOY
M-288, 0.35 C, 1 25 Mn, 0 40 Si, 0.65 Cr, 1.5 Ni, 0 30 Mo, bal Fe.
Normalized: 115,000 TS, 85,000 YS; 18 El; 40 RA; 275 Brin
Heat treated 125,000-245,000 TS; 90,000-190,000 YS; 20-8 El; 50-10 RA; 250-650 Brin
For heavy duty castings; high strength

MIRALITE
M-415; 95 Al 4 1 Ni, 0.32 Si, 0.40 Fe, 0 04 Na, 0 05 Pb
Cast 24,000 TS
Drawn 54,000 TS
For pistons, good machining qualities

MIRA METAL
U S , 75 Cu, 16 3 Pb, 6 8 Sb, 0 24 Ni, 0 43 Fe, 0 62 Zn, 0.91 Sn
For valves, pipes, acid and corrosion resisting

MIRAMINT
W,C+Co
For hard cutting tools and dies, sintered.

MIR-O-COL
M-988, Cr, Mo, W, Co
For hard surfacing welding electrode, wear resistant.

MIR-O-COL NO 1
M-988, 3-4 C, 11-13 Cr, 1 0-1.5 Mn, 2-3 Si, 4-6 Ni, 8 10 Mo, bal Fe
Welded 600-650 Brin
For welding rod for plowshares, shovels, root cutters, austenitic, abrasion resistant

MIR-O-COL NO 3.
M-988, 1 75-2.2 C, 0 5-1.0 Mn, 0.6-0.9 Si, 8-9 Cr, bal Fe
Cast 45,000 TS; 0 El, 480 Brin.
For hard facing welding rod, impact and abrasion resistant, tough, hard.

MIR-O-COL NO 4
M-988, 1 0-1 5 C, 12-14 Mn, 0 8 Si, 0.5-1.0 Mo, bal Fe.
Welded: 60,000 TS; 22 El; 250 Brin.
For hard facing rod; martensitic, impact and abrasion resistant.

MIR-O-COL NO 4T-S.
M-988; Cr, Mo, W, Co.
For hard facing electrode; ductile.

MIR-O-COL NO. 5.
M-988; 0.7-1.0 C, 0.75-1.25 Mn, 3.0-3.5 Ni, 6.5-8.0 Mo, 0.4 Co, 0.8 B, 1.2 Si, 3.5-4.5 Cr, bal Fe.
Welded: 500 Brin.
For welding rod for hot cutting dies, shears and tools; corrosion, heat and abrasion resistant.

MIR-O-COL NO. 6.
M-988; 0.9-1.2 C, 26-30 Cr, 0.5 max Ni, 0.5 max Mo, 3 max Fe, 3.5-5.0 W, bal Co.
Welded: 400-440 Brin.
For welding rod for diesel engine valves; corrosion, abrasion and heat resistant.

MIR-O-COL NO. 11.
M-988; C, Co, Cr, W.
Cast: 500-520 Brin.
For hard facing electrode; corrosion and abrasion resistant.

MIR-O-COL BR.
M-988; C, Cr, Ni, Mo, bal Co.
For hard facing rod; abrasion and impact resistant.

MIRRALOY.
M-15; C, bal Fe.
For journals, shafting; turned, ground and polished

MIRROMOLD see CARPENTER MEL-TROL MIRROMOLD

MIRYCAL.
M-1067; 0.5 C, 0.25 Mn, 0.95 Cr, 1.0 W, 0.2 Mo, bal Fe.
For tools, dies, punches, shear blades, boiler makers' tools; shock resistant.

MIRYCAL CHISEL.
M-434; 0.45 C, 1.0-1.25 W, 0.85-0.95 Cr, 0.15-0.20 Mo, 0.2-0.3 Mn, bal Fe.
For battering tools, chipping chisels, beading tools, rivet busters, cold sets, swages, track chisels, hot dies; tough, shock resistant.

MISCHMETAL.
M-111; 50 Ce, 45 Lathanum + didymium
For pyrophoric alloy in cigarette lighters, removes gas from radio tubes.

MISCO 16.
M-84; 0.2 max C, 16 Cr, bal Fe
For heat and corrosion resistant parts; heat and corrosion resistant.

MISCO 16-8 16C.
M-84; 0.16 max C, 8-10 Ni, 18-20 Cr, 1 max Mn, 2 max Si, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 50 El; 60 RA; 170 Brin.
For stainless castings; corrosion resistant.

MISCO 18-8.
M-84; 0.16 C, 18 Cr, 8 Ni, bal Fe.
85,000 TS; 45,500 YS; 40 El, 50 RA.
For stainless parts, chemical engineering equipment, resists sulfurous acid.

MISCO 18-8.07C.
M-84, 0.07 max C, 8-10 Ni, 18-20 Cr, 1 max Mn, 2 max Si, bal Fe.
Annealed: 75,000 TS; 42,000 YS; 55 El; 65 RA; 156 Brin.
For stainless castings; corrosion resistant.

MISCO 18-8.10C.
M-84; 0.10 max C, 8-10 Ni, 18-20 Cr, 1 max Mn, 2 max Si, bal Fe.
Annealed· 75,000 TS; 42,000 YS; 55 El; 65 RA; 156 Brin.
For stainless castings; corrosion resistant.

MISCO 18-8Cb.
M-84; 0.10 max C, 8-10 Ni, 18-20 Cr, Cb = 8 + C, bal Fe.
Cast: 70,000 TS; 35,000 YS; 40 El; 40 RA; 190 Brin.
Annealed: 82,000 TS; 42,000 YS; 40 El; 40 RA; 179 Brin.
For chemical and plastic plant equipment; Type 347; stainless, austenitic.

MISCO 18-8 MO.
M-84; 0.10 C, 18 Cr, 8 Ni, 3 Mo, bal Fe
Annealed· 85,000 TS; 45,000 YS; 50 El; 60 RA; 179 Brin
For stainless parts; stainless.

MISCO 18-8 Se.
M-84; 0.16 max C, 8-10 Ni, 18-20 Cr, 0.2-0.3 Se, bal Fe
Annealed: 80,000 TS; 40,000 YS; 50 El; 50 RA; 183 Brin.
For corrosion resistant parts, castings; corrosion resistant

MISCO 18-8 Ti
M-84; 0.10 max C, 8-10 Ni, 18-20 Cr, Ti = 4 × C, bal Fe
Annealed 70,000 TS; 35,000 YS, 40 El; 40 RA.
For stainless castings, stainless.

MISCO 20
M-84, 0.07 max C, 27.5-30.5 Ni, 19-22 Cr, 2-3 Mo, 3.5-4.5 Cu, 0.7 Mn, 1.5 max Si, bal Fe.
Annealed 70,000 TS, 34,000 YS; 38 El; 45 RA, 143 Brin
For corrosion resistant castings; resists H_2SO_4.

MISCO 22
M-84, 0.18-0.25 C, 0.6-0.7 Mn, 0.4-0.5 Si, bal Fe
Cast. 60,000 TS, 30,000 YS; 26 El; 38 RA, 120-149 Brin
For gears, pinions, shafts, housings; water hardened

MISCO 25
M-84, 0.22-0.28 C, 0.7 Mn, 0.5 Si, bal Fe.
Cast 70,000 TS, 38,000 YS, 24 El, 36 RA; 143-179 Brin
For gears, shafts, housings, machinery parts, water hardened.

MISCO 25-20
M-84, 0.3-0.4 C, 19-21 Ni, 24-26 Cr, bal Fe.
Cast 229 Brin
For heat resistant castings, corrosion and heat resistant

MISCO 27
M-84; 0.24-0.30 C, 0.8 Mn, 0.5 Si, bal Fe
Cast 75,000 TS, 43,000 YS, 22 El; 30 RA; 149-187 Brin
For machine tool castings, gears, housings, shafts, water hardened.

MISCO 28
M-84; 0.2 max C, 28 Cr, bal Fe
For heat and corrosion resistant parts; heat and corrosion resistant.

MISCO 28-15.
M-84; 0.4 max C, 14.5-16.5 Ni, 27-30 Cr, bal Fe
Cast· 70,000 TS; 40,000 YS; 12 El, 15 RA.
For heat resistant castings; corrosion and heat resistant.

MISCO 28-20.
M-84; 0.4 max C, 19-21 Ni, 27-30 Cr, bal Fe.
Cast
For heat resistant castings; corrosion and heat resistant.

MISCO 30-30.
M-84; C, 30 Cr, 30 Ni, bal Fe.
For chemical engineering equipment; heat and corrosion resistant.

MISCO 430.
M-84; 0.2 C, 17 Cr, bal Fe.
For corrosion resistant castings; corrosion resistant; Type 430.

MISCO "A."
M-81; 1.0 C, bal Fe.
For mining tools, chisels, quarry and track tools; water hardening.

MISCO "A"
M-84, 0.2 max C, 80 Ni, 14 Cr, bal Fe
For exhaust manifolds, springs, heat resistant.

MISCO B
M-81, 0.75 C, 0.30 Si, 0.30 Mn, bal Fe
For mining tools, chisels, hammers, water hardened

MISCO B
M-84; 0.25 C, 25 Cr, 13 Ni, bal Fe
For corrosion and heat resisting parts, chemical engineering equipment, corrosion and heat resistant.

MISCO B-1
M-84, 0.5 C, 25 Cr, 13 Ni, bal Fe
For heat and corrosion resisting parts; heat and corrosion resistant

MISCO "C"
M-84, 0.2-0.3 C, 28-30 Cr, 8-10 Ni, 0.6-0.8 Si, bal Fe
Cast. 90,000-95,000 TS; 60,000-65,000 YS, 28-23 El, 36-30 RA, 197-212 Brin
For use in sulfite industry, castings, valves; corrosion resistant

MISCO C-1
M-84, 0.5 C, 29 Cr, 9 Ni, bal Fe.
For heat and corrosion resisting parts, heat and corrosion resistant.

MISCO C-Mo
M-84, 0.18-0.25 C, 0.7 Mn, 0.5 Si, 0.5 Mo, bal Fe
Cast 70,000 TS; 45,000 YS, 24 El, 35 RA; 143-179 Brin
For machine tool castings, gears, housings, shafts, water hardened

MISCO CROMO
M-84, 0.27-0.33 C, 1.4 Mn, 0.5 Si, 0.9 Cr, 0.3 Mo, bal Fe
Cast: 100,000 TS; 70,000 YS; 18 El, 30 RA; 202-235 Brin
For machinery castings, gears, shafts, housings, oil hardened

MISCO GRADE A
M-84, 0.5-0.7 C, 35-37 Ni, 15-17 Cr, bal Fe.
For furnace parts, retorts, carburizing boxes; resists heat to 1950°F.

MISCO "H.N"
M-84, 0.6-0.7 C, 15-18 Cr, 60-65 Ni, bal Fe.
For heat treating boxes, furnace parts, valves, stills, resists H_2SO_4; heat, wear and corrosion resistant.

MISCO HN-1.
M-84; 0.5-0.8 C, 16-20 Cr, 66-70 Ni, bal Fe.
Cast: 60,000 TS; 36,000 YS; 3 El; 217 Brin.
For stainless steel castings, furnace equipment; acid resistant

MISCO HN-2.
M-84; 0.7 C, 18 Cr, 65 Ni, bal Fe.
For chemical engineering equipment; resists H_2SO_4.

MISCO K.
M-84; 0.2 C, 25 Cr, 20 Ni, bal Fe.
For stainless and heat resistant castings; Type 310 corrosion and heat resistant.

MISCO METAL.
M-84; 0.5 C, 38 Ni, 18 Cr, 1.5 Si, bal Fe.
Cast: 68,000 TS; 40,000 YS; 10 El; 10 RA; 187 Brin.
For furnace parts, annealing boxes, retorts; heat and corrosion resistant.

MISCO MS
M-84; 0.45 C, 18 Cr, 38 Ni, bal Fe.
Cast: 70,000 TS; 45,000 YS; 5 El; 6 RA; 190 Brin.
For castings subject to cyclic heating; resists thermal fatigue.

MISCO N
M-84, 0.4 C, 9 Cr, 21 Ni, bal Fe
75,000 TS, 45,000 YS; 30 El; 40 RA
For chemical engineering equipment; resists sulfuric acid

MISCO N-5.
M-84, 0.4 C, 30 Ni, 4 Si, bal Fe.
For chemical engineering equipment, resists H_2SO_4.

MISCROME 1.
M-84; 0.25-0.35 C, 13-15 Cr, bal Fe.
Cast. 10,000 TS; 72,000 YS; 17 El; 25 RA; 200 Brin.
Heat treated. 123,000 TS; 98,000 YS, 20 El; 44 RA
For chemical engineering equipment; resists HNO_3.

MISCROME 2.
M-84, 0.25 C, 21 Cr, bal Fe.
For chemical engineering equipment; resists HNO_3.

MISCROME 3.
M-84, 0.25 C, 28 Cr, bal Fe
For chemical engineering equipment; resists HNO_3

MISCROME NO 4
M-84, 0.15 C, 13 Cr, bal Fe.
Heat treated 185,000 TS, 138,000 YS, 1 El; 4 RA, 328 Brin
For corrosion resisting parts; corrosion resistant.

MISCROME 5
M-84, 1.4-1.6 C, 12-14 Cr, 0.9-1.1 Mo, 0.5 max Ni, 0.5-0.7 Mn, bal Fe.
Annealed 269 Brin
Heat treated. 131,000 TS; 352 Brin.
For wear and corrosion resistant castings, castings, hard, wear resistant.

MISCROME CR
M-84, 2.5 C, 16 Cr, bal Fe
For heat and corrosion resisting parts, grids; heat and corrosion resistant.

MISCROME KR.
M-84; 1.6 min C, 24-30 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

MISHIMA STEEL.
Japan; 10 Al, 25 Ni, bal Fe.
For permanent magnets; high coercive force, sintered.

MITCHALLOY A.
M-536; 2.9-3.1 T.C., 2-2.5 Ni, 0.3-0.6 Cr, bal Fe.
45,000-50,000 TS; 240-280 Brin.
For brake drums; wear resistant.

MITCHALLOY B.
M-536; 2.8-3.5 C, 4-5 Ni, 1.5-2.0 Cr, bal Fe.
Sand cast: 40,000-50,000 TS; 550-650 Brin.
For pulverizers, grinders, mixers, wear and abrasion resistant.

MITCHALLOY C.
M-536; 2.7-3.0 T.C., 12-15 Ni, 5-7 Cu, 1.5-4.0 Cr, bal Fe.
Cast: 20,000-35,000 TS, 140-190 Brin.
For heat and corrosion resistant parts, austenitic

MITCHALLOY D.
M-536; 3.3 C, 2.6 Si, 1.5 Ni, 0.8 Cr, bal Fe.
For gratebars, alloy cast iron

MITIA GR. A.
M-56, WC, Co
For tipped cutters; for cast iron, tough, intermittent cutting.

MITIA GR B
M-56, WC, Co.
For tipped cutters; for general purpose.

MITIA GR C
M-56, WC, Co.
For tipped cutters; hard grade for cutting chilled cast iron.

MITIA GR TA
M-56; WC, Co.
For tipped cutters, general purpose cutting

MITIA GR TA5
M-56, WC, Co
For tipped cutters, for rough cutting steel

MITIA GR. TE
M-56; WC, Co
For tipped cutters; hard and wear resistant grade for finish turning

MITIA GR. TEIO.
M-56, WC, Co
For tipped cutters, for mild and low alloy steels

MITIFINE.
M-123, Babbitt containing no Pb and more Sn
For heaviest marine engine bearings, cross-heads, heavy machine Babbitts, free flowing, great toughness, slight shrinkage

MITIS IRON.
Eng.; 0.06-0.27 Al, C, bal Fe
For pipes, fittings; wrought iron deoxidized with Al.

MITSUBISHI SH-IS-54.
M-1543, 0.12-0.17 C, 0.8-1.1 Mn, 0.35-0.60 Si, 0.40 max Cu, bal Fe.
Rolled 77,000-88,000 TS, 50,000 min YP, 20 min El.
For railroad and mine cars, bridges, agricultural equipment.
High-tensile, low alloy constructional steel

MITSUBISHI SH-IS-60.
M-1543; 0.15-0.21 C, 0.95-1.25 Mn, 0.50-0.80 Si, bal Fe
Rolled: 85,000-100,000 TS; 54,000 min YP; 17 min El.
For railroad and mine cars, bridges, agricultural equipment.
Constructional steel, tough.

MIXEND 60.
M-677; 60 Ni, 40 Fe.
Welded: 262 Brin.
For welding rod; machinable welds on high P-cast iron

MIXEND 99.
M-677; 99 Ni.
Welded 150 Brin.
For welding rod; machinable welds on cast iron.

M-K-9.
M-859, 4 Cu, bal Al.
Rolled: 60,000 TS, 30 El, 70 Brin.
For light alloy parts, age-hardenable.

MK9-AS
M-859, 4 Si, 5 Cu, bal Al
Cast 35,000 TS
Wrought 47,500 TS
For light alloy parts; age-hardenable.

M K STEEL
Japan, 10-40 Ni, 1-20 Al, bal Fe
For magnets, not forged readily

M K STEEL
Japan; 25 Ni, 10 Al, bal Fe
For magnets, must be cast to shape

MI
M-1, 0.8 C, 18 W, 4 Cr, 2 V, 0.75 Mo, bal Fe.
For tools, cutters, high speed steel.

ML-ALLOY
U.S., 4 Cu, 2 Ni, 2 Mg, 0.3 Mn, 0.05 V, 0.1 Ti, bal Al
Cast 33,000 TS
At 600°F 17,000 TS
For aircraft castings, cylinder heads, pistons, age-hardenable, high temperature use

ML-ALUMINUM
U.S., 4 Cu, 2 Ni, 2 Mg, 0.1 Ti, 0.3 Cr, 0.1 V, 0.3 Mn, bal Al.
Cast 36,000 TS, 31,000 YS, 1.2 El.
At 600°F 17,000 TS; 14,500 YS; 9.0 El.
For aircraft parts, cylinder heads, pistons; good high temperature properties

M L STEEL
M-1, 0.8 C, 2 V, 18 W, 0.75 Mo, 4 Cr, bal Fe
Oil hardened
For high speed tools and cutters, high speed steel

M-M-1
M-365, 0.65-0.85 C, 7.5-9.5 Mo, 1.25-2.25 W, 3.5-4.5 Cr, 0.9-1.5 V, bal Fe
For tools, cutters, high speed steel.

MM 6 & 6
M-365, 0.83 C, 4.15 Cr, 1.9 V, 6.35 W, 5.0 Mo, bal Fe.
High speed steel for cutting tools, Mo-W type, AISI M2

M M M
M-230, M-636, 57.5 min, Ni, 26.0 min Cu, 9.25 max Sn, bal Fe, Si, Mn
Cast 70,000 TS; 45,000 YS, 17.5 El
For valves for superheated steam, modified "Monel" Metal

MMV
M-365, 1.15 C, 4.0 Cr, 2.8 V, 6.0 W, 5.25 Mo, bal Fe
High speed steel for cutting tools, molybdenum-tungsten type; AISI M3, Class 2.

"MNS" NICKEL.
M-121; 1.5-2.25 Mn, high C, Si, 96 min Ni.
Rolled: 80,000 TS; 24,000 YS; 56 El; 76 RA; 139 Brin.

For water meter components, small machined parts; corrosion resistant.

Mo-1.
M-Japan; 23 Mo, 2.5 Cr, bal Fe.
For permanent magnets in magnetic and electrical equipment. High permeability.
Precipitation hardening.

Mo10.
M-459; 0.80 C, 9.0 Mo, 3.8 Cr, 1.75 W, 1.2 V, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

Mo-20
M-459; 0.85 C, 4.2 Cr, 5 Mo, 2 V, 6.5 W, bal Fe
For lathe and planer tools, hobs, drills, reamers, high speed steel, oil hardened

Mo-30
M-459, 1.2 C, 4.2 Cr, 5 Mo, 3.2 V, 6.2 W, bal Fe
For lathe and planer tools, milling cutters, hobs; high speed steel

M.O 81 STEEL
M 1116, 0.87 C, 4 Cr, trace W, 8.5 Mo, 2 V, bal Fe
Air or oil harden to 61-65 Rc.
For twist drills, "hand" taps, dies, extra long drills
AFNOR· Z 90 DV 09.02, US-AISI M10

M O. 82 STEEL
M-1116, 0.84 C, 4 Cr, 1.4 W, 8 Mo, 1.5 V, bal Fe
Air or oil harden to 62-66 Rc
For twist drills, end mills, reamers, taps, counter bores, hobbing cutters
AFNOR Z 85 DVW 08.02.01, US-AISI M1,
Germany S 2.9.1 (B Mo 9), W nr 1.3346

M O 83 STEEL
M-1116, 1.0 C, 4 Cr, 1.4 W, 8.5 Mo, 1.9 V, bal Fe
Air or oil harden to 62-66 Rc
For drills (deep hole), taps (blind holes), counter bores, end mills
AFNOR Z 100 DVW 08.02.01,
US-AISI M7,
Germany S 2.9.2 (B Mo 9V), W.nr 1.3348

M O 88 STEEL
M 1116, 1.10 C, 3.8 Cr, 1.5 W, 9.5 Mo, 1.2 V, 8 Co, bal Fe
Air or oil harden to 63-70 Rc
For turning, drilling, milling, planing extra hard or tough materials
AFNOR Z 110 DKWV 10.08.02.01,
US AISI M 42

Mo-325.
M-459, 0.95 C, 4 Cr, 2.5 Mo, 2.5 V, 2.8 W, bal Fe
For milling cutters, hobs, drills, broaches, high speed steel, oil hardened

Mo-325 X.
M-459, 0.9 C, 4 Cr, 2.5 Mo, 2.5-3 V, 2.2 W, 2.5 Co, bal Fe
For tools, dies, cutters, oil hardening

Mo-1225 X
M-459, 0.9 C, 4 Cr, 2.5 Mo, 2.5-3 V, 1.0 W, 1.05 Co, bal Fe.
For tools, dies, cutters; oil hardening

MOCAR
M 959, 10 Sn, 15 Sb, bal Pb
For bearings for connecting rods and camshafts; Babbitt

MOCARB.
M-140; 1.0 C, 5 Mo, 6.5 W, 4.2 Cr, 1.9 V, bal Fe.
Hardened: C 64-67 Rock.
For lathe and planer tools, broaches, rolls, hobs, reamers, end mills, milling cutters.
High-speed steel. High hot-hardness and wear resistance

MOCASCO.
M-601; 3.2 C, 2.5 Si, 1 Cr, bal Fe.
For castings, cast iron.

MOCASCO 30
M-601, 3.25-3.35 T.C , 2.0-2.2 Si, 1.0-1.35 Ni, 0.25-0.30 Cr, bal Fe.
Cast 30,000 TS; 200 Brin
For air compressor cylinders, motor blocks and heads, wear and heat resistant

MOCASCO 40.
M-601, C, 0.35 Mo, bal Fe
40,000 TS, 200 Brin
For cylinder heads and liners, gears, valves.

MOCASCO 50
M-601, C, 1.5 Ni, 0.6 Mo, bal Fe
Cast. 50,000 TS, 241 Brin
For castings, pistons, gears, valves; cast iron.

MOCASCO 60
M-601, C, 1.5 Ni, Cr, 0.90 Mo, bal Fe.
Cast 60,000 TS, 228-260 Brin
For gears, brake drums, pump and hydraulic castings, cast iron

Mo-CHIP
M-57, 0.7 C, 8 Mo, 2.5 Co, 0.5 Cr, 1.0 V, bal Fe
For tools, cutters, lathe and planer tools, high speed steel, oil hardened.

MOCK GOLD-1
Eng , 80-67 Cu, 20-29 Pt, 0-4 Zn
For ornaments, corrosion resistant

MOCK GOLD-2.
Eng , 6 Ni, 1 Pt, 1 Ag, 1 Brass
For ornaments, corrosion resistant.

MOCK SILVER
Eng , 84 Al, 10 Sn, 5.5 Cu, P
For instruments, fittings, ornamental; corrosion resistant

MOCUT
M-140, 0.60 0.85 C, 3.5-4.0 Cr, 0.9-1.3 V, 1.3-1.8 W, 7.75-9.0 Mo, bal Fe
For twist drills, lathe and planer cutters, reamers, hobs, Type M 1, high speed steel.

MODERN.
M-613, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe
For cutters, tools, high speed steel

MODIFIED MONEL
M-230; 60-65 Ni, 24-27 Cu, 9-11 Sn, 1-3 Fe.
Cast. 70,000 TS, 45,000 YS, 17 El.
For valves for super heated steam; corrosion resistant.

MODIFIED MONEL METAL
M-230, 60-65 Ni, 24-27 Cu, 9-11 Sn, 1-3 Fe, Mn, Si
For valves for superheated steam, v.M M M

MODIFIED "OUNCE" METAL.
M-126, 84 Cu, 5 Sn, 5 Pb, 5 Zn, 1 Ni.
For fittings, valves, hardware castings; pressure tight.

MODULVAR.
M-771; 36 Ni, bal Fe.
Annealed: 70,000 TS; 24,000 YS; 36 El; 68 RA; 143 Brin.
Cold drawn: 90,000 TS; 70,000 YS; 20 El; 60 RA; 185 Brin.
For instruments, chronometers; high positive thermoelastic coefficient.

MOGUL.
M-69; 0.78 C, 4 Cr, 1.5 W, 1.15 V, 8.7 Mo, bal Fe.
Annealed: 228-241 Brin.
For reamers, drills, lathe and planer tools, hobs; Type M1; high speed steel.

MOHAWK HOT DIE.
M-1; 0.45 C, 14 W, 3.5 Cr, 0.60 V, bal Fe.
Oil hardened: 310,000-268,000 TS; 1-23 El; 5-79 RA; 600-321 Brin For high speed steel tools, hot punches, extrusion dies, shearing dies; hot work steel; Iz-13.8-67.4.

MOHECO.
M-601; 2.85-3.05 T.C., 1.75-2.10 Si, 0.6-0.8 Mn, 1.75 Ni, 0.90 Cr, bal Fe.
Heat treated: 525 Brin.
Cast: 220 Brin.
For dies, drawing dies; wear resistant.

MOHICAN.
M-435; 0.8 C, 1.5 W, 4 Cr, 1 V, 8.5 Mo, bal Fe
For tools, cutters, broaches, milling cutters; high speed steel.

MOHICAN 6.
M-435; 0.62 C, 1.7 W, 3.75 Cr, 8.7 Mo, 1 V, bal Fe.
At 400°F: 243,000 TS; 3.6 El; 8.1 RA; 477 Brin.
For hot punches, shear blades, forming dies; shock and wear resistant, high red hardness

MOHICAN 8
M-435; 0.80 C, 1.5 W, 4 Cr, 9 Mo, 1.2 V, bal Fe.
For twist drills, hobs, mills, hot punches, tough, high speed steel.

MOIL POINT.
M-38; 0.8 C, 0.5 Mn, 0.35 Si, bal Fe.
For battering tools, moil points; tough, oil hardening.

MOLDALOY
M-1056; Bi, Pb, Sn, Sb.
Cast: 11,500 TS, 22 Brin.
For molds, forming dies, forging dies, chuck jaws; M.P. 430°F; molding alloy.

MOLDIE.
M-336; 0.9 C, 2.25 Mn, 0.1 V, bal Fe.
For Bakelite and rubber molds; steam resistant.

MOLDTEM.
M-64; C, Cr, Mo, V, bal Fe.
Heat treated: 340 Brin
For zinc die casting dies, plastic mold dies; prehardened, hot work steel.

MOLECULOY.
M-1523; 20 Cr, 3 Al, 2 Co, bal Ni.
Resistance wire: 800 ohms per circular mil ft.
Ann: 130,000 psi ave; hard drawn: 250,000 psi.
For winding precision resistors and potentiometers; max. operating temp.: 250°C.

MOLECULOY III.
M-1523; 20 Cr, 4 Al, 5 Mn, 1 Si, bal Ni.
Resistance wire: 835 ohms per cir.mil.ft.
Ann: 130,000 psi; hard drawn: 260,000 psi.
Max. oper. temp.: 250°C.

MOLEGRAIN.
M-1455; 3.3 C, alloy, Si, Mn, bal Fe.
For gears, shafts, housings, cast iron.

MOLEL.
M-432; C, alloy, bal Fe.
For tools, cutters, punches; oil hardened.

MOLEX NO 5.
M-15; C, alloy, bal Fe
For crushers, punches, wrenches, wedges; shock and abrasion resistant.

MOLEX NO. 6.
M-15; C, alloy, bal Fe.
For gages, chuck jaws, knives, reamers; oil hardened, shock and wear resistant.

MOLEX NO 7.
M-15; C, alloy, bal Fe
For bushings, cam rollers, shear blades, forming dies, oil hardened, wear resistant.

MOLEX NO 8.
M-15; 1.1 C, 0.75 Mn, 0.5 Si, 5.5 Cr, 0.3 V, 1.3 Mo, 0.015 P, 0.015 S, bal Fe.
Air hardening tool steel for cold working tools.

MOLEX NO 8 MODIFIED.
M-15; 0.55 C, 0.9 Mn, 0.25 Si, 3.5 Cr, 0.25 Ni, 0.25 V, 1.4 Mo, bal Fe.
Air hardening tool steel

MOLEX-A.
M-15; C, alloy, bal Fe.
For dies, gauges, broaches, shears, reamers; wear resistant, oil hardened.

MOLEX-O
M-15; C, alloy, bal Fe
Annealed: 202 Brin
For blanking and drawing dies, shear blades; oil hardened, non-deforming

MOLIN METAL
M-1399; Al, bal Cu
Cast
For gears, shafts, bearings; aluminum bronze.

MOLIN METAL.
M-1456, Al, bal Cu.
For molds, dies; Al-bronze.

MOLITE
M-35, 0.8 C, 4 Cr, 5 Mo, 6.5 W, 1.9 V, bal Fe.
For tools, cutters, taps, reamers, broaches; high speed steel

MOLITE 2
M-35; 0.86 C, 6.25 W, 5.0 Mo, 4.15 Cr, 1.9 V, bal Fe.
For milling cutters, twist drills, broaches, reamers; AISI M2 high speed steel

MOLITE 2 SMOOTHCUT.
M-35, 0.86 C, 6.25 W, 5.0 Mo, 4.15 Cr, 1.9 V, bal Fe, plus free machining additions
For gear cutters, twist drills, reamers, broaches; AISI M2 high speed tool steel.

MOLITE 3.
M-35; 1.0 C, 4 Cr, 5 Mo, 6 W, 2.7 V, bal Fe
For cutters, drills, hobs, reamers, broaches; high speed steel; Type M3.

MOLITE 3 SMOOTHCUT Type 1.
M-35, 1.03 C, 6.25 W, 6.25 Mo, 4.0 Cr, 2.5 V, sulphides, bal Fe.
Hardened: C 64-66 Rock.
For broaches, taps, dies, reamers; from tools, hobs, slitting saws.
High speed steel; high red-hardness.
Good machinability rating. AISI M3 (class 1).

MOLITE 3 Type 2.
M-35; 1.2 C, 6.25 W, 6.25 Mo, 4.0 Cr, 3 V, bal Fe.
Hardened: C 64-66 Rock.
For broaches, form tools, taps, dies, milling cutters, cut-off tools.
High speed steel; high red-hardness.
AISI Type M3 (Class 2).

MOLITE 4.
M-35; 1.28 C, 5.50 W, 4.5 Mo, 4.5 Cr, 4.0 V, bal Fe.
Hardened: C 64-66 Rock.
For broaches, counterbores, drills, reamers, milling cutters.
High speed steel. High red-hardness.
AISI Type M4.

MOLITE HW60.
M-35, 0.63 C, 8.25 Mo, 4 Cr, 1.9 V, bal Fe.
Ht. Tr. 202,000 TS, 197,000 YS, 2 El; C 56 Rock.
For hot upsetting and forming dies, hot dummy blocks, hot or cold header dies.
Hot work steel Type H43, shock resistant.

MOLITE 5.
M-35, C, alloy, bal Fe.
For tools, dies; oil hardening.

MOLITE 8.
M-35; C, alloy, bal Fe.
For tools, dies, oil hardening.

MOLITE 9.
M-35, C, alloy, bal Fe.
For tools, dies, oil hardening.

MOLITE HW10.
M-35, 0.85 C, 4 Cr, 2 V, 8 Mo, bal Fe.
For tools, cutters, reamers, drills; high speed steel, oil hardened.

MOLITE M-1.
M-35, C, Cr, Mo, V, bal Fe.
For cutting tools, high speed steel.

MOLITE M2.
M-35; 0.7 C, 4 Cr, 5 Mo, 6.5 W, bal Fe.
For lathe and planer tools, drills, reamers, taps, high speed steel.

MOLITE SMOOTHCUT.
M-35, 0.8 C, 4 Cr, 2 V, 6 W, 5 Mo, bal Fe.
For lathe and planer tools, drills, taps, hobs, reamers, Type M2, high speed steel.

MOLMANG.
M-374, C, 11-13.5 Mn, bal Fe.
Welded: 500-600 Brin.
For welding electrodes for build-up work; austenitic, work hardens.

MO-LO.
M-1456, 3 C, Mn, Si, bal Fe.
For piston rings, cylinder liners, bushings; cast iron.

MOLTROP.
M-860; 0.3-0.5 C, bal Fe.
For gears, shafts, water hardened.

MOLVA-T.
M-373, 0.8 C, 4 Cr, 2 V, 5 Mo, 6 W, bal Fe.
For lathe and planer tools, drills, form cutters, hot punches; high speed steel.

MOLY 8.
M-1433; 0.60 C, 3.6 Cr, 1.75 V, 8.5 Mo, bal Fe.
For hot work tools, shears, punches; Type H12; hot work steel.

MOLY ARK.
M-261; 0.7 C, 5.5 W, 4 Mo, 4 Cr, 1.5 V, bal Fe.
For tools, cutters; high speed steel.

MOLY ASCOLOY.
M-1509; 0.08 C, 13 Cr, 2 Mo, bal Fe.
For jet engine parts, afterburners, nozzles, bolts; high strength and high heat resistance.

MOLY B 100.
M-1246, 50 Mo, 50 W.
For high vacuum tubes; sintered alloy.

MOLYBDENITE.
M-451; C, Cr, Mo, bal Fe.
For mill pinions, guides, rolls.

MOLYBDENUM-0.05 Zr.
M-151, 0.05 Zr, bal Mo.
Rolled Rod. 127,700 TS; 108,400 YS; 20 El; 60 RA.
Recrystallized Sheet: 78,800 TS; 63,500 YS; 40 El.
Stress Relieved Sheet: 126,000 TS; 115,800 YS; 13 El.
For high temperature applications, heat engines, nuclear reactors, glass molding dies.
High heat and corrosion resistance.

MOLYBDENUM-50W.
M-151, M-1246, 0.008 C, 49.3 W, bal Mo.
Stress Relieved: 144,000 TS; 133,800 YS; 14 El.
Recrystallized 97,700 TS, 0 El.
For high temperature applications, heat engines.
High heat and corrosion resistant.

MOLYBDENUM CHISEL.
M-365, 0.6 C, 0.5 Mo, bal Fe.
For chisels, tools, oil hardened.

MOLYBDENUM PERMALLOY.
M-1, 79 Ni, 4 Mo, bal Fe.
For audio and instrument transformers and shielding, high permeability.

MOLYBDENUM PERMALLOY 2-81.
M-22, 2 Mo, 81 Ni, 17 Fe.
For cores for loading coils in telephones, high permeability.

MOLYBDENUM PERMALLOY 2-81.
M-205, 2 Mo, 81 Ni, bal Fe.
For inductance and loading coils, low magnetic core loss.

MOLYBDENUM PERMALLOY 2-81.
M-269, 2 Mo, 81 Ni, 17 Fe.
For inductance and loading coils, low magnetic core loss, high permeability.

MOLYBDENUM PERMALLOY, 4-79.
M-22, M-205; 4 Mo, 79 Ni, 17 Fe.
For high frequency and electrical apparatus; high permeability and resistivity.

MOLYBDENUM SILICON.
M-347; C, Mo, Si, bal Fe.
Heat treated: 100,000-110,000 TS, 197-228 Brin.
For pistons, brake drums; wear resistant.

MOLYBDENUM STEEL.
Eng.; 0.15-0.40 Mo, 0.1-0.45 C, 0.6-1.3 Mn, 0.3-0.5 Si, bal Fe.
For machinery parts, gears, shafts; tough.

MOLYBDIE GRADE FM.
M-55; C, Cr, Ni, Mo, bal Fe.
For dies adapted for the limited production of all types of drop forgings; resistant to heat abrasion.

MOLYCUT 562.
M-56 0.82 C, 4.1 Cr, 5 Mo, 1.9 V, 6.4 W, bal Fe.
For lathe and planer tools, drills, broaches, taps; high speed steel.

MOLY HIGH SPEED.
M-81; 0.80 C, 4 Cr, 4.2 Mo, 1.5 V, 5.5 W, bal Fe.
For lathe and planer tools, hobs, broaches; Type M1; high speed steel.

MOLY-IRON.
M-278; C, 1 Mo, 1 Cr, bal Fe.
Cast: 55,000 TS; 240 Brin
For heat and abrasion resistant castings; heat and abrasion resistant.

MOLYITE
M-35; C, 9 Mo, 4 Cr, 2 V, bal Fe
For tools, cutters; high speed steel.

MOLY-MANG.
M-118; C, 11-13 Mn, bal Fe
For welding rod for high Mn steel; austenitic, wear and abrasion resistant.

MOLYMET.
M-61; 45 Ni, 45 Fe, 10 Mo.
For radio grid wire.

MOLYNEAUX FUSIBLE ALLOY.
France; 41.5 Bi, 16.7 Sn, 25 Pb, 16.7 Cd
For fuses, fire extinguishers; M P 60°C

MOLY-NICKEL
M-810; C, Mo, Ni, bal Fe.
For welding rod.

MOLY PERMALLOY.
M-1, 79 Ni, 4 Mo, 17 Fe.
Annealed: 64,000 TS, 18,500 YS; 27 El; 116 Brin.
Rolled. 160,000 TS; 150,000 YS; 1 El, 280 Brin.
For toroid, tape and lamination cores for transformers and relays, magnetically soft, high permeability.

MOLY PERMINVAR-3.
M-22; 33.7 Fe, 34 Ni, 29 Co, 3 Mo, 0.3 Mn
For magnetic amplifiers

MO-MANG.
M-9; 0.7-0.9 C, 12-14 Mn, bal Fe.
For welding rod, for Mn steel

Mo-MANG
M-642, 0.8 C, 14 Mn, 0.2 Mo, bal Fe
Cast· 200 Brin.
For welding electrodes; work hardens to 550 Brinell.

MOMARC.
M-115; 1.0 C, 1.4 Cr, 1.0 Mo, bal Fe
Normalized: 185,000 TS; 139,000 YS; 13 El, 360 Brin.
For ball bearings, special rolls, precision gauges, arbors, dies.
Wear and abrasion resistant, oil or water hardening.

MONACA.
M-755; 0.5 C, bal Fe.
For gears, shafts; water hardening.

MONACA DRILL ROD.
M-370, 1.15-1.30 C, bal Fe.
Ground and polished drill rod
For instrument shafts, twist drills, jewelers tools.
Type W1 water hardening tool steel

MONACA SPECIAL
M-370; 0.7-0.9 C, 0.2 V, bal Fe.
For tools, drills, taps, reamers, hobs, broaches; Type W2; water hardened.

MONAR 816.
M-677, 0.09 C, 0.8 Mn, 0.08 Si, 65.5 Ni, 2.5 Ti, 1.0 Al, bal Cu.
For bare monel welding wires: class ER-NiCu-7.

MONARCH.
M-502; C, alloy, bal Fe.
For tools, dies; oil hardening.

MONARCH NO. 10.
M-863; Pb, bal Cu.
Cast. 30,000 TS, 22,000 YS, 60 Brin.
For bearings for pumps, electric motors and machine tools; for high speed and moderate load.

MONARCH NO. 12
M-863, Pb, bal Cu.
Cast 30,900 TS, 25,100 YS; 70 Brin.
For bearings for large presses, nail and wire machines, high speeds and moderate, heavy loads

MONARCH NO 16
M-863; Pb, bal Cu.
Cast 37,000 TS, 29,800 YS; 75 Brin
For bearings for large presses, cranes; extra heavy duty at low speeds.

MONARCH METAL
M-863, 20 Pb, 5 Sn, bal Cu.
For bearings, leaded.

MONARK
M-435, 0.6 C, 2 Si, 0.3 Cr, 0.2 Mo, bal Fe.
For tools, chisels, shock resisting

MONARK-1
M-435; 0.5 C, 0.4 Mn, 1.2 Si, 0.5 Mo, bal Fe
For chisels, pneumatic tools, water hardened

MONARK-2
M-435; 0.6 C, 0.75 Mn, 2 Si, 0.3 Cr, 0.2 Mo, bal Fe
For chisels, pneumatic tools, water hardened

MOND
M-86, 26 Cu, 70 Ni, 4 Mn
For turbine blades, pump rods, valve stems; corrosion resistant.

MONEL
M-121, 23 min Cu, 60 min Ni, 3.5 max Fe, 3.5 max Mn, 0.3 max C, 0.5 max Al, 0.5 max Si
Cast 65,000 TS; 30,000 YS, 35 El; 35 RA, 105 Brin
Hot rolled 95,000 TS, 65,000 YS, 35 El, 50 RA; 175 Brin
Cold drawn 125,000 TS; 95,000 YS, 15 El, 50 RA, 260 Brin.
For chemical plant, pickling equipment, pump rods, valve stems and seats, staybolts, corrosion resistant

MONEL 40
M-1499, 0.3 max C, 2.0 max Mn, 63-70 Ni, bal Cu
For acetylene welding rod.

MONEL 60
M-1499, 23 min Cu, 60 min Ni, 3.5 max Fe, 3.5 max Mn.
For inert gas metal arc welding Monel

MONEL 130.
M-897; 28-34 Cu, bal Ni.
For corrosion resistant parts; corrosion resistant.

MONEL-140.
M-68; 23 min Cu, 60 min Ni, 3.5 max Fe, 13 max C.
For welding electrodes, Monel overlay; corrosion resistant.

MONEL ALLOY 400
M-1499; 66.5 Ni, 0.15 C, 1.0 Mn, 1.25 Fe, 0.012 S, 0.25 Si, 31.5 Cu.
Annealed: 70,000-90,000 TS; 25,000-50,000 YS; 60-35 El; 110-149 Brin.
Cold drawn, St.Rel: 84,000-120,000 TS; 55,000-100,000 YS, 40-22 El; 160-225 Brin.
For valves and pumps, marine fixtures, tanks, piping, heat exchangers; corrosion resistant

MONEL ALLOY 401.
M 1499, 42.5 Ni, 0.05 C, 1.13 Mn, 0.38 Fe, 0.008 S, 0.13 Si, bal Cu.
For specialized electrical and electronic applications, wire wound resistors, bimetal contacts.

MONEL 402
M-1499; 0.12 C, 0.90 Mn, 1.2 Fe, 39.8 Cu, bal Ni
Hot rolled 90,000 TS, 65,000 YS, 35 El, 175 Brin
Cold drawn 95,000 TS; 85,000 YS, 25 El; 205 Brin
For corrosion resistant parts, chains, hooks, grates for H_2SO_4 pickling, corrosion resistant, resists hydrogen embrittlement.

MONEL 403
M-1499, 55-60 Ni, 2.5 max Fe, 2.2 max Mn, 0.75 max Si, bal Cu
Annealed: 65,000-85,000 TS, 23,000-45,000 YS; 35-50 El; 130-140 Brin
Hot rolled. 70,000-90,000 TS; 35,000-60,000 YS, 20-40 El, 130-170 Brin
For pickling equipment for H_2SO_4, cable sheathing, high corrosion resistance

MONEL ALLOY 404
M-1499, 54.5 Ni, 0.08 C, 0.05 Mn, 0.25 Fe, 0.012 S, 0.05 Si, 44.0 Cu, 0.03 Al.
For wave guides, metal to ceramic seals, transistor capsules, power tubes Low magnetic permeability; excellent brazing characteristics

MONEL ALLOY 474
M-68, 54 Ni, 46 Cu, 0.01 C, 0.01 Fe, 0.001 S.
At R T 60,000 TS, 25,000 YS
At 800°F 35,000 TS, 16,000 YS
For wave guides, transistor capsules, electronic power tubes, metal-to-ceramic seals
Corrosion and heat resistant

MONEL ALLOY 502
M-1499, 66.5 Ni, 0.05 C, 0.75 Mn, 1.0 Fe, 0.005 S, 0.25 Si, 28.0 Cu, 3.0 Al, 0.25 Ti.
Cold drawn 87,000 TS, 55,000 YS, 42 El; 158 Brin
Cold drawn and aged 140,000 TS, 94,000 YS, 25 El, 255 Brin
For fasteners, pump and propeller shafts, valve stems; machinable, age hardenable

MONEL ALLOY K-500
M-1499, 66.5 Ni, 0.13 Cu, 0.75 Mn, 1.0 Fe, 0.005 S, 29.5 Cu, 3.0 Al, 0.63 Ti
Annealed 90,000-110,000 TS; 40,000-60,000 YS, 45-25 El; 140-185 Brin
Annealed and aged 130,000-165,000 TS; 85,000-120,000 YS, 35-20 El, 250-315 Brin
For pump shafts and impellers, oil well drill collars and instruments, electronic components; corrosion resistant

MONEL ALLOY R-405
M-1499; 66.5 Ni, 0.15 C, 1.0 Mn, 1.25 Fe, 0.043 S, 0.25 Si, 31.5 Cu
Annealed: 70,000-85,000 TS; 25,000-40,000 YS; 50-35 El; 110-140 Brin
Cold drawn. 85,000-115,000 TS; 50,000-105,000 YS; 35-15 El; 160-245 Brin.
For water meter parts, screw machine products, valve seat inserts, fasteners for nuclear applications. Corrosion resistant, free machining

MONEL C.
M-121; 0.2 C, 2.5 max Fe, 2 max Mn, 63-70 Ni, bal Cu.
Cold drawn: 100,000 TS; 75,000 YS; 25 El; 60 RA; 200 Brin
For water meter components, machined parts; corrosion resistant

MONEL FILLER METAL 40.
M-1499, 66.0 Ni, 0.10 C, 0.90 Mn, 1.35 Fe, 0.005 S, 0.15 Si, 31.5 Cu
For oxyacetylene welding of Monel alloys 400 and 404.
AWS A 5.14 Class RNiCu-5, ASME SFB 5.14.

MONEL FILLER METAL 60.
M-1499, 65.0 Ni, 0.03 C, 3.5 Mn, 0.20 Fe, 0.005 S, 1.0 Si, 27.0 Cu, 2.2 Ti.
For gas-shielded arc welding of Monel alloys 400 and 404
AWS A 5.14 Class ERNiCu-7, ASME SFB 5.14

MONEL FILLER METAL 64.
M-1499, 65.0 Ni, 0.15 C, 0.60 Mn, 1.0 Fe, 0.005 S, 0.15 Si, 30.0 Cu, 2.8 Al, 0.5 Ti
For oxyacetylene and gas-shielded arc welding of Monel alloy K 500
AWS A 5.14 Class ERNiCu-8; MIL-E-21562.

MONEL FILLER METAL 67.
M-1499, 31.0 Ni, 0.02 C, 0.75 Mn, 0.50 Fe, 0.005 S, 0.10 Si, 67.5 Cu, 0.30 Ti.
For oxyacetylene and gas-shielded arc welding of 70/30, 80/20, 90/10, copper-nickel alloys and clad side of copper-nickel clad steel
AWS A 5.6 Class ECuNi, ASME SFB 5.6

MONEL G
M-121, 0.3 C, 2.5 max Fe, 2 max Mn, 63-70 Ni, bal Cu
Cold drawn: 100,000 TS, 75,000 YS, 25 El, 60 RA; 200 Brin
For water meter components, machined parts; good corrosion resistance

MONEL K
M-897, 30 Cu, 2 Al, bal Ni
For heat resistant parts, corrosion and heat resistant

MONEL K44
M-897, 30 Cu, 1 Mn, 2 Al, 2 Fe, bal Ni.
For corrosion and heat resistant parts; corrosion and heat resistant

MONEL K64
M-897, 30 Cu, 1 Mn, 2 Al, 2 Fe, bal Ni
For corrosion and heat resistant parts, corrosion and heat resistant

MONEL WELDING ELECTRODE 134
M-1499; 64.0 Ni, 0.20 C, 2.50 Mn, 1.0 Fe, 0.005 S, 0.30 Si, 30.0 Cu, 1.8 Al, 0.75 Ti.
Electrode for shielded metal-arc welding of Monel alloy K-500, overlaying on steel
AWS A 5.11 Class ENiCuAl-1, ASME SFB 5.11.

MONEL WELDING ELECTRODE 187
M-1499; 32.0 Ni, 0.02 C, 2.0 Mn, 0.60 Fe, 0.01 S, 0.15 Si, 65.0 Cu.
Electrode for shielded metal-arc welding of 70/30, 80/20, 90/10 copper-nickel alloys and clad side copper-nickel clad steel.
AWS A 5.6 Class E CuNi; MIL-E-22200/4.

MONEL WELDING ELECTRODE 190.
M-1499, 65.0 Ni, 0.01 C, 3.1 Mn, 0.30 Fe, 0.007 S, 0.75 Si, 30.5 Cu, 0.15 Al, 0 55 Ti.
Electrode for shielded metal-arc welding of Monel alloys 400 and 404; overlaying on steel.
AWS A 5.11 Class E NiCu-2; ASME SFB 5.11.

MONEND see MONEND 806.

MONEND 806.
M-677; 0.03 C, 3.7 Mn, 0.8 Si, 64 Ni, 28 Cu, 0.3 Fe, 0.8 Ti, 0.4 Al.
For welding electrodes, monel, meeting classes ENiCu-1 (3N10), ENiCu-2 (4N10), ENiCu-4 (8N10), also 9N10.

MONEVAL 806
M-677; 64-68 Ni, 27-30 Cu, 1.0 max Fe.
Welded: 75,500 TS; 42,500 YS; 42 El, 60 RA.
For welding electrodes for Monel, Monel type

MONIKROM.
M-185; 3.1-3.4 C, 2 0-2.4 Si, 0.7 Mn, 0 8-1.0 Cr, 0.15-0 25 Ni, 0.15-0 25 Mo, bal Fe.
Cast: 43,000 TS; 240-280 Brin
For camshafts, cam sleeves; alloy cast iron; Tr S. 80,000.

MONIMAX.
M-1; 47 Ni, 3 Mo, bal Fe.
Magnetically soft, saturation inductance 14,500
For electrical equipment, special transformers, tape recording heads, vibrator cores, small motors.

MONIX 10.
M-501; 0 36 C, 1 0 Cr, 1 0 Ni, 0 2 Mo, bal Fe
For gears, bolts, crankshafts, axles; oil hardened, shock resistant.

MONIX 15.
M-501; 0 34 C, 1.55 Cr, 1.55 Ni, 0.2 Mo, bal Fe
For gears, bolts, crankshafts, axles; oil hardened, shock resistant.

MONIX 20.
M-501, 0 3 C, 2 Cr, 0.3 Mo, 2 Ni, bal Fe
For gears, bolts, oil refinery equipment, oil hardened, tough

MONO-LOY.
M-507; 1.4 C, 0 9 Si, 31.0 Mn, 0 5 Cr, 0.5 Mo, 5 5 Ni, bal Fe.
Hard facing electrode.
For overlaying or buildup on crusher rolls, dredge buckets, tractor sprockets, hammers.
Good shock resistance

MONOTYPE, STANDARD
Eng., 74 Pb, 18 Sb, 8 Sn.
For type metal, slightly expansive on solidifying.

MONTAN.
M-1331; 0 70 C, 0.25 max Si, 0 35 max Mn, bal Fe
For rails, tools, springs, axes; water hardened.

MONTAN 70.
M-1331; 0 70 C, 0 25 max Si, 0 25 max Mn, bal Fe
Heat treated: 175,000 TS; 130,000 YS; 12 El; 37 RA; 355 Brin.
For rails, punches, springs, axles, crimpers; water hardened.

MONTANIUM.
Eng., 2.5-3.5 Cu, 0.5 Mg, bal Al.
51,000 TS; 16 El; 50 RA.
For light alloy parts; similar to "Duralumin"

MONTEGAL.
M-299; 0.95 Mg, 0.8 Si, 0.2 Ca, bal Al.
50,000 TS; 6 El; 100 Brin.
For light alloy parts; non-hardenable.

MOONESTONE BRONZE.
M-575; Cu alloy.
For instrument terminals, free-cutting.

MOPERMALLOY 4-79.
M-61; 79 Ni, 17 Fe.
Saturation inductance 8700
For laminated cores for communication inductors, transformers, electro-magnetic shields
Soft magnet, high permeability.

MORAINE.
M-839, Sn, bal Cu
For bearings; sintered

Mo RAPID EXTRA 3.
M-27; 0 95 C, 4 Cr, 3 W, 3 Mo, 3 V, bal Fe.
For cutting tools; high speed steel.

MO RAPID EXTRA 3A
M-27, 1.0 C, 1 35 W, 3 8 Cr, 2.35 Mo, 2 35 V, bal Fe
For tools, dies, cutters, high speed steel.

MOREX
M-985; 0 7 C, 0.6 W, Cr, 4-6 Mo, bal Fe.
For tools, cutters; high speed steel.

MOREX.
M-487, C, Mo, W, bal Fe.
For tools, cutters; high speed steel

MORFLEX
M-237, high expanding side 22 Mn, 18 Cu, 10 Ni and low expanding side 36 Ni, bal Fe
For thermostatic bimetal, maximum temperature 500°F.

MORINS CHINESE BRONZE
Eng , 83 Cu, 10 Pb, 5 Sn, 2 Zn.
For ornaments

MOSAIC GOLD
Eng., 63 Cu, 37 Zn.
46,000 TS
For brass ornaments, yellow brass

MOSIL
M-115, 0 57 C, 1 9 Si, 0.8 Mn, 0 25 Cr, 0 33 Mo, bal Fe
For punches, chisels; shock resistant

MOSTAR
M-884, 0 32 C, 5 Cr, 1 15 Mo, 1 0 Si, 0 35 V, bal Fe.
For upsetters, punches, extrusion dies; oil or air hardened, hot work steel

MOTAL
M-302, 5 Si, bal Al.
21,500-27,000 TS, 6-3 El
For light alloys, automobile parts, motor housings; sand cast alloy

Mo TAP.
M-73, 1 2 C, 0 6 Mo, 0 5 Cr, 0 8 Mn, bal Fe
For taps, drills, reamers, water or oil hardening.

MO-TECHNICKILL
M-229, C, Mo, bal Fe.
For heavy duty rollers; wear resistant

MOTELEC
M-691; 2.5 Si, bal Fe.

MOTEMP.
M-140; 0.88 C, 4 Cr, 8 Mo, 2 V, bal Fe.
Hardened: C 64-66 Rock.
For circular saws, taps, drills, broaches, counterbores, milling cutters, hobs, chasers, form tools.
Type M-10 high speed steel, high red-hardness.

MO-TIGER.
M-24; 0.7 C, 9 Mo, 1.5 W, 4 Cr, 1 V, bal Fe.
For tools, cutters, drills; high speed steel.

MOTOR 03A.
M-1410; 1.5 C, 0.5 Cr, 0.35 V, 4.5 W, 0.35 Mo, bal Fe.
For drawing dies, turning tools, water hardened, abrasion resistant.

MOTOR 05S.
M-1410; 1.4 C, 1.5 Mn, 12 Cr, 1 V, bal Fe.
For rim rolling dies, hot shears, punches; oil or water hardened, non-deforming.

MOTOR 06S.
M-1410, 0.95 C, 0.3 Mn, 0.2 V, bal Fe.
For coining, heading and cutlery dies; cold work steel, water hardened.

MOTOR 07S
M-1410, 1.85 C, 11 Cr, 0.10 Ni, 0.25 V, bal Fe
For gages, guide rolls, impact extrusion dies, air or oil hardened, non-deforming

MOTOR 08S.
M-1410, 1.4 C, 14 Cr, 0.3 Ni, 0.65 Mo, 3.2 Co, bal Fe.
For rim rolling dies, shears, extrusion dies; oil or air hardened, non-deforming.

MOTOR 09B
M-1410, 0.90 C, 1 Mn, 0.5 Cr, 1.25 W, bal Fe.
For blanking and drawing dies; oil hardened, non-deforming.

MOTOR 12S.
M-1410; 0.3 C, 4 Cr, 8.5 W, 0.4 Si, 0.3 Mn, bal Fe
For extrusion and forming dies, air or oil hardened, hot work steel.

MOTOR 14S
M-1410; 2.0 C, 14 Cr, 0.9 Ni, 0.35 V, 0.35 Mn, bal Fe.
For impact extrusion dies, gages, lamination dies, oil hardened, non-deforming

MOTOR 21SW.
M-1410, 1.15 C, 1 Mn, 1 Cr, 0.25 V, 1.35 W, bal Fe
For blanking and drawing dies, shears, hobs; oil hardened, non-deforming.

MOTOR 23S.
M-1410, 2.25 C, 12 Cr, 0.35 V, 0.35 Mn, bal Fe
For lamination and blanking dies, gages, punches, oil hardened, non-deforming.

MOTOR 24S
M-1410, 0.27 C, 6 Cr, 2.5 Ni, 8 W, 0.25 Mo, bal Fe
For extrusion dies, die casting dies; oil hardened, hot work steel.

MOTOR 25B.
M-1410, 1.0 C, 3 Mn, 1 Cr, 1 Mo, bal Fe.
For punches, shares, blanking and drawing dies; air hardened, abrasion resistant.

MOTOR 25S
M-1410; 0.27 C, 4.25 Ni, 6.75 W, 0.20 Mo, 0.30 Si, bal Fe
For extrusion mandrels and dies; hot work steel, air or oil hardened.

MOTOR 53S.
M-1410, 0.37 C, 5 Cr, 0.37 V, 1.5 Mo, 1 Si, bal Fe
For Al and Mg die casting dies; resists abrasion and erosion.

MOTOR 58S.
M-1410, 0.32 C, 5 Cr, 0.25 V, 1 W, 2 Mo, 1 Si, bal Fe.
For extrusion and forming dies for nonferrous metal; air hardened, hot work steel.

MOTOR B.C.C.
M-1410; 0.42 C, 1.15 Cr, 2.25 W, 1 Si, 0.25 Mn, bal Fe.
For heading and piercing dies, shear blades; hot work steel, oil hardened.

MOTOR B.C.D.37.
M-1410; 0.37 C, 1.15 Cr, 0.2 V, 2.25 W, bal Fe.
For pneumatic tools, chipping chisels; shock resistant, non-tempering

MOTOR MAGNUS.
M-1410, 0.80 C, 4 Cr, 1.4 V, 6 W, 5.5 Mo, bal Fe.
For drills, reamers, hobs, broaches, shear blades; high speed steel.

MOTOR MAXIMUM.
M-1410, 0.75 C, 4.5 Cr, 1.2 V, 18 W, bal Fe.
For die casting dies, bushings, ejectors; high speed steel.

MOTOR SPECIAL.
M-1410; 0.70 C, 4 Cr, 14 W, bal Fe.
For drills, slitters, shear blades, chisels; high speed steel.

MOTUF.
M-140, 1.0 C, 3.75 Cr, 2.1 V, 1.75 W, 8.75 Mo, bal Fe.
Hardened. C 65-66 Rock.
For broaches, burnishing tools, reamers, milling cutters, counterbores, taps, end mills, roll turning tools.
Type M-7 high-speed steel. High wear resistance and high red-hardness

MO-TUNG.
M-114, M-39; 0.65-0.85 C, 0.2-0.35 Mn, 7.5-8.5 Mo, 1.5 W, 3.75-4.5 Cr, 1.0-1.25 V, bal Fe
For high speed steel cutting tools, reamers, broaches, drills, lathe tools, high speed steel.

MOTUNG 6-6
M-1, 0.7 C, 6 Mo, 6 W, 4 Cr, V, bal Fe.
For lathe and planer tools, drills; high speed steel.

Mo-TUNG 652
M-114, 0.8 C, 4 Cr, 2 V, 5 Mo, 6.5 W, bal Fe.
For lathe and planer tools, drills, form cutters, hot punches; high speed steel.

MOTUNG-CV
M-114; 1.0 C, 8.75 Mo, 1.75 W, 4.0 Cr, 2.0 V, bal Fe
Hardened: C 64-66 Rock.
For cutters, drills, reamers, end mills, slotting saws, routers, wood working tools, milling cutters Good wear resistance.
AISI-M7 High speed steel

MOTUNG P & D.
M-114; 0.74 C, 8.7 Mo, 1.65 W, 1.15 V, 4 Cr, bal Fe.
Annealed: 228 Brin
For trim dies; cavity punches; high speed steel, oil hardened.

MOULIMPHY.
M-104; C, alloy, bal Fe.
For glass rolls and molds.

MOUREY WHITE GOLD.
Eng.; 50 Au, 35 Ag, 15 Pd.
For jewelry; corrosion resistant.

MOUSSETS SILVER.
Eng.; 27.5 Ag, 59.5 Cu, 9.5 Zn, 3.5 Ni.
For instruments and cheap jewelry; corrosion resistant.

MOVA.
M-56; 0.2 C, 0.25 Si, 0.5 Mn, 0.7 Mo, 0.25 V, bal Fe.
For jet engine components, turbine rotor blades; heat resistant.

MO-VAN.
M-38; 0.85 C, 4 Cr, 1.75 V, 7.5 Mo, bal Fe.
For tools, cutters, reamers; high speed steel.

MOW.
M-459; C, Ni, Mo, bal Fe.
Water treated· 101,000-121,000 TS; 85,000-107,000 YS; 20-17 El
For gears, shafts; oil or water hardening.

MP35N.
M-522, M-1439, M-73; 35 Ni, 35 Co, 20 Cr, 10 Mo.
Ht. Tr · 286,300 TS; 225,000 YS; 11 El; 39 RA.
Annealed: 146,000 TS; 61,000 YS, 70 El; B 100 Rock
For high strength fasteners, bolts, aircraft and spacecraft components, steam turbine parts.
Corrosion resistant, high fatigue strength.

M P.M.-3 C-STEEL.
M-38; 0.3-0.4 C, 1.6-1.9 Mn, bal Fe.
Annealed· 100,000 TS; 60,000 YS, 19 El, 50 RA; 250 Brin.
As rolled: 113,000 TS, 77,000 YS, 22 El; 57 RA; 228 Brin.
For gears, wheels, castings, axles, drive shafts, steering arms, tough, pearlitic.

MRL-A8
M-1719; 6-8 Mg, 0.5 max Si, 0.5 max Fe, 0.35 max Mn, 0.25 max Cu, 0.05-0.30 Cr, 0.20 max Zn, 0.001-0.05 B, 0.02 max Be, 0.015 max Ti, bal Al.
O cond 50,000 TS; 22,000 YS, 25 El.
H38· 69,000 TS, 54,000 YS; 10 El.
Good forming prop ; especially good corrosion resistance, including marine atmosphere
AA-X5090.

MRL-A11.
M-1719; 0.6-0.9 Si, 0.7 max Fe, 0.4-0.6 Mg, 0.25 max Zn, 0.2 max Cu, 0.15 max Ti, 0.05-0.15 Mn, 0.05-0.15 Cr, 0.05-0.15 Zr, bal Al
T5 38,000 TS, 35,000 YS, 8 El
Good impact strength 20-60 V-notch Charpy, generally above 30 ft lb
For highway guard rails, semi-hollow type. Hardenable.

MS-6
M-Switzerland; 1.0 C, 9 Cr, 6 Co, 1.5 Mo, bal Fe.
Hardened: C 60-64 Rock.
For permanent magnets, in magnetic and electrical equipment. Hardened High permeability.

MS-15.
M-Switzerland; 1.0 C, 15 Co, 9 Cr, 1.5 Mo, bal Fe.
Hardened: C 60-64 Rock.
For permanent magnets in magnetic and electrical equipment.
Hardened. High permeability.

MS-35.
M-Switzerland; 0.9 C, 35 Co, 6 Cr, 5 W, bal Fe.
For permanent magnets in magnetic and electrical equipment.
Hardened: High permeability.

MS-250.
M-1619; 0.03 max C, 16.0-17.5 Ni, 9.5-11.0 Co, 4.4-4.9 Mo, 0.05-0.15 Al, 0.15-0.45 Ti, 0.03 max Zr, 0.005 max B, bal Fe.
Heat Treated: 275,000 TS; 263,000 YS; 6 El; 16 RA.
For compressor rotors, high impact pressure devices.
High strength and ductility Maraging cast alloy steel.

MSA.
M-459; 0.8 C, 0.3 Mn, 0.6 W, bal Fe.
For dies, drills, taps, water hardening.

MS ALLOY
Japan, 30-60 Ni, 1-18 Cr, bal Fe
For magnetic shunts, magnetically soft

M S BRONZE.
M-1068, 96 Cu, 3.5 Sn, 0.25 P.
For springs, for watches.

MSM 3Al-2½V.
M-1229, 3 Al, 2.5 V, bal Ti
Heat treated· 120,000 TS; 105,000 YS, 15 El; 47 RA, 140 Brin.
Annealed· 56,000 TS; 48,000 YS; 16 El.
For aircraft and missile components; age-hardenable, good weldability

MSM185
M-1229, Ti alloy
Heat treated· 260,000 TS
For aircraft and missile components; age-hardenable, good weldability.

M S M ALLOY
M-365, 0.5 C, 0.7 Mn, 1.8-2.0 Si, 0.25 Mo, bal Fe
For shear blades, chisels, punches; tough

MSO
M-459; 0.9 C, 2 Mn, 0.1 V, bal Fe
For blanking dies, profile rollers; nondeforming, oil hardened.

MSR-A
M-106, 1.2-2.0 Rare Earth, 2.0-3.0 Ag, 0.4-1.0 Zr, bal Mg
Heat treated 34,800-41,500 TS, 22,400-28,000 YS; 4.8 El, 65-80 Brin
High strength magnesium alloy
Aircraft DTD 5025 (England)

MSR-B
M-106, 2.0-3.0 Rare Earth, 2.0-3.0 Ag, 0.4-1.0 Zr, bal Mg
Heat treated 34,800-41,500 TS, 24,700-30,200 YS; 2-4 El, 78-85 Brin
High strength magnesium alloy
AIRCRAFT DTD 5035 (England).

MST alloys see RMI alloys

M/S VENUS
M-1260; 83.5 Sn, 8 Sb, 6.5 Cu, 2 Pb.
Cast 17,100 TS; 31 Brin.
For diesel engine bearings; M P 355-710°F; wear resistant.

MT-6 see DARWIN MT6.

MT-17.
Eng , 0.07 C, 1.5 Mn, 21 Cr, 30 Ni, 21 Co, 3 Mo, 2.2 W, 1.6 Ti, bal Fe.
For high temperature applications; heat resistant.

MTR
M-1180; 0.13 C, 0.65-0.95 Mn, 0.4-0.7 Cr, 0.25 Cu, 0.4-0.6 Mo, 1.1-1.6 Ni, 0.04-0.10 V, bal Fe

Plate: 107,000-135,000 TS; 78,000 min YS; 13 min El.
For pressure vessels, bridges, mine cars, power shovels, cranes, trucks, trailers
Shock and wear resistant.

MTS4-Cr.
M-459, 0.2 C, 12.5 Cr, 1.1 Mo, 0.25 V, 0.5 W, bal Fe
For surgical and dental instruments, corrosion resistant

MT-STEEL.
M-1566, 8 Al, 2 C, 0.20 max Si, 0.6 Co, bal Fe.
Heat treated. Br = 5000 gauss, H_c = 200 Oersted
For electrical and magnetic equipment.
Permanent magnet Quenched and tempered for max magnetic properties

MUELLER 14S see MUELLER 2014.

MUELLER 17S see MUELLER 2017.

MUELLER 200 see MUELLER 3770

MUELLER 201 see MUELLER 3600.

MUELLER 203 see MUELLER 4640

MUELLER 204 see MUELLER 4851.

MUELLER 207 see MUELLER 4850.

MUELLER 210 see MUELLER 4643

MUELLER 211 see MUELLER 3771

MUELLER 212 see MUELLER 3450

MUELLER 213 see MUELLER 3801

MUELLER 214 see MUELLER 1100

MUELLER 214A see MUELLER 1220.

MUELLER 215 see MUELLER 9370

MUELLER 216 see MUELLER 9380

MUELLER 217 see MUELLER 8386

MUELLER 218 see MUELLER 8360

MUELLER 220 see MUELLER 9050.

MUELLER 221 see MUELLER 9220

MUELLER 224C see MUELLER 6230

MUELLER 224E see MUELLER 6180.

MUELLER 224H see MUELLER 6240.

MUELLER 224K see MUELLER 6300.

MUELLER 232 see MUELLER 9030

MUELLER 241A see MUELLER 6750.

MUELLER 241W see MUELLER 6780

MUELLER 245 see MUELLER 4820

MUELLER 246 see MUELLER 3602.

MUELLER 248 see MUELLER 3530

MUELLER 262 see MUELLER 9230.

MUELLER 270 see MUELLER 9340.

MUELLER 271 see MUELLER 8420.

MUELLER 272 see MUELLER 8440

MUELLER 314 see MUELLER 3406.

MUELLER 515 see MUELLER 7986

MUELLER 600 see MUELLER 6741.

MUELLER 601 see MUELLER 6680.

MUELLER 602 see MUELLER 6730.

MUELLER 603 see MUELLER 6731.

MUELLER 604 see MUELLER 6732.

MUELLER 605 see MUELLER 6733.

MUELLER 721 see MUELLER 6700.

MUELLER 799 see MUELLER 1450.

MUELLER 800 see MUELLER 6550.

MUELLER 802 see MUELLER 6390.

MUELLER 803.
M-266, 2.4-4.0 Si, 1.5-4.0 Fe, 1.5-4.0 Zn, bal Cu.
Annealed: 56,000-68,000 TS; 20,000-32,000 YS; 40-30 El; 89 120 Brin
For jet engine parts, anti-friction roller bearing cages; non-galling, corrosion resistant.

MUELLER 902 see MUELLER 1920.

MUELLER 1020
M-266, 99.95 Cu, 0.04 O_2.
Half Hard: 53,000 TS, 46,000 YS; 5 El; F 90 Rock.
Soft: 32,000 TS; 10,000 YS; 40 El; F 35 Rock.
For high conductivity tubing and forgings.
CDA 102, Formerly Mueller 2140F.
Oxygen Free-High Conductivity Copper.

MUELLER 1100
M-266, 99.9 Cu, 0.04 Oxy.
Hard Rod. 48,000 TS; 44,000 YS, 16 El; F 87 Rock
For trolley wire, cables, conductors; connectors, terminals, fittings, pipes
Tough pitch copper. CDA 110, Formerly Mueller 214 ETP

MUELLER 1220.
M-266; 99.90 Cu, 0.015-0.040 P.
Annealed 32,000 TS, 10,000 YS, 45 El, F 40 Rock.
Hard Drawn 55,000 TS, 50,000 YS, 8 El; B 60 Rock
For air conditioners, refrigerators, kettles, oil coolers, rotating bands.
Phosphorus deoxidized copper.
CDA 122 Formerly Mueller 214 DHP.

MUELLER 1470.
M-266, 0.3 S, bal Cu.
Sulphurized copper.
Half hard 43,000 TS; 40,000 YS; 18 El; 42 Rb.
Hard 48,000 TS; 46,000 YS; 13 El; 50 Rb.
96% conductivity, 85% machinability.
Free machining copper, for screw machined parts requiring properties similar to copper.
CDA No. 147 Was Mueller 771W.

MUELLER 1820
M-266, 1 Cr, 0.02 Si, bal Cu.
Heat treated 78,000 TS; 70,000 YS; 13 El; B 80 Rock.
For resistance welding tips, holders and wheels.
CDA 182 and 184 Formerly Mueller 902.
Heat treatable High strength

MUELLER 2014
M-266; 4.4 Cu, 0.8 Mn, 0.4 Mg, 0.8 Si, bal Al.
Heat treated: 70,000 TS, 60,000 YS; 14 El, 140 Brin
For hardware; forging alloy.

MUELLER 2017
M-266, 4 Cu, 0.5 Mn, 0.5 Mg, 0.75 Si, bal Al.
Heat treated 60,000 TS; 37,500 YS; 22 El; 105 Brin
For hardware; forging alloy.

MUELLER 3406.
M-266, 1 Pb, 65 Cu, bal Zn.
HH Temper: 58,000 TS; 45,000 YS, 30 El; B 70 Rock.
For cold headed fasteners, hardware, marine hardware.
CDA 340. Formerly Mueller 314.
Leaded Brass, good machinability.

MUELLER 3450.
M-266; 2 Pb, 62.5 Cu, bal Zn.
¼ Hard· 53,000 TS; 35,000 YS; 35 El; B 68 Rock.
For thread rolled fasteners, marine hardware.
CDA 345. Formerly Mueller 212.
Leaded Brass, good cold workability.

MUELLER 3470.
M-266; 63 Cu, 1.5 Pb, bal Zn.
Medium leaded brass.
¼ H: 55,000 TS; 35,000 YS; 30 El; 68-70 Rb.
Thread rolling brass; good machining and cold working characteristics. 85% machinability.
CDA No. 347. Formerly Mueller 312.

MUELLER 3500.
M-266; 61.7 Cu, 1.0 Pb, bal Zn
Thread rolling brass.
¼ Hard: 53,000 TS; 35,000 YS; 35 El, 70 Rb.
For roll threaded brass parts.
CDA No. 350. Formerly Mueller 251

MUELLER 3530.
M-266; 36.25 Zn, 2.75 Pb, bal Cu.
Cast.
For screw machine products; commercial brass

MUELLER 3600.
M-266; 3 Pb, 61.5 Cu, bal Zn
HH Temper: 60,000 TS; 45,000 YS; 25 El; B 72 Rock.
Hard Temper: 75,000 TS, 55,000 YS; 10 El; B 78 Rock.
For screw machine products, fasteners, bearings, bushings
CDA 360 Formerly Mueller 201.
Leaded brass, free-cutting

MUELLER 3602.
M-266; 2.75 Pb, 61 5 Cu, bal Zn
¼ Hard: 55,000 TS, 40,000 YS, 25 El; B 68 Rock.
For fasteners, marine hardware.
CDA 360. Formerly Mueller 246
Leaded brass, free-cutting

MUELLER 3770.
M-266, 1.5-2 5 Pb, 58-61 Cu, 0.3 max Fe, bal Zn
Forgings· 50,000-60,000 TS; 20,000-25,000 YS; 40-50 El, B 40-60 Rock.
Extruded: 58,000 TS, 23,000 YS; 42 El, B 48 Rock
For hardware, valve bodies, automobile parts, plumbing fittings.
Brass forging alloy. Formerly Mueller 200

MUELLER 3771
M-266, 2 Pb, 60 Cu, bal Zn.
Forged: 58,000 TS; 23,000 YS, 42 El; B 48 Rock
For forged hardware, shafts, fasteners.
CDA 377 Formerly Mueller 211.
Leaded forging brass

MUELLER 3801
M-266; 2 Pb, 56 Cu, bal Zn.
Forged: 65,000 TS; 30,000 YS; 15 El; B 60 Rock.
For forged hardware, fasteners.
Formerly Mueller 213.
Leaded forging brass

MUELLER 4001.
M-266; 57.5 Cu, 2.4 Sn, 0.2 Si, bal Zn.
Welding rod, low fuming.
Melting point, liquidus: 1635°F.
For welding brass and bronze.
Was Mueller 237.

MUELLER 4620.
M-266; 62-65 Cu, 0.5-1.0 Sn, bal Zn.
HH Temper: 65,000 TS; 45,000 YS; 30 El; B 72 Rock.
For fasteners, bolts, marine hardware, rivets, clamps, connectors.
Corrosion resistant. Naval Brass.
CDA 462. Formerly Mueller 308.

MUELLER 4640.
M-266; 0.75 Sn, 60.5 Cu, bal Zn.
Forged: 64,000 TS; 26,000 YS; 40 El; B 55 Rock.
Hard. 75,000 TS; 60,000 YS; 20 El, B 80 Rock.
For marine products, gears, valve stems, light bearings, screw machine products.
Naval Brass.
CDA 464 Formerly Mueller 203.

MUELLER 4643.
M-266; 60 Cu, 0.3 max Pb, 0.75 Sn, bal Zn.
½ H-temper: 68,000 TS, 45,000 YS; 22 El; 150 Brin.
Soft: 54,000 TS, 22,000 YS; 40 El; 83 Brin.
For propeller shafts, gears, bolts, screw machine products, Tobin Bronze.

MUELLER 4700.
M-266, 58 5 Cu, 0 9 Sn, bal Zn
Naval brass welding rod
Melting point, liquidus: 1640°F.
For welding bronzes, brasses, and for braze welding steel and cast iron
CDA No. 470. Formerly Mueller 228.

MUELLER 4701
M-266, 59 6 Cu, 0 75 Sn, bal Zn
Naval brass welding rod
Melting point, liquidus. 1640°F.
For welding bronzes, brasses and for braze welding steel and cast iron.
CDA No 470 Formerly Mueller 234.

MUELLER 4820
M-266, 0 75 Pb, 0 75 Sn, 60 5 Cu, bal Zn
Forged 60 000 TS, 30,000 YS 40 El, B 55 Rock
Hard· 70,000 TS, 48,000 YS, 30 El, B 78 Rock.
For marine parts, gears, screw machine products.
Leaded Naval Brass, free-turning
CDA 482 Formerly Mueller 245

MUELLER 4850
M-266, 2 Pb, 0 75 Sn, 60 5 Cu, bal Zn
HH Temper 65,000 TS; 48,000 YS, 15 El; B 72 Rock
For marine products, gears, valve stems, light bearings, screw machine products
Leaded Naval Brass
CDA 485 Formerly Mueller 207.

MUELLER 4851
M-266, 2 Pb, 0 75 Sn, 59 5 Cu, bal Zn
Forged 62,000 TS, 24,000 YS, 40 El, B 55 Rock.
For light bearings, forged hardware.
CDA 485 Formerly Mueller 204.
Leaded Naval Brass, free-cutting.

MUELLER 6140.
M-266; 90.5 Cu, 2 Fe, 7.5 Al.
Aluminum bronze.
Drawn. 88,000 TS, 52,000 YS; 35 El, 85 Rb.
High strength, good ductility bronze for shafts, and various load carrying sliding parts.
Non-heat treatable.
CDA No. 614. Formerly Mueller 224-7.

MUELLER 6162
TUF-STUF ALUMINM BRONZE
M-266; 90 Cu, 1 Fe, 9 Al.
½ Hard· 82,000 TS; 50,000 YS; 30 El; 175 Brin (1000 kg)
Forged. 75,000 TS; 36,000 YS; 20 El; 140 Brin (1000 kg).
High strength, heat treatable bronze for shafts and other sliding parts.
CDA No. 617. Formerly Mueller 224 E-30.

MUELLER 6180.
M-266; 10 Al, 1 Fe, 89 Cu.
HH Temper: 100,000 TS; 65,000 YS; 16 El; 208 Brin.
For gears, valve parts, worm wheels, marine hardware.
Aluminum Bronze, corrosion resistant.
CDA 617. Formerly Mueller 224 E-75.

MUELLER 6230.
M-266; 88 Cu, 3 Fe, 9 Al.
HH Temper: 95,000 TS; 62,000 YS; 9 El; 185 Brin.
Forged: 84,000 TS; 40,000 YS; 40 El; 135 Brin.
For gears, worm wheels, marine hardware, shafts.
Aluminum Bronze. Not heat treatable.
CDA 616. Formerly 224C.

MUELLER TUF-STUF 6240.
M-266; 86 Cu, 11 Al, 3 Fe.
Forged· 80,000 TS, 45,000 YS, 10 El; 170 Brin.
Heat treated: 95,000 TS; 70,000 YS; 3 El, 200 Brin.
For valve seat inserts, gears, worm wheels, forging alloy, heat treatable; "Tuf-Stuf H."

MUELLER 6246.
M-266; 85.5 Cu, 3.6 Fe, 10.6 Al.
Aluminum bronze, heat treatable.
Ext: 100,000 TS; 50,000 YS, 7 El; 195 Brin (3000 Kg)
Moderately high strength aluminum bronze, possessing excellent corrosion and high temperature properties.
CDA No 616 Formerly Mueller 224-11.

MUELLER 6250
M-266, 82.8 Cu, 4.3 Fe, 12.9 Al
Aluminum bronze.
Ext 105,000 TS, 65,000 YS, 1 5 El, 285 Brin; (3000 kg)
Heat treatable, good strength, very good wear resistance, for gears, worm wheels, wear plates.
Formerly Mueller 224-13

MUELLER 6300.
M-266, 5 Ni, 1 Mn, 10 Al, 3 Fe, 81 Cu.
Annealed 120,000 TS, 75,000 YS, 15 El, 241 Brin.
Heat treated. 114,000 TS, 66,000 YS, 15 El, 223 Brin
For gears, aviation landing gears, shafts, marine hardware.
Aluminum Bronze, heat treatable.
CDA 628. Formerly Mueller 224K

MUELLER 6390.
M-266; 7 Al, 2 Si, 91 Cu
Hard 98,000 TS; 65,000 YS; 25 El, B 95 Rock.
Forged: 75,000 TS, 35,000 YS; 45 El; B 85 Rock.
For nuts, bolts, pole line hardware.
Aluminum Bronze, corrosion resistant.
CDA 639. Formerly Mueller 802.

MUELLER 6391.
M-266, 91 Cu, 6.7 Al, 1.9 Si.
Aluminum silicon bronze
Hard: 85,000 TS, 45,000 YS, 40 El, 84 Rb.
As forged· 75,000 TS; 35,000 YS; 45 El; 80 Rb.
Machinability 50%.
Free turning, good strength, non-magnetic, corrosion resistant; for shafts, nuts, bolts, pole line hardware.
CDA No. 639. Formerly Mueller 808.

MUELLER 6550
M-266; 2.8-3.8 Si, 0.05 max Pb, 1.5 max Zn,, 0.6 max Ni, 1.5 max Mn, bal Cu.
Bar: 52,000 TS; 20,000 YS, 60 El; B 50 Rock.
For marine hardware, fasteners, screws, bolts, diaphragms.
CDA 655. Formerly Mueller 800.
Silicon Bronze, corrosion resistant.

MUELLER 6680.
M-266; 60.5 Cu, 1 Si, 2.5 Mn, bal Zn.
HH Temper· 70,000-85,000 TS; 40,000-65,000 YS; 15-25 El; 70-87 Rock.
For bearings, gears, connecting rods, marine hardware.
Bearing Bronze Ductile.
Formerly Mueller 601.

MUELLER 6700.
M-266; 3 Fe, 5 Al, 4 Mn, 64 Cu, bal Zn.
Soft· 90,000 TS, 50,000 YS; 20 El, B 84 Rock.
Hard: 124,000 TS; 72,000 YS; 18 El; B 95 Rock.
For rollers, rotors, valve stems
Manganese Bronze, shock resistant.
CDA 670. Formerly Mueller 721B.

MUELLER 6701
M-266; 3 Fe, 5 Al, 4 Mn, 64 Cu, bal Zn.
HH Temper 112,000 TS; 67,000 YS, 13 El; B 94 Rock.
For rollers, rotors, valve stems
Manganese Bronze, shock resistant.
CDA 670. Formerly Mueller 721E.

MUELLER 6702
M-266, 64 Cu, 3 Fe, 5 Al, 4 Mn, bal Zn.
Forged 115,000 TS; 67,000 YS, 18 El; B 95 Rock.
For rotors, rollers, valve stems.
Manganese Bronze, shock resistant.
CDA 670. Formerly Mueller 721X.

MUELLER 6730
M-266, 1 0 Pb, 2 5 Mn, 1.0 Si, 60 5 Cu, bal Zn.
HH-Temper: 70,000-85,000 TS; 40,000-65,000 YS; 15-25 El, B 70-87 Rock
For gears, sleeve and thrust bearings, bushings, cams, marine hardware.
Good bearing characteristics. Formerly Mueller 602.

MUELLER 6731.
M-266, 59 75 Cu, 1 Pb, 1 Si, 2 5 Mn, bal Zn.
Heat treated 75,000 TS; 45,000 YS; 20 El; 82 Rock
For gears, hydraulic pump cylinder liners, bushings, bearings
Bearing Bronze, free-cutting.
CDA 673 Formerly Mueller 603.

MUELLER 6732.
M 266; 61 5 Cu, 2 5 Pb, 1 Si, 2 5 Mn, bal Zn
HH Temper: 65,000-80,000 TS; 40,000-60,000 YS; 10 20 El, 75-86 Rock B.
For bearings used against soft or hard mating surfaces.
Bearing Bronze. Can be soldered.
CDA 673. Formerly Mueller 604.

MUELLER 6733.
M-266, 62 Cu, 0.6 Pb, 1 Si, 2.5 Mn, bal Zn
HH Temper: 70,000-75,000 TS; 45,000-55,000 YS; 18-25 El, 75-82 Rock.
For bearings mating with soft or hard members.
Bearing Bronze, readily cold worked.
CDA 673. Formerly Mueller 605.

MUELLER 6741.
M-266; 58 Cu, 1 Si, 1.5 Al, 2.5 Mn, bal Zn.
HH Temper 68,000-100,000 TS, 34,000-65,000 YS; 12-18 El; B 78-88 Rock.
Forged. 68,000 TS, 34,000 YS; 18 El; B 78 Rock.
For bearings against hardened surfaces, bushings, connecting rods, hardware.
Bearing Bronze, corrosion resistant.
CDA 674. Formerly Mueller 600.

MUELLER 6750.
M-266; 59 Cu, 1 Sn, 1 Fe, 0.25 Mn, bal Zn.
Hard: 83,000 TS; 56,000 YS; 20 El; B 80 Rock.
Forged: 68,000 TS; 35,000 YS, 27 El; B 65 Rock.
For screw machine products, valve stems, airplane parts, balls.
Manganese Bronze, corrosion resistant.
CDA 675. Formerly Mueller 241A.

MUELLER 6780.
M-266; 57 Cu, 1 Fe, 1 Al, 0.25 Mn, bal Zn.
Forged: 80,000 TS; 29,000 YS; 35 El; 130 Brin.
For counterweights for airplane engine crankshafts.
Manganese Bronze. Formerly Mueller 241W.

MUELLER 6800.
M-266; 58.5 Cu, 0.4 Fe, 0.9 Sn, 0.3 Mn, 0.5 Ni, bal Zn.
Welding rod, low fuming
Melting point, liquidus: 1650°F.
For braze welding of steel and cast iron and for surfacing.
CDA No. 680. Formerly Mueller 227.

MUELLER 6801.
M-266; 59.0 Cu, 0.4 Fe, 0.75 Sn, 0.2 Mn, 0.3 Ni, bal Zn.
Welding rod, low fuming.
Melting point, liquidus. 1650°F.
For braze welding of steel and cast iron and for surfacing.
CDA No 680. Formerly Mueller 235.

MUELLER 6810.
M-266, 58.0 Cu, 0.6 Fe, 0.9 Sn, bal Zn.
Welding rod, low fuming
Melting point, liquidus· 1650°F
For welding brass and bronze, braze welding steel and cast iron, and surfacing
CDA No. 681 Formerly Mueller 236

MUELLER 6940.
M-266, 80-83 Cu, 0.3 max Pb, 3.5-4.5 Si, bal Zn.
Rod: 90,000 TS; 57,000 YS; 38 El.
For valve stems.
Silicon Red Brass, corrosion resistant.
CDA 694.

MUELLER 6970
M-266; 77 Cu, 1 Pb, 3 Si, bal Zn
Silicon brass.
¼ hard. 80,000 TS; 46,000 YS; 42 El, 82 Rock B
For shafts, bolts, nuts, cap screws, screw machine parts; good machinability and corrosion resistance, valve stem alloy.
CDA No. 697. Formerly Mueller 804

MUELLER 7986.
M-266; 46 Cu, 10 Ni, 2.5 Pb, 0.25 Mn, bal Zn
Forged: 70,000 TS; 42,000 YS, 30 El; 120 Brin.
For hardware, faucets, fixtures; forging alloy, nickel silver; "Niag 515"

MUELLER 8360.
M-266; 83 Cu, 6 Pb, 4 Sn, 7 Zn.
Cast: 30,000 TS; 15,000 YS; 20 El; 55 Brin
For water pump impellers, fittings for gasoline and oil lines, bushings, miscellaneous castings.
Formerly Mueller 218 cast alloy.

MUELLER 8386.
M-266; 85 Cu, 5 Pb, 5 Zn, 5 Sn.
Cast: 35,000 TS; 15,000 YS; 23 El; 62 Brin.
For water pump impellers, fittings for gasoline and oil lines, bushings, miscellaneous castings
Red Brass, good castability and machinability.

MUELLER 8420.
M-266; Cu alloy, 80 Cu, 10 Zn, 5 Sn, 3 Pb.
For screw pipe fittings, hardware; free-cutting, cast.

MUELLER 8440.
M-266; 80 Cu, 7 Pb, 3 Sn, 0.5 Ni, 9.5 Zn.
Cast· 34,000 TS; 15,000 YS; 24 El; 55 Brin.
For bronze backing of lined bearings, bushings.
Good embeddability, corrosion resistant.
Was Mueller 272.

MUELLER 9030.
M-266; 88 Cu, 4 Zn, 8 Sn
Cast 38,000 TS, 18,000 YS; 15 El; 75 Brin
For bearings, bolts, nuts, gears; modified "G-Metal", wear resistant

MUELLER 9050.
M-266; 88 Cu, 2 Zn, 10 Sn.
Cast· 38,000 TS; 18,000 YS; 15 El; 75 Brin.
For bearings, bolts, nuts, gears, pump pistons; "G Metal" or gun metal, wear resistant.

MUELLER 9220.
M-266, 88.75 Cu, 1.5 Pb, 3.75 Zn, 6 Sn
Cast· 34,000 TS, 18,000 YS; 25 El, 67 Brin.
For steam pressure castings, gears, bushings, oil pumps, "Steam or Valve Bronze," "M"-Bronze

MUELLER 9230
M-266; 8 Sn, 1 Pb, bal Cu.
Cast
For bearings, bushings, bronze, free-cutting.

MUELLER 9340
M-266, 8 Sn, 8 Pb, bal Cu
For bushings, bearings; cast.

MUELLER 9370
M-266, 80 Cu, 10 Pb, 10 Sn
Cast 30,000 TS, 10,000 YS, 10 El, 68 Brin.
For bushings, bearings, castings, acid resistant

MUELLER 9380
M-266, 78 Cu, 15 Pb, 7 Sn.
Soft. 25,000 TS, 17,000 YS, 14 El, 100 Brin
For bearings, mine water pump parts; for moderate pressures, bearing bronze

MUFLEX
M 237, iron-invar
For thermostatic bimetal, high-iron, low-invar

MULTI-ALLOY
Eng., 0.25 C, 46.5 Ni, 20.5 Cr, 2.7 Mo, 3.3 Co, 1.2 Ti, 2.9 Cb, 3.5 W, bal Fe
For gas turbine parts, heat resistant

MULTICUT
M 97, 0.15 max C, 1.20 max Mn, 0.04-0.09 P, 0.24-0.35 C, 0-0.35 Pb, Se, bal Fe
Cold finished bar 78,500 TS, 15 El; 50 RA; 183 Brin
For screw machine products, fasteners, screws, bolts, shafts
Free-machining, tough

MULTIMET
M-167, 0.2 max C, 18-22.5 Cr, 18-22 Ni, 2.75-3.75 Mo, 2-3 W, 18-22 Co, 0.75-1.5 Cb, 0.1-0.2 N, bal Fe
Cast· 83,000 TS, 55,000 YS; 12 El, 14 RA
Forged 110,000-140,000 TS; 30-15 El; 48-45 RA.
For turbine blading, jet and combustion chambers, welding rod, high heat resistant.

MULTIMOLD.
M-24; 0.35 C, 0.70 Mn, 0.80 Cr, 0.30 Mo, bal Fe.
For plastic mold dies, die casting dies; oil hardened.

MULTIPHASE-MP20N
M-1439, 20 Ni, 50 Co, 20 Cr, 10 Mo.
Heat treated: 290,000 TS; 260,000 YS, 10 El, 36 RA.
Annealed 145,000 TS, 60,000 YS; 70 El, B 91-107 Rock.
For high strength bolts and fasteners
High fatigue strength. Corrosion resistant.

MULTIPHASE-MP35N.
M-1439, M-73, M-522, 35 Ni, 35 Co, 20 Cr, 10 Mo.
Ht. Tr : 286,300 TS; 255,000 YS; 11 El; 39 RA.
Annealed: 146,000 TS; 61,000 YS; 70 El; B 91 107 Rock.
For high strength fasteners, bolts
High fatigue strength Corrosion resistant.
Must be work hardened.

MULTOLE
M-336; 0 6 C, 0 7 Mn, 1 9 Si, bal Fe.
For punches, shear blades, knives, keen edge tools.

MU-METAL.
M-108, 76 Ni, 17 Fe, 5 Cu, 2 Cr
Annealed· 87,000 TS, 43,000 YS
For submarine cable, current transformer; magnetic alloy, high permeability.

MU-METAL
M-108, 74 Ni, 20 Fe, 5 3 Cu, 0 7 Mn
87,000 TS, 43,000 YS.
For submarine cable, current transformer; magnetic alloy.

MUNGOOSE.
M-135, Cu, 12-15 Ni, Zn
For domestic utensils, ornaments, nickel silver

MUNTZ METAL
M-33, 61 Cu, 39 Zn
Annealed. 54,000 TS, 21,000 YS, 45 El
Rolled 80,000 TS, 60,000 YS; 5 El
For trim, brazing rod, valve stems, condenser tubes, high strength

MUNTZ METAL
M 188, 60 Cu, 40 Zn
Cast 48,200 TS. 54 El, 52 RA, 93 Brin.
Hard sheet 80,000 TS, 9 5 El.
For bolts, pins, spindles, wire, condenser tubes; high corrosion resistance

MUNTZ METAL NO 3
M-122, 61 Cu, bal Zn
For forgings, 58,000 TS; 25,000 YS, 45 El; Rockwell B55
For forgings, hardware; yellow brass, high strength

MUNTZ METAL-280
M-8, 60 Cu, 40 Zn
Soft 54,000 TS, 20,000 YS, 45 El
For architecture, trim, perforated sheets, high strength.

MUNTZ PATENTS
Eng , 63-56 Cu, 37-42 Zn, 0 4 Pb
For tubes, hardware, free-cutting

MUNZBRONZE
M 297, 4 Sn, 1 Zn, bal Cu.
Soft. 48,000 TS, 44 El, 68 Brin
Hard 82,000 TS, 5 El, 156 Brin
For chemical plant equipment, corrosion resistant

MUSEX 4-6 CHROME
M 529, C, 3.21 Cr, 0.5 Mo, bal Fe
83,000 TS, 62,000 YS; 26 El; 45 RA.
For welding electrodes; corrosion resistant

MUREX ALTERNEX-A.
M-529, 0.1 C, bal Fe.
Welded 76,400 TS, 66,200 YS; 24 El.
For welding electrodes; for mild steel; Type E-6013

MUREX FILLEX.
M-529, 0.2 C, bal Fe.
Welded: 66,000 TS; 53,000 YS, 28 El.
For welding electrodes; for mild steel; Type E-6020.

MUREX GENEX-M.
M-529; 0 2 C, bal Fe.
Welded: 68,000 TS, 54,000 YS; 28 El.
For welding electrodes; Type E-6012.

MUREX HARDEX 20.
M-529; C, Cr, Mn, bal Fe
For hard surfacing electrodes; for moderate abrasion and high impact; obsolete.

MUREX HARDEX 25.
M-529, 0.2 C, 1 2 Mn, 0.7 Cr, 0 9 Si, bal Fe.
For hard facing electrodes, for moderate abrasion and high impact.

MUREX HARDEX 45
M-529, 0 6 C, 1 4 Mn, 2 7 Cr, 0 8 Si, bal Fe.
For hard facing electrodes, for high abrasion and moderate impact

MUREX MOLEX
M-529, 0 15 C, bal Fe
Welded. 75,000 TS, 62,000 YS; 25 El.
For welding electrodes, for C-Mo steel; Type E-7010 Al

MUREX TYPE FHP
M 529, 0 08-0 13 C, 0 2-0 4 Mn, bal Fe.
Welded 67,000 TS, 56,000 YS; 28 El.
For welding, electrodes, shielded arc; Type E-6020.

MURMANS ALLOY-1
Eng , 72 Al, 15 Zn, 14 Mg
For light alloy parts, non-hardenable

MURMANS ALLOY-2.
Eng , 92 Al, 4 4 Zn, 3 6 Mg
For light alloy parts, non-hardenable

"MUSHET" SELF HARDENING STEEL
M-223, 0 05 P, 0 5 Cr, 2 5 C 0.6 Si, 1 7 Mn, 7 W, bal Fe
For tools, dies, self-hardening

MUSHET STEEL
Japan, 1 5 2 0 C, 4-6 W, 0 25-0 30 Cr, 0 3-0 5 Mn, bal Fe
For tools, dies; cannot be cold worked

MUSIC SPRING
M-120; 0 80 C, 0 25 Mn, 0 25 Si, bal Fe
For springs, Swedish steel

MUSTANG-LC
M-69, 0 65 C, 4 0 Cr, 2 0 V, 6 5 W, 5 0 Mo, bal Fe.
As Quenched C 58 59 Rock.
Tempered 1000°F C 60 61 Rock
For hot forming and swaging dies, nut piercers, hot punches, extrusion dies, forging mandrels, chipper dies.
Good resistance to high temperature softening.
High speed steel. Type H-42.

MUSTANG M 2
M-69, 0 84 C, 4 2 Cr, 6 5 W, 2 V, 5 Mo, bal Fe
For cutting tools, broaches, chasers, drills, hobs, reamers, high speed steel

MUSTANG SPECIAL
M-69, 0 8 C, 6 W, 5 Mo, 4 Cr, 1 V, bal Fe.
For cutters, taps, tools, dies, reamers, drills, discontinued, high speed steel

MUTEMP
M-1417; 70 Fe, 30 Ni.
For compensating shunts for electrical equipment; thermo-sensitive, magnetic.

MUVAR
M-1084, 0 3 Mn, 4 Mo, 16.7 Fe, 79 Ni.
For electrical and magnetic equipment, magnetically soft.

M. V. "C" ALLOY.
M-83; 7.5-13 Si, bal Al.
Sand cast: 18,000-27,000 TS; 10,000-11,000 YS; 15-5 El; 50 Brin.
Chill cast. 22,000-30,000 TS; 10 El.
For airplane and automobile parts, marine parts, tubes; great resistance to atmospheric and sea water corrosion; modified Al-Si alloy.

M.W. METAL.
Eng.; 90-95 Mg, 3-7 Al, 2-5 Zn, 0.5 Mn.
36,000-39,000 TS; 33,000 YS; 16-13 El.
For light alloy parts; age-hardenable.

MY NO. 3.
M-27; 0.5 C, 0.7 Mn, 1 8-2.0 Si, 0.2 Mo, bal Fe.
For tools, chisels; tough.

MYA.
M-363; 0.48 C, 0 3 Mn, 1.45 Si, 1 45 Cr, 0 25 V, bal Fe.
Oil hardening tool steel, shock resisting type.

MY-A-CHROME.
M-363; 0.7 C, 1.0 Cr, bal Fe.
For tools, drills, punches; oil or water hardening.

MYSTIC METAL
Eng ; 89 Pb, 11 Sn, 0.1 Bi.
For solder.

N-3 ALLOY.
M-U.S.; 0.4-0.7 C, 2.0 max Si, 1.5 max Mn, 20-26 Cr, bal Fe.
Cast: 60,000 TS; 40,000 YS; 0-El; 200 Brin.
For furnace parts, grids, combustion chambers
High heat and corrosion resistance.

N-3 METAL.
M-264; 32 Ni, 2.75 Pb, 9.5 Si, 0.75 Mn, bal Cu.
For hardware; free-cutting, corrosion resistant.

N10 (New Bide).
M-1203; Sintered carbide tool material.
For heavy roughing cuts on cast iron, non-ferrous metals and non-metallics.

N18K8M3T.
M-Russia, 0.05 C, 18.3 Ni, 8.5 Co, 3 5 Mo, 0.34 Ti, 0.14 Al, bal Fe.
Ht. Tr.: 300,000 TS; 250,000 YP.
For jet engine and spacecraft components, landing gears, missiles, crimping tools
Maraging steel, tough, shock resistant.

N20 (New Bide)
M-1203, Sintered carbide tool material.
For general purpose machining and milling of cast iron and non-ferrous metals.

N22 (New Bide).
M-1203; Sintered carbide tool material.
For machining of high temperature alloys, non-ferrous and non-metallics.

N30 (New Bide).
M-1203; Sintered carbide tool material.
For semi-finishing and finishing of cast iron non-ferrous and non-metallic materials, and high temperature alloys.

N35K6.
M-Russia; 0.01 C, 35 Ni, 5 Co, 2.3 Ti, 0 2 Cu, 0.4 Si, 0 6 Mn, bal Fe.
Hardened: 142,000 TS.
For electrical equipment, instruments, pumps.
Precipitation hardenable.
Low expansion alloy.

N40 (New Bide).
M-1203; Sintered carbide tool material.
For high speed finishing and precision boring of cast iron, non-ferrous metals and non-metallics.

N50 (New Bide).
M-1203; Sintered carbide tool material.
For heavy duty rough machining and milling of carbon and alloy steels.

N60 (New Bide).
M-1203; Sintered carbide tool material.
For general purpose turning, planning and milling of carbon and alloy steel.

N70 (New Bide).
M-1203; Sintered carbide tool material.
For light roughing and finishing cuts on carbon and alloy steel.

N72 (New Bide).
M-1203; Sintered carbide tool material.
For moderate roughing and finishing of carbon and alloy steels.

N80 (New Bide).
M-1203; Sintered carbide tool material.
For fast finishing and precision boring of carbon and alloy steels.

N-80.
M-884, 0 12 C, 1 5 Mn, 0.2 Mo, bal Fe
Tube 100,000 min TS, 80,000 min YS.
For gas well piping and tubing
Resists sulphide stress corrosion.

N93 (New Met).
M-1203; Sintered carbide tool material.
For normal to high velocity machining of carbon and alloy steels where extra toughness is required

N95 (New Met).
M-1203; Sintered carbide tool material
For normal to high velocity machining of carbon and alloy steel to close tolerance finishes.

N-153 ALLOY.
U S.; 0 35-0 45 C, 1.6 Mn, 15-16 Ni, 15-16 Cr, 1.25-1 75 W, 4 Mo, 11-13 Co, 0.8-1.2 Cb, bal Fe.
Rolled· 176,000 TS, 146,000 YS, 15 El; 30 RA.
For jet engine parts, heat resistant

N-155
M-167; 0 1-0 2 C, 18-22 Ni, 18-22 Cr, 2.5-3.5 Mo, 2-3 W, 0 7-1.2 Cb, 0 1-0 2 N_2, 18-22 Co.
Solution treated: 30,000-50,000 TS.
Aged. 52,000 TS
For jet engine parts, gas turbine blades, ship propulsion blades, heat resistant, similar to "Multiwet "

N-238
England; Ni, Cr
For high temperature applications; heat and corrosion resistant.

NA-1
M-189; 0 10-0 50 C, 28 Cr, 10 Ni, bal Fe
Cast· 85,000 TS; 40,000 YS; 9 El; 10 RA; 200 Brin
For heat and corrosion resistant parts, furnace parts; heat and corrosion resistant to S atw

NA-2.
M-189, 0 35-0 70 C, 15 Cr, 35 Ni, bal Fe
Cast: 70,000 TS; 35,000 YS; 10 El, 10 RA; 175 Brin.
For furnace parts; retorts, heat treating boxes; Type HT; corrosion and heat resistant.

NA-2T.
M-189; 0.4-0.6 C, 36-39 Ni, 16-19 Cr, 1.5 Si, 1.2 Mn, bal Fe.
Cast: 68,000 TS; 40,000 YS; 10 El; 10 RA; 187 Brin.
For high temperature chains and conveyors, heat treating boxes; Type HU; good thermal fatigue.

NA3.
M-189, C, alloy, bal Fe.
For high temperature applications; heat resistant to 2000°F, creep resistant.

NA-4.
M-189; 0.10 max C, 18-20 Cr, 8-10 Ni, bal Fe.
Annealed: 75,000 TS, 35,000 YS, 50 El; 50 RA, 150 Brin.
For cast pipe, chemical plant equipment; Type CF; corrosion resistant

N.A -4A.
M-189; 0.20 C, 20 Cr, 10 Ni, bal Fe
For chemical plant equipment, austenitic, stainless.

NA-4CB.
M-189, 0.10 max C, 18-20 Cr, 8-10 Ni, Cb = 10 × C, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 45 El; 45 RA; 15 Brin
For welded structures, chemical plant equipment; Type CF-8C; stainless, austenitic.

NA-4-M.
M-189; 0.10-0.30 C, 18 Cr, 8 Ni, 3 Mo, bal Fe.
For stainless parts, stainless, corrosion resistant.

NA-6.
M-189; 0.25 C, 25-28 Cr, 12-16 Ni, bal Fe
Cast 85,000 TS; 50,000 YS; 15 El; 15 RA; 175 Brin.
For furnace and oil refinery parts; non-magnetic, high creep resisting to 1800°F.

NA-6A
M-189; 0.2 C, 22-26 Cr, 13-16 Ni, bal Fe
Cast 85,000 TS, 50,000 YS, 15 El, 15 RA, 175 Brin
For furnace and oil refinery parts, pipe, non-magnetic, high creep resistant to 1700°F

NA6LC ALLOY
M-189; C, Ni, Cr, bal Fe
For pickling hooks, hangers, frames, corrosion resistant

NA-7.
M-189; 0.3-0.6 C, 24-30 Cr, 18-22 Ni, bal Fe
Cast 75,000 TS, 50,000 YS, 15 El, 15 RA; 175 Brin
For furnace parts, ACI-HK, nonmagnetic, high creep resistant to 2000°F

NA-12
M-189, 0.15-0.40 C, 11.5-14 Cr, 1 max Ni, bal Fe.
Annealed: 95,000 TS, 65,000 YS, 25 El, 190 Brin.
For glass mold dies, steam turbine parts, valves, pumps, Type CA40, corrosion resistant

NA-18.
M-189; 17 Cr, 0.30 max C, bal Fe
Cast 85,000 TS, 65,000 YS, 200 Brin.
For corrosion resisting parts, corrosion resistant.

NA-19
M-189, 26-19 Cr, 0.50-0.70 C, 3 Ni, bal Fe.
Cast. 65,000 TS, 50,000 YS; 2 El; 2 RA; 175 Brin.
For stainless parts, heat resisting parts, Mg pots, pipe; corrosion resistant; heat resistant; ACI-CCHC.

NA-20.
M-189; 0.5 max C, 26-30 Cr, 4-7 Ni, 0.5 max Mo, bal Fe.
Cast: 85,000 TS; 48,000 YS, 16 El; 190 Brin.
For furnace blowers, copper melting equipment; Type HD; resists flue gases.

NA-22H.
M-189; 0.5 C, 28 Cr, 48 Ni, 5 W, 1.3 Mn, 1 Si, bal Fe.
Cast: 64,500 TS; 3.5 El; 2.7 RA.
At 1800°F: 18,000 TS; 32 El; 48 RA.
For furnace parts, retorts, high temperature equipment; heat and creep resistant to 2200°F.

NA22H.
M-1222; 0.44 C, 46 Ni, 26.3 Cr, 5.3 W, 1.4 Mn, 1 Si, bal Fe.
At 70°F: 64,500 TS; 3.5 El, 2.7 RA.
At 1800°F: 18,000 TS; 32.0 El, 48.0 RA.
For radiant tubes for furnaces, gas generator retorts; high heat resistance to 2200°F.

NA-34.
M-189; 0.10 max C, 18-20 Cr, 8-10 Ni, 2-4 Mo, bal Fe.
Heat treated: 75,000 TS; 35,000 YS; 50 El; 50 RA; 200 Brin.
For castings, pipe, paper mill equipment; corrosion resistant.

NA-60.
M-189, 0.20 C, 10-14 Cr, 58-62 Ni, bal Fe
Cast: 68,000 TS, 36,000 YS, 4 El, 179 Brin.
Aged 75,000 TS, 38,000 YS; 4 El; 205 Brin.
For retorts, heat treating fixtures, salt pots; Type HW; heat resistant

NA-65.
M-189; 18-20 Cr, 65-70 Ni, 0.30 max C, bal Fe
Cast: 75,000 TS, 45,000 YS, 15 El; 15 RA; 200 Brin
For high temperature service castings, pipe, retorts; heat resistant to 2100°F, ACI-HX.

NA226
M-137; 4-5 Cu, 0-0.2 Ti, bal Al.
32,000-42,000 TS, 14,000-28,000 YS; 12-5 El, 65-100 Brin.
For light alloy parts; hardenable.

NA350
M-137, 9.5-10.5 Cu, 0.15 max Cu, 0.25 max Si, bal Al
40,000 TS, 21,000 YS; 10 El, 75 Brin
For light alloy parts, hardenable

NACO 1S.
M-1237, M-1238; 99.5 min Al
O-temper. 12,000 TS; 4500 YS, 37 El.
½ Hard 16,000 TS, 14,000 YS; 10 El.
Hard: 20,500 TS; 19,500 YS, 9 El
For light weight structures, corrosion resistant.

NACO 2S
M-1237, M-1238, 1 Fe + Si max, 99.0 min Al
O-temper 13,500 TS, 5500 YS; 35 El, 23 Brin.
Hard temper: 24,000 TS, 23,000 YS; 5 El; 44 Brin.
For light weight structures, tanks, containers; corrosion resistant.

NACO 3S
M-1237, M-1238, 1.2 Mn, bal Al.
O-temper. 17,000 TS, 7500 YS; 30 El, 28 Brin.
Hard temper: 29,000 TS; 27,000 YS; 4 El; 55 Brin.
For structures, tank cars, containers; resists reducing and oxidizing atmospheres

NACO 50S.
M-1237, M-1238; 0.7 Mg, 0.4 Si, bal Al.
O-temper: 16,000 TS; 9000 YS, 26 El.
T-temper: 33,000 TS, 29,000 YS; 18 El.
For architectural shapes, trim, molding; heat treatable, corrosion resistant.

NACO 54S.
M-1237, M-1238; Al alloy.
For light weight parts.

NACO 57S.
M-1237, M-1238; 2.5 Mg, 0.3 Cr, bal Al.
O-temper: 29,000 TS; 14,000 YS; 25 El; 45 Brin.
Hard temper: 43,000 TS; 38,000 YS, 7 El, 85 Brin
For marine construction and hardware;
resists sea water corrosion.

NACO 123.
M-1237, M-1238; 5 Si, 0.2 max Ti, bal Al.
Cast: 19,000-24,000 TS; 9000-19,000 YS; 10-6 El;
40-50 Brin.
For instrument housings, cases; corrosion resistant,
good castability

NACO 160
M-1237, M-1238, 12 Si, bal Al
Die cast: 37,000 TS; 18,000 YS; 2 El.
For instrument housings, cases, corrosion resistant,
for thin wall sections.

NACO 162
M-1237, M-1238; 1 Cu, 1 Mg, 12 Si, bal Al
Cast 36,000 TS; 28,000 YS; 0.5 El, 105 Brin.
For pistons, low coefficient of expansion.

NACO 320.
M-1237, M-1238; 4 Mg, 0.5 Si, 0.2 max Ti, bal Al.
Cast: 25,000 TS; 12,000 YS, 9 El; 50 Brin
For marine parts, architectural trim,
corrosion resistant

NACO 350.
M-1237, M-1238; 10 Mg, bal Al
Heat treated 45,000 TS, 25,000 YS; 14 El, 75 Brin.
For gasoline fuel meters, aircraft and marine
castings; heat treatable, corrosion resisting

NACO STEEL.
M-89; 0.3-0.4 C, 1.5 Mn, bal Fe
110,000 TS; 70,000 YS; 8 El, 15 RA; 250 Brin.
For car coupler knuckles, car wheels, anchor chains,
water hardening.

N.A.D.
M-233; 2.25 C, 13 Cr, bal Fe.
For tools, dies; non-deforming

NADA C.
M-548; 2.2 Si, bal Cu.
Cast: 45,000-55,000 TS; 60-70 El
For bronze castings, corrosion resistant

NADA NT.
M-548; 3.5-3.75 Sn, 0.5-1.0 Pb, 3.5-3.75 Ni,
bal Cu.
Cast: 40,000-45,000 TS; 20,000 YS, 30-40 El;
70-75 Brin
For pressure and structural castings,
corrosion and erosion resisting.

NADA NT-2.
M-548; 4.5-5.0 Sn, 0.5-1.0 Pb, 3.0-3.5 Ni, bal Cu.
Cast: 42,000-48,000 TS; 20,000-22,000 YS;
30-40 El; 72-80 Brin.
For pressure and structural castings,
corrosion and erosion resisting

NADA NT-3.
M-548; 86-88 Cu, 4.5-5.0 Sn, 0.5-1.0 Pb, 2.0-2.5 Ni.
Cast 40,000-43,000 TS; 18,000-20,000 YS; 30-40 El;
70-75 Brin.
For pressure and structural castings;
corrosion and erosion resisting.

NALOY.
M-864, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For broaches, form tools; high speed steel.

NAPAC.
M-776; 0.07 C, 0.32 Mn, 0.003 Cb, 0.07 Al, bal Fe.
Rolled: 52,000-60,000 TS; 38,000-45,000 YS;
35 El; 62 Rock B. (as ordered).
For structural parts such as automobile bumpers.

NAPRALOY.
M-952, 4.5 C, 24 Cr, bal Fe.
Cast: 600 Brin.
For welding rod, hard facing electrodes;
wear resistant

NARITE.
M-1256; Al, bal Cu
For deep drawing dies, press tools; Al-bronze,
wear and corrosion resistant

NARVE.
M-111, 0.65 C, 1 Si, 0.5 Mn, 1.1 Cr, 0.6 Mo,
bal Fe.
For dies, rams, shafts, tools, cold work steel.

NASCO
M-207; 0.5 C, 0.8 Mn, 1 Cr, 0.4 Mo, bal Fe.
Hardened 263,000-274,000 TS, 209,000-220,000 YS;
550-600 Brin
For tools, chisels, punches, wrenches,
non-tempering, shock resistant, tough

NASCOLOY O
M-207, 0.5 C, 0.8 Mn, 1.8 Si, bal Fe
For pneumatic tools, chisels, rivet sets;
wear resistant, tough, oil hardening,
requires tempering

NASCOLOY W
M-207, 0.4 C, 0.7 Mn, 0.2 Si, 0.8 Cr, 0.3 Mo,
0.3 Cu, bal Fe
For pneumatic tools, chisels, rivet sets;
wear resistant, tough, water hardening,
no tempering

NATALLOY NO 2
M-1446; 0.45 C, 0.80 Mn, 0.95 Cr, 0.06 Mo,
0.15 V, bal Fe
Heat treated 108,000 TS, 88,000 YS; 16 El,
34 RA, 225-300 Brin
For plastic and die casting dies; oil hardened,
AISI 6145

NATIONAL
M-432, C, 18 W, Cr, V, bal Fe.
For high speed steel cutters and tools;
high speed steel

NATIONAL NO 1
M-844, 0.06 C, bal Fe
For welding electrodes for low carbon steel,
copper coated

NATIONAL NO 6
M-844; 0.1 C, alloy, bal Fe
For welding electrodes; for high pressure piping.

NATIONAL 217
M-844, C, alloy, bal Fe.
For hard facing electrodes; wear resistant.

NATIONAL 459
M-844, C, alloy, bal Fe
For hard facing electrodes; wear resistant

NATIONAL BEARING SILVER BABBITT NO. 397.
M-539; 1.5-2.6 Ag, 2.5-4.0 Sn, 9-11 Sb, bal Pb.
Cast. 9500-10,000 TS, 5 El, 15.3 Brin.
For bearings; C.S 8000, Babbitt.

NATIONAL ECONOMY.
M-844; C, 10 alloy, bal Fe.
For hard facing electrodes; wear resistant

NATIONAL GRAPHITIC STEEL.
M-89; 0.3 C, 0.5 graphite, bal Fe.
Annealed: 75,000 TS; 200 Brin
For steel castings; abrasion resistant.

NATIONAL HTM.
M-89; 3 C, Mn, Si, bal Fe.
Cast. 70,000-110,000 TS, 48,000-85,000 YS; 12-7 El, 163-302 Brin.
For gears, shafts, housings, staybolts; pearlitic malleable iron.

NATIONALLOY 1.
M-483, 0.4 max C, 18 min Cr, 8 min Ni, bal Fe.
For chemical engineering equipment; stainless.

NATIONALLOY 2
M-483, 0.5 max C, 6 min Cr, 18 min Ni, bal Fe
For chemical engineering equipment, stainless.

NATIONALLOY 3
M-483, 0.2 max C, 12-13.5 Cr, bal Fe
For chemical engineering equipment, stainless.

NATIONAL TOOLFACE
M-844, C, alloy, bal Fe.
For hard facing electrodes; wear resistant.

NATIONAL TUBE 1 Cr-½ Mo
M-90, 0.15 max C, 0.8-1.1 Cr, 0.45-0.65 Mo, bal Fe
Annealed 60,000 TS, 25,000 YS, 30 El, 163 Brin.
For steam pipes, boiler and superheating tubing.

NATIONAL TUBE 1¼ Cr-½ Mo
M-90, 0.15 max C, 1 max Si, 1-1.5 Cr, 0.45-0.65 Mo, bal Fe
Annealed 60,000 TS, 25,000 YS, 30 El, 163 Brin.
For steam pipes, oil refinery still tubing

NATIONAL TUBE 2 Cr-½ Mo
M-90, 0.15 max C, 1.75-2.25 Cr, 0.45-0.65 Mo, bal Fe
Annealed 60,000 TS; 25,000 YS, 30 El; 163 Brin.
For steam pipes, superheater tubing.

NATIONAL TUBE 2¼ Cr-1 Mo
M-90, 0.15 max C, 2-2.5 Cr, 0.9-1.1 Mo, bal Fe
Annealed 60,000 TS, 25,000 YS, 30 El, 163 Brin
For refinery still tubing; corrosion resistant

NATIONAL TUBE 2½ Cr-½ Mo-¾ Si
M-90, 0.15 max C, 1 max Si, 2.25-2.75 Cr, 0.45-0.65 Mo, bal Fe
Annealed 60,000 TS, 25,000 YS, 30 El, 163 Brin.
For refinery still tubing, corrosion resistant

NATIONAL TUBE 2½ NICKEL STEEL
M-90, 0.10-0.20 C, 0.3-0.6 Mn, 0.1-0.2 Si, 2.25-2.75 Ni, bal Fe
Normalized 65,000 TS, 45,000 YS, 30 El
For piping for low temperature service (sub-zero), stationary boiler tubes, high impact value

NATIONAL TUBE 3 Cr-1 Mo
M-90; 0.15 max C, 2.75-3.25 Cr, 0.8-1.0 Mo, bal Fe.
Annealed 60,000 TS; 25,000 YS, 30 El, 163 Brin.
For superheater and refinery still tubing; corrosion resistant.

NATIONAL TUBE 3½ Ni
M-90, 0.2 max C, 2.25-3.75 Ni, bal Fe
Normalized 60,000 TS, 30,000 YS; 25 El; 190 Brin.
For caustic evaporators, low temperature piping; high impact value

NATIONAL TUBE 5 Cr-½ Mo-1½ Si.
M-90, 0.15 max C, 1-2 Si, 4-6 Cr, 0.45-0.65 Mo, bal Fe.
Annealed. 60,000 TS, 25,000 YS, 30 El; 163 Brin.
For heat exchanger tubing; high temperature use.

NATIONAL TUBE 5 Ni.
M-90; 0.17 max C, 4.75-5.25 Ni, bal Fe.
Normalized: 60,000 TS; 30,000 YS; 25 El; 207 Brin.
For caustic evaporators, low temperature piping; high impact value.

NATIONAL TUBE 7 Cr-½ Mo.
M-90; 0.15 max C, 0.5-1.0 Si, 6-8 Cr, 0.45-0.65 Mo, bal Fe
Annealed: 60,000 TS, 25,000 YS; 30 El; 179 Brin.
For heat exchanger tubing; higher temp. use.

NATIONAL TUBE 8 Cr-1 Mo.
M-90, 0.15 max C, 7-9 Cr, 0.9-1.1 Mo, bal Fe.
Annealed 60,000 TS, 25,000 YS; 30 El; 179 Brin.
For heat exchanger tubing, higher heat resistance.

NATIONAL TUBE 9 Cr-1 Mo.
M-90, 0.15 max C, 0.5-1 Si, 8-10 Cr, 0.9-1.1 Mo, bal Fe
Annealed. 60,000 TS, 25,000 YS; 30 El; 179 Brin.
For heat exchanger tubing; oxidation and corrosion resistant.

NATIONAL TUBE 9 Ni
M-90, 0.12 max C, 8-10 Ni, bal Fe
Normalized 80,000 TS, 50,000 YS, 20 El.
For oil well pump tubing, caustic evaporators, low temperature tubing, high impact value.

NATIONAL TUBE DIAMOND METAL.
M-844, WC
For hard facing electrodes, wear resistant

NAUBUC
Eng., 58 Cu, 16.25 Zn, 25 Ni, 0.75 Fe.
For knives, corrosion resistant

NAUTAL
Hungary, 4.5 Mn, 0.4 Mg, bal Al.
For light alloy parts, corrosion resistant.

NAVAL
M-338, 61 Cu, 1.0-1.5 Sn, bal Zn
Drawn: 52,000 TS; 30,000 YS; 35 El; 100 Brin.
For extrusions, corrosion resistant.

NAVAL NO 6
M-122; 60 Cu, 0.75 Sn, bal Zn
Soft 58,000 TS, 28,000 YS, 42 El.
½H-temper 65,000 TS, 38,000 YS, 37 El
H-temper 75,000 TS, 52,000 YS, 25 El
For marine hardware, bolts, rivets, propeller shafts; corrosion resistant.

NAVAL NO 95
M-122, 63 Cu, 0.7 Sn, bal Zn
For marine hardware, bolts, propeller shafts; corrosion resistant.

NAVAL ALUMINUM
U.S., 1.5 Cu, 0.9 Mn, 0.4 Ni, Fe + Si, bal Al.
For instruments and fittings, resists corrosion

NAVAL ALUMINUM BRONZE.
87-85 Cu, 7-9 Al, 2.5-4.5 Fe
For marine parts, propellers, pumps, tough.

NAVAL BRASS
M-33, 60 Cu, 0.75 Sn, bal Zn
Cast 39,000 TS, 19,000 YS, 15 El, 25 RA.
Hot rolled. 55,000 TS; 25,000 YS; 50 El; 30 RA.
Cold rolled: 70,000 TS, 58,000 YS; 17 El; 40 RA.
For condenser tubes, bolts, spindles; resists sea water corrosion

NAVAL BRASS 2
M-141; 60 Cu, 0.75 Sn, bal Zn
Hard 80,000 TS, 52,000 YS, 15 El.
Soft: 55,000 TS; 25,000 YS, 50 El
For hardware, marine parts, valve parts, resists sea water corrosion.

NAVAL BRASS 28
M-141; 60 Cu, 0.6 Pb, 0.75 Sn, bal Zn.
Hard: 75,000 TS; 53,000 YS; 20 El.
Soft: 57,000 TS; 25,000 YS; 47 El.
For hardware; strong.

NAVAL BRASS NO. 63.
M-1191; 57.5-60.5 Cu, 1.25-1.75 Sn, 0.25-0.75 Pb, bal Zn.
Forged: 60,000-65,000 TS; 26,000-30,000 YS; 25-20 El; 95-110 Brin
For hardware, bolts, machinery parts, fasteners; free-cutting, leaded bronze.

NAVAL BRASS, 64%.
M-33; 64 Cu, 0.75 Sn, bal Zn.
½ Hard temper: 60,000 TS; 45,000 YS; 25 El.
For rivets, screws, bolts, nuts; corrosion resistant.

NAVAL BRASS-462.
M-8, 60 Cu, 39.25 Zn, 0.75 Sn.
Soft: 56,000 TS; 22,000 YS.
For condenser plates, marine hardware; corrosion resistant.

NAVAL BRASS-464.
M-8; 60 Cu, 39.25 Zn, 0.75 Sn.
Hard: 63,000 TS; 35,000 YS; 30 El; B 65 Rock
Soft: 56,000 TS; 25,000 YS; 40 El; B 50 Rock.
For nuts, bolts, fasteners, rivets, valve stems, pump shafts, marine hardware.
Corrosion resistant to sea water.

NAVAL BRASS E-24
M-1191; 58.5-60.0 Cu, 0.5-1.0 Sn, bal Zn.
Forged. 60,000-65,000 TS, 25,000-30,000 YS; 45-3 El; 83-94 Brin
For hardware, bolts, machinery parts; corrosion resistant.

NAVAL BRONZE
M-8, M-33; 88 Cu, 8 Sn, bal Zn.
For steam and structural parts, expansion joints, gears, valves; tough bronze.

NAVAL BRONZE NO. 4.
44 Pb, 36 Sn, 16 Sb, 4 Cu.
For bearings; anti-friction.

NAVAL GUN METAL "G"
U.S.; 88 Cu, 10 Sn, 2 Zn.
For gears, pistons, bearings, bushings; high strength.

NAVALIUM.
Eng; 96.6 Al, 0.1 Cu, 0.7 Sn, 0.6 Fe, 2.3 Mn, 0.24 Si.
For light alloy parts.

NAVAL JOURNAL BEARING, SPEC. "H."
U.S.; 83 Cu, 14 Sn, 3.5 Pb
50,000 TS, 9.5 El.
Bearings; heavy duty

NAVAL JOURNAL BEARING, SPEC. "HX."
U.S.; 83 Cu, 14 Sn, 3.5 Pb.
For bearings; heavy duty.

NAVALOY.
Eng; Sn, Sb, bal Pb.
For bearings; Babbitt metal.

NAVAL PHOSPHOR BRONZE (P-C) CAST.
U.S.; 88 Cu, 8 Sn, 4.0 Zn, 0.5 P.
57,000-35,000 TS; 31,000 YS; 18 El.
For bearings, gears, marine parts; resists sea water corrosion; U.S.N.-46 B5f.

NAVAL PHOSPHOR BRONZE (P-R) ROLLED.
U.S.; 94 Cu, 3.5 Sn, 0.5 P.
80,000 TS, 60,000 YS; 12 El.
For pump parts, valve stems, bolts; resists sea water corrosion; U.S.N.-46 B14d.

NAVAL VALVE BRONZE.
U.S.; 88 Cu, 6.5 Sn, 4 Zn, 1.5 Pb.
58,000-32,000 TS; 29,000 YS; 9-17 El; 80 Brin.
For valve stems, valve seats, valve bodies; "Composition M"; U.S.N.-46 B8d.

NAVAN.
M-1405; C, bal Fe.
For gears, shafts, wear resistant parts; case hardened; B.S.I. 5005/101.

NAVY.
M-1260, 74 Sn, 9 Sb, 4 Cu, 13 Pb.
Cast: 14,200 TS; 28 Brin.
For steam turbine bearings; M.P. 355-665°F; wear resistant

NAVY NO 4 ALLOY.
U.S; 96 Al, 4 Cu.
15,000 TS, 5 El.
For light alloy parts, boxes, covers, face plates.

NAVY ALUMINUM ALLOY.
U.S; 1.5 Cu, 0.9 Mn, 0.4 Ni, 0.4 Fe, 0.3 Si, bal Al
For instruments, fittings, light alloy parts; non-hardenable

NAVY ANTIFRICTION METAL GRADE 1.
M-561, 90-93 Sn, 3.5-5 Sb, 0.5 Pb, 3.5-5 Cu
10,770 TS, 18-30 Brin
For antifriction metal, bearings; Babbitt metal, aircraft engine bearings, Babbitt.

NAVY ANTIFRICTION METAL GRADE 2
M-561, 87.5-89.5 Sn, 7-8 Sb, 0.35 Pb, 3.5-4.5 Cu, 0.10 As
For antifriction metal, genuine Babbitt, automotive engine bearings, for moderately severe service.

NAVY ANTIFRICTION METAL GRADE 3
M-561, 83-85 Sn, 7.5-8.5 Sb, 0.35 Pb, 7.5-8.5 Cu, 0.10 As
For hard Babbitt, bearings; for moderately heavy pressures.

NAVY ANTIFRICTION METAL GRADE 4.
M-561; 80.5-82.5 Sn, 12-14 Sb, 0.25 Pb, 5-6 Cu, 0.10 As
For hard bearings, for heavy pressure and high speeds

NAVY ANTIFRICTION METAL GRADE 5.
M-561; 61-63 Sn, 9.5-10.5 Sb, 24-26 Pb, 2.5-3.5 Cu, 0.15 As
For electric motor bearings, for low pressures and high speeds

NAVY ANTIFRICTION METAL GRADE 6.
M-561; 4.5-5.5 Sn, 14-16 Sb, 79-81 Pb, 0.50 Cu, 0.20 As
For cheap Babbitt bearing, for light service.

NAVY ANTIFRICTION METAL GRADE 7.
M-561, 9-10 Sn, 14-16 Sb, 74-76 Pb, 0.50 Cu, 0.20 As
For cheap Babbitt bearing; for light service.

NAVY BEARING.
U.S; 91-80 Sn, 4.5-15 Sb, 3.7-5.0 Cu.
For bearings, bushings; anti-friction.

NAVY BEARING, HARD.
U.S.; 80 Sn, 15 Sb, 5 Cu.
For bearings; anti-friction.

NAVY COMPOSITION "W."
U.S.; 89 Sn, 7.3 Sb, 3.7 Cu.
For bearings; anti-friction.

NAVY GEAR BRONZE.
U.S.; 84-86 Cu, 13-15 Sn, 1.5 Zn, 0.5 P.
30,000 TS; 1-8 El.
For gears and worm wheels; tough.

NAVY "N" ALLOY.
U.S.; 3 Mn, 6 Cu, bal Al.
20,000 TS; 8 El.
For general castings; corrosion resisting.

NAVY TOMBASIL.
M-123, M-346; 5 Si, 6 Zn, bal Cu.
Cast: 60,000 TS; 35,000 YS; 15 El; 110 Brin.
Corrosion resistant; for valve stems.

NAX 9112.
M-766; 0.10-0.15 C, 1.10 max Mn, 0.50-0.90 Si, 0.50-0.80 Cr, 0.05-0.15 Zr, bal Fe.
Water or oil hardenable; for structural parts.

NAX 9115.
M-766; 0.13-0.18 C, 1.10 max Mn, 0.50-0.90 Si, 0.50-0.80 Cr, 0.05-0.15 Zr, bal Fe.
Water or oil hardenable; for structural parts.

NAX 9120.
M-766, 0.18-0.23 C, 1.10 max Mn, 0.50-0.90 Si, 0.50-0.80 Cr, 0.05-0.15 Zr, bal Fe.
Water or oil hardenable; for structural parts.

NAX 9120 MOD.
M-766; 0.15-0.20 C, 1.10 max Mn, 0.50-0.90 Si, 0.50-0.80 Cr, 0.05-0.15 Zr, bal Fe.
Water or oil hardenable; for structural parts.

NAX 9130.
M-766; 0.28-0.33 C, 1.10 max Mn, 0.50-0.90 Si, 0.50-0.80 Cr, 0.05-0.15 Zr, bal Fe.
Water or oil hardenable; for structural parts.

N-A-X AC9111
M-766; 0.10 C, 0.6 Mn, 0.7 Si, 0.6 Cr, 0.1 Zr, bal Fe
Rolled 75,000 TS, 50,000 YS; 40 El, 75 RA.
For structures, bridges; good weldability.

N-A-X AC9115
M-766, 0.10-0.17 C, 0.60 Cr, 0.15 max Mo, 0.05-0.15 Zr, bal Fe
Hot rolled. 76,000 TS, 52,000 YS; 40 El; 74 RA; 150 Brin
For gas turbine structures, good weldability.

NAX FINE GRAIN.
M-766; 0.22 max C, 1.10 Mn, 0.40-0.90 Si, 0.03-0.15 Zr, bal Fe.
Rolled (min) 70,000 TS; 50,000 YS; 22 El; 140-160 Brin.
For structural parts; weldable.

NAX HIGH TENSILE.
M-766, 0.18 max C, 0.50-0.90 Mn, 0.60-0.90 Si, 0.40-0.80 Cr, 0.03-0.12 Zr, bal Fe
Rolled (min). 70,000 TS; 50,000 YS; 22 El; 140-160 Brin.
For structural parts; improved corrosion resistance over most carbon steels, weldable.

N-A-XTRA 55.
M-766, 0.18 C, 0.70 Si, 0.9 Mn, 0.018 P, 0.021 S, 0.89 Cr, 0.32 Mo, 0.09 Zr, bal Fe
Plate: 92,000-114,000 TS, 78,000 min YP; 18 min El.
For bridges, tanks, railroad cars, containers, ships, aircraft.
Good formability and weldability.

N-A-XTRA 60.
M-766; 0.18 C, 0.70 Si, 0.9 Mn, 0.018 P, 0.021 S, 0.9 Cr, 0.3 Mo, 0.09 Zr, bal Fe.
Plate: 100,000-120,000 TS; 86,000 min YP; 18 min El.
For tanks, containers, machine parts, ships, bridges, aircraft, railroad cars.
Good formability and weldability.

N-A-XTRA 65
M-766; 0.18 C, 0.70 Si, 0.9 Mn, 0.018 P, 0.021 S, 0.9 Cr, 0.32 Mo, 0.09 Zr, bal Fe.
Plate· 107,000-127,000 TS; 92,000 min YP; 17 min EL.
For tanks, containers, machine parts, bridges, railroad cars, aircraft.
Good formability and weldability.

N-A-XTRA 70.
M-766; 0.18 C, 0.70 Si, 0.9 Mn, 0.018 P, 0.021 S, 0.9 Cr, 0.3 Mo, 0.09 Zr, bal Fe.
Plate· 114,000-135,000 TS; 100,000 min YP; 16 min El.
For containers, tanks, machine parts, ships, bridges, aircraft, railroad cars.
Good weldability and formability.

N-A-XTRA 80.
M-766; 0.21 max C, 0.60-1.10 Mn, 0.40-0.90 Si, 0.50-0.80 Cr, 0.30 max Mo, 0.05-0.15 Zr, 0.0025 max B, bal Fe
Hardened, min· 95,000 TS, 80,000 YS; 20 El.
For structural parts.

N-A-XTRA 90.
M-766, 0.21 max C, 0.60-1.10 Mn, 0.40-0.90 Si, 0.50-0.80 Cr, 0.30 max Mo, 0.05-0.15 Zr, 0.0025 max B, bal Fe.
Hardened, min: 105,000 TS, 90,000 YS; 18 El.
For structural parts.

N-A-XTRA 100
M-766, 0.21 max C, 0.60-1.10 Mn, 0.40-0.90 Si, 0.50-0.80 Cr, 0.30 max Mo, 0.05-0.15 Zr, 0.0025 max B, bal Fe.
Hardened, min 115,000 TS, 100,000 YS; 18 El.
For structural parts

N-A-XTRA 110
M-766, 0.21 max C, 0.60-1.10 Mn, 0.40-0.90 Si, 0.50-0.80 Cr, 0.30 max Mo, 0.05-0.15 Zr, 0.0025 max B, bal Fe.
Hardened, min. 125,000 TS, 110,000 YS; 18 El.
For structural parts

N-A-XTRA 125
M-766, 0.18-0.22 C, 0.8 Mn, 0.8 Si, 0.6 Cr, 0.16 Mo, 0.12 Zr, bal Fe
Heat treated 139,000 TS; 126,800 YS; 20 El; 55 RA; 293 Brin.
For excavator buckets, mine cars and equipment, road machinery; structural steel, good formability.

N-A-XTRA 150
M-766; 0.26-0.30 C, 0.8 Mn, 0.8 Si, 0.6 Cr, 0.14-0.18 Mo, 0.08-0.15 Zr, bal Fe
Heat treated· 165,000 TS, 158,600 YS, 13 El; 47 RA, 352 Brin.
For excavator buckets, mine cars and equipment, road machinery, structural steel, good formability.

NAX X9115.
M-766, 0.13-0.18 C, 1.10 max Mn, 0.50-0.90 Si, 0.50-0.80 Cr, 0.10-0.20 Mo, 0.05-0.15 Zr, bal Fe.
Water or oil hardenable, for structural parts.

NAX X9120.
M-766, 0.18-0.23 C, 1.10 max Mn, 0.50-0.90 Si, 0.50-0.80 Cr, 0.10-0.20 Mo, 0.05-0.15 Zr, bal Fe.
Water or oil hardenable; for structural parts.

NAX X9120 MOD.
M-766; 0.15-0.20 C, 1.10 max Mn, 0.50-0.90 Si, 0.50-0.80 Cr, 0.10-0.20 Mo, 0.05-0.15 Zr, bal Fe.
Water or oil hardenable; for structural parts.

NAX X9130.
M-766; 0.28-0.33 C, 1.10 max Mn, 0.50-0.90 Si, 0.50-0.80 Cr, 0.10-0.20 Mo, 0.05-0.15 Zr, bal Fe.
Water or oil hardenable; for structural parts.

NB.
M-1577; 0.04 C, 65.32 Ni, 28.20 Mo, 5.18 Fe.
For corrosion and heat resistant parts; chemical plant equipment, pump and valve parts.
Corrosion and heat resistant.

NBD NO. 1 STANDARD BABBITT.
M-539; Sn, Sb, bal Pb.
For bearings; Babbitt metal.

NBD NO 2.
M-539; Sn, Pb, Ni, bal Cu.
Cast: 33,000 TS; 21,000 YS; 7 El; 7 RA; 75 Brin
For bearings, engine and machinery castings; C.Y.P. 14000.

NBD NO. 2 STANDARD BABBITT.
M-539; Pb, Sn, Sb.
For large, slow running bearings, Babbitt metal

NBD NO 3.
M-539; Sn, Pb, bal Cu.
Cast: 32,000 TS; 21,000 YS; 10 El; 10 RA, 74 Brin.
For bushings, gearings; C.Y.P. 14000.

NBD NO. 3 A.
M-539, 80 Cu, 10 Sn, 10 Pb
Cast· 25,000 TS, 12,000 YS, 8 El, 60 Brin.
For bearings,; SAE 64

NBD NO. 3 B.
M-539; 83 Cu, 7 Sn, 7 Pb, 3 Zn
Cast: 30,000 TS, 14,000 YS, 12 El; 60 Brin
For bearings, SAE 660.

NBD NO. 3 D.
M-539, 79.75 Cu, 9 Sn, 10 Pb, 0.75 P, 0.25 Ni
Cast: 25,000 TS, 12,000 YS, 8 El; 60 Brin.
For bearings, heavy duty

NBD NO. 3 STANDARD BABBITT
M-539, Pb, Sn, Sb.
For bearings; Babbitt metal.

NBD NO. 4.
M-539; Sn, Zn, bal Cu.
Cast. 42,000 TS, 23,000 YS; 21 El; 22 RA; 88 Brin
For gears, pinions, worm wheels, nuts; C.Y P 16000.

NBD NO. 4 F.
M-539; 83 Cu, 11 Sn, 3 Pb, 3 Zn.
Cast: 35,000 TS; 16,000 YS; 16 El; 60 Brin.
For bearings; heavy duty.

NBD NO. 4 H.
M-539, 87 Cu, 7 Sn, 3 Pb, 3 Zn
Cast· 30,000 TS, 15,000 YS; 15 El, 60 Brin
For bearings, heavy duty

NBD NO. 4 I.
M-539; 85 Cu, 5 Sn, 5 Pb.
Cast: 30,000 TS, 14,000 YS, 20 El; 60 Brin
For bearings; SAE 40.

NBD NO. 4 J.
M-539; 87 Cu, 9 Sn, 2 Pb, 2 Zn.
Cast. 30,000 TS; 15,000 YS; 15 El; 60 Brin.
For bearings; modified Gun Bronze.

NBD NO. 4 K.
M-539; 88 Cu, 10 Sn, 2 Zn.
Cast: 40,000 TS, 18,000 YS; 20 El; 70 Brin.
For bearings; SAE 62; Gun Bronze.

NBD NO. 4 L.
M-539; 88 Cu, 8 Sn, 4 Zn.
Cast· 40,000 TS; 18,000 YS; 20 El; 70 Brin.
For bearings; SAE 620; Navy "G"

NBD NO 4 STANDARD BABBITT.
M-539; Pb, Sn, Sb.
For severe service bearings; Babbitt metal

NBD NO. 5.
M-539, Sn, bal Cu.
Cast· 37,000 TS; 21,000 YS; 10 El
For gears; acid resistant

NBD NO 6
M-539; Sn, Pb, bal Cu.
Cast 27,500 TS; 17,000 YS; 16 El; 15 RA, 47 Brin.
For gearings with poor lubrication; C Y P. 9700.

NBD NO 6 A
M-539, 77 Cu, 7 Sn, 15 Pb.
Cast 25,000 TS, 14,000 YS; 10 El; 50 Brin.
For bearings; hard bronze.

NBD NO 6 G
M-539, 78 Cu, 6 Sn, 16 Pb.
Cast· 30,000 TS, 16,000 YS; 12 El; 55 Brin
For bearings, heavy duty.

NBD NO. 6-H.
M 539, 74 Cu, 6 Sn, 20 Pb.
Cast 28,000 TS; 14,000 YS; 10 El; 50 Brin
For bearings, bushings, leaded bronze

NBD NO 6 I.
M-539, 78 Cu, 6 Sn, 16 Pb.
Cast 25,000 TS, 14,000 YS, 10 El, 50 Brin
For bearings, heavy duty

NBD NO 6M
M-539, 75 Cu, 7 Sn, 18 Pb
For bearings, bushings, sleeves, heavy duty

NBD NO 6S
M-539, 5 Sn, 24 Pb, bal Cu
Cast. 21,000 TS; 7 El.
For bearings, bushings, liners, heavy duty

NBD NO 7
M-539, Sn, Pb, Ni, bal Cu
Cast 40,000 TS, 27,000 YS, 12 El, 15 RA, 90 Brin
For bearings, for heavy loads

NBD NO 7A
M-539, 10 Sn, 2 Pb, 3 Ni, bal Cu.
Cast 42,000 TS, 18,000 YS; 15 El, 80 Brin
For railway bearings, leaded nickel bronze

NBD NO 9A
M-539, 10 Al, 1 Fe, bal Cu
Cast heat treated 65,000 TS, 25,000 YS, 20 El, 11 RA, 120 Brin
For bearings, wear plates, C Y P 15000; SAE-68B

NBD NO. 9-AF
M-539; 86 Cu, 10.5 Al, 3.5 Fe
Cast 75,000 TS; 30,000 YS, 12 El; 150 Brin.
Heat treated. 90,000 TS, 45,000 YS, 6 El, 190 Brin
For bearing segments, wearing plates, screwdown nuts, Al-bronze, corrosion and wear resistant.

NBD NO. 9B
M-539, Al, Fe, bal Cu.
Cast· 64,000 TS, 28,000 YS, 11 El; 12 RA; 144 Brin.
For acid resisting parts, crates, pickling racks; C Y.P 24000.

NBD NO. 9C.
M-539; Al, Fe, bal Cu.
Cast: 84,000 TS; 33,000 YS, 25 El; 24 RA; 137 Brin.
For bushings, bearings; C.Y.P. 24000

NBD NO. 9D.
M-539; Al, Fe, bal Cu.
Cast: 88,000 TS; 43,000 YS; 13 El; 13 RA; 149 Brin.
For bushings, bearings, C.Y.P. 30000.

NBD NO. 9E.
M-539, Al, Fe, bal Cu.
Cast: 90,000 TS; 43,000 YS; 12 El; 12 RA; 170 Brin
For gears, pinions, worms, worm wheels, C Y P. 35000.

NBD NO. 9F.
M-539, 9 Al, 3 Fe, bal Cu.
Cast heat treated 65,000 TS; 25,000 YS, 20 El, 130 Brin.
For slides, gibs, gears; C Y.P 40000; SAE-68A.

NBD NO 9G
M-539, Al, Fe, bal Cu.
Cast 55,500 TS, 55,500 YS, 0 El, 0 RA, 300 Brin
For forming or drawing dies, C Y P. 61000

NBD NO 9H
M-539, Al, Fe, bal Cu
Cast 120,000 TS, 101,000 YS; 3 El, 5 5 RA; 235 Brin
For propellers, high strength castings, heat treatable

NBD NO 9K
M 539, 10 Al, 4 Fe, 2 Ni, bal Cu
Heat treated 75,000-90,000 TS, 30,000-45,000 YS, 12-6 El, 150 190 Brin
For propellers, bearings, gears, Al-bronze, heat treatable

NBD NO 9L
M 539, 10 Al, 5 Fe, 5 Ni, bal Cu.
Heat treated 90,000 110,000 TS, 40,000-60,000 YS, 6-5 El; 109-200 Brin
For bearings, propellers, gears, Al bronze, heat treatable

NBD NO 10A
M-539, 60 Cu, 1 Al, 3 Mn, 1 Fe, bal Zn
Cast 60,000 TS, 20,000 YS, 15 El, 110 Brin
For high strength castings

NBD NO 10B
M-359, 64 Cu, 6 Al, 4 Mn, 3 Fe, bal Zn
Cast 90,000 TS, 45,000 YS; 20 El, 180 Brin
For high strength castings, C Y P 64000

NBD NO 10C
M-539, 1.2 Al, 1 Mn, 1 2 Fe, 58 Cu, bal Zn
Cast 65,000 TS, 25,000 YS, 20 El, 100 Brin
For bearings, bushings, sleeves; SAE 43; manganese bronze.

NBD NO 10D
M-539; 64 Cu, 6 Al, 3 Mn, 3 Fe, bal Zn
Cast. 110,000 TS, 60,000 YS; 12 El, 200 Brin
For bearings, worm wheels, gears, valves; SAE 430B, manganese bronze

NBD NO 11
M-539, Sn, Pb, bal Cu
Cast: 33,000 TS, 16,000 YS; 12 El, 58 Brin.
For bearings, bushings

NBD NO 11A.
M-539; 88 Cu, 8 Sn, 4 Pb.
Cast: 28,000 TS; 16,000 YS; 12 El, 60 Brin.
For bearings, heavy duty.

NBD NO. 11 C.
M-539; 86 Cu, 8 Sn, 2 Pb, 4 Zn.
Cast: 34,000 TS, 16,000 YS; 20 El; 65 Brin
For bearings; heavy duty.

NBD NO 11D.
M-539; 5 Sn, 4 Zn, 3 Ni, bal Cu.
Cast: 40,000 TS; 17,000 YS; 25 El, 65 Brin.
For bearings, bushings, sleeves; heavy duty nickel bronze

NBD NO 12
M-539; Sn, Pb, bal Cu.
Cast· 40,000 TS; 21,000 YS; 19 El; 18 RA; 81 Brin.
For bearings, bushings; C Y.P. 16600.

NBD NO 13
M-539; Sn, Pb, Zn, bal Cu
Cast, 30,000 TS, 19,000 YS, 13 El, 18 RA; 69 Brin.
For bearings, bushings, for steam and water pressure.

NBD NO 13 A
M 539, 80 Cu, 8 Sn, 12 Pb.
Cast 25,000 TS, 12,000 YS, 8 El, 60 Brin
For bearings, heavy duty

NBD NO 15A
M-539, 5 Sn, 20 Pb, 3 Zn, bal Cu
Cast 21,000 TS, 10,000 YS, 7 El, 45 Brin
For bearings, bushings; sleeves; heavy duty leaded bronze

NBD NO 20 A.
M-539, 97 Cu, 2 Sn, 1 Zn
For bearings, copper, electrodes

NBD NO 20B
M-539, 99 7 Cu.
For bearings, blast furnace copper

NBD NO 20-C
M 539, 99 9 Cu
Cast 25,000 TS, 7000 YS; 45 El, 35 Brin
For electrode holders, water cooled linings, 80% electrical conductivity.

NBD NO 20-H
M-539, 99 3 Cu, 0 7 Cr.
Heat treated 55,000 TS, 35,000 YS, 25 El, 100 Brin
For castings, electrode holders, heat treatable, corrosion resistant

NBD NO 20-K
M-539, 98 2 Cu, 1 5 Ni, 0.3 Be.
Heat treated 75,000 TS; 50,000 YS, 3 El, 200 Brin
For castings, age-hardenable, corrosion resistant

NBD NO 20L
M 539; 99 9 Cu
Cast 25,000 TS, 8500 YS, 45 El, 35 Brin.
For conductors, 90% electrical conductivity

NBD NO 21 A.
M-539, 68 Cu, 2 Pb, 30 Zn
Cast 30,000 TS, 11,000 YS, 20 El, 40 Brin.
For bearings, heavy duty.

NBD NO 21 B
M-539, 63 Cu, 1 Sn, 2 Pb, 34 Zn.
Cast 40,000 TS, 14,000 YS, 15 El, 40 Brin.
For bearings, heavy duty.

NBD NO. 21 C
M-539; 72 Cu, 1 Sn, 2 Pb, 25 Zn.
Cast 35,000 TS, 12,000 YS, 25 El; 40 Brin
For bearings; heavy duty.

NBD NO. 22.
M-539; 88 Cu, 2 Sn.
Cast: 25,000 TS; 7000 YS, 40 El; 45 Brin.
For bells; welding bell copper.

NBD NO. 22A.
M-539; 90 Cu, 10 Sn.
Cast: 35,000 TS; 21,000 YS; 10 El; 90 Brin.
For bearings, gears; SAE 65.

NBD NO. 22 B.
M-539; 93 Cu, 7 Sn
Cast: 35,000 TS; 20,000 YS; 10 El; 85 Brin.
For bearings; heavy duty.

NBD NO. 22-C.
M-539; 91 Cu, 9 Sn.
Cast.
For plumbing, hardware; acid bronze

NBD NO. 22 D
M-539; 84 Cu, 16 Sn.
Cast: 18,000 TS.
For bearings; bridge bronze.

NBD NO. 22 E.
M-539; 80 Cu, 20 Sn.
Cast: 24,000 TS.
For bearings, bridge bronze.

NBD NO 22 F
M-539; 91 Cu, 5.5 Sn, 3.5 Zn
Cast: 37,000 TS; 14,000 YS; 30 El; 40 Brin
For bearings, trolley wheels, heavy duty

NBD NO 46.
M-539, 84 Cu, 8 Sn, 8 Pb.
Cast: 25,000 TS; 12,000 YS; 8 El.
For bearings.

NBD NO 63
M-539, 88 Cu, 10 Sn, 2 Pb
Cast: 35,000 TS; 10 El.
For plumbing, hardware, bearings; SAE63, leaded tin bronze.

NBD NO 64
M-539, 80 Cu, 10 Sn, 10 Pb.
Cast 25,000 TS, 12,000 YS; 8 El; 50 Brin.
For bearings, liners, sleeves, leaded bronze; SAE64

NBD NO 65.
M-539, 88 Cu, 12 Sn
Cast: 35,000 TS; 21,000 YS; 10 El, 90 Brin.
For gears, worm wheels, bearings; SAE65; gear bronze.

NBD NO 65-N.
M-539; 87.5 Cu, 11 Sn, 1.5 Ni.
Cast: 35,000 TS; 21,000 YS; 10 El; 90 Brin.
For gears, nickel gear bronze.

NBD NO. 66
M-539; 85 Cu, 5 Sn, 9 Pb, 1 Zn.
Cast: 25,000 TS; 12,000 YS; 8 El.
For bearings; SAE 66.

NBD NO 197
M-539; 95 Cu, 4 Si, 1 Mn
Cast: 45,000 TS; 18,000 YS; 20 El; 80 Brin
For gears, bolts, shafts, fasteners; silicon bronze.

NBD NO. 198
M-539; 91 Cu, 1 Sn, 5 Zn, 3 Si.
Cast: 45,000 TS; 18,000 YS; 20 El.
For hardware, bolts, shafts; silicon bronze.

NBD NO. 199.
M-539, 82 Cu, 14 Zn, 4 Si
Cast: 60,000 TS; 24,000 YS; 16 El.
For hardware, valves; silicon bronze.

NBD NO. 295.
M-539; 91 Cu, 9 Zn.
Cast.
For ornamental accessories; gilding bronze.

NBD NO. 622.
M-539; 88 Cu, 6 Sn, 1.5 Pb, 4 Zn.
Cast: 34,000 TS; 16,000 YS; 22 El; 50 Brin.
For valves, plumbing; valve bronze; SAE622.

NBD NO. 660.
M-539, 83 Cu, 7 Sn, 7 Pb, 3 Zn
Cast. 30,000 TS; 14,000 YS; 12 El; 50 Brin.
For plumbing, hardware; SAE660, modified red brass

NBD "A" GRADE.
M-539, Pb, Sb, bal Sn.
For low grade bearings; Babbitt metal.

NBD ALUMINUM BABBITT.
M-539, Al, bal Sn
Cast 12,100 TS, 8.8 El, 6.6 RA; 28.6 Brin
For heavy pressure bearings; Babbitt metal; C.S. 23200.

NBD ARCTIC BRONZE
M-539, Sb, Sn, bal Cu
For locomotive bearings

NBD ARMATURE BABBITT
M-539, Sn, Cu, Ni, Sb
Cast 13,600 TS, 6.1 El, 7.0 RA, 33.8 Brin
For armature bearings, marine turbine bearings; Babbitt metal, C.S. 26700

NBD BETA CRUSHER BABBITT
M-539, Sb, Sn, Pb, Cu
Cast 11,300 TS, 4.9 El, 5.3 RA, 27.5 Brin
For bearings for cement mills and mines, Babbitt metal, resists heavy loads

NBD CRESCENT BABBITT
M-539, Cu, Sn, Sb
Cast: 8,500 TS, 1.4 El, 2.1 RA, 25.1 Brin
For heavy duty bearings for rolling mills, paper mills, Babbitt metal; C.S. 18300

NBD ENGINE BABBITT
M-539, 9-11 Sb, 4-6 Cu, bal Sn
Cast 10,000-15,000 TS, 5 El
For bearings, bushings, liners; Babbitt, C.S 10600

NBD EXTRA COPPER-HARDENED BABBITT
M-539, Cu, Sn, Sb
Cast: 8,500 TS, 5.0 El, 5.2 RA; 27.1 Brin
For bearings, Babbitt metal, C.S. 7400

NBD GENUINE BABBITT (ORIGINAL)
M-539; 88.9 Sn, 3.7 Cu, 7.4 Sb.
Cast 13,000 TS; 10 El; 14 RA, 28.7 Brin
For high temperature resistant bearings; Babbitt metal, C.S. 21200

NBD GENUINE BABBITT (SPECIAL).
M-539; Cu, Sb, bal Sn.
Cast: 10,000 TS, 5.0 El; 12.9 RA; 28.9 Brin.
For heavy duty bearings, Babbitt metal; C.S. 22200

NBD HOO-HOO
M-539; Sn, Cu, Ni, Sb.
Cast: 12,800 TS; 11.1 El; 16 RA; 28 Brin.
For bearings, Babbitt metal; C.S. 25600.

NBD IMPROVED BABBITT.
M-539; Cu, Sn, Sb.
Cast: 9,600 TS; 2.2 El, 1.5 RA; 24.1 Brin.
For general utility bearings; Babbitt metal; C.S. 19500

NBD NICKEL BABBITT.
M-539; Sn, Cu, Ni.
Cast: 11,900 TS; 5.0 El; 15.8 RA; 28.9 Brin.
For bearings; high speed and high pressures; C.S. 10600.

NBD PHOSPHOR BRONZE BABBITT.
M-539; P, Cu, bal Sn.
Cast: 11,150 TS; 5.6 El; 7.1 RA; 28.1 Brin.
For marine and stationary engine bearings; Babbitt metal; C.S. 18100.

NBD REGENT BABBITT.
M-539; 14 Sb, 5 Sn, bal Pb.
Cast: 9,000 TS; 2.0 El; 20 Brin
For relining railroad bearings, Babbitt metal.

NBD REX BABBITT.
M-539, 10 Sn, 15 Sb, bal Cu
Cast 10,000 TS, 2 5 El, 1.8 RA; 24.8 Brin.
For medium high speed and heavy pressure bearings, Babbitt metal, C S 10100

NBD SPECIAL MOTOR BABBITT.
M-539, Sb, Sn.
Cast. 9,100 TS; 2 2 El, 3.6 RA; 26.5 Brin.
For motor bearings, Babbitt metal, C S 18000.

NBD SPECIAL NO 1 BABBITT.
M-539; Sn alloy.
Cast 7,500 TS; 1 0 El, 1 7 RA; 24 2 Brin
For bearings for rolling and paper mills, Babbitt metal, C S 14200

NBD TIGER BRONZE
M-539, Pb, Sn, bal Cu
Cast 33,000 TS, 18,000 YS; 19 El; 15 RA; 53 Brin
For engine castings, bearings, shock resistant.

NC
M-1577, 0 05 C, 15 32 Cr, 58 07 Ni, 13 73 Mo, 5 68 Fe, 4 24 W
For chemical plant equipment, pump and valve parts
Corrosion and heat resistant.

NC-4
French, 24 Ni, 3 Cr, bal Fe
For thermostatic bimetal.

N C 82.
M-121, 80 Ni, 20 Cu
For welding wire for high temperature, Ni-Cr and Ni Cr-Fe alloys, heat resistant

N C ALLOY.
M-688, C, alloy, bal Fe
For tools, dies, oil hardening.

N.C A (NON-CORRODIBLE ALUMINUM)
M-411, 2 2 Ni, 3 Cu, 0 2 Mg, 0.2 Mn, bal Al.
Rolled 45,000 TS
Sand cast 24,000-31,000 TS; 12,000-15,000 YS, 7-5 El; 63 Brin
For light alloy parts, resists sea-water corrosion.

N.C C ALLOY.
M 121, 56 min Ni, 23 min Cu, 7 5 min Cr, 1 5 max C, 1.75 max Si.
For production of Ni-resistant castings; M P. 2300°F.

N C.C PIG.
M-68, 56 min Ni, 23 min Cu, 7.5 min Cr, 1 5 max C, 1.75 max Si
For foundry alloy for Ni-Resist Iron, M.P 2300°F.

N.C.M.
M-240; C, Ni, Cr, Mo, bal Fe.
Heat treated: 125,000 TS; 105,000 YS; 16 El; 50 RA, 270-310 Brin.
For gears, shafts, oil hardened, tough.

N.C M
M-499, 0.1-0.2 C, 4.0-4.5 Ni, 1.25-1.5 Cr, 0 15-0 30 Mo, bal Fe
Heat treated: 200,000 TS; 165,000 YS; 15 El, 47 RA, 418 Brin.
For case hardened parts for abrasion resistance; case hardening steel; Iz-26.

NCMV
M-1724, 0.40-0.45 C, 0 6-0 8 Si, 0.3-0 5 Mn, 1 7-2.0 Ni, 1.4-1.6 Cr, 0 9-1.1 Mo, 0.2-0 3 V, bal Fe.
Hardened 210,000-310,000 TS, 194,000-257,000 YS; 12-6 El, 59-45 Rock C.
For high strength parts as airframe, undercarriage components and pressure vessels. Can be nitrided.

NCR-238
M-38; 0 4 C, 1.4 Si, 8 25 Cr, 2.25 Ni, 1 25 Cu, bal Fe.
For stainless parts, pump and furnace parts; stainless

N. D. FORGING STEEL
M-57; 0 3 C, 15 W, 4 Cr, 0.5 V, bal Fe.
For forging dies, extrusion rams and liners; hot work steel, oil hardened

NDHTC-OILITE.
M-211, Fe alloy
Sintered 80,000 TS
For bearings, ferrous, porous

N D S
M-73, 0 75 C, 1 0 Cr, 1 75 Ni, bal Fe
For tools, shear blades, shock resisting

NDZ BRONZE
M-801, 0 25 max Pb, 5 0 max Zn, 5 5 max Ni, 5 5 max Fe, 2 0 max Al, 2 0 max Si, bal Cu
As sand cast: 65,000-69,000 TS, 30,000-35,000 YS, 20-34 El, 123-134 Brin
For valve stems, propeller wheels, gears for marine and outboard industry, marine parts requiring resistance to dezincification and for dealuminization, water works equipment.
Heat treatable to slightly higher properties

NDZ-S BRONZE
M 801, 0.25 max Pb, 2 0 max Zn, 5 5 max Ni, 5 5 max Fe, 2 0 max Al, 2 0 max Si, bal Cu.
As sand cast 69,000-75,000 TS, 40,000-45,000 YS, 13-23 El, 143-149 Brin
For high strength valve stems, propeller wheels, gears, marine hardware requiring resistance to dezincification and/or dealuminization
Heat treatable to slightly higher properties.

NEALLOY.
M 727, 0 6 Cr, 1 0 max Ni, 0 12 max C, 0 6 Si, 0 5 max Cu, bal Fe
For woven wire conveyor belts, wire cloth and slings

NEASCO
M-1265; Si, Fe, bal Cu
For master alloy; for silicon bronzes

NEATRO.
M-115, 1 27 C, 5 5 W, 4 5 Cr, 4 V, 4.5 Mo, bal Fe
For cutting tools, broaches, chasers, hobs; high speed steel

NEATRO FM.
M-115; 1.25 C, 5.5 W, 4 5 Cr, 4 V, 4.5 Mo, bal Fe.
For cutting tools, broaches, chasers, hobs; high speed steel, free-machining.

NEBALOY
M-1720, 62.0-65.0 Cu, 0.07 max Pb, 0.05 max Fe, bal Zn
Elec cond : 26.5% IACS at 68°F.
Good cold working properties
For electrical terminals and connectors, hardware, jewelry, washers, shells, stampings.
Copper alloy No. 272

NECOMICLE.
Japan, C, Ni, Cr, Mo, bal Fe
For turbine blades, chemical apparatus, stainless

NEEDLE METAL.
U.S., 85 Cu, 8 Sn, 5.3 Zn, 1.7 Pb
For needles, valves, fittings, free-cutting

NEEDLE WIRE
M-38, 0.7 C, bal Fe
For spring beard, latch, sewing machine needles, tough.

NEELIUM.
M-1513, Bi, Te, Se, Sb
For thermoelectric cooling, semi conductor

NELOY
M-232, 0.3-0.4 C, 1.0 1.25 Mn, bal Fe
Heat treated. 190,000-220,000 TS, 175,000 195,000 YS, 14.8 El, 45-25 RA, 364-477 Brin
For gears, crankshafts, tough, hard after heat treatment

NELOY NO 1.
M 232, C, alloy, bal Fe
Cast 85,000-95,000 TS, 23 30 El, 50-60 RA, 163-170 Brin
For steel castings, gears, tough

NELOY NO 2.
M 232; 0.4 C, 0.4 Si, 0.75 Mn, bal Fe
Drawn 90,000 93,000 TS, 65,000-75,000 YS, 23-28 El, 55-65 RA, 174-198 Brin
For steel castings, gears, tough

NELOY NO 3
M-232, 0.4 C, 0.4 Si, 0.75 Mn, bal Fe
Heat treated: 100,000 110,000 TS, 80,000-90,000 YS, 20-26 El, 50-60 RA, 202-240 Brin
For steel castings, gears, tough

NELOY NO 4
M-232, 0.4 C, 0.4 Si, 0.75 Mn, bal Fe
Heat treated: 115,000 130,000 TS, 95,000-110,000 YS, 15-20 El, 40-45 RA, 240-268 Brin
For steel castings, gears, tough

NELOY NO 5
M-232, C, alloy, bal Fe
Heat treated 125,000-135,000 TS, 110,000 125,000 YS, 12 20 El, 35 45 RA, 268-288 Brin
For steel castings, gears, tough

NELOY NO 6
M-232, C, alloy, bal Fe
Heat treated: 135,000-150,000 TS, 120,000-135,000 YS, 9-18 El, 30 40 RA, 286-302 Brin
For steel castings, gears, tough

NELOY MOLYBDENUM
M-232, 0.3 C, 0.6 Ni, 0.6 Cr, 0.2 Mo, bal Fe
Annealed 85,000-95,000 TS, 55,000-65,000 YS, 20 25 El, 30-40 RA, 170-197 Brin.
For steel castings, gears, tough

NELOY MOLYBDENUM NO 2A.
M-232, 0.3 C, 0.6 Ni, 0.6 Cr, 0.2 Mo, bal Fe
100,000 115,000 TS, 70,000-90,000 YS, 15-20 El, 35-45 RA, 190-220 Brin
For steel castings, gears; tough

NELOY MOLYBDENUM NO 3A.
M-232, 0.3 C, 0.6 Ni, 0.6 Cr, bal Fe.
Heat treated 125,000-140,000 TS; 115,000-130,000 YS, 12-15 El, 30-40 RA, 250-280 Brin
For steel castings, gears; tough

NELOY MOLYBDENUM NO 5A.
M-232, 0.3 C, 0.6 Ni, 0.6 Cr, bal Fe.
Heat treated 140,000-160,000 TS, 130,000-145,000 YS; 10-13 El, 20-30 RA, 302-331 Brin.
For steel castings, gears, tough.

NELOY MOLYBDENUM NO. 6A.
M-232, 0.3 C, 0.6 Ni, 0.6 Cr, bal Fe
Heat treated 160,000-180,000 TS, 145,000-160,000 YS, 7.5-10 El; 15 25 RA; 341-375 Brin.
For steel castings, gears, tough

NELSON-BOHNALITE
M 196, 10 Cu, 0.2 Si, 0.3 Mg, 0.3 Ni, bal Al
25,500 TS, 23,400 YS, 0.2 El, 110 Brin
For pistons for motor vehicles, coefficient of expansion 0.000024

NELSON BOHNALITE
M-1548, 9.0-11.0 Cu, 0.2 Si, 0.3 Mg, bal Al
For general castings, fittings, hardware
Good machinability, good strength

NEMICLE
Japan, C Ni, Cr, Mo, bal Fe
For turbine blades, chemical apparatus, stainless

NEMICLE C
Japan, C Ni, Cr, Mo, bal Fe
For turbine blades, chemical apparatus, stainless

NEMICLE F
Japan, C, Ni, Cr, Mo, bal Fe
For turbine blades, chemical apparatus, stainless

NEO-BAROS
M-104, 90 Ni 10 Cr
For weights pen points similar to "Baros," non magnetic

NEOCHRAN
M-651 23 30 Cr, 0.5-2.5 Si, 1.0 1.5 C, bal Fe
For stainless castings, corrosion resistant

NEOGEN
U.S., 58 Cu, 27 Zn, 12 Ni, 2 Sn, 0.5 Al, 0.5 Bi
For ornamental and structural parts, corrosion resistant

NEOMAGNAL A
German, Mg, Zn, bal Al
For bearings

NEONALIUM
M 283, 86 94 Al, 6-14 Cu, 0.4-1.0 other elements
Heat treated 22,800 34,000 TS, 11,000-16,000 YS, 1.0 RA, 80 120 Brin
For light alloy parts, good heat resistance

NEONALIUM
M-1548, 6.0-14.0 Cu, bal Al
Sand Cast 26,000 TS, 18,000 YS, 0.8 El, 90 Brin
Chill cast 32,000 TS, 26,000 YS, 0.3 El, 110 Brin
For housings, casings, general castings
Good machinability

NEOR.
M-40, M-289, 2.3 C, 13 Cr, 0.6 Si, 0.6 Ni, 0.4 Mn, bal Fe
For press tools, punches, dies, reamers, broaches, gages, remarkable resistance to abrasion

NEPTUNE
M-1432; 0.30 C, 0.75 Mn, 0.50 Si, 1.7 Cr, 0.4 Mo, bal Fe
Oil hardening steel designed for molds AISI P20

NERGANDIN.
M-188, M-282; 70 Cu, 28 Zn, 2 Pb.
89,000 TS, 10 El; 135 Brin.
For condenser tubes; resistant to sea water corrosion.

NERO 3.
M 1338; 1.05 C, 1.0 Cr, bal Fe.
For bearings, liners, sleeves, punches, cutters; water hardened, wear resistant

NERO EXTRA.
M-1338; 1.0 C, 1.1 Cr, 0.07 Mn, 0.25 Si, bal Fe
For bearings, liners, sleeves, punches, cutters; water hardened, wear resistant

NERO EXTRA SPEZIAL
M-1338, 1.45 C, 1.4 Cr, 0.6 Mn, 0.25 Si, bal Fe
For bearings, liners, dies; water hardened, wear resistant

NERO HBK
M-1338, 1.05 C, 1 Cr, 1.15 W, 0.9 Mn, 0.25 Si, bal Fe
For bearings, forming and blanking dies, oil hardened, abrasion resistant

NERO HFG
M-1338, 1.25 C, 1.15 Si, 0.7 Mn, 1.2 Cr, bal Fe
For bearings, liners, punches, dies, water or oil hardened, wear resistant

NERO HWF1
M-1338, 1.2 C, 0.1 V, 1.0 W, 0.28 Mn, 0.25 Si, bal Fe
For wear plates, punches, tools, dies, oil hardened

NERO KST
M-1338, 0.9 C, 1.9 Mn, 0.25 Si, 0.1 V, bal Fe
For punches, shears, crimpers, dies, upsetters; oil hardened, nondeforming

NERO SPEZIAL
M-1338, 1.05 C, Cr, bal Fe
For bearings, liners, tools, dies, water hardened, wear resistant.

NES 3
M-1651 15 Cr, 17 Mo, 5 Fe, 4 W, bal Ni
For valves, pumps, pharmaceutical and chemical plant equipment Corrosion and heat resistant

N E S 70
M-97 0.18 C, 1.5 Ni, 1.0 Cu, 0.2 Mo, 0.8 Mn, bal Fe
Rolled 110,000 TS, 70,000 YS
For mine cars, cages, skips, coal conveyors, abrasion and corrosion resistant

NESALOY
M-865, Li alloy
To disperse Pb in Cu, alloying

NETIC-S3
M-1567, Ni, bal Fe
Sheet 67,100 TS, 29,500 YP, 7.5 El, B 68-71 Rock
For magnetic shields
Low magnetic retensivity

NETIC S3 5
M-1567, Ni, bal Fe
Sheet 46,100 TS, 28,200 YS, 25 El; B 45 Rock
For magnetic shielding
Low magnetic retentivity.

NETIC S3-6
M-1567, Ni, bal Fe
Sheet 40,000-45,000 TS, 28,000 YP, B 45 Rock
For magnetic shields
Low magnetic retentivity.

NEUF ECLAIRS.
M-1043; 0.85 C, 19 W, 9 Co, 1.8 V, 0.6 Mo, bal Fe.
For cutting tools, lathe and planer cutters; oil hardened.

NEUMAL BD
M-1366, 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, 0.5-2.5 Pb, Sn, Cd, Bi, bal Al
For screw machine products, free-cutting

NEUMAL D3.
M-1366; 2.5 5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
Annealed. 27,000 TS, 11,000 YS; 22 El, 47 Brin.
Heat treated 72,000 TS, 57,000 YS, 130 Brin
For aircraft structures and fittings, fasteners, age hardenable

NEUMAL-S
M-1366, 0.6-1.4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, 0.3 max Cr, bal Al
Annealed 21,000 TS, 8000 YS, 24 El.
For window frames, gutters, fan blades, boats
Good forming and welding properties

NEUSILBER 2A
M-303, 25 Ni, 15 Zn, bal Cu
Annealed 65,000 TS, 40,000 YS, 42 El; 130 Brin
For bathroom fixtures, marine hardware; nickel silver, corrosion resistant.

NEUSILBER 3B
M-303, 18 Ni, 65 Cu, bal Zn
For deep drawn parts, wash basins, fittings; nickel silver, corrosion resistant

NEUSILBER 3F
M 303, 17-19 Ni, 54-56 Cu, bal Zn
For hardware, cutlery, nickel silver, corrosion resistant

NEUSILBER 4B
M-303, 14 16 Ni, 62-64 Cu, bal Zn
For hardware, cutlery, nickel silver, corrosion resistant

NEUSILBER 4C
M-303, 12 13 Ni, 62-64 Cu, bal Zn
For hardware, cutlery, nickel silver, corrosion resistant

NEUSILBER 4D
M-303, 13-14 Ni, 63-64 Cu, 1 Pb, bal Zn
For hardware, cutlery, leaded nickel silver, corrosion resistant

NEUSILBER 47-11 Pb
M-297, 47 Cu, 11 Ni, 1.5 Pb, bal Zn
Soft 58,000 TS, 25 El; 100 Brin
Hard 82,000 TS, 0.5 El, 185 Brin
For optical and camera parts, hardware, tableware, leaded nickel silver, corrosion resistant.

NEUSILBER 57-12 Pb
M 297, 57 Cu, 12 Ni, 1.7 Pb, bal Zn
Soft 58,000 TS, 35 El, 80 Brin
Hard 82,000 TS, 8 El, 160 Brin
For optical and camera parts, tableware, leaded nickel silver, corrosion resistant.

NEUSILBER 60-25
M-297, 60 Cu, 25 Ni, bal Zn
Soft 65,000 TS, 30 El, 90 Brin
Hard 90,000 TS, 7 El, 170 Brin
Spring 114,000 TS; 0.5 El, 200 Brin
For optical and camera parts, tableware, jewelry; nickel silver, corrosion resistant.

NEUSILBER 62-18.
M-297; 62 Cu, 18 Ni, bal Zn.
Soft: 61,000 TS; 40 El; 85 Brin.
Hard: 85,000 TS; 7 El; 165 Brin.
Spring: 108,000 TS; 1 El; 195 Brin.
For optical and camera parts, tableware, jewelry, nickel silver, corrosion resistant

NEUSILBER 62-18 Pb.
M-297; 62 Cu, 18 Ni, 2 Pb, bal Zn.
Soft: 58,000 TS; 35 El; 85 Brin.
Hard. 82,000 TS; 8 El, 160 Brin.
For optical and camera parts, hardware, tableware; leaded nickel silver, corrosion resistant.

NEUSILBER 65-12.
M-297; 65 Cu, 12 Ni, bal Zn
Soft: 58,000 TS; 40 El; 85 Brin
Hard: 80,000 TS; 10 El, 160 Brin.
Spring. 103,000 TS, 1.5 El, 190 Brin
For tableware, jewelry, camera parts, nickel silver, corrosion resistant.

NEUSILBER 71-7
M-297, 71 Cu, 8 Ni, bal Zn
Soft. 58,000 TS; 35 El, 80 Brin
Hard· 80,000 TS, 8 El, 150 Brin.
Spring. 103,000 TS, 3 El, 180 Brin.
For tableware, costume jewelry, hardware; nickel silver, corrosion resistant.

NEUSILBER B UND D. I
M-297; 57 Cu, 12 Ni, 2 Pb, bal Zn.
Rolled 65,400 TS; 8 El, 120 Brin
Annealed. 46,800 TS, 35 El, 70 Brin
For instruments, optical frames; corrosion resistant, free-cutting

NEUSILBER B. UND D II
M-297, 54 Cu, 8 Ni, 1 Pb, bal Zn
Rolled 79,500 TS, 4 El; 180 Brin
Annealed: 56,800 TS, 48 El; 85 Brin
For instruments, optical frames, free-cutting, corrosion resistant

NEUSILBER B. UND D III
M-297; 62 Cu, 15 Ni, 1 Pb, bal Zn
Rolled 81,000 TS, 5 El, 170 Brin.
Annealed· 58,300 TS, 37 El, 95 Brin
For instruments, optical frames, free cutting, corrosion resistant

NEUSILBER B UND D IV
M-297, 47 Cu, 11 Ni, 1 Pb, bal Zn
Rolled· 120,800 TS, 2 El, 210 Brin.
Annealed: 85,200 TS, 30 El; 140 Brin.
For instruments, optical frames; free-cutting, corrosion resistant

NEUSILBER, ENAMEL QUALITY.
M-297; 20 Ni, 5 Zn, bal Cu.
For bullet jackets, condenser tubes, German silver

NEUSILBER EXCELSIOR
M-297, 25 Ni, 15 Zn, 60 Cu
Annealed 57,000 TS, 32 El, 85 Brin
For food handling equipment, German silver.

NEUSILBER, NICKELIN.
M-297, 22 Ni, 20 Zn, 56 Cu
For hardware, electrical resistances; German silver.

NEUSILBER PDS
M-303; 13.5 Ni, 55 Cu, 1.5 Pb, bal Zn.
For hardware, cutlery; leaded nickel silver, corrosion resistant.

NEUSILBER, PRIMA
M-297, 12 Ni, 23 Zn, 65 Cu
Annealed: 50,000 TS; 35 El, 75 Brin.
For ornamental parts; German silver.

NEUSILBER, PRIMA-PRIMA.
M-297, 18 Ni, 20 Zn, 62 Cu.
Annealed. 50,000 TS; 35 El; 75 Brin.
For white metal parts; German silver.

NEUSILBER, QUARTA
M-297; 7 Ni, 22 Zn, 71 Cu
Annealed· 51,200 TS; 45 El; 70 Brin.
For ornaments; German silver.

NEUSILBER, SEKUNDA.
M-297, 10 Ni, 24 Zn, 66 Cu
For ornamental parts, German silver.

NEUSILBER, TERTIA
M-297, 9 Ni, 25 Zn, 66 Cu
For ornaments, German silver.

NEUSILBER, TUBES
M-297, 16 Ni, 19.5 Zn
For German silver tubes, German silver

NEUSTADT
German, 71.5 Cu, 28.5 Zn
For condenser tubing, deep drawn

NEU-TEC-TRONIC 157 BN.
M-717,
Neutral flux core modifications of EUTEC Rod 157

NEUTRALEISEN.
Germany, 14-15 Si, 0.7 Mn, bal Fe
For insoluble anodes, crucibles, condensers, evaporators acid resistant, brittle.

NEUTRALLOY
M 866, 75 Ni, 15 Cr, 10 Fe, Si, Ti, Mn
For castings, corrosion and acid resistant

NEUTROLOY
M-1523, 55 Cu, 45 Ni
Resistance wire 300 Ohms per cir mil ft.
Low temp coefficient of resistance
Ann 50,000 psi, hard drawn 140,000 psi
Max oper temp 500°C

NEVADA
M 1704, 1.1 C, 0.75 Mn, 0.5 Si, 5.5 Cr, 0.3 V, 1.3 Mo, 0.015 P, 0.015 S, bal Fe
Air hardening tool steel for cold work tools.

NEVADA MODIFIED
M 1704, 0.55 C, 0.9 Mn, 0.25 Si, 3.5 Cr, 0.25 Ni, 0.25 V, 1.4 Mo, bal Fe
Air hardening tool steel

NEVADA SILVER
U S; Cu-Ni
For ornaments, electrical resistances; nickel silver

NEVASTAIN 25-12
M-1, 0.25 max C, 24 Cr, 12 Ni, bal Fe
For heat and corrosion resistant parts, see Silcrome 25-12

NEVASTAIN "C A"
M-15, M-76, 12.5-13.5 Cr, 0.30-0.35 C, bal Fe
Annealed 90,000-105,000 TS; 20-25 El; 40 50 RA, 195-210 Brin
Heat treated 225,000 145,000 TS; 9-14 El; 25-47 RA, 420-270 Brin
For cutlery, turbine blades; corrosion resistant, see Silcrome I-12

NEVASTAIN "C B"
M-15, M-76, 16.5-17.5 Cr, 0.65-0.70 C, bal Fe.
For cutlery, knives, corrosion resistant; see Silcrome M-17.

NEVASTAIN "D"
M-15, M-76, 0.15 C, 1.0 Si, 20-21 Cr, bal Fe.
At 70°F· 65,000-75,000 TS, 40,000-45,000 YS; 32 El, 63 RA
At 1500°F. 10,000 TS; 8,000 YS; 90 El, 98 RA.

For furnace linings, conveyors, heat treating boxes; heat resistant; see Silcrome 21.

NEVASTAIN "E.Z."
M-15, M-76; 13.5-15 Cr, 0.12 max C, bal Fe.
For corrosion resisting parts; corrosion resisting; see Silcrome 12-EZ.

NEVASTAIN, GRADE A.
M-15, M-76, 0.3-0.35 C, 12.5-13.5 Cr, bal Fe.
Annealed: 90,000-105.000 TS; 40,000-50,000 YS; 20-25 El; 40-50 RA; 195-210 Brin.
Hardened: 225,000 TS; 185,000 YS; 9 El; 25 RA; 420 Brin.
For stainless cutlery, tanks; corrosion resisting; see Silcrome L-12.

NEVASTAIN, GRADE B.
M-15, M-76; 0.65-0.70 C, 16.5-17.5 Cr, bal Fe.
Annealed: 90,000-95,000 TS; 40,000-45,000 YS; 26 El, 50-45 RA; 180-210 Brin
For stainless cutlery; corrosion resisting; see Silcrome M-17

NEVASTAIN, GRADE RA.
M-15, M-76; 0.10 max C, 16 Cr, 1.0 Cu, 1.0 Si, 0.40 Mn, bal Fe.
Annealed 75,000 TS; 40,000 YS; 40 El; 75 RA; 150 Brin
Oil treated. 90,000-103,000 TS; 50,000-98,000 YS; 30-25 El; 60-63 RA; 170-217 Brin
For general fabricated stainless products, stainless; see Silcrome R A.

NEVASTAIN "H"
M-15, M-76, 1.0-1.1 C, 16-18 Cr, <0.60 Si, bal Fe.
Annealed 115,000 TS, 40,000-50,000 YS, 12 El, 17-18 RA, 195-240 Brin.
Air cooled· 140,000-240,000 TS, 140,000-220,000 YS, 0-2.8 El, 0-13.5 RA
For furnace parts, heat treating equipment; see Silcrome H 17

NEVASTAIN "K A 2."
M-15, M-76, 17-18.5 Cr, 8.25-10 Ni, 0.08-0.16 C, bal Fe
Heat treated· 112,000-86,000 TS; 90,000-37,000 YS; 41-75 El, 64-82 RA
For stainless parts, chemical plant equipment, corrosion resisting, see Silcrome KA2

NEVASTAIN "K.A 2 S."
M-15, M-76; 17-18.5 Cr, 8.25-10 Ni, 0.07 max C, bal Fe
Heat treated 132,000 TS; 42,000 YS, 50 El; 76 RA.
At 1600°F· 20,000 TS; 7,000 YS, 28 El; 26 RA.
For stainless parts, chemical plant equipment; corrosion resisting, see Silcrome KA2S

NEVASTAIN "K N.C -3."
M-15, M-76, 24-26 Cr, 19-21 Ni, 0.15 max C, bal Fe.
For furnace parts, heat and corrosion resisting; see Silcrome 25-20.

NEVASTAIN RA (CINCINNATI STEEL CASTING CO).
M-437, 0.10 C, 16 Cr, 1 Cu, 1 Si, bal Fe.
For rustless and stainless parts; stainless.

NEVASTAIN "S"
M-15, M-76; 11.5-13 Cr, 0.12 max C, bal Fe
Rolled: 125,000-150,000 TS; 8-10 El; 25-35 RA; 280-320 Brin.
Heat treated· 130,000 TS; 21 El; 68 RA; 237 Brin.
Annealed: 50,000 TS; 35 El; 60 RA; 140 Brin.
For turbine blading, pump rods, machine parts, valves, spoons, and forks; high resistance to shock and impact; see Silcrome 12.

NEVEROIL-21.
U.S.; 32.5 Ni, 64.5 Cu.
For corrosion resistant parts; corrosion resistant.

NEVYANSKITE.
Russia; 58-44 Ir, 27-49 Os, 0-10 Pt, 0-6 Ru, 1.5-3 Rh, Pd + Fe + Cu.
For fountain pen points, mined by U.S.S.R.

NEW BIDE.
M-73; carbides.
For dies, cutting tools; cemented carbides.

NEW CAPITAL.
M-1114, 0.70 C, 3.75 Cr, 14 W, 0.5 V, bal Fe.
For lathe and planer tools, reamers, drills, hobs; high speed steel.

NEW CAPITAL STEEL.
Eng.; 14 W, 3.7 Cr, 0.1 V, 0.6 C, bal Fe.
For high speed tools, reamers, cutters, punches, gages, high speed steel

NEWCOMER C-2.
M-1203, Carbide
Rockwell A93
For cutting tools for high speeds; sintered, Tr.S. 220,000.

NEWCOMER C-3
M-1203, Carbide.
Rockwell A92
For cutting tools for roughing and finishing; sintered, Tr S 260,000.

NEWCOMER C-4
M-1203, Carbide.
Rockwell A91
For cutting tools for heavy duty, sintered, Tr.S. 300,000

NEWCOMER C-5.
M-1203, Carbide.
Rockwell A89
For cutting tools for heavy duty, sintered, Tr S. 375,000.

NEWCOMER S-2
M-1203, Carbide
Rockwell A92
For cutting tools for light roughing; sintered, Tr S 220,000

NEWCOMER S-4
M-1203, Carbide.
Rockwell A91.
For cutting tools for roughing; sintered, Tr S. 275,000.

NEWCOMER S-6
M-1203, Carbide.
Rockwell A90.
For heavy duty cutting tools; sintered, Tr.S. 340,000

NEW K S
M-38, 27 Co, 18 Ni, 7 Ti, 3.7 Al, bal Fe.
Bar: 7150 Br, 785 H_c, 4300 Bo, 2,030,000 (BH) max.
For electrical and magnetic equipment
Permanent magnet High permeability.

NEWLOY.
M-310, 64 Cu, 35 Ni, 1 Sn.
For base metal for tableware, resistance wire; good corrosion and acid resistance.

NEWMAX.
M-289, 0.45-0.53 C, 0.75-1.00 Mn, 0.8-1.1 Cr, 0.15-0.25 Mo, bal Fe.
Oil hardening steel, designed for molds; Similar to AISI 4150.

NEW MET
M-1203; Mo, Ti, carbides.
For cutters; sintered carbides.

NEW MET N93.
M-1203, 61 TiC, 8 Ni, 31 MoC.
Sintered: 175,000 Tr.S.; Rock. A 93.5.
For tools, bearings and seals.
Resists heat, oxidation and wear.

NEW MET N95.
M-1203; 64 TiC, 2 Ni, 34 MoC.
Sintered: 150,000 Tr.S.; Rock A 95
For tools, bearings and seals
Resists heat, oxidation and wear

NEWPORT ARMATURE.
M-191; Si, bal Fe.
For electric generators; high permeability.

NEWPORT ELECTRICAL "A"
M-191; Si, bal Fe.
For electric generators, high permeability.

NEWPORT ELECTRICAL "B."
M-191; Si, bal Fe.
For motors, armatures, high permeability.

NEWPORT ELECTRICAL "C."
M-191, Si, bal Fe.
For motors, armatures, high permeability.

NEWPORT FIELD.
M-191, Si, bal Fe.
For fields, armatures, electrical equipment; high permeability

NEWPORT TRANSFORMER
M-191; Si, bal Fe
For transformers, high permeability

NEWPORT TRANSFORMER EXTRA SPECIAL
M-191, Si, bal Fe
For transformers, high permeability

NEWPORT TRANSFORMER SPECIAL.
M-191; Si, bal Fe
For transformers, high permeability

NEW PROCESS COLD HEADER
M-69, 1.0 C, bal Fe.
Annealed: 100,000 TS, 53,000 YS, 21 El, 42 RA, 200 Brin
For cutters, drills, taps, reamers, broaches, Type W1, water hardened

NEW PROCESS COLD HEADER DIE STEEL
M-69, 1.0 C, 0.25 Mn, 0.18 Si, bal Fe
For cold header punches and dies, water hardened

NEW RAPID
M-363, C, W, bal Fe
For punches, dies, cutting tools, high speed steel

NEW RYCUT 50
M-240; 0.50 C, 0.25 Pb, 0.8 Mn, 0.9 Cr, 0.2 Mo, bal Fe.
Annealed. 103,000 TS, 69,000 YS, 19 El, 50 RA, 212 Brin
Heat treated 140,000-115,000 TS, 120,000-85,000 YS; 15-16 El, 40-45 RA; 341-235 Brin
For collets, brake dies, gears, boring bars; free-cutting, leaded steel

NEWTON FUSIBLE ALLOY
England; 50 Bi, 18.75 Sn, 31.25 Pb.
For fire and signal alarms, fire extinguisher plugs; M.P. 95°C.

NEW TOOL STEEL CAST.
Eng.; 58 Ni, 20 Zn, 12 Al, 10 Si.
For cutting tools and dies; corrosion resistant.

NEY #90.
M-349, 10 Cu, 90 Ag
130 Brin
For sliding contacts, low resistivity and high corrosion resistance.

NEYDIUM NO 9
M-349, 82 Au-Pt, bal Cu, Ag, Zn, Sn.
148,000-167,000 TS, 115,000-134,500 YS; 9-8 El, 225-260 Brin
For dental applications, M.P. 1975°F.

NEYDIUM NO 90
M-349, 10 Cu, bal Ag
For slip rings, commutator segments, rivet head contacts
Corrosion resistant. High electrical conductivity

NEY-ORO 28
M-349, 25 Ag, 75 Au.
Cold Worked, 60,000 TS, 35,000 P.L., 100 Brin
For contact brushes, used against coin silver slip rings
Low contact resistance

NEY-ORO 28A
M-349, 75 Au, 23.5 Ag, 1.5 Ni
Rolled 90,000 TS, 50,000 YP, 140 Brin
Annealed 51,000 TS; 84 Brin
For sliding contacts, electrical brush contacts
72-75 ohms/cmf elect. resistivity

NEY-ORO 28B
M-349, 75 Au, 22 Ag, 3 Ni
Rolled 75,000 TS, 40,000 YP, 130 Brin
For sliding contacts on Constantan, make and break contacts
71-75 ohms/cmf (circular mil feet) elect. resistivity

NEY-ORO 69
M-349, 69 Au, 25 Ag, 6 Pt
Annealed 40,000 TS, 18,000 YP, 85 Brin
Work Hardened 70,000 TS, 30,000 YP, 120 Brin.
For make and break contacts, telephone relays, slip rings. Corrosion resistant

NEY-ORO "A"
M-349, 93 Au-Pt, bal Ag, Cu
Cast 32,000 TS, 10,000 YS, 45 Brin
For dental inlays. Soft material

NEY-ORO "A-1"
M-349, 80 Au-Pt, bal 20 Cu, Ag, Zn
Cast 55,000 TS, 27,000 YS, 25 El, 95 Brin
For dental inlays. Soft material.

NEY-ORO "B"
M-349, 85 Au-Pt, bal Cu, Ag, Zn
Soft 52,000 TS, 25,000 YS, 20 El, 105 Brin
Heat treated 60,000 TS, 30,500 YS, 12 El, 115 Brin
For dental inlays, hard

NEY-ORO "B-2"
M-349, 78 Au-Pt, bal Cu, Ag, Zn
Cast 65,000 TS, 38,000 YS, 19 El, 120 Brin
For dental inlays and dental bridges, hard

NEY-ORO "B-W"
M-349, 81 Au-Pt, bal Cu, Ag, Zn
Soft. 57,000 TS, 27,000 YS, 17 El, 102 Brin
Heat treated 60,000 TS, 31,000 YS, 15 El, 113 Brin
For dental inlays, hard.

NEY-ORO "E"
M-349, 79 Au-Pt, bal Cu, Ag, Zn.
Soft. 75,000 TS, 45,500 YS; 6 El, 150 Brin
Heat treated. 112,000 TS; 82,500 YS, 1 El; 235 Brin.
For dental inlays, partial dentures; extra hard.

NEY-ORO ELASTIC.
M-349, 79 5 Au-Pt, bal Cu, Ag, Zn.
Age Hardened: 173,000 TS; 131,000 YP; 270 Brin.
For wire clasps, pinlays in dentures.
Corrosion resistant.

NEY-ORO "G."
M-349, 8 5 Pt, 4 5 Ag, 14.5 Cu, 1 Zn, 71.5 Au
Ht Tr.. 185,000 TS; 165,000 YS, 1 El; 280 Brin
For pivots in instruments bearings, slip rings,
commutator bars, make and break contacts.
Age-hardenable, corrosion and wear resistant.

NEY-ORO "G-3"
M 349, 75 Au-Pt, bal Cu, Ag, Zn
Cast 73,500 TS; 39,000 YS, 20 El, 220 Brin
Age hardenable, for dental inlays, partial dentures;
extra hard

NEY ORO "G W"
M-349, 74 Au Pt, bal Cu, Ag, Zn
Soft· 67,500 TS, 41,000 YS; 13 El, 132 Brin.
Heat treated· 117,000 TS, 76,500 YS, 3 El,
228 Brin
For dental inlays, partial dentures, extra hard

N.G F. ALLOY
U S , 1-1.5 Cu, 0 75-2 0 Mn, bal Al.
25,000 TS, 18,000 YS, 4 El
For light alloy castings

NH PIG
M-68, 44-47 Ni, 15 17 Cr, bal Fe
For foundry alloys, M P. 2250°F

NIAG
U S , 46 7 Cu, 40 7 Zn, 9 1 Ni, 2.8 Pb, 0.3 Mn
For white metal parts, corrosion resistant

NIAG
M 266, 46 Cu, 1 Pb, Ni, bal Zn
70,000 TS, 42,000 YS, 30 El, 120 Brin
For hardware, plated parts,
wear and corrosion resistant

NIAGARA
M-38, 0 45 0 55 C, bal Fe
Rolled 80,000 TS, 50,000 YS
For machine tool parts, gears, shafts,
water hardened

NIAGRA
M 373, 0 7 C, 14 W, 4 Cr, 2 V, bal Fe
For tools, cutters, taps, hobs, high speed steel

NIAGRA BRAND FERRO-CHROME
M 626, 66-70 Cr, bal Fe
For metallurgical applications in steel, Cr-additions

NIAGRA BRAND FERRO-SILICON
M-626, 15-90 Si, bal Fe
For metallurgical applications in steel, Si-additions.

NIAGRA BRAND SILICO MANGANESE
M-626, 12-20 Si, 65-70 Mn, bal Fe.
For steel metallurgical applications, Mn-additions

NIAL
M-210, 24 Ni, 13 Al, 4 Cu, bal Fe
For loud speakers, lighting and ignition equipment
Permanent magnet High permeability.

NIALCO
M-1120, 19 Ni, 12 Co, 10 Al, 6 Cu, bal Fe.
For permanent magnets, electrical and
magnetic equipment.
High magnetic permeability.

NIALCO I
M-1120, 12 Ni, 10 Al, 4-20 Co, 2 Cu, bal Fe.
6500 Br, 530 Hc, 1 4 BH max., C 45 Rock.
For magnets in wattmeters.
Permanent magnet. High permeability

NIALCO II.
M-1120; 12 Ni, 10 Al, 4-20 Co, 2 Cu, bal Fe.
6300 Br, 650 Hc, 1.5 BH max., C 45 Rock.
For magnets in electrical relays.
Permanent magnet. High permeability.

NIALCO III
M-1120; 12 Ni, 10 Al, 4-20 Co, 2 Cu, bal Fe.
7000 Br, 690 Hc, 1 7 BH max, C 45 Rock.
For Magnets in magnetos
Permanent magnet, high permeability

NIALCO IV
M-1120, 12 Ni, 10 Al, 4-20 Co, 2 Cu, bal Fe.
5700 Br, 1000 Hc, 1 9 BH max, C 58 Rock.
For magnets in electrical equipment.
Permanent magnet, high permeability.

NiAlCo 200
Austria, 10 Al, 20 Ni, 15 Co, 3 Cu, bal Fe.
For permanent magnets

NiAlCo 400
Austria, 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe.
For permanent magnets

NIALITE
M-309, 10 Al, 5 Ni, 5 Fe, 1 5 Mn, bal Cu.
Cast 85,700 TS, 39,000 YS, 24 El; 220 Brin.
For pumps, valves, propellers, corrosion and
cavitation resistant

NI-BAR IRON
M-637, 3 3 T C , 0 6 Mn, 1 5 Si, 0.6 Cr, 1 5 Ni,
bal Fe
36,000 TS, 210 Brin
For grate bars, stoker links

Ni-BRAL
M 1228, 5 Ni, 10 Al, 5 Fe, 1.5 Mn, bal Cu
Cast 95,000 TS, 43,000 YS, 18 El, 15 RA;
170 Brin
For pumps, valves, bearings, Al-bronze,
corrosion resistant

NICA-0
M-1449, 0 08 max C, 18 Cr, 8 Ni, bal Fe
Annealed 85,000 TS, 35,000 YS; 60 El, 70 RA;
150 Brin
For chemical plant equipment, tanks, mixers,
Type 304, stainless, austenitic

NICA-00
M-1449, 0 05 max C, 18 Cr, 8 Ni, bal Fe
Annealed 85,000 TS, 35,000 YS; 60 El, 70 RA;
150 Brin
For chemical plant equipment, tanks, mixers,
Type 304, stainless, austenitic.

NICA 1
M 1449, 0 11-0 16 C, 18 Cr, 8 Ni, bal Fe
Annealed 80,000 TS, 35,000 YS, 55 El, 75 RA,
150 Brin
For chemical plant equipment, tanks, mixers, filters;
Type 302, stainless, austenitic

NICA 2
M 1449, 0 17-0 25 C, 18 Cr, 8 Ni, bal Fe
Annealed 85,000 TS, 40,000 YS, 50 El, 70 RA,
160 Brin
For chemical plant equipment, tanks, mixers, filters;
Type 301 and 302, stainless, austenitic

NICALLOY
Eng , 47 Ni, 53 Fe
For electrical equipment, magnetically soft,
high permeability

NICALOI
M-1, 47 Ni, bal Fe
For armature punchings, electrical machinery
and motors, high magnetic permeability.

NICALUN.
M-250; Ni, Cu, alloy base + abrasive grains imbedded.
For elevator door sills, stair treads; castings; wear resitant.

NICAR.
M-677; 3.5-4 C, 1.0 Si, 12-18 Cr, 65-75 Ni, 0.2 Co, 2.5-4.5 B, 4 Fe.
For hardfacing bare rod; class RNiCr-C.

NICAST.
M-1713; 1 Si, 1.96 Fe, bal Ni.
For welding rod; for cast iron.

NI CHILLITE.
M-229; Ni, Cr, Mo, C, bal Fe.
For rolls; chilled iron.

NI CHILLITE NO. 2.
M-229; C, alloy, bal Fe.
For rod mill rolls; heavy duty.

NICHRANEL-C.
M-1687; 60 Ni, 15 Cr, 15 Mo, 5 Fe, 5 W.
For pumps, valves, pharmaceutical and chemical plant equipment.
Heat and corrosion resistant

NICHROFRY 152.
M-1302; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El, 65 RA; 180 Brin.
At 1200°F: 57,000 TS; 22,000 YS, 32 El; 45 RA.
For furnace parts, valves, pumps, heat treating boxes; Type 310; austenitic, heat resistant.

NICHROFY 152.
M-1043; 0.25 max C, 25 Cr, 20 Ni, bal Fe
Annealed: 100,000 TS, 45,000 YS; 50 El, 65 RA; 185 Brin.
For furnace parts, heat treating boxes, Type 310; heat resistant

NICHROFY 345.
M-1043, 0.20 max C, 24 Cr, 12 Ni, bal Fe
Annealed: 90,000 TS; 40,000 YS, 50 El; 65 RA; 170 Brin.
For furnace parts, heat treating boxes, Type 309, heat resistant.

NICHROFY 345SP
M-1043; 0.08 max C, 20 Cr, 11 Ni, bal Fe.
For furnace parts, heat treating boxes, Type 308, corrosion and heat resistant

NICHROFY 424
M-1043, 0.13-0.25 C, 26 Cr, 4 Ni, bal Fe
Cast: 90,000 TS; 65,000 YS, 2 El; 212 Brin
For cylinder liners, valve seats and bodies, bushings, Type 327; heat resistant

NICHROLLOY I.
M-1027; 0.3 C, 23 Ni, 20 Cr, 1 Mn, 1 V, 0.5 Al, bal Fe.
Annealed: 60,000 TS.
For heat treating boxes, resistance wire, high heat resistance.

NICHROLOY II
M-1027; 40 Ni, 7 Cr, 3 Mn, bal Fe.
For resistance wire, heat treating boxes, heat and corrosion resistant

NICHROLOY III
M-1027; 75 Ni, 16 Cr, 3 Mn, bal Fe
105,000-112,000 TS; 60,000-80,000 YS; 45-25 El; 65-59 RA; 180-210 Brin.
For resistance wire, heat treating boxes; heat and corrosion resistant.

NICHROLOY 37.
M-1027; 0.2 C, 25 Cr, 12 Ni, bal Fe.
Cast: 70,000 TS; 30,000 YS; 35 El; 60 RA; 150 Brin.
For furnace parts, cast heat treating boxes; heat resistant to 2000°F.

NICHROLOY 45.
M-1027; 0.4 C, 25 Cr, 20 Ni, bal Fe.
Cast: 75,000 TS; 50,000 YS; 17 El; 170 Brin.
For furnace parts, retorts, skills; heat resistant to 2100°F

NICHROLOY 50.
M-1027, 0.4 C, 15 Cr, 35 Ni, bal Fe.
Cast: 70,000 TS; 40,000 YS, 10 El, 12 RA; 170 Brin
For salt pots, furnace parts, heat treating boxes; heat resistant to 2100°F

NICHROLOY 72.
M-1027; 0.4 C, 12 Cr, 60 Ni, bal Fe.
Cast 70,000 TS; 40,000 YS, 6 El.
For lead and cyanide pots, furnace equipment; heat resistant

NICHROLOY A
M-1510, 0.51 C, 1.05 Cr, 0.25 Mo, 0.53 Ni, 0.21 V, 0.97 Mn, bal Fe.
Heat treated: 165,000 TS, 150,000 YS; 20 El; 59 RA, 280-310 Brin.
For arbors, axles, bolts, cams, gears, hubs, die liners, shock and fatigue resistant, preheat treated at mill

NICHROLOY L
M-1510, less than 0.5 C, 1.05 Cr, 0.25 Mo, 0.53 Ni, 0.21 V, 0.97 Mn, bal Fe
For arbors, axles, bolts, cams, gears, hubs, die liners: preheat treated at mill, shock and fatigue resistant

NICHROME III
M-44, 85 Ni, 15 Cr
110,000 TS
For electrical resistance units, annealing pots, heating elements, heat and corrosion resistant; Coefficient of Res 0.000187; Specific Res 89.5.

NICHROME V
M-44, 80 Ni, 20 Cr
95,000 175,000 TS, 50,000 YS, 35 El
For heating elements in electric furnaces, electric ranges; max operating temperature 1150°C, high heat and oxidation resistant

NICHROME 62 16
M-963,
High temperature nickel-chrome-iron alloy wire for metallizing gun

NICHROME, CAST
M-44, 60 Ni, 15 Cr, bal Fe
Cast 60,000-65,000 TS, 35,000 YS, 3 El, 2 RA; 156-187 Brin
For carburizing boxes, retorts, glass rolls, furnace parts, coefficient of expansion (20-500°C) 0.000013

NICHROME, WROUGHT
M-44; 60 Ni, 15 Cr, bal Fe
Wire 100,000 175,000 TS; 60,000 YS, 25 El; 50 RA; 183 Brin
For rheostats, heating units; coefficient of expansion (20-100°C) 0.000017.

NICHROTHERM NCT-1
M-72, 0.15 C, 15 Ni, 20 Cr, bal Fe.
Untreated: 100,000-114,000 TS; 78,000-93,000 YS; 35-25 El; 55-45 Brin.
For furnace parts, crucibles, autoclaves, recuperators; heat and corrosion resistant to 1050°C

NICHROTHERM-NCT-1A.
M-72; 0.15 C, 2.5 Si, 1.5 Mn, 18 Cr, 10 Ni, bal Fe.
Bar: 90,000 TS; 40,000 YS; 50 El; B 85 Rock.
For heat treating fixtures, annealing boxes, tube supports, furnace parts.
Type 302B stainless steel, austenitic

NICHROTHERM NCT-3.
M-72; 0.15 C, 20 Ni, 25 Cr, bal Fe.
Untreated. 100,000-114,000 TS, 65,000-78,000 YS; 35-25 El; 55-45 RA.
For furnace parts, crucibles, autoclaves, recuperators; heat and corrosion resistant to 1200°C

NICHROTHERM NCT-6
M-72, 0.15 C, 60 Ni, 15 Cr, bal Fe
Untreated: 85,000-100,000 TS, 35,000-50,000 YS, 35-25 El, 55-45 RA
For furnace parts, crucibles, autoclaves, recuperators, heat and corrosion resistant to 1150°C.

NICHROTHERM NCT-6A
M-72; Fe, Cr, Ni.
For furnace parts, crucibles, autoclaves, recuperators; heat and corrosion resistant to 1150°C

NICHROTHERM NCT-8.
M-72, 0.15 C, 80 Ni, 17 Cr, bal Fe.
Untreated 85,000-100,000 TS, 35,000-50,000 YS; 25-36 El, 45-55 RA
For furnace parts, crucibles, autoclaves, recuperators, heat and corrosion resistant, austenitic, max temperature 1300°C

NICHROTHERMSTEEL.
M 118, Ni, bal Fe
Low coefficient of expansion

NI-CHRO-ZINK
Germ., Ni, Cr, Zn
For die casting alloy

NICKAHL IRON
M-249, 1.5 C, 0.8 Cr, 2.2 Si, bal Fe
For die to stamp fenders, door panels and seat sides for automobiles, tough and wear resisting cast iron

NICKEL 61
M 1499, Ni
For inert gas metal arc welding rod for nickel

NICKEL-131
M-897, 0.15 max C, bal Ni
For welding rod

NICKEL-141
M-897, 0.15 max C, bal Ni
For welding rod

NICKEL 200
M-1499, 99.5 Ni, 0.08 C, 0.18 Mn, 0.2 Fe, 0.005 S, 0.18 Si, 0.13 Cu
Annealed 55,000-80,000 TS, 15,000-30,000 YS, 55-40 El, 90-120 Brin
Cold drawn 65,000-110,000 TS, 40,000-100,000 YS, 35-10 El; 140-230 Brin
Hot finished 60,000-85,000 TS, 15,000-45,000 YS; 55-35 El, 90-150 Brin
Commercially pure nickel, for chemical handling, food processing, electronic equipment, corrosion resistant

NICKEL 201
M-1499; 99.5 Ni, 0.01 C, 0.18 Mn, 0.2 Fe, 0.005 S, 0.18 Si, 0.13 Cu.
Annealed: 50,000-60,000 TS, 10,000-25,000 YS; 60-40 El: 75-100 Brin
Cold drawn: 60,000-100,000 TS; 39,000-90,000 YS; 35-10 El; 125-200 Brin.
Lower carbon than Nickel 200; for caustic evaporators, plater bars, combustion boats; preferred for application above 600°F.

NICKEL 205.
M-1499; 99.5 Ni, 0.08 C, 0.18 Mn, 0.10 Fe, 0.004 S, 0.08 Si, 0.08 Cu, 0.03 Ti, 0.05 Mg.
Annealed: 50,000 TS; 13,000 YS; 45-40 El; 77 Brin.
Cold rolled 95,000 TS; 90,000 YS; 3 El, 210 Brin.
For electrical and electronic applications.

NICKEL 211.
M-1499, 96.85 Ni, 0.10 C, 4.75 Mn, 0.38 Fe, 0.008 S, 0.08 Si, 0.13 Cu
For electronic applications Formerly "D" Nickel.

NICKEL 212
M-1499, 98.0 Ni, 0.10 C, 2.0 Mn, 0.05 Fe, 0.005 S, 0.05 Si, 0.03 Cu
Electron tube supports, Formerly "E" Nickel.

NICKEL 220
M-1499, 99.5 Ni, 0.04 C, 0.10 Mn, 0.05 Fe, 0.004 S, 0.03 Si, 0.05 Cu, 0.03 Ti, 0.05 Mg
Annealed: 70,000 TS, 20,000 YS; 40 El; 100 Brin.
For electronic receiving tube cathodes

NICKEL 225
M-1499, 99.5 Ni, 0.06 C, 0.13 Mn, 0.05 Fe, 0.005 S, 0.20 Si, 0.03 Cu, 0.02 Ti, 0.04 Mg.
Annealed 70,000 TS, 20,000 YS, 40 El; 100 Brin
Formerly "225" NICKEL

NICKEL 230
M-1499, 99.5 Ni, 0.05 C, 0.08 Mn, 0.05 Fe, 0.004 S, 0.02 Si, 0.05 Cu, 0.003 Ti, 0.06 Mg
Annealed 70,000 TS; 20,000 YS, 40 El, 100 Brin.
Electron tube applications

NICKEL 233
M 1499, 99.5 Ni, 0.09 C, 0.18 Mn, 0.05 Fe, 0.005 S, 0.03 Si, 0.03 Cu, 0.003 Ti, 0.07 Mg

NICKEL 270
M-1499, 99.98 Ni, 0.01 C, 0.003 Mn
High purity nickel: for electronic applications, heat exchangers

NICKEL ALLOY
M-849, 100 Ni
Welded 45,000 TS, 3 El
For welding electrodes, shielded arc

NICKEL ALLOY, GRADE A
M-33; 65 Cu, 17 Zn, 18 Ni
Plates 58,000-95,000 TS, 32-2 El, 77-158 Brin
For silver plated ware, plumbing pipes, resistance wire; high resistance.

NICKEL ALUMINUM BRONZE
U.S., 88 Cu, 10 Ni, 2 Al, Sn
For heat and corrosion resisting parts, high strength.

NICKEL ALUMINUM BRONZE
U.S., 10 Cu, 40 Ni, 30 Al, 20 Sn.
For ornaments, corrosion resistant

NICKEL ALUMINUM BRONZE
M-129, 78 min Cu, 9-11.5 Al, 3.0-5.5 Ni, 3.0-5.0 Fe, 1.5 max Mn
Cast 80,000 TS; 35,000 YS; 15 El, 15 RA, 140 Brin.
For ship propellers, pump and turbine parts; resists cavitation and corrosion, tough.

NICKEL-ARC.
M 1713; high C, Ni, bal Fe.
For welding electrodes for cast iron; machinable cast iron.

NICKEL-AT.
M 897, 0.15 max C, bal Ni.
For welding rod

NICKEL-AT
M-121; 0.25 max Cu, 0.40 max Fe, 0.35 max Mn, 0.15 max Si, 0.15 max C, 0.01 max S, 99.0 min Ni.
For chemical plant and other corrosion resisting applications.
Good welding qualities, corrosion and heat resistant.

NICKEL BEARING.
Eng.; 50 Cu, 25 Ni, 25 Sn.
For bearings; heavy duty.

NICKEL BORON STEEL.
2.8-3.6 Ni, 0.1-0.5 B, 0.15-0.7 C, bal Fe.
For dynamically stressed parts; water or oil hardened

NICKEL BRASS.
U.S.; 50-54 Cu, 35-44 Zn, 1.5 Ni, 0.5 Fe, Al
For condenser tubes, hardware; corrosion resistant

NICKEL BRASS
M-538; Ni coated brass
For fabricated parts; easily stamped, formed, drawn

NICKEL BRONZE
M-126, 82 Cu, 8 Sn, 2 Zn, 8 Ni
For superheated steam parts; corrosion resistant.

NICKEL-BRONZE.
M-309; 85-90 Cu, 3-6 Sn, 3 7 Ni, 1-3 Zn.
Heat treated: 50,000-80,000 TS, 25,000-60,000 YS, 15-25 El, 15-25 RA, 95-170 Brin.
For gears, screw down nuts, castings

NICKEL "C"
M-303, 1.5 Mn, bal Ni
69,000 TS; 45 El
For chemical apparatus, thermocouple element; heat and corrosion resistant to salt solutions and caustics

NICKEL CAST IRON NO 1
M-68, 3.0 Ni, 1.5 Si, 0.8-1.0 Cr, C, bal Fe
50,000 TS, 385 Brin
For cast gears, wear resisting casting

NICKEL CERIUM STEEL.
Eng., 2.2-3.0 Ni, 0.1-0.9 Ce, 0.4-0.75 C, bal Fe.
For machinery parts, oil hardening

NICKEL CHROME ALUMINUM
Eng; 88 Ni, 12 Al, 8 Cr
For corrosion and heat resistant parts, corrosion and heat resistant

NICKEL CHROME CAST IRON
1.5-1.75 Ni, 0.6-0.8 Cr, 3.3.4 C, 0.9-1.75 Si, 0.5-0.7 Mn, bal Fe.
Cast: 35,000-48,000 TS; 0 El, 0 RA, 170-230 Brin
For grids; corrosion and abrasion resistin.

NICKEL-CHROME-COPPER
Eng, 80-85 Ni, 20-25 Cr, 15-20 Cu
For electric irons, percolators

NICKEL CHROMEIGHT
M-118; C, Cr, Ni, bal Fe
For welding electrodes; for 18/8 stainless steel.

NICKEL CHROME PEERLESS.
Eng.; 16.5 Cr, 3.0 Fe, 2.0 Mn, 0.1 C, bal Ni
For heat resisting parts; heat resistant.

NICKEL CHROME PREMIER
Eng.; 25 Fe, 11 Cr, 3.0 Mn, bal Ni
For heat resisting parts; heat resistant

NICKEL CHROME SUPERIOR.
Eng.; 19.5 Cr, 0.5 Fe, 2.0 Mn, 0.2 C, bal Ni
For heat resisting parts; heat resistant.

NICKELCHROMTWELVE.
M-118; C, Ni, Cr, bal Fe.
For welding electrodes, for 25/12 stainless steel.

NICKEL-CLAD STEEL.
M-176; pure nickel on steel base 10% Ni, bal steel.
Plate: 55,000-65,000 TS, 40,000-50,000 YS; 41-29 El, 62-52 RA.
For vessels, tanks, tank cars, digesters, retorts, piping, stills; corrosion resisting

NICKEL COBALT 9-H.
M-580, Ni-Co.
For anodes, electroplating.

NICKEL COINAGE U S A
U S, 75 Cu, 25 Ni
For coinage, corrosion resistant.

NICKEL COPPER.
M-538, Ni coated Cu
For fabricated parts, easily stamped, formed, drawn

NICKEL COPPER STEEL
U S, 1-25 Ni, 0.4-10 Cu, 0.15-0.8 C, bal Fe.
For structures, machinery parts, fences, gates; resists soil corrosion

NICKEL DUR
M 508, 80 Cu, 10 Pb, 5 Ni, 5 Sn
Cast: 19,000 TS; 85 Brin.
For centrifugal cast liner, nickel bronze, corrosion resistant

NICKELEISEN 36K
M-297, 36-38 Ni, bal Fe
For magnetic and electrical equipment, motors; soft magnet, high permeability

NICKELEISEN 36W
M-297, 36 38 Ni, bal Fe
For magnetic and electrical equipment, motors; soft magnet, high permeability

NICKELENE-1
Eng, 5 30 Ni, 52-80 Cu, 10-35 Zn
For electrical instruments, resistance wires, thermocouples, German silver

NICKELENE-2
Eng, 13 Ni, 55 Cu, 21 Zn, 2 Sn, 10 Pb
For resistance wires, heat resistant

NICKEL FILLER METAL 61
M-1499, 96.0 Ni, 0.06 C, 0.30 Mn, 0.10 Fe, 0.005 S, 0.40 Si, 0.02 Cu, 3.0 Ti
For gas shielded arc welding of Nickel 200 and Nickel 201, overlaying on steel
AWS A 5.14 Class ERNi 3, ASME SFB 5.14

NICKEL "GEA"
M-121, Ni alloy
For electronic equipment, corrosion and heat resistant

NICKEL "HPA"
M-121, Ni alloy.
For electronic equipment, corrosion and heat resistant

NICKEL "HPB"
M-121; Ni alloy.
For electronic equipment; corrosion and heat resistant

NICKELIN
M-297, 50-90 Cu, 3-40 Ni, 0-10 Al, 0-40 Zn
For chemical equipment, corrosion resistant.

NICKELIN
M-297; 58 Cu, 22 Ni, 20 Fe
For regulating and checking electrical resistances; German silver.

NICKELIN-40.
M-789; 67 Cu, 30 Ni, 3 Mn.
Hard: 115,000-128,000 TS.
Soft: 50,000-60,000 TS.
Temp. coef. resist per °C: + 0.00014.
For electrical equipment and instruments.
Resistance alloy. Max operating temperature 400°C.

NICKELIN "A."
Eng; 18 Ni, 62 Cu, 20 Zn
For resistance alloy; heat resistant.

NICKELIN "B"
Eng, 32 Ni, 68 Cu
For resistance alloy; heat resistant.

NICKELIN "C."
Eng; 31 5 Ni, 55.3 Cu, 13 1 Zn.
For resistance alloy; heat resistant.

NICKELINE.
55-75 Cu, 18 32 Ni, 0-20 Zn, 0.20-0 45 Fe
For electrical resistance, heat resistant.

NICKELINE.
M-88; Pb, Sb, bal Sn.
24 Brin.
For Babbitt, bearings; Babbitt metal.

NICKELIN I
M-303; 33.3 Ni, bal Cu.
For chemical equipment, fruit presses, boilers, kettles, corrosion resistant.

NICKELIN I
M 297, 54 Cu, 26 Ni, 20 Zn
Hard 121,000 TS, 1 5 El.
Annealed· 85,000 TS, 30 El
For starting rheostats for motors, field regulators, loading resistances, max. operating temperature 500°C

NICKELIN II
M-297, 67 Cu, 30 Ni, 3 Mn.
Hard· 100,000 TS, 2 El, 170 Brin
Annealed 70,000 TS, 44 El, 92 Brin.
For starting rheostats, field regulators, loading resistances, max operating temperature 500°C.

NICKELIN II
M-303, 25 Ni, bal Cu.
For fruit presses, coinage, corrosion resistant.

NICKELIN III
M-303, 20 Ni, bal Cu
For medals, ornaments, corrosion resistant.

NICKELIN III
M-297, 58 Cu, 22 Ni, 20 Zn
Hard 118,700 TS, 1 El
Annealed 72,000 TS, 34 El.
For regulating and control resistances, max operating temperature 500°C

NICKELIN IV
M 303, 85 Cu, 15 Ni.
45,000 TS, 48 El
For projectiles or bullets to be nickel-jacketed; tough

NICKELIN V
M-303, 10 Ni, 90 Cu.
For armature wires, electrical equipment; corrosion resistant

NICKELIN RESISTANCE
M-297; 54 Cu, 20 Zn, 26 Ni.
For motor starters, electrical equipment; nickel silver.

NICKEL LEADED COMMERCIAL BRONZE.
M-33; 90.25 Cu, 6 9 Zn, 1 Ni, 0.1 P, 1.75 Pb.
For bolts, fasteners, pole line hardware; free-cutting.

NICKEL MALLEABLE.
M-68; 99 4 Ni, 0.15 Mn, 0.1 Cu, 0.05 C, 0.15 Fe.
For coinage, constituent of alloys; corrosion resistant.

NICKELMANG.
M-118; C, alloy, bal Fe.
For welding electrodes for Mn steel; bare and coated.

NICKEL-MANGANESE.
M-897; 2-5 Mn, bal Ni.
Annealed: 78,000 TS, 50,000 YS; 30 El
For grid wires, electronic tubes; corrosion and heat resistant.

NICKEL MANGANESE BRONZE
U.S; 53 Cu, 39 Zn, 2.6 Sn, 2 5 In, 1 7 Mn, Al, Pb.
For corrosion resistant strong castings; corrosion resistant

NICKEL MOLYBDENUM STEEL
U.S; 1.5-3.0 Ni, 0.1 0 7 Mo, 0 4 C, Mn, bal Fe.
For gears, shafts; oil hardened

NICKEL N.93
England; 2 W, 1 Al, 0.2 C, bal Ni
For tube cathodes and valve components; corrosion and heat resistant

NICKEL N 100
England; 2 W, 1 Al, 0.2 C, 0.2 Mg, bal Ni.
For tube cathodes and valve components; corrosion and heat resistant

NICKEL-Ni-Tu
M-897, 2.0 W, Tu, bal Ni.
For electron tube elements; heat resistant.

NICKEL "O."
M-121, Ni alloy
For electronic equipment; corrosion and heat resistant

NICKELOID.
M-135, 45-40 Ni, bal Cu.
For non-rusting and corrosion resistant parts; corrosion resistant.

NICKELOID.
M-553; Pb, Sb, Ni, bal Sn.
For bearings, Babbitt metal

NICKELOID
M-538, Ni coated Zn
For construction, corrosion resistant

NICKELOID
M-182; Sn, Cu, bal Ni
Cast, 36,000-50,000 TS; 180-200 Brin.
For valves for severe steam services, valve seats; corrosion resistant

NICKEL OREIDE
M-303, 63-66 Cu, 31-33 Zn; 2-6 Ni
For hardware, ornamental parts, corrosion resistant

NICKEL OREIDE
M 303, 87 Cu, 6.7 Zn, 6 7 Ni
For hardware, ornamental parts, corrosion resistant

NICKELOY.
Eng; 93.8 Al, 4 15 Cu, 1.41 Ni.
20,000 TS; 5 RA
For automotive engine parts; age-hardenable.

NICKELOY-ROD NO. 2512
M-1096; 0 10-0 15 C, 0.35-0 55 Mn, 0.25-0.35 Si, 4 75-5.25 Ni, bal Fe.
Welded: 80,000-90,000 TS; 65,000-75,000 YS; 25-30 El; 50-55 RA.
For all-position welding rod; low temperature toughness.

NICKEL-SILICON.
M-461; Ni, Si.
Cold rolled: 70,000-85,000 TS; 60,000-70,000 YS; 25-15 El; 55-45 RA; 149-170 Brin.
For pistons.

NICKEL SILICON STEEL.
U.S ; 2.8-3.3 Ni, 0.5-2.2 Si, 0.35-0.50 C, bal Fe.
For machinery parts, gears, shafts, axles; oil hardening.

NICKEL SILVER.
M-322; 18 Ni, 65 Cu, 18 Zn.
59,900 TS; 31,800 YS, 34 El; 65 RA.
For silver plated table ware; Rockwell "B"-50.

NICKEL SILVER 10%.
56-65 Cu, 25-34 Zn, 10 Ni
For ornaments, plated ware; corrosion resistant.

NICKEL SILVER 10% 740.
M-279, 71 Cu, 10 Ni, 19 Zn
Ann : 50,000-60,000 TS; 15,000-33,000 YS, 33-43 El.
Cold rolled. 56,000-95,000 TS, 30,000-86,000 YS; 1-34 El.
A high copper nickel silver, good corrosion resistance; for musical instruments, electronic parts.

NICKEL SILVER 10% 745.
M-8, 65 Cu, 24 75 Zn, 10 Ni, 0.25 Mn.
Hard Sheet: 87,000 TS; 70,000 YS, 6 El, B 87 Rock.
Soft Sheet 55,000 TS; 20,000 YS; 42 El, B 30 Rock.
For optical goods, costume jewelry, holloware, radio dials, nameplates, camera parts
Corrosion resistant, high strength.

NICKEL SILVER 12% 738
M-279; 70 Cu, 12 Ni, 18 Zn
Ann: 48,000-58,000 TS; 12,000-30,000 YS; 35-45 El
Silver color; for coinage.

NICKEL SILVER 12% 762.
M-279; 59 Cu, 12 Ni, 29 Zn.
Ann. 57,000-75,000 TS; 21,000-51,000 YS; 35-50 El.
Cold rolled: 65,000-125,000 TS, 36,000-115,000 YS, 1-40 El.
High strength corrosion fatigue resistant, for relay springs, contacts, connectors, clips

NICKEL SILVER 12%-766
M-8, 31 25 Zn, 12 Ni, 0 25 Mn, bal Cu
Hard: 97,000 TS, 65,000 YS; 5 El, 176 Brin
Soft 60,000 TS; 24,000 YS, 40 El, 80 Brin
For springs; corrosion resistant

NICKEL SILVER 13%-776
M-8, 43 25 Cu, 43 6 Zn, 13 Ni, 0 15 Mn
Extruded: 60,000 TS, 20,000 YS, 20 El
For architectural decoration; warm silver color

NICKEL SILVER 14%.
60-56 Cu, 26-28 Zn, 14 Ni
For ornaments, plated ware, corrosion resistant.

NICKEL SILVER 15%
64-57 Cu, 21-28 Zn, 15 Ni
For ornaments, plated ware; corrosion resistant

NICKEL SILVER 15% 767.
M-8; 56.5 Cu, 28 25 Zn, 15 Ni, 0 25 Mn.
Hard Sheet: 100,000 TS; 75,000 YS; 4 El; B 93 Rock
Soft Sheet. 60,000 TS; 24,000 YS; 40 El, B 50 Rock.
For architectural panel and trim, nameplates, dials, musical instruments, watch cases.
Corrosion resistant, high strength.

NICKEL SILVER 18%.
65-55 Cu, 17-27 Zn, 18 Ni.
For ornaments, plated ware; corrosion resistant.

NICKEL SILVER 18%-719.
M-8; 17 Zn, 18 Ni, 0.25 Mn, bal Cu.
Soft: 58,000 TS; 40 El.
Hard. 70,000 TS
For hardware, marine trim; corrosion resistant.

NICKEL SILVER 18% 735.
M-8, M-279, 72 Cu, 18 Ni, 10 Zn.
Ann: 48,000-56,000 TS, 14,000-24,000 YS; 34-44 El.
Cold rolled: 57,000-90,000 TS, 28,000-80,000 YS; 1-25 El.
Good deep drawing white brass; for ferrules, ink cartridges, condenser cans, instruments

NICKEL SILVER 18% 752
M-8, M-279; 65 Cu, 18 Ni, 17 Zn.
Ann: 51,000-61,000 TS, 16,000-29,000 YS; 35-42 El.
Cold rolled 59,000-104,000 TS; 22,000-96,000 YS; 1-35 El
Silver color, good formability.
For flatware, holloware, musical instruments, coins.

NICKEL SILVER 18% 770
M 279, 55 Cu, 18 Ni, 27 Zn
Ann 61,000-75,000 TS, 22,000-40,000 YS; 35-48 El.
Cold rolled 72,000-126,000 TS; 40,000 116,000 YS; 2-35 El.
High strength spring nickel silver.
For relay springs, contact springs, diaphragms

NICKEL SILVER 18%-770
M-8, 27 Zn, 18 Ni, 0 25 Mn, bal Cu
Soft 60,000 TS, 22,000 YS; 45 El
Hard: 80,000 TS, 60,000 YS; 20 El
For springs, hardware, corrosion resistant

NICKEL SILVER 18%-7641
M-8, 20 25 Zn, 18 Ni, 0 25 Mn, bal Cu
Hard 80,000 TS, 65,000 YS, 8 El, 137 Brin.
Soft 60,000 TS, 25,000 YS, 35 El, 83 Brin.
For tubes, corrosion resistant

NICKEL SILVER 18% (A) Copper Alloy No. 752
M-33, 65 Cu, 18 Ni, 17 Zn.
Strip, Ann: 58,000 TS, 25,000 YS, 40 El, 45 Rock B
Strip, Hard 85,000 TS, 74,000 YS, 3 El, 87 Rock B
For tableware, hollow ware, base for silver plated parts, welding rod
ASTM B122 Alloy 2, B151 Alloy A, B206 Alloy A, CDA 752.

NICKEL SILVER 20%
64 53 Cu, 16-27 Zn, 20 Ni
For ornaments, plated ware, corrosion resistant.

NICKEL SILVER 25%
55 Cu, 25 Ni, 20 Zn
For ornaments, plated ware, corrosion resistant.

NICKEL SILVER 30%
65-47 Cu, 30 Ni, 5-23 Zn
For ornaments, plated ware, corrosion resistant

NICKEL SILVER 55-18
M-8, M-33, M-103, M 238; 53 5-56 5 Cu, 27 Zn, 16 5-19 5 Ni.
Soft 60,000 TS, 27,000 YS; 40 El
Hard 100,000 TS, 85,000 YS, 3 El.
For optical goods, springs, resistance wire; corrosion resistant, good workability.

NICKEL SILVER 65-10
M-8, M 33, M-103, M-238, 63.5-68 5 Cu, 25 Zn, 9-11 Ni
¼-H temper 65,000 TS; 45,000 YS; 25 El.
½-H temper: 73,000 TS; 60,000 YS; 12 El.
H temper: 86,000 TS; 75,000 YS; 4 El.
For hardware, optical parts, hollowware; corrosion resistant, good formability.

NICKEL SILVER 65-12.
M-8, M-33, M-103, M-238; 63.5-66.5 Cu, 23 Zn, 11-13 Ni.
¼ H-temper: 65,000 TS; 45,000 YS; 23 El.
½ H-temper: 73,000 TS; 60,000 YS; 11 El.
H-temper: 85,000 TS; 75,000 YS; 4 El.
For fasteners, hardware, optical parts; corrosion resistant, good formability.

NICKEL SILVER 65-15.
M-8, M-33, M-103, M-238; 63.5-66.5 Cu, 14-16 Ni, 20 Zn.
¼ H-temper: 65,000 TS; 49,000 YS; 21 El.
½ H-temper: 74,000 TS; 62,000 YS; 10 El.
H-temper: 85,000 TS; 75,000 YS; 3 El.
For optical goods, jewelry, hardware; corrosion resistant, good workability.

NICKEL SILVER 65-18.
M-8, M-33, M-103, M-238; 63.0-66.5 Cu, 17 Zn, 16.5-19.5 Ni.
Soft: 58,000 TS; 25,000 YS; 40 El.
½ H-temper: 74,000 TS; 62,000 YS; 8 El.
Hard: 85,000 TS; 74,000 YS; 3 El.
For hardware, optical goods, hollowware; corrosion resistant, good workability.

NICKEL SILVER 548.
M-141; 48 Cu, 9.5 Ni, bal Cu.
For braze welding rods; corrosion resistant.

NICKEL SILVER 565-18% (A).
M-141; 65 Cu, 18 Ni, bal Zn.
Annealed. 60,000 TS; 32 El.
Drawn· 85,000 TS; 3 El
For hardware, hollowware, jewelry; corrosion resistant

NICKEL SILVER 567-10%.
M-141; 65 Cu, 10 Ni, bal Zn.
Annealed 50,000 TS, 45 El.
Drawn: 90,000 TS; 3 El.
For hardware, hollowware, jewelry; corrosion resistant.

NICKEL-SILVER 828.
M-8; 40 Zn, 10.2 Ni, 0.15 Si, 0.02 P, bal Cu.
For welding rod; low fuming; nickel silver, M P 1690°F.

NICKEL SILVER CASTING
70-56 Cu, 13-20 Ni, 5.6-24 Zn, 0-4 Sn, 0-3.5 Pb.
For plumbing fixtures, fittings; corrosion resistant.

NICKEL SILVER GRADE A.
M-98; 65 Cu, 18 Ni, 17 Zn.
55,000-110,000 TS, 50-2 El; 50-175 Brin.
For cutlery, cheap jewelry, resistance wire, auto fittings, plumbing, corrosion resisting.

NICKEL SILVER GRADE B.
M-98; 55 Cu, 18 Ni, 27 Zn.
40-1 El; 50-175 Brin.
For cutlery, cheap jewelry, resistance wire, auto fittings, plumbing, corrosion resisting.

NICKEL SILVER, ROLLING.
49 Cu, 39 Zn, 12 Ni.
For ornamental sheets and rolled parts; corrosion resistant.

NICKEL SILVER, TURNING.
66-59 Cu, 22-29 Zn, 12 Ni, 0-5 Pb.
For screws, bolts; machining grade.

NICKEL SPECIAL.
M-789; 99.4 Ni, 0.2-0.6 Fe.
For electrical equipment and instruments.
Resistance alloy. Max working temperature to 150°C.

NICKEL STAYBOLT.
M-435; 0.08 C, 0.25 Mn, 2.25 Ni, bal Fe.
For boiler staybolts; tough.

NICKEL STEEL.
M-538; Ni bonded to steel.
For floor plates, reflectors, hardware, stampings; resists heat to 1050°F; Ni bonded to steel.

NICKEL TIN.
M-538; Ni coated Sn
For fabricated parts; easily stamped, formed, drawn.

NICKEL-TUNGSTEN.
75-50 W, 25-50 Ni.
For chemical apparatus; resistant to acids.

NICKEL URANIUM STEEL
U.S ; 0.3-0.4 Ni, 0.2-0.4 U, 0.2-0.8 C, bal Fe.
183,000-209,000 TS; 159,000-175,000 YS; 8.5-9.0 El; 34-31 RA.
For general engineering applications; corrosion resistant

NICKELVAC 90.
M-1490; 0.05 C, 12.8 Cr, 5.7 Mo, 2.4 Ti, 35.0 Fe, bal Ni
At 70°F 175,000 TS, 115,000 YS.
At 1000°F. 146,000 TS; 102,000 YS.
For aircraft and industrial gas turbine components, rotor and compressor discs, structural parts
High creep and rupture strength to 1400°F.

NICKELVAC-700.
M-1490, 0.12 C, 0.1 Mn, 0.3 Si, 15 Cr, 28.5 Co, 3.75 Mo, 2.2 Ti, 3.0 Al, 0.7 Fe, 0.05 Cu, bal Fe.
Aged· 172,000 TS, 105,000 YS, 25 El, 27 RA.
At 1200°F 146,000 TS; 92,000 YS; 23 El; 27 RA.
For aircraft gas turbine blades, jet engine components.
Age-hardenable High oxidation and corrosion resistance.

NICKELVAC-751.
M-1490; 0.04 C, 0.7 Mn, 0.3 Si, 15 Cr, 1 Cb, 2.5 Ti, 1.2 Al, 6.75 Fe, 0.05 Cu, bal Ni.
Aged 170,000 min TS, 115,000 min YS, 18 min El.
For valves in spark-ignition and diesel engines.
Age-hardenable Good creep and stress-rupture properties Heat and corrosion resistance.

NICKELVAC-901
M-1490, 0.06 C, 12.5 Cr, 6.1 Mo, 43 Ni, 3 Ti, 0.015 B, bal Fe.
At R.T. 175,000 TS, 130,000 YS; 14 El.
At 1400°F 105,000 TS, 92,000 YS; 19 El
For aircraft and gas turbine components, rotors and compressor discs, fasteners, bolts.
High heat and corrosion resistant High creep and rupture strength

NICKELVAC A-286.
M-1490; 0.06 C, 14.75 Cr, 1.25 Mo, 25.5 Ni, 2.1 Ti, 0.2 Al, 1.5 Mn, bal Fe.
At R.T.· 146,000 TS, 105,000 YS, 25 El
At 1400°F· 64,000 TS; 62,000 YS; 19 El.
For jet engine and supercharger parts, turbine wheels and blades, after-burners, bolting.
Austenitic, high heat and corrosion resistant.

NICKELVAC-B.
M-1490; 0.10 C, 0.8 Mn, 0.7 Si, 0.6 Cr, 2.5 Co, 28 Mo, 5 Fe, 0.3 V, bal Ni.
Annealed: 127,000 TS, 56,000 YS, 52 El.
At 1200°F: 75,000 TS; 42,000 YS; 13 El.
For chemical and oil refinery equipment, valves, pumps, bolts, gas turbine components.
Acid resistant, austenitic, tough.
Good creep and high temperature properties.

NICKELVAC-C.
M-1490; 0.07 C, 0.8 Mn, 0.7 Si, 16 Cr, 2.5 Co, 17 Mo, 4 W, 5 Fe, bal Ni.
Annealed: 130,000 TS, 65,000 YS; 37 El; 31 RA.
At 1200°F: 95,000 TS; 46,000 YS; 22 El; 22 RA.
For chemical and oil refinery equipment, combustion chambers, valves, pumps.
Corrosion and heat resistant. Good high temperature properties.

NICKELVAC-F.
M-1490; 0.05 C, 1.5 Mn, 1.0 Si, 22 Cr, 2.5 Co, 6.5 Mo, 1 W, 2 Cb, 45.5 Ni, bal Fe
Annealed: 108,000-116,000 TS; 48,000-53,000 YS; 40-46 El; 47-54 RA, B 89-93 Rock.
At 1000°F: 79,000 TS; 32,000 YS, 50 El.
For paper and pulp digesters, chemical and petroleum processing equipment.
High heat and corrosion resistance. Good high temperature properties

NICKELVAC-INOR-8.
M-1490, 0.06 C, 0.8 Mn, 0.5 Si, 7 Cr, 0.5 Co, 16.5 Mo, 3 Ti, 5 Fe, 0.01 B, bal Ni
At R.T.. 100,000 TS, 45,000 YS, 50 El.
At 1200°F. 70,000 TS, 30,000 YS; 45 El
For high temperature applications, jet engine and gas turbine components.
High heat and corrosion resistance

NICKELVAC L-605
M-1490; 0.05-0.15 C, 1.0-2.0 Mn, 19-21 Cr, 14-16 W, 9-11 Ni, 3.0 max Fe, bal Co
At 70°F: 161,000 TS, 86,000 YS; 47 El; Rock C 24.
At 1500°F: 55,000 TS, 45,000 YS; 16 El.
For afterburners, nozzle diaphragm valves, high temperature valves and springs, buckets.
High strength above 1600°F, oxidation and corrosion resistant.

NICKELVAC-N.
M-1490; 0.04 C, 0.2 Mn, 0.2 Si, 15.8 Cr, 7.2 Fe, 76 Ni
Annealed· 115,000 TS; 46,000 YS: 50 El
For equipment handling hot fluoride salts, high temperature applications
Corrosion resistant. High oxidation resistant

NICKELVAC N-155.
M-1490, 0.15 C, 1.5 Mn, 0.5 Si, 20 Cr, 20 Ni, 20 Co, 3.5 Mo, 2.5 W, 1.0 Cb, 0.15 N, bal Fe
Sheet· 118,000 TS, 58,000 YS, 49 El
At 1000°F: 94,000 TS, 40,000 YS, 50 El.
For aircraft cabin heaters, afterburners, rocket chambers, combustion chambers and manifolds
High heat and corrosion resistance, good high temperature strength.

NICKELVAC SUPER-X
M-1490; 0.045-0.090 C, 15.0-16.0 Cr, 6.25-7.25 Fe, 0.55-0.90 Al, 2.35-2.70 Ti, 0.80-1.1 Cb + Ta, 0.10 max Cu, 0.25 max Mn, 72.0 min Ni + Co
Heat Treated· 188,000 TS; 129,000 YS, 23.6 El, 33.8 RA.
At 600°F: 178,000 TS, 117,000 YS; 21 El, 36.7 RA.
For applications requiring oxidation and corrosion resistance coupled with high strength to 1200-1500°F.

NICKELVAC-W.
M-1490; 0.06 C, 15.5 Cr, 73 Ni, 2.5 Ti, 0.75 Al, 8 Fe.
At R.T.: 170,000 TS, 100,000 YS; 25 El.
At 1000°F· 138,000 TS; 93,000 YS, 29 El.
For gas turbine and heat engine components, springs, fasteners, bolts.
High heat, corrosion and oxidation resistant. Age-hardenable

NICKELVAC-X.
M-1490, 0.04 C, 0.7 Mn, 0.3 Si, 15 Cr, 0.85 Cb, 2.5 Ti, 0.8 Al, 6.75 Fe, 0.05 Cu, bal Ni.
Annealed: 115,000 TS, 50,000 YS, 50 El; 200 Brin.
Age-Hardened· 180,000 TS; 125,000 YS, 20 El; C 37 Rock
For aircraft gas turbines and heat engines, high temperatures bolts, turbine rotors and blades.
Age-hardenable. High heat and corrosion resistant.

NICKELVAC X-750
M-1490; 0.06 C, 15.5 Cr, 75 Ni, 2.55 Ti, 0.75 Al, 6.75 Fe, 1 Cb
At R.T.. 162,000 TS, 92,000 YS, 24 El.
At 1400°F 70,000 TS; 62,000 YS; 9 El.
For gas turbine blades and wheels, springs, turbochargers, afterburners, fasteners
Age hardenable High heat and corrosion resistance

NICKEL VANADIUM STEEL
3-3.3 Ni, 0.1-0.45 V, 0.36 C, 0.2-0.4 Si, bal Fe
For machinery parts, gears, pinions, shafts, crankshafts, tough, shock resistant

NICKEL WELDING ELECTRODE 141
M-1499, 96.0 Ni, 0.03 C, 0.30 Mn, 0.05 Fe, 0.005 S, 0.60 Si, 0.03 Cu, 0.25 Al, 2.5 Ti
Electrode for shielded metal-arc welding of Nickel 200 and Nickel 201, welding clad side of nickel-clad steel, joining nickel to steel, overlaying on steel
AWS A 5.11 Class ENi-1, ASME SFB 5.11

NICKEL-ZIRCONIUM
86 Ni, 6 Si, 1.5 Zr 0.1 C
For chemical apparatus, corrosion resistant

NICKEL ZIRCONIUM STEEL
3 Ni, 0.24 Zr, 0.4 C, 2.4 Si, bal Fe.
For crankshafts, axles, machinery parts, oil hardening

NICKEND 2
M-677, C, 2.25 Ni, bal Fe
Welded 80,000-90,000 TS, 65,000-75,000 YS, 30-20 El, 60-45 RA
For welding electrodes; for steel, low H_2

NICKEND 3
M-677, 0.06 C, 0.8 Mn, 0.3 Si, 3.4 Ni, bal Fe
For welding electrodes, class E8016-C2, for welding 3¼ nickel steel

NICKIMPHY
M-104, 0.02 C, 0.10 Mn, 0.10 Cu, bal Ni
For radio tube anodes, heat and corrosion resist

NICKKAL STEEL
M-69, C, 39 Ni, bal Fe
For valves, thermostats, controlled expansion

NICKOLITE
M 509, 60 Cu, 3 Sn, 6 Pb, 20 Ni, 11 Zn
For typewriter parts, door knobs, nickel silver

NICKROFRY 345
M-1302, 0.2 max C, 22-24 Cr, 12-15 Ni, 2 max Mn, 1 max Si, bal Fe
Annealed. 85,000-95,000 TS; 40,000-50,000 YS; 45-55 El, 150-185 Brin
For heat treating boxes, oil refinery and chemical plant equipment, Type 309; austenitic, heat resistant

NICKROTHERM.
M-72; C, Cr, Ni, Si, bal Fe.
For chemical plant equipment; corrosion and heat resistant.

NICKROTHERM "F.F."
M-72; 0.2 C, 1.5 Si, 18 Cr, bal Fe.
For heating muffles, autoclaves, roasting furnaces, rabbles, boilers, grates, recuperators, dampers; heat and corrosion resistant.

NICKROTHERM "N.C.T."
M-72, 0.2 C, 19 Cr, 9 Ni, bal Fe.
For heating muffles, autoclaves, roasting furnaces, rabbles, boilers, grates, recuperators, dampers, heat and corrosion resistant.

NICLOY 3½.
M-17, 0.20 max C, 3.25-3.75 Ni, 0.4 Mn, 0.3 Si, bal Fe
Rolled 80,000 TS, 60,000 YS, 35 El; 71 RA.
At 1000°F 35,000 TS; 43 El, 82 RA.
For heat exchangers, refrigerators, liquid air equipment, impact resistant and tough at low temperature

NICLOY 5.
M-17, 0.14 max C, 4.75-5.25 Ni, 0.4 Mn, 0.2 Si, bal Fe
Rolled 100,000 TS; 75,000 YS, 30 El, 70 RA.
At 1000°F 36,000 TS, 45 El, 84 RA.
For heat exchangers, refrigerators, liquid air equipment, impact resistant and tough at low temperature

NICLOY 9
M-17, 0.06 C, 8.5-9.5 Ni, 0.5 Mn, 0.1 Cr, 0.3 Cu, 0.05 Mo, bal Fe.
Rolled 98,000-108,000 TS, 74,000-89,000 YS, 26-27 El, 61-70 RA, 210-260 Brin
For petroleum refining and chemical equipment, resists embrittling effect of sub-zero temp

NICLOY-36
M-447, 36 Ni, bal Fe
Annealed 65,000 TS, 40,000 YS, 35 El, B 70 Rock
Cold Worked 105,000 TS, 95,000 YS; 8 El, 217 Brin
For hairsprings, time pieces, precision instruments, bourdon tubes, bimetals
Low coefficient expansion. Constant modulus Corrosion resistant

NIC-MOTAL
M-554, Pb, Sb, Ni, bal Sn.
For bearings, Babbitt metal

NICO
M-542; 0.2 C, 0.5 Cu, 0.8 Ni, bal Fe.
For corrugated culverts, rust resistant.

NICO
M-685, 0.1 C, bal Fe
For cast iron welding electrodes, ductile

NICO NO 1
Eng, up to 23 Sb, 4-5 Sn, 2-3 Ni, bal Pb.
36 Brin
For bearings, White Metal.

NICO NO 2
Eng; 10 Sb, 10 Sn, 1 Ni, bal Pb.
29 Brin
For bearings; White Metal.

NICOL.
M-1392, 10 Al, 5 Ni, 5 Fe, 1.5 Mn, bal Cu
Cast 93,000 TS, 40,000 YS, 20 El; 137 Brin.
For ship propellers, heat treatable, aluminum bronze, tough.

NICOL-ROD NO 44
M-1096; Cu, Ni.
Welded: 221 Brin.
For welding rod; for malleable iron.

NICOL-ROD NO 99.
M-1096; Ni
For welding rod for cast iron, special iron coating

NICORO
M-1493, 35 Au, 62 Cu, 3 Ni.
For brazing Kovar, copper, nickel and steel.
M P. 1832-1886°F. Corrosion resistant.

NICORROS.
M-297, 67 Ni, 32 Cu, 1 Mo
Soft. 63,000 TS; 24,000 YS, 42 El, 100 Brin.
Hard: 101,000 TS, 89,000 YS; 3 El; 190 Brin
For chemical and oil apparatus, ship construction; highly corrosion resistant.

NICOSEAL.
M-32; 29 Ni, 17.5 Co, bal Fe
For glass and ceramic seals with Pyrex glass and ceramics, lead wires and eyelets
Controlled expansion, resists shock, corrosion resistant

NICOSEL
M-56, 0.04 C, 0.15 Si, 0.3 Mn, 29 Ni, 17.1 Co, bal Fe
For instruments, low coef of expansion

NICOVAR
M-32, 29 Ni, 17.5 Co, bal Fe
For glass and ceramic seals.
Controlled expansion

NICRAL "A."
M-93, 0.1 Ni, 0.5 Cr, 0.5 Cu, 0.5 Mg, bal Al.
Annealed 20,000 TS, 10,000 YS; 24 El; 40 Brin
Heat treated 46,000 TS; 41,000 YS, 8 El; 120 Brin
For light Al alloy parts, high strength and workability

NICRAL A
M-104, M-771, varying C, 15 Cr, bal Fe
Rolled 125,000-150,000 TS, 101,000-114,000 YS; 18-22 El
For carburizing boxes, heat treating equipment, furnace parts, oxidation resistant

NICRAL AD.
M-93, Al alloy
For light alloy parts

NICRAL AD018.
M-93, Al alloy
For rivets

NICRAL AD2012
M-93, Al alloy.
For airplane wing ribs, bus body panels; sheets

NICRAL AD-8412
M-93, Al alloy
For light alloy parts

NICRAL AO.
M-93; Al alloy
For rolled trim, shells

NICRAL "B"
M-93, 0.5 Ni, 0.25 Cr, 0.25 Cu, 0.25 Mg, bal Al
Annealed: 17,000 TS, 6,000 YS, 27 El.
Heat treated 38,000 TS, 32,000 YS, 12 El.
For light Al alloy parts; for stamping and forming

NICRAL B
M-104, M-771, 0.35 max C, 20 Cr, bal Fe.
Rolled 128,000 TS, 101,000 YS; 10 El.
For domestic utensils, electric irons, boiler parts; Type 442, corrosion resistant.

NICRAL BO.
M-93; Al alloy.
For bezels, reflectors, switch covers; deep drawing temper.

NICRAL "C."
M-93; 0.5 Ni, 0.5 Cr, 0.7 Cu, 0.2 Mg, bal Al.
For light alloy parts.

NICRAL C.
M-104; 0.45 max C, 18 Cr, 36 Ni, Si, bal Fe.
For furnace and heat resistant equipment; Type 330; stainless, austenitic.

NICRAL D.
M-104, M-771; 0.25 max C, 22 Cr, 18 Ni, bal Fe.
Rolled: 100,000 TS; 58,000 YS; 30 El.
For carburizing boxes, furnace supports, grids; Type 310; stainless, austenitic.

NICRAL DC:.
M-104; 0.15-0.50 C, 23-25 Cr, 18-20 Ni, Si, bal Fe.
Annealed: 100,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin.
For furnace parts, valves, pumps, turbine parts; Type 310; stainless, austenitic.

NICRAL DS.
M-104; 0.15-0.50 C, 23-25 Cr, 18-20 Ni, Si, bal Fe.
For furnace parts, heat treat boxes; austenitic; Type 310; stainless.

NICRAL E.
M-104, M-771; 0.35 C, 30 Cr, bal Fe.
Rolled: 85,000 TS; 58,000 YS; 20 El.
For carburizing boxes, furnace parts; Type 416; resists S.

NICRAL F.
M-104, M-771; 0.5 max C, 65 Ni, 18 Cr, 1.5 Si, 1 Mn, bal Fe.
Cast: 73,000 TS; 34,000 YS; 6.5 El; 200 Brin.
For furnace parts, gas turbine and gas engine parts; corrosion and oxidation resistant.

NICRAL "FM."
M-93; Mg, Ni, Cr, bal Al.
Extruded: 22,000 TS; 12,000 YS, 22 El.
Heat treated: 41,000 TS; 36,000 YS; 11 El.
For structural and extruded architectural sections; corrosion resistant.

NICRAL FM09.
M-93; Al alloy.
For sash assemblies; extruded.

NICRAL G.
M-104, M-771; 0.3 C, 35 Ni, 30 Cr, bal Fe.
For furnace parts and equipment; heat resistant cast.

NICRAL H.
M-104; C, 12 Ni, 25 Cr, bal Fe.
For heat and corrosion resistant parts, corrosion and heat resistant.

NICRAL H.
M-771; 0.2 max C, 22-24 Cr, 12-15 Ni, 2 max Mn, 1 max Si, bal Fe.
Annealed: 85,000-95,000 TS; 40,000-50,000 YS; 45-55 El; 150-185 Brin.
For heat treating boxes, oil refinery and chemical plant equipment; Type 309; austenitic, heat resistant.

NICRAL H9.
M-104; 0.9 C, 25 Cr, 12 Ni, Si, bal Fe.
For furnace parts, valves; austenitic, corrosion and heat resistant.

NICRALIUM D2018.
M-93; 0.45 Cu, 0.48 Mg, 0.19 Mn, 0.42 Fe, 0.3 Si, 1 Ni, 0.2 Cr, 0.17 Mo, bal Al.
For light alloy parts.

NICRAL J.
M-104; 0.50 max C, 24 Cr, 3 Ni, bal Fe.
For furnace parts and equipment; Type 327; corrosion and heat resistant.

NICRAL K.
M-104; 0.10 max C, 22 Cr, 42 Ni, Si, bal Fe.
For chemical plant equipment; austenitic, corrosion and heat resistant.

NICRAL KM.
M-104, 0.9 C, 20 Cr, 42 Ni, Si, bal Fe.
For heat resistant parts; corrosion and heat resistant.

NICRALLOY-A.
M-1411; 80 Ni, 20 Cr.
Cold drawn. 131,000 TS, 80,000 YS; 35 El; 61 RA.
For electrical resistors, heating elements, operates up to 1150°C, heat resistant.

NICRALLOY-B.
M-1411, 65 Ni, 15 Cr, bal Fe.
Cold drawn 105,000 TS; 59,000 YS; 40 El; 66 RA.
For electrical resistors, heating elements, operates up to 950°C, heat resistant.

NICRAL M
M-104, 0.15 max C, 13 Cr, 2 Si, bal Fe.
For valves, cutlery; corrosion resistant

NICRAL-O.
M-771, 0.20 C, 2.5 Si, 25 Cr, 21 Ni, bal Fe.
Bar: 100,000 TS; 50,000 YS; 45 El; B 89 Rock.
For furnace parts, annealing boxes, heat treating fixtures.
Type 314 Stainless Steel, high heat resistant.

NICRAL P.
M-104, 2.5 C, 26 Cr, bal Fe.
For petroleum and oil refinery equipment; corrosion and heat resistant

NICRAL S
M-104, 0.15 max C, 25 Cr, Si, bal Fe.
Annealed 85,000 TS, 50,000 YS, 30 El; 55 RA; 180 Brin.
For furnace parts and equipment; Type 446; corrosion resistant.

NICRAL S-Cu.
M-104, 0.30 max C, 22 Cr, Cu, bal Fe.
For heat and corrosion resistant parts, heat and corrosion resistant.

NICRAL T
M-104; 0.20 max C, 17 Cr, 13 Ni, W, bal Fe.
For turbo reactor parts, jet engine components; heat resistant, austenitic.

NICRAL V
M-104; 0.55 C, 22 Cr, 36 Ni, Co, Mo, bal Fe.
For furnace parts and equipment; austenitic, corrosion and heat resistant.

NICRAL W
M-104; 0.30 max C, 22 Cr, 12 Ni, W, bal Fe.
For turbo reactors, jet engine components; corrosion and heat resistant.

NICRAL "X."
M-93; 1.0 Ni, 0.5 Cr, 1.0 Cu, 0.5 Mg, bal Al.
Extruded: 35,000 TS; 24,000 YS; 16 El.
Heat treated: 53,000 TS; 43,000 YS; 15.5 El.
For light Al alloy parts, extruded structural shapes; formerly known as Super-Hyblum.

NICRAL X.
M-104; 0.10 max C, 17 Cr, 13 Ni, Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant equipment, Type 316; austenitic, stainless.

NICRAL XD018.
M-93; Al alloy.
For structural shapes.

NICRAL Z.
M-104; 0.15-0.25 C, 14 Cr, 76 Ni, bal Fe.
For thermocouple protection tubes; austenitic, corrosion and heat resistnat.

NICRO 31.
M-111a; 0.15 C, 0.55 Mn, 0.65 Cr, 1.25 Ni, bal Fe.
For gears, crankshafts, camshafts; case hardened.

NICRO 33
M-111a, 0.12 C, 0.55 Mn, 0.75 Cr, 3.0 Ni, bal Fe.
For gears, crankshafts, camshafts; case hardened.

NICRO 34.
M-111a, 0.12 C, 0.55 Mn, 1.25 Cr, 4.5 Ni, bal Fe
For gears, crankshafts, camshafts; case hardened

NICRO 63.
M-111; 0.3 C, 0.6 Mn, 0.75 Cr, 3.5 Ni, bal Fe.
For gears, shafts, bolts, shock resistant.

NICRO 64
M-111, 0.3 C, 0.65 Mn, 1.25 Cr, 4.25 Ni, bal Fe.
For gears, shafts, bolts; shock resistant.

NICRO 71.
M-111; 0.37 C, 0.6 Mn, 0.7 Cr, 1.5 Ni, bal Fe.
For gears, shafts, tough.

NICRO 81
M 111; 0.38 C, 0.8 Mn, 0.8 Cr, 1.25 Ni, bal Fe.
For gears, shafts, tough

NICRO 82
M-111; 0.38 C, 0.55 Mn, 1.15 Cr, 2.6 Ni, bal Fe.
For gears, shafts, oil hardening

NICRO 632.
M-111, 0.3 C, 0.65 Mn, 1 Cr, 3.25 Ni, 0.25 Mo, bal Fe
For gears, shafts, bolts, shock resistant.

NICRO 642
M-111, 0.3 C, 0.5 Mn, 1.25 Cr, 4.25 Ni, 0.25 Mo, bal Fe
For gears, shafts, bolts; shock resistant.

NICROBRAZ 10.
M-963; 0.15 max C, 11 P, bal Ni.
For heat resistant brazing alloy; M.P. 1610°F.

NICROBRAZ 30.
M-963; 0.15 max C, 10 Si, 19 Cr, bal Ni.
For heat resistant brazing alloy; M.P. 1975-2075°F, oxidation resistant to 1800°F

NICROBRAZ 50.
M-963; 13.0 Cr, 10.0 P, bal Ni
Melt: 1630°F, Braze: 1800°-1950°F.
Low melting, free flowing for atmosphere brazing honeycomb structures; used for joining 400 series stainless parts.
Low solubility with base metals; usable with stainless steel cutlery. AWS B Ni-7.

NICROBRAZ-60
M-963; 8 Si, 17 Mn, 0.15 max C, bal Ni.
For heat resistant brazing alloy; M.P. 1850-1890°F.

NICROBRAZ 65.
M-963; 23.0 Mn, 4.5 Cu, 7.0 Si, bal Ni.
Melt: 1800-1850°F; Braze: 1850°-2000°F.
Low melting, free flowing for atmosphere brazing of ferrous, nickel and cobalt alloys.

NICROBRAZ-120.
M-963; 13.5 Cr, 3.5 B, 4.5 Si, 4.5 Fe, 0.8 C, bal Ni.
For heat resistant brazing alloy; M.P. 1760-1875°F.

NICROBRAZ 125
M-963; 0.7 C, 14.0 Cr, 4.5 Si, 4.5 Fe, 3.0 B, bal Ni.
Melt range: 1780°F-1900°F.
Suggested brazing temp.: 2150°F.
For atmosphere brazing stainless steels, nickel and cobalt base high temp. alloys.
Good strength and corrosion resistance.
AMS 4775; AWS B Ni-1.

NICROBRAZ 130.
M-963; 0.06 max C, 3-5 Si, 1.8-3.5 B, bal Ni.
For heat resistant brazing alloy; M.P. 1800-1900°F, free flowing AMS 4778.

NICROBRAZ 135.
M-963, 0.06 max C, 2.0 B, 3.5 Si, bal Ni.
Melt· 1810°-1935°F; Brazing: 1950°-2150°F
For atmosphere brazing stainless and high temperature alloys, wide brazing range, machinable joints, Corrosion resistant.
AMS 4779, AWS B Ni-4

NICROBRAZ 150.
M-963, 0.15 max C, 15 Cr, 3.5 B, bal Ni.
For heat resistant brazing alloy, M P 1930°F, corrosion resistant

NICROBRAZ 160
M-963, 11.0 Cr, 2.25 B, 3.5 Si, 3.5 Fe, 0.5 C, bal Ni
M P 1780-2120°F.
For brazing stainless steels and nickel alloys; bridges wide joints, corrosion and heat resistant.

NICROBRAZ 170.
M-963, 0.55 C, 12 Cr, 2.5 B, 3.5 Si, 3.5 Fe, 16.0 W, bal Ni
High temperature brazing alloy.
Braze temp 2100-2200°F.
For brazing base metals containing cobalt, tungsten and molybdenum for high strength joints at high temperature

NICROBRAZ 171
M 963, 0.40 C, 10.0 Cr, 3.5 Si, 12.0 W, 3.5 Fe, 2.5 B, bal Ni
Melt 1780°-2000°F. Brazing 2100°-2200°F
For atmosphere brazing of high temperature alloys containing cobalt, tungsten and molybdenum
Corrosion resistant, good high temp strength.

NICROBRAZ 180.
M 963; 0.25 C, 5.0 Cr, 3.0 Si, 1.0 Fe, 1.8 B, bal Ni
Melt· 1780°-2160°F, Braze· 2150°-2250°F
For torch brazing wide gap joints in stainless steels and nickel base alloys, Machinable; corrosion and temp. resistant.

NICROBRAZ 200
M-963, 7.0 Cr, 4.5 Si, 6.0 W, 3.0 Fe, 3.2 B, bal Ni.
Melt: 1790°-1900°F; Braze: 1950-2150°F.
For atmosphere brazing on hardenable base metals; high creep and stress rupture strength

NICROBRAZ 210.
M-963; 0.40 C, 19.0 Cr, 17.0 Ni, 8.0 Si, 4.0 W, 0.8 B, bal Co.
Melt: 2025°-2100°F; Braze: 2100°-2250°F.
For atmosphere brazing of cobalt base alloys and similar metals, high temperature strength and low base metal penetration.

NICROBRAZ 220.
M-963; 4.0 Cr, 45.0 Mn, 0.8 B, bal Ni.
Melt. 1852°-1975°F; Braze: 2000°-2150°F.
For atmosphere brazing of high temperature alloys, for rocket thrust chambers and complex heat exchangers. Ductile, usable with any base high melting metal.

NICROBRAZ 230.
M-963; 3.5 Cr, 2.5 Si, 1.0 Fe, 35.0 Mn, 0.9 B, bal Ni
Melt. 1800°-1950°F, Braze: 1950°-2050°F.
For atmosphere brazing high temperature heat exchangers, uses from cryogenic to over 1500°F.

NICROBRAZ 300
M-963, 0.80 C, 21.0 Cr, 3.0 Si, 17.0 Ni, 10.0 W, 3.25 B, bal Ni.
Melt: 1900°-2050°F, Braze 2150°-2250°F.
For atmosphere brazing of T joints or wide gap joints where maximum strength is needed

NICROBRAZ L.C
M-963, 0.15 max C, 13.50 Cr, 5 Si, 3.75 B, 4.5 Fe, bal Ni.
For heat resistant brazing alloy, M P 1780-1970°F, for stainless steels

NICROBRAZ L M
M-963, 0.10 max C, 7.0 Cr, 2.9 B, 4.5 Si, 3.0 Fe, bal Ni
Heat resistant brazing alloy, brazing range 1850-2150°F; corrosion and heat resistant
AMS 4777; BNi-2.

NICROBRAZE STANDARD
M-963; 13.5 Cr, 3.5 B, 4.5 Si, 4.5 Fe, 0.8 C, bal Ni.
For brazing stainless steel and nickel base alloys, melt range 1790-1900°F.

NICROEX
M-35; 0.7 C, 0.8 Cr, 1.25 Ni, 0.35 Mo, bal Fe.
For brake dies; oil hardening

NICROMA 17.
M 1315, 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed 85,000 TS, 50,000 YS, 30 El, 55 RA, 180 Brin.
For furnace parts, grids, conveyors, corrosion and heat resistant

NICROMA 120
M-1315, 0.10 max C, 12.5 Cr, 12 Ni, bal Fe
For valves, pumps, oil refinery equipment; corrosion and heat resistant

NICROMA 130
M-1315; 0.07 max C, 17 Cr, 4.7 Mo, 13 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El, 60 RA; 180 Brin.
For acid resistant equipment, Type 317; stainless, austenitic.

NICROMA 150.
M-1315; 0.07 max C, 17.5 Cr, 2 Mo, 17.5 Ni, 2 Cu, Ti = 7 × C, bal Fe.
For valves, pump parts, chemical plant equipment; corrosion and heat resistant.

NICROMAN.
M-275; 1.0 C, 1.25 Cr, bal Fe.
For blanking and forming dies; shock resistant, oil hardened; Type L-6.

NICROMAN.
M-357; 0.7 C, 0.4 Mn, 1.65 Ni, 1.0 Cr, 0.35 Cu, bal Fe
For dies, hobs, taps, shear blades; tough

NICROMAZ-B.
M-104, M-771; C, alloy, bal Fe.
For furnace parts, heat treating boxes; high resistance to carburizing atmosphere.

NICROMAZ C
M-104, 0.08 max C, 20 Cr, 25 Ni, 4 Mo, bal Fe.
For furnace parts and equipment; corrosion and heat resistant

NICROMAZ C
M-771, 0.10 max C, 18-20 Cr, 11-14 Ni, 3-4 Mo, bal Fe
Annealed 85,000-95,000 TS, 35,000-45,000 YS; 60-50 El, 75-60 RA, 150-190 Brin
For acid resistant chemical plant equipment; Type 317; stainless, austenitic

NICROMAZ SPECIAL B.
M-104, M-771, 0.2 max C, 15 Cr, 5 Si, 5 Mo, 1 Mn, bal Fe
For corrosion and heat resistant castings, resists H_2SO_4 and HCl

NICROSIL
Russia, 1.7-2.0 C, 1.8-3.0 Cr, 16-20 Ni, 0.8-1.3 Mn, bal Fe
For furnace equipment; corrosion resistant, cast iron

NICROSIL AL
M 86, 1.8 C, 6.0 Si, 18 Ni, 2 Cr, 1 Mn, bal Fe
36,000 TS 3 El, 110-250 Brin
For furnace grids, generator boxes, annealing pots, heat resistant, does not glow at high temperature; austenitic

NICROSIL AL
M-494, 1.8 C, 5 Si, 18 Ni, 2 Cr, bal Fe
Cast 36,000 TS, 140-200 Brin
For furnace grids, heat treating boxes, corrosion resistant, non-magnetic

NICROSIL AL 5 Cr
England, 2.1 C, 4.9 Si, 0.9 Mn, 22.8 Ni, 4.6 Cr, 0.05 P, bal Fe
For grids, heat resistant, cast iron

NICROTUNG
M 118, 0.08-0.13 C, 0.02-0.08 B, 0.02-0.08 Zr, 11-13 Cr, 9-11 Co, 7.0-8.5 W, 3.75-4.75 Al, 3.75-4.75 Ti, bal Ni
Cast 130,000 TS, 120,000 YS, 5 El; 9 RA, 380 Brin
At 1800°F 67,000 TS, 52,000 YS, 6 El
For missile and rocket engine components, gas turbines, heat resistant to 2000°F

NICUAR 813
M-677, 0.03 C, 0.8 Mn, 0.1 Si, 30.5 Ni, 0.6 Fe. 0.4 Ti, 0.2 Al, bal Cu.
For bare cupro-nickel welding wire, class RCuNi

NICUEND
M-677, 70 Cu, 30 Ni
For welding electrodes, for Cu-Ni alloys.

NICUITE
M-214; 10 Sn, 3.5 Ni, 2.5 Zn, bal Cu.
Cast: 50,000 TS, 25,000 YS, 24 El; 70 Brin.
Heat treated: 95,000 TS; 75,000 YS; 6 El, 160 Brin.
For bearings, worm gears, slippers, slides; heat treatable, heavy loads, slow speeds.

NICULOY.
M-1265, Cu, Ni, Fe.
For master alloy; for making alloys.

NICUSIL-3.
M-1493, 71.15 Ag, 28.10 Cu, 0.75 Ni.
M.P 1436-1463°F.
For brazing
Good wetting and filleting.

NICU STEEL.
Eng; 2.2 Ni, 0.6 Mn, 0.5 Cu, 0.3 C, bal Fe.
For machinery parts, structural work; oil hardening.

Ni-Fe 30
M-210, 30 Ni, bal Fe.
For shunts in electrical equipment
Temperature compensating alloy.
Low coefficient expansion, high permeability.

NIFER
M-926; low C-steel clad on both sides with Ni.
For electron tubes

NIGY.
M-104, 0.10 C, 0.5-1 Mn, 2-3 Si, bal Ni
For spark plugs; heat and corrosion resistant.

NI-HARD
M-460, 4.5 Ni, 1.5 Cr, 1.5 Mn, 2.75-3.75 C, bal Fe
Chilled 600-750 Brin
For abrasion resisting applications, crushers, rolls, feeder vanes; cast iron, abrasion resisting, formerly "Super Manga Iron"

NI-HARD
M-494, 3 C, 3.5-4.5 Ni, 1.5 Cr, bal Fe.
Cast 40,000 TS, 500-650 Brin.
For castings, abrasion resisting

NI-HARD, TYPE 1.
M-176, M-68, 4.2-4.7 Ni, 3.0-3.60 C, 1.4-2.5 Cr, 0.5 Si, 0.3-0.7 Mn, bal Fe.
Cast 40,000-50,000 TS, 550-650 Brin
Chilled 80,000 TS, 700 Brin.
For die casting pots, pump plungers, roller bearing races, chilled rolls and liners, corrosion and wear resistant, tough.

NI-HARD TYPE 2.
M-68, 2.9 max T.C., 0.5-0.8 Si, 0.4-0.6 Mn, 4.25-4.75 Ni, 1.4-2.5 Cr, bal Fe
Cast 45,000-55,000 TS, 525-565 Brin
For ball mill liners, crushers, pump parts; abrasion and corrosion resistant

NI-HARD Type 3
M-68; 1.0-1.6 C, 0.4-0.7 Si, 0.4-0.7 Mn, 4.0-4.75 Ni, 1.4-1.6 Cr, bal Fe
Sand Cast 75,000-125,000 TS; 350-500 Brin.
Chill cast 90,000-140,000 TS, 300-600 Brin
For jaw crushers, grinding balls, mill liners, slurry pumps. Wear resistant, tough.

NI-HARD Type 4.
M-68, 3.0-3.6 T.C., 0.1 max G.C., 1.5-2.0 Si, 0.4-0.7 Mn, 5.5-6.5 Ni, 7.0-10.0 Cr, bal Fe
Sand Cast: 75,000-85,000 TS; 5000-6000 Tr.S., 0.08-0.11 def., 580 min D.P.N.
For jaw crushers, hammer mills, grinding balls, mill liners.
Wear resistant martensitic white iron with improved resistance to fracture under impact.

Ni-HTC.
M-897; 0.04 Fe, 99.9 Ni.
For heating elements; useful operating temperature to 100°C.

NIKA
Japan; Pb, Sn, bal Cu.
For bearings; tough and non-corrosive.

NIKALIUM.
M-179; Al, bal Cu.
Rolled: 94,000 TS; 36,000 YS; 10 El; 180 Brin
For gears, ship propellers; corrosion and wear resistant, tough.

NIKE-3.
M-1449; 0.10 max C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

NIKE-B.
M-1449; 0.08 max C, 18 Cr, 8 Ni, Ti, bal Fe.
Annealed. 85,000 TS; 35,000 YS; 55 El, 65 RA; 150 Brin.
For welded chemical plant equipment, tanks, vessels, Type 321; stainless, austenitic.

NIKE-M.
M-1449; 0.12 max C, 18 Cr, 10 Ni, 2.5 Mo, bal Fe
Annealed 85,000 TS; 35,000 YS; 50 El, 65 RA, 160 Brin.
For acid resistant chemical plant equipment, mixers, tanks; Type 316, stainless, austenitic.

NIKON.
M-1277, 3.3 C, 0.7 Mn, 2.2 Si, bal Fe
For machinery castings; cast iron

NIKRO M.
M-115, 0.55-0.75 C, 1.4 Ni, 0.85 Cr, 0.4 Mo, bal Fe.
Heat treated 290,000 TS.
For collets, races, arbors, gears.

NIKROME M
M-240, 0.38-0.43 C, 0.7-0.9 Cr, 1.65-2.00 Ni, 0.2-0.3 Mo, bal Fe.
Heat treated: 110,000 TS; 90,000 YS; 16 El; 47 RA, 302 Brin
For heavy duty shafts, pins, axles; heat treated bars

NIKROTHAL
M-1150; 20 Cr, 3 Al, 3 Fe, bal Ni
For heating elements, high heat resistance

NIKROTHAL-2.
M-70, M-1150, 20 Ni, 25 Cr, bal Fe
Resistivity 570 ohms/cmf.
For unsupported heating elements
Max operating temperature 1920°F.

NIKROTHAL-4.
M-1150, 35 Ni, 20 Cr, bal Fe.
Elect resistivity 600 ohms/cmf.
For unsupported heating elements, resistors and potentiometers
Max operating temperature 2000°F.

NIKROTHAL-6.
M-70, M-1150; 16 Cr, 60 Ni, bal Fe.
Annealed: 90,000-200,000 TS, 40,000-50,000 YS; 22-33 El.
For resistors, heating elements; high electrical resistance, max operating temperature 1800°F.

NIKROTHAL-8.
M-70, M-1150; 20 Cr, bal Ni.
Annealed: 95,000-200,000 TS; 40,000-50,000 YS; 22-33 El.
For resistors, heating elements; high electrical resistance, max operating temperature 2100°F

NIKROTHAL-L.
M-70, M-1150; 17 Cr, Si, Mn, 75 Ni.
Annealed: 156,000-200,000 TS; 10-28 El.
For resistors, potentiometers; high electrical resistance.

NIKROTHAL-LX.
M-70, M-1150; 20 Cr, 5 additives, 75 Ni
Wire: 155,000-200,000 TS; 5-25 El.
Elect resistivity 800 ohms/cmf.
For rheostats, resistors, potentiometers, electric appliances, precision and vitreous enamel resistors.
High electrical resistivity, low temperature coefficient. Max. operating temperature 572°F.

NILCOR.
M-1470; Ni alloy.
For springs; non-magnetic.

NILGRO 36.
M-487; 36 Ni, bal Fe.
For thermostats; controlled expansion

NILGRO 42
M-487; 42 Ni, bal Fe.
For thermostats; controlled expansion.

NILO 36
M-121; 36 Ni, bal Fe.
Annealed: 70,000 TS, 24,000 YS; 36 El; 68 RA; 143 Brin.
For thermostats, glass-to-metal seals; controlled expansion.

NILO 40.
M-86, M-121, 40 Ni, 60 Fe
For glass to metal seals, thermostats, controlled coefficient of expansion.

NILO 42.
M-121; 42 Ni, bal Fe.
Annealed. 78,000 TS, 41,000 YS, 45 El; 73 RA; 143 Brin.
For thermostats, bimetals; controlled low expansion.

NILO 48.
M-121; 48 Ni, bal Fe
For thermostats, glass to metal seals, instrument components Controlled and low coefficient of expansion.

NILO 50
M-86, M-121; 50 Ni, 50 Fe.
For glass to metal seals, thermostats, controlled coefficient of expansion.

NILO 475.
M-86, M-121; 47 Ni, 5 Cr, bal Fe
For glass to metal seals, thermostats; controlled coefficient of expansion

NILO 501.
M-121, 50 Ni, bal Fe
For glass to metal seals; controlled expansion.

NILO K
M-121; 29 Ni, 17 Co, bal Fe.
Annealed: 77,200 TS; 54,000 YS, 41 El; 72 RA; 170 Brin.
For glass to metal seals, expansion of medium hard glass.

NILOMAG 471.
M-121; 47 Ni, 3 Mo, bal Fe.
For transformers, alternators; soft magnet for low power losses.

NILOMAG 641.
M-121; 64.3 Ni, 34.7 Fe, 1.0 Mo
For magnetic amplifiers, pulse transformers; soft magnet, domain oriented.

NILOMAG 771.
M-121; 77 Ni, 14 Fe, 5 Cu, 4 Mo.
For cores for telephone transformers, magnetic amplifiers; soft magnet, high permeability.

NILOMAG 772.
M-121; 77 Ni, 14 Fe, 5.5 Cu, 3.5 Mo.
For cores for telephone transformers, magnetic amplifiers, soft magnet, high permeability.

NILOMAG 800.
M-121; 80.5 Ni, 15.5 Fe, 4 Mo.
For cores in logical type circuits, fast switching alloy.

NILOMAG 801.
M-121, 80 Ni, 8 Fe, 12 Mo
For computer work for storage applications, fast switching alloy, soft magnet.

NILOY 48
M-121, 48 Ni, bal Fe
Annealed 50,000 TS; 33,000 YS, 46 El; 67 RA; 143 Brin
For thermostats, bimetals, controlled low expansion.

NILSTAIN 302
M-61, 18-20 Cr, 8-10 Ni, 0.20 C, 2 Mn, bal Fe.
Rolled 85,000 TS; 35,000 YS; 5 El; 9 RA; 140 Brin
For stainless parts, springs, corrosion resistant.

NILSTAIN 304
M-61, 8-10 Ni, 18-20 Cr, 0.08 max C, 2.0 max Mn, bal Fe
Rolled 85,000-250,000 TS; 35,000-200,000 YS, 60-5 El, 70-55 RA, 140-455 Brin
For springs, screws, bolts, stainless wire.

NILSTAIN 305
M-61, 0.12 max C, 17-19 Cr, 10-13 Ni, bal Fe
Annealed 85,000 TS, 38,000 YS, 50 El, 150 Brin
For cold headed parts; corrosion resistant, austenitic

NILSTAIN 308
M-61, 10-12 Ni, 19-22 Cr, 0.08 C, bal Fe
Rolled 85,000-350,000 TS, 35,000-300,000 YS; 60-55 El, 70 55 RA, 140-400 Brin
For weaving wire, bolts, nuts, screws, stainless

NILSTAIN 309
M-61, 12-14 Ni, 22 26 Cr, 0.2 max C, bal Fe
Rolled 100,000-225,000 TS, 52,000-150,000 YS; 75-5 El, 60-50 RA, 160-400 Brin
For weaving wire, heat resisting baskets, heat resistant

NILSTAIN 309 Cb
M-61, 13-15 Ni, 23-25 Cr, 1.5-2.0 Mn, 0.07 max C, Cb = 15 × C, bal Fe
For welding wire; stainless.

NILSTAIN 310
M 61, 19-22 Ni, 24 Cr, 0.25 max C, bal Fe
Cold drawn· 105,000 TS; 50,000 YS; 50 El; 55 RA, 165 Brin
For welding wire, furnace parts, heat resistant.

NILSTAIN 314.
M-61; 25 Cr, 20 Ni, 1.5-3.0 Si, bal Fe.
Annealed. 85,000 TS; 40,000 YS, 40 El.
For wire belts, resists carburizing atmosphere.

NILSTAIN 316.
M-61; 14 max Ni, 16-18 Cr, 2-3 Mo, 0.10 max C, bal Fe
Cold drawn· 95,000 TS; 45,000 YS; 55 El; 75 RA; 185 Brin
For welding wire, weaving wire; stainless.

NILSTAIN 317.
M-61; 14 max Ni, 18-20 Cr, 3-4 Mo, 0.10 max C, bal Fe.
Cold drawn: 95,000 TS; 45,000 TS; 55 El; 75 RA; 185-300 Brin.
For weaving wire; heat resistant.

NILSTAIN 321.
M-61; 0.12 max C, 18 Cr, 8 Ni, Ti, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 50 El; 150 Brin.
For chemical plant equipment; stainless, resists intergranular corrosion.

NILSTAIN 325.
M-61; 19-23 Ni, 7-10 Cr, 1.0-1.5 Cu, 0.25 max C, bal Fe.
Cold drawn: 90,000 TS; 50,000 YS; 30-40 El; 45-55 RA; 160-190 Brin.
For corrosion resisting parts; corrosion resistant.

NILSTAIN 330.
M-61; 33-36 Ni, 14-16 Cr, 0.25 max C, bal Fe.
Cold drawn: 75,000 TS; 15-25 El.
For heat resisting parts; heat resistant.

NILSTAIN 347.
M-61; 17-20 Cr, 8-12 Ni, 0.10 max C, Cb = 10 × C, bal Fe.
Cold drawn: 85,000 TS; 35,000 YS; 55-60 El; 65-75 RA; 130-300 Brin.
For welding wire; corrosion resistant.

NILSTAIN 416.
M-61; 23-30 Cr, 0.35 max C, bal Fe.
Cold drawn: 85,000 TS; 60,000 YS; 20-30 El; 40-50 RA; 160-200 Brin.
For glass sealing wire; heat resistant.

NILSTAIN 430.
M-61; 14-18 Cr, 0 12 max C, bal Fe.
Cold drawn: 75,000-100,000 TS; 50,000-90,000 YS; 35-10 El; 75-60 RA; 140-250 Brin.
For instruments, corrosion resistant.

NILSTAIN C-20.
M-61; 0.07 max C, 20 Cr, 29 Ni, 2 Mo, 3 Cu, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 35-50 El; 50-70 RA, 150-180 Brin.
For chemical plant equipment; stainless, resists H_2SO_4.

NILSTAIN X.
M-61; 7-9 Ni, 17-19 Cr, 1.5-3.0 Cu, 4-6 Mn, C, bal Fe.
Rolled: 80,000 TS; 50 El.
For lock washers, cold heading parts; non-magnetic; stainless.

NILVAR
M-44; 36 Ni, bal Fe.
Wrought: 150,000-70,000 TS.
For bimetals, measuring tapes, length standards, thermostats; low expansion alloy; maximum operating temperature 200°C.

NIMAR 110.
M-1724; 0 02 C, 0 10 Si, 0.10 Mn, 17.0-19 0 Ni, 7.0-8.5 Co, 4.6-5.1 Mo, 0.40-0.60 Ti, 0.05-015 Al, bal Fe.
Maraging steel, 1½ in. bar, as hardened: 266,000 TS; 256,000 YS; 6-12 El.
For parts requiring high strength.

NIMAR 125.
M-50, M-1724; 0.02 C, 0.10 Si, 0.10 Mn, *17.0-19.0 Ni, 8.5-9.5 Co, 4.7-5.2 Mo, 0.6-0.8 Ti,* 0.5-0.15 Al, bal Fe.
Maraging steel, 3 in. bar, hardened: 294,000 TS; 282,000 YS; 5-12 El.
For parts requiring very high strength

NIMAR 700.
M-677; 0.02 C, 0.06 Mn, 0.06 Si, 18.2 Ni, 4.8 Mo, 0.6 Ti, 0.1 Al, 9.8 Co, bal Fe.
For bare welding wire; maraging steel grade 250, for gas metal-arc welding.

NIMAR 701.
M-677; 0.02 C, 0.06 Mn, 0.06 Si, 18.2 Ni, 4.8 Mo, 1.0 Ti, 0.1 Al, 9.8 Co, bal Fe.
For bare welding wire; maraging steel grade 250, for submerged arc welding.

NIMARK-I.
M-32; 0.03 C, 18 5 Ni, 7.5 Co, 4.85 Mo, 0.4 Ti, 0.10 Al, 0.003 B, 0.01 Zr, bal Fe.
Solution Annealed: 142,000 TS; 97,000 YS; 18% El; 76% RA; Rock C 29.
Aged: 271,000 TS; 264,000 YS; 8% El; 42% RA; Rock C 49.
For missile and rocket components.
Vacuum melted, weldable, good ductility at high strength levels. Maraging steel.

NIMARK-II.
M-32; 0.03 C, 20.0 Ni, 1.45 Ti, 0.25 Al, 0.003 B, 0.01 Zr, 0.50 Cb, bal Fe.
Solution Annealed: 162,000 TS; 123,000 YS; 16 El; 74 RA; Rock C 31.
Aged: 280,000 TS; 267,000 YS; 13 El; 58 RA; Rock C 52.
For missile and rocket components.
Vacuum melted, maraging steel.
Good ductility at high strength levels.

NIMARK 300.
M-32, 0.3 max C, 18-19 Ni, 4.9 Mo, 8.7 Co, 0.7 Ti, 0.1 Al, Zr, B, bal Fe.
Ht. Tr.: 289,000 TS; 285,000 YS; 11 El; 58 RA; Rock C 52.
At 1000°F: 168,000 TS
For high strength, shock resisting applications, jet engine and missile components.
Vacuum melted maraging steel, notch-tough.

NIMEND.
M-677; 0.1-0.15 C, 14-18 Cr, 4-5 W, 15-18 Mo, 5.3 Fe, bal Ni.
Welded: 20-25 Rc; Aged 50 hrs at 1475°F: 38-40 Rc.
For hardfacing electrodes; similar to Hastelloy C.

NIMO.
M-40; 0.5-0.6 C, 0.3-0.5 Cr, 0.10-0.15 V, 0 4-0.5 Mo, 2 5-2.8 Ni, bal Fe.
For tools dies; oil hardening.

Ni-MoC.
M-1119, 16 Cr, 17 Mo, 7 Fe, 4 W, bal Ni.
For valves, pumps, pharmaceutical and chemical plant equipment.
Heat and corrosion resistant.

NIMOCAST 75.
M-1485, M-121; 0.1 C, 20 Cr, 5 max Fe, 0.4 Ti, 0.2 Al, bal Ni.
Cast: 75,000 TS; 29,400 YS; 34.8 El; 164 Brin.
Heat treated: 81,500 TS; 27,500 YS; 40.5 El; 172 Brin.
For high temperature applications, high oxidation resistance.

NIMOCAST 80.
M-121; 0.05 C, 20 Cr, 5 max Fe, 2.4 Ti, 1.2 Al, bal Ni.
Cast· 72,000 TS; 66,700 YS; 3 El; 253 Brin
Heat treated: 111,600 TS; 78,000 YS; 14 El; 270 Brin.
For high temperature applications; high creep resistance to 750°C.

NIMOCAST 90.
M-1485, M-121; 0.1 C, 16 Co, 5 max Fe, 2.4 Ti, 1.2 Al, 20 Cr, bal Ni.
Cast: 92,800 TS; 72,700 YS; 8.1 El; 280 Brin.
Heat treated: 106,000 TS; 79,600 YS; 12.6 El; 291 Brin.
For high temperature applications; high creep resistance to 870°C.

NIMOCAST 235D.
M-86, M-121; 14-17 Cr, 4.5-6.0 Mo, 3.5-5.0 Fe, 3.25-4.0 Al, 2.0-3.0 Ti, 5.6-6.5 Al + Ti, 0 3 max Si, 0.10-0.20 C, 0.10 max Mn, 0.05-0 10 B, bal Ni.
At 1200°F: 83,400 Fatigue St.
At 1650°F: 65,000 Fatigue St
For jet engine and aerospace equipment and parts.
High heat and corrosion resistance

NIMOCAST 242.
M-121; 0 3 C, 10 Co, 20 Cr, 0.3 max Ti, 0.2 max Al, 10 Mo, bal Ni
Cast: 70,000 TS; 43,000 YS; 8 El; 220 Brin
For high temperature applications; high resistance to thermal shock

NIMOCAST 257
M-1485, M-121; 0.8 C, 16 Co, 20 Cr, 2 max Fe, 1.6 Ti, 0 9 Al, bal Ni.
Cast.
For gas turbine engine rings; good properties to 650°C.

NIMOCAST 258.
M-121, 0.2 C, 10 Cr, 20 Co, 2 max Fe, 3.7 Ti, 4.8 Al, 5 Mo, bal Ni.
Cast: 122,000 TS; 114,000 YS; 3 4 El; 375 Brin.
Heat treated: 117,400 TS, 110,000 YS; 4 5 El; 383 Brin.
High heat and oxidation resistant, creep resistant, for turbine blades, jet engine and missile components.

NIMOCAST 713
M-86, M-121, 14 Cr, 4 5 Mo, 1 Ti, 6 Al, 2 Cb + Ta, 1 5 max Fe, bal Ni
For gas turbine stator and rotor blades,
Creep resistant for service to 1000°C

NIMOCAST 713V.
M-121, M-86, 14 Cr, 6 5 Al, 4 5 Mo, 2 Cb, 1 Ti, 0 12 C, 0 1 Zr, 0 01 B, bal Ni
For aircraft gas turbine rotor blades, jet engine components
High temperature alloy Heat and corrosion resistant

NIMOCAST-C 242.
M-86, M-121, 0 3 C, 0 3 Si, 0 3 Mn, 20 Cr, 10 Co, 1 max Fe, 0 3 max Ti, 0 2 max Al, 10 Mo, bal Ni.
Cast. 69,700 TS; 43,000 YS; 8 El, 220 DPN.
For high temperature cast components, turbine nozzle guide vanes.
High resistance to thermal shock
High corrosion and heat resistant castings.

NIMOCAST-MC 57.
M-86, M-121; 0.08 C, 0 4 Si, 0.3 Mn, 20 Cr, 16 Co, 2 max Fe, 1.6 Ti, 0.9 Al, bal Ni.
Ht. Tr.: 100'000 TS; 65,000 YS; 16 El.
For high temperature cast components, gas turbine engine rings, jet engine parts.
Cast high temperature alloy.
Good combination of yield strength and ductility at 650°C. Heat treatable.

NIMOCAST-MC 58.
M-86, M-121; 0.2 C, 0.4 Mn, 0.4 Si, 10 Cr, 20 Co, 2 max Fe, 3 7 Ti, 4.8 Al, 5 Mo, bal Ni
Ht. Tr.: 117,500 TS, 110,000 YS; 4.5 El; 383 DPN.
Cast: 122,000 TS; 114,000 YS; 3.4 El; 375 DPN.
For high temperature cast components, turbine and jet engine components.
Good creep resistance up to 1000°C.
Casting alloy, good castability Heat treatable.

NIMOCAST-PD 16.
M-121; 11 W, 6 Cr, 6 Al, 2 Mo, 1.5 Cb, 0 12 Zr, 0 12 C, 0 02 B, bal Ni
For investment cast rotors and stators, gas turbine blades
High temperature casting alloy, heat and corrosion resistant

NIMOCAST PE 10
M-121, M-86, 20 Cr, 6 Mo, 2 5 W, 6 5 Cb + Ta, bal Ni.
For turbo-charger rotors, gas turbine components, diesel engine pre-combustion chambers.
Creep resistant for service to 870°C, oxidation and corrosion resistant

NIMOCAST PK 24
M-86, M-121, 0 18 C, 15 Co, 10 Cr, 3 Mo, 5 2 Ti, B, Zr, 5 6 Al, bal Ni
For gas turbines, engines, turbine-stator blades, turbocharger rotors
High temperature characteristics for max service about 1040°C

NIMOCAST PK 36
M-121, 10 Cr, 10 Co, 5 Ti, 5 Al, 4 Mo, 0 12 Zr, 0 1 C, 0 015 B, bal Ni
For jet engine and gas turbine components
Heat and corrosion resistant
High temperature casting alloy

NIMOL
M-68, M-86, 75 cast iron, up to 14 Cr, 14 Ni, 6 Cu
20,000 27,000 TS, 2 5 1 5 El, 120-240 Brin
For retorts for fuel carbonization, pump and engine liners, pans for fusing caustic alkalis; superseded by Ni-Resist

NIMONIC
M-86, 20 Cr, 2 Ti, 2 Al, bal Ni
For high temperature applications, heat resistant

NIMONIC 58
M-86, M-121, 11 Cr, 5 Mo. 20 Co, 5 Al, 2 Ti, bal Ni
Cast 123,000 TS, 114,000 YS, 3 4 El, 375 DPN.
For high temperature castings, jet engine and gas turbine parts
Heat and corrosion resistant
High creep and rupture strength

NIMONIC 75
M-86, M-121, 0 08-0 15 C, 0 2-0 6 Ti, 18-21 Cr, 1 0 max Si, 1 0 max Mn, 0 5 max Cu, 5-11 Fe, bal Ni + Co
Solution treated 103,000-96,000 TS, 60,000 YS; 50 El; 50 RA
For combustion chambers, turbines, age-hardenable, good resistance to creep and oxidation

NIMONIC 75 F
M-86, M-121, 0.08-0 15 C, 0 2-0.6 Ti, 18-21 Cr, 1 0 max Si, 1.0 max Mn, 0 5 max Cu, 5-11 Fe, bal Ni + Co
For turbines, combustion chambers, heat resistant, age-hardenable, creep and oxidation resistant.

NIMONIC 80.
M-86, M-121; 0.04 C, 0.47 Si, 75 Ni, 21 Cr, 0.56 Mn, 2.45 Ti, 0.63 Al.
Heat treated: 147,000 TS; 41 El; 35 RA; 350 Brin.
At 20°C: 132,000 TS; 80,000 YS; 45 El; 36 RA.
At 800°C: 63,000 TS; 53,000 YS, 8 El, 10 RA.
For rotor blades, gas turbine engines; high creep resistance, age-hardenable.

NIMONIC 80A.
M-86, M-121; 0.04 C, 21 Cr, 0.6 Mn, 2.5 Ti, 0.7 Al, bal Ni.
At 20°C: 132,000 TS; 80,000 YS; 45 El; 36 RA.
At 800°C: 62,000 TS; 53,000 YS, 8 El; 10 RA.
For gas turbine blades; high creep resistant.

NIMONIC 90.
M-86, 0.10 C, 1.5 max Si, 1 max Mn, 0.8-1.8 Al, 5 max Fe, 1.8-2.7 Ti, 18-21 Cr, 15-21 Co, bal Ni.
At 20°C. 155,000 TS, 90,000 YS, 39 El; 20 RA.
At 800°C 78,000 TS; 57,000 YS, 7 El, 4 RA
For jet engine parts; high heat resistant, heat treatable.

NIMONIC 90
M-121, 0.1 max C, 0.8-1.8 Al, 1.8-3.0 Ti, 5 max Fe, 15-21 Co, 18-21 Cr, bal Ni
At 20°C: 166,000 TS, 101,000 YS; 39 El; 20 RA.
At 600°C 132,000 TS; 90,000 YS, 26 El; 21 RA.
At 800°C: 85,000 TS; 63,000 YS, 7 El; 4 RA.
For turbine blades, combustion chambers, rotor dies, age hardened, super heat and creep resistance

NIMONIC 93.
M-86, M-121; 0.10 C, 19.5 Cr, 2.75 Ti, 1.5 Al, 18 Co, 0.3 max Mo, 0.08 Zr, 0.008 B, bal Ni
Heat treated 185,000 TS, 120,000 YS; 28 El; 41 RA
At 600°C 160,000 TS; 105,000 YS; 24 El; 23 RA.
For jet engine and gas turbine components
Age hardenable, heat and oxidation resistant

NIMONIC 95
M-121; 18-21 Cr, 15-21 Co, 0.15 max C, 1.4-2.5 Al, 5 Fe, 4 Ti, bal Ni.
At 20°C· 184,000 TS, 25 El, 24 RA, 290 Brin
At 800°C· 89,600 TS; 5 El; 6 RA; 360 Brin.
For gas turbine rotor blades; age hardened, creep resistant

NIMONIC 100
M-86, M-121, 11 Cr, 5 Mo, 20 Co, 1.5 Ti, 5 Al, bal Ni
Heat treated 320-400 Brin
For gas turbine rotor blades; creep resistant to 1000°C.

NIMONIC 105.
M-121; 15 Cr, 20 Co, 5 Mo, 4.5 Al, 1.4 Ti, 0.15 C, bal Ni.
At 20°C: 144,000 TS; 116,000 YS; 7 El; 7 RA.
At 800°C· 107,000 TS; 78,500 YS; 16 El; 17 RA.
For gas turbine components, jet engines, combustion chambers. Corrosion and heat resistance.

NIMONIC 110.
M-121, M-86, 0.15 C, 15 Cr, 20 Co, 1.75 Ti, 5.75 Al, 5.0 Mo, bal Ni.
Hot Rolled: 180,000 TS; 124,000 YS; 18 El; 17 RA.
At 800°F: 113,500 TS, 84,000 YS; 37 El; 35 RA.
For high temperature applications, aircraft gas turbines, high temperature fasteners, gas turbine blades.
Creep and high oxidation resistance.

NIMONIC 115.
M-121; 0.15 C, 15 Cr, 20 Co, 5 Mo, 4 Al, bal Ni.
For gas turbine engine blades; high creep and rupture strength at high temperature.

NIMONIC 118.
M-86, M-121; 0.16 C, 15 Cr, 3.85 Ti, 4.8 Al, 14.9 Co, 3.5 Mo, 0.045 Zr, 0.016 B, 0.7 max Fe, 0.5 max Mn, bal Ni.
Heat treated· 170,000 TS; 125,000 YS, 29 El, 45 RA.
At 600°C: 150,000 TS; 110,000 YS; 25 El; 34 RA.
For gas turbine and jet engine components, missiles, aircraft.
Age-hardenable, heat and oxidation resistant.

NIMONIC B.
M-86, 0.1 max C, 1.8-2.7 Ti, 0.8-1.8 Al, 5 max Fe, 15-21 Co, 18-21 Cr, bal Ni.
Rolled: 160,000 TS; 90,000 YS, 39 El, 20 RA.
At 1500°F: 76,000 TS; 56,000 YS; 7 El, 4 RA.
For turbine gland springs; heat resistant, heat treatable.

NIMONIC C.
M-86, 0.5-1.8 Al, 1.8-2.7 Ti, 18-21 Cr, bal Ni
At 20°C. 134,000 TS; 80,000 YS; 45 El; 36 RA.
At 800°C· 64,000 TS; 54,000 YS, 8 El; 10 RA.
For heat exchangers, valves, valve inserts, gas turbine parts, heat and corrosion resistant.

NIMONIC C75
M-86, M-121; 0.08-0.15 C, 5 max Fe, 0.2-0.6 Ti, 18-21 Cr, 0.5-max Cu, 0.2 Al, bal Ni.
Cast 74,500 TS, 30,000 YS, 35 El; 164 DPN
Ht Tr 82,000 TS; 28,000 YS, 41 El, 172 DPN.
For furnace trays, gas turbine parts, combustion chambers, jet engine components.
Resists scaling and thermal shock.
Heat and corrosion resistant

NIMONIC C242.
M-86, M-121, 0.3 C, 20 Cr, 10 Co, 10 Mo, 1 max Fe, bal Ni.
Cast 70,000 TS, 44,000 YP; 8 El, 220 DPN
For high temperature castings, nozzle guide vanes, jet engine and gas turbine parts
Heat and corrosion resistant
High resistance to creep and thermal shock

NIMONIC ALLOY C263
M-86, M-121, 0.03 C, 20 Cr, 2.15 Ti, 0.45 Al, 20 Co, 5.9 Mo, 0.02 max Zr, 0.001 max B, 0.007 max S, bal Ni.
Heat treated· 146,000 TS, 90,000 YS, 45 El, 42 RA.
At 600°C 120,000 TS; 70,000 YS; 44 El; 50 RA.
For jet engine and gas turbine components, missiles
Age-hardenable, heat and oxidation resistant.

NIMONIC-CB
M-86, 1.8-2.7 Ti, 0.8-1.8 Al, 5 max Fe, 15-21 Co, 18-21 Cr, bal Ni
Ht Tr 106,000 TS, 80,000 YS, 13 El, 290 DPN.
For gas turbine rotor blades
High creep and oxidation resistant Cast alloy.

NIMONIC C.C.
M-86, M-121: 0.10 max C, 0.5-1.8 Al, 5 max Fe, 1.8-2.7 Ti, 18-21 Cr, 2 max Co, bal Ni
Ht. Tr.: 112,000 TS, 80,000 YS, 14 El; 270 DPN.
For gas engine and jet engine and gas turbine components.
High creep resistance to 900°C
Cast alloy, oxidation resistant

NIMONIC CF.
M-86, 0.08-0.15 C, 0.2-0.6 Ti, 5-11 Fe, 8-21 Cr, bal Ni.
For jet engine components; cast alloy.

NIMONIC D.
M-86, M-121; 37 Ni, 18 Cr, 2 Si, bal Fe.
At 70°F: 94,000 TS; 48,000 YS; 38 El; 50 RA.
At 2000°F: 10,000 TS; 124 El; 83 RA.
For gas turbine parts, impulse blades;
heat resistant.

NIMONIC DS.
M-121; 0.15 max C, 17-19 Cr, 2.0-2.5 Si, 1.2 Mn, 36-39 Ni, bal Fe.
At 20°C: 105,300 TS; 38 El; 50 RA.
At 800°C: 23,500 TS; 93 El; 71 RA.
At 1000°C: 12,400 TS; 124 El; 83 RA.
For woven furnace belts, radiant tubes,
heat treat equipment; oxidation resistant to 950°C.

NIMONIC DT.
M-121; Ni alloy.
For high temperature applications;
heat resistant.

NIMONIC F.
M-86; 0.08-0.15 C, 0.2-0.6 Ti, 5-11 Fe, 18-21 Cr, bal Ni.
For gas turbine flame tube;
oxidation and heat resistant.

NIMONIC M4VC.
M-121; nickel alloy.
For high temperature applications;
high temperature resistance.

NIMONIC M6VC.
M-121; nickel alloy.
For high temperature applications;
high temperature resistance.

NIMONIC M14V.
M-121; nickel alloy.
For high temperature applications;
corrosion and heat resistant.

NIMONIC M15V.
M-121; nickel alloy.
For high temperature applications;
corrosion and heat resistant.

NIMONIC M17V.
M-121; nickel alloy.
For high temperature applications;
corrosion and heat resistant.

NIMONIC MC 57.
M-86, M-121; 0.08 C, 16 Co, 20 Cr, 0.9 Al, 1.6 Ti, bal Ni.
Ht. Tr.: 180,000 TS; 65,000 YS; 16 El.
For high temperature castings,
gas turbine components.
Heat and corrosion resistant.
Good properties to 650°C.

NIMONIC PE 7.
M-86, M-121; 0.1 C, 18 Cr, 5 Mo, 37 Ni, 2.0 max Co, 1.2 Ti, 1.2 Al, bal Fe.
For power generating equipment, gas turbines,
steam plants, casings and compressors.
Creep and high temperature resistance.
For service up to 580°C.

NIMONIC PE 11.
M-86, M-121; 18 Cr, 5.2 Mo, 2.3 Ti, 0.8 Al, 38 Ni, bal Fe.
Heat Treated: 160.000 TS; 100,000 YS; 21 El; 35 RA.
At 600°C: 140,000 TS; 100,000 YS; 23 El; 34 RA.
For gas turbine thrust reversers, noise suppressors,
jet pipes.
Creep resistant. Heat and corrosion resistant;
age-hardenable.

NIMONIC PE 13.
M-86, M-121; 0.05-0.15 C, 20.5-23.0 Cr, 17.0-20.0 Fe, 0.5-2.5 Co, 8.0-10.0 Mo, 0.2-1.0 W, bal Ni.
Annealed: 116,500 TS; 51,500 YS; 43 El; 200 VPN.
At 1000°C; 20,200 TS; 13,500 YS; 44 El.
For elevated temperature applications, missile and jet engine components, furnace parts.
High temperature, heat resistant.

NIMONIC PE 16.
M-86, M-121; 16.5 Cr, 2.0 max Co, 3.2 Mo, 1.2 Ti, 1.2 Al, 43.5 Ni, bal Fe.
Heat Treated: 121,000 TS; 65,000 YS; 29 El.
At 600°C· 99,000 TS; 54,000 YS; 30 El.
For gas turbine compressor delivery casings,
turbine casings.
Creep and oxidation resistant for service up to 750°C., age-hardenable.

NIMONIC PK 25.
M-86, M-121; 19 Cr, 18 Co, 4.2 Mo, 3 Ti, 2.7 Al, bal Ni.
Heat Treated: 197,000 TS; 18 El; 22 RA.
At 1400°F: 155,000 TS; 20 El; 28 RA
For gas turbine blades and other components,
bolts, valves, jet engine components.
Creep and heat resistant to 940°C.

NIMONIC PK 31.
M-86, M-121; 14 Co, 0.06 C, 20 Cr, 4 5 Mo, 2 3 Ti, 0 6 Al, 5.0 Cb, bal Ni.
Heat Treated· 190,000 TS, 140,000 YS; 25 El; 34 RA.
At 600°C: 160,000 TS; 120,000 YS, 25 El; 34 RA
For rotor discs in gas turbines,
jet engine and missile components.
High tensile strength and creep resistant
High oxidation and corrosion resistance.

NIMONIC PK 33
M-86, M-121; 14 Co, 0.05 C, 19 Cr, 7 5 Mo, 2 0 Ti, 2 0 Al, bal Ni.
Heat Treated 165,000 TS, 95,000 YS, 33 El; 41 RA.
At 600°C 140,000 TS, 88,000 YS; 32 El, 40 RA
For engine rotor and sheet components gas turbine parts, jet pipes for service up to 950°C.
High oxidation and corrosion resistance
Age-hardenable.

NIMOPLY
M-121, clad Nimonic 75
For gas turbine construction;
copper rolled between sheets of Nimonic 75

NIOLOY
M-95; 3 0 C, Ni, bal Fe
For rolls for steel mills; chilled iron.

NIO-O-NEL ALLOY 825 replace by INCOLOY ALLOY 825

NIORO.
M-1493; 82 Au, 18 Ni
For brazing W. Mo. Cu. Ni, and Kovar.
M P 950°C. Excellent flow and wetting properties.

NIPERM 50.
M-27; 0.1 C, 48 Ni, Cr, bal Fe.
For soft magnet; high permeability.

NIPERMAG.
M-38, M-867; 12 Al, 32 Ni, 0.4 Ti, bal Fe.
Cast: 10,500 TS; 23,000 Tr. S.; C 45 Rock. 5600 Br, 660 Hc, 3400 Bo.
For loud speakers, motors, generators.
Permanent magnet, high permeability.

NIPIGON.
M-435; 0.8 C, 19 W, 2 V, 4 Cr, 1 Mo, 9 Co, bal Fe.
For tools, dies, cutting tools; high speed steel.

NIPPON EVERSHINING STEEL.
M-716; 0.15 C, 18 Cr, 8 Ni, bal Fe.
For stainless parts; stainless.

NIPPON NST-M1.
M-1651; 0 07-0.12 C, 0.3-0.6 Mn, 0.5 max Si, 12.0.-13.5 Cr, 0.4-0.6 Mo, 0.5 max Ni, bal Fe.
Annealed: 75,000 TS; 35,000 YS; 25 El; B 92 Rock.
For table flatware, springs, oil refinery equipment. Corrosion resistant.

NIPPON NST-M2.
M-1651; 0 10-0.20 C, 0.2-0.8 Mn, 0.5 max Si, 11 5-13 0 Cr, 0.60-1.5 Mo, 0.5 max Ni, bal Fe.
Annealed· 75,000 TS, 40,000 YS; 25 El; B 92 Rock.
For springs, table flatware, oil refinery equipment, surgical instruments, valves.
Corrosion resistant, hardenable.

NIPURE
M-61, 0 01 max Si, 0.05 max Fe, 0 02 max Mn, 0 01 max Mg, 0.04 max Cu, 0.02 max C, 0.01 max Al, 0 01 max Ti, 0.05 max Cr, 0.01 max Pb, bal Ni.
For electronic components
Vacuum melted high purity nickel.

NIRANIUM.
28 8 Cr, 64.2 Co, 4 3 Ni, 2 W, 0.1 Si, 0.2 C, 0.7 Al.
At 1000°C: 82,000 TS, 43,000 YS; 0 7 El.
At 700°C· 85,000 TS; 47,000 YS; 1.3 El.

NI RESIST
M-494, 2 8 C, 14 Ni, 7 Cu, 2 Cr, bal Fe
Cast 28,000 TS, 140-200 Brin
For castings, heat and corrosion resisting.

NIRESIST.
Russia, 2 7 C, 3 0-3 4 Cr, 12-15 Ni, 5-8 Cu, 1 5 Si, bal Fe
Cast 20,000-35,000 TS, 125-200 Brin
For heat and corrosion resistant parts; corrosion and heat resistant, cast iron.

Ni-RESIST TYPE 1.
M-763; 2.5-3 5 C, 1-2 Si, 0.75 1 2 Mn, 12-15 Ni, 1-3 Cr, 5-7 Cu, bal Fe
Cast· 25,000-30,000 TS; 130-160 Brin
For corrosion and heat resistant castings, resists corrosion, heat and wear.

NI-RESIST TYPE I.
M-68, M-271; 1.7-2 5 Cr, 1.0-2 5 Si, 1-1 5 Mn, 13-17 Ni, 5-7 Cu, 3 max T.C , bal Fe.
Cast: 25,000-30,000 TS; 2 El; 0 RA; 130-160 Brin
For pipes, valves, pumps, propellers, hydraulic turbines, oil burners, automotive engine pistons and sleeves; corrosion and heat resisting; austenitic cast iron; non-magnetic

Ni-RESIST I.
M-1188, 2-3 C, 14 Ni, 2 Cr, 6 Cu, bal Fe.
Cast: 25,000-30,000 TS; 120-180 Brin.
For corrosion and heat resistant castings; stainless cast iron, austenitic.

Ni-RESIST TYPE 1-B
M-68; 3 max T.C., 1.0-2.8 Si, 1.0-1.5 Mn, 13.5-17.5 Ni, 2.5-4.0 Cr, bal Fe
Cast: 25,000 TS; 1 El; 140-190 Brin.
For pumps, valves, filter presses, impellers, nozzles; non-magnetic, erosion and corrosion resistant cast iron.

NI-RESIST, TYPE 2.
M-68; 18-22 Ni, 2-4 Cr, 2.2-3.0 C, 1-1.5 Mn, 1.0-2.5 Si, bal Fe.
Cast: 25,000-30,000 TS; 2 El; 0 RA; 120-170 Brin.
For heat resistant parts, grids, furnace parts, pumps, pipe; corrosion resisting and heat resisting.

Ni-RESIST TYPE 2
M-763; 3 max C, 1.7-2.5 Cr, 18-22 Ni, 1-2.5 Si, 0.8-1.5 Mn, bal Fe.
Cast: 25,000-30,000 TS; 130-160 Brin.
For corrosion and heat resistant castings; resists heat, corrosion and wear.

Ni RESIST II.
M-1188; 3 C, 20 Ni, 2 Cr, 2 Si, bal Fe.
Cast: 25,000-30,000 TS; 120-180 Brin.
For corrosion and heat resistant castings; stainless cast iron, austenitic.

Ni-RESIST TYPE 2.
M-994, 3 max C, 1.7-2 5 Cr, 18-22 Ni, 1-2.5 Si, 0 8-1 5 Mn, bal Fe
Cast· 25,000-30,000 TS; 130-160 Brin.
For castings; corrosion and heat resistant.

Ni-RESIST TYPE 2A.
M-994, 2 8 max C, 1.7-2 5 Cr, 18-22 Ni, 1.5-2.7 Si, 0.8-1 5 Mn, bal Fe.
Cast 30,000-50,000 TS; 145-190 Brin.
For castings; corrosion and heat resistant.

Ni-RESIST TYPE 2-B
M-68; 3 max T C , 1.0-2.8 Si, 0.8-1.5 Mn, 18-22 Ni, 2.5-4 0 Cr, bal Fe
Cast: 25,000 TS, 1 El; 130-190 Brin
For turbocharger casings, manifolds, steam turbine nozzles; non-magnetic, heat resistant cast iron.

Ni-RESIST TYPE 2B
M-994, 3 max C, 3-6 Cr, 18-22 Ni, 1.2 Si, 0 8-1.5 Mn, bal Fe.
Cast· 25,000-45,000 TS; 170-250 Brin.
For castings, corrosion and heat resistant.

Ni-RESIST TYPE 3.
M-994, M-68; 2.75 max C, 2.5-3.5 Cr, 28-32 Ni, 1-2 Si, 0 4-0 8 Mn, bal Fe.
Cast 25,000-35,000 TS, 120-150 Brin.
For heat and corrosion resistant castings, corrosion and heat resistant

Ni-RESIST III.
M-1188, 2 7 C, 30 Ni, 2 Si, bal Fe.
Cast· 25,000-35,000 TS, 110-170 Brin.
For corrosion and heat resistant castings; stainless cast iron, austenitic.

Ni-RESIST TYPE 3
M-763; 2 75 max C, 2 5-3 5 Cr, 28-32 Ni, 1-2 Si, 0 4-0.8 Mn, bal Fe.
Cast 25,000-35,000 TS, 120-150 Brin.
For corrosion and heat resistant castings; resists heat, corrosion and wear

Ni-RESIST TYPE 4
M-763, 2 6 max C, 4.5-5 5 Cr, 29-32 Ni, 5-6 Si, 0.4-0.8 Mn, bal Fe.
Cast: 25,000-35,000 TS; 150-180 Brin
For corrosion and heat resistant castings; resists heat, corrosion and wear

Ni-RESIST TYPE 4.
M-994, M-68; 2 6 max C, 4.5-5.5 Cr, 29-32 Ni, 5-6 Si, 0 4-0.8 Mn, bal Fe.
Cast: 25,000-35,000 TS; 150-180 Brin.
For heat resistant castings, stove tops, cookware; corrosion and heat resistant.

Ni-RESIST IV.
M-1188; C, 30 Ni, 3 Si, bal Fe.
Cast: 25,000-35,000 TS; 130-200 Brin.
For food industry equipment; stainless cast iron.

Ni-RESIST TYPE 5
M-68; 2.4 max T.C., 1-2 Si, 0.4-0.8 Mn, 34-36 Ni, 0.5 max Cu, 0.1 max Cr, bal Fe.
Cast: 20,000-25,000 TS; 100-125 Brin.
For gages, glass molds, paper dies, chemical equipment; very low thermal expansion

Ni-RESIST V.
M-1188; 2.4 C, 36 Ni, 1-2 Si, bal Fe.
Cast: 20,000-25,000 TS, 110-160 Brain
For heat resistant castings, stainless cast iron, low coefficient of expansion.

Ni-RESIST TYPE 5
M-994, 2.4 max C, 3 max Cr, 34-36 Ni, 1-2 Si, 0.4-0.8 Mn, bal Fe
Cast: 20,000-25,000 TS; 100-140 Brin
For heat resistant castings, corrosion and heat resistant

Ni-RESIST TYPE D-2.
M-68, 3 max T.C., 1.5-3.0 Si, 0.7-1.2 Mn, 18-22 Ni, 1.75-2.75 Cr, bal Fe.
Cast: 60,000 TS, 30,000 YS, 8-20 El, 140-200 Brin
For pumps, valves, pipe fittings, paper rolls; corrosion and heat resistant cast iron

Ni-RESIST TYPE D-2B.
M-68; 3 max T.C., 1.5-3.0 Si, 0.7-1.2 Mn, 18-22 Ni, 2.7-4.0 Cr, bal Fe
Cast 60,000 TS, 30,000 YS, 7-15 El, 150-210 Brin
For impellers, pumps, valves, engine parts; corrosion and heat resistant cast iron.

Ni-RESIST TYPE D-2C
M-68; 2.9 T.C., 1-3 Si, 1.8-2.4 Mn, 28-32 Ni, bal Fe
Cast: 60,000 TS, 30,000 YS, 20-40 El, 120-170 Brin.
For switch gears, pumps, valves, bearings, seals, corrosion and heat resistant cast iron

Ni-RESIST TYPE D-3
M-68, 2.6 T.C., 1.0-2.8 Si, 28-32 Ni, 2.5-3.5 Cr, bal Fe.
Cast: 55,000 TS, 30,000 YS, 6-20 El; 140-200 Brin
For steam turbines, engines, liners, valves, kettles; corrosion and heat resistant cast iron

Ni-RESIST TYPE D-3A
M-68, 2.6 T.C., 1.0-2.8 Si, 28-32 Ni, 1.5 Cr, bal Fe
Cast: 55,000 TS, 30,000 YS; 10-20 El; 130-190 Brin
For liners, bearings, valve guides, corrosion and heat resistant cast iron

Ni-RESIST TYPE D-4
M-68; 2.6 T.C., 5-6 Si, 28-32 Ni, 4.5-5.5 Cr, bal Fe
Cast: 60,000 TS; 200-270 Brin
For cookware, range tops; nonmagnetic, corrosion resistant cast iron

Ni-RESIST TYPED D-5.
M-68; 2.4 max T.C., 1.0-2.8 Si, 34-36 Ni, bal Fe
Cast. 55,000 TS, 30,000 YS, 20-40 El; 130-280 Brin
For dies, glass molds, ingot molds; corrosion and heat resistant cast iron.

Ni-RESIST TYPE D-5B.
M-68, 2.4 max T.C. 1.0-2.8 Si, 34-36 Ni, 2-3 Cr, bal Fe.
Cast: 55,000 TS; 30,000 YS; 6-15 El, 140-190 Brin
For dies, glass molds, ingot molds, corrosion and heat resistant cast iron

Ni-RESIST G.
M-500; 2.7 C, Ni, Cu, Cr, bal Fe.
Annealed 30,000 TS, 150 Brin.
For chemical plant equipment; resists acids, oxidation.

Ni-RESIST N.
M-500, 2.7 C, Ni, Cr, bal Fe.
Annealed 30,000 TS, 150 Brin.
For chemical plant equipment; resists caustic, ammonia.

NIRESULT
M-84; 1.1 min C, 24-30 Cr, 12-15 Ni, 5-7 Cu, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

NIREX.
M-44, 70 min Ni, 11-15 Cr, 10 max Fe.
For heat resisting parts, stainless, heat resistant.

Ni-ROD
M-68, 92 Ni
For welding rod for cast iron, machinable welds, coated, arc

NI-ROD 55
M-68; 60 Ni, 40 Fe
For welding electrodes for cast iron, machinable.

NI-ROD 55 WELDING ELECTRODE
M-1499, 53 Ni, 1.5 C, 0.3 Mn, 45.0 Fe, 0.005 S, 0.50 Si, 0.10 Cu
Electrode for shielded metal-arc welding of cast and ductile irons, cast irons to wrought alloys
AWS A 5.15 Class F NiFe-CI

NI-ROD WELDING ELECTRODE
M-1499, 95.0 Ni, 1.0 C, 0.2 Mn, 3.0 Fe, 0.005 S, 0.7 Si, 0.10 Cu
Electrode for shielded metal-arc welding of cast iron
AWS A 5.15 Class E Ni-CI

NIROMET 36
M-61, 36 Ni, 64 Fe
Wire (Annealed) 70,000 TS
(Cold worked) 150,000 TS.
For bimetals, precision springs, time devices.
Low expansion

NIROMET 42
M-61, 42 Ni, bal Fe
Bar 70,000-150,000 TS, 50,000 YS, 35 El
For glass-to metal hermetic sealing, leads and terminals for resistors
Matches Corning 1075 glass Controlled expansion.

NIROMET 44
M-61, 44 Ni, 56 Fe
Wire 70,000 TS (Annealed); 150,000 TS (Cold worked)
For special glass sealing and fiber optics.
Controlled expansion

NIROMET 46
M-61, 46 Ni, bal Fe
Bar 70,000-150,000 TS, 50,000 YS; 35 El
For terminal bands in vitreous enameled resistors, cores and armatures for relays, motors, transformers Controlled expansion alloy.

NIROMET 48
M-61, 48 Ni, 52 Fe
Wire 70,000-150,000 TS
For glass-to-metal seals
Controlled expansion.

NIROMET 426
M-61, 42 Ni, 6 Cr, bal Fe.
Wire 80,000-150,000 TS.
For glass to metal seals (Corning #0120 glass).
Controlled expansion

NIRON 46.
M-61, 46 Ni, 54 Fe.
Annealed: 70,000 TS, 50,000 YS; 35 El.
For terminal bands for vitreous enamel resistors; controlled expansion

NIRON 52.
M 61; 51 Ni, 49 Fe.
Annealed: 70,000 TS; 50,000 YS; 35 El.
For glass to metal seals; controlled expansion.

NIRONITE.
M-229, C, alloy, bal Fe
For rolls for strip mills; heavy duty.

NIRONITE B
M-229; 3 2 C, 2 Si, 1 Cr, bal Fe.
For rolling mill casting, special iron alloy.

NIRONITE C
M-229, C, alloy, bal Fe
For rolls for bal and billet mills; heavy duty.

NIRONITE D
M-229, C, alloy, bal Fe
For rolls for strip mills, heavy duty.

NIRONZE 635
M-141, 1 9 Ni, 0 6 Si, bal Cu
Annealed 40,000 TS, 12,000 YS; 50 El, 90 RA; 56 Brin.
Aged 88,000 TS, 70,000 YS; 12 El, 20 RA; 170 Brin
For cold headed bolts, fasteners, switch gear, marine hardware, age-hardenable, corrosion resistant

NIROSTA 18 8
M 184, 0 6-1 25 Si, 8-10 Ni, 16 19 Cr, 0 35 max C, bal Fe
Corrosion resisting articles; now Michiana No. 49

NIROSTA 19-9-4
M 184, 0 6 1 25 Si, 8-12 Ni, 18-20 Cr, 0.35 C, 2-4 Mo, bal Fe
For hot sulfuric acid tanks, corrosion resistant and hot H_2SO_4 resistant, under pressure

NIROSTA 25 20
M-184, 1 5 max Si, 18 22 Ni, 24-27 Cr, 0 35 max C, bal Fe
Applicable to temperature and corrosion work where temperature exceeds 1400°F; heat and corrosion resistant up to 1400°F

NIROSTA KA2
M-15, M 72; 0 16 max C, 0 50 max Mn, 0 50 Si, 17 20 Cr, 7 10 Ni, bal Fe
85,000-95,000 TS, 30,000-40,000 YS, 60 55 El; 75 50 RA, 135-150 Brin
For cutlery, stainless articles, non-magnetic, austenitic, scaling point 1700°F

NIROSTA KA4
M-105, 0 25 C, 0 50 Mn, 0 5-0.75 Si, 17-20 Cr, 8 10 Ni, 2-4 Mo, bal Fe.
At 70°F· 105,000 TS, 49,000 YS, 55 El; 62 RA.
At 1110°F. 70,000 TS, 22,000 YS; 30 El
At 1830°F 9,000 TS, 4,500 YS; 47 El
For pipe fittings, pump casings, impellers, shafts; high corrosion resistance; austenitic, same as "Standard alloy KA4"

NIROSTA VK5M.
M-72, 0 20 C, 13 Cr, 1 2 Mo, bal Fe.
Annealed· 95,000 TS; 40,000 YS; 25 El; 55 RA; B 92 Rock
Cold Drawn· 105,000 TS, 85,000 YS; 17 El; 50 RA; B 95 Rock.
Heat Treated: 250,000 TS; 215,000 YS; 8 El; 25 RA; C 50 Rock.
For cutlery, surgical instruments, oil refinery equipment, valves.
Corrosion resistant, hardenable.

NIROSTA VK7M.
M-72, 0.15 C, 13 Cr, 1.2 Mo, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 25 El; B 93 Rock
Heat Treated: 200,000 TS; 160,000 YS; 12 El; C 45 Rock.
For surgical instruments, cutlery, oil refining equipment, table flatware.
Corrosion resistant, hardenable.

Ni RW 4 Zr
M-Germany; 4 2 W, 0 1 Zr, bal Ni.
For thermionic valves.
Heat and corrosion resistant

NISILOY
M-68; 60 Ni, 30 Si, 10 Fe
For iron inoculant, for gray iron castings; M P. 1800°F.

NISIMAZ
M-104, M-771, C, 21 Ni, 2.5 Cr, 7 Si, bal Fe.
For chemical plant equipment, resists HCl and H_2SO_4

Ni-SPAN C.
M-68, M-237, 41-43 Ni, 2 4 Ti, 5 1-5 7 Cr, 0 6 max C, 0 6 Al, 0.8 Si, bal Fe.
Annealed: 90,000 TS, 35,000 YS, 40 El; 145 Brin.
Aged· 200,000 TS, 180,000 YS; 7 El, 395 Brin.
For instruments springs, diaphragms; age-hardenable, constant modulus.

NI-SPAN-C ALLOY 902
M-1499, 42 25 Ni, 0 03 C, 0 40 Mn, 48 5 Fe, 0 02 S, 0 50 Si, 0 05 Cu, 5 33 Cr, 0 55 Al, 2.58 Ti.
Hot rolled and aged. 175,000 TS, 110,000 YS, 25 El.
For tuning forks and other mechanical resonators, electromechanical filters, watch and clock hairsprings; age hardenable; controllable thermo-elastic coefficient.

NI-SPAN-D
M-121, 42 2 Ni, 6 5 Cr, 2 8 Ti, 0 45 Al, bal Fe.
For diaphragms, capsules, tuning forks, Bourdon tubes, transducer load cells
Max service temperature of 85°C

Ni SPAN HI
M 68, 28-30 Ni, 2.4 Ti, 8-9 Cr, 0 06 max C, 0.5 Si, 0 4 Mn, 0 6 Al, bal Fe
Aged 140,000 TS, 90,000 YS, 20 El.
For thermostats, bimetals, high coefficient of expansion, age hardenable.

Ni-SPAN LO 42
M-68, 40 5 42 5 Ni, 2 2-2 6 Ti, 0.06 max C, 0 4 Mn, 0 5 Si, 0 6 Al, bal Fe.
Annealed 90,000 TS, 40,000 YS, 32 El, 330 Brin.
Hardened 165,000 TS, 120,000 YS, 14 El, 330 Brin
For thermostats, bimetals, age-hardenable, low coefficient of expansion

Ni-SPAN LO 45.
M-68, 44 4-46.5 Ni, 2.4 Ti, 0 06 max C, 0 4 Mn, 0 5 Si, 0 6 Al, bal Fe.
For thermostats, bimetals; low coefficient of expansion, age-hardenable.

Ni-SPAN LO 52
M-68, 51-53 Ni, 2 4 Ti, 0 06 max C, 0 4 Mn, 0 5 Si, 0 6 Al, bal Fe
Annealed. 85,000 TS; 35,000 YS; 27 El; 125 Brin.
Hardened: 120,000 TS; 95,000 YS; 17 El; 305 Brin
For thermostats, bimetals; low coefficient of expansion, age-hardenable.

"NI" STAINLESS STEEL.
M-73; 0.3-0.4 C, 13-15 Cr, 1.5-2.0 Ni, bal Fe.
For pump rods, pistons, valves, cutlery; corrosion resistant; resists heat up to 1000°F.

NITAL.
M-140; 0.27 C, 3 Cr, 0.2 V, 10.5 W, 0.2 Mo, 1.5 Ni, bal Fe.
For brass extrusion dies; hot work steel, oil hardened.

NIT CA1.
M-1315; 0.27 C, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment; creep resistant.

NIT CA2.
M-1315; 0.34 C, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment; creep resistant.

NIT CMA.
M-1315, 0.32 C, 1.1 Al, 1.1 Cr, 0.18 Mo, bal Fe.
For oil refinery equipment, creep resistant.

NIT CMA.
M-1315; 0.31 C, 2.35 Cr, 0.18 Mo, 0.13 V, bal Fe.
For gears, shafts, crankshafts, bolts, studs, oil hardened, shock resistant.

NIT CMNA.
M-1315; 0.33 C, 1.1 Al, 1.7 Cr, 1 Ni, bal Fe
For oil refinery equipment; creep resistant.

NITEC 10224.
M-717;
Nickel base alloy powder for cast iron and steel brazing or build-up.

NITECTIC 222
M-717;
Electrode for DC welding of nickel alloys and dissimilar alloys.
Tensile strength 100,000 psi.

NI TENSILIRON.
M-68; 2.5-3.1 C, 0.5-0.9 Mn, 1.2-2.75 Si, 1-4 Ni, 0-1 Mo, 0-0.5 Cr, bal Fe.
Cast. 40,000-100,000 TS; 220-350 Brin.
For gears, turbines, casings and rotors, valves, bushings, "Ni Tensile;" high strength cast iron.

Ni TENSYLE
M-494; 2.8 C, 1.5-2.0 Ni, 1.25-1.75 Si, bal Fe.
Cast: 56,000 TS; 200 Brin
Heat treated: 66,000 TS; 280 Brin.
For flywheels; cast iron.

NITINOL.
M-US, 40-45 Ti, 55-60 Ni.
54-5% Ni: 110,000-124,000 TS; 40,000-55,000 YS; 15.5 El; 16 RA; Rock A 42-52.
For nonmagnetic tools, sensing devices, chemical plant equipment, space components
Nonmagnetic, corrosion resistant, hardenable, alloy with a memory.

NITINOL-55.
M-US; 55 Ni, bal Ti.
Bar. 120,000 TS; 50,000 YS; 15 El; 16 RA; A 50 Rock.
For non-magnetic tools, sensing devices, chemical plant equipment.
Alloy with a memory. Non-magnetic, corrosion resistant.

NITRALLOY Gr. 3.
M-56; 0.38 C, 1.1 Al, 0.2 Mo, 1.5 Cr, bal Fe.
Ht. Tr.: 123,000-145,000 TS.
For nitrided rolls, crankshafts, camshafts, cams, brick press plates, gears.
Nitriding steel, wear resistant.

NITRALLOY Gr. 5.
M-56; 0.26-0.35 C, 1.5 Cr, 0.2 Mo, 1.1 Al, bal Fe.
Ht. Tr.: 90,000-125,000 TS.
For pump rods, camshafts, cams, crankshafts, gears.
Nitriding steel. Wear resistant.

NITRALLOY 125, TYPE H.
M-1; 0.23 C, 4-0.7 Mn, 0.2-0.4 Si, 0.85-1.2 Al, 1.58 Cr, 0.2 Mo, bal Fe.
Heat treated, for nitrided gears, shafts, cams, clutches, rollers; nitriding steel.

NITRALLOY NO. 135 CVM.
M-115, M-386, 0.30-0.40 C, 0.9-1.4 Cr, 0.15-0.25 Mo, 1.0-1.4 Al, bal Fe
Oil quenched and drawn. 225,000-105,000 TS; 180,000-90,000 YS, 10-27 El; 37-62 RA; 440-175 Brin.
For nitrided parts, gears, shafts; Nitralloy G.

NITRALLOY 135 MODIFIED.
M-1, M-24; 0.40 C, 0.5 Mn, 1.0 Al, 1.75 Cr, 0.4 Mo, bal Fe.
Heat treated 158,700 TS, 141,000 YS, 17 El; 56 RA; 320 Brin
For cylinder barrels, nitrided parts; nitriding steel.

NITRALLOY 135, TYPE G.
M-1; 0.36 C, 0.4-0.7 Mn, 0.2-0.4 Si, 0.85-1.2 Al, 1.49 Cr, 0.18 Mo, bal Fe
Heat treated 224,000-104,000 TS, 180,000-85,000 YS, 11-18 El; 36-59 RA; 445-200 Brin.
For nitrided gears, shafts, cams, clutches, rollers, nitriding steel.

NITRALLOY 230.
M-386, 0.25-0.35 C, 0.4-0.6 Mn, 0.2-0.3 Si, 1-1.5 Al, 0.6-1.0 Mo, bal Fe.
For nitrided parts, gears, shafts, pinions; nitriding steel, Nitralloy N.

NITRALLOY 640
M-386, 0.35-0.45 C, 0.4-0.6 Mn, 0.2-0.3 Si, 1.4-1.6 Cr, 0.45 min V, bal Fe
For nitrided parts, gears, shafts, pinions; nitriding steel, hard case.

NITRALLOY ALAMO
M-1, 0.25-0.35 C, 1.0-1.4 Al, 0.6-1.0 Mo, bal Fe.
For gears, shafts, camshafts, connecting rods; nitriding steel.

NITRALLOY CM
M-56; 0.2-0.4 C, 3 Si, 6 Mn, 1 Cr, 0.6 Ni, 1.2 Mo, bal Fe
For gears, shafts, cams, crankshafts; nitriding steel.

NITRALLOY EZ
M-24, M-1, 0.3-0.4 C, 1.25 Cr, 1.1 Al, 0.2 Mo, 0.15-0.25 Se or S, bal Fe.
Heat treated: 155,000-200,000 TS; 135,000-175,000 YS, 18-16 El, 55-50 RA; 300-400 Brin
For nitrided parts, gears, shafts; nitriding steel.

NITRALLOY EZ 505.
M-1; C, Cr, Mo, 0.85-1.2 Al, 0.2-0.4 Si, bal Fe.
For nitrided parts, gears, shafts; nitriding steel, free-cutting.

NITRALLOY G (135)
M-38; 0.3-0.4 C, 0.4-0.7 Mn, 0.9-1.4 Cr, 0.15-0.25 Mo, 0.8-1.2 Al, bal Fe.
Heat treated. 105,000-225,000 TS; 80,000-177,000 YS; 28-11 El; 60-35 RA; 200-445 Brin.
For cylinder liners, gears, cams, camshafts; nitriding steel.

NITRALLOY G GR. 69.
M-1; 0.38-0.45 C, 0.4-0.7 Mn, 1.4-1.8 Cr, 0.3-0.45 Mo, 0.95-1.35 Al, bal Fe.
For nitrided parts, gears, shafts; nitriding steel.

NITRALLOY GK3.
M-56; 0.35 C, 0.5 Mn, 2.0 Cr, 0.25 Mo, 0.15 V, bal Fe.
For gears, shafts; nitriding steel.

NITRALLOY GK5.
M-56; 0.25 C, 0.5 Mn, 2.0 Cr, 0.25 Mo, 0.15 V, bal Fe.
For gears, shafts; nitriding steel

NITRALLOY GK7.
M-56; 0.18 C, 0.5 Mn, 2.0 Cr, 0.25 Mo, 0.15 V, bal Fe.
For gears, shafts; nitriding steel.

NITRALLOY GR.
M-386; 1.25-1.5 C, 0.4-0.6 Mn, 1.25-1.5 Si, 0.2-0.4 Cr, 0.2-0.3 Mo, 1.0-1.5 Al, bal Fe
Rolled 108,500 TS; 84,000 YS; 17.5 El; 19.4 RA; 363 Brin
For seal rings, cylinder liners; self lubricating, free-cutting

NITRALLOY H (125).
M-38; 0.2-0.3 C, 0.9-1.4 Cr, 0.15-0.25 Mo, 0.85-1.2 Al, bal Fe.
Heat treated: 102,000-178,000 TS; 85,000-155,000 YS, 26-12 El; 70-46 RA, 225-400 Brin.
For cylinder liners, bushings, shafts, gears; nitriding steel

NITRALLOY HCM3.
M-56, 0.4 C, 0.5 Mn, 0.3 Ni, 3 Cr, 1 Mo, 0.25 V, bal Fe
For gears, shafts, nitriding steel

NITRALLOY HCM5.
M-56, 0.3 C, 0.45 Mn, 0.5 Ni, 3 Cr, 0.4 Mo, bal Fe
For gears, shafts, nitriding steel.

NITRALLOY HCM7.
M-56, 0.2 C, 0.45 Mn, 0.5 Ni, 3 Cr, 0.4 Mo, bal Fe.
For gears, shafts, nitriding steel.

NITRALLOY LK1
M-56, 0.5 C, 0.65 Mn, 1.6 Cr, 1.1 Al, 0.2 Mo, bal Fe.
For gears, shafts, nitriding steel.

NITRALLOY LK3
M-56, 0.4 C, 0.65 Mn, 1.6 Cr, 0.2 Mo, 1.1 Al, bal Fe
For gears, shafts, nitriding steel.

NITRALLOY LK5
M-56, 0.3 C, 0.65 Mn, 1.6 Cr, 0.2 Mo, 1.1 Al, bal Fe
For gears, shafts; nitriding steel.

NITRALLOY LK7
M-56, 0.2 C, 0.65 Mn, 1.6 Cr, 0.2 Mo, 1.1 Al, bal Fe.
For gears, shafts; nitriding steel

NITRALLOY N
M-1, M-24; 0.20-0.27 C, 0.4-0.7 Mn, 1.0-1.3 Cr, 0.2-0.3 Mo, 3.25-3.75 Ni, 1.1-1.4 Al, bal Fe.
For nitrided parts; nitriding steel.

NITREX-I.
M-32; 0.38-0.45 C, 0.6 Mn, 0.3 Si, 1.4-1.8 Cr, 0.85-1.2 Al, 0.30-0.45 Mo, bal Fe.
Tempered 1100°F; 181,000 TS; 165,000 YS; 15 El; 54 RA; Rock C 41.
Tempered 1000°F: 206,000 TS; 182,000 YS; 13 El.
For cylinder liners, gears, cams, thread guides, camshafts.
Nitriding steel, wear and abrasion resistant case.

NITREX-II.
M-32; 0.20-0.27 C, 0.6 Mn, 0.3 Si, 1.0-1.5 Cr, 0.8-1.2 Al, 0.2-0.3 Mo, 3.25-3.75 Ni, bal Fe
Tempered 1000°F: 198,000 TS; 191,000 YP; 14 El; 45 RA; 38 Rc.
Tempered 1100°F: 145,000 TS; 130,000 YP; 21 El; 58 RA; 30 Rc.
After Nitriding: 190,000 TS; 180,000 YP; 6-15 El; 43 RA; core Rc 41; case 94 R 15N.
For cylinder liners, bushings, shafts, gears, cams, camshafts.
Precipitation hardening nitriding steel.

NITRICASTIRON.
M-386; 2.75 T.C., 1.89 G.C., 0.86 C.C., 2.58 Si, 1.22 Cr, 0.16 V, 0.24 Mo, 1.01 Al, bal Fe.
Annealed. 56,000-67,000 TS; 302 Brin.
For nitrided cast iron, cams, cylinders, valves; wear resistant

NITRIDING G (135).
M-97, 0.3-0.4 C, 0.4-0.7 Mn, 0.9-1.4 Cr, 0.15-0.25 Mo, 0.85-1.2 Al, bal Fe.
Heat treated· 105,000-225,000 TS; 80,000-177,000 YS, 28-11 El, 60-35 RA; 200-445 Brin
For cylinder liners, gears, camshafts, connecting rods, bushings; nitriding steel.

NITRIDING G-MOD
M-97, 0.38-0.43 C, 0.5-0.7 Mn, 1.4-1.8 Cr, 0.95-1.3 Al, 0.3-0.4 Mo, bal Fe
Heat treated 158,000-206,000 TS; 141,000-181,000 YS, 20-13 El; 64-45 RA; 285-415 Brin.
For cylinder liners, gears, bolts, crankshafts; nitriding steel.

NITRIDING H (125).
M-97; 0.2-0.3 C, 0.9-1.4 Cr, 0.15-0.25 Mo, 0.85-1.2 Al, bal Fe
Heat treated: 102,000-178,000 TS, 85,000-155,000 YS, 26-12 El; 70-46 RA; 225-400 Brin
For cylinder liners, bushings, shafts, gears, rolls; nitriding steel

NITRIDING N
M-97, 0.20-0.27 C, 0.4-0.7 Mn, 1.0-1.3 Cr, 0.85-1.2 Al, 0.2-0.3 Mo, 3.25-3.75 Ni, bal Fe.
Heat treated· 198,000 TS; 191,000 YS; 14 El; 45 RA; 390 Brin
For gears, cams, crankshafts, camshafts; age-hardenable.

NITRIDING STEEL 125 TYPE H
M-38, 0.25 C, 1.15 Cr, 0.2 Mo, 1.15 Al, bal Fe.
Heat treated. 122,000 TS, 103,000 YS; 61 El; 67 RA; 255 Brin.
For nitrided parts, gears, shafts, Nitralloy H.

NITRIDING STEEL 135 MODIFIED.
M-38; 0.4 C. 0.5 Mn, 1 Al, 1.75 Cr, 0.4 Mo, bal Fe.
Heat treated: 158,700 TS; 141,000 YS, 17 El; 56 RA, 320 Brin.
For cylinder barrels, nitrided parts; nitriding steel

NITRIDING STEEL 135 TYPE 6.
M-38; 0.35 C, 1.15 Cr, 0.2 Mo, 1.15 Al, bal Fe.
Heat treated· 138,000 TS; 120,000 YS; 20 El; 58 RA; 280 Brin.
For nitrided parts, gears, shafts; Nitralloy C.

NITRIDING STEEL 230
M-38; 0.25-0.35 C, 0.4-0.6 Mn, 0.2-0.3 Si, 1-1.5 Al, 0.6-1 Mo, bal Fe.
For nitrided parts; nitriding steel.

NITRIDING STEEL BM.
M-38; 0,3 C, 1 Cr, 0.4 Mo, 0.8 Al, bal Fe.
For gears, shafts, pinions, cams, camshafts; nitriding steel.

NITRIDING STEEL N.
M-38; 0.20-0.27 C, 0.4-0.7 Mn, 1.0-1.3 Cr, 0.2-0.3 Mo, 3.5 Ni, 1.1-1.4 Al, bal Fe.
Heat treated: 198,000 TS; 191,000 YS; 14 El; 45 RA; 390 Brin.
For nitrided parts, gears, crankshafts; nitriding steel.

NITRIX 65.
M-501, M-912; 0 27 C, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment, creep and heat resistant.

NITRIX 65A.
M-501, M-912, 0.30 C, 0.9 Al, 1 2 Cr, bal Fe.
For oil refinery equipment, bolts; creep and heat resistant.

NITRIX 71.
M-501, M-912; 0.32 C, 1 1 Al, 1.1 Cr, 0.18 Mo, bal Fe.
For oil refinery equipment, bolts, fasteners; creep and heat resistant.

NITRIX 72.
M-501, M-912; 0.34 C, 1 1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment, heat and creep resistant.

NITRIX 73.
M-501, M-912; 0.31 C, 2.35 Cr, 0.18 Mo, 0 13 V, bal Fe
For gears, shafts, crankshafts, bolts, studs, oil hardened, shock resistant.

NITRIX 80.
M-501, M-912; 0.32 C, 1.1 Al, 0 18 Mo, 1 1 Cr, bal Fe
For oil refinery equipment; heat and creep resistant

NITRIX 1470.
M-501, M-912; 0 31 C, 2 35 Cr, 0.18 Mo, 0 13 V, bal Fe.
For gears, shafts, crankshafts, bolts, fasteners; oil hardened, shock resistant.

NITRIX 1471.
M-501, M-912; 0 32 C, 1.1 Al, 1 1 Cr, 0 18 Mo, bal Fe.
For oil refinery equipment; creep and heat resistant.

NITRIX 1472.
M-501, M-912, 0.34 C, 1.1 Al, 1.1 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

NITRIX 1473.
M-501, M-912; 0.30 C, Cr, V, 0.6 Mn, bal Fe.
For gears, shafts, bolts, fasteners; oil hardened, shock resistant.

NITRO.
M-32; 1 0 C, 0.35 Mn, 0.25 Si, 0 2 V, bal Fe.
For drills, taps, springs, cutters; Type W2

NITRODUR 65.
M-459; 0 27 C, 1.4 Cr, 1.1 Al, bal Fe
For gears, shafts, machine tool parts, nitriding steel.

NITRODUR 65A.
M-459; 0.3 C, 1.2 Cr, 0 9 Al, 0.09 P, 0 09 S, bal Fe.
For gears, shafts, machine tool parts; nitriding steel, free-cutting.

NITRODUR 80.
M-459; 0.32 C 1.1 Cr, 0.2 Mo, 1 1 Al, bal Fe.
For gears, shafts, machine tool parts; nitriding steel.

NITRODUR 81.
M-459; 0.34 C, 1.4 Cr, 1.1 Al, bal Fe.
For gears, shafts, machine tool parts; nitriding steel.

NITRODUR 85.
M-459; 0.33 C, 1.7 Cr, 1 Ni, 1.1 Al, bal Fe.
For gears, shafts, machine tool parts; nitriding steel.

NITRODUR 90
M-459, 0 3 C, 2.3 Cr, 0 15 Mo, 0 1 V, bal Fe.
For gears, shafts, machine tool parts; nitriding steel.

NITRODUR 91
M-459, 0 30 C, Cr, V, bal Fe.
For gears, shafts, bolts, pinions, fasteners; oil hardened, shock resistant.

NITROFIL
M-282, 0 2 Al, 0 2 Ti, bal Cu.
For filler rod and wire for nitrogen-arc and inert gas shielded metal arc welding of copper.

NITROSA STEEL.
M-57, 18 Cr, 8 Ni, 0.35 Mn, 0 35 C, bal Fe.
Cold worked 200,000 TS; 100,000 YS; 13 El.
For stainless parts, chemical apparatus; resists corrosion of acids and gases; resists high temperature to 1650°F

NITTANY (FREE CUTTING) NO 1
M-122, 61 Cu, 3 Pb, bal Zn
Cold drawn. 66,000 TS, 50,000 YS, 29 El, 46 RA; 126 Brin
For screw machine parts, bolts, screws; free-turning yellow brass

NITTANY NO 2.
M 122, 61 5-62 Cu, 2 2-2 5 Pb, bal Zn
51 000-68,000 TS, 23,000-37,000 YS, 29-54 El, 46-50 RA; 58 110 Brin
For screw machine parts, free cutting

NITTANY NO 4
M-122, 62-62 5 Cu, 3 0 3 25 Pb, bal Zn.
50,000 65,000 TS, 27,000-37,000 YS, 29-54 El, 46-51 RA; 63-110 Brin
For screw machine parts, free cutting

NITTANY NO 7
M 122, 62-62 5 Cu, 1 25-1 5 Pb, bal Zn
48,000-60,000 TS, 19,000-36,000 YS, 26 44 El, 62 75 RA, 63-90 Brin
For screw machine parts, free cutting

NITTANY NO 30
M-122, 62-63 Cu, 1.25 Pb, bal Zn
Rolled. 67-79 Brin.
For screw machine products, hardware; free cutting.

NITTANY NO 31
M-122, 62-63 Cu, 1 7 Pb, bal Zn
Rolled 67-79 Brin
For screw machine products, hardware; free cutting

NITTANY NO 35
M-122, 64 Cu, 0 85 Pb, bal Zn
Rolled 100-107 Brin
For hardware, screw machine products; for spinning and swaging parts.

NITTANY NO 38
M 122, 62 Cu, 2 3 Pb, bal Zn
Rolled. 107-125 Brin.
For hardware, screw machine products; free cutting.

NITTANY NO. 49.
M-122, 61 Cu, 3 Pb, bal Zn.
Soft 50,000 TS, 22,000 YS; 32 El; 83 Brin.
½ H-temper: 60,000 TS, 42,000 YS, 22 El; 125 Brin.
H-temper 85,000 TS; 56,000 YS; 7 El; 160 Brin.
For screw machine products, screws, bolts; free-cutting.

NITTANY NO. 77.
M-122; 62.5 Cu, 3 Pb, bal Zn.
For screw machine products, hardware, bolts; free-cutting

NITUF
M-140; 0.5 C, 0.4 Mn, 1.0 Si, 5.25 Cr, 1.5 Ni, 1.0 V, 1.35 Mo, bal Fe.
Air hardening tool and die steel, AISI A9.

NITUNG.
M-1433; 0.30 C, 2.75 Cr, 0.30 Mo, 9.5 W, 1.6 Ni, bal Fe.
For extrusion rams and liners, hot work tools; hot work steel, oil hardened.

NITUTEC 10020.
M 717,
Nickel-copper base powder for thin overlays on other metals

NIVAC
M-1214, M-38, 99.92 Ni
For equipment handling fluorine at high temperatures of 500-600°C.
Corrosion and heat resistant

NIVAC 50 Ni
M-38, 50 Ni, bal Fe
Annealed 58,000 TS; 19,000 YP, 27 El.
Coercive force 0.06 for 10,000 gauss
For magnetic temperature compensator, speedometers, tachometers, voltage regulators, watt-hour meters
High permeability, magnetically soft.

NIVAC-77 Ni
M 38, 77 Ni, bal Fe
For telephone loading coils, magnetic shielding, sensitive relays, pulse transformers.
High permeability, soft magnet.

NIVAC 78 Ni
M 38, 78 Ni, bal Fe
For telephone loading coils, magnetic shielding, sensitive relays, pulse transformers
High permeability, soft magnet

NIVAC 79 Ni
M-38, 79 Ni, bal Fe
For telephone loading coils, magnetic shielding sensitive relays, pulse transformers.
High permeability

NIVAC 80 Ni
M-38, 80 Ni, bal Fe.
For telephone loading coils, magnetic shielding, sensitive relays, pulse transformers
High permeability

NIVAC P
M-1214, 0.007 C, 0.005 O_2, 0.005 Si, 0.002 P, 0.13 Co, 0.005 Cu, 0.010 Fe, bal Ni.
For vacuum tubes, diaphragms, resistance wire; high purity nickel

NIVAFLEX.
M-1631; 0.03 C, 18 Cr, 21 Ni, 45 Co, 4 W, 4 Mo, 1 Ti, 0.3 Be, bal Fe
For high temperature springs
Corrosion and heat resistant.

NIVAN
M-357, C, 1.4 Ni, 0.35 Cr, 0.2 V, bal Fe.
For cutlery, tough.

NIVAROX.
M-296, 28 Ni, 0.5 Be, 8 W, Mo, bal Fe.
For instrument springs, diaphragms.
Constant modulus. Beryllium Invar.

NIVAROX CT.
M-296, 0.1 max C, 37 Ni, 8 Cr, 54 Fe, 0.8 Mn, 0.9 Be, 1.0 Ti, 0.2 Si.
For watch springs; corrosion resistant.

NIVAROX M.
M-296, 0.1 max C, 31.5 Ni, 60 Fe, 0.7 Mn, 0.9 Be, 6.5 Mo, 0.1 Si
For watch springs; corrosion resistant.

NIVAROX N
M-296; 0.1 max C, 36 Ni, 60 Fe, 0.8 Mn, 0.9 Be, 0.1 Si, 2.0 Ti.
For watch springs, corrosion resistant.

NIVAROX W.
M-296, 0.1 max C, 30 Ni, 61 Fe, 0.7 Mn, 0.9 Be, 7.5 W, 0.1 Si, 0.1 Ti
For watch springs; corrosion resistant.

NIVCO
M-118, 0.02 C, 0.35 Mn, 0.15 Si, 22.5 Ni, 1.1 Zr, 1.8 Ti, 0.22 Al, 1.0 Fe, bal Co
At R T · 165,000 TS, 110,000 YS; 25 El.
At 1200°F · 105,000 TS; 75,000 YS, 20 El
For steam turbine blading; high heat strength to 1200°F

NIVCO-10
M-118, 0.02 C, 1.1 Zr, 1.8 Ti, 22.5 Ni, bal Co.
At 70°F: 165,000 TS, 110,000 YS; 25 El
At 1200°F 105,000 TS; 75,000 YS, 20 El
At 1300°F. 85,000 TS; 65,000 YS; 26 El.
For steam turbine blades, used where vibratory stresses are critical

Ni-VEE
M-1007, 5 Ni, 5 Sn, 2 Zn, bal Cu.
Aged. 80,000 TS; 50,000 YS, 10 El; 150 Brin.
For gears, valves, construction castings; age-hardenable, corrosion resistant

Ni-VEE 1
M-214; 88 Cu, 5 Ni, 5 Sn, 2 Zn
Cast · 50,000 TS, 22,000 YS, 40 El, 85 Brin.
Heat treated 65,000-85,000 TS, 40,000-55,000 YS; 10-8 El, 130 180 Brin
For gears, cams, valves, fine grain, heat treatable.

Ni-VEE 2
M-214, 80 Cu, 5 Ni, 5 Sn, 5 Pb, 5 Zn
Cast 40,000 TS, 20,000 YS, 20 El, 80 Brin
Heat treated 50,000 TS, 30,000 YS, 5 El; 130 Brin
For pressure castings, valves, fittings, plumbing parts, fine grain, pressure tight.

Ni-VEE 3
M-214, 80 Cu, 5 Ni, 5 Sn, 10 Pb
Cast 35,000 TS, 20,000 YS; 10 El, 80 Brin
Heat treated: 40,000 TS, 25,000 YS, 5 El, 110 Brin
For bearings, bushings, acid resistant castings; pressure tight, fine grain.

Ni-VEE 4
M-214, 70 Cu, 5 Ni, 5 Sn, 20 Pb
Cast. 25,000 TS, 18,000 YS, 10 El; 70 Brin.
Heat treated 30,000 TS, 22,000 YS, 5 El; 80 Brin.
For bearings, bushings, acid resistant castings; pressure tight, fine grain.

Ni-Vee TYPE A.
M-68, 88 Cu, 5 Ni, 5 Sn, 2 Zn.
Cast · 50,000 TS, 22,000 YS, 40 El; 50 RA; 85 Brin.
Tempered: 65,000 TS, 40,000 YS; 10 El; 130 Brin.
Heat treated · 85,000 TS, 55,000 YS; 10 El; 26 RA; 180 Brin.
For machine tools, cams, rollers, guides, gears; age-hardenable, corrosion resistant

Ni-VEE TYPE B.
M-68; 87 Cu, 5 Ni, 5 Sn, 1 Pb, 2 Zn.
Cast: 45,000 TS; 20,000 YS; 30 El; 80 Brin.
Tempered: 60,000 TS; 30,000 YS; 8 El; 120 Brin.
For machine tools, cylinders, cams, gears, rollers; age-hardenable, corrosion resistant.

Ni-VEE TYPE C.
M-68; 80 Cu, 5 Ni, 5 Pb, 5 Zn, 5 Sn.
Cast: 40,000 TS; 20,000 YS; 15 El; 15 RA; 80 Brin.
Tempered: 50,000 TS; 30,000 YS; 5 El; 2.5 RA; 130 Brin.
For pressure castings, pumps, valves, fittings; age-hardenable, corrosion resistant.

Ni-VEE TYPE D.
M-68; 80 Cu, 5 Ni, 5 Sn, 10 Pb
Cast: 35,000 TS; 20,000 YS, 10 El; 10 RA; 80 Brin
Tempered: 40,000 TS; 25,000 YS, 2 El, 3 RA, 110 Brin.
For bearings, bushings, liners; age-hardenable, corrosion resistant.

Ni-VEE TYPE E.
M-68; 70 Cu, 5 Ni, 5 Sn, 20 Pb
Cast: 25,000 TS, 18,000 YS; 5 El, 5 RA, 70 Brin
Tempered: 30,000 TS; 22,000 YS, 2 El, 2 RA; 80 Brin.
For bearings, bushings, liners, age-hardenable, corrosion resistant.

NI-VEE L2.
M-1007; 5 Ni, 5 Sn, 2.5 Pb, 0.5 max Zn, bal Cu.
Cast. 44,000 TS; 23,000 YS; 30 El, 92 Brin
Heat treated: 55,000 TS, 40,000 YS; 10 El, 135 Brin.
For gears, bushings, bearings, construction castings, fine grain, heat treatable, good castability

NI-VEE L2-Z2.
M-1007; 5 Ni, 5 Sn, 2.5 Pb, 2 max Zn, bal Cu
Cast: 42,000 TS; 24,000 YS; 25 El; 90 Brin
Heat treated: 49,000 TS, 35,000 YS, 8 El; 120 Brin.
For gears, bearings, bushings, construction castings; fine grain, heat treatable, good castability.

Ni-VEE L5
M-1007; 5 Ni, 5 Sn, 5 Pb, 0.5 max Zn, bal Cu.
Cast: 41,000 TS; 20,000 YS; 22 El, 92 Brin
Heat treated: 47,000 TS, 35,000 YS, 7 El, 130 Brin
For bearings, bushings, acid resistant castings; fine grain, heat treatable, good castability.

NI-VEE L5-Z5
M-1007; 5 Ni, 55 Sn, 5 Pb, 5 Zn, 0.05 P, bal Cu.
Cast: 40,000 TS, 20,000 YS, 20 El, 80 Brin
Heat treated: 50,000 TS, 30,000 YS; 5 El, 120 Brin.
For pumps, valves, fittings; corrosion resistant.

Ni-VEE-L10.
M-1007; 80 Cu, 5 Sn, 10 Pb, 5 Ni.
Cast: 35,000 TS, 10 El; 80 Brin
Heat treated: 40,000 TS; 5 El, 110 Brin
For valves, fittings; pressure tight.

Ni-VEE L15.
M-1007; 5 Ni, 5 Sn, 15 Pb, 0.5 max Zn, bal Cu.
Cast: 30,000 TS; 21,000 YS, 12 El; 78 Brin.
Heat treated: 35,000 TS; 24,000 YS; 5 El; 88 Brin.
For bearings, bushings, acid resistant castings; fine grain, heat treatable, good castability.

Ni-VEE-L20.
M-1007, 70 Cu, 5 Ni, 5 Sn, 20 Pb.
Cast. 25,000 TS, 10 El; 70 Brin.
Heat treated 30,000 TS, 5 El, 80 Brin
For pressure castings, bearings, free-cutting

Ni-WELD
M-38, 100 Ni
For welding rod for cast iron; machinable welds

NK-HITEN 60.
M-1542, M-1564, 0.16 max C, 1.35 max Mn, 0.60 max Ni, 0.30 max Mo, 0.15 max V, bal Fe.
Normalized: 85,000 min TS, 65,000 min YP, 16 min El.
Heat Treated 114,000 TS; 100,000 YS; 18-20 El
For agricultural equipment, mine and railroad cars.
High strength low-alloy constructional steel
Tough, shock resistant

NK-HITEN 60
M-1612; 0.15 C, 0.24 Si, 1.37 Mn, 0.015 P, 0.005 S, 0.004 V, bal Fe.
35 mm thick plate. 93,100 TS; 78,300 YS, 47 El
High strength low alloy steel for structural purposes

NK-HITEN 70B
M-1612, 0.010 C, 0.26 Si, 0.90 Mn, 0.008 P, 0.005 S, 0.050 Ni, 0.40 Cr, 0.21 Mo, 0.04 V, 0.001 B, bal Fe
25 mm thick plate: 109,000 TS, 98,600 YS; 43.6 El
High strength low alloy steel structural purposes

HK-HITEN 80
M-1564, 0.18 C, 1.0 Mn, 0.15-0.35 Si, 0.006 B, 0.8 Cr, 0.15-0.50 Cu, 0.6 Mo, 1.0 Ni, 0.1 V, bal Fe
Plate 114,000 min TS, 100,000 min YS, 18 min El
For mine cars, bus bodies, trailers, pressure vessels, cranes, bridges
Wear and shock resistant

NK-HITEN 80A
M-1612, 0.15 C, 0.31 Si, 0.78 Mn, 0.011 P, 0.006 S, 0.92 Cr, 0.26 Mo 0.04 V, 0.22 Cu, 0.0020 B, 0.05 Zr, bal Fe
25 mm thick plate 124,000 TS, 117,000 YS, 20 El
High strength low alloy steel structural purposes

NK HITEN 80B
M 1612, 0.11 C, 0.26 Si, 0.90 Mn, 0.008 P, 0.006 S, 0.21 Cu, 1.06 Ni, 0.45 Cr, 0.31 Mo, 0.04 V, 0.001 B, bal Fe
50 mm thick plate: 124,000 TS, 117,000 YS, 40 El
High strength low alloy steel structural purposes.

NK-HITEN 100
M-1612, 0.13 C, 0.34 Si, 0.97 Mn, 0.011 P, 0.007 S, 0.30 Cu, 0.73 Ni, 0.57 Cr, 0.49 Mo, 0.10 V, 0.0030 B, 0.05 Zr, bal Fe
25 mm thick plate 156,000 TS, 146,000 YS; 19 El.
High strength low alloy steel structural purposes.

N K I METAL
M-417
For superheated steam

NKS
M-Japan, 3.7 Al, 17.7 Ni, 27.2 Co, 6.7 Ti, bal Fe
For permanent magnets, electrical and magnetic equipment High permeability.

NKS-1
M-Japan, 8 Al, 15 Ni, 3 Cu, 1.25 Ti, 24 Co, bal Fe
Cast: 20,000 TS;
For electrical and magnetic equipment.
Similar to Alnico VI, permanent magnet

NKS MAGNET.
Japan; 8 Al, 14 Ni, 24 Co, 3 Cu.
For permanent magnets; high coercive force

NM-100.
M-1665, M-1629, M-1165; 1.25 C, 17.5 Cr, 10.5 W, 9.5 Co, 0.75 V, bal Fe.
Hardened: Room temp, 290,000 TS; 245,000 YS; 1000°F 240,000 TS; 175,000 YS.
For aircraft bearings and other bearings and parts subject to dry friction at elevated temperatures; resistant to galling, corrosion and high temperature softening and oxidation.

N.M.C.
English, 12 Ni, 5 Mn, 3.5 Cr, 0.5 C, 0.5 Si, bal Fe
For valve inserts; heat resistant

NMHG.
M-104; C, 29 Ni, 3 Cr, bal Fe.
For thermal compensation of permanent magnets, electric meters, corrosion resistant.

"NM" STEEL
M-151, M-117; 3-5 Ni, 0.3-0.7 Mo, 0.2-0.4 C, 0.3-0.5 Mn, bal Fe
250,000 TS, 210,000 YS; 8 El, 25 RA; 51 Brin.
For aircraft and automobile parts.

NOBELOY.
Au alloy
For jewelry; corrosion resistant

NOBILIUM
U.S., 65 Co, 28 Cr, 0.1 Ni, 5 Mo, 0.4 C, 1 V, 0.5 Fe, 0.1 Mn, 0.05 Si.
Cast. 168,000 TS, 88,000 YS, 4 El.
For dentures, corrosion resistant.

NO-CHAT.
M-265, 90 W, 6 Ni, 4 Cu.
Sintered. 112,000 TS; 6 El, 250 Brin
Density 16.96
Modulus of rigidity 19.2 × 10^6 psi
For boring bars, grinding quills or arbors, cut-off tools

NODULITE 60-40-18
M-850, 3.3 C, 2.5 Si, 0.7 Mn, 0.05 Mg, bal Fe.
Cast: 60,000-80,000 TS, 40,000-60,000 YS, 18-25 El, 137-192 Brin
For gears, pinions, cams, dies, idlers, track rollers, pumps
Resists thermal shock, tough, ductile iron

NODULITE 65-45-12
M-850, 3.3 C, 2.5 Si, 0.7 Mn, 0.05 Mg, bal Fe
Cast 65,000-85,000 TS, 45,000-60,000 YS, 12-20 El, 143-207 Brin
For pressure castings, pipe fittings, valves, cylinders, pump bodies
Ductile iron, tough, high strength.

NODULITE 80-55-06
M-850, 3.3 C, 2.5 Si, 0.7 Mn, 0.05 Mg, bal Fe
Cast: 80,000-100,000 TS; 55,000-75,000 YS; 6-12 El, 179-269 Brin.
For gears, cams, bearings, pistons, crankshafts, sheaves, sprockets.
Ductile iron, high strength, wear resistant, tough.

NODULITE 100-70-03.
M-850; 3.3 C, 2.5 Si, 0.7 Mn, 0.05 Mg, bal Fe
Cast: 100,000-120,000 TS, 70,000-90,000 YS, 3-10 El; 241-302 Brin.
For gears, crankshafts, pistons, camshafts, track shoes, brake drums.
Ductile iron, high strength and wear resistant, tough.

NODULITE 120-90-02
M-850; 3.3 C, 2.5 Si, 0.7 Mn, 0.05 Mg, bal Fe.
Cast: 120,000-175,000 TS; 90,000-150,000 YS; 2-7 El, 269-388 Brin.
For pinions, gears, cams, machine guides, dies, pumps. Wear resistant ductile iron.

NODULOY Type 7 C.
M-394; 8.0-9.5 Mg, 43-47 Si, 0.5-0.6 Ce, 4.5-6.5 Fe
For inoculating cast iron to nodularize the graphite making ductile iron.
Cast iron inoculant.

NODULOY Type 8 C.
M-394, 8.0-9.5 Mg, 44-48 Si, 0.5 min Ce, 1.0-3.0 Ca, bal Fe.
For inoculating cast iron to nodularize the graphite making ductile iron.
Cast iron inoculant

NODULOY Type 18 C.
M-394; 16.0-20.0 Mg, 60-65 Si, 0.5 min Ce, 1.0-3.0 Ca, bal Fe
For inoculating cast iron to nodularize the graphite making ductile iron
Cast iron inoculant.

NO-DU-MAG
M-54, 3.3 C, 10-11 Ni, 5.6 Mn, 0.17 Mg, 2.5 Si, bal Fe
Cast 53,700-62,700 TS, 40,300-49,300 YS, 8-12 El, 13-18 RA, 260 Brin
For switch gears, resistance grids, magnetic chucks
Austenitic, ductile cast iron

NOGROTH.
M-630, 1.85 T.C., 1.05 Si, 0.16 P, 1.5 Ni, 0.33 Cr, 0.35 Mn, bal Fe.
Annealed 102,000 TS, 85,000 YS, 9.5 El, 250 Brin
For pump liner, piston, valves, cast iron.

N.O.H.
M-499, C, 3 Ni, bal Fe
Annealed 90,000 TS, 60,000 YS, 20 El, 50 RA.
Heat treated 110,000 TS, 90,000 YS, 27 El, 55 RA.
For gears, shafts, tough.

NOHEET
M-581, 98 Pb, 1.4 Na, 0.11 Sb, 0.1 Sn
For bearings, metal or die cast, anti-friction metal

NOH
M-134, 20 Sn, 80 Cu
158 Brin
For piston rings

NOMAG
M-54, M-86, 3 C, 6 Mn 2.3 Si, 10 Ni, bal Fe.
Cast 22,000-26,000 TS, 158-160 Brin
For switch covers, resistance grids, austenitic, cast iron, non-magnetic

NO MR-100 BRONZE
M-1174, Cu composite
For bearings, sintered, 25-30% porosity

NON-CORRODITE NO 25
M-186; 22.2 Cr, 0.4 Ni, 1.57 Si, 1 Mn, 0.15 Cu, 0.34 C, bal Fe
For castings, corrosion resisting parts; non-corrosive, stainless

NONERODE
M-1437, 0.35 C, 5 Cr, 0.4 V, 1.5 Mo, bal Fe.
For die casting dies, punches; Type H11; oil hardened, hot work steel.

NONGRAM.
87 Cu, 11 Sn, 2-3 Zn.
35,000 TS, 16 El; 62 Brin.
For bushings, bearings, valves.

NON-GRAN BRONZE.
M-1153; Sn, bal Cu.
Sintered: 40,000 TS; 22,000 YS; 15 El; 11 RA; 80 Brin.
For bolt headers, pulleys, machinery; nongranular structure.

NON-HARDENING (VULCAN).
M-275; C, alloy, bal Fe.
For tools, drawing dies; tough

NON MAGNETIC.
M-69; 0.35 C, 12.4 Mn, 3.25 Ni, 4.15 Cr, 0.48 Mo, bal Fe
For wear resistant parts; work hardened.

NON-OXIDIZABLE.
62 Fe, 25 Cr, 10 Mn, 1.1 C, 0.95 Si.
For corrosion and heat resisting parts, abrasion resistant parts, U S P. 1,333,151, corrosion, heat and abrasion resistant

NON-PAREIL.
M-562, 78 Pb, 17 Sb, 5 Sn
24 Brin
For bearings, solders, antifriction metal; M P. 300°C.

NON-SCALING-1.
30-40 Ni, 15-20 Cr, 3.5 Si, 1.25 Cu, bal Fe
For furnace parts, heat resisting.

NON-SCALING-2
24 Ni, 24 Cr, 3 Si, bal Fe
For furnace parts; heat resisting.

NON-SCUFF.
M-1437, 0.6 C, 3.7 Cr, 1.8 V, 8.5 Mo, bal Fe
Heat treated: 290,000 TS, 238,000 YS, 0.5 El, 3 RA.
At 1000°F: 216,000 TS, 150,000 YS; 3 El; 7 RA
For hot punches, rivet sets, spike cutters, hot shear blades, headers
Type H43 hot work tool steel, tough, high wear resistance.

NONSHOCK TUNGSTEN
M-1437, 0.55 C, 1.25 Cr, 2.75 W, 0.2 V, bal Fe
Heat treated 231,000-315,000 TS, 209,000-275,000 YS; C 48-56 Rock, 9 11 El, 27-42 RA
For header and swaging dies, chipping chisels, rivet busters, track tools
Type S1 shock resisting tool steel
Good fatigue resistance

NON-SHRINK
M-233, 0.95 C, 1.25 Mn, 0.5 Cr, 0.5 W, bal Fe
For tools, dies, non-deforming

NON-SHRINK
M-334; 1.5 C, 13 Cr, 1.5 W, bal Fe.
For dies and tools, production dies, non-shrinking, oil-hardening

NON-SHRINKABLE
M-115; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe
For general tools, broaches; non-deforming

NON-SHRINKABLE.
M-275; 0.9 C, 1.2 Mn, 0.5 Cr, bal Fe.
For general tools, dies; non-deforming.

NON-SHRINKABLE DRILL ROD.
M-342, M-115; 0.95 C, 1.2 Mn, 0.5 Cr, 0.5 W, 0.2 V, bal Fe
For tools, punches; non-deforming.

NON-SHRINKING PATENT.
87 Pb, 6 Sb, 6 Sn, 1.3 Cd
For impressions, type.

NONSULITE.
M-184; 0.36-0.50 C, 28 Cr, 8 Ni, bal Fe.
For heat and corrosion resistant parts; now Michiana No. 48.

NON-TARNISHABLE.
63.6 Cu, 31 Zn, 3.25 Sn, 2 Pb.
For corrosion and tarnish resisting parts; corrosion resisting

NON-TEMPERING
M 750; 0.35 C, 0.75 Mn, 0.45 Si, 0.8 Cr, 0.25 W, 0.5 Mo, bal Fe.
Water or oil hardening shock resisting tool steel.

NON-TEMPERING TOOL.
M-24, 0.35 C, 0.7 Mn, 0.8 Cr, 0.3 Mo, 0.3 Cu, bal Fe.
For chisels, punches, blacksmith tools, shock resisting

NONVAR
M-56, 0.92 C, 1.75 Mn, 0.3 Si, bal Fe
For tools, dies; oil hardening, non-deforming.

NON-WAIR
M-1724, 2.20 C, 13.0 Cr, bal Fe
Air or oil hardening non-distorting alloy tool steel, for brick molds, tire molds, thread rolling dies, hobs, gauges.

NO-OX
M-1678, C, 6 Al, Si, Mn, bal Fe
Bar Annealed B78.8 Rock, 68,000 TS; 50,000 YS, 30 El
For pack carburizing containers, baffles and flame deflectors, burners, furnace parts, retorts, muffles
High temperature alloy Aluminized Oxidation resistant to 2200°F

NO PS-10 SINTERED IRON
M-1174, Fe
For pole pieces, stators and rotors in motors, for electromagnetic uses, sintered

NO R-35 SINTERED IRON
M 1174, Fe
For bearings, sintered, 18% porosity

NORAL
M-643, 2-4 Cu, 4-6 Si, 0.3-0.7 Mn, 0.35 Ni, 0.3 Zn, 0.2 Ti, bal Al
Sand cast 23,500 TS, 11,200 YS, 3.5 El, 75 Brin.
Permanent mold 26,900 TS, 14,500 YS, 5.0 El, 85 Brin
For general purpose castings, good castability, age-hardenable

NORAL 1S
M-643, 99.5 Al
For impact extruded containers, food and chemical equipment, high corrosion resistance and high ductility

NORAL 1SC
M 643, 99.5 Al
For electrical conductors, busbars, overhead lines, high electrical conductivity

NORAL 2S
M-643, 0.1 Cu, 0.5 Si, 0.7 Fe, bal Al
Soft 11,000 TS, 7000 YS, 35 El, 20 Brin.
Hard 23,000 TS, 14,500 YS, 4 El, 44 Brin.
For chemical and brewing equipment, tanks, paneling, ductile and corrosion resistant

NORAL 3 S
M-643, 1.0-1.5 Mn, 0.15 Cu, 0.6 Si, bal Al
Soft 16,000 TS; 7000 YS, 39 El, 29 Brin.
Hard 29,000 TS, 25,000 YS; 4 El; 30 Brin
For panels, tanks, architecture, trim, food containers; wrought.

NORAL 4 S.
M-643; 1.25 Mn, 1 Mg, bal Al.
Rolled 21,000-22,000 TS; 18-27 El; 37-42 Brin.
For architectural panels, roofing, floors; wrought.

NORAL 10 S.
M-643; 0.5 Mn, 0.5 Mg, bal Al
Rolled. 12,000-13,000 TS; 25-33 El, 25-28 Brin.
For light alloy parts; extruded.

NORAL 11 S
M-643; 5.5 Cu, 0.5 Pb, 0.5 Bi, bal Al
Rolled. 24,000-26,000 TS, 23-27 El; 45-55 Brin.
For light alloy parts, screws, free machining

NORAL 13 S
M-643; 12 Si, bal Al.
Cast: 36,000 38,000 TS; 25-29 El; 70-75 Brin
For light alloy parts, die casting.

NORAL 15 S
M-643, 12.5 Zn, 1.5 Cu, bal Al.
Heat treated 44,000-46,000 TS, 30-31 El, 90-93 Brin
For architectural and marine parts, heat treatable.

NORAL 16S
M-643, 2.5 Cu, 0.3 Mg, bal Al
T6-temper 40,000 TS, 20,000 YS, 20 El, 70 Brin.
For rivets, light alloy parts, age-hardenable

NORAL 17 S
M-643, 3.5-5.0 Cu, 0.4 1.2 Mg, 0.6 Mn, bal Al.
Heat treated 50,000-54,000 TS, 42,600 YS; 15-18 El; 95-104 Brin
For structured and aircraft parts, levers, brackets; wrought, heat treatable

NORAL 19S
M 643, 4 Cu, 1.25 Mg, 2 Ni, bal Fe
Heat treated 58,200 TS, 39,200 YS, 10 El, 130 Brin
For pistons, cylinder heads, age-hardenable, high temperature application

NORAL 22 S
M 643, Cu-Mg-Mn-Si, bal Al
Heat treated 56,000-62,000 TS, 8-13 El, 120-128 Brin
For aircraft parts, wrought, heat treatable

NORAL 24 S
M 643, 4.5 Cu, 1.6 Mg, 0.6 Mn, bal Al
Heat treated 56,000-58,000 TS; 10-17 El; 100-110 Brin
For aircraft parts; wrought, heat treatable

NORAL 25 S
M-643, 0.8 Mn, 4.5 Cu, bal Al
Heat treated 58,000-28,000 TS, 37,000 YS, 19 El, 110 Brin
For aircraft parts, propellers, wrought, heat treatable

NORAL 26 S
M-643; 3.0-4.5 Cu, 1.0 max Si, 1.2 max Mn, 1.0 max Mg, bal Al.
O temper. 60,000 TS, 12,000 YS; 20 El, 80 Brin.
W-temper: 63,000 TS, 38,000 YS; 18 El; 115 Brin
T-temper: 69,500 TS, 58,000 YS, 9 El, 135 Brin.
For aircraft parts, structures, gears, levers, brackets, heat treatable, high strength.

NORAL 28S
M-643, Al alloy
Rolled: 49,300 TS, 14 El.
For machinery parts; free-cutting.

NORAL 31 S
M-643, 9-14 Si, bal Al.
20,000 TS; 30 El; 38 Brin.
For marine parts, panelling; extruded.

NORAL 33S.
M-643; 5 Si, bal Al
M-temper: 19,000 TS; 10,000 YS; 20 El; 33 Brin.
For architectural trim, welding wire; corrosion resistant.

NORAL 38 S.
M-643, 11.5 Si, 1 Cu, 1 Mg, 1 Ni, bal Al.
T6-temper: 54,000 TS, 42,000 YS; 4 El; 100 Brin
For light alloy parts, pistons, heat treatable.

NORAL 42S
M-643; 2.2 Cu, 0.85 Si, 1.2 Ni, 1.5 Mg, 1.0 Fe, 0.2 Ti, bal Al.
Heat treated 58,000 TS, 38,100 YS; 6 El; 125 Brin
For aircraft and general engineering structural parts, age hardenable, extrusions.

NORAL 50 S.
M-643; 0.6 Mg, 0.5 Si, bal Al.
Extruded 22,000 TS; 16,000 YS, 20 El; 40 Brin.
T-temper 36,000 TS, 27,000 YS; 25 El; 45 Brin.
For light alloy parts, auto bodies, panels, trim; heat treatable

NORAL 51 S
M-643, 0.6 Mg, 1 Si, 0.15 Cu, 0.6 Fe, 1.0 Mn, bal Al
Heat treated 44,000 TS, 40,000 YS, 13 El; 90 Brin
For structural, architectural and marine parts; heat treatable

NORAL 54S
M-643, 3-4 Mg, 0.15 Cu, 0.75 Fe, 0.5 Cr, 1 Mn, 0.2 Ti, bal Al
O-temper 33,500 TS, 14,500 YS, 24 El; 55 Brin.
¼H-temper 48,600 TS, 34,200 YS; 9 El; 75 Brin.
For marine parts, car bodies, shipbuilding, sea water corrosion resistant

NORAL 55 S
M-643, Cu, bal Al
Heat treated 33,000 TS, 26 El, 76 Brin
For architectural and marine parts; age-hardenable.

NORAL 57 S
M-643, 0.2 Mg, 0.25 Mn, bal Al
Extruded 24,000 TS, 11,000 YS, 30 El; 45 Brin.
For architectural and marine parts, work hardens

NORAL 58S.
M-643, 6.5-7.5 Mg, 1 Mn, 0.2 Ti, 0.15 Cu, 0.6 Si, bal Al
O-temper 44,800 TS. 20,200 YS, 18 El, 50 Brin
¼H-temper 51,500 TS, 36,000 YS
½H-temper 56,000 TS, 5 El, 70 Brin
Extruded 49,300 TS, 35 El; 85 Brin
For light weight structures, marine parts; good formability and corrosion resistance.

NORAL 62S
M-643, 1.5 Cu, 1 Mg, 0.75 Mn, 1 Si, bal Al.
S-W Temper: 53,700 TS; 33,600 YS; 17 El; 90 Brin
S-T Temper: 62,700 TS, 58,200 YS; 12 El; 120 Brin
For aircraft structures, tubular furniture; heat treatable, wrought.

NORAL 65S
M-643; 0.25 Cu, 1 Mg, 0.50 Si, 0.25 Cr, bal Al.
S-O Temper 19,000 TS; 7840 YS; 24 El;
S-W Temper. 32,500 TS; 19,000 YS; 20 El; 60 Brin
S-T Temper: 43,700 TS; 38,000 YS; 12 El; 90 Brin.
For body panels; wrought, heat treatable.

NORAL 80 S.
M-643; Al alloy.
38,000 TS; 24 El; 77 Brin.
For light alloy parts; free machining.

NORAL 100.
M-643; 99.5 min Al.
Cast· 10,000 TS; 3000 YS; 24 Brin.
For cables; commercially pure aluminum.

NORAL 111
M-643; Si, bal Al
For light alloy castings; high fluidity.

NORAL 115
M-643; Si, bal Al
For light alloy castings; high fluidity.

NORAL 123.
M-643; 5 Si, bal Al
Cast. 22,000 TS; 10,000 YS; 6 El; 50 Brin.
For light alloy castings; corrosion resistant.

NORAL 124
M-643, Si, bal Al.
For light alloy castings; high fluidity.

NORAL 125
M-643, 1.0-1.5 Cu, 0.5 Mg, 5.0 Si, 0.2 max Ti, bal Al
Cast: 30,000 TS; 20,000 YS; 3 El; 80 Brin.
Aged: 42,000 TS, 35,000 YS, 2 El; 110 Brin
For cylinder heads, valve bodies, hose couplings; age-hardenable

NORAL 126.
M-643; Si, bal Al.
For light alloy castings; corrosion resistant.

NORAL 127.
M-643; Si, bal Al
For light alloy castings; corrosion resistant

NORAL 135
M-643; Si, bal Al.
For light alloy castings; corrosion resistant.

NORAL 140
M-643; Si, bal Al.
For light alloy castings, corrosion resistant.

NORAL 150.
M-643, 10 Si, bal Al.
For light alloy castings, high fluidity.

NORAL 155
M-643, Si, bal Al
For light alloy castings.

NORAL 156
M-643, Si, bal Al
For light alloy castings.

NORAL 158
M-643, 11 Si, 3 Ni, bal Al
Sand cast 26,900 TS; 10,100 YS; 2 El
Permanent mold· 35,900 TS, 13,500 YS; 3 El.
For aircraft castings, corrosion resistant.

NORAL 160
M-643; 12 Si, 0.5 Mn, 0.6 Fe, bal Al.
Cast· 31,000 TS; 11,000 YS; 10 El, 10 RA; 60 Brin.
For general marine castings; high strength.

NORAL 161.
M-643; 0.5 Mg, 0.5 Mn, 12.5 Si, bal Al.
Aged· 27,000 TS, 16,000 YS, 1.5 El; 75 Brin.
T-Temper: 45,000 TS; 35,000 YS; 1 El; 115 Brin.
For light castings; heat treatable.

NORAL 162.
M-643; 12 Si, 1 Mg, 1 Cu, 2.5 Ni, bal Al.
Aged: 46,000 TS; 38,000 YS; 5 El; 125 Brin.
For pistons, cylinder heads; age-hardenable, high temperature use.

NORAL 165.
M-643; Si, bal Al.
For light alloy castings.

NORAL 172.
M-643; 8 Cu, 2.5 Si, bal Al.
Cast: 22,000 TS; 15,000 YS; 1 El; 65 Brin.
For light alloy castings.

NORAL 211.
M-643; Cu, bal Al.
For light alloy castings; good machinability.

NORAL 218.
M-643, 4 Cu, 1.5 Mg, 2.5 Ni, bal Al.
Aged: 45,000 TS; 35,000 YS; 1 El; 110 Brin.
For pistons, cylinder heads; age-hardenable, high temperature use.

NORAL 222.
M-643; 4.0-4.6 Cu, 0.9 max Si, 0.7 max Fe, 0.25 max Ti, bal Al.
36,000 TS
For light alloy castings; age hardened.

NORAL 224
M-643, Cu, bal Al
For castings; light alloy.

NORAL 225
M-643; Cu, bal Al.
For castings; light alloy

NORAL 226
M-643; 0.9 max Si, 0.7 max Fe, 0.25 max Ti, 4.0-4.6 Cu, bal Al
W. 34,000 TS, 18,000 YS, 10 El; 90 Brin.
T 61,000 TS, 54,000 YS, 5 El, 130 Brin
For castings, aircraft parts, gear boxes, levers age hardened, high strength

NORAL 232
M-643, Cu, bal Al
For castings, light alloy.

NORAL 234
M-643, Cu, bal Al.
For castings; light alloy.

NORAL 235
M-643, Cu, bal Al
For castings, light alloy

NORAL 236
M-643, Cu, bal Al
For castings, light alloy

NORAL 238
M-643, Cu, bal Al.
For castings, light alloy

NORAL 240.
M-643, Cu, bal Al
For castings; light alloy.

NORAL 242
M-643, Cu, bal Al.
For castings, light alloy

NORAL 244.
M-643; Cu, bal Al
For castings; light alloy.

NORAL 250.
M-643, Cu, bal Al
For castings; light alloy.

NORAL 252.
M-643; 10 Cu, 0.75 Fe, 0.25 Mg, bal Al.
T-Temper: 31,400-44,000 TS; 28,000-36,000 YS; 1 El, 125-130 Brin.
For pistons, castings; heat treatable.

NORAL 260.
M-643; 12 Cu, bal Al.
For castings; light alloy.

NORAL 305.
M-643; 1.5 Mg, 1 Si, bal Al.
T: 34,000 TS; 22,000 YS; 3 El; 85 Brin.
For castings; light alloy, age-hardenable.

NORAL 307.
M-643; Mg, bal Al.
For castings; light alloy.

NORAL 320.
M-643; 0.1 Cu, 3-6 Mg, 0.4 Mn, bal Al.
Cast: 20,200 TS; 3 El.
For gasoline flow meters; corrosion resistant.

NORAL 322
M-643; 3.7 Mg, 2 Zn, bal Al.
Cast: 26,000 TS; 17,000 YS; 5 El; 65 Brin.
For castings; corrosion resistant.

NORAL 330.
M-643; Mg, bal Al.
For castings; light alloy.

NORAL 350
M-643; 9.5-10.5 Mg, 0.35 Si, 0.25 Ti, 0.35 Fe, bal Al.
Sand cast: 40,000 TS; 25,000 YS; 13 El; 95 Brin.
Permanent mold: 47,000 TS, 29,000 YS, 18 El; 105 Brin.
For levers, brackets, marine and bus parts, hardware; age-hardenable, corrosion and shock resistant.

NORAL 450
M-643; Zn, bal Al.
For castings; light alloy.

NORAL 465.
M-643, Zn, Cu, bal Al.
For castings, light alloy

NORAL 510
M-643, Mn, bal Al.
For castings, light alloy.

NORAL 8000 S
M-643; Al alloy.
For conductors in overhead transmission lines; high electrical conductivity.

NORAL A56S.
M-643, 5 Mg, 1 Mn, 0.15 Cu, 0.6 Si, 0.75 Fe, 0.5 Cr, 0.2 Ti, bal Al.
O-temper: 40,100 TS; 18,000 YS; 28 El; 70 Brin.
¼H temper 52,600 TS; 31,400 YS, 8-11 El; 100 Brin.
For marine parts, shipbuilding, rivets; sea water corrosion resistant.

NORAL B26S.
M-643; 3.5-4.8 Cu, 0.8 Mg, 0.9 Si, 1 Fe, 1.2 Mn, 0.3 Ti, bal Al.
W-temper: 53,800 TS, 31,400 YS, 15 El; 115 Brin
For aircraft parts; high strength, fair ductility.

NORAL B51S
M-643; 1 Si, 0.6 Mg, 0.5 Mn, bal Al.
O-temper: 20,200 TS; 10,000 YS; 26 El.
W-temper: 33,600 TS; 24,600 YS; 20 El; 60 Brin.
WP-temper: 49,300 TS; 41,500 YS; 13 El; 95 Brin
For road and rail transport vehicles, bridges, cranes; heat treatable, corrosion resistant.

NORAL B54S.
M-643; 4.25 Mg, 0.75 Mn, bal Al.
Hot rolled: 43,500 TS, 29,000 YS; 20 El; 70 Brin.
O-temper: 40,400 TS; 18,000 YS; 26 El; 65 Brin.
For ship building, marine parts; good formability, corrosion resistant.

NORAL B75S.
M-643; 6 Zn, 2.5 Mg, 0.6 Cu, 0.25 Mn, 0.2 Cr, bal Al.
WP-temper: 90,000 TS; 85,000 YS; 9.5 El; 170 Brin.
For aircraft and engineering structures; heat treatable, high strength.

NORAL B116.
M-643; 0.1 Cu, 0.5 Mg, 3.5-5.5 Si, 0.5 Fe, 0.5 Mn, 0.2 Ti, bal Al.
Sand cast: 22,200 TS; 12,300 YS, 3.0 El; 65 Brin.
Permanent mold: 25,800 TS; 14,500 YS; 5.5 El; 70 Brin.
For aircraft and auto parts; age-hardened, good castability.

NORAL B320.
M-643; 5 Mg, 0.5 Mn, bal Al.
Sand cast: 22,400 TS, 13,500 YS; 4 El; 70 Brin.
Permanent mold: 31,400 TS; 13.500 YS; 12 El; 70 Brin
For architectural and ornamental hardware; corrosion resistant.

NORAL D50S.
M-643; 0.5 Mg, 0.5 Si, bal Al.
WP-temper. 29,200 TS; 23,500 YS; 12 El
For busbars; good strength and conductivity.

NORAL D57S
M-643; 1.3 Mg, bal Al
¼-H temper: 19,100 TS; 14,600 YS; 22 El; 40 Brin
½-H temper: 28,000 TS; 24,600 YS; 10 El; 63 Brin.
H-temper 37,000 TS; 31,400 YS; 5 El; 70 Brin.
For auto trim, domestic appliances; high reflectivity.

NORAL H10.
M-643, 0.4-1.5 Mg, 0.75-1.3 Si, bal Al.
W-temper: 33,600 TS; 20,200 YS; 20 El; 60 Brin.
WP-temper. 44,800 TS; 40,400 YS, 13 El; 90 Brin.
For aircraft structural members; age-hardened

NORAL M57S
M-643; 2 Mg, 0.15 Cu, 0.6 Si, 0.75 Fe, 0.5 Mn, 0.2 Ti, 0.5 Cr, bal Al
O-temper: 24,600 TS; 11,200 YS; 24 El; 48 Brin.
¼H-temper. 31,000 TS; 25,000 YS; 10 El; 63 Brin.
½H-temper: 35,000 TS, 30,900 YS; 7 El, 70 Brin.
For shipbuilding, motor car bodies, marine parts; corrosion resistant, work hardens readily.

NORAL M75 S
M-643, 1.33 Cu, 2.5 Mg, 0.25 Mn, 5.75 Zn, 0.12 Cr, bal Al
S-O Temper 28,000 TS; 12,300 YS; 20 El
S-T Temper: 76,000 TS; 65,999 YS; 12 El.
For aircraft structures; heat treatable; wrought.

NORAL C77 S
M-643; 1.75 Cu, 2 Mg, 7 Zn, 0.13 Cr, bal Al
S-T Temper. 94,000 TS, 85,100 YS; 11 El, 175 Brin.
For aircraft structures, spar booms; heat treatable.

NORAL NA17S ALCLAD
M-643; 3.5-4.5 Cu, 0.5 Mg, 0.7 Mn, bal Al.
For structures, aircraft; heat treatable.

NORAL NA22S ALCLAD.
M-643; Cu, Mg, Si, Mn, bal Al.
For structures, aircraft; heat treatable.

NORAL NA24S ALCLAD.
M-643; 4.4 Cu, 1.7 Mn, 1.5 Mg, bal Al.
For structures, aircraft; heat treatable.

NORAL NA26ST ALCLAD.
M-643; 4.2 Cu, 1.5 Mg, 0.7 Mn, bal Al.
Rolled: 50,000 TS; 8 El.
For structures, aircraft; clad.

NORANDA-1.
M-1560; 34 Zn, 66 Cu.
Hard: 74,000 TS; 60,000 YS; 8 El; B 80 Rock.
Soft: 47,000 TS; 15,000 YS; 62 El; F 64 Rock.
For grill work, radiator cores and tanks, lamp fixtures, reflectors, hardware, plumbing accessories.
Yellow brass, corrosion resistant.

NORANDA-3.
M-1560; 0.60 Pb, 33.9 Zn, 65.5 Cu
Hard: 74,000 TS; 60,000 YS; 8 El, B 80 Rock.
Soft: 49,000 TS, 17,000 YS, 57 El; F 68 Rock.
For pumps, power cylinders, liners, primers, plumbing accessories
Low-leaded brass, good machinability.

NORANDA-5.
M-1560; 20 Zn, 80 Cu.
Hard. 74,000 TS; 59,000 YS, 7 El; B 82 Rock
Soft: 44,000 TS; 14,000 YS; 50 El; F 61 Rock.
For ornamental metal work, spandrels, medallions, bellows, pump liners.
Low brass, corrosion resistant

NORANDA-6.
M-1560; 3.40 Pb, 35.35 Zn, bal Cu
Hard. 58,000 TS; 45,000 YS, 25 El, B 78 Rock
Soft: 49,000 TS; 20,000 YS, 40 El, F 68 Rock.
For hardware, gears, pinions, fasteners, screw machine products.
Free-cutting brass, corrosion resistant.

NORANDA-18.
M-1560; 0.50 Pb, 32.5 Zn, 67.0 Cu.
Hard: 75,000 TS, 60,000 YS; 7 El, B 80 Rock
Soft: 52,000 TS; 20,000 YS; 50 El, F 70 Rock
For pumps, power cylinders, liners, primers, plumbing accessories.
Low-leaded brass, good machinability

NORANDA-19
M-1560; 0.3 Mn, 1.0 Fe, 39.45 Zn, bal Cu.
Hard 83,000 TS; 55,000 YS; 25 El, B 85 Rock
Soft: 72,000 TS, 30,000 YS, 45 El, B 55 Rock
For automotive clutch discs, pump rods, shafting, valve parts, hardware
Corrosion resistant Manganese Bronze. High strength

NORANDA-20
M-1560, 1.0 Sn, 28.0 Zn, 71.0 Cu.
Soft: 53,000 TS; 22,000 YS; 65 El; F 75 Rock
For condensers, evaporators and heat exchangers, ferrules, distiller tubes.
Admiralty metal, corrosion resistant

NORANDA-24.
M-1560; 0.65 Sn, 0.12 Pb, 39.23 Zn, bal Cu.
Hard 75,000 TS; 53,000 YS; 20 El; B 82 Rock.
Soft: 57,000 TS, 25,000 YS; 47 El; B 55 Rock.
For hardware, bolts, marine parts, propeller shafts, valve stems.
Naval Brass. Corrosion resistant.

NORANDA-25.
M-1560; 10 Zn, 90 Cu.
Hard: 61,000 TS; 54,000 YS; 5 El; B 70 Rock
Soft: 38,000 TS; 12,000 YS; 45 El; F 57 Rock.
For screen cloth, weatherstripping, compacts, primer caps, costume jewelry, ornamental trim.
Commercial bronze. Corrosion resistant.

NORANDA-26.
M-1560; 5 Zn, 95 Cu.
Hard: 56,000 TS; 50,000 YS; 5 El; B 64 Rock.
Soft: 35,000 TS; 11,000 YS; 45 El, F 52 Rock.
For coins, medals, tokens, bullet jackets, jewelry, plaques, hardware.
Gilding brass Corrosion resistant

NORANDA-28
M-1560, 0.65 Sn, 0.6 Pb, 38.75 Zn, bal Cu
Hard. 75,000 TS, 53,000 YS; 20 El; B 82 Rock.
Soft: 57,000 TS; 25,000 YS; 47 El; B 55 Rock.
For marine hardware, screw machine products, valve stems.
Corrosion resistant Good machinability. Leaded Naval Brass.

NORANDA-29
M-1560, 0.65 Sn, 1.75 Pb, 37.6 Zn, bal Cu.
Hard 75,000 TS; 53,000 YS; 15 El, B 82 Rock.
Soft 57,000 TS; 25,000 YS; 40 El, B 55 Rock.
For marine hardware, screw machine products, valve stems.
Corrosion resistant Free-cutting Leaded Naval Brass.

NORANDA-30
M-1560, 1.05 Sn, 0.3 As, 27.92 Zn, bal Cu
Soft 53,000 TS, 22,000 YS, 65 El, F 75 Rock.
For condensers, evaporators, and heat exchangers, distiller tubes, ferrules
Arsenical Admiralty Metal. Corrosion resistant.

NORANDA-32
M-1560, 1.25 Sn, 0.05 P, bal Cu
Hard 65,000 TS, 50,000 YS; 8 El, B 75 Rock.
Soft 40,000 TS, 14,000 YS, 48 El; F 60 Rock
For electrical contacts, flexible hose, pole-line hardware
Corrosion resistant. Phosphor bronze Gr F.

NORANDA-35
M-1560, 8.0 Sn, 0.1 P, bal Cu
Hard 93,000 TS, 72,000 YS, 10 El, B 93 Rock
Soft 60,000 TS, 24,000 YS; 63 El, F 82 Rock
For bridge bearing plates, bellows, Bourdon tubing, clutch discs springs, sleeve bushings
Corrosion resistant, high strength Phosphor bronze Gr C

NORANDA-46
M-1560, 0.65 Sn, 35.1 Zn, bal Cu
Hard 60,000 TS, 27,000 YS; 22 El
Soft 48,000 TS, 18,000 YS, 40 El
For hardware, fixtures, pump parts
Naval Brass, cold heading, corrosion resistant.

NORANDA 53
M-1560, 0.25 As, 5.5 Al, bal Cu
Soft. 60,000 TS, 22,000 YS; 60 El, F 78 Rock
For fasteners structural components, mixing troughs, condensers
Aluminum bronze, corrosion resistant.

NORANDA-54
M-1560, 0.03 As, 2.1 Al, 20.87 Zn, bal Cu
Soft 60,000 TS, 27,000 YS. 55 El, F 77 Rock.
Hard: 85,000 TS; 60,000 YS, 15 El, B 88 Rock.
For ferrules, condenser tubes, heat exchangers and distillers
Aluminum Brass, high corrosion and erosion resistance.

NORANDA-62
M-1560; 2.0 Pb, 35.75 Zn, 62.25 Cu.
Hard: 74,000 TS; 60,000 YS; 7 El; B 80 Rock.
Soft. 49,000 TS; 17,000 YS; 52 El, F 68 Rock.
For hardware, fasteners, gears, channel plates, clock and watch cases.
High leaded brass, free cutting.

NORANDA-63.
M-1560; 1.10 Pb, 33.4 Zn, 65.5 Cu.
Hard: 74,000 TS; 60,000 YS, 7 El; B 80 Rock
Soft: 49,000 TS; 17,000 YS; 54 El; F 68 Rock.
For hardware, clock plates, fasteners, gears, channel plates.
Medium leaded brass, free cutting.

NORANDA-64
M-1560, 1.75 Pb, 31.25 Zn, 67.0 Cu.
Hard 75,000 TS; 60,000 YS; 7 El; B 80 Rock.
Soft. 52,000 TS; 20,000 YS, 50 El, F 75 Rock.
High leaded brass.

NORANDA-69.
M-1560; 30.5 Zn, 69.5 Cu
Hard. 76,000 TS, 63,000 YS, 8 El; B 82 Rock.
Soft: 47,000 TS; 15,000 YS; 62 El; F 64 Rock.
For grillwork, radiator cores and tanks, lamp fixtures, ammunition cases
High strength and ductility Cartridge brass.

NORANDA-73.
M-1560, 1.25 Mn, 28.75 Zn, bal Cu
Hard 78,000 TS, 63,000 YS, 7 El, B 87 Rock
Soft 47,000 TS, 15,000 YS; 52 El, F 75 Rock
For clutch discs, pump rods, shafting, valve stems, and bodies
Manganese Brass, corrosion resistant.

NORANDA-85
M-1560, 15 Zn, 85 Cu
Hard 70,000 TS, 57,000 YS, 5 El, B 77 Rock
Soft: 40,000 TS, 12,000 YS, 47 El, F 60 Rock.
For trim, weatherstripping, conduit, pump lines, radiator cores
Red brass, corrosion resistant

NORANDA 89
M 1560, 2.0 Pb, 8.5 Zn, bal Cu.
Hard 52,000 TS, 45,000 YS; 18 El, B 58 Rock
Soft 37,000 TS, 12,000 YS 45 El, F 55 Rock
For screws, screw machine parts, pickling crates
Free-cutting, corrosion resistant
Leaded commercial bronze.

NORANDA-92
M-1560, 1.9 Sn, 9.1 Zn, bal Cu
Hard 90,000 TS; 72,000 YS, 3 El, B 90 Rock
For heat exchangers, ferrules.
Corrosion resistant

NORANDA-102
M-1560, 99.92 min Cu
Hard 50,000 TS, 45,000 YS, 4 El; B 50 Rock.
Soft 34,000 TS, 11,000 YS, 45 El, F 45 Rock
For bus bars, conductors, wave guides, copper to brass seals
Electrolytic tough pitch copper, corrosion resistant

NORANDA-106.
M-1560, 99.9 min Cu
Hard Tube 55,000 TS, 50,000 YS; 8 El, B 60 Rock
Soft Tube 32,000 TS, 10,000 YS, 45 El; F 40 Rock
For radiators, gaskets, windings, switches, commutators, radio parts
Deoxidized copper

NORANDA-110
M-1560, 0.02 P, 99.94 min Cu
Hard Tube 55,000 TS, 50,000 YS, 8 El, B 60 Rock.
Soft Tube: 32,000 TS; 10,000 YS; 45 El, F 40 Rock.
For air conditioners, gas lines, oil burner tubes, hydraulic and oil lines.
D.H.P. copper, phosphorus deoxidized.

NORANDA-113.
M-1560, 0.02 P, 0.3 As, 99.4 min Cu.
Hard: 40,000 TS; 32,000 YS; 25 El; F 77 Rock.
For gas and oil lines, air conditioning
Arsenical copper Deoxidized.

NORANDA-136.
M-1570, M-1560; 1.75 Pb, 0.20 Sn, 39.05 Zn, bal Cu
Hard. 72,000 TS, 50,000 YS; 15 El, B 78 Rock.
Soft. 52,000 TS, 20,000 YS, 45 El; F 78 Rock.
For marine hardware, faucet handles, plumbing, bolts, fasteners.
Forging brass, free cutting, corrosion resistant

NORANDA-520
M-1560; 0.75 Mn, 0.40 Fe, 20.0 Ni, bal Cu
Soft 49,000 TS, 14,000 YS, 40 El; F 70 Rock.
For fasteners, condenser plates, pumps, valves, refrigerators, evaporators.
Cupro Nickel Corrosion resistance.

NORANDA-531
M-1560, 0.75 Mn, 0.40 Fe, 30.0 Ni, bal Cu
Soft 60,000 TS, 25,000 YS, 45 El; F 80 Rock
For fasteners, valves, pumps, refrigerators, tanks, vats
Cupro Nickel Corrosion resistant

NORANDA-555
M-1560, 18.0 Ni, 0.15 Mn, 26.85 Zn, bal Cu.
Hard 115,000 TS, 90,000 YS, 2.5 El, B 99 Rock.
For hardware, fixtures, springs, tableware, jewelry, optical goods.
Nickel Silver, 18% (B) Corrosion resistant

NORANDA 565
M-1560, 18.0 Ni, 0.15 Mn, 16.85 Zn, bal Cu
Hard 85,000 TS, 75,000 YS, 3 El, B 87 Rock.
Soft 60,000 TS, 30,000 YS; 35 El; F 90 Rock.
For optical goods, diaphragms, springs, slide fasteners, jewelry
Nickel Silver, 18% (A), Corrosion resistant

NORANDA-567.
M 1560, 9.75 Ni, 0.15 Mn, 24.85 Zn, bal Cu
Hard 86,000 TS, 75,000 YS, 4 El; B 89 Rock.
Soft 60,000 TS, 28,000 YS, 36 El; F 85 Rock.
For costume jewelry, tableware, camera parts, etching stock
Nickel Silver, 10% Corrosion resistant

NORANDA-580
M-1560, 1.5 Pb, 25.1 Zn, 12.25 Ni, 0.15 Mn, bal Cu
Hard 78,000 TS, 75,000 YS, 7 El, B 80 Rock.
Soft 55,000 TS, 18,000 YS, B 50 Rock
For costume jewelry, etching stock, camera parts, tableware
Leaded Nickel Silver, free-cutting Corrosion resistant

NORANDA-609
M-1560, 1.9 Si, bal Cu
Hard 78,000 TS; 50,000 YS, 5 El, B 80 Rock
Soft 45,000 TS, 15,000 YS; 45 El, F 70 Rock
For hydraulic pressure lines, anchor screws, bolts, pole line hardware
Low silicon bronze, corrosion and wear resistant.

NORANDA-707
M-1560, 2.0 Si, 7.15 Al, bal Cu
Soft 90,000 TS, 50,000 YS, 30 El, B 85 Rock
For marine hardware, fittings, fasteners, bushings.
Aluminum silicon bronze, high strength, corrosion resistant.

NORANDA-820.
M-1560; 5.5 Sn, 0.15 P, bal Cu.
Hard: 81,000 TS; 75,000 YS; 10 El; B 87 Rock.
Soft: 50,000 TS; 21,000 YS; 52 El; F 77 Rock.
For bridge bearing plates, bellows, Bourdon tubing, clutch discs, sleeve bushings, springs.
Tough, high strength, corrosion resistant. Phosphor bronze Gr.A.

NORANDA-1502.
M-1560; 6.25 Sn, 0.24 P, bal Cu.
Hard: 110,000 TS.
Soft: 56,000 TS;
For bridge bearing plates, bellows, springs, clutch discs.
Phosphor bronze, high strength.

NORANDA-1532.
M-1560; 7.5 Sn, 0.30 P, bal Cu.
Hard: 130,000 TS.
Soft: 60,000 TS; 24,000 YS; 65 El.
For bridge bearing plates, springs, switch parts, wire brushes.
High strength, corrosion resistant Phosphor bronze, Gr. C.

NORANDA-3111.
M-1560; 0.05 Ag, 99.9 min Cu.
Hard: 65,000 TS; 45,000 YS; 6 El; B 50 Rock.
Soft: 35,000 TS; 11,000 YS; 45 El; F 45 Rock.
For gaskets, bus bars, radio parts, windings, switches, terminals
High elect. cond. corrosion resistant. Silver bearing copper.

NORANDA-3770
M-1560; 58-61 Cu, 1.5-2.5 Pb, 0.15-0.25 Sn, bal Zn
Hard Drawn: 72,000 TS; 50,000 YS; 15 El, B 78 Rock.
Soft: 52,000 TS; 20,000 YS; 45 El; F 78 Rock
For forged marine hardware, valve stems, bolts, fasteners, plumbing. Forging brass.

NORBIDE.
M-532; 78 B, 0.14 Fe, 21 C, (B_4C).
For wire drawing dies, drilling W C die nibs, nozzles for abrasive blasting; cemented boron-carbide.

NORELCO CONTACT 15.
M-1139, 0.05-0.10 C, 0.5-1.0 Mn, 0.1-0.3 Si, bal Fe.
Welded. 75,000 TS, 65,000 YS; 35 El.
For welding electrodes; lime coated.

NORELCO CONTACT 18
M-1139; 0.08-0.15 C, 0.5-0.7 Mn, 0.1-0.2 Si, bal Fe.
For contact welding electrodes, arc welding, organic coating.

NORELCO CONTACT 20.
M-1139, 0.08-0.15 C, 0.5-0.7 Mn, 0.1-0.2 Si, bal Fe.
Welded: 67,000 TS; 53,000 YS; 25 El.
For welding electrodes; iron oxide coating.

NORIS CME.
M-1338; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe
For gears, cams, camshafts, mandrels; case hardening steel.

NORMALLOY.
M-394; 0.4 C, 0.8 Mn, 1.5 Cr, 0.2 V, bal Fe.
For crankshafts; "Vancoram" normalized alloy steel.

NORMALLOY.
M-604; 0.40-0.50 C, 0.9-1.3 Mn, 0.3-0.6 Cr, 0.05 min V, bal Fe.
Normalized: 110,000 TS; 70,000 YS; 15 El; 40 RA.
For sprockets, gear hubs; for heavy duty automotive machinery.

NORMANNA.
M-333; C, alloy, bal Fe.
For tools; oil hardening.

NORMAR.
M-289; 0.9 C, 0.5 Cr, 1.5 Mn, 0.25 Mo, bal Fe.
For dies, punches, crimpers; non-deforming, shock resistant.

NORO 30.
M-1338; 0.95 C, W, Co, Cr, V, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

NORO 40.
M-1338; 0.82 C, 4 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, hobs, reamers, taps; high speed steel.

NORO 50.
M-1338, 0.85 C, Cr, V, W, Mo, bal Fe
For lathe and planer tools, drills, hobs, taps; high speed steel

NORO 60.
M-1338, 0.86 C, 4.1 Cr, 2.5 V, 0.85 Mo, 12 W, bal Fe
For lathe and planer tools, hobs, broaches; high speed steel.

NORO 60 EXTRA.
M-1338, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe
For engraving tools, form dies, taps; high speed steel

NORO 60 SPEZIAL.
M-1338; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe
For lathe and planer tools, reamers, hobs, taps, drills, high speed steel.

NORO EXTRA D.
M-1338; 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, 0.9 Si, bal Fe
For cold work tools, upsetters, headers, dies, oil hardened, tough

NORO EXTRA L.
M-1338, 0.55 C, 1.05 Cr, 0.18 V, 1.8 W, 0.9 Si, bal Fe
For cold work tools, upsetters, headers, dies; oil hardened, tough.

NORO MKW.
M-1338, 0.38 C, Si, Cr, V, bal Fe.
For gears, pinions, shafts, bolts, crankshafts; oil hardened, shock resistant.

NORO MRO
M-1338; 0.45 C, Si, Cr, V, bal Fe.
For gears, springs, shafts, arbors, crankshafts, oil hardened, shock resistant

NORO REKORD 30
M-1338, 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, hobs, taps; high speed steel

NORO REKORD 50
M-1338; 0.80 C, Co, Cr, V, Mo, W, bal Fe
For lathe and planer tools, drills, taps, reamers; high speed steel.

NORO REKORD 53.
M-1338, 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, hobs, reamers, high speed steel.

NORO REKORD 53V.
M-1338; 1.3 C, W, Co, V, Cr, Mo, bal Fe.
For engraving tools, forming dies, reamers; high speed steel.

NORO REKORD 110.
M-1338; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe
For lathe and planer tools, cutters, reamers, hobs; high speed steel.

NORTH STAR.
M-333; C, W, bal Fe.
For dies, non-deforming.

NORTON 90-10.
M-532; 90 Ta, 10 W
High temp strength and corrosion resistance
For missile components, electronics, high temperature devices

NORTON BORON MASTER ALLOY.
M-532, 8.5 B, 2.7-3.3 Si, 81-84 Fe, 1-1.7 C, bal Ti, Al.
For steel inoculant, increase depth of hardening of steel

NORTON T-111
M-532, 90 Ta, 8 W, 2 Hf
Weldable, ductile; very high strength to weight ratio at high temperatures
For missile hardware, supersonic air and spacecraft, liquid reactors

NO-TIN SILVER FUSE.
M 1243
For solder

NOVALITE
English, 12.5 Cu, 0.3 Mg, 1.4 Ni, 0.5 Fe, 0.5 Si, bal Al
For pistons, cast.

NOVANTIOX
M-1117, 0.06 C, 19 Cr, 10 Ni, bal Fe
Annealed 85,000 TS; 35,000 YS, 60 El; 150 Brin.
For architectural molding and trim, kitchen equipment, chemical plant apparatus and processing equipment
Type 304 stainless steel, austenitic

NOVAR B.
M-1307, 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe
For welded chemical plant and oil refinery equipment, stainless, stabilized

NOVO 2
M-345, 0.55 C, 18 W, 4 Cr, 2 V, bal Fe.
For lathe and planer tools, reamers, broaches; Type T2; high speed steel.

NOVO HIGH SPEED
M-345, 0.50 C, 2.7 Cr, 15 W, 0.6 V, bal Fe
For tools, cutters, punches, dies; high speed steel, oil hardened

NOVOKONSTANT
M-297; 82.5 Cu, 3 Al, 13.5 Mn, 1 Fe
Rolled 142,200 TS, 0.5 El.
Annealed· 78,200 TS, 25 El.
For electrical resistances, heat resistant

NOVONOX-A17.
M-1307; 0.10 C, 17 Cr, 7 Ni, bal Fe
Annealed· 110,000 TS, 40,000 YS; 60 El, B 85 Rock.
Hard: 185,000 TS, 140,000 YS; 8 El; C 41 Rock.
For aircraft structural members, diaphragms, household utensils.
Type 301 stainless steel, good ductility.
Work hardens

NOVONOX-A18.
M-1307; 0.12 C, 18 Cr, 9 Ni, bal Fe.
Annealed, 90,000 TS; 40,000 YS; 50 El; B 85 Rock.
For chemical and textile plant equipment, food processing apparatus, tanks, vessels, agitators.
Type 302 Stainless steel, austenitic

NOVONOX-A18Z.
M-1307, 0.06 C, 18 Cr, 11 Ni, 0.4 Cb, bal Fe.
Annealed: 85,000 TS, 30,000 YS; 55 El; B 80 Rock.
For welded structures, chemical and pharmaceutical plant equipment.
Type 321 stainless steel, stabilized, austenitic.

NOVONOX-A18ZN
M-1307; 0.06 C, 12 Ni, 18 Cr, 0.5 Cb, bal Fe.
Annealed. 85,000 TS; 35,000 YS; 60 El; B 80 Rock.
For welded structures, chemical and pharmaceutical plant equipment.
Type 347 stainless steel, stabilized, austenitic.

NOVONOX-ALC 18
M-1307, 0.03 max C, 19 Cr, 10 Ni, bal Fe.
Annealed 77,000 TS, 30,000 YS, 60 El; 140 Brin.
For architectural trim, chemical plant equipment, food processing equipment
Type 304L stainless steel, austenitic, non-hardenable

NOVONOX-AS18
M-1307; 0.08 max C, 19 Cr, 10 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS; 60 El; 150 Brin.
For architectural trim, chemical plant equipment, tanks, food processing equipment
Type 304 stainless steel, austenitic.
Non-hardenable

NOVONOX-AS 182
M-1307, 0.05 C, 17 Cr, 11 Ni, 3 Mo, bal Fe.
Annealed. 85,000 TS, 35,000 YS, 50 El; B 80 Rock
For chemical plant equipment, kettles, agitators, evaporators, tanks, valve trim
Type 316 stainless steel, austenitic, acid resistant.

NOVONOX-AS 183.
M-1307; 0.06 C, 17 Cr, 12 Ni, 2.5 Mo, bal Fe
Annealed 80,000-90,000 TS, 30,000-40,000 YS, 40-60 El, 70-80 RA; B 78-85 Rock
For chemical plant equipment, agitators, evaporators tanks, valve trim
Type 316-319 stainless steels, austenitic, acid resistant.

NOVONOX F 13 Al
M-1307, 0.06 C, 13 Cr, 0.2 Al, bal Fe
Annealed· 70,000 TS, 40,000 YS; 30 El, 160 Brin
For annealing boxes, oil refining equipment, quenching racks
Type 405 stainless steel, ferritic

NOVONOX-F17.
M-1307: 0.10 C, 16 Cr, bal Fe
Annealed 70,000 TS, 40,000 YS; 30 El, 140 Brin.
For automotive trim, hardware, oil burners, fasteners
Type 430 stainless steel, high heat and corrosion resistance.

NOVONOX-FA26
M-1307, 0.12 C, 28 Cr, 5 Ni, 1 Mo, bal Fe.
Annealed 105,000 TS; 80,000 YS, 25 El; 230 Brin.
Ht Tr. C 45-50 Rock.
For valves, valve fittings, pumps
Type 329 stainless steel, precipitation hardening, corrosion and heat resistant

NOVONOX-T13.
M-1307; 0.20 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; B 92 Rock.
Cold Drawn: 105,000 TS; 85,000 YS; 17 El;
B 95 Rock.
For cutlery, surgical and dental equipment,
gears, shafts.
Type 420 stainless steel, hardenable.

NOVONOX-T131.
M-1307; 0.20 C, 13 Cr, 1.2 Mo, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El, 55 RA;
B 92 Rock.
Heat Treated: 250,000 TS; 215,000 YS; 8 El;
25 RA; C 50 Rock
For cutlery, surgical instruments, ball bearings,
valves, hardware.
Corrosion resistant, hardenable.

NOVONOX-TT131.
M-1307; 0.15 C, 13 Cr, 1.2 Mo, bal Fe.
Annealed. 80,000 TS; 40,000 YS; 25 El; B 93 Rock
Heat Treated 200,000 TS, 160,000 YS,
12 El; C 45 Rock.
For surgical instruments, cutlery, table flatware,
oil refinery equipment.
Corrosion resistant, hardenable.

NOVO SPECIAL.
M-345; 0.7 C, 3-4 Cr, 18 W, 0.9 V, bal Fe.
For lathe tools; high speed steel.

NOVOSTON.
M-452, 1 5-5.0 Ni, 7-9 Al, 11-13 Mn, 2-4 Fe, bal Cu.
Cast.
For ship propellers; Al bronze, corrosion resistant.

NOVO SUPERIOR
M-345; 0 80 C, 0.17 Mn, 2 60 Cr, 18 63 W,
1.01 V, bal Fe
For tools, lathe and cutting tools, taps,
drills, reamers; high speed steel.

NOVO SUPERIOR VANADIUM.
M-345; 1 05 C, 4 Cr, 3 V, 18 W, bal Fe
For reamers, taps, broaches, drills; Type 23;
high speed steel.

NOVOTHERM 8A.
M-1332, 0.12 max C, 0.6 Si, 18 Cr, 10 Ni, Ti,
bal Fe.
Annealed 78,000-108,000 TS, 38,000 YS; 40 El;
140-190 Brin.
For welded chemical plant equipment;
austenitic, resists scaling to 800°C.

NOVOTHERM 8F
M-1332; 0 10 max C, 0.8 Si, 0 8 Al, 6 5 Cr, bal Fe
Annealed: 64,000-85,000 TS, 36,000 YS; 20 El;
140-185 Brin
For oil refinery equipment, AISI 501 and 502;
resists scaling to 800°C.

NOVOTHERM 9F
M-1332; 0 10 max C, 1 2 Si, 1 0 Al, 13 Cr, bal Fe
Annealed· 72,000-92,000 TS, 43,000 YS;
15 El; 160-205 Brin.
For oil refinery equipment, resists scaling to 950°C

NOVOTHERM 10A.
M-1332; 0 15 max C, 2 Si, 20 Cr, 12 Ni, bal Fe
Annealed· 85,000-108,000 TS, 43,000 YS;
40 El; 145-190 Brin
For heat treating boxes, furnace parts; AISI 309,
austenitic, resists scaling to 1050°C.

NOVOTHERM 10F.
M-1332; 0.10 max C, 1.0 Si, 1 0 Al, 18 Cr, bal Fe
Annealed: 72,000-92,000 TS; 43,000 YS, 12 El;
165-210 Brin.
For oil refinery equipment; AISI 405;
resists scaling to 1050°C.

NOVOTHERM 11FA.
M-1332; 0.20 max C, 1.0 Si, 25 Cr, 4.0 Ni, bal Fe.
Annealed. 85,000-107,000 TS; 58,000 YS;
25 El; 175-200 Brin
For heat treating boxes, furnace parts,
oil refinery equipment; AISI 446;
resists scaling to 1100°C.

NOVOTHERM 12A
M-1332, 0 15 max C, 2 Si, 25 Cr, 20 Ni, bal Fe.
Annealed· 85,000-108,000 TS; 43,000 YS; 40 El;
175-190 Brin.
For furnace parts and equipment; AISI 310;
austenitic, resists scaling to 1200°C.

NOVOTHERM 12F.
M-1332; 0 10 max C, 1 5 Si, 1 5 Al, 24 Cr, bal Fe.
Annealed 72,000-92,000 TS; 50,000 YS; 10 El;
170-215 Brin
For oil refinery equipment, resists scaling to 1200°C.

NOVOTHERM 70
M-1307, 0 12 max C, 0.8 Al, 6.5 Cr, bal Fe.
For oil refinery equipment;
heat and creep resistant

NOVOTHERM 85
M-1307, 0.12 max C, 1 2 Si, 1 Al, 13 Cr, bal Fe.
Annealed. 75,000 TS; 40,000 YS; 35 El;
70 RA; 155 Brin.
For oil refinery equipment,
heat and creep resistant.

NOVOTHERM 100
M-1307; 0 12 max C, 1 Si, 1 Al, 18 Cr, bal Fe.
Annealed 80,000 TS, 50,000 YS, 25 El, 50 RA,
150 Brin.
For oil refinery equipment, heat and creep resistant

NOVOTHERM 105
M-1307, 0 15 C, 2 Si, 19 5 Cr, 9 5 Ni, bal Fe
Annealed· 80,000 TS, 35,000 YS; 55 El; 75 RA;
150 Brin.
For chemical plant equipment, tanks, mixers, filters;
Type 302, stainless, austenitic.

NOVOTHERM 110
M-1307, 0 12 max C, 1 5 Si, 1.5 Al, 24 Cr, bal Fe.
For furnace parts, oil refinery equipment;
heat and creep resistant

NOVOTHERM 130
M-1307, 0 15 C, 2 Si, 24 Cr, 19 Ni, bal Fe
Annealed 100,000 TS, 45,000 YS; 50 El, 65 RA;
185 Brin
For furnace parts, valves, pumps, turbine parts;
Type 310, stainless, austenitic

NOVOTHERM NC36
M-1332, 0 12 max C, 1 8 Si, 16 Cr, 36 Ni, bal Fe.
Annealed 78,000 108,000 TS, 38,000 YS;
40 El, 140-185 Brin.
For furnace parts and equipment,
austenitic, resists scaling to 1100°C.

NO. X-10 COMPOSITE METAL.
M-1174, Fe composite
For machine parts, sintered

NO X-20 COMPOSITE METAL.
M-1174, Fe composite.
Hardened 500 Brin.
For machine parts; sintered, hardenable.

NOXIDA-C
M-72, 63 Ni, 16 Cr, 16 Mo, 6 max Fe.
For pharmaceutical and chemical plant equipment,
valves, pumps.
Heat and corrosion resistant.

NOXIS.
M-1115; 0.3-0.4 C, 13-15 Ni, 13-15 Cr, 2-3 W, bal Fe.
Heat treated: 107,000 TS; 50,000 YS; 40 El.
For valves; austenitic, corrosion and heat resistant.

NOXIS 4.
French; C, alloy, bal Fe.
For gas turbines;
heat, creep and oxidation resistant.

N.P.L "Y" ALLOY.
M-311, M-338; 93 Al, 2 Ni, 1.5 Mg, 4 Cu.
Chill cast. 29,000-TS; 25,000 YS; 1 El; 80 Brin.
Heat treated 43,000 TS; 34,000 YS; 3 El, 105 Brin.
For airplane castings, pistons, crankcases,
cylinder heads; corrosion resistant.

NS-1¼ Cr-½ Mo GMA
M-1507; 0.08-0.13 C, 0.55-0.80 Mn, 0.45-0.70 Si, 1.2-1.35 Cr, 0.50-0.70 Mo, bal Fe.
Welding wire for gas metal arc welding of
low alloy steels; desiged for assemblies
to be be annealed or heat treated later.

NS-1¼ Cr-½ Mo SA
M-1507, 0.08-0.13 C, 0.55-0.80 Mn, 0.25 max Si, 1.3-1.65 Cr, 0.50-0.70 Mo, bal Fe
Welding wire for submerged arc welding of
low alloy steels, designed for assemblies
to be annealed or heat treated later.

NS 2¼ Cr-1 Mo GMA.
M 1507, 0.08-0.13 C, 0.55-0.80 Mn, 0.45-0.70 Si, 2.2-2.75 Cr, 1.0-1.2 Mo, bal Fe.
Welding wire for gas metal arc welding of
low alloy steels; designed for assemblies
to be annealed or heat treated later.

NS-2¼ Cr-1 Mo SA
M 1507, 0.08-0.13 C, 0.55-0.80 Mn, 0.25 max Si, 2.40-2.75 Cr, 1.0-1.2 Mo, bal Fe.
Welding wire for submerged arc welding
of low alloy steels, designed for assemblies
to be annealed or heat treated later.

NS-2¼ Nickel
M 1507, 0.03 max C, 0.3-0.6 Mn, 2.0-2.9 Ni, bal Fe.
Welding wire for submerged arc and TIG welding
of 3½% nickel fabricated pipe for
cryogenic applications
25 ft, lbs U notch impact at −150°F.

NS-3½ Nickel
M-1507, 0.03 max C, 0.3-0.6 Mn, 2.9-3.55 Ni, bal Fe
Welding wire for submerged arc and TIG
welding of 3½% nickel fabricated pipe for
cryogenic applications
25 Ft lbs. U-notch impact at −150°F

NS-5
M-264, 50 Ni, 46 Cu, 2.2 Si, 1.9 Mn
100,00 TS; 82,500 YS; 2 El; 300 Brin
For valve seats and disks, wear,
abrasion and corrosion resistant

NS-18 2
M-1507, 0.10 C, 12 Mn, 0.50 Si, 18.0 Cr, 1.6 Ni, 0.34 N, bal Fe.
Low nickel austenitic stainless steel wire
Drawn (0.018" dia). 320,000 TS, 3.2 El
Non magnetic after severe cold work.
Hardens by cold work
For non-magnetic stainless steel springs

N-S 25.
M-189; 0.05-0.15 C, 19-21 Cr, 9-11 Ni, 14-16 W, 46-53 Co, 3 max Fe, 1.4 Mn
Cold drawn wire: 178,500-207,000 TS;
45,000-50,000 YS, 24-7 El.
For springs; high temperature applications

NS-25.
M-1507; 0.05-0.15 C, 1-2 Mn, 19-21 Cr, 9-11 Ni, 14-16 W, 3 max Fe, bal Co.
Drawn: 178,000 TS.
Heat treated: 191,000 TS.
For springs; L605 alloy,
high temperature applications.

NS-60M.
M-1507; 0.15 max C, 4 max Mn, 2.5 max Fe, 1.25 max Si, 62-69 Ni-Co, 1.25 max Al, 1.5-3.0 Ti, bal Cu.
Welding wire; as welded: 76,600 TS; 37.5 El.
For welding Monel pipe.
AWS 5.14 ASTM B304 C1. ER NiCu-7.

NS-61N.
M-1507; 0.15 max C, 1 max Mn, 1 max Fe, 0.75 max Si, 0.25 max Cu, 93 min Ni-Co, 1.5 max Al, 2.0-3.5 Ti.
Welding wire; as welded: 73,700 TS; 32.5 El.
For welding nickel, overlaying steel,
welding cast iron.
AWS 5.14 ASTM B304 C1. ER Ni-3.

NS-62I
M-1507, 0.08 max C, 1 max Mn, 6-8 Fe, 0.35 max Si, 0.50 max Cu, 70 min Ni-Co, 14-17 Cr, 1.5-3.0 Cb-Ta
Welding wire, as welded 87,900 TS; 45 El
For welding Inconel
AWS 5.14 ASTM B304 C1. ER NiCr Fe5

NS-67C.
M-1507, 0.04 max C, 1 max Mn, 0.4-0.7 Fe, 0.15 max Si, 29-32 Ni-Co, 0.2-0.5 Ti, bal Cu.
Welding wire; as welded: 54,200 TS; 37.5 El.
For welding 70/30, 80/20, 90/10 copper-nickel.
AWS A5.5 ASTM B225 C1. E CuNi

NS-82I
M-1507; 0.08 max C, 2.5-3.5 Mn, 1 max Fe, 0.5 max Si, 0.5 max Cu, 67 min Ni-Co, 0.75 max Ti, 18-22 Cr, 2-3 Cb-Ta
Welding wire, as welded: 97,100 TS; 50.5 El
For welding Inconel, 9% Ni steel,
and for overlaying steel
AWS 5.14 ASTM B304 C1 ER NiCr-3.

NS-92I
M-1507, 0.08 max C, 2.0-2.75 Mn, 8 max Fe, 0.35 max Si, 0.5 max Cu, 67 min Ni-Co, 2.5-3.5 Ti, 14-17 Cr
Welding wire, for welding dissimilar metals;
for welding 9% nickel steel
AWS 5.14 ASTM B 304 C1. ER NiCr Fe-6, AMS 5675

NS 101
M-1507; 0.10 C, 1.0 Mn, 0.55 Si, bal Fe
Welding wire: as welded 76,000 TS, 60,000 YS; 28 El, 130 Brin
For inert gas welding mild steel

NS-102
M-1507, 0.08 C, 1.95 Mn, 0.60 Si, 0.50 Mo, bal Fe.
Welding wire, as welded 102,000 TS, 84,000 YS; 21 El, 163 Brin
For inert gas welding 4130 and
some high strength steels.

NS-103
M 1507; 0.05 C, 1.25 Mn, 0.50 Si, 0.10 Al, 0.09 Zr, 0.10 Ti, bal Fe
Welding wire; as welded: 83,000 TS, 71,000 YS; 27.5 El; 140 Brin.
For improved quality welds in inert gas welding
mild steel.

NS-107.
M-1507; 0.15 C, 1.2 Mn, 0.55 Si, 0.65 Al, bal Fe.
Welding wire; as welded: 80,000 TS; 64,000 YS; 25 El; 130 Brin.
For inert gas welding oily and rusty mild steel without porosity.

NS-115.
M-1507; 0.10 C, 1.70 Mn, 1.0 Si, bal Fe.
Welding wire; as welded: 90,000 TS; 68,000 YS; 28 El; 160 Brin.
For producing neat appearing welds when inert gas welding mild steel.

NS-116.
M-1507; 0.10 C, 1.95 Cr, 0.55 Mn, bal Fe.
Welding wire; as welded: 87,000 TS; 71,000 YS; 26 El; 42 ft. lbs. Charpy V notch.
For inert gas welding of mild steel.

NS 190.
French; C, alloy, bal Fe. For heat, creep and oxidation resistant.

NS-355.
M-1507; 15.65 Cr, 4.38 Ni, 2.68 Mo, 1 Mn, 0.14 C, 0.03 P, 0 01 S, 0.32 Si, 0.12 Cu, 0.12 N, bal Fe.
Spring: 290,000-500,000 TS.
For springs; high ultimate strength, corrosion resistant.

NS-750X.
M-1507; 1 max Co, 14-17 Cr, 69 min Ni, 5-9 Fe, 0.08 max C, 0.4-1.0 Al, 2 0-2.5 Ti
Drawn (15% red.) and heat treated wire has: 190,000-205,000 TS.
Corrosion resistant
For springs operating at 550-1100°F.

N-S 1000.
M-189, 0.37-0 43 C, 4.75-5.25 Cr, 1.2-1.4 Mo, bal Fe.
Drawn: 200,000 TS; 1-2 El.
For dies, tools; oil or air hardened.

NS-A286.
M-1507; 13.5-16 Cr, 24-27 Ni, 1.0-1.75 Mo, 0.35 max Al, 1.75-2.25 Ti, 0 10-0 50 V, bal Fe.
Drawn (68% red.) and heat treated wire has· 210,000-236,000 TS.
Austenitic, corrosion resistant.
For springs operating at 600-1000°F.

NSCD.
French: 0 03 C, 18 Cr, 16 Ni, 3 Cu, 6 Mo, bal Fe
For chemical plant equipment; corrosion resistant.

NS-L605.
M-1507; 50 Co, 19-21 Cr, 9-11 Ni, 3 max Fe, 0 05-0.15 C, 14-16 W
Drawn (28% red.) and heat treated wire has: 205,000-225,000 TS.
Corrosion resistant.
For springs operating at 1100-1500°F range; for wire holding parts together for dip brazing at 1400°F.

N-S STAINLESS STEEL WELDING WIRE.
M-1507;
Welding wire of 22 stainless compositions for arc welding stainless steels, bare wire

NTK-M7.
M-1577; 9-11 Cr, 16-18 Ni, 6-8 Mo, 0.06 max C, 1 0 max Si, 2.0 max Mn, 0.03 max S & P, bal Fe.
Rolled: 106,000 TS; 86,000 YS; 34 El; 43 RA.
Annealed: 79,000 TS; 35,000 YS, 60 El; 62 RA.
For chemical and food processing equipment, pumps, impellers.
Stainless. Resists organic chlorination media.
Resists moderate concentrations of hot HCl.

NTK-T1.
M-1577; 1-3 Mo, bal TiC.
Sintered: 120,000-140,000 Tr. S; Rock A 93-94.
For tools, bearings, seals.
Resists heat and wear.

NTK-T3.
M-1577; 13-16 Mo, bal TiC.
Sintered: 155,000-185,000 TS; Rock A 92-93.
For tools, bearings, seals.
Resists heat and wear.

NUALL.
M-1409; C, alloy, bal Fe.
For chuck jaws, reamers, drills; oil hardened.

NU-BRAZE III.
M-1002; Ag, P, Cu.
For brazing of non-ferrous metals, B.P. 1300°F.

NU-BRAZE VI.
M-1002; Ag, Cu, Zn, Cd.
For brazing of non-ferrous metals; M P. 1170°F.

NU-BRAZE SUPER FLO.
M-1002; Ag, bal Cu.
For silver brazing; M.P. 1076°F.

NU-BRONZE.
Eng ; 95.4 Cu, 3.25 Ni, 0.25 Mn, 0.73 Si.
For corrosion resistant parts; corrosion resistant

NUCAST.
M-1075; 99 + Ni.
For nickel anodes.

NUCUT
M-1221; C, alloy, bal Fe.
For dies; oil hardened.

NU-DIE.
M-38; 0.4 C, 1 2 Si, 5 2 Cr, 1.5 Mo, bal Fe.
For die casting dies, plastic mold dies; oil hardening.

NU-DIE
M-1409; 0.4 C, 1.2 Si, 5.2 Cr, 1 5 Mo, bal Fe.
For plastic molds, die casting dies.
Oil or air hardening.

NU-DIE CASTING
M-362, 0 35 C, 5 Cr, 0 4 V, 1.5 Mo, bal Fe.
For die casting dies, punches; Type H11; hot work steel.

NU-DIE DENSIFIED HOT WORK STEEL.
M-38, 0 40 C, 0 4 Mn, 1 0 Si, 5.0 Cr, 0.55 V, 1 35 Mo, bal Fe.
Air hardened. 40-55 Rock C.
Designed for extrusion dies for aluminum and magnesium
AISI H11 Hot work tool steel.

NU-DIE V.
M-38; 0 3-0.4 C, 5 Cr, 1.4 Mo, 1.1 V, 1 Si, bal Fe.
For die casting dies for Al-base alloys; air hardening.

NUERAL.
M-555, Si, Cu, Ni, bal Al.
For cylinder heads; heat resistant.

NUERAL 132
M-555; 0.8-1.0 Cu, 13-14 Si, 1.9-2.4 Ni, bal Al.
Sand cast· 32,000 TS; 0.3 El.
For cylinder heads; heat treatable.

NUERENBERGER GOLD.
German, 2-7.5 Al, 0.2-2.5 Au, bal Cu.
For gold substitute; corrosion resistant.

NU-GILD (SCOVILL ALLOY 226).
M-102; 87.5 Cu, bal Zn.
Annealed: 40,000 TS; 44 El.
Hard: 65,000 TS; 5 El.
For fasteners, jewelry; deep drawing.

NUGILD.
M-103; 13 Zn, bal Cu.
Soft: 43,000 TS; 56 Brin.
½ Hard: 54,000 TS; 116 Brin.

NU-GOLD.
Eng; 87.73 Cu, 12.22 Zn.
For jewelry, ornaments; red brass.

NULOY.
M-288; 0.3 C, 1.5 Ni, 0.8 Cr, bal Fe.
For steel castings; tough.

NUMETAL.
M-1; 77 Ni, 4.5 Cu, 1.5 Cr, bal Fe.
For audio transformers, sensitive relays; high permeability.

NU-MOL.
M-1062; 0.9 C, alloy, bal Fe.
For hacksaws; tough.

NU-PYR-LOY.
M-1432; C, alloy, bal Fe.
Heat treated: 309,000-342,000 TS; 264,000-282,000 YS; 570-600 Brin.
For pneumatic and shock tools, chisels, shear blades; tough and shock resistant, oil hardened.

NURAL.
M-1548; 0.2-1.0 Si, 0.2-0.5 Mn, 3.0-12.0 Mg, bal Al.
Chill Cast: 32,000-37,000 TS; 5-10 El; 78-80 Brin.
For aircraft fittings, car frames, marine parts, lever brackets, hardware, general housings.
Permanent mold and die cast, corrosion resistant.

NURAL 25
M-555; 1-2 Mg, 5-6 Si, 0.1-0.4 Mn, 0.7 Fe, 0.5 Cu, 0.2 Ti, 0.2 Zn, bal Al.
Sand. 19,000 TS; 14,000 YS; 3 El.
Cast: 26,000 TS, 19,000 YS; 1 El
Hardened: 40,000 TS; 36,000 YS; 1 El.
For sand and permanent mold castings; hardenable

NURAL 30.
M-555; 6-7.5 Cu, 0.5-2.0 Si, bal Al
Sand cast: 18,000-28,000 TS, 2.0-0.8 El.
For light alloy parts; non-hardenable

NURAL 43
M-555; 4.5-6 Si, bal Al.
Sand cast 18,000-24,000 TS; 5-2 El.
For light alloy parts; corrosion resistant

NURAL 43.
M-1548, 4.5-6.0 Si, 1.2 Fe, bal Al.
Sand Cast: 17,000-24,000 TS; 2-5 El; 42-50 Brin.
Die Cast: 20,000-28,000 TS; 3-5 El; 50-60 Brin.
For marine castings, manifolds, meter housings, carburetors, food handling equipment.
Sand, permanent mold and die cast.

NURAL 77
M-555, 4-7 Cu, 4-6 Zn, 1-3 Si, 1.5 max Fe, bal Al.
Sand cast: 18,000-25,000 TS; 2-0.5 El.
For light alloy parts; heat treatable.

NURAL 85
M-555; 2-4 Cu, 5-7 Si, 0.4-0.6 Mn, bal Al.
Chill cast: 28,000-35,000 TS; 4.5-1.0 El.
For light alloy parts; heat treatable

NURAL 85 S.
M-555; 2-3 Cu, 4-6 Si, 2.0 max Fe, 0.5 max Mn, bal Al.
Sand cast: 20,000-27,000 TS; 4-1 El.
For light alloy parts; heat treatable.

NURAL 93.
M-555, 4-4.5 Cu, 1.5-2.5 Si, 3-4.5 Ni, bal Al.
Sand cast: 20,000-26,000 TS; 1.2-0.5 El.
For light alloy parts; heat treatable.

NURAL 122.
M-555; 9.5-10.2 Cu, 0.15-0.35 Mg, 0.8-1.5 Fe, bal Al.
Sand cast: 22,000-30,000 TS; 1.5-0.3 El.
For light alloy parts; non-hardenable.

NURAL 122.
M-1548; 9.5-10.2 Cu, 0.15-0.35 Mg, 0.8-1.5 Fe, bal Al.
Chill Cast: 26,000-37,000 TS; 1 El; 70-90 Brin.
For sole plates for electric hand irons, general castings.
Permanent mold cast, good machinability.

NURAL 132
M-1548; 0.8-2.0 Cu, 12.5-14.2 Si, 0.8-1.0 Mg, 0.5 Fe, 0.8-2.4 Ni, bal Al.
Chill Cast: 28,000-37,000 TS; 0.5-1.2 El.
For meter cases, switch boxes, manifolds, fittings, aircraft parts.
Permanent mold cast, good castability and corrosion resistant.

NURAL 132 A.
M-555; 0.8-1.0 Cu, 12.2-12.8 Si, 0.8-1.0 Mg, 0.5 Fe, 1.9-2.4 Ni, bal Al.
Chill cast: 29,000-37,000 TS; 1.2-0.5 El.
For light alloy parts; corrosion resistant.

NURAL 132 B.
M-555; 2 Cu, 12.5 Si, 0.8-1.0 Mg, 0.5 Fe, 0.8-1.0 Ni, bal Al.
Chill cast: 29,000-37,000 TS; 1.2-0.5 El.
For light alloy parts; corrosion ressitant.

NURAL 142.
M-555; 4-4.5 Cu, 1.3-1.8 Mg, 1.8-2.2 Ni, bal Al.
Sand cast: 21,000-28,000 TS; 4-1 El.
For light alloy parts; age-hardenable.

NURAL 142
M-1548; 4.0-4.5 Cu, 1.3-1.8 Mg, 1.8-2.2 Ni, bal Al.
Chill Cast: 23,000-32,000 TS; 1-5 El; 70-85 Brin.
Heat Treated: 26,000-35,000 TS; 1-6 El; 80-110 Brin.
For cylinder heads, pistons, generator housings, fittings.
Permanent mold castings, heat treatable, for high temperature service.

NURAL 195.
M-555, 4-5.5 Cu, 0.5-1.5 Si, 0.4-1.0 Fe, bal Al
Sand cast: 23,000-36,000 TS; 8-2 El
For light alloy parts; age-hardenable.

NURAL 200.
M-555; 14-16.8 Cu, 0.5-1.0 Fe, 0.15-0.35 Mg, bal Al
Sand cast: 20,000-28,000 TS; 0.5-0.3 El
For light alloy parts; heat treatable

NURAL 511.
M-555; 4.5-5.5 Mg, 0.1-0.5 Mn, 0.6-1.5 Si, 0.2 Ti, bal Al
Sand cast 26,000 TS; 14,000 YS, 3 El, 65 Brin.
For light alloy castings; corrosion resistant.

NURAL 1761.
M-555; 0.8-1.2 Cu, 16.4-17.5 Si, 3.2-3.6 Ni, 0.5 Mn, 0.7-1.2 Mg, 0.5 Cr, bal Al
Heat treated: 28,000-36,000 TS, 0.3-0.5 El.
For auto engine pistons, permanent mold castings; low density.

NURAL 1761P.
M-555; 0.8-1.2 Cu, 16.4-17.5 Si, 3.2-3.6 Ni, 0.4-0.6 Mn, 0.7-1.2 Mg, 0.5 Cr, bal Al.
Permanent mold: 29,000-33,000 TS; 28,000-30,000 YS; 0.8-0.3 El; 90-140 Brin.
For pistons; low density.

NURAL 2361.
M-555; 0.8-1.2 Cu, 22-25 Si, 0.8-1.0 Ni, 0.7-1.2 Mg, 0.5 Cr, bal Al.
Permanent mold: 29,000-33,000 TS; 28,000-30,000 YS; 0.3-0.1 El; 90-125 Brin.
For pistons; low density.

NURAL 3210.
M-555; 0.8-1.5 Cu, 11-13 Si, 0.8-1.3 Ni, 0.8-1.3 Mg, bal Al.
Permanent mold: 31,000-35,000 TS; 26,000-30,000 YS; 1-0.3 El; 90-125 Brin.
For light alloy parts; corrosion resistant.

NURAL Al-Mg-Mn.
M-555; 0.2-1.3 Si, 0.6-1.5 Mn, 1.5-3.0 Mg, bal Al.
Chill cast: 32,000-36,000 TS; 10-5 El.
For light alloy parts; age-hardenable.

NURAL DZnAl4Cul.
M-555; 0.6-1.0 Cu, 3.7-4.3 Al, 0.02-0.05 Mg, bal Zn.
Die cast: 36,000-47,000 TS; 5-2 El; 80-100 Brin.
For housings, cases, machinery castings; Zamak 5.

NURAL GAlCu6Si3.
M-555; 4-7 Cu, 2-4 Si, 2.5 Zn, 1.1 Fe, bal Al.
Sand cast: 29,000 TS, 23,000 YS; 0.5 El; 100 Brin.
Permanent mold: 32,000 TS; 28,000 YS; 0.2 El; 110 Brin.
For light alloy castings; age hardenable.

NURAL GAlSi12.
M-555; 11-13.5 Si, 0.3-0.5 Mn, bal Al.
Sand cast: 31,000 TS; 13,000 YS; 4 El; 60 Brin.
For light alloy castings; corrosion resistant.

NUREMBERG GOLD.
90 Cu, 7.5 Al, 2.5 Au
For cheap jewelry; gold color.

NUREX.
M-89; C, Cr, Mn, bal Fe
For mill balls, linings; corrosion and abrasion resisting.

NUROX.
M-89, 3.3 C, Si, Mn, bal Fe.
For gears, shafts, housings; cast iron.

NUSHANK.
M-435, 0.45 C, 0.6 Mn, 0.4 Cr, 3.0 Ni, 0.25 Mo, bal Fe.
For tools shanks; wear resistant.

NUSITE.
M-1454; 0.9 C, 13 Co, bal Fe.
For permanent magnets, heat treated.

NUTHERM.
M-435; 0.70 C, 2 Mn, 1 Cr, 1.35 Mo, 0.30 Si, bal Fe.
For cold work tools and dies; low temperature air hardening.

NW 1.
M-459; C, Ni, bal Fe.
Water treated: 78,000-100,800 TS; 50,000-72,000 YS; 29-22 El.
For gears, shafts; water hardening.

NW 3.
M-459; C, Ni, bal Fe.
Oil treated: 85,000-114,000 TS; 65,000-85,000 YS; 24-18 El.
For gears, shafts; oil hardening, tough.

NW 5.
M-459; C, Ni, bal Fe.
Oil treated: 101,000-127,000 TS; 72,000-101,000 YS; 26-20 El.
For gears, shafts; oil hardening, tough.

N.W.S.
M-487, M-352; 0.9 C, 1.2 Mn, bal Fe.
For tools, dies; non-shrinkable.

NY.
French; 0.07-0.20 C, 0.35 Mn, 4-7 Ni, bal Fe.
Heat treated: 78,000-190,000 TS; 58,000-156,000 YS; 25-8 El.
For construction work, mine car wheels; compare with alloy Serial No. 6788.

NYBY 12-12.
M-1448; 0.08 C, 12 Cr, 12 Ni, bal Fe.
Annealed. 110,000 TS, 44,000 YS; 62 El; 65 RA; 140 Brin.
For valves.
Austenitic stainless steel, heat and corrosion resistant.

NYBY 12-12 FL.
M-1448, 0.05 max C, 12 Cr, 13 Ni, bal Fe.
Annealed 72,000 TS, 29,000 YS; 55 El; 50 RA; 160 Brin.
For pump and valve bodies.
Austenitic, corrosion resistant.

NYBY 14-12.
M-1448; 0.08-0.16 C, 12 Cr, 12 Ni, bal Fe.
For valves; corrosion resistant.

NYBY 16-13 LNb.
M-1448; 0.08 max C, 16 Cr, 13 Ni, Cb = 10 × C, bal Fe.
Annealed: 78,000 TS, 32,000 YS; 35 El; 50 RA; 190 Brin.
For welded chemical plant equipment, tanks, vessels, mixers
Austenitic stainless steel.

NYBY 16-14 LMoNbV
M-1448; 0.08 max C, 16 Cr, 14 Ni, 1.3 Mo, 0.7 V, Cb = 10 × C, 0.15 N, bal Fe.
Annealed: 78,000 TS; 39,000 YS, 30 El; 50 RA; 190 Brin.
For chemical plant equipment, acid mixers, agitators, retorts
Austenitic stainless steel

NYBY 16-16 LMoNb
M-1448; 0.08 max C, 16 Cr, 16 Ni, 1.8 Mo, Cb = 10 × C, bal Fe.
Annealed: 78,000 TS; 36,000 YS; 35 El, 50 RA; 190 Brin.
For welded structures, chemical plant equipment, tanks, acid containers.
Austenitic stainless steel.

NYBY 17-7.
M-1448, 0.12 max C, 17 Cr, 7 Ni, bal Fe.
Annealed 78,000 TS, 34,000 YS; 50 El; 55 RA; 180 Brin
For trailer and truck bodies, household utensils, diaphragms
Austenitic stainless steel type 301.

NYBY 17-12 UL.
M-1448; 0.03 max C, 17 Cr, 12 Ni, bal Fe.
Annealed: 70,000 TS; 28,000 YS; 40 El; 50 RA; 160 Brin.
For chemical plant equipment, stills, mixers, agitators, tanks
Austenitic stainless steel. Not hardenable.

NYBY 18-5-9.
M-1448; 0.10 max C, 18 Cr, 5 Ni, 9 Mn, 0.15 N, bal Fe.
Annealed: 85,000 TS; 47,000 YS; 45 El; 40 RA; 230 Brin.
For chemical plant equipment, auto and truck bodies, bus bodies.
Austenitic stainless steel Type 204. Not hardenable.

NYBY 18-8.
M-1448; 0.10 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant and dairy equipment, tanks; Type 302; stainless, austenitic.

NYBY 18-8EL.
M-1448, 0.05 max C, 18 Cr, 8 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El, 70 RA; 150 Brin
For chemical plant equipment, tanks, mixers; Type 304; stainless, austenitic

NYBY 18-8EMo.
M-1448; 0.12 max C, 18 Cr, 10 Ni, 2.5 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 50 El; 65 RA, 160 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

NYBY 18-8H
M-1448, 0.11-0.16 C, 18 Cr, 8 Ni, bal Fe.
Annealed· 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin
For chemical plant and dairy equipment, tanks; Type 302; stainless, austenitic.

NYBY 18-8L
M-1448, 0.06-0.08 C, 18 Cr, 8 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS; 60 El, 70 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 304, stainless, austenitic

NYBY 18-8L Mo
M-1448, 0.07-0.12 C, 18 Cr, 9.5 Ni, 1.5 Mo, bal Fe
Annealed 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin
For acid resistant chemical plant equipment; Type 316, stainless, austenitic

NYBY 18-8LMoNb
M-1448, 0.08 max C, 17 Cr, 10 Ni, 1.6 Mo, Ti = 5 × C, bal Fe.
Annealed: 78,000 TS, 32,000 YS; 40 El; 50 RA, 190 Brin
For welded chemical plant equipment, tanks, vessels, agitators
Austenitic stainless steel, stabilized, welding grade

NYBY 18-8-LNb
M-1448, 0.08 max C, 18 Cr, 10 Ni, Cb = 10 × C, bal Fe
Annealed 78,000 TS, 31,000 YS; 40 El, 50 RA; 190 Brin.
For welded chemical plant equipment, tanks, mixers, agitators, stills.
Austenitic Type 347 stainless steel, stabilized, welding grade

NYBY 18-8 LT.
M-1448, 0.08 max C, 18 Cr, 10 Ni, Ti = 5 × C, bal Fe.
Annealed: 78,000 TS, 31,000 YS, 40 El, 50 RA; 190 Brin
For welded chemical plant equipment, tanks, vessels, agitators, mixers.
Austenitic stainless steel Type 321, stabilized, welding grade.

NYBY 18-8T.
M-1448; 0.08 max C, 18 Cr, 8 Ni, Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin
For welded chemical plant equipment; Type 321; stainless, austenitic.

NYBY 18-8 UL.
M-1448; 0.03 max C, 19 Cr, 11 Ni, bal Fe.
Annealed: 78,000 TS; 29,000 YS; 50 El; 55 RA, 180 Brin.
For chemical plant equipment, tanks, vessels, mixers, filters, agitators.
Austenitic stainless steel. Type 304 L, welding grade.

NYBY 18-8 UMo.
M-1448, 0.03 max C, 17 Cr, 11 Ni, 1.6 Mo, bal Fe.
Annealed· 78,000 TS; 29,000 YS; 50 El; 55 RA; 180 Brin
For chemical plant and pickeling equipment, agitators, mixers, retorts
Austenitic stainless steel, acid resistant.

NYBY 18-10 E Mo.
M-1448, 0.06 max C, 17 Cr, 11 Ni, 2.3 Mo, bal Fe.
Annealed 78,000 TS; 29,000 YS; 50 El, 55 RA, 180 Brin.
For chemical plant equipment, vats, filters, agitators, digestors, tanks.
Austenitic stainless steel, acid resistant, not hardenable

NYBY 18-10L MoNb.
M-1448, 0.08 C, 17 Cr, 12 Ni, 2.3 Mo, Cb = 10 × C, bal Fe
Annealed· 78,000 TS, 34,000 YS, 40 El; 50 RA; 190 Brin.
For welded chemical plant equipment, mixers, tanks, vessels, retorts
Type 318 stainless steel, austenitic, stabilized, acid resistant

NYBY 18-10 LMoT.
M-1448; 0.08 C, 17 Cr, 12 Ni, 2.3 Mo, Ti = 5 × C, bal Fe
Annealed. 78,000 TS, 32,000 YS, 40 El, 50 RA, 190 Brin
For welded chemical plant equipment, tanks, mixers, agitators, vessels
Austenitic stainless steel, stabilized, welding grade, not hardenable

NYBY 18-12 EMo
M-1448, 0.06 C, 17 Cr, 12 Ni, 2.8 Mo, bal Fe
Annealed· 78,000 TS, 30,000 YS, 50 El; 55 RA, 180 Brin
For acid resistant chemical plant equipment, tanks, mixers, vats
Type 316 stainless steel, austenitic, acid resistant.

NYBY 18-12 LMo
M-1448; 0.08 max C, 17 Cr, 11 Ni, 2.8 Mo, bal Fe.
Annealed 78,000 TS, 30,000 YS, 50 El, 55 RA, 180 Brin.
For acid resistant chemical plant equipment, tanks, mixers, retorts.
Type 316 and Type 319 stainless steel Austenitic, acid resistant

NYBY 18-12 LMoNb
M-1448, 0.08 max C, 17 Cr, 13 Ni, 2.8 Mo, Cb = 10 × C, bal Fe
Annealed. 78,000 TS; 30,000 YS, 40 El, 50 RA; 190 Brin
For welded chemical plant equipment, tanks, vessels, mixers, agitators
Type 318 stainless steel, austenitic, stabilized, acid resistant.

NYBY 18-12 LMoT
M-1448; 0.08 max C, 17 Cr, 13 Ni, 2.8 Mo, Ti = 5 × C, bal Fe.
Annealed· 78,000 TS; 30,000 YS, 50 RA; 190 Brin.
For welded chemical plant equipment, tanks, vessels, agitators.
Austenitic stainless steel, stabilized, welding grade.

NYBY 18-12Mo.
M-1448; 0.10 max C, 19 Cr, 12 Ni, 3.5 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 180 Brin.
For acid resistant chemical plant equipment; Type 317; austenitic, stainless.

NYBY 18-12 UMo.
M-1448; 0.03 max C, 17 Cr, 12 Ni, 2.8 Mo, bal Fe.
Annealed: 78,000 TS; 30,000 YS; 50 El; 55 RA; 180 Brin.
For acid resistant chemical plant equipment, tanks, mixers, vats.
Type 316 L, stainless steel, austenitic, acid resistant.

NYBY 18-14 EMo.
M-1448; 0.06 max C, 19.0 Cr, 14.0 Ni, 3.5 Mo, bal Fe.
Annealed: 78,000 TS; 29,000 YS; 45 El; 45 RA; 190 Brin.
For chemical plant equipment, vats, tanks,
Austenitic, stainless steel, acid resistant.
Type 317 stainless steel, acid resistant

NYBY 18-14 LMo.
M-1448; 0.08 C, 18.5 Cr, 13 5 Ni, 3.5 Mo, bal Fe
Annealed: 128,000 TS; 44,000 YS; 62 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, mixers, tanks, retorts.
Austenitic stainless steel, Type 317, not hardenable.

NYBY 18-15 EMo.
M-1448; 0 06 C, 17 Cr, 15 Ni, 4 5 Mo, bal Fe.
Annealed: 78,000 TS; 29,000 YS; 45 El; 45 RA; 190 Brin.
For chemical plant equipment, vats, tanks.
Austenitic, stainless, acid resistant.
Type 317 stainless steel, not hardenable.

NYBY 20-12 L.
M-1448; 0.08 C, 20 Cr, 11 Ni, bal Fe.
Annealed: 78,000 TS; 32,000 YS; 50 El; 55 RA; 180 Brin.
For heat treating furnaces, salt pots.
Heat and corrosion resistant. Austenitic, Type 308 stainless steel.

NYBY 20-12 Si.
M-1448; 0.20 max C, 20 Cr, 12 Ni, 2 Si, bal Fe.
Annealed: 85,000 TS; 36,000 YS; 45 El; 45 RA; 190 Brin.
For heat treating furnaces and boxes, retorts, salt pots.
Austenitic. Heat and corrosion resistant Type 309B stainless steel.

NYBY 20-20
M-1448; 0.12 max C, 20 Cr, 20 Ni, bal Fe.
For valves, furnace parts and equipment; corrosion and heat resistant.

NYBY 23-14.
M-1448; 0.15 C, 23 Cr, 14 Ni, bal Fe.
Annealed: 121,000 TS; 48,500 YS; 50 El; 55 RA; 170 Brin.
For furnace parts, salt pots, oil refinery equipment.
Austenitic stainless steel. Type 309. Heat resistant.

NYBY 23-14L.
M-1448; 0.08 max C, 23 Cr, 13 Ni, bal Fe.
Annealed: 78,000 TS; 31,000 YS; 35 El; 50 RA; 190 Brin.
For heat treating boxes, furnace parts and equipment, retorts, valves.
Type 309S stainless steel. Austenitic, heat resistant.

NYBY 23-14 L Nb.
M-1448; 0 08 max C, 23 Cr, 14 Ni, Cb = 10 × C, bal Fe.
Annealed: 78,000 TS; 31,000 YS; 35 El; 50 RA; 200 Brin.
For furnace parts and equipment, welded structures and heat treating boxes, retorts.
Type 309 Cb stainless steel. Austenitic.
Weldable grade, heat resistant.

NYBY 25-21.
M-1448; 0.15 C, 25 Cr, 20 Ni, bal Fe.
Annealed· 132,000 TS, 52,500 YS, 45 El; 55 RA; 170 Brin.
For furnace parts, salt pots, heat treating boxes.
Austenitic stainless steel Type 310, heat resistant

NYBY 25-21 L
M-1448; 0.08 max C, 25 Cr, 20 Ni, bal Fe
Annealed: 78,000 TS; 31,000 YS; 45 El; 45 RA; 190 Brin.
For furnace parts and equipment, valves, pumps, gas turbine components, retorts
Type 310 S stainless steel, austenitic. Resists corrosion and oxidation.

NYBY 25-21 Si.
M-1448; 0 20 C, 25 Cr, 21 Ni, 2 Si, bal Fe.
Annealed 85,000 TS, 36,000 YS, 30 El, 35 RA; 200 Brin.
For furnace parts, heat treating boxes, retorts
Type 314 stainless steel, austenitic
Resists oxidation and carburization.

NYBY 25-24
M-1448; 0 25 max C, 25 Cr, 20 Ni, 1 5-3 0 Si, bal Fe.
For furnace parts and equipment, salt pots; Type 314; corrosion and heat resistant.

NYBY 25-24 EMo
M-1448, 0 06 C, 25 Cr, 25 Ni, 2 3 Mo, bal Fe.
Annealed 78,000 TS; 36,000 YS; 35 El; 45 RA; 180 Brin.
For furnaces, retorts, heat treating equipment.
Austenitic stainless steel Heat and acid resistant

NYBY 27-4
M-1448, 0.12 max C, 26 Cr, 4 Ni, bal Fe.
Cast· 90,000 TS; 65,000 YS; 2 El; 212 Brin
For cylinder liners, bushings, valve seats and bodies; Type CC50, heat resistant.

NYBY 27-5 Mo
M-1448, 0 10 C, 27 Cr, 5 Ni, 1.5 Mo, bal Fe.
Annealed: 138,000 TS, 101,000 YS; 29 El; 45 RA; 240 Brin
For furnace parts, retorts, heat treating boxes
Ferritic-austenitic stainless steel, heat resistant.

NYBY 0908 Mo
M-1448, 0 08 max C, 9 Cr, 1 Mo, bal Fe.
Annealed: 64,000 TS; 36,000 YS; 20 El; 50 RA; 190 Brinell.
For oil refinery equipment, heat exchangers.
Good oxidation resistance to 1400°F.
Resists sulphide corrosion.

NYBY-1408.
M-1448; 0.15 max C, 11.5-13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin
For turbine blades, dental and surgical instruments, valves; Type 410; corrosion resistant.

NYBY 1408 Al.
M-1448; 0.08 max C, 13 Cr, 0.2 Al, bal Fe.
Annealed: 58,000 TS; 31,000 YS; 20 El; 55 RA; 190 Brin.
For oil refinery equipment, stills.
Corrosion resistant. Type 405 stainless steel.

NYBY-1410.
M-1448; 0.15 max C, 11.5-13.5 Cr, 1.0 max Si, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, dental and surgical instruments, valves; Type 410; corrosion resistant.

NYBY-1410Mo.
M-1448; 0 08 C, 13 Cr, 1 Mo, bal Fe.
Annealed· 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For oil refinery and chemical plant equipment; corrosion resistant.

NYBY-1415.
M-1448, 0 13-0 18 C, 13 Cr, bal Fe
Annealed: 80,000 TS, 42,000 YS; 33 El; 68 RA; 170 Brin
For turbine blades, valves, cutlery, surgical instruments; Type 420; corrosion resistant.

NYBY-1415
M-1448; 0.13-0.18 C, 13 Cr, bal Fe.
Annealed: 80,000 TS; 42,000 YS; 33 El; 68 RA, 170 Brin.
For turbine blades, valves, cutlery, surgical instruments, Type 420; corrosion resistant.

NYBY-1415Mo
M-1448; 0 14 C, 13 Cr, 1 Mo, bal Fe.
Annealed· 75,000 TS, 40,000 YS; 35 El; 70 RA; 155 Brin
For oil refinery and chemical plant equipment; corrosion resistant.

NYBY 1420
M-1448; 0.20 C, 14 Cr, bal Fe
Annealed. 145,000 TS, 97,000 YS; 27 El; 60 RA; 225 Brin
Heat Treated. 220,000 TS, 8 El, 510 Brin.
For turbine blades, knives, surgical instruments, cutlery
Martensitic stainless steel, Type 420

NYBY-1425
M-1448; 0 19-0.25 C, 13 Cr, bal Fe.
Annealed 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin
For valves, cutlery, surgical instruments, knives; Type 420, corrosion resistant.

NYBY-1435.
M-1448; 0 27-0 35 C, 13 Cr, bal Fe
Annealed: 95,000 TS, 50,000 YS, 25 El; 55 RA; 195 Brin.
For valves, cutlery, surgical instruments, knives; Type 420, corrosion resistant.

NYBY 1706
M-1448, 0 06 max C, 17 Cr, bal Fe
Annealed· 63,000 TS; 40,000 YS; 20 El; 50 RA; 180 Brinell
For chemical plant and oil refinery equipment.
Corrosion resistant. Type 430 stainless steel Ferritic

NYBY 1708.
M-1448, 0.08 max C, 17 Cr, bal Fe
Annealed· 63,000 TS; 43,000 YS; 20 El, 50 RA; 200 Brin.
For furnace parts, chemical plant equipment.
Corrosion resistant.
Type 430 stainless steel. Ferritic.

NYBY 1708 Mo.
M-1448; 0 08 max C, 17 Cr, 1 0 Mo, bal Fe.
Annealed: 65,000 TS; 36,000 YS; 20 El; 50 RA; 200 Brin.
For chemical plant and oil refinery equipment.
Ferritic, corrosion resistant, not hardenable.

NYBY 1708 Mo Nb.
M-1448; 0.08 max C, 17 Cr, 1 0 Mo, Cb = 12 × C, bal Fe.
Annealed. 65,000 TS; 36,000 YS; 20 El; 50 RA; 200 Brin.
For welded furnace parts and heat treating boxes.
Ferritic, corrosion resistant, stabilized, welding grade.

NYBY 1708 MoT.
M-1448; 0 08 max C, 17 Cr, 1.0 Mo, Ti = 7 × C, bal Fe.
Annealed: 65,000 TS; 36,000 YS; 20 El; 50 RA; 200 Brin.
For welded furnace parts, heat treatment boxes.
Ferritic, corrosion resistant, weldable.

NYBY 1708 Nb
M-1448; 0.08 max C, 17 Cr, Cb = 12 × C, bal Fe.
Annealed: 63,000 TS; 36,000 YS; 20 El; 50 RA; 180 Brin.
For welded oil refinery equipment.
Corrosion resistant. Type 430 Cb stainless steel.
Ferritic Welding grade. Stabilized.

NYBY 1708 T.
M-1448; 0.08 max C, 17 Cr, bal Fe.
Annealed 64,000 TS; 36,000 YS; 20 El; 50 RA; 180 Brinell.
For auto trim, kitchen sinks, septic tanks, builder's hardware.
Ferritic stainless steel. Not hardenable by heat treatment.

NYBY-1710.
M-1448, 0 07-0.12 C, 17 Cr, bal Fe
Annealed· 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin
For oil refinery equipment, oil burners and heaters; Type 430; corrosion resistant

NYBY 1710 Si.
M-1448; 0 12 max C, 17 Cr, 2 2 Si, bal Fe.
Annealed 79,000 TS; 50,000 YS; 15 El; 230 Brin.
For retorts, salt pots, furnace parts.
Ferritic, corrosion resistant Type 442.
Not hardenable

NYBY 2520
M-1448, 0 20 max C, 25 Cr, 0.15 N, bal Fe.
Annealed: 78,000 TS; 44,000 YS, 15 El; 50 RA; 230 Brin
For furnace parts, heat treating boxes.
Ferritic Type 446 stainless steel, heat resistant

NYLOID-1
M-667, Core wire of Ni and a covering containing 13 Cr, 10 Fe, Mn, Cb, Mo, bal Ni.
Weld. 96,000-101,000 TS.
For welding 9% nickel steel
Low hydrogen welding electrode.

O-6 GRAPHITIC.
M-24, 1.45 C, 0 8 Mn, 1.05 Si, 0.25 Mo, bal Fe.
For cold working, forming, shaping and drawing dies
AISI Type O6 oil hardening tool steel.

OAKES TRODALOY 1.
M-1094; 0.4 Be, 2 6 Co, bal Cu.
Cast· 90,000 TS; 50,000 YS; 10-15 El.
Wire 125,000 TS; 60,000 YS, 8-15 El.
For springs, age hardenable.

O.B. ALLOY NO. 1 A
M-94, 88 Cu, 8 Sn, 4 Zn.
Cast. 41,400 TS; 20,300 YS; 28 El; 70 Brin.
Used in conjunction with non-ferrous catenary materials; electric motor bearings; Iz-14.2.

O.B. ALLOY NO. 11.
M-94; 94 Cu, 2 Sn, 3 Pb, 4 Zn.
Cast: 31,000 TS; 11,000 YS; 35 El; 49 Brin.
For electric apparatus; free-cutting.

O.B. ALLOY NO. 16.
M-94; 95.75 Cu, 5 Sn, 0.22 Pb.
Cast: 36,300 TS; 16,400 YS; 26 El; 64 Brin.
For trolley wheels; Iz-20.

O.B. ALLOY NO 25.
M-94; 90 Cu, 7 Al, 3 Si.
Cast. 74,500 TS, 54,600 YS; 68 El; 163 Brin.
Used in conjunction with catenary construction; Iz-9 7.

O.B. ALLOY NO. 26.
M-94, 89 Cu, 6 Sn, 1.5 Pb, 3.5 Zn.
Cast: 38,000 TS; 17,000 YS; 30 El; 65 Brin.
For valves; Navy M.

OB ALLOY NO. 27.
M-94; 81 5 Cu, 14.5 Zn, 4 Si.
Cast: 65,000 TS, 34,000 YS; 26 El; 160 Brin.
For trolley shoes, valve parts; Tombasil.

OB ALLOY NO 29.
M-94; 57.5 Cu, 0 5 Sn, 0.25 Pb, 39 25 Zn, 1 Al, 1 Fe.
Cast: 77,000 TS, 31,500 YS; 26 El; 120 Brin.
For splicers, fair electrical conductivity.

O.B. ALLOY U-5
M-94; 85 Cu, 5 Sn, 5 Pb, 5 Zn.
34,750 TS; 14,800 YS, 25 El, 59 Brin.
For valves, electrical appliances; Ounce Metal.

OCTANIUM.
M-1160, 40 Co, 15 5 Ni, 20 Cr, 7 Mo, 2 Mn, 15 Fe, 0.03 Be, 0 15 C
Heat treated 368,000 TS
For fountain pen nibs; noncorrosive, non-magnetic.

ODESSA.
33.25 Ag, 42 5 Cu, 15.75 Zn, 8 5 Ni.
For silver solder; corrosion resistant.

OERDERLIN FMB.
F-1420; 0.1 C, 18 Cr, 8 Ni, 2 5-3 0 Mo, bal Fe.
Rolled 58,000-78,000 TS, 29,000-32,000 YS, 12-18 El; 170-200 Brin.
For chemical plant equipment; stainless, acid resistant, austenitic

OERDERLIN FST.
M-1420, 0 1 C, 18 Cr, 8 Ni, Si, Mn, W, bal Fe
Annealed: 65,000-85,000 TS, 36,000-40,000 YS; 15-20 El; 160-200 Brin
For chemical plant equipment, stainless, austenitic

OERSTIT 30.
M-459, 1 C, 3 Cr, bal Fe
For magnets, hardened for max permeability

OERSTIT 35
M-459, M-1496; 1 C, 4 5 Cr, 1 Mn, bal Fe.
For permanent magnets, workable, max service temperature 175°F

OERSTIT 40
M-459; 1 C, 4 Cr, 0 5 W, 2 Co, bal Fe.
For magnets; hardened for max permeability.

OERSTIT 50.
M-459; 1 C, 8 Cr, 1.2 Mo, 6 Co, bal Fe.
For magnets; hardened for max permeability.

OERSTIT 60.
M-459; 1 C, 8.5 Cr, 1.5 Mo, 10.5 Co, bal Fe.
For magnets; hardened for max permeability.

OERSTIT 70.
M-459; 1 C, 8.5 Cr, 1.5 Mo, 15.5 Co, bal Fe.
For magnets; hardened for max permeability.

OERSTIT 90G.
M-459, M-1496; 0 04 C, 22 Ni, 2 Cu, 11.5 Al, 0.5 Ti, bal Fe.
For permanent magnets; cast.

OERSTIT 90W
M-459; 0.9 C, 4.5 Cr, 0.3 Mo, 4.5 W, 30 Co, bal Fe.
For magnets.

OERSTIT 120.
M-459; 0.04 C, 27 Ni, 2 Cu, 13 Al, 0.5 Ti, bal Fe.
For permanent magnets; cast.

OERSTIT 120 Cu.
M-459; 0 04 C, 25 Ni, 13 Al, 4 Cu, bal Fe.
For magnets; cast.

OERSTIT 120 K.
M-459, 13 Al, 26 Ni, 4 Co, 3 Cu, 1 Ti, bal Fe.
For electrical and magnetic equipment.
Permanent magnet. Isotropic.

OERSTIT 130.
M-459, 0.04 C, 26 Ni, 4 5 Co, 12 Al, 4 5 Cu, bal Fe.
For magnets; cast

OERSTIT 160
M-459; 0 04 C, 24 Ni, 9.5 Co, 11 Al, 4 Cu, bal Fe
For magnets, cast.

OERSTIT 160K
M-459, M-1496, 22 Ni, 17 Co, 10 Al, 3 Cu, 1 Ti, bal Fe
For permanent magnets.

OERSTIT 160R
M-459, M-1496, 22 Ni, 14 Co, 10 Al, 3 Cu, 1 Ti, bal Fe
For permanent magnets

OERSTIT 190
M-459, M-1496, 20 Ni, 16 Co, 9 Al, 3 Cu, 1 Ti, bal Fe
For permanent magnets

OERSTIT 190 K
M-459, 10 Al, 21 Ni, 17 Co, 3 Cu, 1 Ti, bal Fe
For electrical and magnetic equipment.
Permanent magnet Anisotropic

OERSTIT 250
M-459, 0 04 C, 1 Si, 18 Ni, 25 Co, 7 Al, 3 Cu, 5.5 Ti, bal Fe
For permanent magnets; cast.

OERSTIT 260.
M-459, 7 Al, 15 Ni, 28 Co, 5 Cu, 8 Ti, bal Fe.
For electrical and magnetic equipment.
Permanent magnet Isotropic

OERSTIT 300
M 459, M-1496, 17 Ni, 24 Co, 7 5 Al, 3 Cu, 2.5 Ti, bal Fe
For permanent magnets.

OERSTIT 350.
M-459, M-1496; 15 Ni, 30 Co, 7.5 Al, 4 Cu, 5 Ti, bal Fe.
For permanent magnets.

OERSTIT 360.
M-459, 0.04 C, 15 Ni, 23.5 Co, 8 Al, 3 Cu, 1 Ti, bal Fe
For magnets; cast.

OERSTIT 400
M-459, 0 04 C, 15 Ni, 22 Co, 8 Al, 4 Cu, bal Fe.
For magnets; cast.

OERSTIT 400K
M-459, M-1496, 14 Ni, 24 Co, 8 Al, 3 Cu, 0.5 Ti, bal Fe.
For permanent magnets.

OERSTIT 400R.
M 459, M-1496; 14 Ni, 24 Co, 8 Al, 3 Cu, 0.5 Ti, bal Fe
For permanent magnets

OERSTIT 450
M-459; 7 Al, 15 Ni, 30 Co, 4 Cu, 5 Ti, bal Fe
For electrical and magnetic equipment.
Permanent magnet Anisotropic

OERSTIT 450 K
M-459, 7 Al, 14 Ni, 42 Co, 4 Cu, 8 Ti, bal Fe.
For electrical and magnetic equipment.
Permanent magnet. Anisotropic.

OERSTIT 500.
M-459, M-1496, 14 Ni, 24 Co, 8 Al, 3 Cu, 0.5 Ti, bal Fe.
For permanent magnets; high permeability.

OERSTIT 600
M-459, M-1496; 14 Ni, 24 Co, 8 Al, 3 Cu, 0.5 Ti, bal Fe
For magnets, maximum service temperature 660°F, cast and sintered alloy.

OERSTIT 700.
M-459; 21 Ni, 12 Co, 10 Al, 6 Cu, bal Fe.
For permanent magnets, high permeability

OERSTIT 800
M-459, 18 Ni, 19 Co, 9 Al, 4 Cu, 4 Ti, bal Fe.
For permanent magnets; high permeability.

OERSTIT 900 CP
M-459, 78 Pt, bal Co
For electrical and magnetic equipment
Permanent magnet Isotropic

OERSTIT 1000
M 459, 19 or 35 Co, 17.5 Ni, 6-7.5 Al, 3 Cu, 7-8 Ti, bal Fe
For magnetic and electrical equipmen:
Permanent magnet

OERSTIT SPEZIAL
M-459, C, Co, Al, Cu
For permanent magnets, high permeability

OFHC COPPER
M 558, 99.98 Cu
For electrical equipment; oxygen free, high conductivity

OFHC COPPER 101.
M-8, 99.9 + Cu
Hard 48,000 TS, 40,000 YS, 15 El, 83 Brin
Soft 32,000 TS; 10,000 YS; 50 El, 42 Brin.
For electrical apparatus, high conductivity, oxygen free

OFHC COPPER 102
M 8; 99.95 min Cu.
Hard 55,000 TS, 50,000 YS; 10 El; B 60 Rock.
Soft 32,000 TS, 10,000 YS, 55 El; F 40 Rock.
For radar and electronic components, waveguide tubes, Dumet wire, connectors.
Elect. cond 101. Corrosion resistant

OFHC SULFUR COPPER
M-8; 0.20-0.60 S, 99.90 min Cu + S.
½H-temper: 42,000 TS; 36,000 YS; 25 El, 73 Brin.
Hard. 48,000 TS; 42,000 YS, 15 El; 83 Brin.
For contact pins and inserts, screw machine products; high termal and electrical conductivity, free-cutting, corrosion resistant.

O H 38
M-841; 15 Zn, 2-3 Cu, 2 Si, bal Al.
Cast: 30,000 TS; 17,500 YS; 2.5 El; 65 Brin.
For light alloy parts, gear guards.

OHIO DIE FM.
M-115; 1.55 C, 12 Cr, 0.8 V, 0.4 Co, 0.8 Mo, bal Fe
Annealed: 105,000 TS; 60,000 YS; 13 El, 18 RA, 212 Brin
For roll threading dies, punches, gages, shears; air hardening, free-cutting.

OHIO DIE STEEL.
M-34, M-115; 1.55 C, 12 Cr, 0.85 V, 0.8 Mo, bal Fe.
105,000 TS; 60,000 YS; 13 El; 18 RA; 212 Brin
For dies, roller threading dies, punches, gages, shear blades; non-warping, wear resisting.

OHIOLOY 1045.
M 95, 0.40-0.50 C, 0.60-0.90 Mn, 0.60 max Si, bal Fe
Carbon steel casting, 3 strength ranges; 80,000 to 100,000 min TS, 40,000-70,000 min YS; 18-10 El, 163-269 Brin
Weldable; for industrial machinery and tools as pinions, sheaves, sprockets, rollers, gears.
AISI 1045; SAE 0050 A and 0050 B
Formerly Ohio 0-1-50.

OHIOLOY 1670
M-95, 0.60-0.75 C, 0.75-1.0 Mn, 0.3-0.7 Si, 1.3-1.7 Cr, 0.35-0.65 Mo, bal Fe.
Alloy steel casting, hardened to 375 min Brin
For abrasive service in cement mills and similar operations Formerly Ohio 0-16.

OHIOLOY 2300
M-95, 0.50 C, 45 Ni, 25 Cr, 1.5 Si, 1.5 Mn, W, Co, bal Fe
High temperature alloy, non-magnetic.
Cast, room temp 60,875 TS, 60,875 YS; 2 El; 220 Brin At 1800°F· 23,500 TS; 18,000 YS; 27 El.
Weldable (certain conditions), for high temperature applications, resistant to scaling and to creep; for heat treat equipment.

OHIOLOY 4130
M-95; 0.20-0.30 C, 0.75-1.0 Mn, 0.30-0.60 Si, 0.8-1.0 Cr, 0.20-0.40 Mo, bal Fe.
Low alloy steel casting, 80,000 min TS, 50,000 min YS, 22 min El; 183-224 Brin
Weldable, hardenable; for industrial machinery, ordnance, mining equipment as gears, knuckles.
ASTM A148-60 80-50, AISI 4130; SAE 080.
Formerly OHIO 0-41-30.

OHIOLOY 4140
M-95; 0.35-0.45 C, 0.75-1.0 Mn, 0.30-0.60 Si, 0.8-1.1 Cr, 0.20-0.40 Mo, bal Fe
Low alloy steel casting· 105,000 min TS; 85,000 min YS, 17 min El; 229-269 Brin.
Weldable with care, hardenable, for strong parts in industrial as gears, spindles, housings, in construction, road building, ordnance.
ASTM A148-60 105-85; AISI 4140, SAE 0105.
Formerly OHIO 0-41 40

OHIOLOY 4330
M-95, 0.26-0.32 C, 0.65-0.85 Mn, 0.6 max Si, 1.65-2.0 Ni, 0.7-0.9 Cr, 0.2-0.3 Mo, bal Fe.
Alloy steel casting, 100,000 min TS; 65,000 min YS; 17 min El; 202-248 Brin
Weldable, hardenable; for high quality castings for industrial equipment. AISI 4330

OHIOLOY 4330 E Modified OHIOLOY 4330; variations in composition, heat treatment and properties to meet certain specifications.

OHIOLOY 4330 A. Modified OHIOLOY 4330; variations in composition, heat treatment and properties to meet certain specifications.

OHIOLOY 4330 B. Modified OHIOLOY 4330; variations in composition, heat treatment and properties to meet certain specifications.

OHIOLOY 4330 C. Modified OHIOLOY 4330; variations in composition, heat treatment and properties to meet certain specifications.

OHIOLOY 8035.
M-95; 0.30-0.40 C, 1.2-1.4 Mn, 0.6 max Si, 0.2-0.3 Mo, bal Fe.
Low alloy steel casting; 90,000 min TS; 60,000 min YS; 18 min El; 192-241 Brin.
Weldable, hardenable; small casting to be hardened, or large castings not hardened, for construction equipment
Formerly OHIO 0-34A.

OHIOLOY 8035 H Same composition as OHIOLOY 8035, but with modified heat treatments and properties to meet varying industrial or government specifications.

OHIOLOY 8035 E. Same composition as OHIOLOY 8035, but with modified heat treatments and properties to meet varying industrial or government specifications.

OHIOLOY 8035 F. Same composition as OHIOLOY 8035, but with modified heat treatments and properties to meet varying industrial or government specifications.

OHIOLOY 8730.
M-95; 0.25-0.35 C, 0.75-1.0 Mn, 0.30-0.60 Si, 0.4-0.7 Ni, 0.4-0.6 Cr, 0.2-0.3 Mo, bal Fe
Low alloy steel casting: 80,000 min TS, 50,000 min YS; 22 min El, 183-229 Brin
Weldable, hardenable; for small to medium size castings to be hardened for industrial machinery, construction equipment, ordnance.
QQ-S-681d 80-50; AISI 8730; SAE 080
Formerly OHIO 0-15

OHIOLOY 8730 B. Same composition as OHIOLOY 8730 but with modified heat treatment and properties to meet varying industrial or government specifications.

OHIOLOY 8730 H. Same composition as OHIOLOY 8730 but with modified heat treatment and properties to meet varying industrial or government specifications.

OHIOLOY 8730 K Same composition as OHIOLOY 8730 but with modified heat treatment and properties to meet varying industrial or government specifications

OHIOLOY 8730 M Same composition as OHIOLOY 8730 but with modified heat treatment and properties to meet varying industrial or government specifications.

OHIOLOY 8740.
M-95; 0.35-0.45 C, 0.75-1.0 Mn, 0.3-0.6 Si, 0.4-0.7 Ni, 0.4-0.6 Cr, 0.2-0.3 Mo, bal Fe
Low alloy steel casting: 100,000 min TS; 65,000 min YS; 17 min El; 202-248 Brin
Weldable with care, hardenable; for medium size casting, usually to be hardened, for ordnance, construction equipment, mining, railroad.
AISI 8740; Formerly OHIO 0-15-45-C.

OHIOLOY 8740-O. Same composition as OHIOLOY 8740 but with modified heat treatment and properties to meet varying industrial or government specifications.

OHIOLOY 8740-S. Same composition as OHIOLOY 8740 but with modified heat treatment and properties to meet varying industrial or government specifications.

OHIOLOY A-6.
M-95; 1.0-1.2 C, 1.0 max Mn, 1.5 max Si, 25-31 Cr, 1.5 max Mo, 3-6W, 7.5 max Fe, bal Co.
Abrasion and wear resistant.
For worms, sleeves, spacers.
Reference: Stellite 6; Formerly FAHRITE C-6

OHIOLOY A-28.
M-95; 3.0 max C, 1.25 Mn, 2.0 Si, 26-30 Cr, 4.0 max Ni, bal Fe.
Abrasion resistant and corrosion resistant casting, for catalyst plates, cement mill, refinery service.
Formerly FAHRITE HC 28

OHIOLOY B.
M-95; 0.12 C, 1.0 Mn, 1.0 max Si, 1.0 max Cr, 26-30 Mo, 4.0-6.0 Fe, 0.2-0.6 V, 2.5 max Co, bal Ni.
Heat and corrosion resistant casting.
Cast 72,000 TS; 46,000 YS, 6 El.
For turbine blades, bolting material, impellers, shafting; resistant to hot hydrochloric acid.
ASTM B332-58T, Reference: Hastelloy B.
Formerly FAHRITE C-708.

OHIOLOY C.
M-95, 0.12 C, 1.0 Mn, 1.0 max Si, 15.5-17.5 Cr, 16-18 Mo, 2.5 max Co, 3.75-5.25 W, 4.5-7.5 Fe, 0.2-0.6 V, bal Ni
Heat and corrosion resistant casting.
Cast: 72,000 TS, 46,000 YS; 4 El
High temperature trays, shafts, conveyor chains, equipment for chemical plants.
ASTM B332-58T; Reference: Hastelloy C
Formerly FAHRITE C-70C

OHIOLOY C5
M-95, 0.20 max C, 0.40-0.70 Mn, 0.75 max Si, 4.0-6.5 Cr, 0.45-0.65 Mo, bal Fe.
Cr-Mo alloy steel casting, 90,000 min TS; 60,000 min YS; 18 min El; 192-241 Brin.
Weldable, hardenable, for industrial castings of larger size, pressure castings for service temperatures below 1200°F
ASTM A217-60T C5, AISI 501
Formerly OHIO 0-4-20

OHIOLOY C12
M-95, 0.20 max C, 0.35-0.65 Mn, 1.0 max Si, 8.0-10.0 Cr, 0.9-1.1 Mo, bal Fe
Cr-Mo alloy steel casting, 90,000 min TS; 60,000 min YS, 18 min El; 192-241 Brin.
Weldable, hardenable; for industrial castings, of larger size and better corrosion resistance; for use to 1200°F
ASTM A217-60T C12, Formerly OHIO 0-11-20.

OHIOLOY C-16
M-95; 0.30-0.35 C, 0.75-1.25 Mn, 0.8-1.2 Si, 16-18 Cr, 1.2-1.7 Ni, bal Fe
Annealed: 125,000 TS; 95,000 YS; 20 El; C 24 Rock
Hardenable to 180,000-200,000 TS.
For cutter bars, hammers, impellers, pump shafts, marine hardware. Abrasion and corrosion resistance.
AISI 431; Formerly FAHRITE C-16.

OHIOLOY C-355.
M-95; 0.08-0.12 C, 0.75-1.1 Mn, 0.45-0.75 Si, 14.5-15.5 Cr, 4.0-4.5 Ni, 2.0-2.6 Mo, 0.07-0.11 N, bal Fe
Age hardenable, stainless.
Cast: 150,000 TS; 95,000 YS; 10 El.
For compressor blades, aircraft castings.
Reference AM-355; Formerly C-355.

OHIOLOY C-411.
M-95; 0.30 C, 1.5 Mn, 1.0-2.0 Si, 62-66 Ni, 1.0-3.0 Cb, 26-33 Cu.
Corrosion resistant casting.
Cast: 65,000 TS; 32,500 YS; 25 El.
For marine hardware, pulp and paper equipment, valves, fasteners.
QQ-N-288 E; Reference: Monel.
Formerly FAHRITE C-95E.

OHIOLOY CA-15.
M-95; 0.15 max C, 1.0 Mn, 1.5 Si, 11.5-14.0 Cr, 1.0 max Ni, 0.5 max Mo, bal Fe.
Corrosion resistant casting, weldable.
Annealed: 90,000 TS; 65,000 YS; 18 El.
Hardenable to 189-400 Brin.
For pump casings, liners, valve trim, fittings. burner tips, skimmer ladles.
ACI CA-15; AISI 410; SAE 60410.
Formerly FAHRITE C-12.

OHIOLOY CA-40.
M-95; 0.20-0.40 C, 1.0 Mn, 1.5 Si, 11.5-14.0 Cr, 1.0 max Ni, 0.5 max Mo, bal Fe.
Corrosion resistant casting.
Annealed: 90,000 TS; 65,000 YS; 18 El.
Hardenable up to 500 Brin.
For choppers, cutting blades, cylinder liners, pump parts, molds, dies, valve trim.
ACI CA-40; AISI 420; SAE 60420.
Formerly FAHRITE C-12-40.

OHIOLOY CB-7CU.
M-95; 0.06 max C, 0.70 max Mn, 0.5-1.0 Si, 15.7-16.7 Cr, 3.5-4.75 Ni, 0.10-0.35 Cb, 2.5-3.5 Cu, bal Fe.
Corrosion resistant, age hardenable.
Cast. 170,000 TS; 155,000 YS; 10 El.
For valves, shafts, fuel controls, compressor parts, pulp and paper equipment.
ACI CB-7Cu, SAE 60432; Reference 17-4PH.
Formerly FAHRITE C-17-4C.

OHIOLOY CB-30
M-95; 0.30 C, 1.0 Mn, 1.5 Si, 18-21 Cr, 2.0 max Ni, bal Fe.
Corrosion resistant casting, weldable.
Annealed: 65,000 TS; 30,000 YS.
Hardenable up to 500 Brin.
For furnace brackets, hangers, pump parts, valve parts.
ACI CB-30; AISI 431; SAE 60442.
Formerly FAHRITE C-18.

OHIOLOY CC-50.
M-95; 0.50 C, 1.0 Mn, 1.5 Si, 26-30 Cr, 4.0 max Ni, bal Fe
Corrosion resistant casting.
Annealed: 55,000 TS.
For bushings, cylinder liners, pump casings, impellers; good corrosion resistance.
ACI CC-50; AISI 446; SAE 60446.
Formerly FAHRITE C-28.

OHIOLOY CD-4MCU.
M-95; 0.04 max C, 1 max Mn, 1 max Si, 25-27 Cr, 4.75-6.0 Ni, 1.75-2.25 Mo, 2.75-3.25 Cu, bal Fe.
Corrosion and heat resistant, age hardenable.
Cast: 110,000 TS; 95,000 YS; 10 El.
For valve trim, pumps, gears, high pressure parts, pulp and paper equipment.
ACI CD-4MCu; SAE 60328; Formerly FAHRITE C-4.

OHIOLOY CE-30.
M-95; 0.30 C, 1.5 Mn, 2.0 Si, 26-30 Cr, 8-11 Ni, bal Fe.
Corrosion resistant casting.
Annealed: 80,000 TS; 40,000 YS; 10 El.
For digestor fittings, fractionating towers, pump bodies and casings, valve bodies.
ACI CE-30; AISI 312; SAE 60312.
Formerly FAHRITE C-73.

OHIOLOY CF-3.
M-95; 0.03 max C, 1.5 Mn, 2.0 Si, 17-21 Cr, 8-12 Ni, bal Fe.
Corrosion resistant casting, weldable.
Cast: 65,000 TS; 28,000 YS; 35 El.
For autoclaves, pump parts, spray nozzles, heating coils, welded assemblies.
ACI CF-3; AISI 304L; formerly FAHRITE C-8-3.

OHIOLOY CF-3M.
M-95; 0.03 max C, 1.5 max Mn, 1.5 max Si, 17-21 Cr, 9-13 Ni, 2-3 Mo, bal Fe.
Austenitic, stainless, heat resistant.
Cast: (min.) 70,000 TS; 30,000 YS; 30 El.
For centrifuges, fittings, pump parts.
ACI CF-3M; AISI 316L; formerly FAHRITE C-8-3M.

OHIOLOY CF-8.
M-95; 0.08 C, 1.5 Mn, 2.0 Si, 18-21 Cr, 8-11 Ni, bal Fe.
Austenitic corrosion resistant casting.
Cast: 70,000 TS; 30,000 YS; 35 El.
For pump parts, valve parts, spray nozzles, filter press plates, autoclaves.
ACI CF-8; AISI 304; SAE 60304.
Formerly FAHRITE C-8-7.

OHIOLOY CF-8C.
M-95, 0.08 C, 1.5 Mn, 2.0 Si, 18-21 Cr, 9-12 Ni, Cb = 8 × %C min, bal Fe.
Stabilized austenitic stainless steel casting.
Cast. 70,000 TS; 30,000 YS; 30 El.
For pump parts, valves, stainless welded assemblies, chemical plant equipment.
ACI CF-8C, AISI 347; SAE 60347.
Formerly FAHRITE C-8Cb.

OHIOLOY CF-8M
M-95; 0.08 C, 1.5 Mn, 1.5 Si, 18-21 Cr, 9-12 Ni, 2-3 Mo, bal Fe.
Austenitic, stainless, heat resistant.
Cast: 70,000 TS, 30,000 YS; 30 El.
For agitators, spray nozzles, valve bodies, for food and chemical plants; elevated temperature equipment.
ACI CF-8M, AISI 316, SAE 60316.
Formerly FAHRITE C-8-7M.

OHIOLOY CF-16F.
M-95; 0.16 max C, 1.5 max Mn, 2 max Si, 0.17 max P, 0.04 max S, 18-21 Cr, 9-12 Ni, 1.5 max Mo, 0.20-0.35 Se, bal Fe.
Austenitic, stainless, free-machining.
Cast: (min) 70,000 TS, 30,000 YS; 25 El
For bearings, bushings, hardware, pump and machinery parts, valves.
ACI-CF; AISI 303; SAE 60303; Formerly FAHRITE C-8-16F.

OHIOLOY CF-16FA.
M-95; 0.15 max C, 1.5 max Mn, 2 max Si, 0.04 max P, 0.2-0.4 S, 18-21 Cr, 9-12 Ni, 0.4-0.8 Mo, bal Fe.
Free-machining, stainless, austenitic.
Cast: (min.) 70,000 TS; 30,000 YS; 25 El.
For bushings, bearings, hardware, pump and machinery parts, valves.
ACI-CF-16FA; AISI 303; SAE 60303a; Formerly FAHRITE CF-16 Fa.

OHIOLOY CF-20.
M-95; 0.20 C, 1.5 Mn, 2.0 Si, 18-21 Cr, 8-11 Ni, bal Fe.
Austenitic corrosion resistant casting.
Cast: 70,000 TS; 30,000 YS; 30 El.
For cylinder liners, pumps, valve parts, street markers, pulp and paper equipment.
ACI CF-20; AISI 302; SAE 60302.
Formerly FAHRITE C-8 20.

OHIOLOY CG-12.
M-95, 0.12 C, 1.5 Mn, 2.0 Si, 20-23 C, 10-13 Ni, bal Fe.
Austenitic, stainless, heat resisting.
Cast: 70,000 TS; 28,000 YS; 35 El
For pump parts, valve parts, furnace and heat treat equipment.
ACI CG-12, AISI 306; Formerly FAHRITE C-10

OHIOLOY CH-20
M-95, 0.20 C, 1.5 Mn, 2.0 Si, 22-26 Cr, 12-15 Ni, bal Fe
Austenitic, stainless, heat resisting
Cast: 70,000 TS; 30,000 YS, 30 El.
For digester fittings, valves, chemical processing equipment, furnace and heat treat parts
ACI CH-20; AISI 309, SAE 60309,
Formerly FAHRITE C-3.

OHIOLOY CK-20
M-95, 0.20 C, 2.0 Mn, 2.0 Si, 23-27 Cr, 19-22 Ni, bal Fe
Austenitic, stainless, heat resisting
Cast: 65,000 TS; 28,000 YS; 30 El
For filter press parts, chemical and food equipment, furnace and heat treat parts
ACI CK-20; AISI 310, SAE 60310,
Formerly FAHRITE C-63.

OHIOLOY CN-7M
M-95, 0.07 C, 1.5 Mn, 1.5 Si, 19-22 Cr, 28-30 Ni, 2-2.75 Mo, 3.0-3.5 Cu, bal Fe.
Austenitic, very good stainless properties.
Cast 62,500 TS, 25,000 YS; 30 El.
For pickling rolls, equipment for food processing, pulp and paper, plastics, paint industries
ACI CN-7M; SAE 60332;
Formerly FAHRITE C-20

OHIOLOY H-611.
M-95; 0.20-0.50 C, 2.0 max Mn, 2.0 Si, 14-16 Cr, 70-72 Ni, bal Fe
High temperature corrosion resistant casting
For muffle tubes, heat exchangers, oxygen nozzles in glass making, furnace parts
Reference-Inconel; Formerly FAHRITE N-88

OHIOLOY H-810
M-95; 0.45 max C, 2.0 max Mn, 2.0 Si, 19-21 Cr, 31-33 Ni, bal Fe.
High temperature corrosion resistant casting.
For parts used at high temperature, heat treat parts, furnace parts
Reference-Incoloy; Formerly FAHRITE N-53

OHIOLOY HC
M-95; 0.50 max C, 1.0 Mn, 2.0 Si, 26-30 Cr, 4 max Ni, 0.50 max Mo, bal Fe
Ferritic, corrosion resistant, heat resistant.
Cast: 55,000 min TS
For salt pots, electrodes, tuyers, parts for elevated temperature operation.
ACI HC, AISI 446; SAE 70446
Formerly FAHRITE C-28.

OHIOLOY HD.
M-95, 0.50 max C, 1.5 Mn, 2.0 Si, 26-30 Cr, 4-7 Ni, 0.50 max Mo, bal Fe.
High temperature, corrosion resistant casting.
Cast: 75,000 TS; 35,000 YS; 8 El.
For furnace parts, salt pots; resists sulphur atmospheres; light loads to 1900°F.
ACI HD, AISI 327; SAE 70327.
Formerly FAHRITE N-83

OHIOLOY HE
M-95, 0.20-0.50 C, 2.0 Mn, 2.0 Si, 26-30 Cr, 8-11 Ni, 0.50 max Mo, bal Fe.
High temperature, corrosion resistant casting.
Cast 85,000 TS; 40,000 YS; 9 El.
For furnace parts, smelting, and elevated temperature operation; resists sulphur atmosphere and scaling; usable to 2000°F
ACI HE, AISI 312, SAE 70312.
Formerly FAHRITE N-73

OHIOLOY HF
M-95; 0.20-0.40 C, 2.0 Mn, 2.0 Si, 18-23 Cr, 8-12 Ni, 0.5 max Mo, bal Fe
High temperature, corrosion resistant casting.
Cast 70,000 TS, 35,000 YS, 25 El.
For tube supports, beams, brackets in cement mills, furnaces, glass equipment, refineries.
Usable to 1600°F
ACI HF, AISI 302B, SAE 70308. Formerly FAHRITE N 8

OHIOLOY HH
M-95, 0.20-0.50 C, 2.0 Mn, 2.0 Si, 24-28 Cr, 11-14 Ni, 0.5 max Mo, bal Fe
High temperature, corrosion resistant casting
Cast 75,000 TS, 35,000 YS, 10 El
Usable to 2000°F
For tube supports and beams in oil refineries, heat treat plants, ore roasting equipment
ACI HH, AISI 309; SAE 70309
Formerly FAHRITE N-3

OHIOLOY HH 45
M-95 0.35-0.45 C, 2.0 Mn, 1.75 Si, 23-28 Cr, 10-14 Ni, bal Fe
High temperature, corrosion resistant casting
Aged 24 hours, 1400°F 80,000 TS, 4 El
Usable to 2000°F
For equipment operating at high temperature in glass factories, furnaces, petroleum plants
ACI HH, AISI 309, SAE 70309
Formerly FAHRITE N 3-45

OHIOLOY HI
M-95, 0.20-0.50 C, 2.0 Mn, 2.0 Si 26-30 Cr, 14-18 Ni 0.5 max Mo, bal Fe
High temperature, corrosion resistant casting
Cast 70,000 TS, 35,000 YS, 10 El
For cast retorts for cyaniding, heat treating, brazing fixtures melting magnesium; weldable, usable to 2150°F
ACI HI, Formerly FAHRITE N-4.

OHIOLOY HK
M-95, 0.20-0.60 C, 2.0 Mn, 2.0 Si, 24-28 Cr, 18-22 Ni, 0.5 max Mo, bal Fe.
High temperature, corrosion resistant casting
Cast 65,000 TS, 35,000 YS, 10 El
For tube supports, beams, fittings, tubing in chemical and oil refineries, furnaces, weldable, usable to 2100°F
ACI HK, AISI 310, SAE 70310.
Formerly FAHRITE N-63

OHIOLOY HL
M-95, 0.20-0.60 C, 2.0 Mn, 2.0 Si, 28-32 Cr, 18-22 Ni, 0.5 max Mo, bal Fe
High temperature corrosion resistant casting.
Cast: 65,000 TS; 35,000 YS; 10 El
For gas dissociation equipment, furnace equipment, chemical and petroleum plants; weldable, usable to 2100°F.
ACI HI ; SAE 70310A; Formerly FAHRITE N 43.

OHIOLOY HN.
M-95; 0.20-0.50 C, 2.0 Mn, 2.0 Si, 19-23 Cr, 23-27 Ni, 0.5 max Mo, bal Fe.
High temperature corrosion resistant casting.
Cast: 63,000 TS, 8 El.
For brazing fixtures, trays, furnace parts, chains, beams, radiant tubes; usable to 2150°F.
ACI HN; Formerly FAHRITE N-41.

OHIOLOY HT.
M-95; 0.35-0.75 C, 2.0 Mn, 2.5 Si, 13-17 Cr, 33-37 Ni, 0.5 max Mo, bal Fe.
High temperature corrosion resistant casting.
Cast: 65,000 TS; 4 El.
For heat treat and carburizing boxes, fixtures, fan blades, furnace parts. Usable to 2000°F reducing; 2100°F oxidizing
ACI HT, AISI 330; SAE 70330
Formerly FAHRITE N-1.

OHIOLOY HU.
M-95, 0.35-0.75 C, 2.0 Mn, 2.5 Si, 17-21 Cr, 37-41 Ni, 0.5 max Mo, bal Fe.
High temperature corrosion resistant casting
Cast: 65,000 TS; 4 El
For parts requiring high strength and corrosion resistance at high temperatures. Usable to 2000°F reducing 2100°F oxidizing.
ACI HU, ASTM A297-60T HU, SAE 70331.
Formerly FAHRITE N-51.

OHIOLOY HW
M-95, 0.35-0.75 C,, 2.0 Mn, 2.5 Si, 10-14 Cr, 58-62 Ni, 0.5 max Mo, bal Fe
High temperature corrosion resistant casting.
Cast 60,000 TS.
For furnace muffles, hearths, retorts, trays, enameling boxes, quenching fixtures, usable to 1900°F in non-sulphur reducing, 2100°F oxidizing
ACI HW, ASTM A297-60T HW; SAE 70334
Formerly FAHRITE N-61

OHIOLOY HX
M-95, 0.35-0.75 C, 2.0 Mn, 2.5 Si, 15-19 Cr, 64-68 Ni, 0.5 max Mo, bal Fe
High temperature corrosion resistant casting
Cast. 60,000 TS
For high temperature applications as cyanide pots, salt pots, muffles, annealing trays, usable to 1900°F in non-sulphur reducing; 2100°F in oxidizing
ACI HX; ASTM A297-60T HX, SAE 70335.
Formerly FAHRITE N-71

OHIOLOY LC1 see OHIOLOY WC1.

OHIOLOY LC3
M-95; 0.15 max C, 0.50-0.80 Mn, 0.60 max Si, 3.0-4.0 Ni, bal Fe
Nickel alloy steel casting: 65,000 min TS, 40,000 min YS, 24 min El; 137-187 Brin.
Weldable; for pressure castings for sub-zero service to −150°F
ASTM A352-60T LC3, Formerly OHIO 0-25

OHIOLOY Ni
M 95; 0.5 max C, 1.75 max Mn, 1.5 max Si, 2.0 max Fe, 0.8 max Cu, bal Ni.
Corrosion resistant nickel casting.
Cast: 50,000 TS; 25,000 YS; 10 El.
For equipment in chemical industry to avoid metal contamination.
Formerly FAHRITE Ni.

OHIOLOY WC1 (or LC1).
M-95; 0.25 max C, 0.50-0.80 Mn, 0.60 max Si, 0.45-0.65 Mo, bal Fe.
Carbon-Moly steel casting: 65,000 min TS; 35,000 min YS; 24 min El; 137-187 Brin.
Weldable; for pressure castings, service to 1100°F.
ASTM A217-60T WC1; ASTM A352-60T LC1.
Formerly OHIO 0-2-25.

OHIOLOY WC6.
M-95, 0.20 max C, 0.50-0.80 Mn, 0.60 max Si, 1.0-1.5 Cr, 0.45-0.65 Mo, bal Fe.
Cr-Mo low alloy steel casting; 70,000 min TS; 40,000 min YS; 20 min El; 137-187 Brin.
Weldable; for yokes, valves, fittings, flanges, bonnets; for service up to 1200°F.
ASTM A217-60T WC6; Formerly OHIO 0-23-20.

OHIOLOY WC9.
M-95; 0.18 max C, 0.40-0.70 Mn, 0.60 max Si, 2.0-2.75 Cr, 0.9-1.2 Mo, bal Fe.
Cr-Mo alloy steel casting: 70,000 min TS; 40,000 min YS; 20 min El; 143-187 Brin.
Weldable, for pressure castings with service temperatures not exceeding 1200°F.
ASTM A217-60T WC9; Formerly OHIO 0-5M-20.

OHIOLOY WCA.
M-95; 0.25 max C, 0.70 max Mn, 0.60 max Si, bal Fe.
Carbon steel casting: 60,000 min TS; 30,000 min YS; 25 El; 137-187 Brin.
Weldable; for light loaded parts and assemblies operating below 1000°F.
ASTM A27-60 60-30, AISI 1020, SAE 0022.
Formerly OHIO O-1-25.

OHIOLOY WCB.
M-95; 0.30 max C, 0.70 max Mn, 0.60 max Si, bal Fe.
Carbon steel casting: 65,000 min TS; 35,000 min YS, 22 min El; 137-217 Brin
Weldable, for light loaded parts and assemblies operating below 1000°F
AISI 1030, SAE 0030; Formerly OHIO 0-1

OHMAL.
87.5 Cu, 9 Mn, 3.5 Ni
For electrical resistors; heat resistant.

OHMALLOY.
M-897, 15 Cr, 5 Al, 80 Fe.
Annealed 100,000 TS; 70 000 YS; 25 El.
For cathodes and filaments in electronic tubes; heat resistant

OHMALON
M-61; 12 Cr, 14 Al, bal Fe.
For heat resistant parts; heat resistant.

OHMALOY.
M-1; 12-14 Cr, 0.5 max Ni, 0.15 max C, 3-4.5 Al, bal Fe.
Annealed. 80,000 TS; 50,000 YS, 20 El, 60 RA; 240 Brin
For chemical engineering equipment; furnace resistors, corrosion resistant; Type 406.

OHMALOY.
M-61, 13 Cr, 0.6 C, 4 Al, bal Fe.
Cold rolled: 128,000 TS; 103,800 YS; 5 El.
Annealed: 85,700 TS; 67,640 YS; 33 El.
For resistance wire, rheostats, resistors; brittle above 1600°F; superseded by "Fecraloy."

OHMSNIT 110.
M-27; 0.1 C, 20 Cr, 80 Ni.
For heating elements; heat resistant.

OILCRAT.
M-1149; 0.95 C, 1.25 Mn, 0.15 V, 0.5 Cr, 0.5 W, bal Fe.
For taps, punches, spindles, crimpers; oil hardened, non-deforming.

OIL CUPS.
88 Cu, 5 Sn, 7 Zn.
For oil cups, fittings.

OIL DIE SMOOTHCUT (Was Oil Die).
M-35; 1.0 C, 1.5 Cr, 0.45 W, 0.8 Mn, 0.15 S, bal Fe.
Annealed: 190 Brin.
For blanking and piercing dies, shaving and trimming dies.
Oil harden, non-deforming, free-cutting, cold work tool steel.

OILGRAPH.
M-1; 1.45 C, 0.8 Mn, 1.15 Si, 0.2 Cr, 0.25 Mo, bal Fe.
Annealed: 85,000 TS; 50,000 YS; 25 El; 40 RA; 197 Brin.
Heat treated: 164,000-218,000 TS; 136,000-177,000 YS; 13-8.5 El; 23-14 RA; 302-388 Brin.
For blanking and forming dies, punches, gages; nondeforming, oil hardened.

OILGRAPH EZ.
M-1; 1.45 C, 1.15 Si, 0.20 Cr, 0.25 Mo, 0.10 S, 0.2-0.4 graphite, bal Fe.
For tools, dies; free-cutting, non-galling graphitic steel.

OIL HARD.
M-1482; 0.90 C, 1.25 Mn, 0.5 Cr, 0.3 Mo, 0.25 V, bal Fe.
For forming and blanking dies, punches, headers; oil hardened, non-deforming.

OIL HARDENING.
M-1424; 0.90 C, 1.2 Mn, 0.3 Si, 0.5 Cr, 0.2 V, 0.5 W, bal Fe.
Oil hardening tool steel; AISI 01.

OILITE 993.
M-211; 1.0-3.0 Cu, 0.25-0.60 C, 3.0-5.0 Ni, bal Fe.
Sintered and heat treated: 120,000 TS; 6.8 min density; 40,000 fatigue.

OILITE ALUMINUM.
M-211; 4.0-5.0 Cu, 3.0-4.0 Pb, 3.0-4.0 Sn, 85-87 Al, 3.0 max other.
Sintered: 15,000 TS; 2.2-2.4 density.
Oilite bearing material.

OILITE BRASS.
M-211; 77.0-80.0 Cu, 0.25 max Fe, 1.0-2.0 Pb, 0.10 max Sn, bal Zn.
Sintered: 20,000 TS; 9 El; 7.2-7.7 density 25,000 shear; 8500 fatigue.
ASTM B282-60 Class A; SAE 890; PMPMA BZ-0218-T.

OILITE BRONZE (Was Oilite).
M-211; 87.5-90.5 Cu, 1.0 max Fe, 1.75 max C, 9.5-10.5 Sn.
Sintered: 14,000 TS; 11,000 YS; 6.4-6.8 Density.
Oilite bearing material.
ASTM B438-67 Gr 1 Type II; SAE 841.
PMPMA BT-0010-R.

OILITE COPPER.
M-211; 98.0 min Cu, 0.10 max Fe.
Sintered: 20,000 TS; 8 El; 8.0 min density.
MIL-B-20296.

OILITE LEAD BRONZE.
M-211; 76-78.5 Cu, 1.0 max Fe, 14-16 Pb, 1.0 max C, 6.5-8.5 Sn.
Sintered: 8000 TS; 6.8-7.2 density.
Oilite bearing material.

OILITE NICKEL SILVER.
M-211; 63.0-66.5 Cu, 16.5-19.5 Ni, 16.5-19.5 Zn.
Sintered: 30,000-37,500 TS; 10-15 El; 7.5-8.0 density.
ASTM B458-67 Gr 1, Type 1;
PMPMA BZN-1818-U.

OILITE STAINLESS STEEL.
M-211; 0.08-0.20 C, 17-19 Cr, 8-9 Ni, 70.5-73.0 Fe.
Sintered: 35,000 TS; 6.0-6.4 density. 20,000 shear, 26,000 fatigue.
PMPMA SS-304-L-P.

OILITE STRESSITE BRONZE.
M-211; 93.0-96.0 Cu, 4.0-6.0 Sn, 2.5 max others.
Sintered: 20,000 TS; 10 El; 7.2-7.8 density. 10,000 fatigue strength.

OIL PUMP.
Eng ; 85 Cu, 3 Sn, 9 Zn, 3 P.
For oil pump parts.

OILWAY.
M-345; 0.94 C, 0.44 Cr, 0.5 W, 1.2 Mn, bal Fe.
For tools, dies; oil hardening.

OJIBWAY.
M-435; 0.95 C, 0.3 Mn, 0.3 Si, bal Fe.
For open headed dies; water hardened.

OKADUR 6.
M-462; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
For light alloy structural parts; age hardenable.

OKADUR 10.
M-462; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
For light alloy structural parts; age hardenable.

OKADUR 58.
M-462; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, 0.5-2.5 Pb, Sn, Cd, Bi, bal Al.
For screw machine products; free-cutting.

OKADURPLAT.
M-462; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al
For aircraft structures; clad, age hardenable.

OKER-1.
Eng , 69 Cu, 30 Zn, 0.97 Pb
Rolled· 40,000 TS; 35 El; 37 Brin.
For tubes, sheets.

OKER-2.
Eng , 55 Cu, 45 Zn, 0.5 Sn
Rolled· 50,000 TS.
For sheets, architectural purposes; corrosion resistant

OKER BRASS
Germ.; 64.25 Cu, 35.25 Zn, 0.39 Sn, 0.12 Pb.
For hardware, bolts, fittings; high strength.

OKER BRASS.
England; 44.5 Zn, 0.5 Sn, bal Cu.
For architectural structures and trim; high strength, corrosion resistant.

OKER-CAST.
Eng.; 72 Cu, 24 Zn, 1.1 Pb, 2.3 Fe.
Cast: 60,000 TS; 33 El; 30.6 RA; 86 Brin.
For turbine parts; free-cutting.

OKER I BRASS.
England; 30 Zn, 1 Pb, bal Cu.
For fittings, hardware; good workability, free-cutting.

OLD GENUINE BABBITT.
M-77; 89 Sn, 7.5 Sb, 3.5 Cu.
For bearings; heavy duty.

OLD HYCC.
M-38; 1.5 C, 12 Cr, bal Fe.
For dies; oil hardening, non-deforming.

OLDS BEARING BRONZE.
M-1007; 60-65 Cu, 17-19 Pb, 9-11 Zn, 4.5-6.0 Ni, 4.5-6 5 Sn.
Cast: 22,000 TS; 16,000 YS; 3 El; 56 Brin.
For formed parts, bearings, bushings; corrosion resistant.

OLDS HI TENSIL BRONZE NO. 7025.
M-1007; Cu alloy.
Rolled. 75,000 TS; 32,000 YS; 31.5 El; 140 Brin.
For hardware, gears, tough

OLDS HI TENSIL BRONZE NO 9025.
M-1007; Cu alloy
Rolled: 92,000 TS, 42,000 YS; 28 El; 180 Brin.
For hardware, gears, tough

OLDS HI TENSIL BRONZE NO. 11515.
M-1007; Cu alloy.
Rolled· 118,000 TS; 80,000 YS; 15 El; 215 Brin.
For hardware, gears; tough.

OLDS LEADED BRONZE, OA-10.
M-1007, 70 Cu, 10 Sn, 20 Pb.
As cast 54-58 Brin (500 kg).
For bearings
QQ-B-691 Comp 7; SAE 794.

OLDSMOLOY.
M-1007, 15 Ni, 35 Zn, Cr, Mn, Sn, 45 Cu.
Rolled· 70,000-76,000 TS, 15-20 El, 21 RA; 150-160 Brin
For bearings, gears, hardware, food machinery; resists salt water and food acids.

OLIN NO 605
M-279; 2 3 Fe, 0 03 P, bal Cu.
Annealed 48,000 TS, 20,000 YS, 28 El; 95 DPH
½ Hard 61,000 TS; 56,000 YS, 6 5 El; 131 DPH.
Spring. 75,000 TS, 69,000 YS, 1 5 El; 149 DPH
For springs, diaphragms, hollow ware, gaskets, clips, terminals, contacts
65% electrical conductivity, corrosion resistant.

OLIN 0629
M-279, 9-10 Al, 3 5-4 5 Fe, 0 8 max Zn, bal Cu
Annealed 85,000-100,000 TS; 45,000-65,000 YS, 30-35 El, B 70 Rock
Hard 112,000-130,000 TS; 90,000-110,000 YS; 10 El, B 96-101 Rock
For fuses, clips, springs, fasteners.
Aluminum bronze, corrosion resistant.

OLIN-0629M
M-279, 9 4-10 0 Al, 3 5-4 5 Fe, 0.8 max Zn, bal Cu.
Annealed. 85,000-100,000 TS, 45,000-65,000 YS; 30-35 El, B 80-90 Rock
Heat treated. 150,000-170,000 TS; 100,000-120,000 YS; 3 El.
For bushings, worm gears, bearings, shafts.
Aluminum bronze, heat treatable.

OLIN ALLOY 638.
M-279; 2 8 Al, 1 8 Si, 0.4 Co, bal Cu
Annealed· 82,000 TS; 54,000 YS; 36 El.
Spring Temper· 125,000 TS; 111,000 YS, 4 El.
At 400°C, Spring Temper: 25,000 TS; 18,000 YS; 100 El.
For heat exchangers, glass to metal seals, springs, electrical terminals.
Aluminum bronze, high strength, corrosion resistant, oxidation resistant.

OLIN ALLOY 688.
M-279; 22.7 Zn, 3.4 Al, 0.40 Co, bal Cu.
Spring Temper: 120,000 TS; 108,000 YS; 1.5 El.
Annealed: 78,000-82,000 TS; 47,000-55,000 YS; 36-39 El.
½ Hard: 90,000 TS; 81,000 YS; 18 El.
For springs, diaphragms, connectors.
Readily deep drawn, good corrosion and stress corrosion resistance.

OLIN KO-1.
M-1642, M-279; 4 8 Cu, 0.23 Mg, 0.27 Ti, 0 64 Ag, bal Al.
Sand Cast: 68,000 TS; 60,000 YS; 6 El.
Permanent mold: 67,000 TS; 55,000 YS; 10 El.
For landing gear struts, gear box housings, aircraft and auto truck components, aerospace equipment.
High strength casting alloy.

OLYMPIC.
M-73; 1.5 C, 12 Cr, 1 V, 0.7 Mo, bal Fe.
For dies, tools, lamination dies, punches, forming dies; air hardening, abrasion resistant, non-deforming.

OLYMPIC.
M-484; 0 7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed tools and cutters, high speed steel.

OLYMPIC BRONZE TYPE A.
M-33, 96 0 Cu, 1.0 Zn, 3.0 Si.
Annealed: 60,000 TS; 25,000 YS; 60 El; 60 RA; 50 Brin.
Hard rolled. 94,000 TS; 58,000 YS; 8 El; 14 RA; 140 Brin.
For sheet, rod, wire, tubes, bolts, nuts, hardware, cable, welding rod, corrosion resisting.

OLYMPIC BRONZE TYPE B.
M-33; 97.5 Cu, 1.0 Zn, 1 5 Si
Annealed 52,000 TS, 25,000 YS.
Hard· 90,000 TS, 67,000 YS, 12 El
For screw machine work, bolts, nuts, screws, welding rods, cable, hardware; resists "season cracking"

OLYMPIC FM
M-73; 1 5 C, 12 Cr, 1 V, 0.7 Mo, bal Fe.
For lamination and blanking dies, punches; air hardening, free-cutting, non-deforming.

OMAN
M-842, Pb-Cu.
For bearings; self-lubricating.

OMANITBRONZE
M-330, 81 Cu, 10 Al, bal Ni, Fe.
10 El.
For valve gauge fittings; corrosion resistant.

OMAN METAL
M-714, 25 Pb, bal Cu.
For bearings; heavy duty.

OMC-3 Al-2 5 V.
M-1532; 3 Al, 2 5 V, bal Ti.
Wrought, min· 125,000 TS; 105,000 YS; 10 El.
Weldable; suitable for fabricating into welded titanium tubing, or seamless tubing.

OMC-5 Al-2.5 Sn.
M-1532; 5 Al, 2.5 Sn, bal Ti.
Wrought, Ann, min: 120,000 TS; 115,000 YS; 10 El.
For aircraft tailcones, compressor cases, housings, stiffeners, cryogenic tankage.
Weldable, forgeable; good creep resistance to 900°F.
AMS 4910, 4926, 4953, 4966.

OMC-6 Al-2 Sn-4 Zr-2 Mo.
M-1532; 6 Al, 2 Sn, 4 Zr, 2 Mo, bal Ti.
Wrought, min: 135,000 TS; 120,000 YS; 10 El; 25 RA.
Compressor blades and wheels; good strength and toughness to 800-900°F.

OMC-6 Al-4V.
M-1532; 6 Al, 4 V, bal Ti (0.10 max C).
Wrought, min: 130,000 TS; 120,000 YS; 10 El.
For aircraft and engine forgings, compressor wheels and blades, spacers, cryogenic and marine equipment.
Some response to heat treatment.
AMS 4928, 4911, 4935.

OMC-6 Al-6V-2 Sn.
M-1532; 6 Al, 6 V, 2 Sn, bal Ti.
Wrought, min: 150,000 TS; 140,000 YS; 10 El.
For pressure vessels, rocket motor cases, airframes, ordnance equipment.
MIL-T-46035.

OMC-7 Al-4 Mo.
M-1532; 7 Al, 4 Mo, bal Ti.
Wrought, HT, min: 145,000 TS; 135,000 YS; 10 El.
Heat treatable forging alloy;
For aircraft turbines, compressor wheels, and blades, spacer rings, airframes.

OMC-8 Al-1 Mo-1 V.
M-1532; 8 Al, 1 Mo, 1 V, bal Ti.
Wrought, min: 130,000 TS; 120,000 YS; 10 El.
High temp. jet engine forging alloy;
For airframes, turbine parts.
MIL-T-9046 Type II Comp. F.

OMC-40.
M-1532; Ti, unalloyed.
Wrought, min: 40,000 TS; 30,000 YS; 25 El; 35 RA.
For valves, heat exchangers, aircraft ducting, good corrosion resistance.
MIL-T-12117 Class 40.

OMC-55.
M-1532; Ti, unalloyed.
Ann, min: 65,000 TS; 35,000 YS; 20 El.
For heat exchangers, valve trim, welding rods, anodizing racks, chemical plant equipment.
AMS 4900.

OMC-70.
M-1532; Ti, unalloyed.
Ann, min: 80,000 TS; 70,000 YS; 15 El.
For airframe equipment, ammunition boxes, anodizing racks, shroud spacers.
AMS 4901, 4921.

OMC-103 (cast).
M-1532; 0.20 Pd, bal Ti.
Cast, min: 50,000 TS; 40,000 YS; 22 El.
For chemical process equipment for oxidizing and mildly reducing environments.

OMC-105 (cast).
M-1532; Ti, unalloyed.
Cast, min: 80,000 TS; 70,000 YS; 15 El.
For aircraft equipment, marine equipment, brackets, housings, anodizing racks.

OMC-164 B (cast).
M-1532; 6 Al, 4 V, bal Ti.
Cast, min: 130,000 TS; 120,000 YS; 10 El.
Compressor wheels, and blades, rocket cases cyrogenic equipment, marine equipment.

OMC-166 A (cast).
M-1532; 5 Al, 2.5 Sn, bal Ti.
Cast, min: 120,000 TS; 115,000 YS; 10 El.
For aircraft tailcones, compressor case housings, stiffeners, cryogenic tankage.
Weldable, forgeable; good creep resistance to 900°F.

OMC-Pd.
M-1532; 0.20 Pd, bal Ti.
Wrought, min: 50,000 TS; 40,000 YS; 22 El.
For chemical process equipment for oxidizing and mildly reducing environments.

OMEGA.
M-24; 0.6 C, 0.7 Mn, 1.85 Si, 0.25 V, 0.5 Mo, bal Fe.
Heat treated: 340,000-320,000 TS; 310,000-280,000 YS; 5-6 El; 11-21 RA.
For pneumatic chisels, rivet sets, punches, blacksmith tools; Iz-7-15; resists shock and fatigue.

OMEGA BRAND PHOSPHOR BRONZE NO. 47.
M-98; 91.6 Cu, 8.0 Sn, 0.15 P.
Sheet: 51,000-130,000 TS; 75-1.0 El.
For paper mill equipment; El-Res. 14.8.

OMEGA BRAND PHOSPHOR BRONZE NO. 209.
M-98; 90 Cu, 10 Sn, trace P.
Sheet. 55,000-130,000 TS; 80-1.0 El.
For sulfide solutions in paper mill machinery; El-Res. 16.1.

OMEGA EXTRA
M-1339, 0.55 C, 0.7 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For gears, machine tool parts, crankshafts; oil hardened, shock resistant.

OMEGA EXTRA V.
M-1339; 0.56 C, 0.7 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For gears, machine tool parts, crankshafts; oil hardened, shock resistant.

OMMET A.
M-1246; 50 Ni, 20 Mo, 22 Fe.
For amplifiers and transmitter tubes; corrosion and heat resistant

OMMET "A" ALLOY.
M-837; Mo-Ni-Fe.
280 Brin.
For machinery parts; sintered alloy, heat resistant

OMMET-B
M-1246, Ni-Mo-Fe
For amplifiers and transmitter tubes, chemical plant equipment; sintered, corrosion resistant.

OMMET-Fe.
M-1246; Fe.
For structural parts for amplifiers, transmitter tubes, rectifiers, valves, sintered, highest purity.

OMMET IRON.
M-837; 0.001 C, 0.01 Si, 0.01 P, 0.01 Mn, 99.98 Fe.
For vacuum tubes; sintered iron.

OMMET-SIVAR 48.
M-837; Fe-Co-Ni.
For glass to metal seals, vacuum tubes; sintered alloy.

OMMET-SIVAR 60.
M-837; Fe-Co-Ni.
For glass to metal seals, vacuum tubes; sintered alloy.

OMMET-SIVAR 90.
M-837; Fe-Co-Ni.
For glass to metal seals; sintered alloy.

ON.
M-366; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, high speed cutters; high speed steel.

ONEIDA.
M-15; 0.90 C, 1.2 Mn, 0.5 Cr, 0.2 V, 0.5 W, bal Fe.
Oil hardening tool steel; AISI 01.

ONERAL.
M-England; 0.9 C, 10 Mo, 0.03 Ti, 6 Ni, 0.03 Zr, 4 Fe, 28 Cr, bal Co.
For cast turbine blades, high temperature components.
High heat resistance.

ONE TON BRASS.
Eng.; 61 Cu, 38 Zn, 1 Sn.
For marine parts, condenser tubes; corrosion resistant.

O-NICKEL.
England; 99.5 min Ni + Co, controlled Mg.
For valve components, tube cathodes; corrosion and heat resistant.

ONION FUSIBLE ALLOY.
England; 50 Bi, 20 Sn, 30 Pb.
For fuses, safety plugs; M.P. 92°C.

ONPLUS.
M-366, 0.7 C, 18 W, 4 Cr, 2 V, bal Fe.
For cutting tools; high speed steel.

ONTARIO.
M-1, 1 5 C, 12 Cr, 0.9 V, 1.0 Mo, bal Fe.
Annealed: 102,000 TS; 85,000 YS; 29 El; 217 Brin.
Hardened· 171,000-227,000 TS; 1.5 El; 600 Brin.
For dies, shears, punches, blanking and stamping dies, forming tools
Type D2 air hardening, non-deforming, wear resistant.

ONTARIO-EZ
M-1, 1 5 C, 12 Cr, 0.9 V, 1.0 Mo, 0.15 S, bal Fe
Annealed: 103,000 TS; 18 El; 30 RA; 217 Brin
Hardened· 225,000 TS; 1.5 El; 600 Brin.
For punches, shear blades, blanking and forming tools and dies
Type D2 air hardening, non-deforming, free-cutting.

ONTOP.
M-366, 0 7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe
For tools, high speed cutters; high speed steel.

ONYX
M-38; 0.7 C, bal Fe.
For springs; water hardening.

O.P.
Japan.
For permanent magnets; high coercive force.

OPTAL 3.
M-764; 2.8 Mg, 0-0 4 Mn, 0-0.3 Cr, bal Al.
Extruded· 29,000 TS; 20,000 YS; 15 El; 55 Brin.
Cold drawn: 40,000 TS; 31,000 YS, 4 El; 80 Brin.
For ship building, car bodies, window frames; corrosion resistant.

OPTAL 5.
M-764; 4.8 Mg, 0.15 Mn, 0.3 Cr, bal Al.
Extruded· 36,000 TS; 17,000 YS; 15 El; 60 Brin.
½ H-temper: 40,000 TS; 26,000 YS; 9 El; 75 Brin.
For automobile bodies, ship building; corrosion resistant.

OPTAL 7.
M-764; 6.8 Mg, 0.15 Mn, 0.3 Cr, bal Al.
½ H-temper: 50,000 TS; 31,000 YS; 9 El; 90 Brin.
For fuel gages, cooking utensils, machine tool parts; corrosion resistant, shock resistant.

OPTICAL WIRE ALLOY.
U.S.; 54 Cu, 28 Zn, 18 Ni.
Annealed: 33,000 TS; 20,000 YS; 33 El; 38 RA; 50 Brin.
For optical instruments; German Silver.

OPTIMUM.
M-1340; 2.1 C, 11.5 Cr, bal Fe.
For forming and blanking dies, punches; oil or air hardened, nondeforming.

OPTIMUM Co20.
M-1340; 1.65 C, 12 Cr, Co, bal Fe.
For forming and blanking dies, punches; air hardened, nondeforming.

OPTIMUM W.
M-1340; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For forming and blanking dies, punches; air hardened, nondeforming.

OPTIMUM Z.
M-1340; 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For forming and blanking dies, punches; oil or air hardened, nondeforming.

ORALLOY.
M-838; Au alloy.
For dentures.

ORANGE LABEL.
M-343; 0.45-0.55 C, 1.25-1.75 Cr, 2-3 W, 0.2-0.3 V, bal Fe.
For chisels, punches, rivet sets; "Special Alloy Tool."

ORANGE LABEL.
M-365; 1.0-1.05 C, bal Fe.
For tools; precision cast.

ORANGE LABEL SPECIAL ALLOY TOOL STEEL.
M-343; C, alloy, bal Fe.
For chisels, punches, heading tools, rivet sets; fatigue resistant.

ORANIUM BRONZE.
M-141; 90 Cu, 10 Al.
Cast: 65,000 TS, 20 El. Rolled: 80,000 TS.
For castings, gears; Al-Bronze.

ORANIUM BRONZE, "H.H."
89 Cu, 11 Al.
For gears, propellers; Al-bronze, tough.

ORANIUM BRONZE, "H.X."
88.5 Cu, 11.5 Al.
For gears, bearings; Al-bronze, tough.

ORANIUM BRONZE "M.H."
M-8, 92 Cu, 8 Al.
130,000 TS; 4 El.
For hardware; medium hard-soft.

ORANIUM BRONZE "S."
M-8; 97 Cu, 3 Al.
30,000 TS; 60 El.
For hardware; soft-soft.

ORBIS.
M-111; 0.95 C, 1.5 Si, 0.75 Mn, 1 Cr, 0.1 V, bal Fe.
For dies; for cold work.

ORBIT.
M-38; 0.7 C, 2 Mn, 0.15 S, 1.0 Cr, 1.35 Mo, bal Fe.
For dies for blanking and forming, rim rolls, master hubs; tough, air hardened, free-machining.

ORDIX.
M-912; 0.6-0.7 C, 1.2-1.5 Si, 0.35-0.50 Mn, bal Fe.
For tools, dies, chisels, punches; tough, shock resistant.

ORDIX EXTRA.
M-501, M-912; 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For springs, punches; oil hardened, shock resistant.

ORDIX SPECIAL.
M-912; 0.55-0.62 C, 0.8-1.1 Mn, 0.9-1.2 Cr, 0.07-0.12 V, bal Fe.
For tools, dies, crimpers, punches; oil hardening, tough.

OREIDE .5%.
M-102; 89-92 Cu, 0.3-0.7 Sn, 0.1 max Pb, bal Zn.
Annealed: 42,000 TS; 12,000 YS; 43 El; F 60 Rock.
Hard: 68,000 TS; 57,000 YS; 4 El; B 76 Rock.
For jewelry and weather stripping.
Good formability, weldability and corrosion resistance.

OREIDE "A."
Eng.; 68 Cu, 32 Zn, 0.5 Sn.
60,000 TS; 30 El.
For hardware; Tobin Bronze.

OREIDE "B."
Eng.; 90-81 Cu, 10-15 Zn, 0-4 Sn.
French gold, carriage and harness hardware, ornamental work.

OREIDE, BRUNSWICK.
Eng.; 68 Cu, 32 Zn, 0.5 Sn.
For condenser tubing; corrosion resistant.

OREIDE, FRENCH GOLD.
90-81 Cu, 10-15 Zn, 0-9 Sn, 1-2 Pb.
For plumbing, hardware; free-cutting.

OREIDE SCOVILL ALLOY 321.
M-102; 88-91 Cu, 0.35-0.65 Sn, bal Zn.
Annealed: 40,000 TS; 40 El.
Hard: 75,000 TS; 4 El.
For bearings, jewelry; corrosion resistant.

ORELLOY 242.
M-1603; 0.10 C, 0.50 Mn, 0.09 P, 0.03 S, 0.48 Si, 0.86 Cr, 0.43 Cu, bal Fe.
Rolled: 70,000 TS; 50,000 YS; 22 El.
For structural members, bridges, booms, derricks, tanks.
High strength low-alloy steel.

ORIEDE B.
90-81 Cu, 10-15 Zn, 0-4.9 Sn.
For hardware, ornamental work; French gold.

ORIENTED M-6W.
M-10; Si, bal Fe.
For transformers; formerly Tran-Cor 4W-O; grain oriented.

ORIENTED M-7X
M-10; Si, bal Fe.
For transformers; formerly Tran-Cor 3X-O; grain oriented.

ORIENTED M-7W.
M-10; Si, bal Fe.
For transformers; formerly Tran-Cor 3W-O; grain oriented.

ORIENTED M-8X.
M-10; Si, bal Fe.
For transformers; formerly Tran-Cor 2X-0; grain oriented.

ORIENTED T.
M-10; Si, bal Fe.
For armatures, electric generators; high permeability; formerly Tran-Cor T-O.

ORIENTED T-S.
M-10; Si, bal Fe.
For wound type transformers and reactors; high permeability; formerly Tran-Cor T-O-S.

ORIGINAL MONEL METAL.
M-557; 23 Cu, 2.5 Si, bal Ni.
Sand cast: 56,000-72,000 TS; 28,000-43,000 YS; 30-20 El; 120-140 Brin.
For pump parts, chemical industries; corrosion resistant.

ORION.
M-414; 0.5 C, 1.0 Cr, 0.2 V, bal Fe.
Heat treated: 240,000-115,000 TS; 195,000-80,000 YS; 5-23 El; 15-65 RA; 440-262 Brin.
For machine parts, tools, automobile springs and gears, forging dies, shear blades; resists heavy vibrations.

ORION-100 CAST.
M-1546; 0.35 C, 27 Cr, 1.2 Si, bal Fe.
Cast: 95,000 TS, 65,000 YS; 2 El, 212 Brin.
For furnace parts, heat treating boxes, salt pots, oil burners, exhaust manifolds.
Ferritic stainless steel, heat and oxidation resistant.

ORION-100 FORGE.
M-1546; 0.15 C, 27 Cr, bal Fe.
Annealed: 92,500 TS; 57,000 YS; 25 El.
For furnace parts, heat treating boxes, salt pots.
Ferritic stainless steel. Heat and oxidation resistant.

ORION-120
M-1546; 0.02 max C, 27 Cr, bal Fe.
Annealed· 80,000 TS; 50,000 YS; 25 El; B 82 Rock.
For furnace parts, salt pots, heat treating boxes, oil burners.
Ferritic stainless steel Heat resistant to 1150°C in oxidizing atmosphere.

ORLEANS
M-373, 0 55 C, 0 80 Mn, 2 Si, 0 25 Cr, 0.2 V, 0 35 Mo, bal Fe.
For pneumatic chisels, punches, concrete breakers, cutters; Type S5; oil hardened, shock resistant.

ORTHONIK
M-10, M-1084; 50 Ni, 50 Fe.
For magnetic and electrical equipment, magnetic tape and foil
Magnetically soft, high permeability.

ORTHONOL.
U.S ; 50 Fe, 50 Ni
For magnets, soft.

ORTHOSIL
M-1192, Si, bal Fe.
For laminations for transformers, chokes, filters, reactors; high magnetic saturation.

ORVAR 1.
M-111, M-111a; 0 3 C, 0.9 Si, 0.5 Mn, 5.25 Cr, 1.4 Mo, 0.1 V, bal Fe.
For punches, crimpers, upsetters, riveters; hot work steel, oil hardened. AISI H13.

OSBORN-EWC.
M-233; 0.03 C, 18 25 Cr, 13.5 Ni, 3.75 Mo, bal Fe.
Annealed: 108,000 TS; 45,000 YP; 47 El; 57 RA.
For scrubber liners, chemical plant equipment, digesters.
Acid resistant; Type 317, austenitic.

OSCILLUMIN.
Germany; 0.8 Cu, 0.4-0.6 Fe, 12.6-13.2 Si, bal Al.
28,000 TS; 4 El; 65 Brin.
For light alloy castings; high fluidity.

OSEMUND.
M-1337; 1.4 C, 0.30 Cr, 0.10 V, bal Fe.
For cutters, bearings, liners; oil hardened, wear resistant.

OSMAGAL.
M-462; 1.8 Mn, bal Al.
For sheets; rolled.

OSMAGAL.
M-1548; 1.8 Mn, bal Al.
Soft: 15,000 TS; 6400 YS; 30 El; 25 Brin.
Hard: 35,000 TS; 28,000 YS; 2 El; 60 Brin.
For heat exchangers, truck panels, fixtures, duct work.
Non-heat treatable.

OSMAGAL S.
M-462; 1.5-3.0 Mg, 0.5-1.5 Mn, 0.3 max Cr, bal Al.
For aircraft and structural parts; resists sea water corrosion.

OSMIRIDIUM (NATURAL) NEVYANSKITE.
58-44 Ir, 27-49 Os, 0-10 Pt, 0-6 Ru, 1.5-3.0 Rh.
For pen points; corrosion resistant.

OSMIRIDIUM (NATURAL) SISERSKITE.
57 Os, 34 Rh + Ir, 8 Ru.
For pen points; corrosion resistant.

OSMIRIDIUM SISEROKITE.
57 Os, 34 Rh + Ir, 8 Ru.
For pen points.

OSNALIUM 3.
M-462; 2-4 Mg, 0.4 max Mn, 0.3 max Cr, bal Al.
Soft: 28,000 TS; 13,000 YS, 30 El; 47 Brin.
Hard: 42,000 TS; 37,000 YS; 8 El; 77 Brin.
For light alloy parts, marine hardware; resists sea water corrosion.

OSNALIUM 5.
M-462; 4.0-5.5 Mg, 0.8 max Mn, 0.3 max Cr, bal Al.
Soft. 42,000 TS; 22,000 YS; 35 El; 65 Brin.
Hard: 60,000 TS; 50,000 YS; 15 El; 100 Brin.
For aircraft structures, light alloy parts; corrosion resistant.

OSNALIUM 7.
M-462; 5.5-7.5 Mg, 0.8 max Mn, 0.3 max Cr, bal Al.
For light alloy parts; corrosion resistant.

OSTERMANN CAST BRONZE NO. 10.
M-330, 90 Cu, 10 Sn.
29,000 TS; 15 El.
For general construction of machinery fittings, apparatus; corrosion resistant.

OSTERMANN CAST BRONZE NO. 14.
M-330; 86 Cu, 14 Sn, 29,000 TS; 3 El.
For bearings, gears, high pressure hydraulic apparatus; wear resistant.

OSTERMANN CAST BRONZE NO. 20.
M-330; 80 Cu, 20 Sn.
21,000 TS.
For step-bearings, slide valves, wearing plates, bells; for parts with high friction loading.

OSTERMANN LEAD BRONZE NO. 10.
M-330, 86 Cu, 10 Sn, 4 Pb.
28,000 TS; 15 El.
For bearings for hot rolling works and electrical machinery; heavy duty.

OSTERMANN LEAD TIN BRONZE NO. 8
M-330; 80 Cu, 8 Sn, 12 Pb.
23,000 TS; 8 El.
For bearings with high compressive loading and cold rolling mills; heavy duty.

OSTERMANN RED BRASS NO. 4.
M-330; 93 Cu, 4 Sn, 2 Zn, 1 Pb.
29,100 TS; 25 El.
For pipe flanges; known as "Flange Bronze."

OSTERMANN RED BRASS NO. 5.
M-330; 85 Cu, 5 Sn, 7 Zn, 3 Pb.
21,000 TS; 10 El.
For railroad machinery fittings to be bright finished or polished; free-cutting.

OSTERMANN RED BRASS NO. 8.
M-330; 82 Cu, 8 Sn, 7 Zn, 3 Pb.
21,000 TS; 6 El.
For machine fittings to be bright finished or polished; free-cutting.

OSTERMANN RED BRASS NO. 9.
M-330; 85 Cu, 9 Sn, 6 Zn.
29,000 TS; 12 El.
For railroad bearings, fittings; heavy duty.

OSTERMANN RED BRASS NO. 10.
M-330, 86 Cu, 10 Sn, 4 Zn.
29,000 TS; 10 El.
For pipe lines and fittings, general machinery construction; also called "Machine Bronze."

OSTERMANN WROUGHT BRONZE NO. 6.
M-330; 94 Cu, 6 Sn.
For wire, sheet strip; tin bronze.

OTISCOLOY.
M-840; 0.08-0.12 C, 0.90-1.25 Mn, 0.35 Cu, 0.10 Ni, 0.05 Cr, bal Fe.
Drawn: 70,000 TS; 50,000 YS; 25 El; 55 Brin.
For deep drawn parts.

OTISEL NO. 1.
M-331; 18 Cr, 8 Ni, C, bal Fe.
For heat and corrosion resisting parts; heat and corrosion resisting alloy.

OTISEL NO. 2.
M-331; 0.10-0.15 C, 12-16 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

OTISEL NO. 3.
M-331, 0.10-0.15 C, 15-18 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

OTISEL NO. 4.
M-331; 0.20 max C, 20-30 Cr, 12-20 Ni, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

OTISEL NO. 5.
M-331; 0.25 max C, 26-30 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

OTISEL K-4 MOLYBDENUM.
M-331; 0.13-0.35 C, 5-7 Cr, bal Fe, Mo.
For corrosion resistant parts; corrosion resistant.

OTISEL K-5 TUNGSTEN.
M-331; 0.13-0.35 C, 5-7 Cr, W, bal Fe.
For corrosion resistant parts; corrosion resistant.

OTISEL O-12.
M-331; 0.12-0.35 C, 11-14 Cr, bal Fe.
Cast: 75,000-130,000 TS; 39,000-90,000 YS; 10-25 El; 140-150 Brin.
For acid resistant castings, corrosion resistant.

OTISEL O-16.
M-331; 0.12 C, 14-18 Cr, bal Fe.
Cast: 70,000-80,000 TS; 39,000-43,000 YS; 20-15 El; 140-175 Brin.
For acid resistant castings; corrosion resistant.

OTISEL O-18.
M-331; 0.08-0.20 C, 18-20 Cr, 8-10 Ni, bal Fe.
Cast: 78,000-85,000 TS; 39,000-42,000 YS; 60-65 El; 135-160 Brin.
For acid resistant castings; stainless.

OTISEL O-24.
M-331; 0.20 max C, 22-25 Cr, 10-13 Ni, bal Fe.
Cast: 80,000-85,000 TS; 40,000-43,000 YS; 45-50 El; 140-150 Brin.
For heat resistant castings; heat resistant.

OTISEL O-30.
M-331; 0.25 max C, 25-30 Cr, 1.0 max, Mn, bal Fe.
Cast: 45,000-99,000 TS; 35,000-60,000 YS; 2-3 El; 170-190 Brin.
For heat resistant castings; resists heat to 2150°F.

OTISEL O-S.
M-331; C, alloy, bal Fe.
For castings.

OTOTANI-ALLOY Grade 2.
M-1718; 35-50 Si, 20-30 Ca, 5-15 Mn, 10-20 Fe, 1.5 max Al, 0.08 max P, 0.05 max S.
For melting or ladle additions to produce cast steel with nodular graphite to increase the wear resistance, as on steel rolls for rolling mills.

OTOTANI-ALLOY Grade 3.
M-1718; 35-50 Si, 20-25 Ca, 10-25 Fe, 5-15 Mn, 4-10 Al, 0.3 max C, 0.08 max P, 0.05 max S.
For melting or ladle additions to produce fine grain steel.

OTTAWA.
M-435, 0.8 C, 0.25 Mn, 0.15 Si, bal Fe.
For mining drills and rods; hollow drill steel.

OTTAWA 60.
M-1, 3.25 C, 1 Cr, 1 Mo, 12 V, bal Fe.
For drawing rings for stainless steel; heat treatable, galling resistant.

OTTO'S SPECULUM.
Eng.; 69 Cu, 31 Sn
40,000 TS; 10,000 YS; 38 El.
For telescope reflectors, mirrors.

OUNCE METAL.
M-126; 85 Cu, 5 Sn, 5 Zn, 5 Pb.
27,000-33,000 TS; 20-15 El, 20-15 RA; 50-59 Brin.
For bearing metal, casting valves, carburetor and pump parts; Composition Brass, also called "Std. Red Composition."

OXALLOY-28.
M-856; 99.92 min Cu.
Annealed: 50,000 TS; 35,000 YS; 10-30 El;
For high temperature wire.
Heat resistant to 400°F.

OXWELD NO. 1 HT.
M-843; C, alloy, bal Fe.
Welded: 70,000 TS.
For welding rod for alloy steel.

OXWELD NO. 7.
M-843; C, bal Fe.
Welded: 45,000 TS.
For welding rod for steel; copper coated.

OXWELD NO. 9.
M-843; 3.2 C, 2.2 Si, bal Fe
For cast iron welding rod; for gray cast iron.

OXWELD NO. 19 CUPRO.
M-843; Cu alloy.
Welded: 35,000 TS.
For bronze welding rod; phosphor bronze.

OXWELD NO. 23.
M-843; 5 Si, bal Al.
For Al welding rod.

OXWELD NO. 25 M.
M-843; Sn, Zn, bal Cu.
Welded: 50,000 TS; 96 Brin.
For bronze welding rod.

OXWELD NO. 26.
M-843; Si-Cu alloy, 2.5 Si, bal Cu.
For bronze welding rod.

OXWELD NO. 28.
M-843; 0.08 C, 18 Cr, 8 Ni, Cb, bal Fe.
For stainless steel welding rod.

OXWELD NO. 31 T.
M-843, Sn, Zn, bal Cu.
For bronze welding rod.

OXWELD NO. 32 CMS.
M-843; C, bal Fe.
Welded: 95,000 TS.
For welding rod.

OXWELD NO. 38.
M-843; Cu alloy.
For Cu welding rod.

OXYGEN FREE COPPER.
M-33; 99.98 Cu.
Annealed: 32,000 TS; 10,000 YS; 45 El.
Rolled: 50,000 TS; 45,000 YS; 6 El.
For electrical conductors; high conductivity.

P2.
M-1114, 0.8-1.0 C, bal Fe.
For tools, dies, fixtures, water hardened.

P2 ALLOY.
M-137; 3.0-4.5 Cu, 4-5 Si, 2-4 Fe, 1.75-2.5 Ni, bal Al
Cast: 25,000 TS; 23,000 YS; 2 El; 101 Brin
For carburetors, brake shoes, cameras, electric meters; pressure die casting.

P3.
M-1114, 1.05-1.15 C, bal Fe
For tools, drills, taps; water hardened.

P4.
M-1114, 0.9-1.0 C, bal Fe
For tools, taps, reamers; water hardened.

P5
M-1114; 0.7-0.8 C, bal Fe
For tools; water hardened.

P6.
M-1114; 0.7-0.8 C, bal Fe.
For tools; water hardened

P-50 NICKEL.
M-68; 0.04 max Cu, 0.02 max Mn, 0.05 max Fe, 0.05 max C, 0.01 max Mg, 0.02 max Si, bal Ni + Co
For cathodes in electron tubes, high purity nickel.

PA 22 NICKEL.
M-121, 99.5 min Ni, 0.06-0.09 Mg.
For sleeves of indirectly heated, oxide coated cathodes in radio valves
Cathode nickel.

PA 23 NICKEL.
M-121; 99.5 min Ni, 0.035-0.065 Mg
For sleeves of indirectly-heated, oxide-coated cathodes in radio valves.
Cathode nickel.

PACKING
82 Pb, 4.8 Sn, 13 Sb.
20 Brin
For metallic packing; pouring temperature 324°C.

PACKING METAL.
51.8 Cu, 14.3 Zn, 15 Ni, 17 Pb, 1.8 Sn.
For metallic packing.

PACKING, PISTON.
M-258; 73-76 Pb, 12-14 Sn, 10-15 Sb.
11,000 TS; 26 Brin.
For metallic packing.

PACKING RINGS, FRENCH.
French; 51.8 Cu, 14.3 Zn, 15 Ni, 17 Pb, 1.8 Sn.
For packing rings.

PACKING, RUSSIAN.
Russian; 99 Zn, 0.9 Sn, 0 3 Pb, 0.2 Fe.
For packing metal.

PACKING (VALVE).
71 Sn, 24 Sb, 5 Cu
For valve packing, anti-friction.

PAGE 3½ Ni.
M-872; C, 3 5 Ni, bal Fe.
For gas welding rod; corrosion resistant.

PAGE-ALLEGHENY 4-6 CHROMIUM MOLY.
M-872, 0.10 max C, 4 Cr, Mo, bal Fe.
Annealed· 70,000 TS; 30,000 YS; 37 El, B70 Rock.
For welding electrodes, corrosion resistant.

PAGE-ALLEGHENY 8-10 Cr-Mo.
M-872, 0.08 max C, 8.5-10.5 Cr, 1.25-1 75 Mo,
bal Fe.
For welding electrodes; martensitic stainless steel.

PAGE-ALLEGHENY 12-14 Cr.
M-872, 0 12 min C, 12-15 Cr, bal Fe.
Annealed. 85,000 TS, 40,000 YS; 30 El; B95 Rock.
For combustion and steam engine parts, fans;
heat resistant to 1500°F.

PAGE-ALLEGHENY 12% Cr
M-872, 12 Cr, 0 12 max C, bal Fe.
Annealed· 70,000 TS; 35,000 YS; 25 El; B80 Rock.
For welding electrodes; corrosion resistant.

PAGE-ALLEGHENY 14-18 Cr.
M-872, 0 08 max C, 15-18 Cr, 0.5 max Ni, bal Fe.
Annealed· 65,000 TS; 35,000 YS, 35 El, 180 Brin.
Drawn 120,000 TS; 0 5 El; 230 Brin.
For welding electrodes, corrosion resistant, magnetic.

PAGE-ALLEGHENY 15-35
M 872, 0 25 max C, 15 Cr, 35 Ni, bal Fe
For welding electrodes for stainless steel,
coated, stainless

PAGE-ALLEGHENY 16% Cr
M-872, 0 12 max C, 16 min Cr, bal Fe.
For welding electrodes, corrosion resistant

PAGE-ALLEGHENY 17-7.
M-872, 0 10-0 20 C, 16-18 Cr, 7-8 5 Ni, bal Fe.
Annealed. 110,000 TS; 40,000 YS; 35 El;
B88 Rockwell
Drawn 270,000 TS, 240,000 YS; 1 El, C47 Brin
For trim, household articles,
Type 301X, stainless, austenitic

PAGE-ALLEGHENY 18-8
M-872, 18 Cr, 8 Ni, 0.07 C, 1.3 Cb, bal Fe.
Annealed. 90,000 TS; 35,000 YS; 55 El;
B80 Rockwell
Drawn· 350,000 TS, 175,000 YS; C45 Brin
For welding electrodes, strand springs, rope;
stainless steel

PAGE-ALLEGHENY 18-8 EZ.
M-872; 0 15 max C, 17-19 Cr, 8-10 Ni,
0.7 min P or S or Se, bal Fe
Annealed: 90,000-120,000 TS; 35,000 YS; 50-35 El;
130-150 Brin
For screw machine products, hardware;
stainless, austenitic, Type 303; free-cutting.

PAGE-ALLEGHENY 18-8 Mo.
M-872; 0 07 max C, 18-20 Cr, 12-15 Ni, 2.0-2.5 Mo,
bal Fe.
Annealed: 90,000 TS; 30,000 YS; 50 El
Drawn: 210,000 TS; 190,000 YS; 0.5 El.
For welding electrodes; austenitic, stainless.

PAGE ALLEGHENY 18-8S.
M-872; 0.03 C, 19-22 Cr, 10-12 Ni, bal Fe.
For welding electrodes; Type 304; stainless.

PAGE-ALLEGHENY 18-8 TYPE 307.
M-872; 0.07-0 15 C, 4 Mn, 0.5 Si, 19.5-22 Cr,
9-10.5 Ni, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 50 El; 60 RA;
180 Brin
For stainless parts; Type 307; stainless, austenitic.

PAGE-ALLEGHENY 18-8S.
M-872; 0 03 C, 19-22 Cr, 10-12 Ni, bal Fe.
For welding electrodes, stainless steel.

PAGE-ALLEGHENY 18% Cr.
M-872; 0.35 max C, 18 min Cr, bal Fe.
For welding electrodes, corrosion resistant

PAGE-ALLEGHENY 19-9
M-872; 19 Cr, 9 Ni, 0.07 C, bal Fe.
Annealed: 80,000 TS; 30,000 YS, 50 El;
B80 Rockwell.
For welding electrodes; stainless steel.

PAGE-ALLEGHENY 23% Cr.
M-872; 0 16 max C, 23 Cr, bal Fe.
Annealed 85,000 TS; 25 El; B84 Rock.
For welding electrodes; corrosion resistant

PAGE-ALLEGHENY 25-20.
M-872, 0 25 max C, 27 Cr, 21 Ni, bal Fe
Annealed 90,000 TS, 40,000 YS; 50 El;
B80 Rockwell
Drawn: 200,000 TS; 150,000 YS; C36 Brin.
For welding electrodes, stainless steel.

PAGE-ALLEGHENY 25-20 Cb.
M-872, 0.06-0 10 C, 27 5 min Cr, 20-22 Ni,
1 2-1 4 Cb, bal Fe
Annealed: 75,000 TS, 30,000 YS; 40 El; 50 RA;
180 Brin.
For welding electrodes; stainless,
austenitic, stabilized.

PAGE-ALLEGHENY 25-20 Mo
M-872; 0 06-0 10 C, 1 5-2.0 Mn, 27 5 min Cr,
20-22 Ni, 2 Mo, bal Fe
For welding electrodes,
heat and corrosion resistant

PAGE-ALLEGHENY 33 GRADE C1
M-872, 0 12 max C, 12-14 Cr, bal Fe.
For fans, blowers, condensers, engine parts,
heat resistant to 1500°F

PAGE-ALLEGHENY 33 N.H.
M-872, 0.08 max C, 11.5-13.5 Cr, 0.10-0.20 Al,
bal Fe
For welding electrodes, stainless.

PAGE-ALLEGHENY 33 TQ
M-872; 0 12 max C, 11.5-13 Cr, bal Fe.
For welding electrodes; stainless.

PAGE-ALLEGHENY 34
M-872, 0 12 max C, 14-16 Cr, bal Fe.
For fans, blowers; corrosion resistant.

PAGE-ALLEGHENY 44
M-872; 0.20 max C, 22-26 Cr, 11-13 Ni, bal Fe.
For furnace parts, boiler baffles, pumps;
heat resistant to 2100°F.

PAGE-ALLEGHENY 46.
M-872; 0 10 min C, 4-6 Cr, bal Fe
For welding electrodes; for 4-6 Cr steel.

PAGE-ALLEGHENY 55.
M-872; 0.35 max C, 23-30 Cr, bal Fe.
For furnace parts, boiler baffles;
heat resistant to 2100°F.

PAGE-ALLEGHENY 66 GRADE B.
M-872; 0.12 min C, 15-18 Cr, bal Fe.
For fans, blowers, condensers, evaporators; heat resistant to 1600°F.

PAGE-ALLEGHENY 66 GRADE C2.
M-872; 0.12 max C, 16-18 Cr, bal Fe.
For corrosion resisting parts; corrosion resistant.

PAGE-ALLEGHENY 66W.
M-872; 0.12 max C, 16-18 Cr, 2.5-3.5 W, bal Fe.
For welding electrodes; corrosion resistant.

PAGE-ALLEGHENY 67.
M-872; 0.35 max C, 18-23 Cr, bal Fe.
For welding electrodes; corrosion resistant.

PAGE-ALLEGHENY 430F.
M-872; 0.12 max C, 14-18 Cr, 0.7 min P, S, Se, or 0.6 max Mo, Zn, bal Fe.
For welding rod; free-cutting, stainless.

PAGE-ALLEGHENY ALLOY 22 Cr.
M-872; 0.08-0.20 C, 19-22 Cr, 9-12 Ni, bal Fe.
For digesters, pipes, tanks, agitators, strainers; corrosion resistant.

PAGE-ALLEGHENY AMO.
M-872; 0.10 max C, 16-19 Cr, 14 max Ni, 2-4 Mo, bal Fe.
For welding electrodes; stainless.

PAGE-ALLEGHENY A-Ti
M-872; 0.10 max C, 17-20 Cr, 7-10 Ni, Ti = 6 × C, bal Fe.
For welding electrodes; stainless.

PAGE-ALLEGHENY "B" SP.
M-872; 0.11 max C, 18-20 Cr, 8-10 Ni, bal Fe.
For welding electrodes; stainless.

PAGE-ALLEGHENY METAL A.
M-872; 0.11 max C, 17-19 Cr, 7-9 Ni, bal Fe.
For welding electrodes; stainless.

PAGE-ALLEGHENY METAL B.
M-872; 0.08-0.20 C, 18-20 Cr, 8-10 Ni, bal Fe.
For welding electrodes; stainless

PAGE-ALLEGHENY METAL C.
M-872; 0.08-0.20 C, 17-19 Cr, 7-9 Ni, bal Fe
For stainless parts; Type 302.

PAGE-ALLEGHENY METAL Cb.
M-872; 0.10 max C, 17-20 Cr, 8-12 Ni, Cb = 10 × C, bal Fe.
For welding electrodes; stainless.

PAGE-ALLEGHENY METAL FM.
M-872; 0.20 max C, 17-19 Cr, 7-9.5 Ni, S or Se or Mo, bal Fe.
For welding electrodes; stainless.

PAGE-ALLEGHENY OHMALOY.
M-872; 0.12 max C, 12-14 Cr, 4-4.5 Al, bal Fe.
For welding electrodes; stainless.

PAGE-ARMCO
M-872; 0.03 max C, bal Fe.
Welded: 55,000 TS; 8 El.
For welding electrodes; bare and coated.

PAGE A-S-3½N.
M-872; 0.15-0.20 C, 0.3-0.6 Mn, 0.15-0.75 Si, 3.25-3.75 Ni, bal Fe.
For welding wire for Ni and alloy steels; bare.

PAGE A-S-6.
M-872; C, bal Fe.
For welding wire for submerged arc welding; bare.

PAGE A-S-10.
M-872; C, bal Fe.
For welding wire for submerged arc welding; bare.

PAGE A-S-15.
M-872; C, bal Fe.
For welding wire for submerged arc welding; bare.

PAGE A-S-15-Mo.
M-872; C, alloy, bal Fe.
For welding wire for submerged arc welding; bare.

PAGE A-S-20.
M-872; C, bal Fe.
For welding wire; bare.

PAGE A-S-65.
M-872; C, bal Fe
For welding wire; bare.

PAGE A-S-110.
M-872; C, bal Fe.
For welding wire; bare.

PAGE-AUTO.
M-872; 0.06 C, bal Fe.
For welding electrodes.

PAGE B
M-872; 0.13-0.18 C, bal Fe.
Welded: 55,000 TS; 7 El.
For welding electrodes, rust and lime coated.

PAGE C.
M-872; 0.06 max C, 0.15 max Mn, bal Fe.
Welded 52,000-60,000 TS, 27-23 El
For gas welding rod, radio tube leads; AWS-GA-50, gas welding.

PAGE CE
M-872, 0.06 C, bal Fe
Welded: 50,000 TS, 8 El.
For welding electrodes, rust and lime coated.

PAGE DENTAL ALLOY.
93 Al, 2.25 Cu, 4.75 Au.
For dental applications

PAGE E.
M-872, 0.13-0.18 C, bal Fe.
Welded. 55,000 TS; 5 El.
For welding electrodes; rust and lime coated.

PAGE HARD FACING.
M-872, 0.6 C, 12-14 Mn, 2 Ni, bal Fe.
For hard facing electrodes; high manganese steel.

PAGE HC
M-872; 0.9 C, 1.4 Mn, bal Fe.
For welding electrodes; abrasion resistant.

PAGE HIGH CARBON.
M-872; 0.9-1.1 C, 0.6 Mn, bal Fe.
For hard facing electrodes; wear resistant.

PAGE HI-TENSILE C.
M-872; 0.07 C, bal Fe.
Welded: 75,000 TS; 20 El.
For welding electrodes; shielded arc.

PAGE HI-TENSILE F.
M-872, 0.06 C, bal Fe.
Welded: 80,000 TS; 17 El.
For welding electrodes; shielded arc.

PAGE HI-TENSILE G.
M-872; 0.11 C, bal Fe.
Welded: 85,000 TS; 17 El.
For welding electrodes; shielded arc.

PAGE HI-TENSILE M.
M-872; 0.06-0.08 C, 0.32-0.42 Mn, bal Fe.
Welded: 70,000-85,000 TS; 55,000 YS; 32-25 El.
For welding electrodes for low alloy steels; E-6015.

PAGE HI-TENSILE SHIELDED ARC.
M-872; 0.07 C, bal Fe.
Welded: 80,000 TS; 25 El.
For welding electrodes; shielded arc.

PAGE HT.
M-872; 0.2 C, bal Fe.
For welding electrodes.

PAGE MANGANESE BRONZE.
M-872; 0.3 Mn, 40 Zn, 0.75-0.85 P, bal Cu.
Welded: 60,000-65,000 TS; 25-20 El.
For gas welding wire; for cast iron welding

PAGE MANGANESE NICKEL.
M-872; 0.8-1.0 C, 12-14 Mn, 3.0-3.5 Ni, 0.2 Mo, 0.8-1.1 Si, bal Fe
Welded: 150 Brin.
For welding electrode, hard facing electrode; shielded arc, austenitic.

PAGE MC.
M-872, 0.36 C, 1 Mn, 1.2 Si, bal Fe.
For welding electrodes; mild, wear resistant.

PAGE MEDIUM CARBON
M-872; 0.32-0.45 C, 0.9-1.1 Mn, bal Fe.
For hard facing electrodes; tough

PAGE NAVAL BRONZE.
M-872; 59-61 Cu, 0.5-1.0 P, bal Zn
Welded. 49,000-55,000 TS; 35-25 El.
For gas welding wire, for cast iron welding.

PAITUNG WHITE COPPER.
26-40 Cu, 41-32 Zn, 16-37 Ni, 0-2.6 Fe.
For ornamental white metal parts; corrosion resistant

PAKTONG, COOKSON.
40.9 Cu, 45 Zn, 11.1 Ni, 2.5 Fe, 0.16 Co.
For domestic utensils, corrosion resistant

PAKTONG, FYFE
40.4 Cu, 25.4 Zn, 31.6 Ni, 2.6 Fe
For tableware, domestic utensils, corrosion resistant

PAKTONG, KEFERSTEIN.
26.3 Cu, 36.8 Zn, 36.8 Ni.
For tableware, corrosion resistant.

PAKTONG (Packfong)
Eng., 32-41 Ni, 26-40 Cu, 16-37 Zn, 0-2.6 Fe.
130,000 TS, 2 El
For tableware and ornamental uses, Nickel Silver.

PAKTONG, PEAT
57.9 Cu, 32.2 Zn, 7.7 Ni, 2.5 Fe
For ornamental ware, domestic utensils; corrosion resistant

PAKTONG, THURSTON
43.8 Cu, 40.6 Zn, 15.6 Ni.
For tableware, corrosion resistant

PAKTONG, TUTENAG
44-45.7 Cu, 16-39.6 Zn, 17.4 40 Ni
For domestic ware, ornamental parts; corrosion resistant.

PALAU-A
Eng., 60 Ni, 20 Pt, 10 Pd, 10 V.
For jewelry, chemical apparatus; Pt substitute, white gold.

PALAU-B
Eng., 20 Pd, 80 Au
For jewelry, chemical apparatus; Pt substitute, white gold

PALCO.
M-1493; 65 Pd, 35 Co.
For brazing molybdenum and tungsten. For cathode structures.
M.P. 2244-2250°F.

PALCRONIRD.
M-1493; 41 Au, 27 Pd, 22 Ni, 10 Cr.
M.P. 2150-2200°F.
For high temperature brazing.
Good flowability and wettability.

PALCUSIL-5.
M-1493; 68 Ag, 27 Cu, 5 Pd.
M.P. 1485-1490°F.
For brazing Kovar to ceramic seals.
Good wettability.

PALCUSIL-10
M-1493; 58 Ag, 32 Cu, 10 Pd.
M.P. 1515-1566°F.
For high temperature brazing of Kovar to ceramic seals
Good wettability.

PALCUSIL-15
M-1493; 65 Ag, 20 Cu, 15 Pd.
M.P. 1562-1652°F
For high temperature brazing for Kovar and ceramic seals
Good flowability and wettability

PALCUSIL-25.
M-1493; 54 Ag, 21 Cu, 25 Pd.
M.P. 1652-1742°F.
For high temperature brazing for Kovar.
High vapor pressure. Does not embrittle Kovar.

PALE YELLOW GOLD.
92 Au, 0.8-3 Ag, 0-8.3 Fe.
For jewelry; corrosion resistant.

PALID.
German; 11 Sb, 7 As, bal Pb.
For bearings; anti-friction.

PALINEY NO. 6
M-349, 44 Pd, 38 Ag, 1 Pt, 16 Cu, 1 Zn
Ht. Tr.: 165,000 TS, 110,000 YS; 15 El; 260 Brin.
Annealed: 110,000 TS, 63,000 YS; 24 El; 150 Brin.
For pivots, springs, bearings, electrical contacts.
Heat treatable, nonmagnetic, corrosion resistant.

PALINEY NO. 7.
M-349, 35 Pd, 10 Pt, 30 Ag, 14 Cu, 10 Au, 1 Zn.
Ht. Tr.: 185,000 TS, 150,000 YS; 10 El; 280 Brin
Annealed: 120,000 TS; 89,000 YS; 24 El; 180 Brin.
For springs, pivots, bearings, contacts, potentiometers
Non-magnetic, corrosion and wear resistant

PALINEY NO. 8.
M-349, 45 Pt, 38 Ag, bal Pd
Wire Annealed: 95,000-125,000 TS; 14 min El
Sheet Heat Treated: 160,000-200,000 TS; 0.5 min El; 110,000 PL; 390 Knoop.
For sliding contact in potentiometer windings of Nichrome.
Corrosion and wear resistant

PALINEY M
M-349; Pt, Au, Ag, bal Pd.
Wire: 60,000 TS; 24,000 YS; 23 El; 95 Brin.
For sliding contacts in potentiometers; corrosion and tarnish resistant, resistance wire.

PALIUM A
French; 1 Sn, 4 Pb, 4 Cu, 0.8 Mg, 0.3 Mn, 22 Zn, bal Al.
For bearings; antifriction

PALIUM Z
French; 2.6 Sn, 4 Pb, 4.5 Cu, 0.6 Mg, 0.3 Mn, 0.3 Zn, bal Al.
For bearings; antifriction.

PALLABRAZE-810.
M-200; 5 Pd, bal Ag + Cu
For brazing thermionic valves, magnetrons, klystrons.
M.P. 807-810°C.
High temperature brazing alloy

PALLABRAZE-840.
M-200; 10 Pd, Ag, bal Cu.
For brazing thermionic valves, magnetrons, klystrons.
M.P. 830-840°C.
High temperature brazing alloy.

PALLABRAZE-850.
M-200; 10 Pd, Cu, bal Ag.
For brazing thermionic valves, magnetrons, klystrons.
M.P. 824-850°C.
High temperature brazing alloy.

PALLABRAZE-880.
M-200; 15 Pd, Cu, bal Ag.
For brazing thermionic valves, magnetrons, klystrons.
M P. 856-880°C
High temperature brazing alloy.

PALLABRAZE-900.
M-200; 20 Pd, Cu, bal Ag.
For brazing thermionic valves, magnetrons, klystrons.
M.P. 876-900°C.
High temperature brazing alloy

PALLABRAZE-950.
M-200; 25 Pd, Cu, bal Ag
For brazing thermionic valves, magnetrons, klystrons.
M.P. 901-950°C.
High temperature brazing alloy.

PALLABRAZE-1010.
M-200, 5 Pd, bal Ag.
For brazing thermionic valves, magnetrons, klystrons.
M.P. 970-1010°C.
High temperature brazing alloy

PALLABRAZE-1090.
M-200; 18 Pd, bal Cu
For brazing thermionic valves, magnetrons, klystrons
M.P. 1080-1090°C.
High temperature brazing alloy.

PALLABRAZE-1225.
M-200; 30 Pd, bal Ag.
For brazing thermionic valves, magnetrons, klystrons.
M.P. 1150-1225°C.
High temperature brazing alloy.

PALLABRAZE-1237.
M-200; 60 Pd, bal Ni.
For brazing thermionic valves, magnetrons, klystrons
M.P. 1237°C.
High temperature brazing alloy.

PALLADENT.
40 Pd, bal Ag.

PALLADIUM ALLOY-1.
10 Rh, 90 Pb.
For jewelry; corrosion resistant.

PALLADIUM ALLOY-2.
67 Pd, 33 Ag.
For jewelry, corrosion resistant.

PALLADIUM GOLD-1.
90 Au, 10 Pd.
For jewelry; white gold, Pt substitute.

PALLADIUM GOLD-2.
40 Cu, 31 Au, 10 Ag, 10 Pd.
For jewelry; white gold, Pt substitute.

PALLAS.
M-1306; 1.05 C, Cr, bal Fe.
For bearings, cutters, liners, sleeves; water hardened, wear resistant.

"P" ALLOY.
Eng; 0.11 Fe, 0.11 Si, bal Al.
8,000 TS; 34 El.
For light alloy parts.

PALMANSIL-5.
M-1493; 75 Ag, 20 Pd, 5 Mn.
M.P 1846-1962°F.
For high temperature brazing
Good flowability and weldability

PALNI.
M-1493; 60 Pd, 40 Ni.
M.P 2260°F.
For high temperature brazing.
Good flowability and wettability.

PALNIRO-1.
M-1493, 50 Au, 25 Pd, 25 Ni.
M P. 2016-2050°F
For high temperature brazing
Wets and flows well on Mo-W and stainless steel.

PALNIRO-4
M-1493; 30 Au, 34 Pd, 36 Ni
M.P 2075-2136°F.
For high temperature brazing.
Wets and flows well on Mo-W and stainless steel.

PALNIRO-7
M-1493, 70 Au, 8 Pd, 22 Ni.
M P 1841-1899°F.
For high temperature brazing.
Wets W-Mo and stainless steel

PALORO.
M-1493, 92 Au, 8 Pd.
For brazing on molybdenum and tungsten.
M.P. 2192-2264°F

PALSIL-10
M-1493; 90 Ag, 10 Pd
M P. 1835-1950°F
For high temperature brazing
Good wettability and flowability.

PAN-7.
M-1218, M-1218a; 81.9 Cu, 10 Sn, 1 Ni, 7 Pb, 0.1 P
Cast 22,500-29,000 TS; 13,500-20,000 YS; 11-5 El; 65-75 Brin.
For connecting rod bearings, liners, sleeves; leaded bronze, anti friction

PAN-444.
M-1218, M-1218a; 83.75 Cu, 4 Sn, 4 Ni, 4 Pb, 0.25 P.
Cast: 27,000-36,000 TS; 16,000-20,000 YS; 18-8 El; 65-80 Brin.
For rocker bracket bushings in aircraft engines; leaded bronze, high ductility.

PAN-B
M-1218, M-1218a; 72.45 Cu, 9.5 Sn, 3 Ni, 15 Pb, 0.05 P.
Cast: 22,500-38,000 TS; 13,500-22,500 YS; 15-6 El; 60-75 Brin
For bearings, bushings, liners, sleeves; leaded phosphor bronze, corrosion resistant.

PAN-BS.
M-1218, M-1218a; 37 Pb, 0.5 Sn, 0.05 P, 0.5 Ni, bal Cu
Cast.
For main bearings, locomotive slippers; leaded bronze.

PANDALOY.
M-1256, M-1; C, Cr, Ni, bal Fe.
For paper making equipment, feed screws; stainless.

PANDEX.
M-73; 0.08 max C, 13-16 Cr, 24-28 Ni, 1-1.5 Mo, 1.75-2.25 Ti, 0 10-0.50 V, bal Fe.
Rolled: 135,000-160,000 TS; 85,000-115,000 YS; 30-20 El; 55-30 RA.
At 1400°F: 64,000 TS; 18.5 El; 23.5 RA.
For jet engine parts, superchargers, turbine wheels and blades; austenitic, heat resistant, age-hardenable.

PAN-H
M-1218, M-1218a; 66.85 Cu, 10 Sn, 3 Ni, 20 Pb, 0 15 P.
Cast. 20,000-27,000 TS, 11,500-18,000 YS; 13-6 El; 60-70 Brin.
For rotors, sleeves, bearings, bushings; leaded bronze, corrosion resistant.

PANSERI.
English; 1 Cu, 0.4 Mg, 4.5 Ni, 0.5 Fe, 11.5 Si, bal Al.
For pistons; high temperature resistance.

PANTAL
M-116, 0 5-1 0 Mg, 0.4-1 4 Mn, 0.8-2.0 Si, 0.3 Ti, bal Al.
Annealed· 16,000 TS, 14,000 YS; 25 El; 50 Brin.
Aged 60,000 TS, 50,000 YS; 10 El; 100 Brin.
For sheathing, body construction, architectural use; corrosion resistant, age-hardenable.

PANTAL.
M-935, 0.7 Si, 1 4 Mg, 0 9 Mn, 0-0 2 Ti, bal Al.
Heat treated· 43,000-50,000 TS; 26,000-36,000 YS; 12-15 El, 70-95 Brin.
For light alloy parts

PANTAL
M-1548, 0 5-1 0 Si, 0.4-1.4 Mn, 0 8-2 0 Mg, bal Al.
Half Hard 22,000 TS; 17,000 YS; 8 El; 45 Brin
Hard· 36,000 TS, 28,000 YS, 4 El, 60 Brin
For general structures, scaffolds, booms, transmission towers.
Corrosion resistant.

PANTAL 5
M-299, 9-13 Si, 0.25-0.40 Mg, 0.3-0.5 Mn, bal Al.
For light alloy parts; high corrosion resistance.

PANTAL-5
M-1548, 5 0 Si, 0.7 Mn, 0 7 Mg, bal Al.
Hard 26,000-37,000 TS, 21,000-33,000 YS; 4-8 El, 55-70 Brin
For general purposes, welding rods.
Corrosion resistant.

PANTANAX.
M-459; 1.2 C, 0.4 Si, 12 5 Mn, bal Fe.
For earth moving equipment, crushers, wear plates; wear and abrasion resistant.

PANTHER 5.
M-1; 1 5 C, 4 7 Cr, 12.5 W, 5 V, 5 Co, bal Fe.
Annealed. 241 Brin.
Heat treated: 660 Brin.
For lathe and planer tools, reamers; high speed steel, oil hardened. AISI T15.

PANTHER 5N.
M-1291, M-1114; 0 80 C, Co, 4.3 Cr, 0 85 Mo, 2 1 V, W, bal Fe.
For lathe and planer tools, broaches, reamers, taps; high speed steel.

PANTHER 750 SPECIAL.
M-1114, M-1291; 1.3 C, 4.3 Cr, 0.85 Mo, 4.5 V, 12 W, 5 Co, bal Fe.
For blanking and forming dies, chasers, broaches, taps, reamers, form cutters.
High speed steel. Excellent red-hardness.

PANTHER EXTRA.
M-1; 0.80 C, 14 W, 4 Cr, 2 V, 0.68 Mo, 5 Co, bal Fe.
For tools, cutters; high speed steel.

PANTHER EXTRA 655.
M-1291; 0.80 C, 6.5 W, 4 Cr, 5 Mo, 2 V, 5 Co, bal Fe.
Hardened: C 64-66 Rock.
For lathe and planer tools, form cutters, drills, chasers, reamers, broaches.
High speed steel, high red-hardness.

PANTHER EXTRA SPEZIAL.
M-1291, M-1114; 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, reamers, drills, taps; high speed steel.

PANTHER N.
M-1291, M-1114; 0.86 C, 3.0 Co, 4.3 Cr, 0.85 Mo, 3.0 V, 12 W, bal Fe.
For lathe and planer tools, reamers, drills, taps, chasers, broaches; high speed steel.

PANTHER SPECIAL.
M-1; 0.75 C, 19 W, 4 Cr, 1 V, 5 Co, bal Fe.
For lathe and planer tools, reamers, hobs, drills; high speed steel, heavy duty; Type T4.

PANTHER SPECIAL.
M-1114; 0 7 C, 18 W, 9 Co, 1 Mo, 4 Cr, 2 V, bal Fe.
For lathe and planer tools, milling cutters, hobs, taps; Type T4; high speed steel.

PANTHER ULTRA.
M-1291, M-1114; 0.76 C, 12 Co, 4 2 Cr, 0.8 Mo, 1 5 V, 18 W, bal Fe.
High speed steel; for lathe and planer tools, drills, reamers, taps.

PANZER
M-615; 0 7 C, 19 W, 4 Cr, 2 V, bal Fe.
For cutters, tools; high speed steel.

PAR 1.
M-153; Cr-W-Co, Fe
For heat and wear resting parts; resists wear at high temperature to 2000°F

PAR 2.
M-153; 0.3 C, 1.5 Cr, 2 5 Ni, 0.3 Mo, bal Fe.
For gears, pinions, shafts; wear and shock resistant.

PAR 2C.
M-153; C, Cr, Ni, bal Fe
For heat and corrosion resisting castings; heat, wear and corrosion resistant

PAR 3.
M-153; 0 35 C, 3 Cr, bal Fe.
For machinery parts, wear and abrasion resistant.

PAR 4.
M-153; 0.4 C, 25 Cr, 2 Ni, bal Fe
For heat and corrosion resting parts; heat and acid resistant.

PAR 5.
M-153; 0.3 C, 18 Cr, 8 Ni, bal Fe.
For heat and corrosion resisting parts; heat and acid resistant.

PAR 6
M-153; 0.4 C, 28 Cr, 10 Ni, bal Fe.
For heat and corrosion resisting parts; heat and acid resistant.

PAR 7.
M-153; 0.4 C, 16 Cr, 35 Ni, bal Fe.
For heat and corrosion resisting parts; heat and acid resistant.

PAR 8.
M-153; 0.25 C, 18 Cr, 65 Ni, bal Fe.
For heat and corrosion resisting parts; heat and acid resistant.

PAR 9.
M-153; 0.40 C, 30 Cr, bal Fe.
For heat and corrosion resisting parts; heat and acid resistant.

PAR 9A
M-153; C, Ni, Cr, bal Fe.
For heat and corrosion resisting castings; heat, wear and corrosion resistant.

PAR 10.
M-153, 0.8 C, 15 Cr, 0.45 Mo, 0.50 W, 0.04 Al, bal Fe.
For guides for hot work; corrosion and heat resistant.

PAR 10A.
M-163; C, Ni, Cr, bal Fe.
For heat and corrosion resisting castings; heat, wear and corrosion resistant.

PAR 11.
M-153; 0.55 C, 0.75 Cr, 1.5 0.3 Mo, bal Fe.
For forging dies; oil hardened.

PAR 11A
M-153, C, Ni, Cr, bal Fe
For heat and corrosion resisting castings; heat, wear and corrosion resistant.

PARA.
M-114, 1.25 C, 0.4 Cr, 1.6 W, 0.2 V, bal Fe.
For cutters, dies, taps, drills, shear blades, punches; dense deep hardening steel.

PARAGON A
M-38; 0.98 C, 1.68 Mn, 0.26 V, 0.11 Cu, 0.63 Cr bal Fe
For tools, dies; non-deforming.

PARAGON OIL HARDENING
M-38; C, alloy, bal Fe
For dies, rollers, punches; air hardened, non-deforming

PARALLOY
M-873; 3 C, 1 Mn, 2.5-3 Ni, 0.5-0.75 Cr, 2 Si, 0.2-0.25 Mo, bal Fe.
Cast 50,000 TS; 250 Brin.
For castings, cylinders, dies; cast iron.

PARALOY NO. 2.
M-873; 3 C, 1.5 Si, 2-4 Ni, 0.75-1.0 Cr, bal Fe.
Cast: 40,000-50,000 TS; 250-300 Brin.
For cast dies for sheet metal stamping and drawing; cast iron.

PARASTEEL
M-367; 0.5 C, 3 Ni, 1 Cr, bal Fe.
For gears, shafts; tough

PAR-EXC.
M-115; 0.50 C, 2 W, 1.65 Cr, 0.25 V, bal Fe.
Annealed: 70,000 TS; 30 El; 64 RA; 165 Brin.
Heat treated: 245,000 TS; 5 El; 18 RA; 525 Brin.
For punches, dies, chisels, shear blades, cutters, pneumatic tools, hot working dies; extremely tough.

PARISION ALLOY.
Eng.; 69 Cu, 19.5 Ni, 6.5 Zn, 5 Cd.
For cheap jewelry; gilt finish.

PARK A HOLLO DRILL.
M-38; 0.3 C, 0.95 Mn, 2.25 Ni, 0.7 Cr, 0.3 Mo, bal Fe.
For hollow drill rod for detachable bits; oil hardening.

PARK ALLOY CLIPPER BLADE.
M-38; 1.1 C, 0.35 Ni, 0.4 Cr, 0.3 V, bal Fe.
For hair clippers; oil hardening.

PARKALOY.
M-874; 0.3 C, 1.2 Ni, 7 Cr, bal Fe.
For screws, bolts; cold forging alloy.

PARKERS CHROME ALLOY.
60 Cu, 20 Zn, 10 Ni, 10 Cr.
For fountain pen points; corrosion resistant.

PARK GATE.
M-488, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed tools and cutters; high speed steel.

PARK ORTHOPEDIC STEEL.
M-38, C, alloy, bal Fe.
For orthopedic braces.

PARK SILVER.
M-38; 0.7 1.2 C, bal Fe.
For cutters, drills, broaches, dies; water hardening.

PARK SPECIAL
M-38; C, alloy, bal Fe
For tools.

PARR
Eng ; 80 Ni, 15 Cr, 5 Cu
73,000 TS; 15 RA; 137 Brin
For chemical machinery parts; stainless.

PARR
Eng ; 66.6 Ni, 18 Cr, 8.5 Cu, 3.3 W, 2 Al, 1 Mn, 0.2 Ti, 0.2 B
For chemical machinery parts, corrosion resistant.

PARSONS 2 S.A.
M-179, Sn base alloy
Cast
For bearings for internal combustion engines and steam turbines; antifriction white metal.

PARSON'S ALLOY
M-129; 56 Cu, 41.5 Zn, 1.2 Fe, 0.7 Sn, 0.1 Mn, 0.46 Al
70,000 TS; 25 El; 119 Brin.
For propeller blades, valve stems, engine frames, machine parts; tough.

PARSON'S MANGANESE BRONZE.
M-179, 55-60 Cu, 3.5 max Mn, Sn, Al, bal Zn.
Forged: 64,000 TS; 28,000 YS, 35 El, 120 Brin
Rolled 70,000 TS; 32,000 YS, 34 El; 130 Brin.
Extruded: 70,000 TS; 38,000 YS; 28 El.
For pump and sluice valve spindles, propellers, marine engine parts, condenser tubes, valves; non-corrosive, resists mild acids.

PARSONS STAR.
M-179, Sn base alloy
Cast
For marine main bearings, thrust blocks, steam pumps, and reciprocating engines; antifriction white metal.

PARSON'S WHITE BRASS.
M-179; 62 Sn, 35 Zn, 3 Cu.
Cast: 12,250 TS.
For marine and automobile bearings; hard, tough alloy.

PARSON'S WHITE BRASS.
M-309; 74 Sn, 5 Cu, 7 Sb, 14 Pb.
Cast: 12,250 TS; 10,700 YS; 3 El.
For marine and automobile bearings; Babbitt.

PARSON'S WHITE BRASS.
M-179; 65-70 Sn, 30-25 Zn, 5 Cu.
For marine and automobile bearings; tough.

PARSONS WHITE BRASS DA.
M-309; 3.7 Cu, 7.5 Sb, bal Sn.
Cast: 10,500 TS; 9400 YS; 3.5 El; 3.9 RA; 29 Brin.
For bearings for diesel turbine and gasoline engines; Babbitt.

PAR-TEN.
M-604; 0.12 C, 0.75 Mn, 0.10 Si, 0.04 V, bal Fe.
Rolled: 62,000 TS; 45,000 YS; 28 El.
For railroad and agriculture equipment, mine cars, auto bodies; high strength, low alloy construction steel.

PARTINIUM-1.
Eng.; 89 Al, 7.4 Cu, 1.7 Zn, 1.3 Fe, 1.1 Si.
19,000 TS; 12,000 YS; 2.5 El; 50 Brin.
For light aircraft and automobile parts; similar to Alcoa No. 113.

PARTINIUM-2.
Eng.; 96 Al, 2.4 Sb, 0.8 W, 0.6 Cu, 0.2 Sn.
65 Brin.
For light aircraft and automobile parts.

PATENT COBALT-CHROME STEEL
M-40; 1.27-1.43 C, 11.75-13.75 Cr, 2.7-3.3 Co, 0.60 max Ni, 0.55-0.85 Mo, 0.35 Mn, 0.6 max Si.
For air cooled aeronautic engine valves, blanking, trimming, forming and shearing tools; air hardening, non-deforming; resists wear.

PATINA STEEL.
M-383; C, 0.2-0.3 Cu, bal Fe.
Rolled: 52,000 64,000 TS; 35,000-50,000 YS; 725 El; 750 RA; 100 Brin.
For sheet metal structures, roofing, fences, pipes, bridges, nails; rust resisting.

PATINA STEEL BEIZEREI.
M-383; 0 4 Cu, Mn, Si, P, bal Fe.
Rolled: 52,000-64,000 TS; 35,000-50,000 YS; > 25 El; > 50 RA; > 100 Brin
For pickling installations and structures; high acid resistance

PATINA STEEL RAUCHGAS.
M-383, 0.4 Cu, Mn, Si, P, bal Fe.
Rolled: 52,000-64,000 TS; 35,000-50,000 YS; > 25 El; > 50 RA; > 100 Brin.
For structures exposed to smoke and acid fumes; high smoke resistance.

PATRIUS CNM
M-1388; 0.56 C, 0.8 Cr, 0.2 Mo, 1.75 Ni, 0.1 V, bal Fe.
For forging and heading dies; oil hardened, tough.

PATRIUS V.
M-1388; 0 55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For forging and heading dies; oil hardened, tough.

PATTERN ALLOY-1.
Eng ; 90 Al, 8 Cu, 2 Sn.
20,000-29,000 TS; 6-4 El.
For pistons; similar to Alcoa No. 12.

PATTERN ALLOY-2.
Eng.; 87 Pb, 13 Sb.
18,000 TS; 11 El; 10 RA.
For bearings; hard.

PATTERN METAL.
30-40 Zn, 15-40 Sn, 20-42 Pb, 0-3 Cu.
For bearings; anti-friction.

PAULITE.
M-875; 3.2 C, 2.5 Si, 1.5 Ni, 0.8 Cr, bal Fe.
For crushers; cast iron abrasion resistant.

PAX NON BREAK.
M-618; 0.5 C, 1.5 Cr, 2.25 W, 0.25 V, bal Fe.
For hot work dies; hot work steel.

P.B.
M-368; 0.7-0.9 C, bal Fe.
For tools; water hardening.

P.C. NO, 110-9A.
M-1599; 2.9-3.5 TC, 1.8-2.5 Si, 0.5-0.8 Mn, 0.2-0.8 Cr, 0.25-1.0 Cu, 0.25-1.0 Ni, bal Fe
Cast: 30,000 min TS; 212-293 Brin.
For machine dliners, machinery parts, housings, gears.
Wear resistant cast iron.

P.C. NO. 110-28.
M-1599; 2.8-3.3 TC, 1.8-2.5 Si, 0.5-0.8 Mn, 0.2-0.8 Cr, 0.25-1.5 Cu, 0.25-1.5 Ni, 0.5 Mo, bal Fe.
Cast: 40,000 min TS; 241-293 Brin.
For machined liners, gears, housings.
Wear resistant cast iron.

P.C. NO. 110-38.
M-1599; 3.0 max TC, 2.5-3.0 Si, 1.0-1.5 Mn, 1.75-2.5 Cr, 5.5-7.5 Cu, 13.5-17.5 Ni, bal Fe.
Cast: 25,000 min TS; 174 max Brin.
For stainless cast liners.
Stainless, austenitic cast iron.

P.C NO. 110-50.
M-1599; 2 9 max C, 2.0-3.2 Si, 0.8-1.5 Mn, 1.75-2.4 Cr, 18.0-22.0 Ni, bal Fe.
Cast: 55,000 min TS; 32,000 min YS; 8 El.
For cast liners.
Corrosion resistant, ductile cast iron.

P.C. NO. 110-63.
M-1599; 3 35-3.65 TC, 2.3-2.55 Si, 0.5-0.7 Mn, 0.2-0.4 Cr, 0 6-0.9 Cu, 0.3-0.5 Ni, bal Fe.
Cast: 30,000 min TS; 195-267 Brin.
For thin walled liners.
Wear resistant cast iron.

PDCP
M-319, Cu.
For electric generators and motors; electrolytic pure copper.

PDRL 162.
M-1491; 0 12 C, 10 Cr, 4 Mo, 2 W, 1 Cb, 1 Ti, 6.5 Al, 0.02 B, 0 10 Zr, 2.0 Ta, bal Ni.
Cast: 146,000 TS; 118,000 YS; 7 El.
At 1400°F: 146,000 TS; 123,000 YS; 5.5 El.
For high temperature service, jet engine and turbine components.
Heat and corrosion resistant. Casting alloy.

PDRL 163.
M-1491; 16.7 Cr, 6.3 Al, 0.1 Ti, 1.6 Mo, 2 W, 1 Cb, 0.05 C, 2 Ta, 0.02 B, 0.10 Zr, 0.30 max Fe, bal Ni.
For jet engine and gas turbine components, high temperature parts.
High heat and oxidation resistance. Cast alloy.

P-D TUNGSTEN.
M-432; C, 9.5 W, alloy, bal Fe.
For hot work and punch dies; high speed steel for maximum red-hardness.

PE 8
Russia; 92 WC, 8 Co.
For cutting tools; cemented.

Pe 50.
M-Italy; 5 Mg, bal Al.
Annealed: 42,000 TS; 22,000 YS; 35 El; 65 Brin.
For rivets.
Non-heat treatable.

PECHKO WHITE GOLD.
60 Au, 30 Pd, 10 Pt, 0.1-2.0 Ir.
For jewelry, ornaments; corrosion resistant.

PECKRITE.
M-876; 2.8-3.0 T.C., 1.6-1.8 Si, 0.75 Mn, 1.2-1.5 Ni, bal Fe.
Cast: 50,000 TS.
Heat treated: 70,000 TS; 450 Brin.
For bushings, gears, piston rings, cams; cast iron.

PECO.
M-1291; 0.63 C, 0.8 Cr, 1.5 Si, bal Fe.
For shears, knives, cold work tools, punches.
Tough, shock resistant, oil harden.

PEERLESS.
16.5 Cr, 3 Fe, 2 Mn, bal Ni.
For heating elements; resistance alloy.

PEERLESS 56.
M-38; 0.40 C, 3.25 Cr, 0.33 V, 2.5 Mo, bal Fe.
Heat treated: 307,000 TS; 243,000 YS; 8 El; 36 RA; 600 Brin
For extrusion mandrels; hot work steel, oil hardened.

PEERLESS "A."
M-38; 0.3 C, 9 W, 3.25 Cr, 0.25 V, bal Fe
For hot-heading and forging dies, gripping dies, swedges, hot work steel.

PEERLESS COLD HEADER.
M-38; 0.95 C, bal Fe.
Water hardened.
For tools, cold heading dies; cold work steel.

PEERLESS EXTRA.
M-38, 0.7-1.2 C, bal Fe.
For tools and punches, cutters; water hardening.

PEERLESS J.
M-38, 0.53 C, 0.11 Ni, 1.37 Cr, 1.3 V, 2.8 W, 1.5 Mo, bal Fe.
Annealed 88,000 TS; 60,000 YS; 29 El; 56 RA.
Heat treated: 256,000-209,000 TS; 232,000-188,000 YS; 8-7 El, 25-27 RA.
For hot work dies, aircraft structural members, hot work steel, oil hardened.

PEERLESS LCT-2
M-38; 0.4 C, 0.3 Mn, 2 Cr, 0.35 V, 11.5 W, bal Fe.
Ht Tr: 190,000 TS, 160,000 YS; 9 El; C 42 Rock
For dummy blocks, die holders, brass extrusion and forging dies, punches, die casting dies.
Abrasion and heat resistant.
Type H22 hot work steel.

PEERLESS SPECIAL.
M-343; C, Co, bal Fe.
For tools, dies; oil hardened.

PEERLESS W Co.
M-38; 0.30 C, 2.5 Cr, 12 W, 3.5 Co, bal Fe.
For extrusion dies and tools, hot work steel.

PELCOLOY.
M-1523; 70 Ni, 30 Fe.
Resistance wire. 120 ohms per cir.mil.ft
Ann: 70,000 psi; Hard drawn: 150,000 psi.
High temp coefficient of resistance: 4500 ppm between 0° and 100°C
Max. op temp: 590°C.

PENAIR 5.
M-341; 1.0 C, 0.6 Mn, 5.25 Cr, 1.1 Mo, 0.25 V, bal Fe.
For dies, rollers, punches; air hardened, non-deforming. AISI A2.

PENCO.
M-39; 0.95-1.05 C, bal Fe.
For tools, drills, taps; water hardened.

PENCO 70.
M-341, 0.70 C, 0.7 Mn, 0.25 Si, 0.7 Cr, 1.5 Ni, 0.3 Mo, bal Fe
Oil hardening, for forming rolls, punches, dies, clutch parts, knuckle pins, spindles.
Reference AISI-SAE 4370.

PENCO ACS.
M-341, 0.07 max C, 0.4 Mn, 0.25 Si, 4.5 Cr, bal Fe.
For hubbed cavity plastic mold; oil hardening.

PENCO BRAKE DIE
M-341; 0.51 C, 0.95 Cr, 0.87 Mn, 0.2 Mo, bal Fe.
Hardened: 140,000 TS; 293 Brin
For press brake dies, oil hardening

PENCO Cr-Mo-W.
M-341, 0.33 C, 1.05 Si, 1.55 W, 1.65 Mo, 5 Cr, bal Fe
For hot work dies; air hardening.

PENCO HI-VAN.
M-341, 0.4 C, 5.25 Cr, 1.2 Mo, 0.9 V, 1.1 Si, bal Fe
For hot work dies, oil or air hardening.

PENCO-OCS
M-341, 0.06 C, 0.30 Mn, 1.0 Cr, 0.25 Mo, B, bal Fe
For hobbed cavity molds, case hardened

PENCO WH
M-341, 0.95-1.1 C, bal Fe
For tools, dies, water hardening

PENCOYD.
M-877, 0.3 C, 1 Ni, bal Fe.
For bridge construction.

PEN-HOB.
M-341; 0.10 max C, 0.60 Cr, 1.25 Ni, bal Fe.
For hobbed cavity molds; case hardened.

PEN METAL-1.
Eng, 67 Au, 25 Cu, 8 Ag
145,000 TS
For pen points, corrosion resistant.

PEN METAL-2
Eng, 85 Cu, 13 Zn, 2 Sn
For pen points; corrosion resistant

PENN-AIR
M-1433, 1.0 C, 2 Mn, 1 Cr, 1 Mo, bal Fe
For punches, dies, blanking and forming tools; Type A2, air hardened

PENNALOY "A"
M-466, 0.4 C, 1.5 Ni, 0.8 Cr, 0.2 Mo, bal Fe.
Medium: 225-250 Brin.
For castings for abrasion resistance, bucket lips and teeth; abrasion resistant

PENNALOY "B"
M-466, C, alloy, bal Fe
Hardened. 500-600 Brin.
For crusher jaws, cement mills, sand pumps; wear resistant

PENNALOY "C"
M-466; C, alloy, bal Fe.
Hardened 500-600 Brin.
For sand and sludge pumps; resists mine waters.

PENNALOY "D."
M-466; C, alloy, bal Fe.
Medium: 225-240 Brin.
For sand and sludge pumps, pump sleeves; resists mine waters.

PENNALOY HEAT RESISTANT.
M-466; 0.13-0.20 C, 5-7 Cr, bal Fe.
For oil refineries; corrosion resistant.

PENNALOY HEAT RESISTANT.
M-466; 0.21-0.25 C, 7-11 Cr, bal Fe.
For oil refineries; corrosion resistant.

PENNANT
M-432; 0.90 C, 1.6 Mn, 0.20 V, bal Fe.
For tools, blanking and forming dies, broaches, taps, reamers; non-shrinkable.

PENN-CUT.
M-1433, 0.70 C, 4 Cr, 1 V, 18 W, bal Fe.
For taps, hobs, reamers, lathe cutters; Type T1; high speed steel.

PENN-CUT 5.
M-1433; 0.80 C, 4 Cr, 1 V, 18 W, 5 Co, bal Fe
For lathe and planer tools, form cutters, hobs, Type T5; high speed steel

PENN-CUT MOLY.
M-1433; 0.80 C, 4 Cr, 2 V, 6.4 W, 5 Mo, bal Fe.
For lathe and planer tools, form cutters, hobs; Type M2, high speed steel.

PENN-FLEX
M-1433, 0.33 C, 0.72 Mn, 0.25 Si, 0.85 Cr, 0.42 W, 0.45 Mo, bal Fe.
Oil or water hardening tool steel, designed for plastic molds

PENNROLD-10
M-1252, 0.40-0.60 Be, 2.35-2.60 Co or Ni, bal Cu
Annealed. 40,000 TS; 25,000 YS, 30 El, 40 RA.
Heat treated 150,000 TS; 140,000 YS, 1 El
For current carrying springs, switch parts, circuit breaker parts; age-hardenable, fatigue and corrosion resistant

PENNROLD-25
M-1252, 1.8-2.05 Be, 0.20 min Co or Ni, 0.60 max Co plus Ni, bal Cu.
Annealed 60,000 TS, 28,000 YS, 60 El
Hard 120,000 TS, 112,000 YS, 2 El.
Heat treated 215,000 TS, 205,000 YS, 1 El.
For current carrying springs, diaphragms, switch blades, contacts, bellows; age-hardenable, fatigue and corrosion resistant.

PENNROLD-165
M-1252; 1.6-1.8 Be, 0.20 min Co or Ni, 0.60 max Co plus Ni, bal Cu
Annealed 60,000 TS, 25,000 YS, 60 El.
Hard· 120,000 TS, 110,000 YS; 2 El
Heat treated· 200,000 TS, 180,000 YS; 1 El.
For current carrying and mechanical springs, age-hardenable, fatigue and corrosion resistant.

PENNSYLVANIA L C D
M-1433, 0.40 C, 4.5 Cr, 1 Mo, 0.8 W, 0.4 Mn, bal Fe.
For shears, punches, blanking and trimming dies; oil hardened, non-deforming.

PENNSYLVANIA L T.A.
M-1433, 1 C, 2 Mn, 0.9 Cr, 0.9 Mo, bal Fe.
For chisels, punches, dies, mandrels, crimpers; air hardened, non-deforming.

PENNSYLVANIA P.B DRILL ROD
M-368; 1.0-1.2 C, bal Fe.
Annealed· 100,000 TS, 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, reamers; Type W1; water hardened

PENNSYLVANIA P.H.-9.
M-1433; 0.35 C, 2.75 Cr, 0.30 V, 9 W, bal Fe.
For extrusion rams, liners, die casting dies; hot work steel, oil hardened.

PENNSYLVANIA P.H. 14.
M-1433; 0.42 C, 3.5 Cr, 0.3 V, 14 W, bal Fe.
For extrusion dies, liners and rams, hot punches; hot work steel, oil hardened.

PENNSYLVANIA P.H VAN.
M-1433; 0.40 C, 1.1 Si, 5.25 Cr, 0.9 V, 1.2 Mo, bal Fe.
For hot work tools and dies; hot work steel, oil hardened.

PENNSYLVANIA P.H.W.
M-1433; 0.35 C, 1.5 Mn, 5 Cr, 1 Si, 1.25 W, 1.25 Mo, 0.2 V, bal Fe.
For hot work tools and dies; hot work steel, oil hardened

PENNTEMP 165.
M-1252, 1.6-1.8 Be, 0.20-0.35 Co, bal Cu.
AM-temper. 100,000-110,000 TS; 75,000-90,000 YS; 18-22 El
XHM-temper: 160,000-175,000 TS, 135,000-150,000 YS, 3-7 El.
For contacts, switch members, clips, springs; age hardenable.

PEN-O-FOUR
M-341; 0.75 C, 0.7 Mn, 0.9 Cr, 1.75 Ni, 0.35 Mo, bal Fe.
For tools, dies, oil hardening

PENSTOCK-B
0.25 max C, 0.90-1.35 Mn, 0.15-0.30 Si, bal Fe.
Normalized. 70,000 min TS, 42,000 min YS; 23 min El.
For welded structures, hydroelectric penstocks. Shock resistant

PENTANAX S
M-459, 0.85 C, 1 Si, 17.5 Mn, bal Fe.
For wear and abrasion resistant parts; wear and abrasion resistant

PEN-VAN NO 12
M-341, 0.55 C, 1 Cr, 0.15 V, bal Fe.
For tools, chisels, punches; oil hardening.

PER 2.
French, 0.25 C, 22 Cr, 2 Ti, 2 Al, bal Ni.
For gas turbine components; heat and oxidation resistant

PERALUMAN 1
M-249, M-624, 0.5-1.5 Mg, 0.5-1.5 Mn, bal Al.
Soft 25,000 TS, 10,000 YS, 20 El, 45 Brin.
Hard 41,000 TS; 38,000 YS; 8 El; 75 Brin.
Extruded: 26,000 TS; 14,000 YS; 20 El; 45 Brin.
For paneling, roofing, containers; corrosion resistant, non-hardenable

PERALUMAN 2.
M-249, M-624, 2.15 Mg, 1.4 Mn, bal Al.
Soft. 31,000-36,000 TS, 15,000-21,000 YS; 20-16 El.
Hard 50,000-65,000 TS, 45,000-58,000 YS; 5-2 El
For panelling in architecture, ship building, automotive parts; corrosion resistant.

PERALUMAN 2.
M-1548, 1.3-1.5 Mn, 2.0-2.3 Mg, bal Al.
Soft· 31,000 TS; 14,000 YS; 20 El; 50 Brin.
Hard: 60,000 TS; 57,000 YS; 2 El; 105 Brin.
For vessels, storage tanks, welded structures. Non-hardenable, corrosion resistant.

PERALUMAN 3.
M-541, M-1220; 3.0-3.3 Mg, 0.30 Mn, bal Al.
Cast: 21,400-28,500 TS; 9000-12,000 YS; 6-10 El; 45-50 Brin
For light alloy castings; corrosion resistant.

PERALUMAN 3.
M-1420; 2-3 Mg, 0-0.4 Mn, bal Al.
Sand cast: 22,800 TS; 11,400 YS; 5 El; 50 Brin.
Permanent mold: 29,000 TS; 11,400 YS; 10 El; 55 Brin.
For aircraft and marine equipment; corrosion resistant to sea water.

PERALUMAN 3.
M-249, M-493; 2-3 Mg, 0-0.4 Mn, bal Al.
Soft: 32,000 TS; 16,000 YS; 25 El; 60 Brin.
Hard: 45,000 TS; 40,000 YS; 7 El; 90 Brin.
For architectural trim, containers, ship building corrosion resistant.

PERALUMAN 3.
M-1176; 3 Mg, 0.3 Mn, bal Al.
Cast: 21,000-29,000 TS; 8,000-12,000 YS; 10-6 El; 45-55 Brin.
For light alloy parts; corrosion resistant.

PERALUMAN 3G.
M-1605; 0.2-0.4 Si, 0.25-0.35 Mn, 3.0-3.3 Mg, 0.08-0.15 Ti, bal Al.
As Cast: 27,000 TS; 14,000 YS; 3-8 El; 45-60 Brin.
Heat Treated: 33,000 TS; 20,000 YS; 2-8 El; 50-70 Brin.
For sand and die castings, marine hardware, crankcases, oil pans, housings.
Fair castability, high corrosion resistant. Resists sea water. Heat treatable.

PERALUMAN 5.
M-249, M-1220, M-493; 5 Mg, 0.5 Mn, bal Al.
Soft: 41,000 TS; 21,000 YS; 24 El; 70 RA; 160 Brin.
For architectural trim; corrosion resistant.

PERALUMAN 5.
M-1176; 5 Mg, 0.4 Mn, bal Al.
Heat treated: 28,000-33,000 TS; 13,000-17,000 YS; 12-8 El; 60-80 Brin.
For light alloy parts; corrosion resistant.

PERALUMAN 5G.
M-1605; 0.8-1.0 Si, 0.25-0.35 Mn, 5.0-5.5 Mg, 0.08-0.15 Ti, bal Al.
Sand cast: 28,500 TS; 15,500 YS; 2-5 El; 55-70 Brin.
Die cast: 36,000 TS; 16,000 YS; 3-8 El; 60-80 Brin.
For marine hardware, crankcases, instrument cases, fuel gages.
Fair castability, high strength and corrosion resistant to sea water.

PERALUMAN 7.
M-624, M-249; 7 Mg, 0.5 Mn, bal Al.
Half hard: 60,000 TS; 43,000 YS; 15-20 El; 90-95 Brin.
Annealed: 43,000 TS; 29,000 YS; 26-30 El; 80-90 Brin.
For light alloy parts, aircraft parts; corrosion resistant.

PERALUMAN 7.
M-1176; 7 Mg, 0.4 Mn, bal Al.
Heat treated: 37,000-43,000 TS; 19,000-22,000 YS; 11-5 El; 70-80 Brin.
For marine hardware; resists sea water corrosion, age-hardenable.

PERALUMAN 7.
M-1548; 0.3-0.5 Mn, 7.0 Mg, bal Al.
Soft: 42,000 TS; 21,000 YS; 24 El; 75 Brin.
Hard: 64,000 TS; 51,000 YS; 4 El; 130 Brin.
For rivets.
Non-heat treatable.

PERALUMAN 9.
M-541, M-1220; 8-10 Mg, 0.3 Mn, bal Al.
Cast: 35,600-40,000 TS; 21,400-27,000 YS; 6-13 El; 75-80 Brin.
For fuel meters; corrosion resistant.

PERALUMAN 9.
M-1176; 9.3 Mg, 0.3 Mn, 0.02 Be, bal Al.
Heat treated: 28,000-35,000 TS, 14,000-19,000 YS; 2.5-1.5 El; 70-80 Brin.
For marine hardware; resists sea water corrosion, age-hardenable.

PERALUMAN 9G.
M-1605; 0.25-0.35 Mn, 9.0-9.5 Mg, 0.03 Be, bal Al.
Die cast: 38,000 TS; 23,000 YS; 1-3 El; 60-80 Brin.
For general die castings, marine hardware.
Fair castability, good strength, high corrosion resistance. Heat treatable

PERALUMAN 10.
M-1176; 10 Mg, 0.4 Mn, bal Al.
Heat treated: 50,000-56,000 TS; 21,000-26,000 YS; 13-6 El; 75-85 Brin.
For marine and aircraft parts; heat treatable, resists sea water corrosion.

PERALUMAN 15
M-249, M-541; 0-0.3 Mn, 1.3-1.8 Mg, bal Al.
Soft: 21,000 TS; 8,000 YS; 28 El; 40 Brin.
Hard: 32,000 TS, 30,000 YS; 6 El; 65 Brin.
For panels, containers.
Corrosion resistant.

PERALUMAN 25.
M-624, M-541; 2.2-2.8 Mg, 0.15-0.45 Mn + Cr, 0.4 max Fe, 0.3 max Si, bal Al
Annealed: 22,000-31,300 TS; 11,400-17,000 YS; 22-30 El, 45-55 Brin
Hard: 37,000-41,200 TS, 34,000-40,000 YS; 5-9 El; 70-85 Brin
For boat hulls, guided missile containers.
Corrosion resistant.

PERALUMAN-30.
M-249; 0.4 max Mn, 3-4 Mg, bal Al.
½H-temper: 39,750 TS; 35,500 YS; 8 El; 80 Brin.
H-temper: 49,500 TS.
For chemical and food processing equipment, ship building; resists sea water corrosion.

PERALUMAN 30G.
M-249, M-1634, 2-4 Mg, 0.25-0.35 Mn, bal Al.
Annealed: 21,400-28,500 TS, 9,000-12,000 YS; 20-6 El; 45-50 Brin.
For architecture, shipbuilding; corrosion resistant.

PERALUMAN 35.
M-624, M-541; 3.2-3.8 Mg, 0.2-0.4 Mn, 0.1 max Ti, 0.4 max Fe, 0.05 max Cu, bal Al.
Annealed: 30,000-37,000 TS; 12,800-20,000 YS; 20-30 El; 55-70 Brin.
Hard: 41,200-47,000 TS; 35,600-44,100 YS; 4-9 El; 85-100 Brin.
For boat hulls, guided missile containers.
Corrosion resistant.

PERALUMAN 50.
M-249, M-541; 0.2-0.4 Mn, 4.5-5.6 Mg, bal Al.
½ H-temper: 45,500 TS; 25,000 YS; 30 El; 80 Brin.
H-25 temper: 57,000 TS; 48,000 YS; 8-13 El; 110-95 Brin.
For chemical and food processing equipment; resists sea water corrosion.

PERALUMAN 50G.
M-249, M-1634; 4-6 Mg, 0.3 Mn, 0.7-1.0 Si, bal Al.
Annealed: 41,000 TS; 21,000 YS; 24 El; 70 Brin.
For architectural trim, corrosion resistant.

PERAX.
M-753; C, alloy, bal Fe.
For punches, dies, tools; oil hardened, tough.

PERCEIT.
Eng ; 55-80 Co, 20-35 Cr, 0-10 W.
40,000-130,000 TS; 570 Brin.
For high speed tools and dies; high speed steel.

PERCIT.
Cr-Co-W-Ni.
For tools; similar to Stellite.

PERCIT EXTRA.
M-72; 1.1 C, 2.5 Si, 0.4 Mn, 27 Cr, 60 Co, 4.3 W, bal Fe.
For hard facing electrodes; heat resistant.

PERCIT SPECIAL.
M-72; 1.5 C, 1.45 Si, 0.4 Mn, 27.5 Cr, 32.5 Co, 4.25 W, bal Fe.
For hard facing electrodes; heat resistant

PERCY ALUMINUM.
Eng ; 90-86 Cu, 7.5-13 Al, 0-2 Pb, 0-1.5 Mn.
Rolled· 53,000 TS; 9 El.
Cast. 12,000 TS, 30 El, 30 RA.
For bearings, stripper nuts, heavy duty.

PERDONAL.
M-764; 1.5-3.0 Mg, 0.5-1.5 Mn, 0.3 max Cr, bal Al.
Soft· 26,000 TS; 10,000 YS; 20 El; 45 Brin.
Hard 41,000 TS, 36,000 YS; 5 El; 77 Brin
For roofing, hydraulic tubing, architectural trim; good forming and welding properties

PERDURO
M-170; 1 6-1.8 T C , 0 4-0 6 C C., 0 5-0 7 Mn, 1 5 Si, 0 9-1.1 Cu, bal Fe
Heat treated 80,000-90,000 TS; 60,000-70,000 YS, 8-6 El, 179-207 Brin
For cast chains, sprockets, chain links; resists heat to 1100°F, malleable iron.

PEREKS CC
M-40; 0 66-0 80 C, 49-57 Ni, 24-30 Cr, Si, Mn, bal Fe
For heat and corrosion resistant parts, heat and corrosion resistant

PERFECTION ANTIFRICTION.
M-88, Pb, Sn, Sb.
For bearings; Babbitt.

PERFORCE SPEZIAL 3.
M-1308; 0 40 C, 13 Cr, 0 30 Mn, 0 40 Si, bal Fe.
Annealed· 100,000 TS, 55,000 YS; 20 El, 50 RA; 200 Brin.
For valves, gages, cutlery, surgical instruments, Type 420; stainless

PERKING BRASS.
Eng ; 76.2-80 Cu, 23.8-19.8 Sn, 0-0.14 Zn.
For ornamental parts, reflectors.

PERLIT NICKEL CAST IRON.
1.7-3 0 C, < 1 Si, Ni, Mn, bal Fe.
For castings, frames, housings; U.S.P. 1564284, sufficient Ni to ppt. graphite

PERLIT (PERLITGUSS).
M-160, M-527; 2 4-3 5 C, 0.5-1.5 Si, 0.2-0.6 P, 0 6-1 0 Mn, Ni, Cr, bal Fe.
30,000 TS; 200 Brin.
For automotive engine blocks, brake drums; nickel cast iron; wear resistant, tough.

PERMADUR-ADS.
M-1309; 1.05 C, 0.5 Si, 0.5 Mn, 5.25 Cr, 1.15 Mo, 0.30 V, bal Fe.
Ht. Tr.· 215,000 TS; 195,000 YS; 5 El; C 50 Rock.
For forming and blanking dies, shear blades, master hubs, punches.
Wear resistant, Type A2, air hardening.

PERMADUR-ADWS.
M-1309; 1 65 C, 0.32 Si, 0.3 Mn, 11.5 Cr, 0.6 Mo, 0.5 W, 0.09 V, bal Fe.
Ht. Tr.. 278,000 TS; 214,000 YS; 1 El; C 56 Rock.
For blanking and drawing dies, punches, thread rolling dies.
Type D2 air hardening.
Wear resistant, nondeforming.

PERMADUR H.
M-1340, 0.55 C, 1 05 Cr, 0.18 V, 1.85 W, bal Fe.
For cold work tools, upsetters, crimpers, punches; oil hardened, tough.

PERMADUR W.
M-1340; 0 35 C, 1 05 Cr, 0.18 V, 1.85 W, bal Fe.
For cold work tools, upsetters, punches, dies; oil hardened, tough.

PERMAFLY
M-1043, 80 Ni, 20 Fe.
For magnets for electrical equipment; magnetically soft

PERMAL.
M-878; 5 Si, bal Al.
For die castings, good fluidity.

PERMALLOY
M-205, 39-81 Ni, 61-19 Fe.
For loading material for signaling conductors, audio frequency transformers, greater magnetic qualities than iron.

PERMALLOY 3 8-78.5 Cr.
U.S , 3 8 Cr, 0 6 Mn, 17.1 Fe, bal Ni.
For soft magnets, high permeability.

PERMALLOY 4-79 Mo.
M-205, 0 3 Mn, 4 Mo, 16 7 Fe, bal Ni.
85,000 TS; 24,000 YS
For laminated cores, inductors, transformers, magnetic field detectors.

PERMALLOY 12 5-80 Mo.
M-205, 12 5 Mo, 7 5 Fe, 80 Ni.
For magnets; soft

PERMALLOY 45
M-22, M-205, 45 Ni, 0 3 Mn, bal Fe.
Sheet: 65,800 TS, 21,000 YS, 30 El; 108 Brin.
Initial permeability 2500, max permeability 25,000.
Eor audio frequency apparatus and output transformers, high permeability.

PERMALLOY 45.
M-61, 45 Ni, 55 Fe
Saturation inductance 16,000.
For cores and armatures in relays, motors, inductors, transformers, electromagnetic shields. Soft magnet

PERMALLOY 49.
M-61, 49-51 Ni, bal Fe
Saturation inductance 16,000
For leads and armatures for glass shielded switches, laminated cores for magnetic amplifiers, motors. Soft magnet.

PERMALLOY-68.
M-22, 68 Ni, bal Fe.
For magnetic apparatus, high permeability.

PERMALLOY 70.
M-61, 70 Ni, 30 Fe.
Saturation inductance 12,500.
For square loop laminated cores for magnetic amplifiers. Soft magnet.

PERMALLOY 78.
M-22, M-205; 78.5 Ni, 21.1 Fe, 0.3 Mn.
Sheet: 75,000 TS; 15,000 YS; 35 El, 115 Brin.
Initial permeability 8000; max permeability 100,000; Hc = 0.05.
For sensitive D.C. apparatus, relays; high permeability.

PERMALLOY-78.5.
M-61, 78.5 Ni, 21 5 Fe.
Saturation inductance 10,700.
For reeds in mercury wetted switches, relay armatures. Soft magnet.

PERMALLOY B.
M-269; 46 Ni, 54 Fe.
For telecommunications; low coefficient of expansion.

PERMALLOY D
M-269, 36 Ni, 64 Fe
For magnetic equipment, low coefficient of expansion.

PERMALLOY F.
M-269; 65 Ni, 35 Fe.
Domain oriented alloy for electrical equipment; high magnetic permeability.

PERMALLOY 'G.'
M-269, 46 Ni, 54 Fe.
Grain oriented alloy for electrical equipment; high magnetic permeability

PERMALLOY STANDARD.
M-22, 78 5 Ni, 21 5 Fe, 0 04 C, 0 37 Co, 0 022 Mn.
For loading submarine cables; high elec. resisting.

PERMALLOY 'SUPER C'
M-269, 77 4 Ni, 13 3 Fe, 3 7 Mo, 5 Cu
For transformers, chokes, magnetic shielding μ (.001) > 50,000
Soft magnet; high permeability

PERMAN.
M-1331; 1 05 C, 1 0 Cr, 1 15 W, bal Fe.
For bearings, cutters, liners, sheaves; water hardened, wear resistant.

PERMANENT 10.
M-1309, 0 80 C, W, Co, Cr, V, Mo, bal Fe
For lathe and planer tools, reamers, taps, hobs; high speed steel.

PERMANENT 17.
M-1309; 0 85 C, 3.0 Co, 4 5 Cr, 1.0 Mo, 2.0 V, 12 W, bal Fe
For lathe and planer tools, reamers, broaches, high speed steel.

PERMANENT 35
M-1309; 0 80 C, 5 0 Co, 4.5 Cr, 0.8 Mo, 1.7 V, 18 W, bal Fe
High speed steel, for lathe and planer tools, reamers, drills, hobs.

PERMANENT 40.
M-1309; 0.90 C, 4 5 Cr, 1.0 Mo, 2.6 V, 12 5 W, bal Fe
High speed steel, for lathe and planer tools.

PERMANENT 50
M-1309; 1.3 C, 4 5 Cr, 1.0 Mo, 4.0 V, 12.5 W, bal Fe.
High speed steel; for engravers tools, forming and drawing dies.

PERMANENT 70.
M-1309; 1.40 C, 4.5 Cr, 6.0 Co, 4.0 V, 12.5 W, bal Fe.
High speed steel; for lathe and planer tool, reamers, hobs, taps.

PERMANENT 80.
M-1309; 0.80 C, 10 Co, 4.5 Cr, 0.8 Mo, 1.7 V, 18.5 W, bal Fe.
High speed steel; for lathe and planer tools, form cutters.

PERMANENTE.
M-1025; 2.89 Zn, 6 Al, 0.25 Mn, bal Mg.
Cast. 28,300 TS, 7 El, 52 Brin
For light alloy castings, heat treatable.

PERMANICKEL renamed PERMANICKEL ALLOY 300

PERMANICKEL ALLOY 300.
M 1499, 98 5 Ni, 0 20 C, 0 25 Mn, 0.30 Fe, 0 005 S 0 18 Si, 0 13 Cu, 0 40 Ti, 0 35 Mg.
Hot-finished: 90,000-120,000 TS; 35,000-65,000 YS, 45-20 El, 140-230 Brin.
Hot-finished and aged: 160,000-200,000 TS; 120,000-150,000 YS; 20-10 El; 285-360 Brin.
For grid lateral winding wires, magnetostriction devices, thermostat contact arms, solid-state capacitors, grid slide rods, diaphragms, springs, clips, fuel cells

PERMANIT 30
M-27, 1 C, 4 Cr, 0.15 W, bal Fe.
For permanent magnets, 9500 gausses residual.

PERMANIT 35.
M-27; 1 C, 4 Cr, 0 25 W, 1 Si, bal Fe.
For permanent magnets, 10,000 gausses residual.

PERMANIT 38
M-27; 1 C, 1 Mn, 5 Cr, bal Fe
For magnets, permanent.

PERMANIT 40
M 27, 1 C, 3 7 Cr, 0 5 W, 2 3 Co, bal Fe
For magnets, permanent.

PERMANIT 50
M-27, 1 C, 8 Cr, 1-2 Mo, 6 5 Co, bal Fe
For permanent magnets, high permeability

PERMANIT 70
M-27, 0 95 C, 8 5 Cr, 1 Mo, 15 5 Co, bal Fe
For permanent magnet; 9000 gausses residual

PERMANIT 95
M-27, 1 C, 4 5 Cr, 4.5 W, 0 5 Mo, 30 Co, bal Fe.
For permanent magnet, 9500 gausses, residual.

PERMANIT 110
M-27, 0 05 C, 21 Ni, 12 Al, bal Fe
For cast permanent magnets, high permeability.

PERMANIT 120
M-27, 0 05 C, 26 Ni, 14 Al, bal Fe
For cast magnet, permanent magnet.

PERMANIT 140
M-27, 0 05 C, 26 Ni, 8 Co, 11 Al. bal Fe.
For cast magnets, permanent magnet

PERMANIT 160
M-27, 0 5 C, 15 Co, 20 Ni, 9.5 Al, 3 5 Cu, bal Fe.
For cast magnets; permanent magnet

PERMANIT 180K.
M-27; 0 04 C, 20 Ni, 20 Co, 7 Al, 7 Cu, 6 Ti, bal Fe
For magnets; permanent.

PERMANIT 200
M-27; 0.05 C, 20 Ni, 15 Co, 9 5 Al, 3 5 Cu, bal Fe.
For cast magnets; permanent magnet.

PERMANIT 250
M-27; 0.04 C, 20 Ni, 24 Co, 8 Al, 4 Cu, 5 Ti, bal Fe.
For magnets; permanent.

PERMANIT 400.
M-27; 0.05 max C, 21 Ni, 25 Co, 8 Al, 3 Cu, bal Fe.
For cast magnets, electrical equipment; high coercive force.

PERMANIT 400K.
M-27; 0.01 C, 14 Ni, 24 Co, 8 Al, 3 Cu, Ti, bal Al.
For magnets; permanent.

PERMANIT 500.
M-27; 0.05 C, 14 Ni, 24 Co, 8 Al, 3 Cu, Ti, bal Fe.
For magnets, permanent.

PERMANIT 600.
M-27; 0 05 C, 14 Ni, 24 Co, 8 Al, 3 Cu, bal Fe.
For magnets; permanent.

PERMANITE.
U S ; Co, Cr, W, bal Fe.
For permanent magnet steel; high coercive force.

PERMAN N
M-1331, 1 0 C, Mn, W, Cr, V, bal Fe.
For bearings, cutters, sleeves, liners; water hardened, wear resistant

PERMANT
M 56, 0 08 C, 0 2 Mn, 0 05 Si, 36 Ni, bal Fe.
For scales, clocks, watches, instruments; low coefficient of expansion.

PERMAS
M-378; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Rolled. 95,000 TS, 45,000 YS, 50 El, 65 RA; 185 Brin
For balance weights, Type 311; corrosion resistant.

PERMAT
45 Cu, 30 Co, 25 Ni
For magnets for electrical equipment; magnetically soft

PERMAX
M-104, Fe, alloys, bal Ni
For electrical equipment, high permeability, constant magnetic properties

PERMAX
M-775, C, alloy, bal Fe
Cast 60,000 TS, 38,000 YS, 10 El, 150 Brin
For bell yokes, direct current magnets.

PERMENDUR
M-108, 49 7 Fe, 0 30 Mn, bal Co.
For rotor and stator laminations, servo motors; soft magnet, high permeability

PERMENDUR
M-205, 50 Co, 50 Fe

PERMENDUR 2-V.
M-22, M-205, 48 8 Co, 48 8 Fe, 0 4 Mn, 1.7 V.
Sheet· 87,000 TS; 60,000 YS
For receiver diaphragms

PERMENDUR 50-50
M-205, M-22; 0 4 Mn, 49 8 Fe, 49 8 Co
For electrical equipment; high flux density.

PERMENDUR-50 KF.
M-Russia; 49 95 Co, 1 4 V, 0 04 Si, 0 22 Mn, 0 02 C, 0 007 S, 0 006 P, bal Fe.
For magnetic and electrical equipment.
Soft magnetic alloy. High permeability High magnetostriction saturation.

PERMENOR-4801.
M-296; 48 Ni, bal Fe
Cold Rolled and annealed: 58,000 TS; 19,000 YS; 27 El
For high temperature low expansion applications, audio transformers, motor rotors.
High permeability, controlled expansion.

PERMENORM see PERMENOR —4801.

PERMENORM 5000 Z.
M-296; 50 Ni, 50 Fe.
For soft magnets, magnetic amplifiers, electrical equipment; high permeability.

PERMET.
U.S.; 25 Ni, 30 Co, 45 Cu.
For permanent magnets; from powder metallurgy. Precipitation hardened.

PERMET PF-1.
M-38; 100 Fe.
For magnets; 1,100,000 BH max; Br 5700; 3650 Bo; Hc 470.

PERMET PF-2.
M-38; 30 Co, 70 Fe.
For magnets; 1,520,000 BH max.
Br 6000, 3830 Bo, Hc 625.

PERMINVAR 7-70
M-70; 7 Co, 23 Fe, 70 Ni.
Permeability 850-4000, coercive force 0.6, saturation induction 12,500.
For magnets for electrical and magnetic instruments.
Curie temperature 650°C.
Soft magnetic alloy.

PERMINVAR 7 5-45-25 Mo.
M-205, 0 6 Mn, 7.5 Mo, 45 Ni, 25 Co, 21.9 Fe.
Initial permeability 850,
Max permeability 4000, Hc = 0 6
Soft magnetic material.

PERMINVAR 7 5-70
M-22, M-205; 7 5 Co, 70 Ni, 22 7 Fe, 0.3 Mn.
For communication equipment for modulus cores; high initial permeability.

PERMINVAR 25-45.
M-22, M-269, 45 Ni, 25 Co, 30 Fe.
1.2 Hc, 400 initial permeability,
2000 max permeability, B = 10,000
For electrical communication, circuits, magnetic circuits
High permeability, soft magnet.

PERMINVAR 43-23
M-205, 0.3 Mn, 43 Ni, 23 Co, 33.7 Fe.
For magnetic coils, transformers; soft.

PERMITE
M-6; 0 5 Si, 10 Cu, 1 Fe, 0 4 Mg, bal Al.
40,000 TS, 38,000 YS, 0.5 El; 120 Brin
For internal combustion engine pistons; coef exp 0 0000127.

PERMITE.
M-240, Sn, bal Cu.
For machinery parts, bronze.

PERMITE 1002 (2002).
M-6, 9-11 Cu, 0 4-0 6 Si, 0.25-0.40 Mg, 1.0-1.5 Fe, bal Al.
Cast· 26,000-45,000 TS; 21,000-35,000 YS; 1.0 El; 60-150 Brin
For light alloy parts, pistons, permanent mold castings, non-hardenable.

PERMITE NO. 1003 (LOW EXPANSION ALLOY).
M-6, 1 0 Cu, 1.0 Fe, 13.5 Si, 0.25 Zn, 1.0 Mg, 0 10 Mn, 2 5 Ni, bal Al
Heat treated: 28,000-35,000 TS; 0 5-1.0 El; 100-90 Brin.
Cast. 25,000 TS, 1.0 El; 85 Brin.
For low expansion alloy; coefficient of expansion 0.0000110.

PERMITE NO. 1004 (2004).
M-6; 6-8 Cu, 1.5 Fe, 2.0 Si, 2.5 Zn, 0.2 Mg, 0.2 Mn, bal Al.
Chill cast: 23,000 TS; 1.0 El; 80 Brin.
Sand cast: 20,000-16,000 TS; 1.0-2.5 El; 60 Brin.
For general castings; coefficient of expansion 0.000013.

PERMITE 1005.
M-6; 7 Cu, 1.2 Fe, 1.7 Si, bal Al.
For permanent mold castings; similar to Alcoa 12.

PERMITE NO. 1006 (2006).
M-6; 11.0-13.5 Cu, 0.75 Fe, 0.5 Si, 0.25 Zn, bal Al.
Chill cast: 25,000 TS; 1.0 El; 100 Brin.
Sand cast: 23,000 TS; 1.0 El; 90 Brin.
For leak proof castings; high fluidity.

PERMITE NO. 1007 (2007).
M-6; 6-8 Cu, 1.0 Fe, 1-2 Si, 0.25 Zn, 0.20 Mg, 0.20 Mn, bal Al.
Chill cast: 26,000 TS; 2.5 El; 75 Brin.
Sand cast: 24,000 TS; 2.0 El; 70 Brin.
For general castings; good machinability.

PERMITE NO. 1008 (2008).
M-6; 4-5 Cu, 1.2 Fe, 2-3 Si, 0.25 Zn, bal Al.
Chill cast: 25,000 TS; 2.0 El; 70 Brin.
Heat treated: 35,000-38,000 TS; 4.0-1.0 El; 70-100 Brin.
For general castings; age-hardened.

PERMITE NO. 1009 (2009).
M-6; 4-5 Cu, 0.5 Fe, 0.5 Si, bal Al.
Sand cast: 25,000 TS; 2 El.
Heat treated: 28,000-36,000 TS; 6.0-1.0 El; 60-75 Brin.
For general castings; age-hardened.

PERMITE NO. 1010.
M-6; 4 Cu, 1 Si, bal Al.
For machine parts; age-hardenable.

PERMITE 1011 (2011).
M-6; 0.75 Fe, 4-5 Si, 0.5 Zn, 0.1 Mg, bal Al.
Chill cast: 21,000 TS; 2.5 El; 50 Brin.
Sand cast: 17,000 TS; 3.0 El; 45 Brin.
For general castings; corrosion resistant.

PERMITE NO. 1014 (2014) (Y-ALLOY).
M-6; 4.0 Cu, 0.75 Fe, 0.75 Si, 0.2 Zn, 1.0-1.5 Mg, 2.0 Ni, bal Al.
Sand cast: 23,000 TS; 0.5 El; 90 Brin.
Heat treated 30,000 TS; 0 El; 110 Brin.
For general castings; coefficient of expansion 0.0000136.

PERMITE NO. 1015 (2015).
M-6; 2.5 Cu, 0.75 Fe, 1.0 Si, 30-31 Zn, bal Al.
Sand cast. 25,000 TS; 3 El; 70 Brin.
Chill cast: 30,000 TS, 3 El; 70 Brin.
For general castings; non-hardenable.

PERMITE NO. 1016.
M-6; 10 Cu, 1.0 Fe, 3-4 Si, 0.25 Zn, 0.20 Mg, bal Al.
Chill cast: 22,000 TS; 1.0 El; 85 Brin.
For general castings; non-hardenable.

PERMITE 1018.
M-6; 1.0-1.5 Cu, 0.5 max Si, 0.6 max Fe, 0.7-1.2 Mn, bal Al.
23,000-30,000 TS, 3,500-10,000 YS; 12-8 El; 45-70 Brin.
For light alloy parts; non-hardenable.

PERMITE NO. 1019 (2019).
M-6; 1.25 Cu, 1.0 Fe, 4.5-5.5 Si, 0.25 Zn, 0.5 Mg, bal Al.
Heat treated: 27,000-35,000 TS; 4.5-1.0 El; 60-90 Brin.
For general castings; age-hardened.

PERMITE 1020.
M-6; 7 Si, 0.3 Mg, bal Al.
Heat treated and T-6 temper: 38,000 TS; 5 El; 90 Brin.
For permanent mold castings; similar to Alcoa 356.

PERMITE 1021.
M-6; 1.8 Zn, 3.8 Mg, bal Al.
Cast: 25,000 TS; 8 El; 60 Brin.
For permanent mold castings; similar to Alcoa A 214.

PERMITE 1024.
M-6; 7 Cu, 5.5 Si, 0.3 Mg, bal Al.
T-551 Temper: 31,000 TS; 1 El; 110 Brin.
For permanent mold castings; similar to Alcoa 152.

PERMITE 1027.
M-6; 4.5 Cu, 5.5 Si, bal Al.
Cast: 28,000 TS; 4 El; 70 Brin.
For permanent mold castings; similar to Alcoa A 108.

PERMITE 1029.
M-6; 3.5 Cu, 6.0 Si, bal Al.
T-6 Temper: 38,000 TS; 4 El; 95 Brin.
For permanent mold castings; similar to Alcoa 319.

PERMITE 1031.
M-6; 1.0 Cu, 1.0 Ni, 6.5 Sn, bal Al.
T-533 Temper: 20,000 TS; 10 El; 100 Brin.
For permanent mold castings; similar to Alcoa 750.

PERMITE 1034.
M-6, 3.0 Cu, 9.5 Si, 1 Mg, 1 Ni, bal Al.
Heat treated: 34,000 TS; 10 El; 105 Brin.
For permanent mold castings; similar to Alcoa D 132.

PERMITE 2003
M-6; 0.8 Cu, 0.8 Fe, 12 Si, 1 Mg, 2.5 Ni, bal Al.
For sand castings; similar to Alcoa A 132 alloy.

PERMITE 2004.
M-6; 7 Cu, 1.2 Fe, 1.7 Zn, bal Al.
Cast: 23,000 TS, 3 El; 70 Brin.
For sand castings; similar to Alcoa 112.

PERMITE NO. 2005.
M-6; 6.0-8.5 Cu, 0.75 Fe, 0.50 Si, 0.25 Zn, bal Al.
Sand cast 20,000 TS; 2.0 El; 65 Brin.
For general castings, non-hardenable.

PERMITE 2010.
M-6, 4-5 Cu, 1.0 Fe, 1.0 Si, 0.25 Zn, 0.20 Mg, bal Al
Sand cast: 27,000 TS; 2.0 El; 50 Brin.
Heat treated: 28,000-38,000 TS; 5.0-1.0 El; 100-60 Brin
For general castings; age-hardened.

PERMITE NO. 2012 .
M-6; 0.75 Fe, 9-11 Si, 0.5 Zn, 0.1 Mg, bal Al.
Sand cast. 23,000 TS, 5.0 El; 50 Brin.
For general castings; corrosion resistant.

PERMITE NO. 2013.
M-6; 0.75 Fe, 13 Si, 0.5 Zn, 0.1 Mg, bal Al.
Sand cast. 28,000 TS; 8.0 El; 50 Brin.
For general castings; corrosion resistant.

PERMITE NO. 2017 (PATTERN ALLOY).
M-6; 6-8 Cu, 1.0 Fe, 1.0 Si, 2.5 Zn, 1.0 Sn, bal Al.
Sand cast: 18,000 TS; 2.0 El; 70 Brin.
For general castings; good machinability.

PERMITE NO. 2018.
M-6; 2.5 Cu, 0.5-2.0 Mn, bal Al.
Sand cast: 20,000 TS; 8 El.
Heat treated: 28,000-30,000 TS; 6-4 El.
For general castings; high ductility.

PERMITE NO. 2020.
M-6; 1.0 Fe, 6.5-7.5 Si, 0.25 Zn, 0.35 Mg, bal Al.
Heat treated: 26,000-30,000 TS; 5-3 El; 55-70 Brin.
For general castings; age-hardened.

PERMITE NO. 2021.
M-6; 0.1 Cu, 0.5 Fe, 0.5 Si, 3-4 Mg, bal Al.
Sand cast: 22,000 TS; 6 El; 50 Brin.
For general castings; corrosion resistant.

PERMITE NO. 2022.
M-6, 0.1 Cu, 0.5 Fe, 0.5 Si, 5-6 Mg, bal Al.
Sand cast: 25,000 TS; 4 El; 60 Brin.
For general castings; corrosion resistant.

PERMITE NO 2023.
M-6; 0.1 Cu, 0.5 Fe, 0.5 Si, 9-10 Mg, bal Al.
Sand cast: 27,000 TS; 3 El, 60 Brin.
Heat treated. 38,000 TS; 11 El; 75 Brin.
For general castings; corrosion resistant.

PERMITE 2025.
M-6; 4.0 Cu, 3.0 Si, bal Al.
Cast: 21,000 TS; 2.5 El; 55 Brin.
For sand castings; similar to Alcoa 108.

PERMITE 3011.
M-6, 5 Si, bal Al.
Cast: 30,000 TS; 14,000 YS; 7 El.
For die castings; similar to Alcoa 43.

PERMITE 3012
M-6, 12 Si, bal Al.
Cast: 37,000 TS, 18,000 YS; 1.8 El.
For die castings; similar to Alcoa 13.

PERMITE 3027.
M-6; 4 Cu, 5 Si, bal Al.
Cast: 40,000 TS; 22,000 YS; 3.5 El.
For die castings, similar to Alcoa 85.

PERMITE 3032
M-6, 8 Mg, bal Al.
Cast. 42,000 TS; 23,000 YS; 7 El.
For die castings; similar to Alcoa 218.

PERMITE 3033.
M-6, 9.5 Si, 0.5 Mg, bal Al
Cast. 42,000 TS; 23,000 YS; 1.8 El.
For die castings; similar to Alcoa 360.

PERMITE 3034.
M-6; 3.5 Cu, 8.5 Si, bal Al.
Cast: 45,000 TS; 25,000 YS; 2.0 El.
For die castings; similar to Alcoa 380.

PERMITE A-2023 SPECIAL.
M-6; 0.20 max Si, 9.5-10.5 Mg, max Fe, 0.4-0.6 Zn, bal Al.
27,000 TS; 18,000 YS; 4 El; 60-70 Brin.
For light alloy parts, pistons, permanent mold castings, pumps; heat treatable.

PERMIUM NO. 205.
M-879; Os, Ru, Rh, Co, Ni.
For jewelry, instrument jewels; sintered.

PERMO.
M-880, Os, Rh, Ru.
For instrument bearings, fountain pen tips; corrosion and wear resistant.

PERMOLD.
M-881; Cu, Si, bal Al.
For washing machine and typewriter parts; permanent mold.

PERMOLD 3-5.
M-881; 3.75 Cu, 6.25 Si, 0.1 Mg, bal Al.
Sand cast-T6: 31,000 TS; 24,000 YS; 1.5 El; 80 Brin.
Permanent mold-T6: 38,000 TS; 26,000 YS; 1.5 El; 90 Brin.
For aircraft castings; Type 319; age-hardenable.

PERMOLD 7.3.
M-881; 7 Si, 0.3 Mg, bal Al.
Heat treated and aged: 33,000 TS; 3 El; 70 Brin.
For castings; heat treatable, permanent mold cast.

PERMOLD 15.3.
M-881; 1.3 Cu, 5 Si, 0.3 Mn, 0.3 Mg, bal Al.
Heat treated: 32,000 TS; 2 El; 75 Brin.
For aircraft castings; heat treatable, permanent mold cast.

PERMOLD 15.5.
M-881; 1.5 Cu, 5 Si, 0.4 Mn, 0.4 Mg, bal Al.
Heat treated and aged: 37,000 TS; 1.5 El; 75 Brin.
For castings; heat treatable.

PERMOLD 18.3.
M-881; 1.3 Cu, 8 Si, 0.3 Mn, 0.3 Mg, bal Al.
Heat treated: 34,000 TS; 1 El; 80 Brin.
For aircraft castings; heat treatable, permanent mold cast.

PERMOLD 40.
M-881; 4.5 Cu, bal Al.
Heat treated: 32,000 TS; 3 El; 65 Brin.
For castings; heat treatable, permanent mold cast.

PERMOLD 40E.
M-881; 0.6 Mg, 5.5 Zn, 0.5 Cr, 0.15 Ti, bal Al.
T5-temper: 32,000 TS; 25,000 YS; 3 El; 75 Brin.
For high strength castings; self-aging.

PERMOLD 42N.
M-881; 4 Cu, 1.1 Fe, 2 Si, bal Al.
Heat treated and aged: 40,000 TS, 2 El; 75 Brin
For aircraft parts; heat treatable.

PERMOLD 45.
M-881; 4 Cu, 5 Si, bal Al.
Cast permanent mold. 23,000 TS; 1 El; 60 Brin.
For light alloy castings; not heat treatable.

PERMOLD 75.3.
M-881, 7 Cu, 5 Si, 0.3 Mg, bal Al.
Stabilized. 35,000 TS; 0 El; 100 Brin.
For pistons; heat treatable

PERMOLD 90-10.
M-881; 10 Cu, 4 Si, 0.3 Mg, bal Al.
Permanent mold 30,000 TS; 24,000 YS; 1.5 El, 100 Brin
For sole plates for electric irons; Type 138.

PERMOLD 90-10S.
M-881; 10 Cu, 1.2 Fe, 4 Si, 0.5 Mg, bal Al.
Cast: 26,000 TS; 0 El; 90 Brin
For sole plates for electric irons; heat treatable, permanent mold cast.

PERMOLD 95.5.
M-881; 5.25 Si, bal Al.
Sand cast: 19,000 TS; 9000 YS; 6 El; 40 Brin.
Permanent mold: 21,000 TS, 10,000 YS; 5 El; 50 Brin.
For cooking utensils, architectural castings; corrosion resistant; Type 43.

PERMOLD 103.7N.
M-881; 3 Cu, 10 Si, 0.7 Mg, 0.8 Ni, bal Al.
Sand cast-T65: 30,000 TS; 25,000 YS; 0.5 El; 100 Brin.
Permanent mold-T5: 36,000 TS; 28,000 YS; 1.0 El; 105 Brin.
For automotive pistons; Type D132; age-hardenable.

PERMOLD 110.5.
M-881; 1.5 Cu, 10 Si, 0.7 Mn, 0.5 Mg, bal Al.
Stabilized: 34,000 TS; 0 El; 90 Brin.
For pistons; heat treatable.

PERMOLD 113.5.
M-881; 1.5 Cu, 13 Si, 0.7 Mn, 0.5 Mg, bal Al.
Stabilized: 34,000 TS; 0 El; 90 Brin.
For automotive pistons; heat treatable.

PERMOLD 120.5.
M-881; 1.5 Cu, 20 Si, 0.7 Mn, 15 Mg, bal Al.
Stabilized: 28,000 TS; 0 El; 90 Brin
For pistons; heat treatable.

PERMOLD 135W.
M-881; 3.75 Cu, 6.25 Si, 0.1 Mg, 0.8 max Fe, bal Al.
Sand cast-T6: 36,000 TS; 24,000 YS; 2.0 El; 80 Brin.
Permanent mold-T6: 40,000 TS; 27,000 YS; 3.0 El; 95 Brin.
For general purpose castings; age-hardenable.

PERMOLD H.P.7.3
M-881; 0.2 max Fe, 0.7 Si, 0.3 Mg, bal Al.
Permanent mold-T61: 38,000 TS, 28,000 YS; 5 El; 85 Brin.
For high strength castings; good strength and ductility, age-hardenable.

PERMOLD H.P.15.5.
M-881, 1.3 Cu, 5 Si, 0.5 Mg, bal Al.
T61-temper: 41,000 TS; 31,000 YS; 3 El; 85 Brin.
For aircraft castings; Type C355; age-hardenable.

PERMOLD H.P 40.
M-881, 4.5 Cu, 1 max Fe, bal Al.
T6-temper: 40,000 TS; 30,000 YS, 2 El; 95 Brin
For machinery and aircraft castings; age-hardenable, Type 195.

PERMOLD H P 42
M-881; 4.5 Cu, 1 max Fe, 2.5 Si, bal Al.
T6-temper. 40,000 TS; 26,000 YS; 5 El; 90 Brin
For machinery and aircraft castings; age-hardenable; Type B195.

PERMOLD X-12.
M-881; 7.5 Cu, 1.0 Fe, 2 Zn, bal Al
Cast permanent mold: 26,000 TS; 1 El; 90 Brin.
For washing machine and home appliance parts, not heat treatable

PERMOLD Y.
M-881; 4 Cu, 1.5 Mg, 2 Ni, bal Al.
Heat treated: 32,000 TS, 0 El, 90 Brin
For cylinder heads, pistons; heat treatable, permanent mold cast.

PERMOMETOL NO. 11.
M-880; Os, Ru, Ir
For instrument pivots; wear and corrosion resistant.

PERMOMETAL NO. 81.
M-880; Os-Ru.
For instrument pivots, fountain pens, needles; corrosion resistant.

PERMOMETAL NO. 115.
M-880; Os, Ru, Ir.
For instrument pivots; corrosion resistant.

PERPLEX.
M-1331; 1.05 C, 1 Cr, 1.15 W, 0.9 Mn, bal Fe.
For bearings, cutters, liners, sleeves; water hardened, wear resistant.

PERUNAL.
M-249, M-493, M-1634; 6 Zn, 2 Mg, 1.5 Cu, bal Al
74,000-83,000 TS; 64,000-72,000 YS; 10-5 El; 155 Brin
For light alloy parts

PETERSON 52100
M-1053; 0.95-1.1 C, 0.25-0.45 Mn, 1.3-1.6 Cr, bal Fe.
Annealed: 90,000 TS; 51,000 YS; 31 El; 61 RA; 180 Brin
Hardened: 300,000 TS; 650 Brin.
For tools, dies, bearings, bushings; oil hardening.

PETITE IRON
M-153; Cr, Ni, V, bal Fe
For cams, forming and spinning rolls, machine slides, forming dies, wear resisting.

PEWTER.
U S.; 85-90 Sn, bal Pb
For household utensils, dishes, ornamental articles; soft, ductile, easily worked.

PFIZER INC DUCTILE COBALT
M-1623; 95 Co, 5 Fe
High cobalt content with excellent ductility
80,000 TS, 50 El
Sheath for cobalt base composite welding rods.

PFIZER INC HP COBALT
M-1623; 99.9 Co + Ni
High purity cobalt in strip form
110,000 TS; 20 El
For electroplating anodes, high temperature magnetic applications, cobalt 60 gamma radiation sources, sheath for cobalt base composite welding rods, x-ray tube targets

PFIZER INC HP NICKEL.
M-1623, 99.9 min Ni (6 grades of hardness)
Soft 45,000-50,000 TS
Half hard: 65,000-75,000 TS
Full hard: 85,000-100,000 TS
High purity, ductile, corrosion resistant, gas free.
For electronic tube components, deep drawing and stamping small parts, magnetostrictive transducers, heat exchange fins.

PFIZER INC NICKEL CLAD STEEL
M-1623. Nickel on one or both sides of carbon steel base (as per customer requirements)

PFIZER INC PM 42 ALLOY
M-1623, 42 Ni, bal Fe
80,000 TS; 34,000 YS
Controlled expansion
For glass to metal sealing on hard or soft glass.

PFIZER INC. PM 46 Alloy.
M-1623; 46 Ni, bal Fe.
82,000 TS, 34,000 YS.
Controlled expansion
For glass to metal seals, especially terminal caps and bonds on vitreous enameled resistors

PFIZER INC. PM NICKEL-COPPER ALLOY.
M-1623, 65 Ni, 1 Fe, bal Cu.
Corrosion resistant, especially in marine environments
For tubing, banding, small parts.

PFIZER INC. SEAL VAR TM
M-1623, 30 Ni, 15 Co, bal Fe.
Controlled thermal expansivity to match hard glasses.
For hermetic glass to metal seals (hard glass) and ceramic to metal seals.
ASTM F-15.

PFIZER INC. STAINLESS STEEL CLAD ALUMINUM.
M-1623; Al or Al alloys clad on one or both sides with a stainless steel (as per customer requirements).

PFIZER INC. STAINLESS CLAD CARBON STEEL.
M-1623; Stainless steel on one or both sides of carbon steel base.
(as per customer requirements).

PH NO. 2.
M-38, C, alloy, bal Fe
387 Brin
For dies for Zn die castings; age-hardenable, die steel

P & H NO. 21
M-1713, 0.14-0.20 C, 1.0-1.3 Cr, 1.75 Ni, 0.75-1.00 Mn, 0.8 Mo, 0.2 V, bal Fe.
Welded. 125,000-143,000 TS, 80,000-125,000 YS, 22-17 El; 29 RA.
For welding rods for aircraft steels, for heat treating applications.

P & H 70 LA-2
M-1713, 0.12 max C, 0.85-1.20 Mn, bal Fe
Welded 79,000 TS, 69,000 YS, 31 El; 65 RA
For welding rods for high C and alloy steel; low H_2 type

P & H 75 LP.
M-1713; 0.12 max C, 2.5 Ni, bal Fe
Welded. 85,000 TS, 75,000 YS; 26 El; 43 RA.
For welding rods for low temperature applications, high impact at low temperature.

P & H 80 LE
M-1713, 0.10 max C, 0.8-1.1 Cr, 0.4-0.6 Mo, bal Fe
Relieved 80,000 TS, 67,000 YS; 27 El.
Welded: 86,000 TS, 77,000 YS; 24 El, 41 RA.
For welding rods for Cr-Mo steel; high temperature-pressure power piping

P & H AW-2B
M-1713, 0.4 C, bal Fe.
Welded: 90,000 100,000 TS, 22-28 El, 220-270 Brin
For welding electrodes

PHENIX.
M-68, 75 Fe, 25 Ni.
Rolled 104,000 TS, 56,000 YS, 45 El, 68 RA
For resistance alloy, Sc-21

PHENIX-HD32
M-616, 0.20 C, 0.3 Mn, 0.4 Si, 12.75 Cr, 1.15 Mo, 0.4 Ni, bal Fe.
Annealed 95,000 TS, 50,000 YS, 25 El, 55 RA
Heat treated 250,000 TS, 215,000 YS, 8 El, C 52 Rock
For cutlery, oil refinery and chemical plant equipment, surgical instruments
Corrosion resistant, hardenable

PHENIX-HD40
M-1308, 0.20 C, 12 Cr, 1.15 Mo, 0.5 Ni, 0.3 V, bal Fe
Annealed 90,000 TS, 38,000 YS; 26 El; B 93 Rock
Hardened: 235,000 TS; 195,000 YS; 10 El; C 48 Rock.
For bearings, hardware, cutlery, valves, surgical instruments
Corrosion resistant, hardenable.

PHENIX-HD50.
M-616; 0.20 C, 0.3 Mn, 0.4 Si, 12.0 Cr, 1.15 Mo, 0.65 Ni, 0.3 V, 0.5 W, bal Fe.
Annealed. 95,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened: 240,000 TS; 210,000 YS; 10 El; C 50 Rock.
For cutlery, bearings, valves, surgical instruments.
Corrosion resistant, hardenable

PHENIX-HD301
M-616, 0.15 C, 12.75 Cr, 1.15 Mo, 0.5 Ni, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold Drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin
For oil refinery and chemical plant equipment, table flatware, knives, cutlery
Corrosion resistant.

PHILADELPHIA BRONZE 40
M-1228, 8 Al, bal Cu
Cast: 70,000 TS, 28,000 YS, 25 El; 110 Brin
For gun mountings, worm wheels, gears, valve seats, Al-bronze, corrosion resistant

PHILADELPHIA BRONZE 41
M-1228, 9 Al, bal Cu
Rolled 75,000 TS; 35,000 YS, 20 El
For valve stems, propeller blades, bolts, pumps, corrosion resistant, Al-bronze.

PHILADELPHIA BRONZE 77.
M-1228; Cu alloy
Cast 70,000-85,000 TS; 35,000-70,000 YS, 12-1 El, 200-350 Brin
For bushings, bearings, drawing dies; wear and erosion resistant

PHILADELPHIA BRONZE 85.
M-1228, 12 Ni, 1.5 Al, bal Cu
Cast 85,000-95,000 TS, 60,000-70,000 YS; 11-7 El, 200-220 Brin
For marine hardware, fittings, valves, pumps; resists sea water corrosion

PHILADELPHIA BRONZE 137.
M-1228, M-265, 5 Ni, 2 Zn, 5 Sn, bal Cu
Cast 45,000 TS, 22,000 YS; 25 El, 85 Brin
For valves, pump fittings, gears, cams, corrosion resistant

PHILADELPHIA BRONZE 137 T
M-1228, 5 Ni, 2 Zn, 5 Sn, bal Cu.
Heat treated 70,000-90,000 TS, 50,000-75,000 YS; 20-10 El, 140-200 Brin.
For bearings, pole line hardware, ratchets; shock resistant, high fatigue resistant

PHILADELPHIA BRONZE 404
M-1228, 10 Al, 5 Ni, 5 Fe, bal Cu.
Cast: 90,000 TS; 45,000 YS, 15 El, 180 Brin
For impeller blades, valve seats, worm gears, Al bronze; heat treatable

PHILADELPHIA BRONZE 4010.
M-1228, Cu alloy.
Cast 70,000 TS, 32,000 YS, 10 El; 170 Brin
For dies for flash welding, gears, valve components; corrosion resistant

PHILADELPHIA BRONZE 4040.
M-1228, 10 Al, 5 Ni, 5 Fe, bal Cu
Cast 90,000 TS, 45,000 YS, 15 El; 180 Brin
For valve seats, discs, bearings, gears, bushings; Al-bronze, heat treatable

PHILO BRAND FERROCHROME
M-398; 65-70 Cr, 4-6 C, under 2 Si, bal Fe.
For metallurgical applications; Cr-additions.

PHILO BRAND FERROMANGANESE.
M-398; < 7 C, < 1 Si, < 0.30 P, 78-82 Mn, bal Fe.
For metallurgical applications; Mn-additions.

PHILO BRAND FERROSILICON 50% GRADE.
M-398; 50 Si, 48.5 Fe, 1.5 others.
For metallurgical applications; Si-additions.

PHILO BRAND FERROSILICON 75% GRADE.
M-398; 75 Si, 22.5 Fe, 2.5 others.
For metallurgical applications; Si-additions.

PHILO BRAND FERROSILICON 85% GRADE.
M-398; 85 Si, 12.5 Fe, 2.5 others.
For metallurgical applications; Si-additions.

PHILO BRAND FERROSILICON 90% GRADE.
M-398; 91 Si, 6.5 Fe, 2.5 others.
For metallurgical applications; Si-additions.

PHOENIX.
M-35; 0.95 C, 3.95 Cr, bal Fe.
Annealed: 190 Brin.
For hot grip dies; resists shock, abrasion and heat.

PHOENIX.
M-88; Sn, Sb, bal Cu.
Cast: 24 Brin.
For bearings for crossheads; heavy loads and high speeds.

PHOENIX.
M-1308; C, alloy, bal Fe.
For machine tool parts; oil hardened.

PHOENIX 430A.
M-1594; 0.08 C, 0.45 Mn, 0.017 P, 0.010 S, 0.38 Si, 15.68 Cr, bal Fe
Plate· 73,200 TS, 48,600 YS; 31 El; 57 RA; 143 Brin.
For chemical plant industries, agitators, furnace parts.
Resists nitric acid and sulphur bearing gases to 1500°F. Tough and weldable.

PHOENIX 430B.
M-1594; 0.08 C, 0.42 Mn, 0.017 P, 0.013 S, 0.38 Si, 16.88 Cr, bal Fe.
Plate: 76,000 TS; 52,000 YS, 30 El, 56 RA; 143 Brin.
For chemical plant industries, furnace parts, acid containers.
Resists nitric acid and sulphur bearing gases to 1500°F. Tough and weldable.

PHOENIX A.
M-369; C, alloy, bal Fe.
For steel castings.

PHOENIX-A387 Gr D.
M-1594; 0.10 C, 2.25 Cr, 1.0 Mo, bal Fe.
Normalized. 60,000-85,000 TS.
For structures operating up to 800°F. heat exchangers, high pressure boilers.
High strength, high temperature steel.

PHOENIX A SPECIAL.
M-369, C, alloy, bal Fe.
For steel castings.

PHOENIX CM-70.
M-448; 0.16-0.21 C, 1.1-1.4 Mn, 0.15-0.35 Si, bal Fe.
Heat treated: 156,000 TS.
For general purpose structural components.
Suitable for carburizing and cold extrusion.

PHOENIX CM-70 (SPT 539).
M-1724; 0.16-0.21 C, 1.1-1.4 Mn, 0.15-0.35 Si, bal Fe.
Hardened: 157,000 TS; 116,000 YS; 32 Izod.
For case hardened gears, cams, sprockets, spline shafts.

PHOENIX CM-70F (SPT 565).
M-1724; 0.14-0.19 C, 1.1-1.4 Mn, 0.15-0.35 Si, 0.004 max B, bal Fe.
Hardened: 157,000 TS; 112,000 YS; 10 El.
For case hardened gears, cams, sprockets, spline shafts.

PHOENIX CM-80F (SPT 566).
M-1724; 0.17-0.23 C, 1.2-1.5 Mn, 0.15-0.35 Si, 0.004 max B, bal Fe.
Hardened: 179,000 TS, 134,000 YS; 10 El.
For case hardened gears, cams, sprockets, spline shafts.

PHOENIX CM-90F (SPT 567).
M-1724, 0.20-0.25 C, 1.3-1.6 Mn, 0.15-0.35 Si, 0.004 max B, bal Fe
Hardened· 200,000 TS; 134,000 YS; 10 El.
For case hardened gears, cams, sprockets, spline shafts.

PHOENIX HANSA.
M-616; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutters, tools, high speed steel.

PHOENIXITE.
German, For cutting tools; hard metal.

PHOENIX K.
M-369, 3.2 C, 1.8 Si, 1 Cr, bal Fe.
For castings; cast iron.

PHOENIXLOY.
M-68, M-369; 5 Ni + Cr, bal Fe
For mill rolls for heavy duty; super hard alloy cast iron, Sc 80-90.

PHOENIX METAL.
M-88, Pb alloy.
For bearings; solidification temperature 234°C.

PHOENIX METAL.
M-369; 3.2 C, 1.5 Ni, 1 Cr, 1.7 Si, bal Fe.
Cast.
For rolls; hard cast iron

PHOENIX MOLYBDENUM CHILL
M-369, 3.2 C, 1.8 Si, 0.5 Mo, bal Fe
For castings, cast iron.

PHOENIX NICKEL CHILL
M-369; 3.2 C, 1.8 Si, 1.5 Ni, bal Fe.
For castings, wear plates, cast iron

PHOENIX PIROCO.
M-369; C, alloy, bal Fe
For steel castings

PHOENIX RAPID MACHINING STEEL
M-448; 0.15 C, 0.3 S, bal Fe
63,500 TS, 44,000 YS; 48 El, 61 RA.
For screws, bolts, nuts, free cutting

PHONO BRONZE.
M-141; 98.74 Cu, 1.25 Sn, 0.008 Fe.
Hard: 90,000 TS; 65,000 YS; 4 El, 70 RA.
For trolley wire, hardware; resists air corrosion.

PHONO CADMIUM 955
M-141; 0.85 Cd, 0.55 Sn, bal Cu.
Annealed· 40,000 TS; 50 El.
Drawn· 85,000 TS; 10 El.
For trolley wire, cable; 55% conductivity.

PHONO ELECTRIC 865.
M-141; 0.4 Sn, bal Cu.
Annealed: 35,000 TS; 50 El.
Drawn. 63,000 TS, 10 El.
For trolley wire, marine hardware; 65% conductivity.

PHONO ELECTRIC BRONZE 840.
M-141; 1.4 Sn, bal Cu.
Annealed· 40,000 TS; 50 El.
Drawn: 85,000 TS; 10 El.
For trolley wire, hardware; 40% min conductivity.

PHONO ELECTRIC WIRE.
98.55 Cu, 1.40 Sn, 0.05 Si.
For trolley wire, electrical conductors; high electrical conductivity.

PHONO HI CONDUCTIVITY.
M-141; 0.9 Cd, bal Cu.
Annealed: 37,000 TS; 50 El.
Drawn: 65,000 TS; 6 El.
For trolley wire, hardware; 80% min conductivity.

PHONO HI-CONDUCTIVITY 985.
M-141; 0.9 Cd, bal Cu.
Annealed: 37,000 TS; 50 El.
Drawn: 80,000 TS; 6 El.
For cable, trolley wire; 85% conductivity.

PHONO-HI-STRENGTH
M-141; 97 Cu, 2 Sn, 1 Si.

PHONO HI-STRENGTH 715.
M-141; 2.7 Al, 0.35 Si, bal Cu
Annealed: 50,000 TS; 50 El.
Drawn: 125,000 TS; 5 El.
For cable, hardware, bolts; 15% conductivity.

PHONO TELEPHONE 830.
M-141, 1.7 Sn, bal Cu.
Annealed: 40,000 TS; 50 El.
Drawn: 90,000 TS, 10 El
For cable, drop wire, 30% conductivity.

PHOSCO.
M-1013, 7.5 P, 92.5 Cu.
For brazing non-ferrous metals; M.P. 1320-1450°F; self-fluxing.

PHOS-COPPER.
M-118, 8 P, bal Cu.
Welded. 85,000 TS, 17 El
For brazing alloy for Cu and brass parts, M.P. 1305-1460°F

PHOS-COPPER-5
M-118, 4.8-5.2 P, bal Cu.
For filler metal for electrical connections, brazing, M.P. 1640-1310°F, AWS C1 BCuP-1.

PHOSNIC BRONZE.
M-33, 0.85-1.35 Ni, 0.18-0.30 P, bal Cu
Soft 38,000 TS, 10,000 YS, 40 El.
Age-hardened 85,000 TS; 68,000 YS, 15 El
Spring: 110,000 TS, 100,000 YS; 4 El.
For marine hardware, spring clips, electrical conductors; corrosion resistant, age-hardenable

PHOSON 6
M-1013; 7 P, 6 Ag, bal Cu
Cast: 95,000 TS.
For silver brazing alloy; M.P. 1190-1380°F; self-fluxing.

PHOSON-15
M-1013, 15 Ag, 5 P, 85 Cu.
Cast: 86,000 TS
For brazing alloy for copper and Cu alloys; M.P. 1185-1500°F; self fluxing

PHOSON-0.
M-1013; 7-12 P, bal Cu.
Cast: 93,000 TS
For brazing alloy for copper and brass parts for close joint tolerance
M.P. 1305-1485°F.

PHOSPHOR BRONZE.
80 Cu, 8 Sn, 10 Pb, 2 P-Sn.
For railroad bearings; heavy duty.

PHOSPHOR BRONZE NO. 1.
M-1518; 90 Cu, 10 min Sn, 0.50 min P.
Cast: 27,000 TS; 1.5 El; 65-90 Brin.
For bearings with hardened shafts, heavy loads and high speeds.

PHOSPHOR BRONZE 1.25% E, 505.
M-279; 98.7 Cu, 1.25 Sn, 0.04 P.
Ann. 37,000-42,000 TS; 8000-17,000 YS; 40-47 El.
Cold rolled: 41,000-84,000 TS; 16,000-77,000 YS; 1-45 El.
For flexible metal hose, pole line hardware.
Corrosion resistant and corrosion fatigue resistant.

PHOSPHOR BRONZE NO. 2
M-1518; 88.0 Cu, 12 Sn, 0.15 P.
Cast: 31,500 TS; 7 El; 69 Brin
For gears, bushings, bearings with hardened shafts; heavy loads and high speeds.

PHOSPHOR BRONZE NO. 3.
M-1518; 9-11 Sn, 0.03-0.25 P, bal Cu.
Cast: 36,000 TS; 10 El.
For pressure tight castings; corrosion resistant.

PHOSPHOR BRONZE NO. 4.
M-1518, 7.5 Sn, 0.3 P, 2-5 Pb, bal Cu.
Cast: 27,000 TS, 3 El; 60-80 Brin.
For medium duty castings; good bearing qualities.

PHOSPHOR BRONZE 4%, 511.
M-279; 96 Cu, 4 Sn, 0.05 P.
Ann 40,000-52,000 TS; 12,000-24,000 YS; 45-58 El.
Cold rolled 45,000-109,000 TS; 18,000-96,000 YS; 1-44 El
High conductivity spring phosphor bronze.
For electric terminals, clips, connectors.

PHOSPHOR BRONZE 5% A, 510.
M-279, 94.8 Cu, 5 Sn, 0.2 P
Ann 46,000-56,000 TS; 19,000-29,000 YS; 48-62 El.
Cold rolled: 49,000-122,000 TS, 21,000-110,000 YS; 1-50 El.
High strength, fatigue and corrosion resistant.
For bellows, electric spring contacts, connectors, terminals

PHOSPHOR BRONZE 8% C, 521.
M-279; 91.8 Cu, 8 Sn, 0.2 P.
Ann 56,000-65,000 TS; 23,000-34,000 YS, 60-67 El.
Cold rolled 63,000-134,000 TS; 33,000-122,000 YS; 1-60 El.
Very high strength spring bronze
For diaphragms, springs, bellows, pen clips.

PHOSPHOR BRONZE, 10% GR. D.
M-33, 90 Cu, 9.85 Sn, 0.15 P
Annealed 66,000 TS, 28,000 YS, 68 El.
Hard rolled 100,000 TS, 13 El.
For springs, bridge bearing plates; tough.

PHOSPHOR BRONZE NO. 30
M-98, 94.8 Cu, 5 Sn, 0.2 P
Wire: 105,000-135,000 TS.
For hardware, springs, wire rope; corrosion resistant.

PHOSPHOR BRONZE 301
M-8, 3 Sn, 0.25 P, bal Cu.
Hard 90,000 TS, 70,000 YS, 4 El.
For Fourdrinier wire.

PHOSPHOR BRONZE-314.
M-8; 4 Sn, 0.25 Mn, 0.8 P, bal Cu.
Soft 48,000 TS, 20,000 YS; 50 El
Hard 65,000 TS, 55,000 YS; 30 El.
For hot work parts, strong.

PHOSPHOR BRONZE 320.
M-8, 6.5 Sn, 0.30 P, bal Cu.
Hard: 120,000 TS; 2 El
Soft: 57,000 TS; 40 El.
For Fourdrinier wire.

PHOSPHOR BRONZE-356.
M-8; 1.25 Sn, 0.05 P, bal Cu.
Soft: 40,000 TS; 14,000 YS; 48 El.
Hard: 65,000 TS; 50,000 YS; 6 El.
For electrical conductors, metal hose; corrosion resistant.

PHOSPHOR BRONZE-507.
M-8; 1.75 Sn, 0.01 P, bal Cu.
Soft: 45,000 TS.
Hard· 105,000 TS.
For trolley and line wires; strong.

PHOSPHOR BRONZE (A)-305.
M-8; 5 Sn, 0.05 P, bal Cu.
Hard. 65,000 TS; 57,000 YS, 20 El; 150 Brin.
Soft: 48,000 TS; 20,000 YS; 50 El, 67 Brin.
For strips and tubes; corrosion resistant.

PHOSPHOR BRONZE (A) 351.
M-8; 5 Sn, 0 25 P, bal Cu
Hard drawn. 130,000 TS.
Soft: 45,000 TS; 50 El.
For tubes, sheets, wire, general parts; resists fatigue and corrosion and abrasion

PHOSPHOR BRONZE A510
M-8, 94 8 Cu, 5 0 Sn, 0 20 P.
Hard Sheet: 80,000 TS, 65,000 YS; 10 El; B 86 Rock
Soft Sheet. 48,000 TS, 20,000 YS, 50 El, B 28 Rock.
For chemical hardware, springs, bridge bearing plates, Bourdon tubes
Good resilience and fatigue resistance Corrosion resistance

PHOSPHOR BRONZE (A) 5090
M-8, 4 0 Sn, 0.05 P, bal Cu
Sheet, hard: 80,000 TS, 65,000 YS; 8 El; 86 Rb
Soft· 48,000 TS; 20,000 YS, 48 El, 28 Rb.
For drawing into containers as kettles, electrical terminals; weldable and solderable

PHOSPHOR BRONZE, AMERICAN NO 1.
M-98, 70 Cu, 13 Sn, 16 Pb, 1 P.
For fittings, exposed to sea water gun fittings, small springs, high resistance to corrosion and fatigue.

PHOSPHOR BRONZE, AMERICAN NO. 2
M-98, 95 Cu, 4 9 Sn, 0 1 P.
For screw propellers, airplane parts, worm wheels, bearings, fuse clips, high resistance to corrosion and fatigue.

PHOSPHOR BRONZE BEARINGS-1
83 Cu, 14 Sn, 1 P, 2 Zn
For bearings, bushings, heavy duty.

PHOSPHOR BRONZE BEARINGS-2.
88 1 Cu, 8 Sn, 0 15 P, 4 7 Pb.
For bearings, bushings, heavy duty

PHOSPHOR BRONZE BRIDGE-1.
80 Cu, 20 Sn, 1 0-0 2 P
For bearings, bushings, high strength.

PHOSPHOR BRONZE BRIDGE-2.
85 Cu, 15 Sn, 1 P.
For bearings, bushings; high strength.

PHOSPHOR BRONZE (C) 353.
M-8, 8 Sn, 0 25 P, bal Cu.
Hard drawn 130,000 TS.
Hard sheet 110,000 TS; 3 El.
For tubes, sheets, wire general parts; resists fatigue and corrosion.

PHOSPHOR BRONZE (D) 354.
M-8; 10 Sn, 0.25 P, bal Cu.
Hard· 130,000 TS; 5 El.
Soft: 60,000 TS; 65 El.
For tubes, sheets, wire, general parts; resists fatigue and corrosion.

PHOSPHOR BRONZE-D524.
M-8; 89 75 Cu, 10.0 Sn, 0.25 P.
Hard Sheet: 102,000 TS; 70,000 YS; 12 El; B 97 Rock.
Soft Sheet· 66,000 TS; 28,000 YS; 65 El; B 55 Rock.
For clips, beater bars, chemical hardware, springs, condenser tubes.
High strength, resilience and resistance to fatigue. Corrosion resistant

PHOSPHOR BRONZE ENGLISH.
79 2 Cu, 10 2 Sn, 9 6 Pb, 0 97 P
For tubes, hardware, free-cutting

PHOSPHOR BRONZE, ENGLISH NO. 1.
M-98, 79.5 Cu, 10 2 Sn, 9 6 Pb, 0.7 P
For fittings exposed to sea water, gun fittings, small springs, bearings, high resistance to corrosion and fatigue

PHOSPHOR BRONZE, ENGLISH NO. 2.
M-98, 76 8 Cu, 8 Sn, 15 Pb, 0 2 P.
For screw propellers, airplane parts, worm wheels, fuse clips, high resistance to corrosion and fatigue

PHOSPHOR BRONZE GEAR-1
88 Cu, 10 Sn, 2 Pb, 0.1 P.
For gears, tough

PHOSPHOR BRONZE GEAR-2
85 Cu, 13 Sn, 2 Zn, 0 1 P
For gears, tough

PHOSPHOR BRONZE GRADE A
M-33, 95 Cu, 4 75 Sn, 0 25 P.
Annealed 49,000 TS, 20,000 YS, 58 El
Rolled 81,000 TS, 75,000 YS, 10 El
For springs, diaphragms, wire rope, corrosion resisting

PHOSPHOR BRONZE GRADE A
M-102, 4-6 Sn, 0.35 max P, bal Cu
Annealed· 50,000 TS, 50 El.
Hard 95,000 TS, 2 El
For springs, diaphragms; P-Bronze

PHOSPHOR BRONZE GRADE C.
M-33, 92 Cu, 7 75 Sn, 0 25 P
Annealed 60,000 TS, 24,000 YS, 65 El.
Rolled 93,000 TS, 72,000 YS, 10 El
For springs, welding rod, corrosion resisting.

PHOSPHOR BRONZE GRADE C
M-102; 7 9 Sn, 0 35 max P, 0 20 max Zn, bal Cu
Annealed 55,000 TS, 60 El .
Hard· 110,000 TS, 2 El
For springs, bearings, P-Bronze.

PHOSPHOR BRONZE HAIRSPRINGS.
93 Cu, 6 6 Sn, 0 12-0 2 P
For hairsprings, high strength

PHOSPHOR BRONZE, LOCOMOTIVE BEARING
M-98, 90 34-94 7 Cu, 8.9-4 4 Sn, 0 76-0 35 P.
For screw propellers, fittings exposed to sea water, worm wheels, bearings; high resistance to corrosion and fatigue

PHOSPHOR BRONZE PRR-B.
76.8 Cu, 8 Sn, 15 Pb, 0 2 P.
For railroad bearings; heavy duty

PHOSPHOR BRONZE PRR-P.
86 5 Cu, 9 85 Sn, 3.77 Zn, 0.05 P.
For railroad bearings; heavy duty.

PHOSPHOR BRONZE, RUSSIAN.
M-98; 93.7 Cu, 5.8 Sn, 0.16 P, 0.34 Zn.
For screw propellers, fittings exposed to sea water, bearings, worm wheels; high resistance to corrosion and fatigue.

PHOSPHORBRONZE Sn BZ 4.
M-297; 4 Sn, 0.3 P, bal Cu.
Rolled: 82,000 TS, 5 El; 156 Brin.
Annealed. 48,300 TS; 44 El; 70 Brin.
For springs; tough.

PHOSPHORBRONZE Sn BZ 6.
M-297; 6.5 Sn, 0.3 P, bal Cu.
Rolled: 113,800 TS, 2 El; 210 Brin.
Annealed: 59,700 TS, 70 El; 75 Brin.
For springs, contacts; tough.

PHOSPHORBRONZE Sn BZ 8.
M-297; 8 Sn, 0.3 P, bal Cu.
Rolled: 156,200 TS; 1 El.
Annealed: 71,100 TS, 55 El.
For springs, contacts, tough

PHOSPHOR BRONZE "S" PA.
U.S., 79.7 Cu, 10 Sn, 9.5 Pb, 0.8 P.
For heavy duty bearings, high strength.

PHOSPHOR COPPER GRADE A.
M-165, 0.14 min P, 0.15 max Fe, 99.75 min P + Cu.
25,000 TS, 8 El
For bearings and machine castings; corrosion resistant

PHOSPHOR COPPER GRADE B
M-165; 0.10 min P, 0.15 max Fe, 99.75 min P + Cu
For bearings and machine castings; corrosion resistant

PHOSPHORIZED ARSENICAL COPPER-142
M-8, 99.68 Cu, 0.02 P, 0.30 As
Hard Tube: 45,000 TS, 40,000 YS, 10 El, B 50 Rock
Soft Tube 33,000 TS, 10,000 YS, 45 El, F 45 Rock
For condensers and heat exchangers.
Elect cond 45 Pitting and corrosion resistant.

PHOSOPHORIZED COPPER-122
M 8, 99.9 Cu, 0.02 P
Hard Sheet 48,000 TS, 40,000 YS, 6 El, B 50 Rock
Soft Sheet 33,000 TS, 10,000 YS; 45 El, F 45 Rock
For refrigeration and air conditioning units, plumbing and heating units, oil carriers, hydraulic and gas lines.
Elect. cond 85. No hydrogen embrittlement

PHOS SIL-0
M-1483, 92.8 Cu, 7.2 P
Cast 93,000 TS
For brazing alloy for copper to copper
B CuP-2 Spec, M.P. 1305°F.
Corrosion resistant.

PHOS SIL-2
M-1483; 91 Cu, 2 Ag, 7 P
Cast. 93,000 TS.
For brazing alloy for copper to copper
B CuP Spec; M.P 1190°F
Corrosion resistant.

PHOS SIL-6
M-1483, 87.75 Cu, 6 Ag, 6.25 P.
Cast: 92,000 TS.
For brazing alloy for joints with poor fit-up.
B CuP-3 Spec.; M.P. 1185°F.
Very ductile.

PHOS SIL-6F.
M-1483; 6 Ag, 86.75 Cu, 7.25 P.
Cast: 90,000 TS.
For brazing alloy for critical joints.
B CuP-4 Spec.; M.P. 1190°F.
Good penetration.

PHOS SIL-15.
M-1483; 15 Ag, 80 Cu, 5 P.
Cast. 86,000 TS.
For brazing alloy for non-ferrous metals.
B CuP-5 Spec; M P. 1185°F.
Rapid penetration.

PHOS-SILVER.
M-118; 6 Ag, 7.8 P, bal Cu.
Cast: 85,000 TS
For brazing for copper alloys; self-fluxing, M.P. 1185-1230°F.

PHOS-SILVER-2
M-118; 6.9-7.1 P, 1.8-2.2 Ag, bal Cu.
For brazing alloy, M P 1190-1455°F.

PHOS-SILVER-6.
M-118, 7.20-7.35 P, 5.8-6.2 Ag, bal Cu.
For brazing alloy, M.P 1190-1330°F; for close fit-up work; AWS Cl-BCuP-4.

PHOS-SILVER-6M
M-118, 6.05-6.20 P, 5.8-6.2 Ag, bal Cu.
For brazing alloy, M.P. 1190-1465°F; very ductile, AWS Cl.BCuP-3.

PHOS-SILVER-15
M-118, 4.9-5.1 P, 14.8-15.2 Ag, bal Cu.
For brazing alloy, M.P. 1190-1485°F; AWS Cl BCuP-5

PHOS-SILVER 18
M-118; 17.5-18.5 Ag, 7.0-7.5 P, bal Cu
For brazing copper, brass and bronze.
Lowest melting point 1190°F
Brazing temperature 1200-1250°F

PHOS-SILVER-65.
M-118, 4.9-5.1 P, 5.8-6.2 Ag, bal Cu
For brazing alloy for lap joints; M.P. 1190-1595°F.

PHOS-TRODE.
M-13; 7-9 Sn, 0.35 P, 0.5 max others, bal Cu.
Cast: 55,000 TS; 29,000 YS, 35 El; 33 RA; 89 Brin
For shielded arc welding rod.
Grade C. Phosphor Bronze.

P H S.
M-210, 0.10 C, 0.10 Si, 0.40 Mn, bal Fe.
For plastic mold dies, hobbing steel.

P.H VAN.
M-1433; 0.35 C, 1.0 Si, 5 Cr, 1 V, 1.5 Mo, bal Fe.
Annealed: 98,000 TS; 74,000 YS, 28 El, 210 Brin.
Hardened 135,000-290,000 TS, 100,000-228,000 YS, 3-16 El, 7-48 RA; C 27-55 Rock.
For forging and heading dies, compression tools, die casting dies, hot piercing and forming punches, bolt dies, swaging dies
Type H13 hot work steel, red-tough, shock and impact resistant.

PHV DIE.
M-38, 0.27 C, 2.8 Ni, 1.15 Cr, 0.40 V, 0.25 Mo, 1.15 Al, bal Fe.
Heat treated: 170,500 TS; 159,000 YS; 16 El; 42 RA, Rockwell C54-C62
For dies for plastic and injection molding inserts; age-hardenable.

P.H.W.
M-1433; 0.35 C, 1.05 Si, 1.55 W, 1.65 Mo, 5.15 Cr, bal Fe.
Hardened: 216,000 TS; 185,000 YS; 14 El; 53 RA.
At 1000°F: 144,000 TS; 110,000 YS; 19 El; 64 RA.
For die casting dies, hot shear blades, forging and heading dies, punches.
Type H12 hot work tool steel, tough and shock resistant.

PIERROT METAL, BEUGNOT
83 Zn, 8.3 Cu, 7.6 Sn, 3.5 Sb, 3 Pb.
For bearings; anti-friction.

PIERROTS B.M.
England; 83.3 Zn, 7.6 Sn, 2.3 Cu, 3.8 Sb, 3.0 Pb.
For bearings; will not resist heat or live steam.

PINCHBECK.
88-94 Cu, 6-12 Zn.
For cheap jewelry; red brass.

PINKUS BRASS.
Eng; 88.1 Cu, 6.9 Zn, 2.5 Sn, 1.8 Pb, 0.3 Ni, 0.32 Sb.
For hardware, fittings; free-cutting

PINKUS BRONZE.
England; 14.7 Sn, 1.5 Zn, 8.8 Pb, 2.5 Sb, bal Cu.
For bearings, bushings; heavy duty.

PINSBAC.
M-882; 0.3-0.5 C, bal Fe.
For machinery parts, gears; water hardening.

PIONEER.
M-1705; 0.55 C, 0.3 Mn, 0.9 Si, 5.1 Cr, 1.25 W, 1.45 Mo, bal Fe.
Air hardening tool steel, AISI A8.

PIONEER 921-T.
M-1403; 2 Si, 3.5 Cu, 0.5 max Fe, 0.08 Ti, bal Al.
Cast: 20,000 TS; 18,000 YS, 1.0 El; 70 Brin.
T6-temper: 45,000 TS; 22,000 YS; 0.5 El; 104 Brin
For tooling plates; heat treatable, dimensionally stable.

PIONEER HEAT RESISTING METAL.
M-326, C, 20 Cr, 20 Ni, 1 Mo, bal Fe.
For heat treating equipment between 1700-2000°F; resists heat up to 2000°F.

PIONEER METAL.
M-326; 65 Ni, Cr-Mo, bal Fe.
Cast: 74,000 TS, 36,500 YS; 42 El; 150 Brin
For castings, fittings, pumps, valve parts; acid resistant.

PIONEER METAL (PIONEER "A" ACID RESISTING).
M-326; 35 Ni, 25 Cr, <5 Mo, 0.2-0.5 C, bal Fe.
Cast: 74,000 TS; 36,500 YS; 42 El; 150 Brin
Heat treated: 65,000 TS; 45,000 YS; 20 El.
For valves, fittings, pump parts, castings; corrosion and acid resistant

PIREKS 12/25.
M-487, C, 12 Ni, 25 Cr, bal Fe
For furnace parts and equipment; heat resistant to 1100°C.

PIREKS 12/25.
M-1725;
Heat resisting alloy; good against sulphurous atmospheres

PIREKS 20/25.
M-487; C, 20 Ni, 25 Cr, bal Fe.
For furnace parts and equipment; creep and heat resistant to 950°C.

PIREKS 20/25.
M-1725;
Heat resisting alloy; good creep resistance up to 1050°C.

PIREKS 25/20.
M-487; C, 25 Ni, 20 Cr, bal Fe.
For furnace parts and equipment; heat resistant to 950°C.

PIREKS 25/20.
M-1725,
Heat resisting alloy; for continuous service to 1050°C.

PIREKS 35/15.
M-487, C, 35 Ni, 15 Cr, bal Fe.
For furnace parts and equipment; heat resistant to 950°C.

PIREKS 35/15.
M-1725;
Nickel-chromium heat resisting alloy for cycling use in carburizing atmospheres.

PIREKS 37/18/2.
M-1725;
Heat resisting nickel-chromium-niobium alloy for cycling use in carburizing atmospheres, as carburizing boxes.

PIREKS 60.
M-487, C, alloy, bal Fe.
For quenching jigs and fixtures; heat resistant to 1050°C

PIREKS 60
M-1725;
Heat resisting alloy; for continuous use up to 1050°C

PIREKS 60/13.
M-487; C, alloy, bal Fe.
For furnace trays, containers, electrical resistors, high heat resistance

PIREKS 60/13.
M-1725;
Heat resisting alloy, for cycle heating and cooling to about 1050°C.

PIREKS 228
M-487; C, alloy, bal Fe
For damper plates, pyrometer tubes; heat resistant to S atmosphere.

PIREKS 529.
M-1725;
Heat resisting alloy, ferritic type, good resistance to attack from high sulphur.

PIREKS METAL.
M-418, 0.25 C, 18 Cr, 8 Ni, bal Fe
At 20°C. 80,500 TS; 250 Brin
At 1000°C: 34,000 TS.
For annealing and carburizing boxes, heat treating appliances; cast alloy, resists heat up to 1000°C

PIREKS RCC
M-40, 0.21-0.35 C, 49-57 Ni, 24-30 Cr, Si, Mn, bal Fe
For heat and corrosion resistant parts; heat and corrosion resistant.

PIREKS-REACTAL.
M-40; 0.6 C, 20 Cr, 65 Ni, 2 Si, bal Fe.
For furnace parts, carburizing and annealing boxes; heat resistant.

PIRSCH'S GERMAN SILVER.
80-71 Cu, 16-17 Ni, 1-7.5 Zn, 1-2.8 Sb, 1-2 Co, 1-1.5 Fe, 0-0.5 Al.
For ornaments, tableware; corrosion resistant.

PISTONS-1.
83 Cu, 16 Zn, 1 Sn.
For pistons; corrosion resistant.

PISTONS-2.
93.5 Al, 2.45-3.4 Cu, 1.39 Mg, 0.4 Si, 0-0.28 Zn, 0-1.47 Ni.
For pistons, cylinder heads; age-hardenable.

PITALOY NO. 90.
M-236; 0.3 C, 0.1 V, 0.9 Mn, 0.35 Si, 1.6 Ni, bal Fe.
Cast: 90,000 TS; 60,000 YS; 25 El; 50 RA.
For general castings, locomotive frames, roll mill machinery, cross-heads; tough.

PITALOY NO. 100.
M-236; 0.35-0.40 C, 1.0 V, 0.9 Mn, 0.35 Mo, 0.35 Si, bal Fe.
Cast: 100,000 TS; 70,000 YS; 22 El; 40 RA.
For general castings, locomotive frames; tough.

PITHO.
M-618; 0.95 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For reamers, taps, broaches, gauges; non-shrinking.

PITTSBURG.
M-370; 1.0 C, 5.25 Cr, 0.5 Mn, 1.1 Mo, 0.25 V, bal Fe
Air hardenable to 64 Rc.
For tools, dies, jigs, precision parts.
Type A2 air hardening tool steel.

PITTSBURGH.
M-883; 0.1 C, bal Fe.
For welding rod.

PITT-TEN NO 1.
M-883; 0.12 max C, 0.10 max Si, 0.7 Mn, 0.8 Cu, 0.7 Ni, 0.07 max P, 0.05 max S, bal Fe.
For truck and bus bodies, mine cars; high strength structural steel.

PITT-TEN NO. 2.
M-883, 0.15 max C, 0.75 max Mn, 0.10 max Si, 0.07 max P, 0.05 max S, 0.05 Cr, bal Fe.
For trucks and bus bodies, mine cars; high strength structural steel.

PITT-TEN "X."
M-883; 0.10-0.20 C, 0.50-1.0 Mn, 0.01 min Cb, bal Fe.
Rolled: 60,000-75,000 TS; 45,000-60,000 YS; 18-24 El
For agricultural equipment, bus and truck bodies.
High strength structural steel

PIVOT DRILL ROD.
M-38; 1.25 C, bal Fe.
For drills, pivots; water hardening.

PLACET.
Eng ; 60 Ni, 20 Fe, 15 Cr, 5 Mn.
Cast: 50,000 TS; 1 El; 179 Brin.
For resistance alloy; heat resistant.

PLACOVAR.
M-1084; 50 atomic % Co, 50 atomic % Pt.
Permanent magnet alloy, ductile.
Coercive force: 4300 Oersteds.
Residual induction: 6450 Gausses.
Energy product: 9.5 × 10^6 Gauss-Oersteds.
For use in instruments.

PLANCHER.
M-289; 0.55-0.65 C, 0.5 Mo, 0.8 Mn, 2.0 Si, bal Fe.
For chisels, punches, shear blades, plastic master hobs, oil hardened, shock resistant.

PLANET CHOICE.
M-372; 0.7-1.2 C, bal Fe.
For tools, drills, taps; water hardened.

PLANET COLD ROLLED.
M-372; 0.7-0.9 C, bal Fe.
For tools; water hardening.

PLANET DRILL ROD.
M-372; 1.2 C, bal Fe.
For drill rods, drills, tools; cold drawn.

PLANET EXTRA.
M-372; 0.9-1.2 C, bal Fe.
For tools, drills, taps; water hardened.

PLANET HIGH SPEED.
M-372; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutting tools, taps; high speed steel.

PLANET REGULAR.
M-372; 0.8-1.2 C, bal Fe.
For tools, drills, taps; water hardened.

PLANET SHEFFOIL.
M-372; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed tools, cutters; high speed steel.

PLANET SPECIAL.
M-372; 0.7-1.0 C, 0.2 V, bal Fe.
For dies and tools; water hardening.

PLANSEE WZ 12D.
M-1246; 35 TiC, 39 Ni, 13 Co, 13 Cr.
For jet engine components; high heat resistance.

PLASDIE.
M-35, 0.30 C, 0.75 Cr, 0.25 Mo, bal Fe.
For Zn die casting dies, Type H13; oil hardened.

PLASMEX 1000.
M-207; 0.30 C, 0.75 Mn, 0.50 Si, 1.7 Cr, 0.40 Mo, bal Fe.
Oil hardening tool and die steel, for molds.

PLASMOLD.
M-56; 0.35 C, 0.25 Si, 0.50 Mn, 4.3 Ni, 1.3 Cr, 0.3 Mo, bal Fe.
For gears, bolts, crankshafts, forging dies, oil hardened, shock resistant.

PLASTALLOY.
M-357; 0.08 C, 0.43 Mn, 1.3 Ni, 0.56 Cr, bal Fe.
For dies, plastic molds; water hardened.

PLASTIC BRONZE.
M-126, 66 Cu, 5 Sn, 28 Pb, 1 Ni.
For bearings; heavy duty.

PLASTIC CSM NO. 2.
M-38; 0.30-0.35 C, 0.7 Mn, 0.5 Si, 0.8 Cr, 0.25 Mo, bal Fe.
For plastic mold dies, zinc die-casting dies; water hardening.

PLASTIC HOBBING STEEL.
M-210; C, bal Fe.
110 Brin.
For plastic mold dies; hobbed dies

PLASTIC METAL.
Eng., 81 Sn, 9.5 Cu, 8.6 Sb, 1.4 Fe
21-24 Brin.
For bearings, bushings; Babbitt.

PLASTIFORM.
M-1724; 0.30 C, 4.0 Ni, 1.3 Cr, 0.25 Mo, bal Fe.
Air or oil hardening alloy toolsteel; for stamping dies, plastic molds, drop stamping dies.

PLASTIRON.
M-357; 0.12 max C, bal Fe.
For plastic molds; carburized grade.

PLAST-IRON.
M-1090; 0.008 C, 0.001 Mn, 0.005 Si, 99.98 Fe.
For magnets, radio cores; powdered metal.

PLASTO C.
M-1331; 0.15 C, Cr, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel.

PLASTO CC.
M-1331; C, Cr, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel.

PLASTO MC.
M-1331; 0.2 C, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel.

PLASTO MCW.
M-1331; 0.15 C, 1.0 Cr, 1.25 Mn, 0.25 Si, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel.

PLASTO Ni.
M-1331; 0.19 C, 1.75 Cr, 0.2 Mo, 3.75 Ni, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel, shock resistant.

PLASTO RR.
M-1331; 0.4 C, 13 Cr, 0.3 Mn, 0.4 Si, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 22 El; 52 RA; 200 Brin.
For cutlery, valves, oil refinery equipment; Type 420; stainless.

PLASTO U.
M-1331; 0.15 C, 0.15-0.35 Si, 0.25-0.50 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, cams, fasteners, bolts; case hardening steel.

PLASTO V.
M-1331; 0.5 C, Ni, Cr, V, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

PLATALARGAN.
Pt, Al, Ag.
For pen points; corrosion resistant.

PLATA METAL NO. 5.
M-567; Sb, Sn, Pb.
For bearings; Babbitt metal.

PLATE AJ 30/4.
M-1337; 0.45 C, 1.50 Si, 0.60 Mn, 1.40 Cr, 0.10 V, bal Fe.
Oil hardening tool steel.
For cold punches, mandrels, embossing tools, lettering and numbering dies
DIN 45SiCrV6; Werkstoff 1.2249.

PLATE AJ 30/H.
M-1337; 0.61 C, 0.90 Si, 0.80 Mn, 1.20 Cr, 0.10 V, bal Fe.
Oil hardening tool steel.
For cold punches for heavy sheet, large embossing tools, staking tools.
DIN 61CrSiV5; Werkstoff Nr. 1.2243.

PLATE AJ30N.
M-1337; 0.61 C, 1.18 Cr, 0.1 V, bal Fe.
For springs, upsetters; oil hardened, shock resistant.

PLATE AK14
M-1337; 0.7 C, 0.25 Si, 0.25 Mn, bal Fe.
Heat treated: 175,000 TS; 130,000 YS; 12 El; 36 RA; 355 Brin.
For rails, springs, hammers, axes; water hardened.

PLATE AK20.
M-1337; 1.0 C, 0.2 Si, 0.2 Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, hobs, reamers, taps; Type W1; water hardened.

PLATE AR 40/1.
M-1337; 0.45 C, 1.0 Si, 0.35 Mn, 1.1 Cr, 0.20 V, 2.0 W, bal Fe.
Oil hardening tool steel.
For pneumatic tools, chisels, staking tools, riveting hammers.
DIN 45WCrV7; Werkstoff Nr. 1.2542.

PLATE AR 40/2.
M-1337; 0.35 C, 1.0 Si, 0.35 Mn, 1.1 Cr, 0.20 V, 2.0 W, bal Fe
Oil hardening tool steel.
For cold shear blades, header chisels, cold heading dies.
DIN 35WCrV7; Werkstoff Nr. 1.2541.

PLATE AR404.
M-1337; 0.55 C, 0.9 Si, 0.3 Mn, 1.05 Cr, 0.2 V, 1.85 W, bal Fe
For upsetters, punches, shears, cold work tools; oil hardened, tough

PLATE BM 260.
M-1337; 0.40 C, 0.40 Si, 0.30 Mn, 13.5 Cr, bal Fe
Air or oil hardening tool steel.
For plastic molds for corrosive plastics
DIN X40Cr13; Werkstoff Nr. 1.2083

PLATE BP 16 E.
M-1337, 0.15 C, 0.25 Si, 0.50 Mn, 0.65 Cr, bal Fe.
For case hardening parts for roller bearings, measuring instruments, piston pins.
DIN 15Cr3

PLATE BP 18 E
M-1337; 0.16 C, 0.25 Si, 1.2 Mn, 1.0 Cr, bal Fe.
For case hardening small cog wheels, shafts, control levers.
DIN 16MnCr5.

PLATE BP 20 E
M-1337, 0.21 C, 0.30 Si, 1.2 Mn, 1.2 Cr, bal Fe.
For case hardening gears, spline shafts, pinions, crank shafts for small engines.
DIN 21MnCr5

PLATE BS 30 E.
M-1337; 0.15 C, 0.25 Si, 0.50 Mn, 1.55 Cr, 1.55 Ni, bal Fe.
For case hardening cog wheels, chain drives, splined shafts, gears
DIN 15CrNi6.

PLATE BS 70 E.
M 1337, 0.14 C, 0.30 Si, 0.40 Mn, 0.75 Cr, 3.50 Ni, bal Fe.
For case hardening parts such as gears, cam shafts, splined couplings of middle stress.
DIN 14NiCr14; W Nr. 1.5752.

PLATE BS 90 E.
M-1337; 0.14 C, 0.30 Si, 0.40 Mn, 1.10 Cr, 4.50 Ni, bal Fe.
For case hardening parts as crankshafts, highly stressed gears and shafts of large section as for trucks and ordnance.
DIN 14NiCr18; W Nr. 1.5860.

PLATE BS 90 E Mo.
M-1337, 0.19 C, 0.20 Si, 0.40 Mn, 1.25 Cr, 0.25 Mo, 4.0 Ni, bal Fe.
For case hardening parts such as truck and tractor gears and splined shafts, for case hardened ordnance parts.
DIN 19NiCrMo15; W. Nr. 1.6587.

PLATE BV36.
M-1337; 0.5 C, 0.25 Si, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, pinions, crankshafts, bolts, studs; oil hardened, shock resistant.

PLATE CLIMAX TZM.
M-1337; 99.3 Mo, 0.5 Ti, 0.1 Zr.
For hot extrusion dies, mandrels, turbine components, casting dies and molds.

PLATE E 5 S.
M-1337; 0.06 max C, 0.20 max Si, 0.20 Mn, 4.50 Cr, 0.50 Mo, bal Fe.
For case hardening heavy gears, axles, shafts, tractor, railroad and ordnance equipment.
DIN X6CrMo5.

PLATE EXTRA EXTRA P10.
M-1337, 0.45 C, Ni, Cr, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

PLATE EXTRA SPEZIAL MH.
M-1337; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 20 El; 40 RA; 210 Brin.
For springs, drills, hobs, reamers; Type W1; water hardened.

PLATE EXTRA SPEZIAL ZAH.
M-1337, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, taps, reamers, Type W1; water hardened

PLATE EXTRA SPEZIAL ZH
M-1337, 1 0 C, 0 25 max Si, 0 25 max Mn, bal Fe.
Annealed 100,000 TS; 53,000 YS, 21 El, 42 RA; 200 Brin.
For springs, taps, reamers, broaches, Type W1; water hardened.

PLATE K 14.
M-1337, 0.70 C, 0 30 max Si, 0.35 max Mn, bal Fe.
Water hardening tool steel; for stone tools for soft stones, chisels, snap head dies
DIN C70W2; Werkstoff Nr 1.1620.

PLATE K18.
M-1337, 0.85 C, 0 30 max Si, 0.35 max Mn, bal Fe.
Water hardening tool steel, for stone tools for middle hard stones, hammers, leather and spoon dies.
DIN C85W2, Werkstoff Nr 1.1630

PLATE K 20.
M-1337; 1 00 C, 0 30 max Si, 0.35 max Mn, bal Fe
Water hardening tool steel; for stone tools, for hard stone, embassing tools, scythes.
DIN C100 W2; Werkstoff 1 1640.

PLATE KM 20 V.
M-1337, 1 0 C, 0.20 Si, 0.25 Mn, 0 10 V, bal Fe.
Water hardening tool steel.
For piercing dies, upsetting dies, small shear blades, shovels, hand tools.
DIN 100V1; Werkstoff Nr. 1.2833

PLATE KP260W.
M-1337, 1.65 C, 11.5 Cr, 0 10 V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

PLATE KS 7.
M-1337; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Water hardening carbon tool steel; for cold trimming dies, trimming punches, centering drifts, little drop hammer dies.
DIN C70W1; Werkstoff Nr. 1.1520.

PLATE KS 9.
M-1337; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Water hardening tool steel; for cold impact tools, cold cutting and punching dies, strainers, snap dies.
DIN C85W1; Werkstoff Nr. 1.1530.

PLATE KS 10.
M-1337; 1.00 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Water hardening tool steel; for cutting and punching dies, shear blades, hollow and massive embossing dies.
DIN C100W1; Werkstoff Nr 1.1540.

PLATE KS 12.
M-1337; 1.10 C, 0 25 max Si, 0 25 max Mn, bal Fe.
Water hardening tool steel, for small cutting and punching dies, milling cutters, scrapers, cutting tools, twist drills.
DIN C110W1; Werkstoff Nr. 1.1550.

PLATE KS 66.
M-1337; 0 50 C, 0.30 Si, 0.50 Mn, 1.1 Cr, 0.20 Mo, 3 25 Ni, bal Fe.
Oil hardening tool steel.
For cutlery dies, artificial resin molding dies, dies for tableware.
DIN (Similar to) 50NiCr13 and Werkstoff 1 2721.

PLATE KW 83.
M-1337, 0.45 C, 0 30 Si, 0 65 Mn, 1.4 Cr, 0.50 Mo, 4 0 Ni, 0 15 V, 0 50 W, bal Fe.
Oil or air hardening tool steel.
For large, tough embossing tools, cold upsetting tools, air hardening dies.
DIN (Similar to) X45NiCrMo4 and Werkstoff Nr. 1.2767.

PLATE LM22.
M-1337; 0 90 C, 0 80 Cr, 0.30 Mn, bal Fe
For bearings, liners, punches, bushings; water hardened, wear resistant

PLATE-LOY.
Pb.
For hot lead plating.

PLATE MS4.
M-1337; 0 45 C, 0 10-0.40 Si, 0.5-0 7 Mn, bal Fe.
Hot rolled· 98,000 TS; 60,000 YS; 24 El, 45 RA; 212 Brin
For axles, gears, bolts, crankshafts; water hardened.

PLATE MS7
M-1337, 0 60 C, 0.25-0 50 Si, 0 30-0 80 Mn, bal Fe.
Hot treated 160,000-115,000 TS, 113,000-77,000 YS, 12-23 El, 40-54 RA; 320-230 Brin.
For wheels, die blocks, girders, rails; water hardened.

PLATE MS8.
M-1337; 0 75 C, 0 25-0.50 Si, 0 30-0 80 Mn, bal Fe
Heat treated. 174,000-122,000 TS; 128,000-82,000 YS; 12-22 El; 37-52 RA; 350-240 Brin.
For springs, clutch discs, punches, die blocks; water hardened; Type W1.

PLATE MSS.
M-1337; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
Oil hardenable to 54-60 Rock C.
For axles, pins, staking tools, cold chisels.
DIN 53MnSi4; Werkstoff Nr. 1.2825.

PLATE NM 30.
M-1337, 1.05 C, 0.30 Si, 0.20 Mn, 1.40 Cr, bal Fe.
Water or oil hardening tool steel for small dies, punches, gages.
DIN 105Cr5; Werkstoff Nr. 1.2060.

PLATE NM 110 Mo.
M-1337; 1.00 C, 0.30 Si, 0.50 Mn, 5.20 Cr, 1.15 Mo, 0.30 V, bal Fe.
Air hardening tool steel.
For thread rolling dies, trimming dies, shear punches.
DIN X100CrMoV51; Werkstoff Nr. 1.2363.

PLATE NM 240.
M-1337; 2.10 C, 0.30 Si, 0.30 Mn, 12.0 Cr, bal Fe.
Oil or air hardening tool steel.
For heavy duty stamping dies, broaches, cold shears, wood milling cutters.
DIN X210Cr12; Werkstoff Nr. 1.2080

PLATE NM 240 Co.
M-1337; 2.10 C, 0.30 Si, 0.40 Mn, 12.0 Cr, 0.40 Mo, 0.15 V, 0.70 W, 1.0 Co, bal Fe.
Air or oil hardening.
For thread rolling dies, punching and forming dies, broaches.
DIN X210CrCoW12; Werkstoff Nr. 1.2884.

PLATE NM 240 V.
M-1337; 2.10 C, 0.30 Si, 0.30 Mn, 12.0 Cr, 0.80 W, bal Fe.
Oil or air hardening tool steel.
For heavy duty stamping dies, punches, broaches, die rings, plastic molds.
DIN X210CrW12; Werkstoff Nr. 1.2436.

PLATE NM 240 W.
M-1337; 1.65 C, 0.30 Si, 0.30 Mn, 12.0 Cr, 0.10 V, bal Fe.
Air or oil hardening tool steel.
For heavy duty and long wearing stamping and punching dies, broaches
DIN X165CrV12; Werkstoff 1.2201.

PLATE NM 240 WMo.
M-1337; 1.65 C, 0.30 Si, 0.35 Mn, 12.0 Cr, 0.70 Mo, 0.35 V, 0.50 W, bal Fe.
Air or oil hardening.
For heavy duty punching and stamping dies and die blocks, broaches, plastic molds for corrosive plastics.
DIN X165CrMoV12; Werkstoff Nr 1.2601.

PLATE NN 20.
M-1337; 1.05 C, 0.25 Si, 1.10 Mn, 0.90 Cr, bal Fe.
Oil hardening tool steel.
For threading tools, cutting and punching dies for medium duty.
DIN 105MnCr4; Werkstoff Nr. 1.2127.

PLATE NN26M.
M-1337, 1.25 C, 1.15 Si, 0.7 Mn, 1.2 Cr, bal Fe.
For blanking and forming dies, bushings, liners; oil hardened, wear resistant.

PLATE NN 40
M-1337; 0.90 C, 0.20 Si, 2.0 Mn, 0.10 V, bal Fe.
Oil hardening tool steel.
For difficult cutting dies and punches for sheets up to 3 mm thick.
DIN 90MnV8; Werkstoff Nr. 1.2842.

PLATE NR 40/D.
M-1337; 0.45 C, 1.0 Si, 0.35 Mn, 1.65 Cr, 0.20 V, 2.0 W, bal Fe.
Oil hardening tool steel.
For cold shear blades, pneumatic tools, chisels, cold upset dies.
DIN 45WCrV77; Werkstoff Nr. 1.2547.

PLATE NR 40/H.
M-1337; 0.60 C, 0.60 Si, 0.30 Mn, 1.10 Cr, 0.20 V, 2.0 W, bal Fe.
Oil hardening tool steel.
For highly stressed perforating dies, trimming dies, lower dies.
DIN 60WCrV7; Werkstoff Nr. 1.2550.

PLATE ON 22.
M-1337; 1.15 C, 0.20 Si, 0.35 Mn, 0.70 Cr, 0.10 V, bal Fe.
Water or oil hardening tool steel.
For twist drills, reamers, punches, taps.
DIN 115CrV3; Werkstoff Nr. 1.2210.

PLATE ON28
M-1337, 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For bearings, liners, blanking dies, cutters; water or oil hardened, wear resistant.

PLATE OW20V.
M-1337; 1.2 C, 0.10 V, 1.0 W, 0.28 Mn, bal Fe.
For cutters, bearings, liners, water hardened.

PLATE OR 33 M
M-1337; 1.05 C, 0.25 Si, 1.0 Mn, 1.0 Cr, 1.2 W, bal Fe.
Oil hardening tool steel.
For cutting and stamping dies for sheet steel up to 5 mm thick
DIN 105WCr6; Werkstoff Nr. 1.2419.

PLATE OW 90.
M-1337, 1.42 C, 0.20 Si, 0.30 Mn, 0.35 Cr, 0.25 V, 3.25 W, bal Fe
Water or oil hardening tool steel.
For lathe and planing tools, engraving needles, scrapers, serrating steels.
DIN 142WV13, Werkstoff Nr. 1.2562.

PLATE PA 188
M-1337; 0.12 max C, 18.0 Cr, 9.0 Ni, bal Fe
Ann. 71,000-100,000 TS, 31,000 min YS; 50 min El; 130-180 Brin.
Austenitic, stainless, hardenable only by cold work.
For stainless equipment in food, beverage, dairy, paper, chemical industries.
DIN X12CrNi188; Werkstoff Nr. 1.4300.

PLATE PA 188 S
M-1337, 0.15 max C, 18.0 Cr, 9.0 Ni, S, bal Fe.
Ann 71,000-100,000 TS; 31,000 min YS; 50 min El; 130-180 Brin
Austenitic, stainless, free machining
For machined shafts, bolts, screws and similar parts in food and beverage plants.
DIN X12CrNiS188; Werkstoff Nr. 1.4305.

PLATE PA 188 Ti
M-1337, 0.10 max C, 18.0 Cr, 11.0 Ni, Ti, bal Fe.
Ann 71,000-106,000 TS, 35,000 min YS; 40 min El; 130-190 Brin.
Austenitic, stainless, weldable.
For parts and welded assemblies for use in food, beverage, dairy and chemical industries.
DIN X10CrNiTi1810, Werkstoff Nr 1.4541.

PLATE PA 188 W.
M-1337; 0.07 C, 18.0 Cr, 10.0 Ni, bal Fe.
Ann: 71,000-100,000 TS, 31,000 min YS; 50 min El, 130-180 Brin.

Austenitic, stainless, weldable.
For parts and welded assemblies in food, dairy, beverage, and chemical industries.
DIN X5CrNi189; Werkstoff Nr. 1.4301.

PLATE PAO 188/2 Ti.
M-1337; 0.10 max C, 18.0 Cr, 11.0 Ni, 2.3 Mo, Ti, bal Fe.
Ann: 71,000-106,000 TS; 35,000 min YS; 40 min El; 130-190 Brin.
Austenitic, weldable, very good stainless properties.
For parts and welded assemblies in paper, textile and chemical industries.
DIN X10CrNiMoTi1810; Werkstoff Nr. 1.4571.

PLATE PAO 188/2 W.
M-1337; 0.07 max C, 18.0 Cr, 11.0 Ni, 2.3 Mo, bal Fe.
Ann. 71,000-100,000 TS; 28,000 min YS; 45 min El; 130-180 Brin.
Austenitic, very good stainless properties.
For parts and assemblies in paper, textile, and chemical industries.
DIN X5CrNiMo1810, Werkstoff Nr. 1.4401.

PLATE PCL.
M-1337, 1.05 C, Cr, bal Fe.
For bearings, cutters, liners; water hardened.

PLATE PFC 141
M-1337; 0.08 max C, 14.0 Cr, bal Fe
Ann. 71,000-92,000 TS, 43,000 YS; 20 min El, 140-180 Brin
Corrosion resistant steel, not hardenable by heat treatment, ferritic.
For structural parts, building fittings.
DIN X7Cr14, Werkstoff Nr. 1.4001

PLATE PFC 171
M-1337; 0.10 max C, 17.0 Cr, bal Fe
Ferritic corrosion resistant steel; not hardenable by heat treating
Ann 64,000-85,000 TS, 42,000 min YS; 20 min El, 130-170 Brin
For building fittings, corrosion resistant hardware, spoons
DIN X8Cr17, Werkstoff Nr 1.4016.

PLATE PFC 171 S
M-1337, 0.12 C, 17.0 Cr, 0.25 Mo, S, bal Fe.
Oil quenched 100,000-120,000 TS, 64,000 min YS, 12 min El, 190-235 Brin.
Ferritic, corrosion resistant steel, free machining grade
For machined parts as corrosion resistant screws, bolts, studs, nuts
DIN X12CrMoS17, Werkstoff Nr 1.4104.

PLATE PFMC 14
M-1337, 0.20 C, 13.0 Cr, bal Fe
Heat treated. 113,000-135,000 TS; 78,000 min YS, 5 min El, 225-275 Brin.
Martensitic corrosion resistant steel, oil hardenable to 40-48 Rock C.
High strength structural parts for pumps, impellers, turbine wheels.
DIN X20Cr13, Werkstoff Nr. 1.4021.

PLATE PGS 1.
M-1337; 0.15 C, 0.25 Si, 0.35 Mn, bal Fe.
For case hardening small parts of machines as levers, links, bolts, pins.
DIN C15W3.

PLATE PGS 4
M-1337; 0.45 C, 0.35 Si, 0.70 Mn, bal Fe.
Water hardening tool steel; for hammers, forks, axes, knives, shears, screw drivers.
DIN C45W3; Werkstoff Nr 1.1730.

PLATE PGS 6.
M-1337; 0.60 C, 0.35 Si, 0.70 Mn, bal Fe.
Water or oil hardening tool steel;
for shanks for tools, bars, needle beds, stone breakers hammers
DIN C60W3; Werkstoff Nr. 1.1740.

PLATE PLATIT 40.
M-1337; 1.0 C, 31.0 Cr, 14 W, 53 Co.
For parts for high temperature operation.

PLATE PLATIT EXTRA.
M-1337; 2.50 C, 33.0 Cr, 14.5 W, 48.0 Co.
For parts for high temperature operation.

PLATE PLATIT HH.
M-1337, 0.25 C, 27.0 Cr, 6.0 Mo, 55 Co, bal Fe.
For high temperature operations.

PLATE PM 512
M-1337; 0.37 C, 1.0 Si, 0.5 Mn, 5.3 Cr, 1.5 Mo, 0.2 V, 1.3 W, bal Fe
Hot work tool steel, air or oil hardening.
For forging and pressing dies,
ferrous and non-ferrous
DIN X37CrMoW51; Werkstoff Nr. 1.2606

PLATE PM 512 Co.
M-1337; 0.35 C, 0.7 Si, 0.4 Mn, 5.0 Cr, 1.6 Mo, 0.5 V, 2.0 W, bal Fe
Hot work tool steel, air or oil hardening

PLATE PM 524.
M-1337; 0.38 C, 1.0 Si, 0.4 Mn, 5.3 Cr, 1.4 Mo, 0.6 V, bal Fe.
Hot work tool steel, air or oil hardening
For pressure casting molds for light alloys.
DIN X38CrMoV51, Werkstoff Nr 1.2343.

PLATE PM 524 V.
M-1337, 0.40 C, 1.0 Si, 0.4 Mn, 5.3 Cr, 1.4 Mo, 1.2 V, bal Fe.
Hot work tool steel, air or oil hardening
Pressure casting molds for light alloys.
DIN X40CrMoV51; Werkstoff Nr. 1.2344

PLATE PM 1291.
M-1337, 0.30 C, 0.5 Si, 0.3 Mn, 12.0 Cr, 1.0 Mo, 0.5 V, 10.0 W, 1.5 Co, bal Fe.
Hot work tool steel, air or oil hardening.
For extrusion dies, die cast dies
Werkstoff Nr 1.2871

PLATE PMC 145.
M-1337, 0.40 C, 13.0 Cr, bal Fe.
Martensitic corrosion resistant steel
Air or oil hardenable to 45-55 Rc.
For shafts, spline shafts, impellers, turbine wheels, pump parts, cutlery.
DIN X40Cr13; Werkstoff Nr. 1.4034

PLATE PMC Ni 162.
M-1337; 0.22 C, 17.0 Cr, 2.0 Ni, bal Fe
Heat treated. 115,000-135,000 TS, 85,000 min YS; 4 min El, 225-275 Brin.
Corrosion resistant.
For structural parts requiring good strength and non-rusting properties
DIN X22CrNi17; Werkstoff Nr 1.4057.

PLATE PMCO 174.
M-1337; 0.38 C, 17.0 Cr, 1.20 Mo, 0.50 Ni, bal Fe.
Ht Tr. R.T.: 115,000-135,000 TS, 85,000 min YS; 14 min El; 225-275 Brin.
At 400°C: 71,000 min YS
Corrosion resistant, good temperature resistance.
For arbors, shafts, spindels,
bolts operating up to 400°C
DIN X35CrMo17; Werkstoff Nr. 1.4122.

PLATE PMCO 189.
M-1337; 0.90 C, 18.0 Cr, 1.20 Mo, V, bal Fe.
Martensitic, corrosion resistant, air or oil hardenable to 50-60 Rock C.
For valves, knives, cutlery, ball bearings and races, shafts, couplings, surgical instruments, dental tools.
DIN X90CrMoV18; Werkstoff Nr. 1.4112.

PLATE PMCO 1310.
M-1337; 1.05 C, 13.0 Cr, 0.50 Mo, bal Fe.
Martensitic, corrosion resistant steel.
Air or oil hardenable to 52-60 Rock C
For stainless ball bearings, valves, balls for ball point pens, cutlery, knife blades.
DIN X105CrMo13; Werkstoff Nr. 1.4108.

PLATE PN 24.
M-1337; 0.50 C, 0.25 Si, 0.90 Mn, 1.0 Cr, 0.10 V, bal Fe.
Oil hardening tool steel.
For cold punches.
DIN 50CrV4; Werkstoff Nr 1.2241

PLATE PP 32.
M-1337; 0.40 C, 0.3 Si, 1.5 Mn, 2.0 Cr, 0.2 Mo, bal Fe.
Hot work tool steel; air or oil hardening.
For drop forge hammer dies, can forming tools.
DIN 40CrMnMo7, Werkstoff Nr. 1.2311.

PLATE PP 36
M-1337; 0.48 C, 0.3 Si, 0.7 Mn, 1.5 Cr, 0.7 Mo, 0.3 V, bal Fe.
Hot work tool steel; oil hardening.
For punches, centrifugal casting molds.
DIN 48CrMoV67; Werkstoff Nr. 1.2323.

PLATE PP36J
M-1337; 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe
For gears, bolts, crankshafts, axles; oil hardened, tough.

PLATE PR97K
M-1337, 0.30 C, 1.1 Cr, 0.18 V, 3.75 W, 1 Si, bal Fe.
For upsetters, riveters, punches, crimpers, oil hardened, tough

PLATE PS 300.
M-1337, 0.50 C, 1.3 Si, 0.7 Mn, 14.0 Cr, 13.0 Ni, 1.2 V, 1.3 W, bal Fe.
Hot work tool steel, not heat treatable
For pressing dies of simple profile, Austenitic.
DIN X50NiCrWV1313, Werkstoff Nr. 1.2731

PLATE PU 27.
M-1337; 0.56 C, 0.30 Si, 0.70 Mn, 1.0 Cr, 0.50 Mo, 1.70 Ni, 0.10 V, bal Fe.
Oil hardening tool steel
For coining and stamping dies, large mandrels, cold headers, embossing tools
DIN 56NiCrMoV7, Werkstoff 1.2714.

PLATE PU 37.
M-1337, 0.55 C, 0.3 Si, 0.7 Mn, 1.0 Cr, 0.5 Mo, 1.7 Ni, 0.1 V, bal Fe
Hot work tool steel, oil or air hardening.
For drop forge hammer dies.
DIN 56NiCrMoV7; Werkstoff Nr. 1.2714.

PLATE PU 83
M-1337; 0.45 C, 0.2 Si, 0.5 Mn, 1.3 Cr, 0.5 Mo, 4.5 Ni, 0.2 V, 0.5 W, bal Fe.
Hot work tool steel; air or oil hardening.
For hot pressing tools with difficult gravures.
DIN X45NiCrMo4; Werkstoff Nr. 1.2767.

PLATE PV30.
M-1337; 0.56 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

PLATE PV36.
M-1337; 0.45 C, 0.70 Cr, 1.65 Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

PLATE PVX 1212.
M-1337; 0.45 C, 0.6 Si, 0.6 Mn, 4.5 Cr, 0.8 Mo, 12.0 Ni, 1.2 V, 12.0 W, 0.5 Co, bal Fe.
Hot work tool steel, not heat treatable.
For high temperature pressing using light loads.

PLATE PW32
M-1337, 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough

PLATE PW 78
M-1337; 0.45 C, 0.6 Si, 0.7 Mn, 1.7 Cr, 0.6 Mo, 0.8 V, 0.8 W, bal Fe
Hot work tool steel; oil hardening.
Shear blades, pressing dies and punches
DIN 45CrVMoW58; Werkstoff Nr. 1.2603

PLATE PW83.
M-1337, 0.40 C, Ni, Cr, Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough

PLATE PW 97
M-1337; 0.30 C, 1.0 Si, 0.4 Mn, 1.0 Cr, 0.2 V, 4.0 W, bal Fe
Hot work tool steel, oil or water hardening
Forming dies for non-ferrous production, cold headers for non-ferrous parts
DIN X30WCrV41, Werkstoff Nr. 1.2564

PLATE PW 100
M-1337, 0.30 C, 0.2 Si, 0.3 Mn, 2.4 Cr, 0.6 V, 4.3 W, bal Fe
Hot work tool steel, oil hardening
For pressure casting molds and dies for non-ferrous processing
DIN X30WCrV53, Werkstoff Nr 1.2567.

PLATE PW100 EXTRA
M-1337; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe
For extrusion press rams and liners, punches; hot work steel, oil hardened.

PLATE PW 134
M-1337; 0.60 C, 0.3 Si, 0.3 Mn, 4.0 Cr, 0.9 Mo, 0.7 V, 9.0 W, bal Fe
Hot work tool steel, air or oil hardening
Tube pressing mandrels, hot work forming tools.
DIN X60WCrMoV94, Werkstoff Nr 1.2622.

PLATE PW 190
M-1337, 0.30 C, 0.2 Si, 0.3 Mn, 2.6 Cr, 0.4 V, 8.5 W, bal Fe.
Hot work tool steel; oil or air hardening.
Hot extrusion dies, pressure casting molds and dies for non-ferrous.
DIN X30WCrV93, Werkstoff Nr. 1.2581.

PLATE PZ 190
M-1337, 0.30 C, 0.2 Si, 0.3 Mn, 2.4 Cr, 0.3 V, 8.5 W, 2.0 Co, bal Fe
Hot work tool steel: oil or air hardening
Pressure casting molds for heavy metal
DIN Z30WCrCoV93; Werkstoff Nr. 1.2662.

PLATE PZ 194
M-1337, 0.32 C, 0.6 Si, 0.5 Mn, 2.3 Cr, 3.2 Mo, 0.5 V, 6.5 W, 4.5 Co, bal Fe.
Hot work tool steel; air or oil hardening.
Pressure casting molds, extrusion dies.
Werkstoff Nr. 1.2676.

PLATE SVX 33.
M-1337; 0.95 C, 4.0 Cr, 2.7 Mo, 2.4 V, 3.0 W, bal Fe.
For twist drills, milling cutters, broaches, band saws, hack saw blades.
High speed steel.
Werkstoff Nr 1.3333; DIN S3-3-2.

PLATE SVX 34.
M-1337; 0.85 C, 4.0 Cr, 0.9 Mo, 1.6 V, 9.0 W, bal Fe.
Milling cutters, twist drills and taps for working on soft materials.
High speed steel
Werkstoff Nr. 1.3316; DIN S9-1-2.

PLATE SVX 54.
M-1337; 0.85 C, 4.0 Cr, 0.9 Mo, 2.5 V, 12.0 W, bal Fe.
For lathe tools, milling knives, relieved cutters for working on hard materials.
High speed steel.
Werkstoff Nr. 1.3318; DIN S12-1-2.

PLATE SVX 90.
M-1337; 1.25 C, 4.2 Cr, 0.9 Mo, 3.8 V, 12.0 W, bal Fe
For finishing and milling tools, pinion type cutters, steel shapes, broaches.
High speed steel
Werkstoff Nr 1.3302, DIN S12-1-4.

PLATE SVX 360
M-1337, 0.75 C, 4.0 Cr, 0.5 Mo, 1.1 V, 18.0 W, bal Fe
For twist drills, threading tools, milling cutters, gear shapers
High speed steel
Werkstoff Nr. 1.3355, DIN S18-0-1.

PLATE SVX 526
M-1337, 0.85 C, 4.2 Cr, 5.0 Mo, 2.0 V, 6.3 W, bal Fe
For twist drills, broaches, milling cutters, segments for circular saws, lathe tools for roughing cuts.
High speed steel
Werkstoff Nr. 1.3343, DIN S6-5-2

PLATE SVX 536
M-1337, 1.20 C, 4.2 Cr, 5.0 Mo, 3.3 V, 6.3 W, bal Fe
For heavy duty milling cutters, highly stressed broaches, reamers
High speed steel
Werkstoff Nr. 1.3344, DIN S6-5-3.

PLATE SVX 811.
M-1337, 0.82 C, 3.8 Cr, 8.6 Mo, 1.2 V, 1.8 W, bal Fe
For twist drills, reamers, milling cutters, threading tools and taps
High speed steel
Werkstoff Nr 1.3346; DIN S2-9-1.

PLATE SVZ 203
M-1337, 0.83 C, 4.2 Cr, 0.9 Mo, 1.9 V, 12.0 W, 2.8 Co, bal Fe.
For lathe tools and milling cutters, good retention of hardness
High speed steel
Werkstoff Nr. 1.3211; DIN S12-1-2-3.

PLATE SVZ 210.
M-1337; 1.25 C, 4.2 Cr, 3.8 Mo, 3.3 V, 10.5 W, 10.5 Co, bal Fe.
For lathe tools, form tools at high speeds or on tough austenitic steels.
High speed steel, good red hardness
Werkstoff Nr. 1.3207, DIN S10-4-3-10.

PLATE SVZ 245.
M-1337; 1.30 C, 4.2 Cr, 0.9 Mo, 3.8 V, 12.0 W, 4.8 Co, bal Fe.
For finishing and roughing cutting tools for best wear characteristics. High speed steel.
Werkstoff Nr. 1.3202; DIN S12-1-4-5.

PLATE SVZ 365.
M-1337; 0.80 C, 4.2 Cr, 0.7 Mo, 1.6 V, 18.0 W, 4.8 Co, bal Fe.
Lathe and planing tools with eminent cutting strength and toughness.
High speed steel
Werkstoff Nr. 1.3255; DIN S18-1-2-5.

PLATE SVZ 410.
M-1337; 0.76 C, 4.2 Cr, 0.7 Mo, 1.6 V, 18.0 W, 9.5 Co, bal Fe.
Lathe and planing tools for heavy work requiring good red hardness, and for machining austenitic steels.
High speed steel.
Werkstoff Nr. 1.3265; DIN S18-1-2-10.

PLATE SVZ 526 Co
M-1337; 0.82 C, 4.2 Cr, 5.0 Mo, 2.0 V, 6.3 W, 4.8 Co, bal Fe
For lathe tools, drills, milling cutters for tough austenitic steels.
High speed steel, good red hardness.
Werkstoff Nr 1.3243; DIN S6-5-2-5

PLATE TV27.
M-1337; 0.31 C, 2.35 Cr, 0.18 Mo, 0.13 V, bal Fe.
For die casting and plastic mold dies; oil hardened, tough

PLATE UP24
M-1337, 0.45 C, Si, Cr, V, bal Fe.
For springs, gears, bolts, punches, crankshafts; oil hardened, shock resistant.

PLATE US Mo
M-1337, 0.30 C, 0.3 Si, 0.3 Mn, 3.0 Cr, 2.8 Mo, 0.5 V, bal Fe.
Hot work tool steel, oil hardening
Pressure casting molds for heavy metal alloy, pressing dies
DIN X32CrMoV33, Werkstoff Nr. 1.2365

PLATE US Mo Co.
M-1337; 0.30 C, 0.3 Si, 0.4 Mn, 2.8 Cr, 2.7 Mo, 0.5 V, 3.0 Co, bal Fe.
Hot work tool steel, air or oil hardening

PLATE US Mo K.
M-1337, 0.30 C, 0.2 Si, 0.4 Mn, 2.8 Cr, 2.8 Mo, 0.5 V, bal Fe
Hot work tool steel, oil or air hardening
For pressure casting molds, pressing dies.
DIN X32CrMoV33, Werkstoff Nr. 1.2365.

PLATE UW280
M-1337, 0.20 C, 13 Cr, 0.30 Mn, bal Fe.
Annealed 95,000 TS, 50,000 YS, 25 El; 55 RA; 196 Brin
For turbine blades, valves, cutlery, surgical instruments, Type 420, stainless.

PLATE WCN.
M-1337, 0.50 C, Ni, Cr, bal Fe
For gears, bolts, machine tool parts, shafts; oil hardened, shock resistant.

PLATE WKL.
M-1337; 0.56 C, Ni, Cr, Mo, V, bal Fe.
For forging and heading dies, punches; oil hardened, shock resistant.

PLATE WL30.
M-1337, 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
For chisels, pneumatic tools, punches; oil hardened, tough.

PLATE WP32.
M-1337; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

PLATE WV 27.
M-1337; 0.55 C, 0.30 Si, 0.60 Mn, 0.70 Cr, 0.30 Mo, 1 70 Ni, 0 10 V, bal Fe.
Oil hardening tool steel, for hot work.
For coining dies, embossing tools, counterbores, large mandrels.
DIN 55NiCrMoV6; Werkstoff Nr. 1.2713.

PLATE WV30.
M-1337, 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.10 V, bal Fe.
For die casting and plastic mold dies; oil hardened, tough.

PLATE ZM13.
M-1337; 0.90 C, 0.80 Cr, 0.30 Mn, 0.25 Si, bal Fe.
For bearings, cutters, sleeves, liners; water hardened, wear resistant.

PLATE ZM 14.
M-1337; 1 40 C, 0 30 Si, 0.30 Mn, 0 35 Cr, 0 10 V, bal Fe.
Water hardening tool steel .
For punches, cold drawing dies, cutting tools that operate cold, bearings
DIN 140CrV1; Werkstoff Nr. 1.2206.

PLATE ZW 100.
M-1337; 1.30 C, 0.25 Si, 0 30 Mn, 0.30 Cr, 5.0 W, bal Fe.
Water or oil hardening tool steel.
For drawing dies, highly stressed cold forming dies.
DIN X130W5; Werkstoff Nr. 1.2453.

PLATIKUT
M-357; 0.20 C, 0 8 Mn, 0.55 Ni, 0.50 Cr, 0 20 Mo, bal Fe
150 Brin
For molds, dies; for plastic industry.

PLATINA, BIRMINGHAM.
Eng.; 46.6 Cu, 53 15 Zn, 0.25 Fe.
For hardware, ornaments; corrosion resistant

PLATINA, BIRMINGHAM.
Eng ; 20.25 Cu, 79 4 Zn, 0.33 Fe.
For hardware, ornaments.

PLATINA, PLATING.
Eng ; 46 5 Cu, 53 5 Sn.
For hardware, ornaments

PLATINAX-II
M-200, 23.3 Co, bal Pt.
6400 Br, 9 2 BH max
For permanent magnets, metering devices.
Can be machined, rolled and drawn.
Outstanding magnetic properties obtained by a 2 stage heat treatment.
Corrosion resistant to H_2SO_4 and HNO_3.

PLATINE.
Eng , 57 Zn, 43 Cu.
For ornaments, weak and brittle.

PLATINE-AU-TITRE (PROPLATINUM).
French; 83-65 Ag, 17-35 Pt.
For substitute for platinum; corrosion resistant.

PLATINEL 1503.
M-686; 65 Au, 35 Pd.
For high temperature thermocouples.
Negative leg.

PLATINEL 1786.
M-686; 3 Au, 83 Pd, bal Pt.
For high temperature thermocouples.
Positive leg.

PLATINEL 1813.
M-687; 55 Pd, 31 Pt, 14 Au.
For high temperature thermocouples.

PLATINIRIDIUM
French, 55 Pt, 28 Ir, 7 Rh, 3 Cu, 4 Fe, traces Pd + As.
For pen nibs, ornamental parts; mined in Russia.

PLATINIT.
Eng.; 46 Ni, bal Fe.
For chemical apparatus, corrosion resistant.

PLATINITE.
M-104; 0.15 C, 49 Ni, bal Fe.
Annealed. 78,000-90,000 TS; 48,000-60,000 YS; 45-30 El.
To replace Pt in electric light bulbs; heat resistant; coef. exp of glass.

PLATINITE + Cr.
M-771; 0.15 C, 49 Ni, Cr, bal Fe.
For glass-to-metal seals
Stepped expansion.

PLATINOID.
50-90 Cu, 3-40 Ni, 0-10 Al, 0-40 Zn.
For chemical equipment and construction; corrosion resistant

PLATINOID A.
Eng., 60 Cu, 24 Zn, 14 Ni, 2 W.
57,000 TS; 33 El
High resistance alloy, heating elements, thermocouples; Tungsten, German Silver

PLATINOID B
Eng , 54 Cu, 20 Zn, 25 Ni, W, 0 5 Fe, 0.2 Mn
72,000 TS; 30 El; 89 Brin.
For high resistance alloys, heating elements, thermocouples; Tungsten, German Silver.

PLATINOR.
45 Cu, 18 Pt, 18 brass, 9 Ag, 9 Ni.
For cheap jewelry, ornaments, corrosion resistant.

PLATINUM ALLOY
2-5 parts Ag, 1 part Pt, 0-1 part Cu
For ornaments, jewelry, corrosion resistant

PLATINUM ALLOY NO 479.
M-1295, 92 Pt, 8 W.
Cold drawn 300,000 TS
For potentiometers, variable resistors, high electrical and heat resistance.

PLATINUM ALLOY NO 851
M-1295, 79 Pt, 15 Rh, 5 Ru.
Cold drawn 300,000 TS.
For potentiometers, variable resistors, high electrical and heat resistance.

PLATINUM GOLD-1
70 Au, 30 Pt.
For ornaments, jewelry; white, corrosion resistant

PLATINUM GOLD-2.
58 Pt, 25 Ag, 17 Au
For jewelry; corrosion resistant.

PLATINUM GOLD-3.
60 Au, 40 Pt.
For jewelry; corrosion resistant.

PLATINUM IRIDIUM-1.
5.0 Ir, 95 Pt
170 Brin.
For Jewelry, corrosion resistant.

PLATINUM IRIDIUM-2
30 Ir, 70 Pt.
400 Brin.
For surgical instruments; corrosion resistant.

PLATINUM LEAD (BIRMINGHAM PLATINUM).
79-53 Zn, 20-47 Cu, 0.3 Fe.
For ornamental parts; castings.

PLATINUM RHODIUM.
100-80 Pt, 0-20 Rh.
For thermocouples; heat resistant.

PLATINUM SILVER.
66.7 Ag, 33.3 Pt.
For ornaments, jewelry; corrosion resistant.

PLATINUM SOLDER.
73 Ag, 27 Pt.
For solder for platinum alloys, corrosion resistant.

PLATINUM SUBSTITUTE.
23.6-24.0 Al, 3.7 Bi, 0.7 Au, 72 Ni.
For ornamental white metal parts; corrosion resistant.

PLATINUM SUBSTITUTE COOPERS-1
70 Ag, 25 Pd, 5 Co.
For jewelry; corrosion resistant.

PLATINUM SUBSTITUTE COOPERS-2.
70 Ag, 25 Pt, 5 Ni.
For jewelry, corrosion resistant.

PLATINUM SUBSTITUTE ELECTRICAL-1.
70 Au, 25 Ag, 5 Ni or Pt
For electrical contacts; heat resistant.

PLATINUM SUBSTITUTE ELECTRICAL-2.
68 Au, 25 Ag, 7.5 Pt.
For electrical contacts; heat resistant.

PLATNAM
M-995; 54 Ni, 33 Cu, 13 Sn, 0.5 Fe, 0.3 Al.
For steam valves up to 600°C, valve disks and seats, heat resisting, abrasion and erosion resistant.

PLATNIK.
Pt-Ni
For ornaments, jewelry, corrosion resistant.

PLETTENBERG CMV
M-1344, 0.45 C, Ni, Cr, W, bal Fe
For forging dies, upsetters, header dies, oil hardened, tough.

PLETTENBERG EXTRA MH.
M-1344; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 18 El; 38 RA; 210 Brin.
For springs, tools, drills, taps, reamers; Type W1; water hardened

PLETTENBERG EXTRA WEICH.
M-1344; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin
For springs, rails, punches, axes, tools, Type W1; water hardened.

PLETTENBERG EXTRA ZAH.
M-1344; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, tools, cutters, taps, drills; Type W1; water hardened.

PLETTENBERG EXTRA ZH.
M-1344; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed: 100,000 TS; 53,000 YS, 21 El; 42 RA; 200 Brin.
For springs, drills, taps, hobs, reamers; Type W1; water hardened.

PLETTENBERG GC.
M-1344; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, shock resistant.

PLETTENBERG GCN1.
M-1344; 0.55 C, 0.7 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For springs, gears, crankshafts, bolts, studs; oil hardened, shock resistant.

PLETTENBERG GCN2.
M-1344; 0.56 C, Ni, Cr, Mo, V, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

PLETTENBERG GMS.
M-1344; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
For upsetters, punches, crimpers, water hardened.

PLETTENBERG HW.
M-1344; 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe
For upsetters, punches, die blocks; oil hardened, tough.

PLETTENBERG KCr2
M-1344; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For cams, bolts, camshafts; case hardened.

PLETTENBERG KCr13
M-1344; 0.40 C, 13 Cr, 0.3 Mn, bal Fe.
Annealed: 100,000 TS; 55,000 YS, 20 El; 50 RA; 200 Brin
For valves, cutlery, surgical and dental instruments; Type 420, stainless

PLETTENBERG KL.
M-1344, 0.55 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For header dies, forging dies; oil hardened, tough.

PLETTENBERG KLV.
M-1344, 0.61 C, 0.85 Si, 0.75 Mn, 1.18 Cr, 0.1 V, bal Fe
For crankshafts, header dies, punches; oil hardened

PLETTENBERG KS
M-1344, 0.45 C, W, Cr, V, bal Fe
For forging and header dies, upsetters, oil hardened, tough

PLETTENBERG LC13.
M-1344, 2.1 C, 11.5 Cr, 0.30 Mn, bal Fe.
For blanking and forming dies, punches; oil hardened, nondeforming.

PLETTENBERG LC13S.
M-1344, 1.65 C, 11.5 Cr, 0.1 V, 0.30 Mn, bal Fe.
For blanking and forming dies, punches; air hardened, nondeforming

PLETTENBERG LC13SK
M-1344; 1.65 C, 11.5 Cr, Co, 0.30 Mn, bal Fe.
For blanking and forming dies, punches; air hardened, nondeforming

PLETTENBERG LC13W.
M-1344; 2.1 C, 11.5 Cr, 0.70 W, 0.30 Mn, bal Fe.
For blanking and piercing dies, punches; oil hardened, nondeforming

PLETTENBERG Mo6.
M-1344, 0.85 C, W, Mo, bal Fe
For cutters, tools, dies, oil hardened.

PLETTENBERG Mo10.
M-1344, 0.80 C, Cr, Mo, W, V, bal Fe.
For cutters, tools, dies, oil hardened.

PLETTENBERG PCr1.
M-1344; 0.45 C, 0.7 Mo, 0.3 V, 1.4 Cr, bal Fe.
For forging dies, headers, upsetters; oil hardened, tough.

PLETTENBERG PCr2.
M 1344; 0.90 C, 0.8 Cr, 0.30 Mn, bal Fe.
For bearings, cutters, bushings, liners, races; water or oil hardened.

PLETTENBERG PD.
M-1344; 0.35 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For heading and forging dies, punches, upsetters; oil hardened, tough.

PLETTENBERG PF.
M-1344; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, punches; oil hardened, tough

PLETTENBERG PG.
M-1344; 0.15 C, 0.35 Si, 0.35 Mn, bal Fe.
Annealed: 70,000 TS; 55,000 YS; 25 El; 60 RA; 145 Brin
For screws, bolts, gears, machine tool parts; case hardened.

PLETTENBERG PG65
M-1344; 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Hot rolled: 98,000 TS, 59,000 YS; 24 El, 45 RA; 212 Brin
For axles, gears, bolts, tie rods, crankshafts; water hardened.

PLETTENBERG PG85.
M-1344; 0.60 C, 0.25-0.50 Si 0.30-0.80 Mn, bal Fe.
Heat treated. 160,000-115,000 TS, 113,000-77,000 YS; 12-23 El; 40-54 RA, 320-230 Brin
For wheels, die blocks, girders, tie rods, springs; water hardened.

PLETTENBERG PG90.
M-1344; 0.67 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Heat treated: 174,000-122,000 TS, 128,000-82,000 YS, 12-22 El, 37-52 RA, 352-240 Brin.
For springs, clutch discs, die blocks, girders, rails; water hardened

PLETTENBERG PG95
M-1344, 0.75 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Heat treated: 180,000-125,000 TS, 130,000-85,000 YS; 10-20 El, 35-50 RA; 360-245 Brin
For springs, clutch discs, die blocks, rails, water hardened.

PLETTENBERG PG100
M-1344, 0.90 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Heat treated 180,000-130,000 TS, 120,000-80,000 YS, 10-20 El, 30-47 RA, 375-270 Brin.
For drills, hobs, taps, springs, reamers, water hardened, Type W1.

PLETTENBERG PN.
M-1344; 0.50 C, 1.05 Cr, 3.25 Ni, 0.50 Mn, bal Fe.
For gears, bolts, crankshafts, oil hardened, shock resistant

PLETTENBERG PRIMA-MH
M-1346, 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS, 58,000 YS; 18 El; 38 RA; 210 Brin.
For springs, taps, reamers, drills, hobs; Type W1; water hardened.

PLETTENBERG PRIMA WEICH
M-1344; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 174,000-122,000 TS; 128,000-82,000 YS; 12-22 El; 37-52 RA, 350-240 Brin
For wheels, die blocks, girders, springers, Type W1; water hardened.

PLETTENBERG PRIMA ZAH
M-1344; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 188,000-129,000 TS; 143,000-87,000 YS; 12-21 El; 35-50 RA; 388-235 Brin.
For springs, taps, reamers, drills, cutters; Type W1; water hardened.

PLETTENBERG PRIMA-ZH.
M-1346; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 200,000 TS, 150,000 YS; 8 El; 28 RA; 410 Brin.
For springs, taps, reamers, drills, hobs; Type W1; water hardened.

PLETTENBERG RAPID EXTRA III
M-1344; 0.95 C, W, Mo, bal Fe.
For cutters, dies, tools; oil hardened.

PLETTENBERG S111.
M-1344; 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For heading dies, drawing and forming dies; oil hardened, tough

PLETTENBERG S113.
M-1344; 1.45 C, 1.4 Cr, 0.60 Mn, bal Fe
For blanking and forming dies, bearings, oil hardened, abrasion and wear resistant

PLETTENBERG SK
M-1344; 1.0 C, 0.1 V, 0.30 Mn, bal Fe.
For blanking and forming dies, reamers; Type W2; water hardened

PLETTENBERG SP.
M-1344; 0.45 C, Si, Cr, V, bal Fe
For gears, bolts, crankshafts, oil hardened, shock resistant

PLETTENBERG SP35
M-1344, 0.38 C, Si, Cr, V, bal Fe
For gears, bolts, crankshafts, oil hardened, shock resistant

PLETTENBERG SVM2
M-1344, 0.90 C, 1.9 Mn, 0.10 V, bal Fe
For punches, shears, blanking and forming dies, oil hardened, non-deforming

PLETTENBERG WCR13
M-1344, 0.20 C, 13 Cr, 0.30 Mn, bal Fe
Annealed 95,000 TS, 50,000 YS, 25 El, 55 RA, 195 Brin
For valves, cutlery, surgical and dental instruments, Type 420; stainless

PLETTENBERG WP5
M-1344, 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe
For shear blades, upsetters, forging dies, hot work steel, oil hardened.

PLETTENBERG WP9
M-1344, 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe
For extrusion rams and liners, shears, punches; hot work steel, oil hardened

PLETTENBERG WPK
M-1344, 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe
For extrusion rams and liners, punches, hot work steel, oil hardened

PLETTENBERG WP SPEZIAL EXTRA.
M-1344, 0.30 C, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For forging and heading dies, upsetters, shears, hot work steel, oil hardened

PLETTENBERG WPV.
M-1344, 0.65 C, 3.75 Cr, 0.85 Mo, 0.70 V, 8.5 W, bal Fe
For shear blades, cutters, upsetters; oil hardened, hot work steel.

PLOWFACE.
M-712; 4.5 C, 6.5 Mn, 2 Si, 30 Cr, bal Fe. 550 Brin.,
For hard surfacing electrodes; abrasion and impact resistant.

PLOW STEEL.
0.6-0.9 C, bal Fe.
For plow shares, blacksmith tools;
water hardening.

PLUMBERS SOLDER
67 Pb, 33 Sn.
For solder, soft solder.

PLUMBERS WHITE NO 1
54 Cu, 27 Zn, 17 Ni, 2 Pb.
For plumbing fixtures; free-cutting.

PLUMBERS WHITE NO. 2.
54 Cu, 25 Zn, 13 Ni, 7 Pb, 1 Sn.
For faucets, cocks; free-cutting.

PLUMBERS WHITE NO 3.
58 Cu, 25 Zn, 15 Ni, 1 Pb, 1 Fe, 0.3 Mn.
For faucets, cocks, corrosion resistant

PLUMBIC BRONZE.
England, 26 Pb, 1.7 Mn, 1.5 Sn, 1.2 Fe, bal Cu
For bearings, bushings, heavy duty.

PLUMBITE
M-123, Pb, Sn, Sb.
Used in slow running and light weight machines;
free flowing, durable plastic.

PLUMBSOL
M-200; Ag, Sn
Cast 3350 TS, 60 El.
For soft solder for plumbing installations,
M P 221-225°C.

PLUMRITE NO 67
M-141; 67 Cu, 32.5 Zn, 0.5 Pb
For water pipes, plumbing, free-cutting

PLUMRITE 85
M 141, 85 Cu, 15 Zn
Annealed 45,000 TS, 45 El
For water pipes, plumbing; red brass

PLUMRITE COPPER
M-141, 99.9 Cu
Annealed 30,000 TS, 40 El
Drawn 48,000 TS; 4 El
For piping, water tube, corrosion resistant

PLUMRITE STANDARD 85
M-141; 85 Cu, 15 Zn
Hard 70,000 TS, 57,000 YS; 5 El
Soft 40,000 TS, 12,000 YS, 47 El
For flexible hose, deep drawn parts,
corrosion resistant

PLURALLOY 70.
M-849, 0.06-0.10 C, 0.6-0.8 Mn, bal Fe
Welded 75,000 TS, 64,000 YS, 31 El, 137 Brin.
For welding electrodes, AWS-F6015,
shielded arc, low hydrogen

PLURALLOY 100.
M-849, 0.06-0.10 C, 0.6-0.8 Mn, 0.7-0.9 Mo, bal Fe.
Welded· 95,000 TS, 83,000 YS, 27 El; 197 Brin.
For welding electrodes, AWS-E9015, shielded arc.

PLURALLOY 120.
M-849; 0.06-0.10 C, 0.6-0.8 Mn, 0.2-0.4 Mo,
1.75-2.25 Ni, 0.1-0.2 V, bal Fe.
Welded. 110,000 TS, 106,000 YS, 22 El; 220 Brin.
For welding electrodes; shielded arc.

PLUTAIR-675.
M-1410; 0.50 C, 7.5 Cr, 0.5 Mo, 1.3 Si, 0.45 Mn,
bal Fe.
For hot shears, die holders, hot dies;
air hardened.

PLUTEOUS 1000.
M-1410; 0.1 C, Cr, bal Fe.
Heat treated· 78,500-101,000 TS, 67,000-89,600 YS;
25 El; 65 RA.
For aircraft parts, fittings, pump rods,
plastic mold dies; martensitic,
corrosion and heat resistant.

PLUTEOUS 1001.
M-1410; med C, Cr, bal Fe.
Heat treated: 103,000-116,500 TS;
78,500-101,000 YS; 20 El; 55 RA.
For ball and roller bearings, needles, springs, valves;
martensitic, stainless.

PLUTEOUS 1001/31 C
M-1410; medium C, Cr, S, bal Fe.
For oil pump and valve parts,
free-cutting, stainless, martensitic

PLUTEOUS 1003
M-1410, C, 18 Cr, 8 Ni, bal Fe.
Annealed. 78,400-94,000 TS, 30-50 El, 60 RA.
For chemical and textile equipment, marine parts;
stainless, austenitic.

PLUTEOUS 1009
M-1410; C, 16 Cr, 2 Ni, bal Fe.
Heat treated· 123,000 TS, 96,300-114,200 YS,
20 El, 40-60 RA
For aircraft parts, fittings, pump shafts, valves;
martensitic, stainless.

PLUTO
M-616; 0.7 C, 19 W, 4 Cr, 2 V, bal Fe
For cutters, tools, high speed steel.

PLUTOCRAT
M-1410; 0.8 C, 4.5 Cr, 1 V, 22 W, bal Fe.
For milling cutters, drills, reamers, boring tools;
high speed steel.

PLUTO G
M-616, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe
For lathe cutters, drills, hobs, reamers,
Type T1, high speed steel

PLUTO G
M-1308, 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps,
high speed steel

PLUTOIL 704
M-1410, 0.90 C, 1.5 Mn, 0.5 Cr, bal Fe
For shearing and trimming dies, gages,
oil hardened, non deforming

PLUTOIL 708
M-1410, 0.90 C, 1.5 Mn, 0.5 Cr, bal Fe
For forming, punching, and trimming dies,
thread gages, oil hardened, non-deforming

PLUTOIL 720
M-1410, 1.0 C, 0.5 Mn, 1.5 Cr, bal Fe
For collets, taps, drills, broaches, chasers;
oil hardened, abrasion resistant.

PLUTOIL 723.
M 1410, 1.0 C, 0.5 Mn, 1.5 Cr, bal Fe
For collets, taps, drills, cams, broaches;
oil hardened, abrasion resistant

PLUTONIC-12S
M-1410; 0.30 C, 8.5 W, 4 Cr, 0.30 Mn, bal Fe.
For Al die casting dies, resists heat checking.

PLUTONIC-151.
M-1410; 0.15 C, 0.60 Mn, bal Fe
For hobbed plastic molds, case hardened.

PLUTONIC-153
M-1410, 0.12 C, 0.45 Mn, 3 Ni, bal Fe.
For collets, gears, fasteners;
case hardened, shock resistant.

PLUTONIC-155.
M-1410; 0.15 C, 0.45 Mn, 1 Cr, 3 Ni, bal Fe.
For gears, pinions, camshafts, cams; case hardened, shock resistant.

PLUTONIC-157.
M-1410; 0.15 C, 1.2 Cr, 4.25 Ni, bal Fe.
For gears, pinions, camshafts, cams; case hardened, shock resistant.

PLUTONIC-163.
M-1410; 0.15 C, 0.80 Ni, 0.10 Mo, 0.60 Cr, 0.80 Mn, bal Fe.
For gears, pinions, camshafts, cams, case hardened, shock resistant.

PLUTONIC-164.
M-1410; 0.20 C, 0 80 Cr, 1 Ni, 0 10 Mo, bal Fe.
For gears, pinions, camshafts, cams, bolts; case hardened, shock resistant.

PLUTONIC-165.
M-1410; 0.20 C, 1.25 Ni, 0.12 Mo, 0.75 Mn, bal Fe.
For gears, pinions, camshafts, cams; case hardened, shock resistant.

PLUTONIC-167.
M-1410; 0.20 C, 1.6 Cr, 2 Ni, 0.20 Mo, 0 55 Mn, bal Fe.
For gears, pinions, camshafts, cams; case hardened, shock resistant.

PLUTONIC-280.
M-1410; 0 60 C, 0.60 Mn, 0 60 Cr, bal Fe
For hot punches and forging dies, caulking tools; oil hardened, tough.

PLUTONIC-451.
M-1410; 0.30 C, 0.25 Cr, 3 Ni, 0.55 Mn, bal Fe.
For die casting dies; oil hardened.

PLUTONIC 552
M-1410; 0.28 C, 1.75 Cr, 4.25 Ni, 0.30 Mo, 0.3 Si, bal Fe.
For cam blocks, bolsters, punches, shear blades; oil hardened, hot work steel.

PLUTONIC-553
M-1410; 0.40 C, 0.60 Mn, 1.1 Cr, 1.5 Ni, 0.3 Mo, bal Fe.
For mandrels, gears, bolts, crankshafts; oil hardened, shock resistant.

PLUTONIC-558.
M-1410; 0.30 C, 0.60 Mn, 0.60 Cr, 2.5 Ni, 0 60 Mo, bal Fe.
For mandrel bars; oil hardened, tough.

PLUTONIC-564.
M-1410; 0.30 C, 0.6 Mn, 0.75 Cr, 3 Ni, bal Fe.
For punches, dies, collets, plastic molds; oil hardened, shock resistant.

PLUTONIC-601.
M-1410; 0.4 C, 0.65 Mn, 1.25 Cr, 0.15 V, bal Fe.
For die casting and permanent mold dies; oil hardened.

PLUTONIC-602.
M-1410; 0.4 C, 1 Cr, 0.20 Mo, 0.65 Mn, bal Fe.
For die casting and permanent mold dies; oil hardened.

PLUTONIC-606.
M-1410; 1.25 C, 0.5 Cr, 1.5 W, bal Fe.
For draw bench dies, taps; water hardened, tough.

PLUTONIC-609.
M-1410; 0.40 C, 0.8 Mn, 1 Cr, bal Fe.
For hot and cold tube mandrels; oil hardened.

PLUTONIC-1000.
M-1410; 0 12 C, 1 Mn, 13 Cr, 1 Ni, 1 Si, bal Fe.
For plastic mold dies; corrosion resistant.

PLUTONIC-1001.
M-1410; 0.21 C, 1 Mn, 13 Cr, 1 Ni, 1 Si, bal Fe.
For plastic mold dies; corrosion resistant.

PLUTONON 272
M-1410; 0.37 C, 0.80 Cr, 0 75 Mo, 0.25 Si, bal Fe.
For chipping chisels, drills, plow teeth; water hardened, non-tempering.

PLUTO PARAMOUNT.
M-1410, 0.80 C, 5 Cr, 1.5 V, 21 W, 0.65 Mo, 10-12 Co, bal Fe.
For cutting tools for fine finishing; high speed steel.

PLUTO PERFECTUM
M-1410; 0.85 C, 5 Cr, 18 W, 5-6 Co, bal Fe.
For milling cutters, lathe and planer tools; high speed steel.

PLYKROME
M-72; M-318; composite steel plus welded stainless surface high Cr, high Ni ferrous alloy.
For stainless steel parts, tanks, vessels; stainless steel sheet welded onto steel surface.

PLYMITE
M-193; W alloy.
For wear resistant parts.

PM-20.
M-884, 0 05 C, 0.9 Mn, 3 Ni, 0.7 Cu, 0 18 Mo, bal Fe
Rolled: 85,000-95,000 TS; 57,000-68,000 YS; 18 El
For automotive and railway bodies; good workability.

P M G NO 1.
M-319, 1-3 Si, bal Cu
Cast· 53,000 TS; 18,000 YS; 15 El; 115 Brin
For tanks, pressure vessels, fire extinguishers, corrosion resistant

PMG NO 3
M-319, 98 2 Cu, 1 2 Si, 0 6 Fe.
For screws, rivets, bolts, nails; corrosion resistant.

P M.G. NO 4
M-319, 1-3 Si, bal Cu
Cast 50,000 TS; 16,000 YS, 30 El; 90 Brin.
For marine hardware, tanks, pressure vessels; corrosion resistant.

P.M.G NO 6
M-319, 1-3 Si, bal Cu
Cast 40,000 TS; 13,000 YS; 50 El; 80 Brin.
For fire extinguishers, marine hardware; corrosion resistant

PMG NO. 10.
M-319; 95.6 Cu, 3.2 Si, 1 2 Fe
For tanks, vats, pump rods, pistons; corrosion resistant.

P.M.G NO. 13.
M-319; 1-3 Si, bal Cu
Cast: 50,000 TS; 23,000 YS; 10 El; 116 Brin.
For pressure vessels, tanks, marine construction; corrosion resistant.

P.M.G. NO. 14.
M-319; 1-3 Si, bal Cu.
Cast: 45,000 TS; 40,000 YS; 1 El; 150 Brin.
For marine hardware, pressure vessels, fasteners; corrosion resistant.

PMG NO. 95.
M-319; 96.6 Cu, 0.4 Pb, 2.5 Si, 0.5 Fe.
For screw machine products; tough, corrosion resistant.

P.M.G. ALLOY.
M-117, M-319; 95.5 Cu, 3 Si, 1.5 Fe.
Sand cast: 53,000 TS; 22,000 YS; 30 El; 100 Brin.
Chill cast: 53,000 TS; 22,000 YS; 30 El; 150 Brin.
For pump parts, gears, shafts, trolley wheels, marine fittings; substitute for Admiralty Gun Metal.

P.M.G. ALLOY
M-319; 91.5 Cu, 3.5 Si, 1.5 Fe, 4 Zn.
Forged. 70,000 TS; 28,000 YS; 35 El; 140 Brin
For spindles, stems, gears, shafts; wear resistant

P.M.G. ALLOY
M-319; 95.5 Cu, 3 Si, 1.5-1.8 Fe, bal Zn.
Cold drawn 95,000 TS, 45,000 YS; 30 El; 150 Brin.
For nuts, bolts, screws, valve stems, pump spindles, shafting; corrosion resistant.

PMM NO. 96
M-319, 97 Cu, 2.5 Si, 0.5 Fe.
For bolts, nuts, tubing, cold heading

PMP-Z-10
M-1018, C, bal Fe
For cams, keys, bushings, powdered metals, cemented

PMP-Z-70.
M-1098, Cu alloy
For cams, latches, keys, bushings; powder metals, sintered.

P.N. BRONZE.
M-1169, 3.0-4.0 Ni, 0.05-0.30 P, 11.5-13.0 Sn, bal Cu
Cast 31,000-45,000 TS, 5-20 El, 70-100 Brin
For pump and valve components
Good for high pressure work.

PNEU-DIE
M-357, 0.48 C, 2.15 Cr, 0.3 Mo, bal Fe
For chisels, punches, tough

PNEUMO.
M-1405, 0.45 C, 1.25 Cr, 0.2 W, 0.35 Mn, 0.75 Si, bal Fe
For upsetters, rivet sets, oil hardened, tough

PNEUTOUGH
M-1724, 0.50 C, 0.70 Si, 1.5 Cr, 0.25 V, 2.25 W, bal Fe
Oil hardening shock resisting special alloy tool steel; for pneumatic chisels, coal picks, diecasting dies (zinc), pneumatic tools, guillotine blades

PNUSNAP OH
M-56, 0.43 C, 1 Si, 0.5 Mn, 1 Cr, 1.8 W, bal Fe.
For tools, dies, hot work steel.

PNUSNAP WH.
M-56, 0.35 C, 0.6 Si, 0.3 Mn, 1.1 Cr, 1.9 W, bal Fe.
For tools, dies, hot work steel

POBEDIT.
Russian; 90 WC, 10 Co
For cutting tools; cemented.

POBEDIT-ALPHA.
Russian; TiC, Co.
For cutting tools; cemented.

POFORS SR1855.
M-1184, 1 C, 1.5 Si, 1 Cr, bal Fe.
For cutting and threading tools; oil hardened.

POLAR.
M-1490; 0.20 C, bal Fe.
Annealed: 73,000 TS; 41,000 YS; 22 El; 58 RA; 140 Brin.
For pole pieces for magnetos; high permeability.

POLARIS.
M-357; 0.6 C, 0.7 Ni, 0.15 Cr, 0.15 Mo, bal Fe.
For lawn mower blades, dies; tough, wear resistant.

POLARIS 2.
M-1705, 0.06 C, 0.3 Mn, 0.15 Si, 0.95 Cr, 0.25 Mo, (boron added), bal Fe.
Steel for plastic molds. AISI P2.

POLARIS 20
M-1705; 0.37 C, 1.0 Mn, 0.3 Si, 1.25 Cr, 0.15 V, 0.35 Mo, bal Fe
Steel for plastic molds. AISI P 20.

POLDI
M-96, 1.47 C, 0.23 Mn, 4.11 W, bal Fe
For cutting tools, oil hardening.

POLDI 2.
M-96, 1.2-1.35 C, 0.3 Mn, 0.2 Si, bal Fe.
For tools, files, drills; water hardening.

POLDI 3.
M-96, 1.05-1.2 C, 0.3 Mn, 0.2 Si, bal Fe.
For tools, files, drills; water hardening

POLDI 3 C.
M-96, 1.15 C, 0.15 Cr, bal Fe.
For tools, drills, taps, water hardening.

POLDI 4
M-96, 0.90-1.05 C, 0.3 Mn, 0.2 Si, bal Fe.
For tools, drills, files, water hardening

POLDI 5.
M-96, 0.75-0.90 C, 0.32 Mn, 0.20 Si, bal Fe.
For tools, files, drills; water hardening

POLDI 6
M-96, 0.65-0.75 C, 0.35 Mn, 0.20 Si, bal Fe.
For tools, files, drills, water hardening

POLDI NO 25 BEST.
M-96; 0.85 C, bal Fe.
For tools, drills, springs; water hardened.

POLDI NO 212
M-96; 0.3 C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe
For hot work tools; hot work steel.

POLDI 212 D2.
M-96, 0.3 C, 2.75 Cr, 4.35 W, 0.55 V, bal Fe
For tools, dies, hot work steel.

POLDI 425
M-96, 0.3 C, 1.1 Si, 1.45 Cr, 3.75 W, bal Fe.
For tools, dies; hot work steel

POLDI 702D
M-96, 0.45 C, 0.4 Mn, 3.1 Si, 0.85 Cr, bal Fe.
For gears, shafts, oil hardening.

POLDI 1555.
M-96; 0.12 C, 0.45 Mn, 5 Cr, 0.43 Mo, bal Fe
For corrosion resistant parts, corrosion resistant.

POLDI 1888.
M-96; 0.70 C, 0.55 Mn, 0.05 V, bal Fe.
For tools, springs, punches, water hardening

POLDI NO 2002
M-96; 2 C, 12 Cr, bal Fe.
Annealed: 102,000 TS, 205 Brin.
For cutting dies, punches, milling cutters, reamers, broaches; for highly stressed parts.

POLDI 2002 E.S.
M-96; 1.5 C, 13 Cr, bal Fe.
For highly stressed tools subject to severe abrasive wear; oil or air hardening.

POLDI 2002 SPECIAL.
M-96; 2.2 C, 13 Cr, bal Fe.
For tools, dies; non-deforming.

POLDI 2514.
M-96; 0.28-0.35 C, 1.2-1.5 Mn, bal Fe.
For shafts, dies; water hardening.

POLDI 2518.
M-96, 0.33-0 40 C, 1.1-1.4 Mn, 1.1-1.4 Si, bal Fe.
For dies, chisels, punches; shock resistant.

POLDI 2526
M-96; 0.36 C, 1.7 Mn, 0.3 Cr, bal Fe.
For dies, punches; oil hardening, non-deforming.

POLDI 2526N.
M-96; 0.33-0 40 C, 1.6-1 9 Mn, bal Fe.
For dies, punches, non-deforming.

POLDI AK-1.
M-96, 0.10 C, 13 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

POLDI AK1B.
M-96; 0.10 C, 16 Cr, 0.3 Ni, 0 2 Mo, 1 8 Cu, bal Fe
Annealed 75,000-85,000 TS, 40,000-55,000 YS; 30-25 El; Rockwell B75-80.
For chemical plant equipment, trim, stainless.

POLDI AK1B EXTRA.
M-96, 0 09 C, 17.5 Cr, 0 5 Ti, bal Fe
Annealed· 75,000-85,000 TS; 40,000-55,000 YS; 30-25 El; Rockwell B75-80
For chemical plant equipment; Type 430; corrosion resistant.

POLDI AK1V.
M-96; 0 12 max C, 14-18 Cr, 0.07 min S or Se, bal Fe.
Annealed. 75,000-85,000 TS, 40,000-55,000 YS, 30-25 El; Rockwell B75-80.
For chemical plant equipment, screw machine products; Type 430 F, free-cutting, stainless.

POLDI AK1W.
M-96, 0.07 C, 0.5 Mn, 13 Cr, bal Fe.
For corrosion resistant parts, corrosion resistant.

POLDI-AK2.
M-96; 0.20 C, 16 Cr, bal Fe.
Annealed· 75,000 TS; 45,000 YS, 28 El; 145 Brin.
Cold Rolled: 120,000 TS, 90,000 YS, 10 El, 195 Brin.
For automotive trim, oil burner parts, septic tanks, hardware. Corrosion resistant.

POLDI-AK2MV
M-96; 0 20 C, 0.9 Mn, 0.1 Si, 11.2 Cr, 2.4 Mo, 0.1 Ni, 0.25 V, bal Fe
Annealed 100,000 TS, 45,000 YS, 20 El, 50 RA; B 95 Rock
Heat Treated. 250,000 TS; 215,000 YS, 8 El; 25 RA; C 52 Rock.
For surgical instruments, cutlery, gears, shafts
Corrosion resistant, hardenable.

POLDI AK2S.
M-96, 0 22 C, 0 5 Mn, 13 Cr, bal Fe
For corrosion resistant parts, corrosion resistant.

POLDI AK 2 SPECIAL.
M-96, 0 22 C, 0.5 Mn, 15 2 Cr, bal Fe.
For corrosion resistant parts, corrosion resistant.

POLDI AK3S
M-96; 0.33 C, 13 Cr, 0.5 Mn, bal Fe.
Annealed: [illegible]8,000 TS, 40,000 YS; 32 El; 68 RA; 170 Brin.
Heat treated· 256,000 TS, 190,000 YS, 6 El; 10 RA; 540 Brin.
For valve trim, surgical instruments, cutlery, Type 420; hardenable, corrosion resistant.

POLDI AK-5.
M-96; 0.50 C, 15.5 Cr, 0.40 Mo, bal Fe.
For corrosion resistant parts; corrosion resistant.

POLDI AKC.
M-96, 0 20 C, 24 Cr, 19.5 Ni, bal Fe.
Annealed: 95,000 TS, 45,000 YS; 50 El; 65 RA; 180 Brin
At 1200°F: 57,000 TS, 22,000 YS; 32 El; 45 RA
For furnace parts and equipment, heat treating boxes; Type 310; austenitic, heat resistant.

POLDI AKCF.
M-96; 0 10 C, 21 Cr, 10 Ni, bal Fe
Annealed· 85,000 TS, 35,000 YS, 55 El; 65 RA; 150 Brin
For valve trim, oil refinery and chemical plant equipment; Type 308; austenitic, corrosion resistant.

POLDI AKCM
M-96, 0 45 C, 18 Cr, 19 5 Ni, 3 25 Mo, bal Fe.
For corrosion and heat resistant parts; corrosion and heat resistant.

POLDI AKCR
M-96; 0.15 C, 25 Cr, 14 5 Ni, bal Fe.
Annealed 85,000-95,000 TS, 40,000-50,000 YS; 45-55 RA, 150-185 Brin.
For refinery and chemical plant equipment; Type 309, austenitic, heat resistant

POLDI AK-H
M-96, 1 0 C, 16 Cr, 1 Mo, 1.3 Co, bal Fe.
For corrosion resistant parts, corrosion resistant

POLDI AKI 1
M-96, 0 15 C, 0 6 Mn, 12 3 Cr, 10.5 Ni, bal Fe
For stainless parts; corrosion resistant

POLDI AKM
M-96, 0 07 C, 18 Mn, 0 8 Si, 10 Cr, 1 Ni, 1 Mo, bal Fe
For wear and corrosion resistant parts, corrosion resistant

POLDI AKR
M-96, 0 45 C, 1 5 Si, 12 5 Cr, 2 2 W, 12 5 Ni, bal Fe
For stainless parts; corrosion resistant

POLDI AKS
M-96, 0 35 C, 0 5 Mn, 4 5 Cr, 22 Ni, bal Fe
For stainless parts, corrosion resistant

POLDI AKS 2
M-96, 0 10 C, 4 8 Cr, 2 W, 25 Ni, 3 5 Mo, 2 5 Cu, bal Fe
For acid resistant equipment, corrosion resistant

POLDI AKV
M-96, 0 15 C, 18 5 Cr, 9 Ni, bal Fe
Annealed. 85,000 TS, 35,000 YS; 60 El; 70 RA, 150 Brin
Cold drawn· 125,000 TS, 95,000 YS; 25 El; 55 RA, 277 Brin.
For chemical and plastic plant equipment, Type 302, stainless, austenitic.

POLDI AKV EXTRA.
M-96; 0 07 C, 18 5 Cr, 9 Ni, 1.65 Mo, bal Fe
Annealed 95,000 TS; 45,000 YS; 50 El; 60 RA; 195 Brin.
For chemical and plastic plant equipment; Type 316, austenitic, stainless.

POLDI AKV EXTRA S.
M-96, 0.10 max C, 16-18 Cr, 10-14 Ni, 1.7-2 7 Mo, Cb = 10 × C, bal Fe.

Annealed: 85,000-95,000 TS; 35,000-45,000 YS. 60-50 El; 75-60 RA; 150-190 Brin.
For acid resistant chemical plant equipment; Type 316 Cb, stainless, austenitic.

POLDI AKVH.
M-96, 0.08 max C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe.
Annealed: 90,000 TS, 45,000 YS; 60 El; 135 Brin.
Cold drawn. 180,000 TS; 150,000 YS; 10 El; 330 Brin.
For chemical plant equipment, welded structures; Type 304; stainless, austenitic.

POLDI AKVM.
M-96; 0.10 C, 18 Cr, 9 Ni, bal Fe.
Annealed. 90,000 TS, 35,000 YS; 60 El, 150 Brin.
For chemical plant equipment, tanks, digesters, agitators, molding and trim
Type 302 stainless steel Austenitic

POLDI AKVN
M-96; 0.10 C, 18.5 Cr, 9 Ni, bal Fe
Annealed 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin
Cold drawn. 125,000 TS, 95,000 YS, 25 El, 55 RA; 260 Brin
For chemical plant equipment, oil refinery tanks; Type 302; austenitic, stainless

POLDI AKVS
M-96, 0.10 C, 18.5 Cr, 8.5 Ni, 0.6 Ti, bal Fe.
Annealed. 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin
For welded structures, chemical plant equipment; Type 321, austenitic, stainless

POLDI AKVU
M-96, 0.15 C, 18.5 Cr, 9 Ni, bal Fe
Annealed. 85,000 TS; 35,000 YS; 50 El; 65 RA, 150 Brin
For chemical plant equipment, Type 302, austenitic, stainless

POLDI AKX
M-96, 0.10 C, 0.5 Mn, 25 Cr, bal Fe
For heat resistant parts, heat resistant

POLDI AL 14
M-96, 0.44 C, 1.5 Cr, 0.23 Mo, 0.95 Al, bal Fe.
For gears, cams, shafts, nitriding steel

POLDI AL 16
M-96, 0.35 C, 0.75 Mn, 1.65 Cr, 1.1 Al, bal Fe.
For gears, cams, shafts, nitriding steel

POLDI AM.
M-96, 0.7 C, 8.9 Mn, 3.15 Cr, 7.7 Ni, bal Fe
For corrosion resistant parts, corrosion resistant

POLDI AMK
M-96, 0.4 C, 18 Mn, 3.3 Cr, bal Fe
For wear and heat resistant parts, wear and heat resistant.

POLDI AMS
M-96, 0.55 C, 5.25 Mn, 3.55 Cr, 12.15 Ni, bal Fe.
For heat and corrosion resistant parts, heat and corrosion resistant.

POLDI AUTOR.
M-96; 0.40-0.50 C, 1.4-1.7 Cr, 0.6 Mn, 0.4 max Si, bal Fe
For bolts, gears, crankshafts; oil hardened, tough.

POLDI B 200.
M-96; 0.38 C, 1.9 Mn, 3.75 Cr, 0.18 V, bal Fe.
For dies, punches; oil hardening

POLDI BO-4.
M-96; 0.35 C, 0.6 Cr, 1.45 Ni, bal Fe.
For gears, shafts, shock resistant.

POLDI BOZ.
M-96; 0.39 C, 0.6 Mn, 1.1 Cr, 2 Ni, 0.15 Mo, bal Fe.
For gears, shafts; oil hardening.

POLDI BRAND NO. 4
M-96; 1.0 C, bal Fe.
For general tools, cold work dies, stamps, punches; water hardening

POLDI CE
M-96; 0.10 C, 0.55 Mn, 0.75 Cr, bal Fe.
For gears, shafts; case hardening.

POLDI CM 2.
M-96; 0.20 C, 1.05 Mn, 1.2 Cr, 0.23 Mo, bal Fe.
For gears, shafts; tough.

POLDI CM 3.
M-96; 0.22-0.30 C, 0.9-1.2 Cr, 0.15-0.25 Mo, bal Fe.
For gears, shafts; tough.

POLDI CNB
M-96; 0.38 C, 1.5 Cr, 0.6 W, 4.25 Ni, 0.3 Mo, bal Fe.
For tools, gears, shafts; tough, oil hardening.

POLDI CNBD.
M-96, 0.38 C, 1.5 Cr, 3.5 Ni, bal Fe.
For tools, gears, shafts, tough, shock resistant.

POLDI CNF.
M-96, 0.35 C, 0.9 Cr, 4.85 Ni, bal Fe
For tools, gears, shafts; tough, oil hardening.

POLDI CNH SPECIAL
M-96; 0.55 C, 0.5 Mn, 0.75 Cr, 2.6 Ni, bal Fe.
For tools, gears, shafts; tough, shock resistant.

POLDI CNL
M-96; 0.3 C, 0.85 Cr, 4.85 Ni, bal Fe.
For gears, shafts, oil hardening.

POLDI CNLW.
M-96, 0.27 C, 0.4 Mn, 0.85 Cr, 4.5 Ni, bal Fe
For gears, shafts, oil hardening.

POLDI CNS.
M-96, 0.33 C, 0.8 Cr, 3.35 Ni, bal Fe.
For gears, shafts, oil hardening, tough

POLDI CNSW.
M-96, 0.25 C, 0.8 Cr, 3.35 Ni, bal Fe.
For gears, shafts, tough, shock resistant.

POLDI "C.R."
M-96, 0.9 C, 0.75 Cr, 0.1 V, bal Fe.
For dies, punches, cold rolls, deep hardening, water quenched.

POLDI CR 1.
M-96, 0.90 C, 0.35 Mn, 1.0 Cr, 1 V, bal Fe.
For tools, bearings, dies, wear resistant.

POLDI CR 2.
M-96, 0.8 C, 0.35 Mn, 1.7 Cr, bal Fe
For tools, dies, cutters; oil hardening.

POLDI CR2W.
M-96, 0.7 C, 0.35 Mn, 1.7 Cr, bal Fe
For tools, dies, oil hardening

POLDI CV.
M-96, 0.6 C, 1.0 Cr, 0.2 V, 0.5 Mn, bal Fe.
For tools, punches; oil hardened

POLDI CX
M-96, 0.3 C, 0.9 Si, 2.45 Cr, 0.35 V, bal Fe.
For tools, punches, dies, tough, oil hardening.

POLDI D.
M-96, 1.05-1.2 C, 0.3 Mn, bal Fe.
For tools, files, drills; water hardening.

POLDI DIAMANTHART.
M-96; 1.35 C, 0.55 Cr, 4.9 W, 0.35 V, bal Fe.
For tools, dies.

POLDI DS SPECIAL.
M-96; 1.15 C, 1.0 Cr, 0.18 V, bal Fe.
For tools, cutters, bearings; oil hardening.

POLDI DUPLEX EXTRA.
M-96; 1.05 C, 0.25 Cr, 1.15 W, 0.2 V, bal Fe.
For tools, dies.

POLDI E.
M-96; 0.90-1.05 C, 0.3 Mn, bal Fe.
For tools, files, drills; water hardening.

POLDI EPAZ.
M-96; 1.25 C, 0.12 Cr, 0.15 V, bal Fe.
For tools, cutters, bearings; water hardening.

POLDI ESH.
M-96; 0.6 C, 0.9 Mn, 1.9 Si, bal Fe.
For punches, dies, chisels; tough.

POLDI ESH 1.
M-96; 0.65 C, 0.75 Mn, 1.75 Si, bal Fe
For punches, dies, chisels; tough.

POLDI EXTRA F-GuB
M-96; 1.7 C, 0.4 Si, 18 Cr, 1.25 W, 1.4 Ni, bal Fe.
For chemical plant equipment, corrosion resistant.

POLDI E.Z H.
M-96, M-36; 0.95-1.05 C, bal Fe.
Annealed: 91,000 TS; 180 Brin.
For cold dies, punches, tools, short shear blades; tool steel.

POLDI EZH SPECIAL.
M-96; 1.0 C, 0.35 Mn, 0.15 V, bal Fe
For tools, drills, taps; water hardening.

POLDI GFE.
M-96, 0.6 C, 25 Cr, bal Fe.
For heat and corrosion resistant parts; heat resistant.

POLDI GS3.
M-96; 0.38 C, 1.4 Mn, 2.5 Cr, 0.28 Mo, bal Fe.
For gears, dies, shafts; oil hardening.

POLDI HP51.
M-96, 0.5 C, 2 W, 0.8 Cr, 0.2 V, bal Fe
For hot work tools and dies; hot work steel.

POLDI "H P S"
M-96; 0.5 C, 3 W, bal Fe.
For tools for hot work; hot work steel.

POLDI HPS 2.
M-96; 0.25 C, 2.25 Cr, 9.5 W, 1.5 Ni, 0.1 V, bal Fe.
For tools, dies; hot work steel.

POLDI HS.
M-96, 1.3 C, 13.75 Mn, 0.25 Si, bal Fe.
For wear resistant parts; austenitic, wear resistant.

POLDI K 1.
M-96, 1.2-1.35 C, 0.25 Mn, 0.12 Si, bal Fe.
For tools, drills, files; water hardening.

POLDI K 2.
M-96; 1.0-1.2 C, 0.25 Mn, 0.12 Si, bal Fe.
For tools, files, drills; water hardening.

POLDI KAPTOR.
M-96; 0.35 C, 1.5 Si, 12.5 Cr, 2.6 W, 12.5 Ni, 1.25 V, bal Fe.
For stainless parts; corrosion resistant.

POLDI KO.
M-96; 1.35-1.50 C, 0.2 Mn, 0.12 Si, bal Fe.
For tools, drills, files; water hardening.

POLDI L-AK2.
M-96; 0.20 C, 0.5 Mn, 15.2 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

POLDI L-AKMF 3.
M-96; 0.09 C, 17.5 Mn, 1.5 Si, 11.5 Cr, 0.5 Ti, bal Fe.
For corrosion and wear resistant parts; corrosion resistant.

POLDI L-AKR.
M-96; 0.45 C, 1.5 Si, 12.5 Cr, 2.2 W, 12.5 Ni, bal Fe
For stainless parts, corrosion resistant.

POLDI L-AKRD.
M-96, 0.45 C, 0.75 Mn, 1.5 Si, 15 Cr, 2.3 W, 13 Ni, bal Fe
For stainless parts, corrosion resistant.

POLDI L-AL 12.
M-96; 0.33 C, 0.45 Mn, 1.8 Cr, 0.18 Mo, 1 Ni, 1.1 Al, bal Fe
For machinery parts, gears, shafts, nitriding steel.

POLDI L-AL 14.
M-96, 0.44 C, 0.55 Mn, 1.5 Cr, 0.23 Mo, 0.95 Al, bal Fe
For machinery parts, gears, shafts, nitriding steel

POLDI L-AL 16
M-96, 0.35 C, 0.75 Mn, 1.65 Cr, 1.1 Al, bal Fe
For machinery parts, gears, shafts, nitriding steel.

POLDI L-AL 30
M-96; 0.32 C, 0.70 Mn, 1.1 Cr, 0.18 Mo, 1.15 Mo, bal Fe
For machinery parts, gears, shafts, nitriding steel

POLDI L-CNL
M-96, 0.3 C, 0.85 Cr, 4.85 Ni, bal Fe
For gears, shafts, oil hardening

POLDI L-CNS
M-96, 0.27 C, 0.55 Cr, 3.25 Ni, bal Fe.
For gears, shafts, tough, shock resistant

POLDI L-CVMW.
M-96, 0.27-0.34 C, 1.9-2.7 Cr, 0.25 Mo, 0.1-0.3 V, bal Fe
For gears, shafts, oil hardening, tough

POLDI LDH
M-96, 0.30 C, 0.7 Cr, 4.25 Ni, 1.5 Mo, bal Fe
For tools, gears, shafts, oil hardening, tough

POLDI LDH 3 SPECIAL
M-96, 0.3 C, 0.7 Cr, 2.4 Ni, 0.75 Mo, 0.3 V, bal Fe
For tools, gears, shafts, tough, oil hardening.

POLDI LDH 4 SPECIAL.
M-96, 0.3 C, 0.7 Cr, 1.4 Ni, 0.45 Mo, 0.22 V, bal Fe.
For tools, gears, shafts, oil hardening, tough.

POLDI LDS
M-96; 0.45 C, 0.5 Mn, 1.45 Si, 0.6 Cr, bal Fe.
For tools, dies, shears; tough, oil hardening.

POLDI L-MS
M-96; 0.29 C, 18 Mn, 0.5 Si, 1.3 Cr, bal Fe
For wear resistant parts, corrosion resistant, austenitic.

POLDI L-MV 4.
M-96, 0.38-0.42 C, 1.5-2 Mn, 0.4 Si, 0.10-0.20 V, bal Fe
For dies, punches; non-deforming.

POLDI L-NIT 2.
M-96, 0.30 C, 0.6 Mn, 2.5 Cr, 0.25 Mo, 0.25 V, bal Fe.
For machinery parts, gears, shafts; nitriding steel.

POLDI L-NIT 4.
M-96; 0.27 C, 0.6 Mn, 2.5 Cr, 0.30 V, bal Fe.
For machinery parts, gears, shafts; nitriding steel.

POLDI MAXIMUM SPECIAL.
M-96; 0.7 C, 19 W, 4 Cr, 1.2 V, bal Fe.
For turning, planing tools, twist drills, milling cutters, boring and milling tools, screwing dies; high speed steel.

POLDI MAXIMUM SPECIAL NO. 30.
M-96; 0.7 C, 17.5 W, 4.2 Cr, 0.6 Mo, 1.4 V, 2.7 Co, bal Fe.
For turning, planing and slotting tools, twist drills, milling cutters, boring and milling tools; high speed steel.

POLDI MAXIMUM SPECIAL NO. 55.
M-36, M-96; 0.7 C, 17.5 W, 4 Cr, 0.6 Mo, 1.4 V, 5 Co, bal Fe.
For turning, planing and slotting tools, flat drills, twist drills, milling cutters, boring and milling tools; high speed steel.

POLDI MAXIMUM SPECIAL G.
M-96; 0.8 C, 4 Cr, 38 W, 2 V, bal Fe.
For tools, cutters; high speed steel.

POLDI MAXIMUM SPECIAL G EXTRA.
M-96; 0.85 C, 4.2 Cr, 9.75 W, 2.4 V, bal Fe.
For tools, cutters, high speed steel.

POLDI MAXIMUM SPECIAL H
M-96; 0 8 C, 4.2 Cr, 17.5 W, 0.6 Mo, 1.35 V, bal Fe.
For tools, cutters; high speed steel

POLDI MAXIMUM SPECIAL MO
M-96, 1 0 C, 5.2 Cr, 1.7 W, 2 4 Mo, 2.85 V, bal Fe.
For tools, cutters, high speed steel

POLDI M.K
M-36, M-96; 0.65 C, 18 W, 5 Co, 4 Cr, 1.3 V, 0.7 Mo, bal Fe.
For turning, planing, drilling and milling tools, flat drills, twist drills, boring and milling cutters; high speed steel.

POLDI MO
M-96, 0.3-0 4 C, 0 5 Mn, 0 2 Si, bal Fe.
For welding rod.

POLDI ORI.
M-96; 1 25 C, 0 7 Mn, 1.15 Si, 1.2 Cr, bal Fe.
For tools, chisels; shock resistant.

POLDI RADECO D.
M-96, 0.85 C, 4.2 Cr, 12 5 W, 0 6 Mo, 2 V, 5 Co, bal Fe.
For tools, cutters, hobs, abrasion resistant.

POLDI RCR-1.
M-96; 1.5 C, 0.25 Mn, 0.75 Cr, bal Fe.
For tools, cutters; wear resistant.

POLDI REDI.
M-96; 0.45 C, 0 5 Mn, 1.45 Si, 0.6 Cr, bal Fe.
For tools, dies, shears; tough, oil hardening.

POLDI S.
M-96; 0.70-0.80 C, 0.3 Mn, bal Fe.
For tools, files, drills; water hardening.

POLDI S 4.
M-96; 0.9-1.05 C, 0.05 Si, bal Fe.
For welding rod.

POLDI S 6.
M-96; 0.65-0.75 C, 0.05 Si, bal Fe.
For welding rod.

POLDI SC.
M-96; 0.6 C, 0.7 Mn, 1.55 Si, 0.8 Cr, bal Fe.
For tools, dies, shears; tough, oil hardening

POLDI SCH.
M-96; 0.55 C, 0.7 Mn, 1.45 Si, 0.6 Cr, bal Fe.
For punches, dies, chisels; oil hardening.

POLDI SCM.
M-96; 0.4-0.55 C, 1.5-2.0 Mn, bal Fe.
For shafts, dies; oil hardening.

POLDI SP.
M-96; 1.2 C, 0.7 W, bal Fe.
For tools, dies.

POLDI SPS
M-96; 1.2 C, 0.4 Cr, 1.15 W, bal Fe.
For tools, dies.

POLDI SR 4.
M-96; 0 90-1.05 C, 0.2 Si, bal Fe.
For welding rod.

POLDI S SPECIAL.
M-96, 0.75 C, 0.3 Mn, 0.15 V, bal Fe.
For tools, punches, springs; water hardening.

POLDI "S S T."
M-96; 1 C, 1.2 W, bal Fe.
For taps, dies, punches, shop tools; water hardening.

POLDI T3
M-96, M-1322, M-1323, 1.1 C, 0.25 max Mn, 0 25 max Si, bal Fe.
Heat treated 125,000-220,000 TS; 88,000-155,000 YS; 18-10 El; 45-30 RA, 240-555 Brin.
For drills, taps, reamers, broaches; Type W1; water hardened.

POLDI T4.
M-96, M-1322, M-1323; 1.0 C, 0 25 max Si, 0.25 max Mn, bal Fe.
Heat treated 121,000-213,000 TS; 84,000-150,000 YS; 20-11 El; 47-33 RA; 235-534 Brin.
For drills, taps, reamers, broaches, Type W1, water hardened.

POLDI T5.
M-96, M-1322, M-1323; 0.85 C, 0.25 max Mn, 0.25 max Si, bal Fe.
Heat treated: 188,000-130,000 TS; 143,000-87,000 YS; 12-21 El; 35-50 RA; 388-255 Brin.
For tools, cutters, springs; Type W1; water hardened

POLDI T5 HART.
M-1322, M-96; 0.61 C, 0.65 Mn, 0.25 Si, bal Fe.
Hot rolled: 118,000 TS, 70,000 YS; 16 El; 35 RA; 229 Brin
For punches, crimpers, axles, water hardened.

POLDI T5W
M-96, M-1322; 0.60 C, 0 5 Si, 0 6 Mn, bal Fe.
Hot rolled: 118,000 TS; 70,000 YS; 16 El; 35 RA; 229 Brin.
For punches, crimpers, axles; water hardened.

POLDI T5W EXTRA.
M-96; 0.52-0.60 C, 0.25 Si, bal Fe
For welding rod.

POLDI T6
M-96, M-1322; 0.7 C, 0 25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 122,000-174,000 TS; 82,000-128,000 YS; 22-12 El; 52-37 RA; 241-352 Brin.
For punches, crimpers, axles; water hardened.

POLDI T6H.
M-96, M-1322; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 94,000 TS; 60,000 YS; 26 El; 50 RA; 200 Brin.
For gears, pinions, shafts, crankshafts; water hardened

POLDI T6HB.
M-96; 0.48-0.54 C, 0.5 Mn, 0.2 Si, bal Fe.
For welding rod.

POLDI T6H EXTRA.
M-96; 0.42-0.50 C, 0.75 Mn, 0.25 Si, bal Fe.
For welding rod.

POLDI T6W.
M-96, M-1322; 0.35 C, 0.25 Si, 0.55 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 183 Brin.
For gears, shafts, crankshafts; water hardened.

POLDI T6W EXTRA.
M-96, M-1322; 0.35 C, 0.25-0.60 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 183 Brin.
For gears, shafts, crankshafts, bolts; water hardened, SAE 1035.

POLDI T7.
M-96, M-1322; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Heat treated: 71,000-80,000 TS; 36,000-50,000 YS; 30-20 El; 69-60 RA; 143-163 Brin.
For gears, bolts, shafts, camshafts; case hardening steel.

POLDI T8.
M-96, M-1322; 0.15 C, 0.25 Si, 0.45 Mn, bal Fe.
Hot rolled: 61,000 TS; 46,000 YS; 39 El; 61 RA; 126 Brin.
For gears, pinions, camshafts, cams; case hardening steel.

POLDI TBOS.
M-96; 0.05 C, 0.8 Cr, 1.45 Ni, bal Fe.
For gears, shafts; oil hardening.

POLDI TO EXTRA SIMPLEX.
M-96; 0.8 C, 1 Mn, 0.6 Si, 0.4 Cr, bal Fe.
For tools, dies, cutters; water hardening.

POLDI W8.
M-96; 0.06-0.13 C, 0.5 max Mn, 0.35 max Si, bal Fe.
Annealed: 58,000 TS; 45,000 YS; 30 El; 66 RA; 125 Brin
For nails, rivets, screws, bolts; water and case hardened.

POLDI WP.
M-96, 0.4 C, 0.65 Mn, 2.5 Cr, 0.6 Mo, 0.4 V, bal Fe.
For axes, shafts; oil hardened.

POLISH 2H18N9.
M-Poland; 0.2 C, 0.7 Mn, 18 Cr, 8.3 Ni, 0.9 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 55 El, 155 Brin.
For chemical plant equipment, agitators, digesters, tanks.
Stainless, austenitic, nonmagnetic.

POLITAL.
M-457; 0.5-2.0 Mg, 0.3-1.5 Si, 0-1.5 Mn, bal Al.
For light alloy parts, corrosion resistant, hardenable.

POLITAL.
M-1548; 0.5-1.5 Si, 0.4-1.0 Mn, 0.4-1.0 Mg, bal Al.
Hardened: 40,000-50,000 TS; 26,000-36,000 YS; 10-20 El; 70-100 Brin
For general structures, scaffolds, booms, transmission towers.
Heat treatable, high strength.

POLITAL 38.
M-457; 2.5-4.0 Mg, bal Al.
Soft: 26,500 TS; 12,000 YS; 26 El; 60 Brin.
Hard: 43,000 TS; 37,000 YS; 4 El; 85 Brin.
For light alloy parts; corrosion resistant.

POLITIT.
M-1338; 0.40 C, 13 Cr, 0.3 Mn, 0.4 Si, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For turbine blades, cutlery, valves, knives, fasteners; Type 420; stainless, hardenable.

POLITIT 13/1.
M-1338, 0.12 max C, 13 Cr, 0.4 Si, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For turbine blades, valve trim; Type 410; stainless.

POLITIT 13/2
M-1338; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El; 55 RA; 195 Brin
Cold drawn: 105,000 TS; 85,000 YS, 17 El; 50 RA; 215 Brin
For turbine blades, valve trim, cutlery, surgical instruments; Type 420, stainless, hardenable.

POLITIT 13/4.
M-1338; 0.4 C, 13 Cr, 0.4 Si, bal Fe
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For cutlery, knives, surgical instruments; Type 420, stainless, hardenable

POLITIT 13M
M-1338; 0.2 C, 13 Cr, 1.15 Mo, bal Fe.
Annealed 95,000 TS, 50,000 YS, 25 El, 55 RA; 200 Brin.
For acid resistant and oil refinery equipment; corrosion resistant

POLITIT 17M.
M-1338, 0.35 C, 16.5 Cr, 1.15 Mo, bal Fe
For chemical plant and oil refinery equipment; corrosion resistant

POLITIT 17N.
M-1338, 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed 125,000 TS; 95,000 YS; 20 El; 55 RA; 240 Brin
For furnace parts and accessories, corrosion resistant, hardenable

POLITIT 18/8
M-1338, 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin
For chemical plant equipment, tanks, dryers, mixers, Type 302, stainless, austenitic

POLITIT 18/8T.
M-1338, 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed 85,000 TS; 35,000 YS, 55 El; 65 RA; 150 Brin
For welded chemical plant equipment, tanks, mixers; Type 321; stainless, austenitic.

POLITIT 18/9
M-1338, 0.07 C, 18 Cr, 9.5 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS, 125,000 YS; 10 El; 330 Brin.
For welded chemical plant equipment; Type 304; stainless, austenitic.

POLITIT 18/10M.
M-1338; 0.07 max C, 18 Cr, 2 Mo, 10.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn. 150,000 TS; 135,000 YS; 6 El; 300 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

POLITIT 18/10MT.
M-1338; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 180 Brin.
For welded chemical plant equipment; Type 316 Ti, stainless, austenitic.

POLITIT 18CM.
M-1338; 0.90 C, 18 Cr, 1 V, 1.15 Mo, bal Fe.
Annealed. 108,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin.
Heat treated. 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin.
For bearings, valves, gauges, sleeves, stainless, wear resistant.

POLIVIT.
German, 97 4 Al, 0.6 Cu, 1 8 Mn, 0.2 Ag.
For light alloy parts.

POLYMET A-G.
M-1567, Ag + plastic lubricant.
For instrument bearings, valve seats, rings and brushes.
Low friction. Withstands temperatures to 700°F.

POMET 111.
M-885; 5-10 Sn, bal Cu.
For mechanical and electrical parts, powder metals.

POMET 117B
M-885; 94-96 Cu, 4-6 Sn.
Sintered· 18 El
For precision parts, sintered.

POMET 117C.
M-885, 89-92 Cu, 8-11 Sn
Sintered 39,000 TS
For instrument parts, sintered, good wear resistance.

POMET 141
M-885, 0 2 C, 18 Cr, 8 Ni, bal Fe
For mechanical parts, sintered, stainless.

POMET 300
M-885; Fe
For magnetic cores, pole shoes; powder metallurgy.

POMET 309
M-885, 0 2-0 3 C, bal Fe
Sintered 38,000 TS
For machine and instrument parts; sintered alloy

POMET 309H.
M-885, 0.3 C, bal Fe
Sintered and heat treated 400 Brin
For clutch parts, cams, gears, sintered

POMET 389.
M-885; 0 10 C, bal Fe
For general parts; powdered metals.

POMET 560.
M-885, 5 Cu, bal Al
For light alloy parts; powder metals.

POMOLOY C-2.
M-886; 3.2 C, 2 2 Si, bal Fe
Cast· 40,000 TS; 215 Brin.
For pump casings; gray cast iron.

POMOLOY C-3.
M-886, 3.2 C, 2.0 Si, bal Fe
Cast: 40,000 TS, 210 Brin
For pump casings; gray cast iron

POMPEY 8CN2
M-884; 0.08 C, 0.40 Mn, 0 20 Si, 2.0 Ni, bal Fe.
Heat treated· 85,000-121,000 TS; 64,000 YS; 12 El.
For gears, cams, camshafts, fasteners; case hardening, shock resistant, Afnor 10N8h.

POMPEY 8NK.
M-884; 0.8 C, 1.5 Ni, Cr, bal Fe.
For wood saws, circular saws; water hardened.

POMPEY 8SRX.
M-884; 0.8 C, Ni, Cr, V, bal Fe.
For band saws, water or oil hardened.

POMPEY 9KX.
M-884; 0.9 C, 0.8 Cr, V, bal Fe.
For bearings, stamps, coining dies; water hardened.

POMPEY 10 CNK1.
M-884; 0.09 C, 0.75 Mn, 0.25 Si, 1.4 Ni, 1.1 Cr, bal Fe.
Heat treated: 144,000-186,000 TS; 121,000 YS.
For gears, bolts, cams, camshafts; Afnor 10NC6, case hardening steel, tough.

POMPEY 10 CNK3.
M-884; 0.10 C, 3 Ni, 0.75 Cr, bal Fe
For gears, cams, machine tool parts; Afnor 10NC12, case hardening steel, tough.

POMPEY 10K2.
M-884; 1.0 C, 1.5 Cr, bal Fe.
Annealed: 95,000 TS; 62,000 YS; 27 El; 62 RA; 179 Brin.
Heat treated 200,000 TS; 185,000 YS; 3 El; 30 RA; 390 Brin.
For punches, bearings, bushings, water hardened, wear resistant.

POMPEY 10WK2.
M-884; 1 0 C, 2 W, Cr, bal Fe
For metal saws, water hardened

POMPEY 11.
M-884, 1.1 C, bal Fe.
For files, water hardened.

POMPEY 11WK1
M-884; 1 1 C, 1.0 W, Cr, bal Fe
For metal saws, water hardened.

POMPEY 12 CNK3
M-884, 0 14 C, 3 Ni, 0 75 Cr, bal Fe.
For gears, cams, camshafts, machine tool parts, Afnor 14NC12, case hardening steel, tough.

POMPEY 12KV
M-884, 1 2 C, 1 Cr, V, bal Fe
For milling cutters, reamers, taps, threading dies, water or oil hardened

POMPEY 12W1.
M-884, 1 1 C, 1 W, V, bal Fe
For drills, taps, cutters, reamers, water hardened

POMPEY 14CNK3
M-884, 0 14 C, 0 40 Mn, 0 20 Si, 3 5 Ni, 0 75 Cr, bal Fe
Heat treated 178,000 TS; 135,000 YS; 10 El, 55 RA
For gears, bolts, camshafts, cams,
DIN 14NiCr14, case hardened

POMPEY 15N3
M-884, 0.15 C, 0 50 Mn, 0 35 Si, 3 Ni, bal Fe.
Heat treated. 127,000-163,000 TS, 100,000 YS; 10 El
For gears, cams, machine tool parts, fasteners, case hardening, shock resistant.

POMPEY 16 CNK1.
M-884, 0.15 C, 0.75 Mn, 0 25 Si, 1.4 Ni, 1.1 Cr, bal Fe
For gears, bolts, cams, machine tool parts; Afnor 16NC6, case hardening steel, tough.

POMPEY 20N2.
M-884; 0.22 C, 0.45 Mn, 0.20 Si, 2 Ni, bal Fe.
Heat treated: 143,000-177,000 TS; 121,000 YS; 7 El.
For gears, cams, camshafts, fasteners; Afnor 20N8, case hardened, shock resistant.

POMPEY 20ND2.
M-884; 0.20 C, 1.8 Ni, 0.25 Mo, bal Fe
Heat treated: 143,000-177,000 TS; 121,000 YS; 7 El.
For gears, machine tool parts, fasteners; Afnor 20ND8, case hardened, shock resistant.

POMPEY 20 NK1.
M-884; 0.20 C, 1.4 Ni, 1.1 Cr, bal Fe.
For gears, bolts, cams, machine tool parts; Afnor 20NC6, case hardening steel, tough.

POMPEY 20 NK3.
M-884; 0.22 C, 0.50 Mn, 2.8 Ni, 0.75 Cr, bal Fe.
Heat treated: 128,000-157,000 TS; 114,000 YS.
For gears, cams, camshafts, machine tool parts; Afnor 20NC11, case hardening steel.

POMPEY 20NKD.
M-884; 0.20 C, 0.6 Ni, 0.5 Cr, 0.2 Mo, bal Fe.
Hot rolled: 93,000 TS; 65,000 YS; 25 El; 63 RA; 162 Brin.
For gears, bolts, machine tool parts; case hardening, shock resistant, Afnor 20NCD2

POMPEY 30NK3.
M-884; 0.29 C, 2.8 Ni, 0.75 Cr, bal Fe
Heat treated: 143,000-175,000 TS; 128,000 YS.
For gears, bolts, crankshafts, fasteners, Afnor 30NC11, oil hardened, shock resistant

POMPEY 30NKD2.
M-884; 0.30 C, 2 Ni, 2 Cr, 0.35 Mo, bal Fe.
Heat treated: 170,000-200,000 TS, 143,000 YS; 8 El.
For bolts, gears, machine tool parts; oil hardened, shock resistant.

POMPEY 30NKD3.
M-884; 0.30 C, 3 Ni, 0.9 Cr, 0.35 Mo, bal Fe.
Heat treated: 135,000-185,000 TS, 128,000 YS, 12 El.
Fro bolts, gears, crankshafts, fasteners, oil hardened, shock resistant.

POMPEY 32NK3.
M-884; 0.32 C, 3.45 Ni, 0.70 Cr, bal Fe
Heat treated: 143,000-175,000 TS, 128,000 YS
For gears, bolts, crankshafts, fasteners, DIN-VCN35, oil hardened, shock resistant

POMPEY 35CP.
M-884; 0.35 C, 0.95 Cr, 0.25 Mo, bal Fe.
For cutters, dies, oil hardened.

POMPEY 35 NK1.
M-884; 0.34 C, 1.45 Ni, 1.0 Cr, bal Fe
For gears, bolts, crankshafts, axles, studs; Afnor 35NC6, oil hardened, shock resistant

POMPEY 35NKD1.
M-884; 0.35 C, 1.2 Ni, 0.6 Cr, 0.15 Mo, bal Fe.
Heat treated: 150,000-177,000 TS, 143,000 YS, 10 El.
For gears, bolts, fasteners, crankshafts; Afnor 35NCDM.

POMPEY 40NKD
M-884; 0.40 C, 0.6 Ni, 0.5 Cr, 0.2 Mo, bal Fe.
Annealed: 107,000 TS; 90.000 YS; 14 El, 45 RA; 217 Brin.
For bolts, gears, crankshafts, fasteners; oil hardened, shock resistant.

POMPEY 45CP
M-884; 0.45 C, 0.95 Cr, 0.25 Mo, bal Fe.
For cutters, dies, gears, shafts, oil hardened, shock resistant.

POMPEY ABRADUR M14.
M-884; 1.2 C, 13 Mn, bal Fe
For pulverizers, crushers, rock breakers; high wear and abrasion resistance

POMPEY ANTICHOC-1.
M-884, 0.6 C, 1.8 Si, 0.9 Mn, 0.4 Cr, bal Fe.
For punches, pneumatic tools, rivet sets; oil hardened, shock resistant

POMPEY ANTICHOC-2
M-884, 0.5 C, Si, + Cr, bal Fe.
For punches, chisels, pneumatic tools, oil hardened, shock resistant.

POMPFY ANTICHOC-H
M-884, 0.45 C, 1-1 Cr, 2 W, 0.2 V, bal Fe.
For pneumatic chisels, crimpers, punches, shock resistant, hot work steel

POMPEY ANTICHOC-HD.
M-884, 0.55 C, 1.1 Cr, 2 W, 0.2 V, bal Fe.
For punches, crimpers, pneumatic tools; impact resistant, hot work steel.

POMPEY APS5.
M-884, 0.07 C, 0.40 Mn, 0.40-0.55 Cu, W, Mo, bal Fe
Annealed 50,000-56,000 TS, 36,000 YS; 30 El.
For siphons, oil industry parts, heat exchangers, corrosion resistant.

POMPEY APS6
M 884, 0.08 C, 0.40-0.55 Mn, 0.40-0.55 Cu, Mo, bal Fe
Annealed 60,000 TS, 40,000 YS, 26 El
For siphons, oil industry parts, heat exchangers, corrosion resistant.

POMPEY APS10
M-884, 0.12 C, 2.0-2.5 Cr, 0.35-0.90 Al, 0.35 max Mo, bal Fe
Normalized 92,000 TS; 52,000 YS, 20 El
For evaporators, transportation tanks; corrosion resistant

POMPEY-APS10A
M-884, 0.12 C, 2 Cr, 0.9 Al, bal Fe.
Normalized: 69,000-85,000 TS, 44,000 YS
For evaporators, dryers, graters, nitrate plants, chemical plant equipment
Corrosion resistant

POMPEY APS10C
M 884, 0.12 C, 2.5 Cr, 0.4 Al, 0.2 Cu, bal Fe
Normalized: 76,000 92,000 TS, 52,000 YS
For marine equipment, vats, hardware.
Resists marine corrosion

POMPEY-APS10M
M 884, 0.12 C, 2.0 Cr, 0.9 Al, 0.12 Mo, bal Fe.
Normalized 72,000-88,000 TS, 46,000 YS
For evaporators, dryers, graters, nitrate plants, chemical equipment
Corrosion resistant to stress cracking due to nitrate

POMPEY-APS10M4.
M-884, 0.12 C, 2.0 Cr, 0.35 Al, 0.35 Mo, bal Fe
Normalized 87,000 TS, 42,000 YS
For marine equipment, vats, hardware
Corrosion resistant to marine atmospheres

POMPEY APS20
M-884, 0.12 C, 4 Cr, 0.9 Al, 0.2 max Cu, 0.12 max Mo, bal Fe
Normalized 92,000-70,000 TS, 52,000-43,000 YS, 20-22 El
For chemical plant equipment, resists salt water and marine corrosion

POMPEY-APS20A.
M-884; 0.12 C, 4.0 Cr, 0.9 Al, bal Fe.
Normalized: 69,000-85,000 TS; 43,000 YS.
For oil refinery and coking equipment.
Corrosion resistant to industrial and marine atmospheres.

POMPEY-APS20C.
M-884; 0.12 C, 4.0 Cr, 0.4 Al, 0.2 Cu, bal Fe.
Normalized: 76,000-92,000 TS; 52,000 YS.
For oil refinery equipment, furnace parts.
Corrosion resistant to marine and industrial atmospheres

POMPEY-APS20M.
M-884, 0.12 C, 4.0 Cr, 0.9 Al, 0.12 Mo, bal Fe.
Normalized: 72,000-90,000 TS; 47,000 YS.
For evaporators, dryers, graters, nitrate plants, oil refinery equipment.
Corrosion resistant to marine and industrial atmospheres.

POMPEY APS25.
M-884, 0.12 C, 4 Cr, 0.9 Al, 0.9 Ni, 0.2 Cu, 0.12 Mo, bal Fe.
Normalized. 121,000-157,000 TS; 85,000 YS, 14 El.
For automobile bodies, railroad cars, diesel motor parts, resists marine and industrial atmospheres.

POMPEY APS1001.
M-884, C, 2 Cr, 0.9 Al, bal Fe.
For agricultural equipment.

POMPEY AUSTINOX
M-884, 0.08 C, 18 Cr, 9 Ni, bal Fe
Annealed 80,000 TS, 30,000 YS, 60 El; 70 RA; 150 Brin
Cold drawn 180,000 TS; 125,000 YS, 10 El, 330 Brin
For chemical plant equipment, tanks, vessels; AISI304, austenitic, stainless

POMPEY AUSTINOX SB
M-884; 0.08 max C, 18 Cr, 12 Ni, 2 Mo, 0.2 Ti, bal Fe
Annealed 80,000 TS; 30,000 YS, 40 El; 70 RA; 140 Brin
Cold drawn 150,000 TS, 135,000 YS; 6 El, 300 Brin.
For chemical plant equipment, mixers, agitators, Type 316, austenitic, stainless.

POMPEY C1K.
M-884, 0.12 C, 0.75 Mn, 0.8 Cr, bal Fe.
Heat treated 107,000-128,000 TS, 72,000 YS, 15 El, 40 RA.
For gears, bolts, machine tool parts, Afnor 12C3h, case hardening steel

POMPEY C1MK
M-884, 0.15 C, 1.2 Mn, 1 Cr, bal Fe.
Heat treated. 144,000-200,000 TS, 107,000 YS; 8 El, 35 RA.
For gears, cams, camshafts, fasteners; Afnor 16MC5, case hardening steel.

POMPEY C2K.
M-884, 0.18 C. 0.75 Mn, 0.8 Cr, bal Fe.
Heat treated· 135,000-172,000 TS; 120,000 YS; 8 El; 30 RA
For gears, bolts, machine tool parts; Afnor 18C3h, case hardening steel.

POMPEY C2MK.
M-884; 0.20 C, 1.4 Mn, 1.35 Cr, bal Fe.
Heat treated· 163,000-220,000 TS, 127,000 YS; 7 El; 30 RA.
For gears, cams, camshafts; Afnor 20MC5, case hardening steel.

POMPEY CKD1.
M-884; 0.12 C, 1 Cr, 0.25 Mo, bal Fe.
Heat treated· 150,000-186,000 TS; 121,000 YS.
For gears, cams, camshafts, machine tool parts; AISI 4110, case hardening steel, tough.

POMPEY CKD2.
M-884; 0.18 C, 1.0 Cr, 0.25 Mo, bal Fe.
Heat treated: 157,000-193,000 TS; 130,000 YS.
For gears, bolts, machine tool parts; AISI 4120, case hardening steel, tough.

POMPEY CNKD.
M-884; 0.10 C, 1.2 Ni, 0.6 Cr, 0.15 Mo, bal Fe.
Heat treated. 135,000-164,000 TS; 114,000 YS; 11 El.
For gears, fasteners, cams, machine tool parts; Afnor 10NCD4, case hardening, shock resistant.

POMPEY CNKD1.
M-884; 0.15 C, 1.2 Ni, 0.5 Cr, 0.15 Mo, bal Fe.
Heat treated· 143,000-185,000 TS, 114,000 YS; 8 El
For gears, fasteners, cams, machine tool parts; Afnor 16NCD4, case hardening, shock resistant.

POMPEY CNKD2
M-884, 0.17 C, 1.4 Ni, 1.0 Cr, 0.20 Mo, bal Fe.
Heat treated: 170,000-206,000 TS; 143,000 YS; 9 El
For gears, cams, camshafts, fasteners; Afnor 18NCD6, case hardening, shock resistant.

POMPEY CNKD3
M-884, 0.17 C, 3.2 Ni, 1.0 Cr, 0.25 Mo, bal Fe.
Heat treated. 186,000-221,000 TS, 143,000 YS; 8 El.
For gears, cams, camshafts, fasteners; Afnor 16NCD13, case hardening, shock resistant.

POMPEY CROSTAR
M-884, 2.0 Cr, 13 Cr, V, bal Fe
For forming and blanking dies, cutters; oil hardened, non-deforming

POMPEY D3
M-884, 0.32 C, 0.70 Mn, 0.30 Si, bal Fe.
Normalized· 85,000 TS; 58,000 YS; 25 El
For gears, fasteners, shafts, bolts, water hardened

POMPEY D3SS
M-884; 0.35 C, 1.15 Mn, 0.25 Si, 0.15 S, bal Fe
Normalized. 85,000 TS 58,000 YS, 24 El.
For screw machine products, bolts, fasteners; free cutting

POMPEY D48
M-884, 0.48 C, 0.60 Mn, 0.30 Si, bal Fe.
Normalized. 103,000 TS, 61,000 YS; 19 El
For gears, fasteners, axles, shafts, bolts, water hardened.

POMPEY DC1.
M-884, 0.11 C, 0.45 Mn, 0.20 Si, 0.03 max P, 0.025 max S, bal Fe
Normalized· 60,000 TS, 40,000 YS, 35 El.
For gears, shafts, cams, fasteners; case hardening.

POMPEY DK3
M-884, 0.32 C, 0.75 Mn, 1 Cr, bal Fe.
Heat treated. 143,000-163,000 TS; 127,000 YS; 10 El; 40 RA.
For gears, bolts, machine tool parts; Afnor 32C4, oil hardened.

POMPEY DK4.
M-884, 0.40 C, 0.75 Mn, 1 Cr, bal Fe.
Heat treated: 150,000-175,000 TS; 128,000 YS; 9 El; 35 RA.
For gears, bolts, machine tool parts; Afnor 38C4, oil hardened.

POMPEY E7.
M-884; 0.7 C, 0.04 max S and P, bal Fe.
Heat treated: 174,000 TS; 128,000 YS; 12 El; 37 RA; 352 Brin.
For cams, forging tools, nippers, lifters; water hardened

POMPEY E7FX.
M-884; 0.75 C, 0.015 S, 0.025 P, bal Fe.
Heat treated: 180,000 TS; 140,000 YS; 14 El; 38 RA; 370 Brin.
For crimpers, punches, tools; water hardened.

POMPEY E8FX.
M-884; 0.8 C, 0.015 S, 0.025 P, bal Fe.
Heat treated: 188,000 TS; 143,000 YS, 12 El; 35 RA; 390 Brin.
For tools, dies, drills, taps; water hardened.

POMPEY EF10
M-884, 1.0 C, 0.025 max S and P, bal Fe.
Annealed. 100,000 TS; 53,000 YS, 21 El; 42 RA; 200 Brin
For cams, knives, cutters, drills, gages; water hardened, Type W1.

POMPEY EF10X
M-884; 1.0 C, 0.025 max S and P, bal Fe
For cutters, reamers, drills, punches; water hardened, tool steel

POMPEY EF12.
M-884; 1.2 C, 0.025 max P and S, bal Fe.
For cutters, reamers, drills, broaches, water hardened, tool steel.

POMPEY EGALIT
M-884; 0.85 C, 2.0 Mn, 0.2 V, bal Fe.
For drills, taps, cutting tools, stamps, water hardened

POMPEY ETAN
M-884, 0.38 C, 4.3 Ni, 1.75 Cr, bal Fe.
Heat treated 260,000 TS; 200,000 YS, 5 El, 40 RA
For gears, pinions, crankshafts, Afnor 40NC17, oil hardened, shock resistant.

POMPEY ETANO
M-884, 0.35 C, 3.75 Ni, 1.7 Cr, bal Fe
Heat treated: 250,000 TS, 192,000 YS, 6 El, 40 RA
For gears, pinions, crankshafts, Afnor 35NC15, oil hardened, shock resistant.

POMPEY ETH.
M-884, 0.30 C, 3.75 Cr, 0.25 Mo, 1.0 Ni, bal Fe.
Heat treated 235,000-300,000 TS; 192,000-213,000 YS, 6 El, 40 RA
For gears, pinions, shafts; air or oil hardened, shock resistant.

POMPEY ETH
M-884; 0.40 C, 1.0 Cr, 0.25 Mo, bal Fe.
Heat treated: 270,000 310,000 TS, 235,000-270,000 YS, 5 El, 40 RA
For gears, pinions, crankshafts, Afnor 42CD4, oil hardened, shock resistant

POMPEY F8.
M-884, 0.8 C, 0.035 max S and P, bal Fe
For cutting tools, springs, drills, hammers; water hardened

POMPEY GK.
M-884, 1.4 C, 0.15 V, 1.5 Cr, bal Fe
For bearings, taps, cutters; water hardened.

POMPEY HARDINOX 3.
M-884; 0.35 C, 13.5 Cr, bal Fe.
Annealed: 100,000 TS; 60,000 YS; 22 El, 52 RA; 200 Brin.
For cutlery, surgical and dental instruments; AISI420, corrosion resistant

POMPEY INOX 1.
M-884; 0.15 max C, 13 Cr, 0.5 max Ni, bal Fe.
Annealed: 75,000 TS, 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold drawn. 100,000 TS; 85,000 YS, 17 El; 60 RA; 205 Brin.
For springs, hardware, tableware, turbine blades; AISI410, corrosion resistant.

POMPEY INOX 2.
M-884, 0.20 C, 13.5 Cr, 0.5 Ni, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El, 55 RA; 196 Brin
Cold drawn. 105,000 TS, 85,000 YS; 17 El, 50 RA; 215 Brin.
For cutlery, surgical and dental instruments, AISI420, corrosion resistant.

POMPEY INOX 3.
M-884; 0.30 C, 13.5 Cr, 0.5 Ni, bal Fe.
Annealed: 105,000 TS, 60,000 YS; 20 El; 50 RA; 210 Brin
For cutlery, surgical and dental instruments; AISI 420, corrosion resistant.

POMPEY INOX 431.
M-884, 0.20 max C, 17 Cr, 2 Ni, bal Fe
Annealed 120,000 TS, 90,000 YS; 15 El; 20 RA, 260 Brin
Heat treated 180,000 TS, 130,000 YS, 10 El; 15 RA, 420 Brin
For pump shafts, marine hardware, valve trim, martensitic, ferritic, corrosion resistant

POMPEY K74
M-884, 0.75 C, 0.5 Cr, bal Fe
For wood saws, water hardened

POMPEY KD2
M-884, 0.26 C, 1 Cr, 0.25 Mo, bal Fe
Heat treated 143,000 170,000 TS; 130,000 YS
For gears, bolts, machine tool parts, Type 4125, oil or water hardened, tough

POMPEY KD2S
M-884, 0.23 C, 1 Cr, 0.25 Mo, bal Fe
Heat treated 134,000 164,000 TS, 121,000 YS
For gears, bolts, machine tool parts, Type 4125, case hardening steel, tough

POMPEY KD3
M-884, 0.35 C, 1.0 Cr, 0.25 Mo, bal Fe
Heat treated 156,000 186,000 TS, 142,000 YS
For gears, bolts, crankshafts, machine tool parts, Type 4135, oil hardened, tough

POMPEY KD4
M-884 0.42 C, 1.0 Cr, 0.25 Mo, bal Fe.
Heat treated 170,000-199,000 TS, 157,000 YS
For gears, bolts, crankshafts, machine tool parts, Type 4140, oil hardened, tough

POMPEY KR6
M-884, 1.0 C, 1.4 Cr, bal Fe.
Heat treated 120,000 237,000 TS, 95,000-226,000 YS, 14-3 El, 47-30 RA, 227-444 Brin.
For bearings, sleeves, liners, SAE52100, Afnor 100C6, wear resistant

POMPEY L7
M-884, 0.7 C, bal Fe.
Heat treated 174,000 TS, 128,000 YS, 12 El, 37 RA, 352 Brin
For files, water hardened.

POMPEY L12
M-884, 1.2 C, bal Fe
For files; water hardened.

POMPEY L13
M-884, 1.3 C, bal Fe.
For files; water hardened

POMPEY LCKD.
M-884; 0.60 C, 0.90 Mn, 1.75 Si, 0.4 Cr, 0.25 Mo, bal Fe.
For wire cutters, punches, crimpers, upsetters; oil hardened, non-deforming.

POMPEY LK.
M-884; 1.4 C, Cr, bal Fe.
For files; water hardened.

POMPEY LRT.
M-884; 0.5 C, bal Fe.
Annealed: 96,000 TS; 52,000 YS; 16 El; 23 RA; 170 Brin.
For files; water hardened.

POMPEY MANGANESE-CHROME.
M-884, 0.12-0.20 C, 1.2-1.3 Mn, 0.25-0.40 Cr, 0.25-0.40 Cu, bal Fe.
Rolled. 85,000 TS, 50,000 YS; 20 El.
For bridges, auto and railroad bodies; high tensile construction steel.

POMPEY MAS
M-884; 0.55 C, 2.0 Ni, 1.1 Cr, 0.35 Mo, 0.1 V, bal Fe
For punches, shears, upsetters, forging dies; oil hardened, hot work steel.

POMPEY MC7
M-884; 0.75 C, bal Fe.
Heat treated: 185,000 TS, 140,000 YS; 13 El; 36 RA, 375 Brin
For rock crushers, water hardened.

POMPEY MC8
M-884, 0.8 C, bal Fe
For grate bars; water hardened

POMPEY MC12.
M-884; 1.2 C, bal Fe
For ore and rock crushers, water hardened.

POMPEY MKND
M-884, 0.4 C, 4 Cr, 1 N + Mo, bal Fe.
For hot work tools, shears, oil hardened

POMPEY MKND-1
M-884, 0.1 C, 4 Cr, 1 Ni, Mo, bal Fe
For hot work tools, oil hardened.

POMPEY MODAL-1
M-884, 0.08 C, bal Fe.
For molds and dies for plastics; case hardened

POMPEY MODAL-2
M-884, 0.1 C, 2 Ni, bal Fe
For molds and dies for plastics, case hardened

POMPEY MODAL-3
M-884, 0.1 C, 1.5 Ni, Cr, bal Fe.
For molds and dies for plastics, case hardened.

POMPEY MODAL-4
M-884, 0.1 C, 4.5 Ni, Cr, bal Fe
For molds and dies for plastics, case hardened.

POMPEY MSV.
M-884, 0.06-0.11 C, 0.30-0.50 Mn, 0.10 Si, bal Fe
Annealed. 65,000 TS. 40,000 YS; 28 El; 65 RA; 130 Brin
For nails, rivets, screws, bolts, bushings, Type 1008; case hardened.

POMPEY MSV3
M-884; 0.26-0.35 C, 0.40-0.90 Mn, 0.12 Si, bal Fe.
Hot rolled: 80,000 TS; 50,000 YS; 30 El; 56 RA; 165 Brin
For gears, bolts, armature shafts, keys, brackets, Type 1030; water hardened.

POMPEY MSVD.
M-884; 0.15-0.23 C, 0.40-0.60 Mn, 0.12 Si, bal Fe.
Annealed: 73,000 TS; 42,000 YS; 22 El; 58 RA; 140 Brin.
For screws, bolts, gears, cams; Type 1020; case hardened.

POMPEY NITRAL 3.
M-884; 0.40 C, 1.7 Cr, 0.2 Mo, 1.0 Al, bal Fe.
Heat treated: 144,000 TS; 121,000 YS; 12 El; 50 RA.
For engine cylinders, pistons, pumps, arbors; heat and creep resistant.

POMPEY PEGASE-S.
M-884; 0.5 C, bal Fe.
Annealed: 96,000 TS; 52,000 YS; 16 El; 23 RA; 170 Brin.
For hammers, gears, axles; water hardened.

POMPEY PF1
M-884; 0.15 C, 0.55 Cr, 0.55 Mo, bal Fe.
Normalized. 72,000 TS; 25,000 YS; 18 El
For oil refinery equipment; Afnor 13CD2; creep resistant.

POMPEY PF2
M-884; 0.12 C, 1.0 Cr, 0.55 Mo, bal Fe.
Normalized: 85,000 TS; 50,000 YS; 20 El.
For oil refinery equipment; creep resistant; Afnor 10CD5

POMPEY PF5
M-884, 0.13 C, 5 Cr, 0.55 Mo, bal Fe
Normalized. 85,000 TS, 25,000 YS; 25 El.
For oil refinery equipment, creep and heat resistant.

POMPEY PF6.
M-884; 0.13 C, 2.2 Cr, 1 Mo, bal Fe.
Normalized 82,000 TS, 30,000 YS; 21 El
For oil refinery equipment, Afnor 10CD9, creep resistant

POMPEY PFV55.
M-884, 0.12 C, 2 Cr, 0.30 V + Al, bal Fe.
Normalized. 85,000 TS, 32,000 YS; 20 El.
For oil refinery equipment, creep resistant.

POMPEY PM17
M-884, 0.12 C, 1.5 Mn, bal Fe.
Rolled 77,000-92,000 TS, 58,000 YS, 20 El.
For agricultural and tractor parts, automobiles, scrapers, bulldozers

POMPEY PM18
M-884, 0.2 C, 1.7 Mn, 0.2 Mo, bal Fe
Rolled 72,000-117,000 TS; 50,000-65,000 YS, 15 El
For machine tool parts, case hardened

POMPEY PM20.
M-884, 0.10 C, 0.6-1.0 Mn, 2.3-3.2 Ni, 0.15-0.25 Mo, 0.4-0.6 Cu, bal Fe.
Rolled 82,000-97,000 TS; 58,000 YS, 20 El
For automobile parts, gears, fasteners; case hardened.

POMPEY PM35
M-884; 0.18 C, 1.5 Mn, 1.5 Cr, 0.12 Mo, bal Fe.
Heat treated: 143,000-186,000 TS; 103,000 YS; 11 El; 45 RA
For agricultural and mining equipment.

POMPEY PP.
M-884; 0.30 C, 0.25 Mo, 2.4 Cr, 0.25 V, bal Fe.
For gears, shafts, crankshafts, bolts, studs; oil hardened, tough, high temperature use.

POMPEY PSK
M-884, C, Si, Cr, bal Fe
For vises, ejectors, molds, mandrels, punches; oil hardened.

POMPEY RKV.
M-884; 0.50 C, 0.80 Mn, 1 Cr, 0.15 V, bal Fe.
Heat treated: 170,000-206,000 TS; 156,000 YS; 8 El; 35 RA.
For gears, bolts, springs, crankshafts; Afnor 50CV4, oil hardened, shock resistant.

POMPEY RMK.
M-884; 0.48 C, 0.80 Mn, 0.30 Si, 1.0 Cr, bal Fe.
Heat treated: 193,000-221,000 TS; 171,000 YS; 5 El; 30 RA.
For springs, torsion bars, Afnor 48C4, oil hardened.

POMPEY RMKR.
M-884; 0.80 C, 0.95 Mn, 0.60 Si, 0.40 Cr, bal Fe.
Heat treated: 150,000-177,000 TS; 107,000 YS; 8 El; 40 RA.
For springs, oil hardened.

POMPEY RP.
M-884; C, Ni, Cr, V, bal Fe.
For cams, guides, rollers, machine tool parts; oil hardened.

POMPEY RS.
M-884, 0.45 C, 0.65 Mn, 1.8 Si, bal Fe.
Heat treated: 200,000-235,000 TS; 170,000 YS; 6 El; 30 RA.
For springs; Afnor 45S7, water hardened.

POMPEY RS3.
M-884; 0 55 C, 0.75 Mn, 1 7 Si, bal Fe
Heat treated: 200,000-235,000 TS; 177,000 YS; 5 El; 25 RA.
For springs; Afnor 55S7, oil hardened.

POMPEY RS3K
M-884; 0.60 C, 0.85 Mn, 1 8 Si, 0.40 Cr, bal Fe.
Heat treated· 213,000-242,000 TS; 185,000 YS; 5 El, 25 RA
For springs, coils; oil hardened.

POMPEY RS4E
M-884; 0.60 C, 0.85 Mn, 1.9 Si, bal Fe.
Heat treated 213,000-242,000 TS; 185,000 YS; 4 El, 25 RA.
For springs; Afnor 55S7, Afnor 65S7, oil hardened.

POMPEY RSKD
M-884; 0.45 C, 0.40 Mn, 1.6 Si, 0.8 Cr, 0.25 Mo, bal Fe.
Heat treated· 228,000-260,000 TS, 200,000 YS; 5 El; 30 RA.
For springs, torsion bars; Afnor 45SCD6, oil hardened

POMPEY S3
M-884; 0 35 C, bal Fe.
Hot rolled. 85,000 TS; 54,000 YS, 30 El, 53 RA; 185 Brin.
For gears, shafts, housings; water hardened.

POMPEY S3F.
M-884, 0.35 C, bal Fe.
Hot rolled. 85,000 TS, 54,000 YS; 30 El; 53 RA; 185 Brin
For gears, shafts, axles, mowers, water hardened.

POMPEY S4
M-884; 0.45 C, bal Fe.
Hot rolled: 98,000 TS, 59,000 YS, 24 El; 45 RA; 212 Brin.
For machine tool parts, gears, shafts; water hardened.

POMPEY S4F.
M-884; 0 40 C, bal Fe.
Hot rolled: 91,000 TS, 58,000 YS; 27 El; 50 RA; 200 Brin.
For gears, shafts, axles, mowers, water hardened.

POMPEY S4M.
M-884; 0 9 C, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For cutters, dies; water hardened.

POMPEY S4S
M-884; 0.4 C, 0.035 S, 0.035 P, bal Fe.
Hot rolled: 91,000 TS, 58,000 YS, 27 El; 50 RA; 200 Brin.
For agricultural equipment, plows; water hardened.

POMPEY S5M.
M-884; 1 1 C, bal Fe.
Annealed: 110,000 TS; 56,000 YS; 20 El; 40 RA; 210 Brin.
For cutters, dies; water hardened

POMPEY S6F
M-884, 0 62 C, bal Fe
Heat treated· 160,000 TS; 113,000 YS, 12 El; 40 RA, 325 Brin.
For agricultural equipment, mowers; water hardened.

POMPEY S7F
M-884, 0 68 C, bal Fe
Heat treated 174,000 TS; 128,000 YS, 12 El; 37 RA, 355 Brin
For agricultural equipment, mowers; water hardened.

POMPEY S7 TRIPLEX
M-884, 0 7 C, bal Fe
Heat treated 174,000 TS, 128,000 YS, 12 El, 37 RA, 352 Brin.
For agricultural equipment, plows, water hardened

POMPEY S8.
M 884, 0 8 C, bal Fe
Heat treated 188,000 TS, 143,000 YS, 12 El, 35 RA, 385 Brin
For tools, dies, mandrels, water hardened

POMPEY S8R
M-884, 0 8 C, 0 035 S, 0 035 P, bal Fe
Heat treated 188,000 TS, 143,000 YS, 12 El, 35 RA, 390 Brin
For agricultural equipment, rakes; water hardened.

POMPEY S65.
M-884; 0.65 C, bal Fe.
Heat treated· 170,000 TS, 116,000 YS, 10 El; 38 RA, 340 Brin
For shafts, mandrels, dies, tools; water hardened

POMPEY S75
M-884, 0.75 C, bal Fe
Heat treated 180,000 TS, 140,000 YS; 13 El, 36 RA; 370 Brin
For crimpers, punches, dies, tools, water hardened.

POMPEY S90
M-884, 0 9 C, 0 035 S, 0.035 P, bal Fe
Heat treated 190,000 TS, 145,000 YS, 10 El; 30 RA, 400 Brin.
For agricultural equipment, mowing machines, water hardened.

POMPEY SH4
M-884, 0.48 C, bal Fe.
Annealed: 96,000 TS; 52,000 YS; 16 El, 23 RA; 170 Brin.
For machine tool parts, gears, shafts; water hardened.

POMPEY SH5.
M-884; 0.54 C, bal Fe.
Annealed. 100,000 TS, 55,000 YS; 15 El; 22 RA; 180 Brin.
For shafts, axles, tools; water hardened.

POMPEY TR4.
M-884; 0.45 C, 0.15 Cr, 0.7 Mn, 0.25 Si, bal Fe.
Heat treated: 127,000-157,000 TS; 114,000 YS; 10 El; 40 RA; 590 Brin.
For machine tool parts, shafts, gears; induction or flame hardened parts.

POMPEY TR4M.
M-884; 0.45 C, 0.15 Cr, 0.9 Mn, 0.25 Si, bal Fe.
Heat treated: 127,000-157,000 TS; 114,000 YS; 10 El; 40 RA; 590 Brin.
For machine tool parts, shafts, gears; induction or flame hardened parts.

POMPEY TR5.
M-884; 0.52 C, 0.7 Mn, 0.25 Si, 0.15 Cr, bal Fe.
Heat treated 121,000-150,000 TS, 92,000 YS; 10 El; 40 RA; 620 Brin.
For machine tool parts, shafts, gears; induction or flame hardened parts.

POMPEY TR5M.
M-884; 0.52 C, 0.8 Mn, 0.25 Si, 0.15 Cr, bal Fe.
Heat treated· 121,000-150,000 TS; 92,000 YS; 10 El; 40 RA; 620 Brin.
For machine tool parts, shafts, gears; induction or flame hardened parts.

POMPEY TRK.
M-884, 0.50 C, 0.9 Mn, 0.3 Si, 1.0 Cr, bal Fe.
Heat treated· 163,000-193,000 TS; 150,000 YS; 8 El; 30 RA; 610 Brin.
For machine tool parts, shafts, gears; induction or flame hardened parts.

POMPEY TRKD
M-884; 0.42 C, 0.7 Mn, 0.3 Si, 1 Cr, 0.25 Mo, bal Fe.
Heat treated 170,000-200,000 TS, 157,000 YS; 8 El, 40 RA, 590 Brin
For machine tool parts, shafts, gears; induction or flame hardened parts.

POMPEY TRNKD.
M-884, 0.40 C, 0.9 Mn, 0.3 Si, 0.5 Ni, 0.5 Cr, 0.2 Mo, bal Fe.
Heat treated 157,000-186,000 TS, 150,000 YS, 10 El, 40 RA, 590 Brin.
For machine tool parts, shafts, gears; induction or flame hardened parts.

POMPEY TUREX 4
M-884; 0.4 C, 4 W, 1.4 Cr, 0.2 V, bal Fe.
For hot work tools; oil hardened.

POMPEY TUREX 9.
M-884; 0.30 C, 2.8 Cr, 10 W, 0.3 V, bal Fe.
For extrusion press rams and liners, punches, shears, hot work steel, oil hardened.

POMPTON
M-1, 0.7-1.4 C, 0.25 Mn, 0.25 Si, bal Fe.
Heat treated. 228-715 Brin.
For threading dies, shear knives, chisels, drills, punches, Type W1; water hardened.

POMPTON D R.
M-1; 1.2 C, bal Fe.
For drills, taps, drill rod, water hardening.

POMPTON EXTRA.
M-1; 0.7-1.0 C, alloy, bal Fe.
For tools, drills, taps; water hardening

POMPTON SPECIAL
M-1; 0.7-1.4 C, 0.015 max. P, 0.015 max. S, 0.25 Mn, 0.20 Si, bal Fe.
Water hardened: 228-715 Brin.
For lathe, planer and finishing tools, reamers, taps, gages, dies; made in all tempers; Iz-7-50.

PONSARD'S HIGH MANGANESE BRASS.
Eng.; 75-50 Cu, 20-25 Mn, 2-15 Zn, 0-16 Fe.
For corrosion resisting and marine parts; corrosion resistant.

POPES ISLAND METAL.
French; 70 Cu, 15 Zn, 14 Ni, 1 ?
For tableware, base for plated ware; generic name of a series of French alloys.

POREX.
M-839; 5-11 Sn, bal Cu.
For filters, porous membranes, diffusers; powdered metals.

PORO BRONZE.
M-525; 13 Sb, 7 Cu, bal Sn.
For bearings, bushings; Babbitt.

POSITIVE-ROD NO. 105.
M-1096; 0.08-0.12 C, 0.45-0.65 Mn, 0.15-0.25 Si, 0.03 S, 0.03 P, bal Fe.
Welded: 62,000-70,000 TS; 50,000-55,000 YS; 25-35 El; 40-45 RA.
For all-position general purpose welding rod; AWS-E6010.

POTASSIUM AMALGAM.
Hg24K.
For organic reductions.

POTERIE D'ETAIN.
90 Sn, 9 Sb, 1 Cu.
For tableware, bearings, anti-friction.

POTINGRIS.
Potinjaune plus Pb + Sn
For hardware.

POTINJAUNE.
72 Cu, 25 Zn, 2 Pb, 1.2 Sn.
For hardware, French yellow brass.

POT METAL
80-67 Cu, 20-33 Pb
For bearings, heavy duty

POTOMAC
M-1, 0.35 C, 0.85 Si, 1.25 W; 5 Cr, 0.2 V, 1.5 Mo, bal Fe
Air hardening tool and die steel; for forging dies, hot nut tools, hot die steel. Resists shock and heat checking. AISI H12.

POTOMAC 2V.
M-1, 0.60 C, 0.65 Mn, 1.0 Si, 6.5 Cr, 2.15 V, 1.4 Mo, bal Fe
Air hardening hot work tool and die steel.

POTOMAC 4V
M-1, 1.15 C, 0.35 Mn, 1.0 Si, 5.25 Cr, 4.0 V, 1.3 Mo, bal Fe.
Air hardening hot work tool and die steel.

POTOMAC-A.
M-1; 0.40 C, 0.30 Mn, 0.90 Si, 5.0 Cr, 1.3 Mo, 0.5 V, bal Fe
Heat treated: 290,000 TS, 234,000 YS; 16 El; 41 RA; 55 Brin.
At 1000°F. 207,000 TS, 157,000 YS; 15 El; 35 RA; 54 Brin
For fasteners, gears, rocket cases, aircraft and missile structures; maintains strength to 1000°F.

POTOMAC M.
M-1, 0.40 C, 1.0 Si, 5.25 Cr, 1.0 V, 1.0 Mo, bal Fe.
For hot die steel, brass forging and pressing dies; resists shock and heat checking; AISI H13.

POTOSI SILVER.
Ni-Cu.
For ornamental and corrosion resistant parts; nickel silver.

POWDER BRAZE.
M-799; Zn, bal Cu.
For brazing; powdered metals.

POWDIRON 56-L.
M-632; 2.5 Graphite, bal Fe.
Sintered: 5,000 TS; 5.6 Density; 28% oil by volume.
For bearings for low cost,
light duty motor applications.

POWDIRON 59-FM.
M-632; 99.5 Fe, 0.5 other.
Sintered: 17,000 TS; 5.9 Density;
25% oil by volume.
For low and medium load bearings
requiring machining, staking or spinning;
good ductility.
ASTM B310-67 Type 1, Class A; SAE 850;
PMPMA F-0000-N.

POWDIRON 59-I.
M-632; 100 Fe.
Sintered: 12,000 TS; 5.9 Density;
25% oil by volume.
For low cost bearings for wheels, toys,
and general bearing applications.
ASTM B439-67; Gr 1; SAE 850;
PMPMA F-0000-N.

POWDIRON 59-PC.
M-632; 4 Cu, 0.8 C (comb.), bal Fe.
Sintered 34,000 TS; 5.9 Density;
20% oil by volume
For structural parts requiring ductility
and shock resistance.
ASTM B426-65 Type 1, Grade 2, SAE 865 A

POWDIRON 59-T.
M-632, 0.8 C (comb.), bal Fe.
Sintered· 24,000 TS; 5.9 Density;
20% oil by volume.
For structural parts requiring good hardness
and wear resistance.
ASTM B310-67 Type 1, Class C, SAE 852.

POWDIRON 61-P.
M-632; 10 Cu, bal Fe.
Sintered; 30,000 TS; 6.1 Density;
25% oil by volume
High strength, general purpose bearing
for automotive, farm equipment, wheel bearings,
and machine tool applications
ASTM B439-67, Grade 3; SAE 862;
PMPMA FC-1000-N.

POWDIRON TCU.
M-632, 20 Cu, 0.8 C (comb.), bal Fe
Sintered: 85,000 TS, 7.3 Density
For structural parts, particularly gears.
ASTM B303-67 Class C;
SAE 872, PMPMA FX-2010-T.

POWER 52.
4-5 Si, bal Fe.
For laminations for power units,
high permeability

POWER 58.
4.25-4.75 Si, bal Fe.
For laminations for power units; high permeability

POWER 65.
4.24-4.75 Si, bal Fe.
For laminations for power units, high permeability.

POWER 72
3.75-4.25 Si, bal Fe.
For laminations for power units; high permeability

POWER 82.
3.0-3.5 Si, bal Fe.
For laminations for power units,
high permeability.

POWER 101.
2.25-2.75 Si, bal Fe.
For laminations for power units; high permeability.

POWER 117.
1.0-1.5 Si, bal Fe.
For laminations for power units;
high permeability.

POWER 130.
0.5-0.75 Si, bal Fe.
For laminations for power units; high permeability.

POWER 145
0.25-0.5 Si, bal Fe.
For laminations for power units,
high permeability

POWER 165
Under 0.25 Si, bal Fe
For laminations for power units, high permeability.

POWER NICKEL GENUINE BABBITT
M-178; 83-85 Sn, bal Sb and Cu
Cast 17,500 TS; 10,500 YS, 27 Brin
For bearings, for high pressures and temperatures.

POWERSTEEL.
M-1052, 0.9 C, 4 Co, bal Fe
For tools, cutters; cast.

POWHATAN
M-435, 0.83 C, 18 W, 4 Cr, 1.7 V, 10.5 Co,
1 Mo, bal Fe
For cutting tools, lathe and planer tools,
high speed steel

PRECEDENT 71 GRADE A
M-1103; 6.5-7.5 Zn, 0.65-0.85 Mg, 0.06-0.15 Cr,
0.10-0.25 Ti, 0.15 max Si, 0.15 max Fe,
0.1 max Cu, 0.1 max Mn, bal Al
Aged 43,000 TS, 33,000 YS, 3 El, 96 Brin.
T6-temper· 50,000 TS, 46,000 YS; 4 El, 100 Brin.
For aircraft and missile guidance systems,
computing devices, age hardens at
room temperature, shock and fatigue resistant

PRECEDENT 71 GRADE B
M-1103, 6.0-7.0 Zn, 0.55-0.75 Mg, 0.06-0.15 Cr,
0.10-0.25 Ti, 0.15 max Si, 0.15 max Fe,
0.1 max Mn, 0.1 max Cu, bal Al
Aged 40,000 TS, 32,000 YS, 7 El, 88 Brin
Stress relieved 40,000 TS, 31,000 YS, 6 El,
90 Brin
For aircraft and missile guidance systems,
computing devices, age hardens at
room temperature, shock and fatigue resistant

PRECEDENT NO 356
M-1103, 6.5-7.5 Si, 0.20-0.40 Mg, bal Al
For light alloy parts,
sand and permanent mold castings.

PRECEDENT NO 356A
M-1103, 7 Si, 0.3 Mg, bal Al
For light alloy parts;
sand and permanent mold castings

PRECISION
M-740; 0.3 C, bal Fe
For structural parts

PRECISION A-12
M-887; 11-13 Si, 0.6 max Cu, 2 max Fe,
0.5 max Ni, bal Al.
Cast. 33,000 TS, 1.5 El; 80 Brin
For light alloy die castings;
corrosion resistant

PRECISION A-50
M-887; 4.5-6.0 Si, 0.6 max Cu, 2 max Fe, bal Al.
Cast 29,000 TS; 4 El; 70 Brin.
For die castings; high impact strength.

PRECISION A-54.
M-887; 4.5-5.5 Si, 3.4-4.5 Cu, 2 max Fe, bal Al.
Cast: 32,000 TS; 2 El; 75 Brin.
For die castings; high strength.

PRECISION A-94.
M-887; 3.5-4.5 Si, 3.0-4.0 Cu, 1.3 max Fe, 0.6 max Zn, bal Al.
Die cast: 38,000 TS; 2 El; 77 Brin.
For die castings; high strength.

PRECISION A-218
M-887; 8 Mg, 1.8 max Fe, 0.2 max Cu, 0.3 max Mn, 0.1 max Ni, bal Al.
For die castings; corrosion resistant.

PRECISION A-360
M-887; 8-10 Si, 0.5 Mg, 2 max Fe, bal Al.
Die cast. 42,000 TS, 23,000 YS; 1.8 El.
For die castings, corrosion resistant.

PRECISION BR-1
M-887, 63-67 Cu, 32-36 Zn, 0.7-1.3 Si
Die cast: 70,000 TS, 35,000 YS, 25 El; 120 Brin.
For die castings; high strength

PRECISION BR-2.
M-887, 81.5 Cu, 14.5 Zn, 4 Si.
Die cast 85,000 TS; 50,000 YS, 8 El; 170 Brin.
For die castings; high strength

PRECISION BR-3
M-887; 83 Cu, 10 Zn,, 5 Si, 1 Mn, 1 Al.
Die cast 105,000 TS; 60,000 YS; 5 El; 190 Brin.
For die castings, high strength

PRECISION M-13
M-887, 8.3-9.7 Al 0.4-1.0 Zn, bal Mg
Die cast 29,000-34,000 TS; 20,000 YS; 2-5 El, 66 Brin.
For die castings

PRECISION ZN-5
M-887, 3.5-4.3 Al, 0.75-1.25 Cu, bal Zn.
Cast 42,000 TS, 4 El; 75 Brin.
For die castings.

PRECISION ZN-6
M-887, 3.5-4.3 Al, 0.10 max Cu, bal Zn.
Cast 36,000 TS, 5 El, 65 Brin.
For die castings.

PRECISION ZN-7
M-887; 3.5-4.3 Al, 2.5-3.5 Cu, bal Zn
Cast 45,000 TS, 5 El; 80 Brin
For die castings

PREMABRAZE 130
M-63, 82 Au, 18 Ni
M P & Flow P. 1742°F.
For brazing stainless steel, Inconel X, other nickel base alloys, good oxidation resistance to 1500°F
AWS BAu-4.

PREMABRAZE 615.
M-63, 61.5 Ag, 24 Cu, 14.5 In
M P 1155-1305°F; for ferrous and non-ferrous and in vacuum tube brazing.

PREMAG.
M-526; 0.8 Ag, bal Cu.
For welding rod; copper welds

PREMALOY 301.
M-63; Pt, Au, Ag, Cu, bal Pd
For resistors, high electrical resistance.

PREMET.
M-1; 30 Co, 19 W, 0.12 C, 2 V, 5 Mo, 0.2-0.5 Mn, bal Fe.
For cutting tools; cast alloy.

PREMIER.
M-248; 15 Cr, 62 Ni, bal Fe.
Annealed: 95,000 TS, 35,000 YS; 40 El; 60 RA.
For resistances; heat resistant; now Alray C.

PREMIER NO. 1.
0.10-0.20 C, 0.65-0.85 Cr, 0.10 max V, bal Fe.
For case hardened parts, carburizing steel.

PREMIER 3½ Ni WELD
M-12; 0.15-0.25 C, 0.4-0.6 Mn, 3.2-3.7 Ni, bal Fe.
For welding wire

PREMIER NO 6
Eng; 0.6-0.7 C, 0.7-0.9 Cr, 0.10 max V, bal Fe.
For hammers, dies, blacksmith tools; water hardened

PREMIER AW WELD.
M-12; 0.14-0.20 C, 0.9-1.2 Mn, bal Fe.
For welding wire; acetylene.

PREMIER "C"
M-248, 24 Fe, 60 Ni, 16 Cr.
For rheostat and resistance units, used up to 1700°F.

PREMIER EA WELD
M-12; 0.06 max C, 0.17 max Mn, bal Fe.
For welding wire, electric.

PREMIER EB WELD
M-12, 0.13-0.18 C, 0.4-0.6 Mn, bal Fe
For welding wire, electric.

PREMIER EP WELD
M-12, 0.13-0.18 C, 0.4-0.6 Mn, bal Fe.
For welding wire; electric

PREMIER GA WELD
M-12, 0.06 max C, 0.17 max Mn, bal Fe.
For welding wire; acetylene

PREMIER GS WELD.
M-12, 0.10 max C, 0.4-0.6 Mn, bal Fe.
For welding wire; acetylene.

PREMIER HC WELD
M-12, 0.95-1.1 C, 0.4-0.6 Mn, bal Fe.
For welding wire, electric or gas.

PREMIER H S WELD
M-12, 0.13-0.18 C, 0.4-0.6 Mn, 1.1-1.4 Ni, 0.55-0.75 Cr, bal Fe.
For welding wire, acetylene welding.

PREMIER MB SPRING
M-12; 0.45-0.70 C, 0.6-1.2 Mn, bal Fe.
For springs, oil hardening.

PREMIER NICKEL CHROME.
M-248, 60-62 Ni, 25 Fe, 14-16 Cr, 0.10 C
Wire 100,000 TS, 60,000 YS, 25 El; 50 RA; 182 Brin
For rheostats, dipping baskets, heating units, wire cloth, corrosion resisting

PREMIER NICKEL CHROME.
M-248, 25 Fe, 11 Cr, 3 Mn, bal Ni
Rod. 100,000 TS, 25 El, 182 Brin
For rheostats, dipping baskets, heating units, wire cloth, corrosion resisting.

PREMIER SPRING.
M-12; 0.45-0.70 C, 0.6-1.2 Mn, bal Fe
Drawn: 145,000-260,000 TS.
For springs, oil hardening

PRESCOLOY.
M-583; 0.2 C, 0.9 Ni, bal Fe.
90,000 TS; 60,000 YS; 25 El; 40 RA.
For truck side frames, bolsters, freight car castings; high strength.

PRESNEAL.
M-64; 0.3 C, Ni, Mo, bal Fe.
Annealed.
For dies, punches; hot work, press and upsetter.

PRESSANT.
M-1340; 0.15 C, 0.2 Si, 0.4 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, pinions, cams, camshafts; case hardening steel.

PRESSANT ECR80.
M-1340; 0.15 C, 0.25 Si, 0.5 Mn, 0.65 Cr, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, pinions, cams, camshafts; case hardening steel

PRESSANT EM212.
M-1340; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe
For gears, cams, camshafts, case hardening steel.

PRESSCO NO. 1.
M-1168, 85-88 Cu, 1-1.5 Fe, 10-11 Al.
Die cast. 75,000-85,000 TS; 36,000 YS, 26-17 El, 140-180 Brin
For marine hardware, propellers; heat treatable; Al-bronze

PRESSCO NO. 2
M-1168, 80-83 Cu, 13-16 Zn, 3.5-4.5 Si
Die cast: 75,000-85,000 TS; 40,000 YS; 160-200 Brin
For gears, shafts, pump parts; silicon bronze.

PRESSCO NO 3.
M-1168; 55-59 Cu, 1 Mn, 0.2 max Fe, 1 max Sn, 0.5 max Pb, bal Zn
Cast: 76,000 TS; 33,000 YS; 15 El; 102 Brin.
For fittings, spiders, brackets; SAE 43, manganese bronze

PRESSCO NO 4
M-1168; 58-62 Cu, 36-41 Zn, 1 max Pb, 1 max Sn
Die cast: 50,000-60,000 TS, 35,000 YS; 12-10 El
For die castings, corrosion resistant

PRESSCO NO. 5.
M-1168, 3.5-5.5 Ni, 3-5 Fe, 10-11 Al, 3.5 max Mn, bal Cu.
Cast. 90,000 TS, 40,000 YS; 10 El; 157 Brin.
For pump parts, bushings, bearings, Al bronze, heat treatable.

PRESSCO NO 6
M-1168; 59 min Cu, 0.5 max Al, bal Zn
Cast: 40,000 TS, 11,000 YS, 25 El, 79 Brin
For hardware, die castings; yellow brass

PRESSCO NO 7
M-1168; 61.5-63.5 Cu, 35-38 Zn, 0.75-1.25 Pb, 0.9-1.2 Al, 0.5 max Sn, 0.5 Fe
Cast: 63,000 TS, 35,000 YS, 30 El; 102 Brin
For hardware, die castings; free-cutting

PRESSCO NO. 8.
M-1168; 4.5-6.5 Fe, 6.5-7.5 Ni, 11.5-12.5 Al, bal Cu.
Cast: 115,000 TS; 82,000 YS; 3 El, 220 Brin.
For hardware, die castings, Al-bronze.

PRESSCO NO. 9.
M-1168; 58 min Cu, 1.3 max Pb, bal Zn.
Cast: 49,000 TS; 12,000 YS; 5 El; 70 Brin
For hardware, die castings; SAE 41, leaded brass.

PRESSCO NO. 10.
M-1168; 60 max Cu, 1 min Si, bal Zn.
Cast: 74,000 TS; 38,000 YS; 19 El; 130 Brin.
For hardware, die castings; high strength.

PRESSOFOND S5C.
M-1445; 4 Cu, 5.5 Si, bal Al.
Cast: 28,000-32,000 TS; 20,000-23,000 YS; 4-1.5 El; 55-75 Brin
For light alloy parts; heat treatable.

PRESSOFOND S9CF
M-1445; 3.5 Cu, 0.9 Fe, 8.5 Si, bal Al.
Cast: 41,000-47,000 TS; 24,000-29,000 YS; 5.0-2.5 El, 80-100 Brin
For light alloy parts; corrosion resistant

PRESSURDIE NO 1
M-140; 0.3-0.4 C, 0.8-1.0 Si, 4.75-5.25 Cr, 2 V, 5 W, 6 Co, 0.25 Mo, bal Fe
For extrusion dies, dummy blocks, punches, hot work steel, oil hardened.

PRESSURDIE NO 2
M-140, 0.35 C, 1.5 Mo, 1.25 W, 5 Cr, 0.15 V, bal Fe
For extrusion and forging dies, punches, Type H12; hot work steel

PRESSURDIE NO 3
M 140; 0.3-0.4 C, 0.85-1.0 Si, 4.9-5.25 Cr, 0.10-0.15 V, 0.45-0.60 Mo, bal Fe
For tools, aluminum die casting dies, oil hardening

PRESSURDIE NO 3-I
M-140, 0.37 C, 0.35 Mn, 1.0 Si, 5.5 Cr, 0.45 V, 1.15 Mo, bal Fe
For dies, oil hardening

PRESSURDIE 5
M-140, 0.38 C, 1.0 Si, 3.5 Cr, 1.0 V, 1.25 W, 1.0 Mo, 0.60 Mn, bal Fe
Heat treated 268,500 TS, 243,000 YS, 8.5 El, 28 RA, 520 Brin
At 900°F 191,400 TS, 172,000 YS, 14 El, 41 RA, 420 Brin
For aluminum extrusion dies and mandrels, upset punches, hot work steel, tough

PRESSURDIE 6
M-140; 0.40 C, 0.50 Mn, 1.0 C, 3.2 Cr, 0.30 V, 2.5 Mo, bal Fe
For aluminum extrusion dies and mandrels, hot shears, hot work steel, tough

PRESSURDIE NO 7
M-140, 0.50 C, 1.0 Si, 5.0 Cr, 2.0 V, 1.3 Mo, bal Fe
Air or oil hardening hot work tool and die steel

PRESSURDIE NO 16
M-140, 0.55 C, 0.90 Si, 1.25 W, 5 Cr, 1.25 Mo, bal Fe
For trimming and forming dies, forging die inserts, hot work steel, oil hardened

PRESSURDIE C
M-140, 0.38-0.43 C, 4.0-4.5 Cr, 4.0-4.5 W, 4.0-4.5 Co, 1.9-2.2 V, 0.4-0.7 Mo, bal Fe
For dies, dummy blocks, valve dies, extrusion mandrels; hot work steel, air hardened

PRESSURE DIE CASTING
M-122; 62 Cu, 0.75 Pb, 0.50 Sn, bal Zn
Die cast: 58,000 TS, 36,000 YS, 6 El, 7 RA; 124 Brin
For plumbing fixtures, hardware, pressure die casting.

PRESSURE TITE IRON
M-508, 2.85 T.C., 0.65 C.C., 1.25 Ni, 0.8 Mn, 0.4 Cr, 1.6 Si, bal Fe
Cast: 55,000 TS; 285 Brin
For liners, engine sleeves, oil pumps; centrifugal cast

PRESTEM.
M-64; 0.3 C, Ni, Mo, bal Fe.
Hardened: 341-429 Brin.
For dies, punches; hot work, press and upsetter, prehardened.

PRESTO
M-1339, 1.35 C, 4.3 Cr, Co, V, W, bal Fe.
For engraving tools, form cutters, forming dies, high speed steel.

PRESTO 2 KRONEN
M-1339; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

PRESTO B
M-1339; 0.82 C, 4.1 Cr, 0.85 Mo, 8.7 W, 1.6 V, bal Fe
For lathe and planer tools, reamers, drills, taps, high speed steel

PRESTO C3
M-1339, 0.95 C, 4 Cr, Mo, V, W, bal Fe
For lathe and planer tools, reamers, broaches, high speed steel.

PRESTO CHROME BEARING STEEL
M-32, 1.0 C, 0.3 Mn, 0.25 Si, 1.4 Cr, bal Fe.
Oil or water hardenable to 60-66 Rock C.
For ball and roller bearings and races.

PRESTO ENORM.
M-1339, 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe
For lathe and planer tools, drills, taps, hobs; high speed steel

PRESTO Mo PLUS
M-1339, 0.85 C, 4 Cr, V, W, Mo, bal Fe
For lathe and planer tools, taps, drills, reamers; high speed steel

PRESTO Mo SUPERIOR
M-1339, 0.80 C, 4 Cr, V, W, Mo, bal Fe
For lathe and planer tools, broaches, reamers, hobs, high speed steel

PRESTO STEEL NO. 9-266
M-32, 1.05 C, 1.4 Cr, bal Fe
Hardened
For ball races, see "Presto Tool."

PRESTO UNIKUM
M-1339, 0.79 C, 4.7 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe
For lathe and planer tools, reamers, broaches, taps, high speed steel.

PRESTO UNIKUM 3
M-1339; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe
For lathe and planer tools, reamers, broaches, hobs; high speed steel

PRESTO UNIKUM 5.
M-1339; 0.79 C, 4.7 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe
For lathe and planer tools, reamers, broaches, drills, high speed steel

PRESTO UNIKUM 125
M-1339, 0.80 C, 4.3 Cr, Co, W, V, Mo, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

PRESTO UNIKUM SUPERB
M-1339; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, form cutters; high speed steel.

PRESTO V22.
M-1339; 0.86 C, 4.1 Cr, 0.8 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

PRESTO V205
M-1339, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For engraving tools, form cutters, forming dies; high speed steel.

PREUSS ALLOY
30 Co, 0.2-1.5 Si, 0.04-0.06 C, bal Fe.
For magnetic circuits, high permeabiltiy.

PREWESTA 1.
M-1294, 0.55 C, 1 Ni, 0.18 V, 1.8 W, bal Fe.
For upsetters, crimpers, cold punches, oil hardened, tough.

PREWESTA 2
M-1294; 0.45 C, 1 Ni, 0.18 V, 1.85 W, bal Fe.
For upsetters, crimpers, cold punches; oil hardened, tough

PREWESTA 3.
M-1294; 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For upsetters, crimpers, cold punches; oil hardened, tough

PRG 35
M-1340; 0.5 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, springs, crankshafts, oil hardened, shock resistant

PRIMA 2H
M-1337, 1.3 C, 0.25 max Mn, 0.25 max Si, bal Fe.
For engravers tools, form cutters, water hardened, Type W1.

PRIMA 3MH
M-1337, 1.15 C, 0.25 max Si, 0.35 max Mn, bal Fe
For drills, taps, hobs, cutters, lathe tools, Type W1, water hardened.

PRIMA 4ZH
M-1322, M-1337, 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For drills, taps, hobs, cutters, lathe tools; Type W1, water hardened.

PRIMA 5ZAH
M-1337, M-1322, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 190,000 TS, 145,000 YS; 10 El, 30 RA, 400 Brin.
For springs, tools, punches, drills, Type W1, water hardened

PRIMA 6 SEHR ZAH.
M-1337, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 175,000 TS; 128,000 YS, 12 El, 37 RA, 355 Brin.
For springs, axes, rails, tools, punches; Type W1, water hardened

PRIMA 45
M-1340; 0.45 C, 0.5 Si, 0.6 Mn, bal Fe.
Hot rolled. 98,000 TS; 59,000 YS; 24 El, 45 RA; 212 Brin
For gears, bolts, shafts; water hardened.

PRIMA 55.
M-1340; 0.55 C, 0.2 Si, 0.6 Mn, bal Fe.
Heat treated: 150,000 TS; 110,000 YS; 14 El; 45 RA; 320 Brin.
For gears, springs, crimpers, axles, shafts; water hardened.

PRIMA 60
M-1340; 0.60 C, 0.5 Si, 0.6 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS, 12 El;
40 RA; 325 Brin.
For springs, punches, crimpers, axes,, hammers;
water hardened

PRIMA 65.
M-1319, 0.45 C, 0.50 Si, 0.60 Mn, bal Fe.
Hot rolled· 98,000 TS; 60,000 YS; 24 El;
45 RA; 215 Brin
For gears, bolts, machine tool parts, shafts,
water hardened.

PRIMA 75.
M-1340; 0.75 C, 0.4 Si, 0.6 Mn, bal Fe
Heat treated 180,000 TS, 140,000 YS, 14 El,
36 RA, 375 Brin
For crimpers, punches, springs, rails,
water hardened.

PRIMA 85.
M-1319; 0.60 C, 0.4 Si, 0.6 Mn, bal Fe
Heat treated. 160,000 TS, 115,000 YS, 12 El,
40 RA; 325 Brin.
For gears, bolts, hammers, axles, shafts;
water hardened.

PRIMA 90.
M-1319; 0.67 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Heat treated· 175,000 TS, 128,000 YS, 12 El,
37 RA, 355 Brin
For rails, springs, hammers, axes; water hardened

PRIMA 90
M-1340, 0.9 C, 0.4 Si, 0.6 Mn, bal Fe
Heat treated 190,000 TS, 145,000 YS, 10 El,
30 RA; 400 Brin
For tools, cutters, springs, drills,
water hardened, Type W1.

PRIMA 95.
M-1319; 0.75 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Heat treated. 185,000 TS; 140,000 YS; 15 El,
40 RA, 395 Brin
For springs, rails, punches, tools, crimpers,
water hardened

PRIMA 100
M-1319; 0.90 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Annealed. 95,000 TS, 50,000 YS, 25 El, 45 RA,
190 Brin
For springs, tools, cutters, punches, drills, taps;
Type W1, water hardened

PRIMA H
M-27, M-1314, M-1344, 1.3 C, 0.25 max Si,
0.25 max Mn, bal Fe
For engravers tools, drills, reamers, form cutters,
Type W1; water hardened.

PRIMA H
M-1309, 0.90 C, 0.25-0.50 Si, 0.3 0.8 Mn, bal Fe
Heat treated· 190,000 TS; 145,000 YS, 10 El,
30 RA, 400 Brin
For springs, tools, cutters, punches, drills, taps,
Type W1; water hardened

PRIMA HARTE 3.
M-1346; 0.9 C, 0.4 Si, 0.6 Mn, bal Fe.
Heat treated. 190,000 TS, 145,000 YS; 10 El,
30 RA, 400 Brin.
For springs, tools, cutters, dies,
Type W1; water hardened

PRIMA HARTE ¾
M-1346; 0.75 C, 0.4 Si, 0.6 Mn, bal Fe
Heat treated: 175,000 TS; 126,000 YS, 10 El,
35 RA; 375 Brin.
For springs, tools, hammers, rails, axes,
Type W1; water hardened

PRIMA HARTE 4.
M-1346; 0.60 C, 0.4 Si, 0.6 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS, 12 El;
40 RA; 325 Brin.
For crankshafts, axes, axles, crimpers,
punches, gears, water hardened

PRIMA HARTE 5
M-1346, 0.45 C, 0.4 Si, 0.6 Mn, bal Fe.
Hot rolled 98,000 TS, 59,000 YS, 24 El, 45 RA;
215 Brin
For gears, pinions, bolts, studs, crankshafts,
water hardened

PRIMA HARTE 6
M-1346; 0.35 C, 0.3-0.5 Si, 0.3 0.8 Mn, bal Fe
Hot rolled 85,000 TS, 54,000 YS; 30 El, 53 RA;
185 Brin
For gears, bolts, fasteners, crankshafts,
water hardened

PRIMA MH
M-501, M-1314, M-1344, 1.15 C, 0.25 max Si,
0.25 max Mn, bal Fe
Annealed 100,000 TS, 56,000 YS, 20 El, 40 RA;
210 Brin
For drills, taps, reamers, hobs, cutters,
Type W1, water hardened

PRIMA MH
M 1309, 0.75 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated 175,000 TS, 130,000 YS, 10 El,
35 RA, 380 Brin
For springs, rails, hammers, tools, punches,
Type W1, water hardened

PRIMA MH
M-1352, M-1338, 0.90 C, 0.25-0.50 Si, 0.3 0.8 Mn,
bal Fe
Heat treated 190,000 TS, 145,000 YS, 10 El,
30 RA, 400 Brin
For springs, tools, drills taps, reamers,
hobs, Type W1; water hardened.

PRIMA MH 100
M-27, 1.0 C, 0.25 max Si, 0.25 Mn, bal Fe
Annealed 100,000 TS, 53,000 YS, 21 El, 42 RA;
200 Brin
For springs, tools, cutters, reamers,
Type W1, water hardened

PRIMA MH 115
M-27, 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed 110,000 TS, 56,000 YS, 18 El, 40 RA;
210 Brin
For drills, taps, reamers, broaches,
Type W1, water hardened

PRIMA ZAHWEICH
M-1314, 0.45 C, 0.25 max Si, 0.25 max Mn,
bal Fe
Hot rolled 98,000 TS, 59,000 YS, 24 El,
54 RA, 212 Brin
For gears, bolts, fasteners, shafts,
water hardened

PRIMA ZH I
M-1314, 1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed. 100,000 TS; 53,000 YS, 21 El, 42 RA,
200 Brin.
For cutters, drills, punches, springs, reamers, taps,
Type W1, water hardened

PRIMA ZH II.
M-1314, 0.9 C, 0.25 max Si, 0.25 max Mn,
bal Fe
Heat treated· 190,000 TS, 145,000 YS, 10 El;
30 RA, 400 Brin.
For cutters, taps, springs, drills, hobs,
Type W1; water hardened.

PRIMA ZH III.
M-1314; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 188,000 TS; 143,000 YS; 12 El; 35 RA; 320 Brin.
For drills, punches, taps, springs, cutters; Type W1, water hardened.

PRIMER GILDING.
97 Cu, 3 Zn, traces Pb, Fe.
For primers, base for fire-enameled parts.

PRINCE.
M-365, 1 C, 1 Cr, bal Fe.
For ballbearing; water hardening.

PRINCES METAL NO. 1.
83-61 Cu, 17-39 Zn.
For hardware, brass.

PRINCES METAL NO 2
85 Cu, 15 Zn
For flexible hose; good workability.

PRIZE RIBBON.
M-959; Cu, Sb, bal Sn.
Cast 15,200 TS, 34.4 Brin.
For bearings, Babbitt.

PRK-33.
M-40, M-157, 3.7 Co, 13.6 Cr, 79.5 Fe, 0.84 Mo, 1.5 C, 0.60 Si, 0.25 V, 0.30 Mn, 0.50 Ni.
Air hardened 602-654 Brin.
For milling cutters, twist drills, press tools; non-scaling steel, non-deforming.

PRK 33 COBALTCROM.
M-289, 1.4 C, 13 Cr, 3.3 Co, 0.5 Ni, 0.6 Mo, bal Fe
For blanking and forming dies, trimmers, punches, air hardened, non-deforming, wear resistant.

PRK-SH
M-40, C, Cr, W, bal Fe.
For self hardening welding electrodes; for hardened tool and die steels.

PROBEDIT
Russian, WC
For cutting tools and dies; sintered

PRODUCTION-ROD NO. 140.
M-1096, 0.06-0.10 C, 0.55 Mn. 0.03 S, 0.01 P, 0.10-0.25 Si, bal Fe
Welded. 68,000-75,000 TS, 55,000-65,000 YS; 23-27 El, 50-55 RA
For all purpose welding rod; AWS-E6013

PROFERALI
M-347, 2.2-2.35 Si, 0.5-0.6 Mn, 0.55-1.0 combined C, 3.15 total C, 0.8-1.0 Cr, 0.4-0.5 Mo, 0.4-0.5 Ni, bal Fe
60,000-75,000 TS, 250-300 Brin
For diesel engine parts, crankshafts, cylinders, pistons, refrigeration parts, high test cast iron; wear resistant

PROFERALI. A.
M-347; 3.3 C, 1.5 Ni, 0.9 Cr, 0.2 Mo, 2 Si, bal Fe.
Cast: 35,000 TS, 207-241 Brin
For oil pump gears; cast iron.

PROGEN.
M-969, 0.33-0.40 C, 0.5-0.7 Mo, 0.55-0.75 Cr, 0.45-0.65 Cu, 0.5-0.7 Si, 0.15 Ti, bal Fe
Annealed: 97,000 TS; 57,000 YS; 22 El; 42 RA; 197 Brin.
Hardened. 285,000 TS; 245,000 YS, 11 El; 40 RA, 555 Brin.
For tools, chisels, picks, dies for die casting; tough, shock resistant, self-tempering tool steel.

PROJECT-70.
M-32, 0.15 max C, 12-14 Cr, bal Fe, 0.15 S.
Annealed: 103,000 TS; 75,000 YS; 22 El; 216 Brin.
For fittings, gears, housings, valve stems, valve trim.
Corrosion resistant, free-cutting.

PROJECTILE STEEL.
U.S.; 2.4 Cr, 0.8 C, 0.4 Mn, 0.2 Si, bal Fe.
110,000 TS; 80,000 YS; 18 El.
For projectiles; oil hardening.

PROLYT.
M-1088; Pb-Sn.
For Al solder; soft.

PROMAL
M-89; 1.8 T.C., 0.4 C.C., 1.0 Si, bal Fe.
Cast. 65,000-70,000 TS, 45,000-50,000 YS; 14-10 El, 170-190 Brin
For sprockets, gears, chains, brake drums, malleable iron.

PROMAL.
M-228; 1.8 total C, 0.4 combined C, 1.0 Si, 0.3 Mn, bal Fe.
Cast: 65,000-70,000 TS; 45,000-50,000 YS; 14-10 El; 170-190 Brin.
For cast chains, sprockets, parts, valve parts, wrench gears, brake drums; malleable cast iron.

PROMET NO 1
M-956, 66-71 Cu, 2-4 Sn, 24.5-29.5 Pb, 0.5-1.0 Ni.
Cast 18,000 TS, 11,000 YS; 10 El; 30 Brin.
For bearings, wear parts, castings; sand and centrifugally cast

PROMET 2S
M-956, 70-75 Cu, 4.0-5.5 Sn, 19.0-23.0 Pb, 0.2-0.8 Ni.
Sand Cast: 27,000 TS, 15,000 YS; 16 El; 45-55 Brin.
For bearings, bushings, sleeves.
AMS 4840, ASTM B144-3E.

PROMET NO 3.
M-956, 85-89 Cu, 7.5-9.0 Sn, 0.5-1.5 Pb, 0.5-1.0 Ni, 2.5-5.0 Zn.
Bearing and gear bronze.
Sand Cast: 40,000 TS; 20,000 YS, 28 El; 70 Brin.
For high duty bearings, gears, pump impellers, piston rings, steam fittings

PROMET NO. 6
M-956; 76-79 Cu, 4.5-6.5 Sn, 12.5-15.5 Pb, 1.0-1.7 Ni
Cast. 30,000 TS, 20,000 YS; 16 El, 64 Brin.
For bearings, bushings, castings; heavy duty.

PROMET 6CR
M-956, 76-80 Cu, 7-9 Sn, 11-14 Pb, 0.25-1.0 Ni.
Cast 37,000 TS, 20,000 YS; 20 El, 65 Brin
For bearings, wear parts.
Corrosion resistant, good embeddability.

PROMET 6SK
M-956, 75-79 Cu, 6.5-8.0 Sn, 12.5-15.5 Pb, 1.25-1.75 Ni
Sand Cast. 36,000 TS, 19,000 YS, 18 El, 60 Brin.
For bearings, bushings, liners, sleeves, pump bodies; free-cutting.

PROMET 22.
M-956; 86.0 Cu, 10 Sn, 2 Pb, 2 Zn.
Sand Cast: 43,000 TS; 19,000 YS; 18-40 El; 68 Brin
For heavy duty bearings, nuts, gears, worm wheels.

PROMET 80A.
M-956, 78-82 Cu, 9-11 Sn, 8-11 Pb, 0.75 max Zn, 0.75 max Ni.
Sand cast. 39,000 TS; 18,000 YS; 30 El; 67 Brin.
High leaded tin bronze for bearing applications.

PROMET 83A.
M-956; 81-85 Cu, 6.25-7.5 Sn, 6.0-8.0 Pb, 2.0-4.0 Zn, 0.50 max Ni.
Sand cast. 34,000 TS; 18,000 YS; 15 El; 65 Brin.
Leaded, general utility bearing bronze for bearings, bushings.
SAE 660. ASTM B144-3B.

PROMET 85A.
M-956; 84-86 Cu, 4.0-6.0 Sn, 4.0-6.0 Pb, 4.0-6.0 Zn, 0.8 max Ni.
Sand Cast: 35,000 TS; 15,000 YS, 32 El, 54-67 Brin.
For bearings, bushings.
SAE 40; ASTM B145-4A.

PROMET 86P
M-956, 78.0-82.0 Cu, 2.25-3.5 Sn, 6.0-8.0 Pb, 7.0-10.0 Zn, 1.0 max Ni
Sand cast: 34,000 TS; 15,000 YS, 24 El, 55 Brin
Leaded semi-red brass
For general hardware fittings, pump bodies, low pressure valves and fittings

PROMET 89-S.
M-956, 86-89 Cu, 7.0-9.0 Sn, 2.0-4.0 Pb, 0.25-0.75 Ni.
Cent chill cast 40,000 TS, 20,000 YS, 30 El
For heavy duty bearings, gears, worm wheels

PROMET 91-CK
M-956; 83 min Cu, 9.0-10.5 Sn, 1.3-3.0 Pb, 0.75-1.5 Ni, 1.5 max Zn
Cent. chill cast 50,000 TS, 22,000 YS, 15 El.
For heavy duty bearings, gears, worm wheels.

PROMET 91-SK replaced by **PROMET 91-CK**

PROMET 93 AB
M-956; 8.5-9.5 Al, 2.5-4.0 Fe, 86.0 min Cu
Sand cast. 79,000 TS, 28,000 YS, 30 El, 130 Brin
Alpha phase aluminum bronze
For worm wheels, bearings and bushings, slides, pump parts, utility machine parts

PROMET 100
M-956, 55-60 Cu, 0.5-2.0 Fe, 0.5-2.0 Al, 0.25-1.5 Mn, 1.0 max Sn, bal Zn
Cast: 65,000-80,000 TS; 28,000-40,000 YS, 20-40 El, 115-150 Brin
For valves, engine framing, valve stems, lever arms, gears, liners, bearings, marine hardwear
Alpha-beta manganese bronze SAE 43

PROMET NO 101-AB
M-956, 86-90 Cu, 0.75-1.5 Fe, 9-11 Al, 0.50 max Mn, 0.5 max Ni
Cast 85,000 TS, 45,000 YS, 25 El
For gears, propellers, shafts, Al-bronze, corrosion resistant

PROMET 104 AB
M-956, 10-11 Al, 3-5 Fe, 1.0 max Ni, 0.5 max Mn, 83.0 min Cu
Sand Cast (min): 80,000 TS, 30,000 YS; 12 El, 145 Brin.
Centrifugal (min): 90,000 TS, 32,000 YS; 12 El, 150 Brin.
For gears, worm wheels, rolling mill bearings, and slippers, bearing races.
Aluminum bronze, wear and fatigue and corrosion resistant.

PROMET 115-N.
M-956; 78 min Cu, 3.0-5.0 Fe, 3.0-5.5 Ni, 10.0-11.5 Al, 3.5 max Mn.
Cast: 100,000 TS; 45,000 YS; 8 El; 195 Brin.
Heat Treated 118,000 TS; 80,000 YS; 7 El; 240 Brin.
For bearings, gears, cams, valve and pump parts, castings.
Corrosion resistant, heat treatable. ASM 4880.

PROMET 150.
M-956; 60-68 Cu, 0.2 max Sn, 0.2 max Pb, 2.0-4.0 Fe, 3.5-5.0 Al, 2.5-5.0 Mn, bal Zn.
Cast (min): 90,000 TS; 45,000 YS; 18 El.
For gears, cams, hydraulic cylinder parts, bearings

PROMET 200.
M-956; 60-68 Cu, 3.5-7.0 Al, 2.0-4.0 Fe, 2.5-5.0 Mn, 0.2 max Sn, 0.2 max Pb, bal Zn.
Sand cast: 110,000-119,000 TS; 60,000-80,000 YS; 12-14 El, 200-225 Brin.
For valve stems, gears, cams, bridge parts, heavy load bearings, hydraulic cylinder parts.
SAE 430B ASTM B147-8C.

PROMET 406
M-956, 62 Cu, 1.0 Sn, 1.0 Pb, 36 Zn (nominal).
Cast: 40,000 TS; 14,000 YS, 15 El .
For bushings, hardware fittings, ornaments.
QQ-B-621 Class A

PROMET 712
M-956, 67-72 Cu, 8.5-11.0 Sn, 18-22 Pb, 0.25-1.0 Ni
Sand cast 33,000 TS, 17,000 YS, 18 El, 53-63 Brin
For bearings, especially under boundary or mixed film lubricants

PROMET 782
M-956, 65-72 Cu, 7.0-9.0 Sn, 20-24 Pb, 0.25-1.0 Ni
Sand cast 30,000 TS, 17,000 YS, 15 El, 45-60 Brin
High lead tin bronze; for bearings, especially under boundary or mixed film lubricants, Can deform to correct bad fit.

PROMETAL
M-700, C, Cr, Ni, bal Fe
For stainless parts, heat and corrosion resistant

PROMETAL CHROME INOXYDABLE R F
M-700, C, Cr, Ni, bal Fe
For stainless parts; heat and corrosion resistant

PROMETAL INOXYDABLE R F -3.
M-700, C, Cr, Ni, bal Fe
For stainless parts; heat and corrosion resistant

PROMET BRONZE 53
M-956, 11.5-12.5 Sn, 0.02 max P, (others 0.5 max), bal Cu
Cent. Cast 50,000 TS, 25,000 YS, 12 El; 95 Brin.
For worm gears and wheels

PROMET BRONZE 53L
M-956, 9.75-11.5 Sn, 0.3 max P, 0.25 Pb, (others 0.5) 1.25-1.75 Ni, 85-89 Cu
Cent Cast. 35,000 TS; 12 El, 85 Brin.
For worm gears and wheels.

PROMET BRONZE 53N
M-956, 11.0-12.0 Sn, 0.25 max P, (others 0.5 max), 1.25-1.75 Ni, bal Cu
Cent. Cast 50,000 TS, 28,000 YS; 12 El, 100 Brin
For worm gears and wheels.

PROMETHIUM.
67 Cu, 30 Zn, 3 Al
For condenser tubes, high ductility

PROMET M-640
M-956; 84-88 Cu, 10-12 Sn, 0.5-1.25 Pb, 1.25-1.75 Ni, 0.10-0.30 P.
Centrifugal Chill Cast. 55,000 TS; 27,000 YS; 12 El.
For heavy duty bearings, gears, worm wheels.

PRONET P-48N.
M-956; 9.25-10.75 Sn, 2.0-3.5 Pb; 3.0-4.0 Ni, (others 1.25), bal Cu.
Leaded nickel tin bronze.
Sand Cast: 50,000 TS; 28,000 YS; 18 El; 85 Brin.
For heavy duty bearings, nuts, gears, worm wheels. ASTM B427; Alloy D.

PROMET X.
M-956; 75 Sb, 3.5 Cu, bal Sn.
Cast: 10,900 TS; 8 El.
For bearings, bushings; Babbitt; C.S. 13625.

PROMET XX.
M-956; 7.5 Pb, 15 Sb, 10 Sn.
Cast: 10,500 TS; 4 El.
For bearings, bushings; Babbitt; C.S. 17150.

PROMET XXX
M-956; 17.5 Sb, 1.4 Sn, 1.5 As, 0.5 Cu, bal Pb.
Cast: 10,350 TS; 2 El.
For bearings, bushings; Babbitt; C.S. 14200.

PROPELLER BUSHING.
69 Zn, 19 Sn, 7 Sb, 5 Cu
For propeller bushings.

PROPLATINUM.
72 Ni, 23.6 Ag, 3.7 Bi, 0.7 Au.
For corrosion resistant parts; platinum substitute.

PROTECTIVE DECK PLATE.
3.5 Ni, 1.5 Cr, 0.2-0.3 C, bal Fe.
For armor plate, case-hardened.

PROTECTIVE NETTING.
27.8 Ni, 0.4 C, bal Fe.
For armor steel for torpedo defense, netting; corrosion resistant

PROTOCHROME.
M-1201, 2.0-2.5 C, 24-27 Cr, bal Fe.
Welded 600 Brin
For hard surfacing electrode; heat and abrasion resistant

PROTOLOY
M-1523, 80 Ni, 20 Cr
Resistance Wire: 650 ohms per cir mil. ft.
Ann: 100,000 psi, hard drawn· 225,000 psi
For resistors and heating elements.
Max. oper. temp.: 1100°C.

PROTOLOY B
M-1523, 80 Ni, 20 Cr.
Resistance wire· 680 ohms per cir, mil ft
Ann: 100,000 psi, hard drawn 225,000 psi
For resistors.
Max oper temp.: 1100°C

PSI NO. 1.
M-1053, 0.92-1.02 C, 0.95-1.2 Mn, 0.5-0.7 Si, 0.9-1.15 Cr, bal Fe.
For master tools, gauges, ceramic molds; non-deforming, wear resistant.

PSI NO 2.
M-1053; 0.87-0.97 C, 1.4-1.7 Mn, 0.6-0.8 Si, 1.4-1.7 Cr, bal Fe.
For master tools and gauges, clutch liners, pump sleeves; non-deforming, wear resistant.

PSP.
M-459; 0.5 C, 0.25 Si, 0.50 Mn, 1 Cr, 3.25 Ni, bal Fe.
For coining dies, gears, shafts; oil hardened, tough.

PSU.
M-459; 0.08 C, 0.4 Mn, 0.05 Si, bal Fe.
Welded: 68,000 TS; 45,000 YS; 30 El; 60 RA.
For welding rod.

P-TIN ALLOY.
M-1557; 55.5 Sn, 41.1 Pb, 3.4 Sb.
For soldering.
Soft solder.

PULSUS.
M-912; 0.35-0.42 C, 4.7-5.0 Cr, 1.5 Ni, 0.5 Mo, 0.2 V, bal Fe.
For tools, dies; hot work steel.

PUMP COCKS.
72 Zn, 7 Cu, 21 Sn.
For pump cocks; castings.

PURALLOY.
M-1466: 3 C, Si, Mn, bal Fe.
For rolls for paper and allied industries; cast iron.

PURCO CHISEL.
M-372, 0.7 C, 2 Si, 0.9 Mn, bal Fe.
For chisels, punches; tough.

PURE ORE AIRCHROME see AIR CHROME.

PURE ORE CLIPPER see CLIPPER.

PURE ORE D-C-33.
M-335; 0.33 C, 5 Cr, 1.4 W, 1.6 Mo, 0.9 Si, 0.3 Mn, bal Fe.
For hammer dies, press tools, punches, hot shears; hot work steel, oil hardened.

PURE ORE EXTRA.
M-335, C as specified, bal Fe.
For tools, dies; water hardening; AISI W1.

PURE ORE HI-RUN see HI-RUN.

PURE-ORE KLS-44.
M-335, 0.57 C, 0.5 Mn, 1 Cr, 0.9 Mo, 1.4 Ni, bal Fe.
For hot work dies; hot work steel.

PURE ORE SPECIAL.
M-335, C as specified, bal Fe
Water hardening tool steel; for dies and special tools, AISI W1.

PURE ORE STANDARD.
M-335; C as specified; bal Fe.
Water hardening tool steel; for tools, dies, AISI W2.

PURE ORE SUPERALLOY see SUPERALLOY.

PURE SILVER SOLDER.
72 Ag, 28 Cu.
For silver solder, corrosion resistant.

PURETUNG.
M-725, 99.9 W.
For welding electrodes

PURO 18/8.
M-1339, 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks; Type 302; stainless, austenitic.

PURO H.
M-1339; 0.4 C, 13 Cr, 0.4 Si, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 25 El; 55 RA; 200 Brin.
For valve trim, gauges, valves, turbine blades; Type 420; corrosion resistant.

PURO M.
M-1339; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 28 El; 58 RA; 195 Brin.
For valve trim, gauges, cutlery, turbine blades; Type 420: stainless, hardenable.

PURO-MMo
M-1652; 0.20 C, 13 Cr, 1 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; B 92 Rock.
Ht. Tr.: 250,000 TS; 215,000 YS; 8 El; C 52 Rock.
For cutlery, surgical instruments, gears, shafts, needle valves, gages.
Corrosion resistant, hardenable.

PURO-MMo 2.
M-1652; 0.15 C, 13 Cr, 1 Mo, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 30 El; B 80 Rock.
Cold Drawn: 95,000 TS; 80,000 YS: 15 El; B 92 Rock.
For chemical plant and oil refinery equipment.
Corrosion resistant.

PURON.
M-118; 99.95 Fe
For spectroscopic and magnetic standards; high purity iron.

PURO W.
M-1339; 0.10 C, 0.4 Si, 13 Cr, bal Fe
Annealed: 75,000 TS; 40,000 YS, 35 El; 70 RA; 155 Brin.
Cold drawn· 100,000 TS; 85,000 YS; 17 El; 60 RA; 200 Brin.
For valve trim, cutlery, surgical instruments, Type 410; stainless.

PURPLE CUT STEEL.
M-1; 1.2 C, 1.2 Cr, 1 2 Mo, 0 25 V, 1 2 Si, 0 40 W, 0.3 Mn, bal Fe.
For taps, threading dies, broaches, milling cutters, drills, and tools, punches, retains cutting edge at purple heat

PURPLE LABEL.
M-69; 0 74 C, 5 Co, 18.5 W, 4.3 Cr, 1 5 V, bal Fe.
For high speed cutting tools, lathe and planer tools; high speed steel.

PURPLE LABEL.
M-69; 1.1 C, 0 20 Mn, bal Fe, Co
For tools, turning tools; high speed steel

PURPLE LABEL
M-343; 0 5-1 1 C, 0.2-0 9 Mn, bal Fe.
Water hardened
For tools.

PURPLE LABEL EXTRA
M-69; 0 78 C, 0 8 Mo, 18 5 W, 8 Co, 2 V, 4 Cr, bal Fe.
Annealed 228-241 Brin
For heavy roughing cutters, lathe and planer tools; Type T5; high speed steel.

PURPLE LABEL SPECIAL.
M-69; 0.79 C, 4 Cr, 2 V, 0.75 Mo, 14 W, 5 Co, bal Fe.
For lathe and planer tools, drills, broaches; high speed steel

PW2.
M-459; 0 55 C, 1.25 Cr, 2 75 W, 0.2 V, bal Fe.
Heat Treated: 231,000-315,000 TS; 209,000-275,000 YS, 9-11 El; 27-42 RA; C 48-56 Rock.
For headers and swaging dies, chipping chisels, rivet busters, track tools.
Type S1 shock resisting tool steel, good fatigue resistance.

PW 190R.
M-1321; 0.35 C, 2.8 Cr, 9 W, 0.3 V, bal Fe.
For extrusion rams and liners; hot work steel, oil hardened.

PWA-649.
M-1491; 0 03-0.10 C, 0.35 max Mn, 50.0-55.0 Ni, 17.0-21 0 Cr, 2.8-3.0 Mo, bal Fe.
At R T. 200,000 TS; 170,000 YS; 20 El; 25 RA; C 42 Rock
At 1200°F: 165,000 TS; 140,000 YS; 20 El; 25 RA.
For aircraft and jet engine components, high temperature bolting.
Similar to alloy 718C, Corrosion and oxidation resistance.

PWA651A
M-1278; 23 5-26 5 Cr, 2-4 Mo, 5 max Fe, 10-15 Co, 6-8 W, bal Ni.
For jet engine components; heat and corrosion resistant.

PWA 652
M-1491, 0 10 max C, 0 50 max Mn, 0 75 max Si, 18-21 Cr, 3 5-5 0 Mo, bal Ni
Heat Treated: 188,000 TS; 115,000 YS; 28 El, 25 RA
For jet engine and gas turbine buckets and discs, high temperature bolts
Creep and heat resistant Similar to Waspaloy

PWA 653
M-1491, 0.4-0 5 C, 10-12 W, 20-22 Cr, 1 max Ni, 0 6 max Fe, 1.5-2 0 Cb + Ta, bal Co
Cast 120,000 TS; 90,000 YS; C 38 Rock.
At 1800°F 37,000 TS, 27,000 YS; 24 El.
For gas turbine engine components, turbine nozzle vanes.
High heat and oxidation resistant in the 1000-2000°F range

PWA 656B
M-1491; 0 05-0 09 C, 0 15 max Mn, 0 20 max Si, 14 0-15 5 Cr, 3 90 4.90 Mo, bal Ni
Rolled 205,000 TS, 140,000 YS, 17 El, 20 RA
For turbine and jet engine components, combustion chambers
Creep and oxidation resistant Similar to U-700.

PWA 663.
M 1491; 0 1 C, 8 Cr, 10 Co, 6 Mo, 4 25 Ta, 6 Al, 1 Ti, Zr, B, bal Co.
At R T · 141,000 TS; 120,000 YS, 8 El
At 1400°F· 138,000 TS, 117,000 YS, 4 El
For high temperature applications, turbines, jet engines
Heat resistant Similar to B1900.

PWA 664
M-1491, 0 12-0 17 C, 8 10 Cr, 11 5-13 5 W, 9-11 Co, 0 75-1 25 Cb, 4 7-5 2 Al, 2 Ti, 0 05 Zr, 0 01-0 02 B, bal Ni
As Cast 135,000 TS, 120,000 YS, 7 El
At 1400°F: 135,000 TS, 122,000 YS, 3 5 El.
For cast turbine blades and vanes in aircraft gas turbines
Precipitation hardening, high temperature strength.

PWA 786A.
M-1278; 0 25 max C, 15 5-17 5 Cr, 3 5-5.0 Ni, 3 5-4 5 Cu, 0 2 Ti, bal Fe.
For chemical plant equipment; heat and corrosion resistant

PWA 1030
M-1491, 0 06 C, 0.08 Mn, 0 01 S, 0 004 P, 0 1 Si, 20 5 Cr, 14 2 Co, 4.2 Mo, 3 Ti, 1.5 Al, 0.03 Zr, 0 003 B, 0 05 Cu, bal Ni
Aged 186 000 TS; 138,000 YS; 26 El; C 39 Rock
For jet engine turbine buckets and discs, high temperature bolts, missile systems
Precipitation hardened. Waspalloy. High temperature strength.

P.X.D.
M-73; C, W, Ni, Mo, bal Fe.
For piercing points, hot forging dies; for hot working.

PYR-AIR-DIE
M-1432; C, alloy, bal Fe.
For blanking and forming dies, cutter blades; air hardened, non-deforming.

PYR-AIR-DIE MODIFIED.
M-1432; 0.55 C, 0.9 Mn, 0.25 Si, 3.5 Cr, 0.25 Ni, 0.25 V, 1.4 Mo, bal Fe
Air or oil hardening tool steel.

PYRAL.
M-104; 0.12 max C, 6 Cr, Mo, Al, bal Fe
Annealed: 70,000 TS, 30,000 YS, 28 El, 65 RA, 160 Brin.
For oil refinery equipment; Type 501; corrosion and creep resistant.

PYRALLOY
M-472; 0.3 C, 12-16 Cr, bal Fe.
69,000 TS
For furnace parts, valves for internal combustion engines, heat and corrosion resistant to 800°C

PYRAMID BABBITT
M-178; Sn, Sb, bal Pb.
Cast 17,800 TS; 8,870 Brin
For bearings, Babbitts; pouring temperature 875-1000°F

PYRAMID SPECIAL
M-433, 0.9-1.2 C, bal Fe
For tools, dies, drills, water hardening.

PYRASTEEL NO 14
M-146, 0.2 C, 18 Cr, 0.5 Mo, bal Fe
At 70°F 110,000 TS, 75,000 YS; 18 El, 32 RA, 215 Brin
At 1000°F 70,000 TS; 49,000 YS, 24 El, 64 RA
For corrosion and heat resistant parts, oil refineries, corrosion and heat resistant

PYRASTEEL NO 18
M-146, 25-28 Ni, 16-18 Cr, 2.5 Si, bal Fe
For chain conveyors, lead pots, resistant to 1800°F

PYRASTEEL NO 20
M-146, 0.2 C, 17-18 Cr, 35-38 Ni, 2.5 Si, bal Fe
For heat resistant parts, furnace parts; corrosion and heat resistant

PYRASTEEL NO 2000
M-146, 25-27 Cr, 12-14 Ni, 1.5 Si, C, bal Fe
For castings, kilns, clinker coolers, heat and corrosion resistant to 2000°F

PYRASTEEL-A.
M-146, 0.3 C, 4-8 Ni, 8 Cr, bal Fe
For carburizing boxes, furnace parts and grids, heat resistant parts; heat resistant

PYRASTEEL-B
M-146; 0.3 C, 15 Ni, 14 Cr, bal Fe.
For carburizing boxes, furnace parts; heat resistant

PYRASTEEL-C.
M-146, 0.3 C, 25 Ni, 20 Cr, bal Fe.
Cast 68,000 TS; 38,000 YS, 17 El, 160 Brin
For furnace parts, torch nozzles, trays; heat resistant

PYRASTEEL-D.
M-146; 0.3 C, 35 Ni, 25 Cr, bal Fe
Cast: 70,000 TS; 40,000 YS; 10 El; 12 RA; 170 Brin.
For carburizing boxes, pots; heat resistant.

PYRASTEEL SPECIAL.
M-146, 14 Ni, 25-28 Cr, 2.5 Si, bal Fe.
For salt pots; resistant to 2000°F.

PYROCAST.
M-192; 1.75-2.0 C, 24-28 Cr, bal Fe.
Cast: 70,000 TS; 70,000 YS; 0 El; 0 RA; 300 Brin.
For heat treating and carburizing boxes, furnace parts; high heat resistance

PYROCHROM 20
M-1342, 0.05 max C, 25 Cr, 20 Ni, bal Fe.
Quenched 83,500-106,700 TS; 42,700 min YS, 30 min El
For heat conducting material for electric heating; working temp. max. 1920°F.

PYROCHROM 30.
M-1342; 0.05 max C, 20 Cr, 33 Ni, bal Fe.
Quenched. 85,300-106,700 TS; 42,700 min YS; 30 min El
For heat conducting material for electrical heating; working temp max. 2060°F.

PYROCHROM 60
M-1342, 0.05 max C, 15 Cr, 64 Ni, bal Fe
Quenched 85,300-106,700 TS, 42,700 min YS; 30 min El.
Heat conducting material for electric heating; working temp max 2010°F

PYROCHROM 80
M-1342; 0.05 C, 20 Cr, 80 Ni.
Quenched: 85,300-106,700 TS, 42,700 min YS; 30 min El
For electrical heating elements, working temp. max 2190°F

PYRO DIE
M-38, 0.4 C, 1.0 Cr, 0.25 V, bal Fe
For hot work tools, header dies, chipping chisels; hot work steel.

PYRODIE
M 1724, 0.40 C, 1.0 Si, 5.0 Cr, 1.3 Mo, 1.0 V, bal Fe
Air or oil hardening hot die steel.
For drawing dies, hot gripper dies, heading dies, drawing dies, extrusion dies

PYRODUR 7
M-1290, 0.3 C, 2.2 Si, 6 Cr, bal Fe
For heat resistant parts, corrosion and heat resistant

PYRODUR 8
M 1290, 0.60 C, 13 Cr, 1.5 Si, bal Fe
For corrosion resistant parts; GX60CrSi13; stainless

PYRODUR 9
M-1290, 0.50 C, 17 Cr, 1.5 Si, bal Fe
For corrosion resistant parts, GX50CrSi17; stainless

PYRODUR 10
M-1290; 0.60 C, 1.5 Si, 22 Cr, bal Fe.
For heat treating boxes, furnace parts, GX60CrSi22; heat resistant

PYRODUR 12
M-1290, 0.6 C, 1.5 Si, 29 Cr, bal Fe
For heat treating boxes, furnace parts; GX60CrSi29; heat resistant

PYRODUR 12R.
M 1290; 1.3 C, 1.5 Si, 29 Cr bal Fe
For furnace parts; GX130CrSi29; heat resistant.

PYRODUR CN5.
M-1290, 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
For furnace parts, heat treating boxes; GX40CrNiSi274; heat resistant.

PYRODUR CN10.
M-1290; 0.4 C, 2 Si, 22 Cr, 9.5 Ni, bal Fe.
For refinery and chemical plant equipment; GX40CrNiSi229; corrosion and heat resistant, austenitic.

PYRODUR CN15.
M-1290; 0.4 C, 2 Si, 26 Cr, 14 Ni, bal Fe.
For furnace parts, heat treating boxes; GX40CrNiSi2614; corrosion and heat resistant.

PYRODUR CN20
M-1290; 0.4 C, 2 Si, 25 Cr, 19 Ni, bal Fe.
For heat treating boxes, furnace parts; GXCrNiSi2519, heat resistant.

PYRODUR CN38.
M-1290; 0.4 C, 2 Si, 18 Cr, 38 Ni, bal Fe.
For heat treating boxes, furnace parts; GXCrNi1838; heat resistant.

PYRODUR P7.
M-1290, 0.30 C, 6 0 Cr, 2.25 Si, bal Fe
Cast, annealed: 71,000-100,000 TS; 6 min El.
Elevated temperature applications; resistant to scaling to about 700°C
Werkstoff Nr 1.4710; DIN G-X30CrSi6.

PYRODUR P8.
M-1290; 0.60 C, 13 0 Cr, 1 25 Si, bal Fe
Cast, annealed: 71,000-100,000 TS, 4 min El.
Elevated temperature applications; resistant to scaling to about 800°C.
Werkstoff Nr. 1.4729; DIN G-X45CrSi13.

PYRODUR P9.
M-1290; 0.50 C, 17 0 Cr, 1 25 Si, bal Fe
Cast, annealed· 71,000-100,000 TS, 2 min El.
Elevated temperature applications; resistant to scaling to about 900°C
Werkstoff Nr. 1.4740, DIN G-X40CrSi17

PYRODUR P9R.
M-1290; 1 5 C, 19.0 Cr, 1 25 Si, bal Fe
Cast, annealed 250-350 Brin.
Elevated temperature applications; resistant to scaling to about 900°C.
Werkstoff Nr. 1 4743, DIN G-X160CrSi18.

PYRODUR P10
M-1290, 0.60 C, 22 5 Cr, 1.6 Si, bal Fe
As cast: 200-280 Brin.
Elevated temperature applications; resistant to scaling to about 1050°C
Werkstoff Nr 1 4745, DIN G-X40CrSi23

PYRODUR P12
M-1290; 0.60 C, 29 0 Cr, 1.6 Si, bal Fe.
As cast· 220-300 Brin
Elevated temperature applications, resistant to scaling to about 1180°C
Werkstoff Nr. 1.4776; DIN G-X40CrSi29

PYRODUR P12R.
M-1290; 1 40 C, 29.0 Cr, 1.60 Si, bal Fe.
Cast, annealed: 250-350 Brin
Elevated temperature applications, resistant to scaling to about 1150°C.
Werkstoff Nr 1.4777; DIN G-X130CrSi29.

PYRODUR P-CN 5
M-1290; 0.35 C, 27 0 Cr, 4.0 Ni, 1 25 Si, bal Fe
As cast: 64,000-85,000 TS; 42,500 min YS; 4 min El.
Elevated temperature applications; resistant to scaling to about 1150°F.
Werkstoff 1.4823; DIN G-X40CrNiSi27 4
ASTM A297 Gr.HC.

PYRODUR P-CN 10.
M-1290; 0.30 C, 22.0 Cr, 10.0 Ni, 1.25 Si, bal Fe.
As cast: 71,000-91,000 TS, 12 min El.
Elevated temperature operation: resistant to scaling to about 1050°C.
Werkstoff Nr. 1 4826; ASTM A297 Gr.HF.
DIN G-X40CrNiSi229.

PYRODUR P-CN 13
M-1290; 0.30 C, 25 0 Cr, 12.5 Ni, 1.25 Si, bal Fe.
As cast· 71,000-92,000 TS; 10 min El
Elevated temperature operations, resistant to scaling to about 1150°C.
Werkstoff Nr 1 4837, DIN G-X35CrNiSi2512, ASTM A297; Gr HH

PYRODUR P CN 13H
M-1290, 0 70 C, 25 0 Cr, 12.5 Ni, 1.25 Si, bal Fe.
As cast 71,000-92,000 TS, 3 min El
Elevated temperature operations· resistant to scaling to about 1100°C
DIN G-X70CrNiSi2512

PYRODUR P-CN 13S
M-1290, 0 08 C, 25 0 Cr, 12 5 Ni, 1 25 Si, bal Fe
Sol. ann & age 64,000 85,000 TS; 28,000 min YS; 20 min El
Elevated temperature operations; resistant to scaling to about 1100°C
DIN G-X8CrNiSi2512, ASTM A351 Gr CH 20

PYRODUR P-CN 13 W
M-1290, 0.12 C, 23 0 Cr, 12 5 Ni, 1 25 Si, bal Fe
Sol ann & age 64,000-85,000 TS, 28,000 min YS, 20 min El
Elevated temperature operation, resistant to scaling to about 1080°C
DIN G X12CrNiSi2312, ASTM A351, Gr CH 10.

PYRODUR P CN 15
M-1290, 0 30 C, 27 0 Cr, 15 5 Ni, 1 25 Si, bal Fe
As cast 71,000 92,000 TS, 8 min El
Elevated temperature operations, resistant to scaling to about 1150°C
Werkstoff Nr 1 4846, DIN G-X40CrNiSi2614, ASTM A297, Gr HI

PYRODUR P-CN 15H
M-1290, 0 70 C, 27 0 Cr, 15 5 Ni, 1 25 Si, bal Fe
As cast· 71,000-92,000 TS, 3 min El
Elevated temperature operations, resistant to scaling to about 1150°C.
DIN G-X70CrNiSi2715

PYRODUR P-CN 15T
M-1290, 0 30 C, 19 5 Cr, 15 0 Ni, 1 25 Si, bal Fe
As cast 71,000 92,000 TS, 12 min El
Elevated temperature operations, resistant to scaling to about 1050°C
DIN G-X25CrNiSi2014, Werkstoff Nr. 1 4832

PYRODUR P-CN 15TW
M-1290, 0 12 C, 19 5 Cr, 15 0 Ni, 1 0 Si, bal Fe
Sol ann & age 64,000 85,000 TS, 28,000 min YS, 20 min El
Elevated temperature operations, resistant to scaling to about 1050°C
DIN G-X15CrNiSi2015

PYRODUR P-CN 15W
M-1290; 0 12 C, 27 0 Cr, 15 5 Ni, 1 25 Si, bal Fe
Sol ann. & age· 64,000-85,000 TS, 28,000 min YS, 20 min El
Elevated temperature operations, resistant to scaling to about 1150°C
DIN G X12CrNiSi2715.

PYRODUR P-CN 20
M-1290, 0 30 C, 25 0 Cr, 20 0 Ni, 1.25 Si, bal Fe.
As cast· 64,000-85,000 TS, 28,000 min YS; 8 min El
Elevated temperature operations; resistant to scaling to about 1150°F.
Werkstoff Nr 1 4848, DIN G-X40CrNiSi2520; ASTM A297, Gr.HK.

PYRODUR P-CN 20H.
M-1290; 0.70 C, 25.0 Cr, 20.0 Ni, 1.75 Si, bal Fe.
As cast: 71,000-92,000 TS; 3 min El
Elevated temperature operations; resistant to scaling to about 1150°C.
DIN G-X70CrNiSi2520.

PYRODUR P-CN 20W
M-1290, 0.15 C, 25.0 Cr, 21.0 Ni, 0.75 Si, bal Fe.
Sol ann. and age: 64,000-85,000 TS; 28,000 min YS, 20 min El.
Elevated temperature operations; resistant to scaling to about 1150°C
Werkstoff Nr 1.4849; DIN G X15CrNiSi2520.
ASTM A351; Gr CK20.

PYRODUR P-CN 35.
M-1290, 0.30 C, 35.0 Ni, 20.5 Cr, 1.75 Si, bal Fe
As cast: 64,000 85,000 TS; 10 min El
Elevated temperature operations; resistant to scaling to about 1150°C
DIN G-X30NiCrSi3520

PYRODUR P-CN 35 W
M-1290, 0.10 C, 35.0 Ni, 20.5 Cr, 1.75 Si, bal Fe
Sol ann & age 64,000-85,000 TS, 28,000 min YS; 20 min El
Elevated temperature operations, resistant to scaling to about 1150°C.
DIN G X10NiCrSi3520

PYRODUR P-CN 38
M-1290, 0.25 C, 37.0 Ni, 17.5 Cr, 1.25 Si, bal Fe
As cast 64,000 85,000 TS; 8 min El
Elevated temperature operations, resistant to scaling to about 1120°C.
Werkstoff Nr 1.4865, DIN G X40NiCrSi3616
ASTM A297, Gr HU

PYRODUR P CN 60
M 1290 0.35 C, 53.0 Ni 21.0 Cr, bal Fe
As cast 57,000 78,000 TS, 4 min El
Elevated temperature operations; resistant to scaling to about 1050°C
DIN G-X35NiCr5422

PYRODUR P CN 80
M 1290, 0.15 C, 78.0 Ni 14.0 Cr, bal Fe
Sol ann & age 64,000 85,000 TS, 31,000 min YS 12 min El
Elevated temperature operations, resistant to scaling to about 1020°C.
DIN G-X15NiCr7814

PYROFERAL
Czech , C, Cr, bal Fe
For furnace parts and equipment, heat resistant

PYR OIL DIE
M-1432, C, alloy, bal Fe
For dies, punches, crimpers, knives, oil hardened, non deforming

PYROMET see CARPENTER PYROMET

PYROMIC
M 108, 80 Ni, 20 Cr
121,000 TS
For electrical resistance, formerly "Pyromic No 2"

PYRON 6
M-1331, C 2-3 Si, 6 Cr, bal Fe
For oil refinery equipment, creep and heat resistant

PYRON 7
M 1331, C, 2-3 Si, 6 Cr, bal Fe
For oil refinery equipment, creep and heat resistant.

PYRON 8
M-1331, 0.12 max C, 2-3 Si, 6 Cr, bal Fe
For oil refinery equipment; heat and creep resistant

PYRON 8A1
M-1331; 0.12 max C, 0.8 Si, 0.8 Al, 6.5 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant.

PYRON 9
M-1331, 0.12 max C, 2.2 Si, 13 Cr, bal Fe.
Annealed. 80,000 TS, 40,000 YS; 35 El; 65 RA; 160 Brin
For valves, pumps, oil refinery equipment; heat and corrosion resistant

PYRON 9A1
M-1331, 0.12 max C, 1.2 Si, 1.0 Al, 13 Cr, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 35 El; 65 RA; 160 Brin.
For valves, pumps, oil refinery equipment; heat and corrosion resistant.

PYRON 10.
M-1331; 0.12 max C, 2 Si, 18 Cr, bal Fe.
Annealed 85,000 TS, 45,000 YS; 25 El, 50 RA; 160 Brin
For furnace parts and equipment, heat and corrosion resistant

PYRON 10A1
M-1331, 0.12 max C, 1 Si, 1 Al, 18 Cr, bal Fe.
Annealed 85,000 TS, 45,000 YS; 25 El, 50 RA, 160 Brin
For oil refinery equipment, heat and corrosion resistant.

PYRON 12A1
M-1331, 0.12 max C, 1.5 Si, 1.5 Al, 24 Cr, bal Fe.
Annealed 85,000 TS, 50,000 YS, 30 El, 55 RA; 180 Brin
For oil refinery and furnace equipment, heat resistant

PYRON 16 36
M-1331, 0.12 C, 16 Cr, 25 Ni, bal Fe
For furnace parts, chemical plant equipment; corrosion and heat resistant

PYRON 20 13
M-1331, 0.12 C, 20 Cr, 13 Ni, bal Fe
Annealed 80,000 TS, 35,000 YS, 50 El, 65 RA, 160 Brin
For chemical plant equipment, stainless, austenitic.

PYRON 25 04 SPEZIAL
M-1331, 0.12 C, 25 Cr, 4 Ni, bal Fe
For furnace parts, valves, heat treating boxes; heat resistant

PYRON 2010
M-1331, 0.15 C, 19.5 Cr, 9.5 Ni, bal Fe
Annealed 80,000 TS. 35,000 YS, 55 El, 75 RA, 150 Brin
For chemical plant equipment, tanks, mixers; Type 302, stainless, austenitic

PYRON 2419
M-1331, 0.15 C, 2 Si, 24 Cr, 19 Ni, bal Fe
Annealed 100,000 TS, 45,000 YS, 50 El, 65 RA, 185 Brin
For furnace parts, valves, pumps, turbine parts; Type 310, stainless, austenitic

PYRON 2504.
M-1331, 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe.
For furnace parts, valves, heat treating boxes; heat resistant

PYRONEAL
M-64, 0.55 C, 0.9 Cr, 0.7 Mo, 0.6 Si, 2.2 Ni, bal Fe
For hot work dies, punches; oil or air hardened, hot work, press and upsetter dies.

PYRON G27.04.
M-1331; 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
Cast· 90,000 TS; 65,000 YS, 2 El; 212 Brin.
For furnace and turbine parts; heat resistant

PYRON G55.24Ni.
M-1331; 0.55 C, 1 3 Si, 55 Cr, 24 Ni, bal Fe.
For furnace parts; heat and oxidation resistant.

PYRON G85.
M-1331; 0.3 C, 2.2 Si, 6 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant.

PYRON G95.
M-1331; 0 5 C, 1 5 Si, 17 Cr, bal Fe.
For furnace parts, chemical plant equipment; heat and corrosion resistant

PYRON G105.
M-1331; 0 6 C, 1.5 Si, 22 Cr, bal Fe.
For furnace parts, heat treating boxes, heat resistant

PYRON G115
M-1331, 0.6 C, 1 5 Si, 29 Cr, bal Fe
For furnace parts, heat treating boxes, heat resistant.

PYRON G2210.
M-1331; 0.4 C, 2 Si, 22 Cr, 9 5 Ni, bal Fe
Cast 85,000 TS; 45,000 YS, 35 El, 165 Brin
For furnace parts, heat treating boxes, valves, corrosion and heat resistant

PYRON G2519.
M-1331, 0 4 C, 2 Si, 25 Cr, 19 Ni, bal Fe.
Cast· 75,000 TS; 50,000 YS, 17 El; 170 Brin
For pumps, valves, furnace parts, heat treating boxes, corrosion and heat resistant.

PYROPHORIC ALLOY.
U S; 10 Mn, 10 Sb, 20 Cr, 15 Ti, bal Fe
For lighters for gas stoves, cigarette lighters, produces violent sparks when abrased

PYROS.
M-104, 82 Ni, 7 Cr, 3 Fe, 5 W, 3 Mn
For dilatometric temperature indicating or control devices, heat resisting alloy

PYROTEM.
M-64; 0 55 C, 2.1 Ni, 0.87 Cr, 0 73 Mo, bal Fe
Annealed: 250 Brin.
Heat treated 570 Brin
For hot work dies, cold shear knives, oil hardened, shock resistant.

PYROTHERM 5 Mo
M-1342, 0.15 max C, 5 Cr, 0 5 Mo, bal Fe
Tempered· 64,000-92,000 TS, 35,600 min YS, 23 min El.
Heat resistant chromium steel, for furnace parts and equipment.

PYROTHERM 6
M-1342; 0 12 max C, 2 3 Si, 6 Cr, bal Fe
For oil refinery equipment, heat and creep resistant

PYROTHERM 14.
M-1342; 0.12 max C, 2 2 Si, 13 Cr, bal Fe.
Annealed 75,000 TS; 40,000 YS, 35 El; 70 RA; 155 Brin
For oil refinery equipment; creep and heat resistant.

PYROTHERM 18
M-1342; 0.12 max C, 2 Si, 18 Cr, bal Fe
Annealed 80,000 TS; 50,000 YS, 25 El; 50 RA; 150 Brin.
For oil refinery equipment, corrosion and heat resistant.

PYROTHERM 18/8.
M-1342; 0 12 max C, 18 Cr, 9 Ni, bal Fe.
Quenched 71,000-99,500 TS; 31,300 min YS; 40 min El
Bearing parts in industrial furnaces for mechanical loads

PYROTHERM 18/36.
M-1342, 0 15 max C, 18 Cr, 36 Ni, bal Fe.
Quenched. 78,200-106,700 TS, 38,400 min YS; 40 min El
Heat resistant austenitic Cr-Ni steel.
For parts, containers and equipment in carburizing atmosphere

PYROTHERM 20/15M
M-1342, 0 15 max C, 20 Cr, 14.5 Ni, 0 9 Mo, 1.2 Cb, bal Fe
For acid resistant, chemical plant equipment; stainless, austenitic, stabilized

PYROTHERM 20/15 MoNb.
M-1342, 0 13 max C, 20 Cr, 15 Ni, 1 3 Mo, 1.2 Nb, bal Fe
Quenched 85,300-106,700 TS, 42,700 min YS; 40 min El
Bearing bars in annealing furnaces.
Austenitic, heat resisting

PYROTHERM 20/33
M-1342, 0 15 max C, 20 Cr, 33 Ni, 0 4 Al, 0 4 Ti, bal Fe
Quenched 78,200-106,700 TS, 35,600 min YS; 40 min El
Austenitic heat resisting steel, for parts in petrochemical industry

PYROTHERM 22/10
M 1342, 0 15 C, 2 Si, 19 5 Cr, 9 5 Ni, bal Fe
Annealed 80,000 TS, 35,000 YS, 55 El; 75 RA, 150 Brin
For chemical plant equipment, tanks, mixers, Type 302, stainless, austenitic

PYROTHERM 25
M 1342, 0 12 max C, 1 5 Si, 24 Cr, 1 5 Al, bal Fe
For oil refinery equipment, heat and corrosion resistant.

PYROTHERM 25/4
M 1342, 0 2 C, 1 2 Si, 25 Cr, 4 Ni, bal Fe
Annealed 90,000 TS, 65,000 YS, 2 El, 212 Brin.
For furnace parts, oil refinery equipment, corrosion and heat resistant

PYROTHERM 25/12
M-1342, 0.20 max C, 25 Cr, 12 Ni, bal Fe
Quenched 85,300 106,700 TS, 42,700 min YS; 40 min El
Bearing parts in industrial furnaces for mechanical loads

PYROTHERM 25/20
M-1342 0 15 C, 2 Si, 24 Cr, 19 Ni, bal Fe.
Annealed 100,000 TS, 45,000 YS, 50 El, 65 RA; 185 Brin
For valves, pumps, furnace parts, Type 310, stainless

PYROTHERM 25/20 Nb
M-1342; 0 40 max C, 25 Cr, 20 Ni, 1 2 Nb, bal Fe.
As cast 71,100 99,600 TS, 35,600 min YS, 10 min El
Austenitic stainless, for heat exchanger tubes, annealing furnace grates, and castings for petroleum industry

PYROTHERM 28/48/5W
M-1342; 0 15 max C, 28 Cr, 48 Ni, 5 W, bal Fe.
Quenched: 78,200-113,800 TS, 38,400 min YS, 30 min El

Heat resistant austenitic steel.
For load carrying members at elevated temperatures.

PYROTHERM G 5 Mo.
M-1342, 0.12 max C, 5 Cr, 0.5 Mo, bal Fe.
Tempered 64,000-92,500 TS, 35,600 min YS; 23 min El.
Heat resistant chromium steel, for supports for furnace parts and other equipment at elevated temperature

PYROTHERM G6.
M-1342: 0.3 C, 2.2 Si, 6 Cr, bal Fe
For oil refinery equipment, heat and creep resistant.

PYROTHERM G14
M-1342; 0.5 C, 2.2 Si, 14 Cr, bal Fe
For valves, cutlery, turbine blades, knives; Type 420, stainless, hardenable

PYROTHERM G17.
M-1342; 0.5 C, 1.5 Si, 17 Cr, bal Fe
Annealed 80,000 TS, 50,000 YS, 25 El, 50 RA, 150 Brin.
Cold drawn 130,000 TS; 120,000 YS; 2 El; 185 Brin
For chemical plant equipment, furnace parts; corrosion resistant; Type CB50.

PYROTHERM G 18
M-1342, 0.40 max C, 18 Cr, bal Fe.
Annealed 78,000-113,800 TS, 49,800 min YS, 2 min El
Heat resistant chromium steel, for industrial furnace parts

PYROTHERM G18/8
M 1342, 0.15 C, 1.5 Si, 18 Cr, 8.5 Ni, bal Fe.
Annealed 80,000 TS, 35,000 YS, 55 El; 75 RA, 150 Brin
Cold drawn 150,000 TS, 100,000 YS, 15 El, 250 Brin
For chemical plant equipment, tanks, fixtures, mixers, Type 302, stainless, ferritic

PYROTHERM G 18/36H.
M-1342, 0.40 max C, 18 Cr, 36 Ni, bal Fe
As cast 56,900 85,300 TS, 29,900 min YS, 8 min El
Austenitic stainless, for grates, carburizing boxes in annealing and carburizing furnaces
ACI Type HU

PYROTHERM G 20/33
M-1342, 0.15 max C, 20 Cr, 33 Ni, bal Fe
As cast 56,900 85,300 TS, 25,600 min YS, 12 min El.
Austenitic stainless, for cracking tubes, heat exchanger tubes, similar high temperature equipment

PYROTHERM G 20/33H
M 1342, 0.40 max C, 20 Cr, 33 Ni, bal Fe
As cast 56,900 85,300 TS, 29,900 min YS; 8 min El
Austenitic stainless, for cracking tubes, heat exchanger tubes, similar high temperature equipment

PYROTHERM G 20/33Nb
M-1342, 0.10 max C, 20 Cr, 33 Ni, 1.5 Nb, bal Fe
As cast, 56,900 85,300 TS; 28,500 min YS, 8 min El
Austenitic stainless; for heat exchanger tubes, cracking equipment in petroleum industry, and similar parts for elevated temperature operation.

PYROTHERM G22/10.
M-1342; 0.4 C, 2 Si, 22 Cr, 9.5 Ni, bal Fe.
Cast: 85,000 TS; 45,000 YS; 35 El; 165 Brin
For conveyor belts, furnace parts, heat treat boxes, fixtures, corrosion and heat resistant Type HF.

PYROTHERM G 22/14
M-1342; 0.15 max C, 22 Cr, 14 Ni, bal Fe.
As cast 56,900-85,300 TS, 31,300 min YS; 14 min El
Austenitic stainless, for lightly loaded parts for furnaces and in petrochemical industry. ACI Type CH-20.

PYROTHERM G 24/24Nb.
M 1342, 0.30 max C, 24 Cr, 24 Ni, 1.5 Nb, bal Fe.
As cast 71,100-99,600 TS, 35,600 min YS; 10 min El.
Austenitic stainless; for heat exchanger tubes, annealing furnace grates, and castings for petroleum industry

PYROTHERM G25
M-1342, 0.40 max C, 25 Cr, bal Fe.
As cast 200-300 Brin
Heat resistant chromium steel, for furnace parts

PYROTHERM G25/4
M-1342, 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
Cast 70,000 TS, 65,000 YS; 2 El, 190 Brin.
Aged 115,000 TS, 80,000 YS; 15 El.
For furnace parts, grate bars, salt pots, baffles, soot blowers, Type HC, corrosion and heat resistant

PYROTHERM G25/12.
M-1342, 0.35 max C, 25 Cr, 12 Ni, bal Fe
As cast 64,000-92,500 TS, 34,100 min YS; 10 min El
Austenitic stainless, for lightly loaded parts for furnace and in petrochemical industry
ACI Type HE

PYROTHERM G25/20
M-1342, 0.4 C, 2 Si, 25 Cr, 19 Ni, bal Fe.
Cast 75,000 TS, 50,000 YS, 17 El, 170 Brin
Aged 85,000 TS; 50,000 YS, 10 El, 190 Brin
For furnace parts, retorts, skid rails, rabble arms, Type HK, corrosion and heat resistant

PYROTHERM G 25/20H
M-1342, 0.40 max C, 25 Cr, 20 Ni, bal Fe.
As cast 64,000 92,500 TS; 35,600 min YS, 10 min El
Austenitic stainless, for parts at elevated temperatures in furnaces and in petroleum industry
ACI*Type HK, ASTM A351 HK 40

PYROTHERM G25/35
M-1342, 0.5 C, 1.8 Si, 25 Cr, 30 Ni, bal Fe
For furnace parts, fixtures, conveyors, heat treat boxes, corrosion and heat resistant

PYROTHERM G 25/35H
M-1342, 0.35 max C, 25 Cr, 35 Ni, bal Fe
As cast 64,000-92,500 TS, 35,600 min YS, 8 min El
Austenitic stainless, for ethylene-tubes, collectors, heat exchanger equipment, cracking tubes

PYROTHERM G25H
M-1342, 0.6 C, 1.5 Si, 22 Cr, bal Fe
Cast 70,000 TS, 65,000 YS, 2 El, 190 Brin.
For furnace parts, heat treat boxes, skids, housings; heat resistant

PYROTHERM G26/14.
M-1342, 0.4 C, 2 Si, 26 Cr, 14 Ni, bal Fe.
Cast. 75,000 TS, 47,000 YS, 17 El, 25 RA; 200 Brin
For furnace parts, salt pots, stack dampers, grate bars, Type HH, corrosion and heat resistant.

PYROTHERM G28.
M-1342; 0.6 C, 1.5 Si, 29 Cr, bal Fe.
Cast: 70,000 TS; 65,000 YS; 2 El; 212 Brin
Heat treated: 97,000 TS; 65,000 YS; 18 El; 210 Brin.
For cylinder liners, bushings, valve seats and bodies; Type CC60.

PYROTHERM G28/5.
M-1342; 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
Cast: 70,000 TS; 65,000 YS; 2 El, 190 Brin
Aged: 115,000 TS; 80,000 YS, 15 El
For furnace parts, salt pots, fixtures, grates; Type HC; heat resistant.

PYROTHERM G 28/48/5W
M-1342, 0.45 C, 28 Cr, 48 Ni, 5 W, bal Fe
As cast: 56,900-85,300 TS, 42,700 min YS; 3 min El.
Good high temperature properties, for use in furnace equipment, tube supports, brackets and hangers for use at elevated temperature

PYROTHERM G28H
M-1342, 1.3 C, 1.5 Si, 29 Cr, bal Fe
For heat and abrasion resistant parts, heat and abrasion resistant

PYROTHERM G 50/50
M-1342, 0.04 max C, 50 Cr, 50 Ni
As cast 79,600 min TS, 49,800 min YS; 5 min El.
Good high temperature properties; for tube supports, brackets, hangers for furnaces, resistant to oil ash corrosion ASTM A560

PYROTHERM G 60/40
M-1342; 0.04 max C, 60 Cr, 40 Ni
As cast: 111,000 min TS
Good high temperature properties, for tube supports, brackets, hangers for furnaces; resistant to oil-ash corrosion.
ASTM A560.

PYROTHERM G UMCo 50
M-1342; 0.20 max C, 28 Cr, 50 Co, bal Fe.
As cast: 71,000-99,500 TS; 34,100 min YS, 8 min El
For parts and equipment in furnaces and other high temperature areas; working temperature to 2336°F

PYROTHERM G UMCo 51
M-1342; 0.30 max C, 28 Cr, 49 Co, 2 Nb, bal Fe
As cast 71,000-99,500 TS, 34,100 min YS, 4 min El
For parts and equipment in furnaces and other high temperature areas; working temperature to 2282°F

PYROTHERM UMCo 50.
M-1342; 0.10 max C 28 Cr, 50 Co, bal Fe
Quenched 99,500-128,000 TS, 49,800 min YS, 10 min El.
Cobalt base alloy for load carrying parts at elevated temperatures

PYROTHERM UMCo 51
M-1342, 0.10 max C, 28 Cr, 49 Co, 2 Nb, bal Fe.
Quenched: 113,800-142,000 TS, 56,900 min YS, 6 min El
Cobalt base alloy for load carrying parts at elevated temperatures

PYROTOOL A see CARPENTER PYROTOOL A.

PYROTOUGH
M-1724, 0.35 C, 2.75 Cr, 0.25 V, 9.5 W, bal Fe.
Air or oil hardening high tungsten tool steel for hot work; for tube mandrels, hot punches, hot heading dies, brass stamping dies, plastic mould cores

PYROVAN
M-73, 0.75 C, 1.0 Si, 5.25 Cr, 2.5 V, 1.1 Mo, bal Fe
Hardened. C 55-63 Rock.
Hot work die steel with extra high carbon for higher hardness and wear resistance.
For forging dies, hot press and forming dies.
Air hardenable, good temperature resistance.

PYTHON
M-1, 0.8-1.2 C, 0.2 V, 0.25 Mn, 0.25 Si, bal Fe.
Annealed: 88,000 TS; 54,000 YS; 20 El; 190 Brin
Ht Tr 215,000 TS; 188,000 YS; 9 El; 400 Brin.
For pneumatic tools, chisels, dies, shear blades.
Type W2 water hardening.

Q-ALLOY A
M 59, 0.35-0.75 C, 15-19 Cr, 64-68 Ni, bal Fe.
Cast. 65,000 TS, 36,000 YS; 9 El; 176 Brin
For lead pots, carburizing boxes, furnace fixtures, cyanide pots
Heat and corrosion resistant.

Q ALLOY B
M 59, 0.35-0.75 C, 58-62 Ni, 10-14 Cr, bal Fe
Cast 68,000 TS, 36,000 YS, 4 El; 185 Brin.
For furnace parts, carburizing and heat treating boxes, gas retorts, muffles
Heat resistant. Max operating temperature is 2000°F

Q ALLOY B-Si
M-59, 0.36-0.50 C, Si, 58-66 Ni, 16-23 Cr, bal Fe
For heat and corrosion resistant parts, heat and corrosion resistant

Q-ALLOY "C-1."
M-59, 26-30 Cr, bal Fe
Cast 80,000 TS, 40 000 YS, 3 El, 4 RA, 180 Brin
Heat treated 40,000-55,000 TS, 30.000-45,000 YS; 0-1 El, 0-2 RA, 160-550 Brin
Suited for acid mine water, nitric acid and bad sulfuric acid furnace conditions, heat treating boxes, corrosion and heat resisting

Q-ALLOY C-1SC
M-59, 0.25 max C, 28 Cr, 3 max Ni, bal Fe.
For salt pots, furnace equipment, high corrosion resistance, brittle.

Q-ALLOY "C-2."
M 59, 16-18 Cr, 0.4 C, bal Fe
Cast 60,000 TS, 55,000 YS; 12 El, 17 RA; 205 Brin
Heat treated 80,000 TS, 60,000 YS, 20 El, 35 RA
Suited for acid mine water and nitric acid corrosion resisting parts, heat treating boxes, corrosion resisting, heat resisting

Q-ALLOY "C-3."
M-59, 28-30 Cr, high C, 3 max Ni, bal Fe.
Cast 30,000-45,000 TS, 0 El, 0 RA, 300-600 Brin
For rolling mill guides, wear plates for crusher parts, chute plates, heat and wear resisting

Q-ALLOY CHROME C-1
M-59, 25-30 Cr, 3 max Ni, 0.2 C, bal Fe
For corrosion resistant castings; resists mine water corrosion

Q-ALLOY CHROME C-1A
M-59, 0.21-0.35 C, 24-30 Cr, bal Fe
For heat and corrosion resistant parts; heat and corrosion resistant

Q ALLOY CHROME C-2.
M-59, C, Cr, bal Fe.
For chemical equipment, resists nitric acid corrosion

Q-ALLOY CHROME C-2A.
M-59; 0.13-0.20 C, 12-15 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

Q-ALLOY CHROME C-2B.
M-59; 0.21-0.35 C, 12-15 Cr, bal Fe
For corrosion resistant parts; corrosion resistant.

Q-ALLOY CHROME C-2C.
M-59, 0.12 max C, 16-23 Cr, bal Fe.
For corrosion resistant parts; heat and corrosion resistant

Q-ALLOY CHROME C-2D.
M-59; 0.13-0.20 C, 16-23 Cr, bal Fe.
For corrosion resistant parts; heat and corrosion resistant

Q-ALLOY CHROME C-2E
M-59, 0.21-0.35 C, 16-23 Cr, bal Fe.
For corrosion resistant parts; heat and corrosion resistant.

Q-ALLOY CHROME C-3.
M-59, C, alloy, bal Fe
500 Brin
For mill guides, heat resisting to 2000°F.

Q-ALLOY CHROME C-3A.
M-59, 0.81-1.10 C, 16-23 Cr, bal Fe.
For heat and corrosion resistant parts, heat and corrosion resistant

Q-ALLOY CHROME CN1 A.
M-59; 0.21-0.35 C, 24-30 Cr, 7-11 Ni, bal Fe
For heat and corrosion resistant parts, heat and corrosion resistant

Q-ALLOY CHROME CN1-B
M-59; 0.13-0.20 C, 24-30 Cr, 12-15 Ni, bal Fe
For heat and corrosion resistant parts; heat and corrosion resistant

Q-ALLOY CHROME CN1-S
M-59, 0.36-0.50 C, 24-30 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant

Q-ALLOY CHROME CN2-A
M-59, 0.21-0.35 C, W, 16-23 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant

Q-ALLOY CHROME J
M-59, 0.12 max C, 12-15 Cr, bal Fe
For corrosion resistant parts, corrosion resistant.

Q-ALLOY CHROME K 1
M-59; Ni, Cr, bal Fe
For furnace parts not subject to high sulfur fumes; high heat resistance to 2200°F

Q-ALLOY CHROME KA-2
M-59; 0.13-0.20 C, 16-23 Cr, 7-11 Ni, bal Fe
For heat and corrosion resistant parts, stainless.

Q-ALLOY CHROME KA 2H.
M-59; 0.21-0.35 C, 16-23 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts; stainless.

Q-ALLOY CHROME KA-2Mo
M-59, 0.13-0.20 C, Mo, 16-23 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts;
heat and corrosion resistant

Q-ALLOY CHROME KA-2S.
M-59; 0.12 max C, 16-23 Cr, 7-11 Ni, bal Fe.
For stainless parts, stainless

Q-ALLOY CHROME KA-4.
M-59; 0.21-0.35 C, Mo, 16-23 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts;
heat and corrosion resistant.

Q-ALLOY KNC-3.
M-59; 0.13-0.20 C, Si, 24-30 Cr, 16-23 Ni, bal Fe.
For heat and corrosion resistant parts;
heat and corrosion resistant.

Q-ALLOY "C.N.1."
M-59, 24-26 Cr, 11-13 Ni, bal Fe.
Cast 65,000-85,000 TS, 40,000 YS; 10-27 El; 15-45 RA; 180-220 Brin
Heat treated 50,000-65,000 TS; 35,000-50,000 YS; 0-11 El; 0-12 RA;
For furnace parts where temperature is not excessive, heat treating boxes;
heat and corrosion resistant;
max operating temperature 2100°F

Q-ALLOY CN1-H
M-59; 0.13-0.20 C, 24-30 Cr, 7-11 Ni, bal Fe.
For furnace chains, muffles, retorts;
heat and corrosion resistant.

Q-ALLOY CN-1H-Mo
M-59, 0.13-0.20 C, Mo, 24-30 Cr, 7-11 Ni, bal Fe
For heat and corrosion resistant parts;
heat and corrosion resistant.

Q-ALLOY CN-1 Mo
M-59; 24-26 Cr, 11-13 Ni, 1.5-3.0 Mo, bal Fe
For pulp industry exposed to hot sulfite liquors and bleaches, corrosion and heat resistant.

Q-ALLOY "C.N.-2."
M-59, 18-20 Cr, 8-10 Ni, bal Fe
Cast 60,000-80,000 TS, 35,000-40,000 YS, 10-50 El, 10-40 RA, 160-210 Brin.
Heat treated 80,000-100,000 TS, 35,000-50,000 YS, 5-15 El, 10-20 RA
For heat treating boxes, furnace parts;
corrosion and heat resisting,
max operating temperature 2000°F.

Q-ALLOY CN2-MO
M-59, 17-21 Cr, 7-9 Ni, 1-4 Mo, 0.2 C, bal Fe.
For chemical equipment, stainless, austenitic.

Q-ALLOY, GRADE A-4
M-59, 66-68 Ni, 19-21 Cr, bal Fe.
Cast. 80,000-90,000 TS, 50,000-45,000 YS,
For carburizing boxes, retorts, solution pots, furnace parts, heat resistant to 2220°F

Q-ALLOY X-2
M-59, C, 30 Ni, 30 Cr, bal Fe
For high temperature applications,
corrosion and heat resistant

Q-ALLOY X-3.
M-59; C, 20 Ni, 30 Cr, bal Fe.
For high temperature applications;
corrosion and heat resistant

Q-ALLOY X-4.
M-59, C, 20 Ni, 25 Cr, bal Fe
For high temperature applications,
corrosion and heat resistant

Q-ALLOY X-5.
M-59, C, 5 Ni, 28 Cr, bal Fe.
For high temperature applications;
corrosion and heat resistant.

Q-ALLOY X-6
M-59, C, 16 Ni, 28 Cr, bal Fe.
For high temperature applications;
corrosion and heat resistant.

Q-ALLOY X-7.
M-59; 0.2 C, 25 Cr, 12 Ni, bal Fe.
For furnace rails and rollers, oil still tube supports;
austenitic, resists thermal shock and high stresses.

Q-ALLOY X-8.
M-59, C, 10 Ni, 20 Cr, bal Fe.
For high temperature applications; corrosion and heat resistant

Q-TEMP 10B18Q.
M-604; 0.15-0.20 C, 0.80-1.10 Mn, 0.20-0.35 Si, 0.0005 min B, bal Fe.
Rolled: 70,400 TS; 38,700 YP, 25 El; 63 RA; B 72 Rock.
For fasteners, bolts, screws, clips. Tough, water hardening.

Q-TEMP 10B21Q.
M-604; 0.18-0.23 C, 0.80-1.10 Mn, 0.20-0.35 Si, 0.00005 min B, bal Fe.
Rolled: 72,000 TS; 39,000 YS; 24 El; 62 RA, B 73 Rock.
For fasteners, bolts, screws, clips.
Tough, water hardening

Q-TEMP 10B22Q.
M-604, 0.17-0.23 C, 1.0-1.3 Mn, 0.20-0.35 Si, 0.0005 min B, bal Fe.
Rolled: 75,000 TS, 40,000 YS, 22 El; 60 RA, B 76 Rock.
For fasteners, screws, bolts, nuts.
Tough, water hardening

Q-TEMP 10B23Q.
M-604; 0.17-0.23 C, 1.1-1.4 Mn, 0.20-0.35 Si, 0.0005 min B, bal Fe
Rolled: 80,000 TS; 44,000 YS; 20 El; 56 RA; B 78 Rock
For fasteners, screws, bolts, nuts
Tough, water hardening.

QUAKER
M-1431, 0.4 C, 0.4 Mn, 4.5 Cr, 1 Mo, 0.8 W, bal Fe
For tools, dies, air or oil hardened

QUALITAT-55
M-1548; 3.0-5.0 Cu, 0.3-0.7 Si, 0.3-0.8 Mn, bal Al.
Heat Treated. 50,000-60,000 TS; 18-23 El; 100-110 Brin.
For rivets, hydraulic fittings, aircraft engine components.
Heat treatable, high fatigue strength

QUALITAT-M.
M-1548; 0.85 Si, 0.6-0.9 Mn, 0.5-1.0 Mg, bal Al
Heat Treated. 50,000-60,000 TS; 3-8 El; 95-100 Brin
For general light structures, booms, scaffolds, transmission tires
Good strength and fabricability Heat treatable

QUALITY CARBON DRILL ROD
M-1702; 1.10-1.25 C, 0.15-0.40 Mn, 0.10-0.40 Si, 0.03 P, 0.03 S, bal Fe
Water hardening tool steel; AISI W1
Type W1 water hardening tool steel

QUALITY STEEL.
M-237; 1.2-1.5 Cr, 4.5-5.0 Ni, 0.3-0.5 Mn, 0.3-0.35 C, bal Fe
226,000 TS; 15 El, 45 RA.
For gears; air hardening

QUARZAL.
German; 15 Cu, 10 max Si, Fe, Ni, Cr, Mo, bal Al
For bearings, wear resisting.

QUARZAL Q2.
German; 2 Cu, 1.0 max Fe, 0.5 hardening agent, bal Al.
For bearings.

QUARZAL Q5
German; 5-15 Cu, 1.0 max Fe, 0.5 hardening agent, bal Al.
125 Brin.
For bearings.

QUARZEL Q8
German, 5-15 Cu, 1.0 max Fe, 0.5 hardening agent, bal Al
For bearings.

QUARZAL Q12
German, 5-15 Cu, 1.0 max Fe, 0.5 hardening agent, bal Al.
125 Brin
For bearings.

QUARZAL Q15.
German, 5-15 Cu, 1.0 max Fe, 0.5 hardening agent, bal Al.
125 Brin
For bearings

QUATRE ECLAIRS
M-1043, 0.85 C, 18 W, 1.6 V, 0.6 Mo, bal Fe.
For lathe and planer tools, saws, oil hardened

QUATRE ECLAIR SPECIAL
M-1043, 0.85 C, 19 W, 3 Co, 1.5 V, 1 Mo, bal Fe.
For lathe and planer tools, oil hardened

QUEEN'S METAL.
Eng; 88.5 Sn, 7.0 Sb, 3.5 Cu, 1.0 Zn.
For utensils, resists tarnishing.

QUEEN'S METAL "B"
Eng., 50.5 Sn, 16.5 Sb, 16.5 Pb, 16.5 Zn
For type metal.

QUEEN'S METAL "C"
Eng., 87 Sn, 8.5 Sb, 3.5 Cu, 1 Zn
For type metal

QUEEN'S METAL "D"
Eng., 73.36 Sn, 8.88 Sb 8.88 Pb, 8.88 Zn.
For type metal

QUEEN'S METAL "E."
Eng., 88.5 Sn, 7 Sb, 3.5 Cu, 1 Bi
For type metal

QUICKSILVER SOLDER
63-57 Ag, 21-25 Cu, 3.8-6.2 Sn, 10-12 Zn
For silver solder, corrosion resistant

QUINZE ECLAIRS
M-1043, 0.98 C, 20 W, 15 Co, 1.1 V, 1 Mo, bal Fe.
For cutting and boring tools, oil hardened

R6F2K8M5
M-Russia, 0.8 C, 5 Mo, 4 Cr, 2 V, 6 W, 8 Co, bal Fe
Hardened C 64-67 Rock
For drills, reamers, broaches, lathe and planer tools
High-speed steel, high red-hardness.

R6F2K14M5
M-Russia, 0.8 C, 4 Cr, 2 V, 6 W, 5 Mo, 14 Co, bal Fe
Hardened C 64-66 Rock
For lathe and planer tools, form cutters, reamers, drills, broaches
High-speed steel, high red-hardness

R6K8F2M5
M-Russia, 0.8 C, 6 W, 4 Cr, 2 V, 5 Mo, 8 Co, bal Fe.
Hardened C 64-66 Rock.
For lathe and planer tools, form cutters, reamers, broaches, drills
High-speed steel, high red-hardness.

R6K14F2M5
M-Russia, 0.8 C, 6 W, 4 Cr, 2 V, 5 Mo, 14 Co, bal Fe
Hardened: C 64-67 Rock
For form cutters, drills, reamers, broaches, lathe and planer tools
High-speed steel, high red-hardness.

R9.
M-Russia; 0.9 C, 8.5 W, 4 Cr, 2.1 V, bal Fe.
Hardened. C 64-66 Rock.
For lathe and planer tools, drills, reamers, broaches, form cutters.
High-speed steel, high red-hardness

R9K5 (EI 705).
M-Russia, 0.8-0.9 C, 3.8-4.4 Cr, 5.0-6.0 Co, 9.0-10.5 W, 1.6-2.0 V, bal Fe
Hardened· C 64-67 Rock
For machining heat resistant steels, tools, cutters, plane and lathe tools, broaches, reamers, form tools
High speed steel, high red-hardness.

R9K8F4M
M-Russia; 1.3 C, 8.8 W, 4.2 Cr, 3.6 V, 1 Mo, 8.1 Co, bal Fe
Hardened C 65-67 Rock
For precision tools and cutters, reamers, broaches, drills.
High-speed steel, high red-hardness.

R9K10
M-Russia, 0.95 C, 9.5 W, 4 Cr, 2.4 V, 10 Co, bal Fe
Hardened C 65-67 Rock
For reamers, broaches, cut-off tools, form cutters, drills
High-speed steel, high red-hardness

R9K30
M-Russia, 0.90 C, 4.0 Cr, 10.2 W, 1.6 V, 29.4 Co, bal Fe
Hardened C 64-68 Rock
For heavy duty cutters drills, reamers, broaches, lathe tools
High speed steel, high red hardness

R10F5K5
M-Russia, 1.5 C, 10 W, 4 Cr, 4.5 V, 6 Co, bal Fe
Hardened C 66-68 Rock
For cutters, reamers, broaches, drills, textile needles, form tools
High speed steel, high red-hardness

R15K5
M-Russia; 0.8 C, 15 W, 3 Cr, 1.5 V, 5 Co, bal Fe
Hardened C 64-66 Rock
For lathe and planer tools, form cutters, drills, reamers, broaches
High-speed steel, high red hardness

R15K12
M Russia, 0.8 C, 15 W, 3 Cr, 1.5 V, 12 Co, bal Fe
Hardened C 64-67 Rock
For lathe and planer tools, drills, reamers, broaches, form tools, hobs, taps
High speed steel, high red-hardness

R18
M Russia, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe
Hardened C 64-66 Rock
For cutters, reamers, hobs, lathe and planer tools, form and milling cutters
High red-hardness
Type T1 high speed steel

R18F4K8M.
M-Russia, 1.25-1.4 C, 4.4-5.0 Cr, 15.5-17 W, 3.2-3.8 V, 7.5-8.5 Co, 1.2-1.5 Mo, bal Fe
Hardened. C 64-67 Rock
For cutters, reamers, broaches, taps, hobs, textile needles
High red-hardness.
High speed steel, abrasion resistant

R18K8F4M.
M-Russia; 1.3 C, 17 W, 4 Cr, 4 V, 1.4 Mo, 8 Co, bal Fe.
Hardened· C 64-67 Rock
For reamers, broaches, drills, hobs, taps, form cutters.
High-speed steel, high red-hardness.

R18K10.
M-Russia, 0.88 C, 4.0 Cr, 1.3 V, 18.3 W, 9.6 Co, bal Fe.
Hardened C 64-67 Rock
For cutters, reamers, broaches, drills, taps, hobs.
High-speed steel, high red-hardness

R43 see HEPPENSTALL R43.

R 448
Eng., C, 10-12 Cr, bal Fe
For gas turbine parts, corrosion and heat resistant

R2799
M 108, 70 Fe, 30 Ni
For compensating shunts for electrical equipment, temperature-sensitive, magnetic

RA 309
M-1209, 0.20 max C, 22-24 Cr, 12-15 Ni, bal Fe.
Annealed 85,000-95,000 TS, 40,000-50,000 YS, 55-45 El, 150-185 Brin
For furnace parts and equipment, refinery equipment, corrosion and heat resistant, austenitic

RA 310
M-1209, 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe
Annealed 95,000 TS, 45,000 YS, 50 El, 185 Brin
For furnace parts and equipment, gas turbine and jet engine components, corrosion and heat resistant, austenitic

RA 330
M-1209, 0.05 C, 1.5 Mn, 1.25 Si 19 Cr, 35 Ni, 43 Fe
Room temp 85,000 TS, 42,000 YS, 45 El
1400°F 34,000 TS, 18,800 YS, 64.8 El
Austenitic, non hardenable, heat and corrosion resistant alloy, weldable and machinable
For high temp applications, turbine parts heat exchangers, heat treating equipment radiant tubes, muffles
AMS 5592, AMS 5716

RA 333
M-1209, 0.05 C, 1.5 Mn, 1.25 Si, 25 Cr, 45 Ni, 3.0 Mo, 3.0 Co, 3.0 W, 18 Fe
Room temp 100,000 TS, 50,000 YS, 50 El
1400 F 57,200 TS 28,300 YS, 44.8 El
Austenitic, non-hardenable, heat and corrosion resistant alloy, weldable and machinable
For high temp application, turbine parts, radiant tubes, heat treating fixtures chemical plant equipment
ASM 5593, ASM-5517.

RA 430
M 1209; 0.12 max C, 14-18 Cr, bal Fe
Annealed 70,000-90,000 TS, 40,000-55,000 YS; 30-20 El, 55-40 RA, 140-160 Brin.
Cold rolled 90,000-130,000 TS, 65,000-120,000 YS, 20-2 El, 185-220 Brin
For oil burners, septic tanks, furnace parts, corrosion and heat resistant, ferritic

RA 446
M-1209; 0.20 max C, 23-27 Cr, 0.25 max Ni, bal Fe.
Annealed 80,000-90,000 TS; 50,000-60,000 YS, 25-20 El; 150-190 Brin.
For furnace parts, heat treat boxes, conveyor chains; heat resistant, ferritic

RA 600.
M-1209; 15 Cr, 8 Fe, 0.7 Mn, 0.05 C, bal Ni.
Hot Rolled. 110,000 TS; 45,000 YS; 40 El; 175 Brin.
Heat Treated: 112,000 TS; 49,500 YS, 41 El, 175 Brin.
For furnace parts, grids, gas turbine components, retorts.
Resists oxidizing and carburizing atmospheres, corrosion resistant.

RACO 5.
M-986, 0 10 C, 0.35 Mn, bal Fe.
For welding electrodes; for mild steel, AWS-E6030.

RACO 7
M 986, 0.07 C, 0.35 Mn, 0.10 Si, 0 03 S, 0 03 P, bal Fe.
For welding electrodes for mild steel, E-6010

RACO NO 8
M-986; 0 07 C, bal Fe
For welding electrodes, for mild steel

RACO NO. 11.
M-986, C, bal Fe
For A C. welding electrodes; for mild steel

RACO 13
M-986; 0 07 C, 0.30 Mn, 0.10 Si, 0.03 S, 0 03 P, bal Fe
For mild steel welding electrodes, F 6013.

RACO 20
M-986; 0.08 C, 0 35 Mn, 0.10 Si, 0 03 S, 0 03 P, bal Fe
For welding electrodes for mild steel; F-6020

RACO 25
M-986, 0 15 C, 1 0 Cr, 0 5 Mn, bal Fe
Welded. 200 Brin
For welding electrodes for mild steel, machinable

RACO 45.
M-986; 0 25 C, 2 5 Cr, 1.0 Mn, bal Fe
Welded: 450 Brin
For hard surfacing electrodes, wear resistant.

RACO 55
M-986; 0 4 C, 3 0 Cr, 1.5 Mn, bal Fe.
Welded: 550 Brin
For hard surfacing electrodes, wear resistant

RACO HD 64.
M-986; 0 08 C, 0 5 Mo, bal Fe
For welding electrodes, for high tensile steel

RACOLLOY MANGANESE
M-986; C, 14 Mn, 3 5 Ni, bal Fe.
For hard facing electrodes, for Mn steel, coated, austenitic

RACO RED LABEL
M-986; 0.1 C, 0 4 Mn, bal Fe.
For welding rods; gas welding

RACO TYPE D.
M-986, 0 10 C, bal Fe
For welding electrodes, E 4520 cored rod

RACO TYPE M.
M-986, 0.10 C. 0 40 Mn, 0.01 Si, 0 03 S, 0 03 P, bal Fe
For welding electrodes, copper coated

RADAX SPEZIAL.
M-1340; 1 45 C, 1 40 Cr, 0.60 Mn, bal Fe.
For bearings, bushings, cutters; oil or water hardened, wear resistant

RADAX W10
M-1340; 1.2 C, 1.0 W, 0.1 V, 0 2 Cr, bal Fe.
For cutters, dies; water hardened, wear resistant.

RADECO.
M-1322; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe
For forming and blanking dies, punches; high speed steel

RADIAMETAL
M-1, 47 Ni, bal Fe
For electrical equipment

RADIANITE
M-73, 0.7-0 8 C, 16 5-18 0 Cr, bal Fe
For cutlery, stainless articles, keen cutting edge

RADIKAL EXTRA.
M-1309, 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8 7 W, bal Fe
For lathe and planer tools, drills, taps, reamers, high speed steel

RADIKAL EXTRA M
M-1309, 0 95 C, 4 Cr, 2 8 Mo, 3 0 W, 2 5 V, bal Fe
For lathe and planer tools hobs, broaches, form tools, drills
High-speed steel, high-red hardness

RADIKAL Mo 5
M 1309, 0 85 C, 6 7 W, 4 5 Cr, 2 0 V, 5 3 Mo, bal Fe
Hardened C 64 67 Rock
For lathe and planer tools, hobs, taps, drills, reamers, broaches
High speed steel, high red hardness

RADIKAL Mo6
M 1309, 0 85 C, 4 Cr, Mo, W, V bal Fe
For milling cutters, broaches, reamers taps, high speed steel

RADIKAL Mo 9
M-1309, 0 85 C, 4 Cr, 9 2 Mo, 2 W, 1 3 V, bal Fe.
Hardened C 64 68 Rock
For milling cutters, lathe and planer tools, broaches, reamers, hobs, taps
High speed steel, high red-hardness

RADIKAL Mo 55
M-1309, 0 85 C, 6 7 W, 4 5 Cr, 5 5 Co, 2 0 V, 5 3 Mo, bal Fe
Hardened C 64 66 Rock
For lathe and planer tools, hobs, taps, reamers, drills, broaches
High-speed steel high red hardness

RADIKAL Mo 60
M 1309, 1 25 C, 6 7 W, 4 5 Cr, 3 7 V, 5 3 Mo, bal Fe
Hardened C 64-66 Rock
For lathe and planer tools, reamers, broaches, hobs, taps, form cutters
High-speed steel, high red-hardness

RADIKAL Mo 92
M 1309, 1 1 C, 2 0 W, 4 2 Cr, 2 1 V, 9 2 Mo, bal Fe
Hardened C 64 67 Rock
For reamers, broaches, taps, hobs, form cutters.
High-speed steel, high red-hardness

RADIKAL Mo 95
M-1309; 0.85 C, 2 2 W, 4 2 Cr, 5.0 Co, 1 3 V, 8 8 Mo, bal Fe
Hardened C 64-66 Rock
For reamers, broaches, hobs, taps, lathe and planer tools
High-speed steel, high red-hardness

RADIKAL Mo 98
M-1309; 0 95 C, 2.2 W, 4.2 Cr, 8.0 Co, 2.2 V, 8.8 Mo, bal Fe
Hardened: C 64-67 Rock.

For reamers, drills, hobs, taps, broaches, lathe and planer tools
High speed steel, high red-hardness

RADIO ALLOY NO 30.
M-61; 98 Cu, 2 Ni
For electrical instruments, rheostats, voltage control relays; working temperature 350°C (max).

RADIO ALLOY NO 60
M-61, 95 Cu, 5 Ni
For electrical instruments, resistors, working temperature 350°C (max)

RADIO ALLOY NO 90.
M-61, 88 Cu, 12 Ni
For electrical instruments, resistors, working temperature 400°C (max)

RADIO ALLOY NO 180.
M-61, 95 Ni, 2.5 Si, 2.5 Mn.
For electrical instruments, resistors, working temperature 400°C (max)

RADIOHM
M-44, 10-17 Cr, 5 Al, bal Fe
Rolled 128,000-85,000 TS, 5-33 El
For radio tube parts, resistors, heat resistant to 1000°C, obsolete

RADIO METAL "A"
M-108, 50 Fe, 45 Ni, 5 Cu
For magnetic alloy for the cores of small transformers, high permeability

RADIUM A
M-959, 4.5 Sb, 4.5 Cu, bal Sn
Cast 12,850 TS, 28 Brin
For heavy duty bearings, bushings, Babbitt, M.P. 437-699°F

RAE 40 C
M-England 0.55 Mg, 2.0 Cu, 2.5 Mn, 4.4 Ni, 0.27 Be, bal Al
Wrought (at R.T.) 36,000 TS, 1.0 El
Wrought (at 752°F) 4120 TS, 59.5 El
For aircraft and jet engine parts
Good resistance to loads at moderately elevated temperatures

RAE 55
M-England, 0.71 Mg, 1.84 Cu, 2.02 Mn, 2.34 Ni, 0.2 Be, bal Al
Wrought (at R.T.) 39,700 TS, 9.5 El
Wrought (at 752°F) 4520 TS, 79.0 El
For aircraft and jet engine parts
Good resistance to loads at moderately elevated temperatures

RAFFINAL
M-249, M-493, M-541, 99.99 + Al
Soft 7000 TS, 3000 YS, 60 El, 14 Brin
Hard 16,000 TS, 15,000 YS, 6 El, 30 Brin
For window frames, door handles, chemical plant equipment, corrosion resistant

RAFFINAL
M-764, 99.9 Al
Annealed 6800 TS, 2800 YS, 35% El
For electrical conductors
High electrical conductivity.

RAILENDER
M-712; 0.35 C, 1.8 Cr, 0.12 V, bal Fe
320-336 Brin
For hard facing electrodes, for battered rail ends

RAILITE
M-211; 75 Fe, 25 Cu.
For bearing, oil-cushion bearings; sintered, self lubricating

RAILROAD "A" BRONZE
England; 0-20 Sn, 0-22 Zn, 0-20 Pb, 0-0.5 P, bal Cu.
For axle bearings, gears, piston rods, side valves, heavy duty

RAILROAD BRONZE DURABLE "K."
73.5 Cu, 9.5 Sn, 9.5 Zn, 7.5 Pb
For locomotive bearings, heavy duty

RAILROAD BRONZE DUTCH "F."
85.25 Cu, 12.75 Sn, 2.0 Zn
For eccentric straps for railroad, high strength

RAILROAD BRONZE FRENCH "B"
French, 82 Cu, 10 Sn, 8 Zn
For axle bearings; high strength

RAILROAD BRONZE FRENCH COMMON "C."
French, 78 Cu, 20 Sn, 2 Zn
For axle bearings, high strength

RAILROAD BRONZE GEARING "H"
88.8 Cu, 8.5 Sn, 2.7 Zn
For railroad gearing, tough

RAILROAD BRONZE GERMAN "J"
81 Cu, 15 Zn, 4 Pb
For locomotive bearings, heavy duty

RAILROAD BRONZE HARD "E"
87.05 Cu, 7.88 Sn, 5.07 Zn
For hard axle bearings, high strength

RAILROAD BRONZE "I"
89 Cu, 2.4 Sn, 7.8 Zn
For locomotive bearings, heavy duty.

RAILROAD BRONZE "L"
74.1 Cu, 3.7 Sn, 22.2 Zn
For locomotive pistons and piston rods, high strength

RAILROAD BRONZE LAFOND "D"
80 Cu, 18 Sn, 2 Zn
For axle bearings, high strength

RAILROAD BRONZE LAFOND "G"
84 Cu, 14 Sn, 2 Zn
For eccentric straps for railroads, high strength

RAILROAD BRONZE "M"
84.5 Cu, 10 Sn, 5 Pb, 0.5 P
For locomotive side valves, high strength.

RAILROAD BRONZE "N"
84 Cu, 8.5 Sn, 5 Zn, 2.5 Pb
For locomotive injectors, free-cutting

RAILROAD BRONZE "O"
88.5 Cu, 10 Sn, 0.5 P
For bronze parts, high strength

RAILROAD BRONZE "P."
80 Cu, 5 Sn, 15 Pb
For locomotive axle box bearings, heavy duty

RAILROAD BRONZE "Q"
75 Cu, 5 Sn, 20 Pb
For bearings, Babbitts, anti-friction.

RAIL STEEL
Eng., 0.50-0.89 C, 0.60-0.90 Mn, 0.04 max. P, 0.15 min Si, bal Fe
For steel rails, wear resistant

RAILWAY AXLE BOX
M-657, 83 Cu, 7 Sn, 6 Zn, 4 Pb.
Cast 30,000 TS, 12,000 YS, 18 El.
For castings, bearings, tough

RAILWEAR.
M-844, 0.7 C, 13 Mn, bal Fe.
Cast: 350-380 Brin
For hard surfacing electrodes, coated, for rail joints.

RAISED-LAY.
M-1066; precious metal tip on base metal blade.
For electrical bar contacts, laminated, composite

RAKEL'S METAL.
88 Cu, 10 Ni, 1 Mn, 1 Zn.
For corrosion resistant parts, corrosion resistant

RAMET 1
M-329; Submicron dispersion-strengthened carbide.
Hardness 91.5 Rock A,
Transverse rupture strength 400,000 psi;
Compraessive strength 525,000 psi,
Young's modulus 80×10^6 psi,
For machining high strength alloys and most "difficult-to-machine" alloys.

RAMSOS 1
M-1288, 0.30 C, 2.6 Cr, 0.3 V, 8.5 W, bal Fe
For punches, shears, extrusion rams, hot work steel, 30WCrV3411

RAMSOS 1C.
M-1288, 0.35 C, W, Cr, V, bal Fe
For punches, shears, crimpers, upsetters, hot work steel, 35WCrV4012

RAMSOS 1Mo.
M-1288, 0.35 C, 5 Mo, 2.5 Cr V, bal Fe
For punches, shears, crimpers, upsetters shears, hot work steel, 35MoCrV179.

RAMSOS 1N
M-1288, 0.25 C, W, Cr, Ni, V, bal Fe
For punches, shears, crimpers, hot work steel, 25WCrNiV3610

RAMSOS 2A
M-1288, 0.60 C, Mo, Cr, W, V, bal Fe
For punches, shears, crimpers, hot work steel, 60MoCrWV9515

RAMSOS 2B
M-1288, 0.60 C, W, Mo, Cr, V, bal Fe
For punches, shears, crimpers, hot work steel; 60WMoCrV2726

RAMSOS 3
M-1288, 0.35 C, Cr, W, Mo, Si, V, bal Fe
For extrusion rams, liners, punches, hot work steel, 35CrWMoSiV226

RAMSOS 5A
M-1288; 0.45 C, Cr, Ni, W, Si, Mn, bal Fe
For hot work tools, punches, crimpers, hot work steel, 45CrNiWSiMn5252

RAMSOS 6Mo
M-1288, 0.30 C, Cr, Mo, V, bal Fe
For hot work tools, hot work steel, 30CrMoV1328

RAMSOS 6(S6)
M-1288, 0.30 C, 1.1 Cr, 0.18 V, 3.75 W, bal Fe
For hot work tools, punches, crimpers, hot work steel, 30WCrV15

RAMSOS 7
M-1288, 0.45 C, 1.3 Cr 0.45 Mo, 0.8 V, 0.45 W, bal Fe
For hot work tools, hot work steel, 45CrVMoW58

RAMSOS 7Mo
M-1288. 0.30 C Cr, Mo, Mn, V, bal Fe
For hot work tools; 30CrMoMnV710, hot work steel

RAMSOS 8.
M-1288, 0.40 C, 2 Cr, 1 Mn, 0.25 Mo, bal Fe
For header tools, container jackets, 40CrMnMo7; hot work steel

RAMSOS 9
M-1288, 0.30 C, 2.5 Cr, 0.20 Mo, 0.15 V, bal Fe.
For extrusion press parts, mandrels, liners, 30CrMoV9; hot work steel

RAMSOS 55
M-1288, 0.55 C, 0.10-0.40 Si, 0.5-0.7 Mn, bal Fe.
For gears, shafts, axles, tools, DIN-C55WS, water hardened

RAMSOS 80
M-1288, 0.80 C, 0.10-0.40 Si, 0.5-0.7 Mn, bal Fe.
For tools, springs, cutters, drills, water hardened; Type W1

RAMSOS G1
M-1288, 0.55 C, 0.7 Cr, 0.18 Mo, 1.65 Ni, 0.2 V, bal Fe
For hot work tools, punches, upsetters, 55NiCrMoV6, hot work steel

RAMSOS G1M
M-1288, 0.50 C, 0.8-1.1 Mn, 0.25-0.50 Si, bal Fe
Heat treated, 115,000-135,000 TS
For gears, shafts, punches, crimpers, 50Mn4, oil hardened

RAMSOS G1 SPECIAL
M-1288, 0.50-0.60 C, 1.2 Cr, 0.35 Mo, 1.6 Ni, 0.2 V, bal Fe
For hot work tools, punches, crimpers, 56NiCrMoV7, hot work steel

RAMSOS G3
M-1288, 0.45 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
For gears, pinions, shafts, axles, water hardened, C45W3

RAMSOS G4
M-1288, 0.60 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
For crimpers, punches, tools, dies, C60W3, water hardened

RAMSOS G5
M-1288, 0.75 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
For crimpers, tools, springs, punches, C75W3, water hardened

RAMSOS GF4
M-1288, 1.0 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
For drills, taps, punches, tools, Type W1, water hardened, C100W?

RAMSOS KSZ
M-1288, 0.3 C, 0.5 Mn, 0.25 Si, 2.5 Cr, 0.15 V, bal Fe
For extrusion press parts, mandrels, liners, 30CrMoV9, hot work steel

RAMSOS MUK
M-1288, 0.45 C, 0.9 Si, 0.3 Mn, 1 Cr, 0.2 V, 1.8 W, bal Fe
For hot working tools, crimpers, upsetters, 45WCrV7, oil hardened

RAMSOS O
M-1288, 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe
For lathe and planer tools, reamers, broaches, hobs, high speed steel, 82WV3419

RAMSOS O 2
M-1288; 0.65 C, 3.75 Cr, 0.85 Mo, 0.7 V, 8.5 W, bal Fe
For lathe and planer tools, drills, hobs, reamers, high speed steel, 65WMo348

RAMSOS OK
M-1288, 0.65 C, 3.75 Cr, 0.85 Mo, 8.5 W, 0.7 V, bal Fe
For lathe and planer tools, hobs, broaches, high speed steel, 65WMo348.

RAMSOS OO
M-1288; 0.95 C, 4 Cr, 1 V, Mo, W, bal Fe.
For cutters, drills, hobs, reamers; high speed steel; 95WMo1126

RAMSOS S4
M-1288; 0.30 C, 0.3 Mn, 2.35 Cr, 0.6 V, 4.25 W, bal Fe
Heat treated 198,000-242,000 TS
For extrusion dies, rams and liners, hot work steel, 30WCrV179

RAMSOS SGK.
M-1288, 0.30 C, Cr, Mo, Si, V, bal Fe
For punches, upsetters, crimpers, 30CrMoSiV-2011; hot work steel

RAMSOS SUPER A.
M-1288, 0.40 C, W, Mo, Cr, V, bal Fe
For tools, dies, upsetters, punches, 40WMoCrV-1838, hot work steel

RAMSOS SUPER K
M-1288, 0.30 C, W, Co, Cr, Mo, V, bal Fe.
For crimpers, dies, punches, shears, 30WCoCrMoV2424, hot work steel.

RAMSOS SUPER WN
M-1288, 0.55 C, Ni, W, Cr, Co, Si, V, bal Fe
For hot work tools, dies, 55NiWCrCoSiV484416, oil hardened

RAMSOS VC
M-1288, 0.40 C, Ni, Cr, Mo, bal Fe
For gears, axles, crankshafts, 40NiCrMo176, oil hardened, shock resistant

RAN
M-501, M-912, 0.45 C, 0.5 Cr, 1.5 Ni, bal Fe
For gears, shafts, crankshafts, bolts, studs, oil hardened, shock resistant

RAN 1 W H
M-501, M-912, 0.28-0.35 C, 0.5 Cr, 1.5 Ni, bal Fe
For gears, shafts, crankshafts, bolts, studs, oil hardened, shock resistant

RAN 2 W/H
M-501, M-912, 0.28-0.35 C, 0.7 Cr, 2.5 Ni, bal Fe
For gears, shafts, crankshafts, bolts, studs, oil hardened, shock resistant

RAN 3 W/H
M-501, M-912, 0.22-0.30 C, 0.7 Cr, 3.5 Ni, bal Fe
For gears, shafts, crankshafts, bolts, studs, oil hardened, shock resistant

RAN 6
M-501, M-912, 0.35 C, 1.3 Cr, 4.5 Ni, bal Fe
For gears, shafts, crankshafts, bolts, studs, oil hardened, shock resistant

RANALLOY TYPE A
M-1128, C, Mo, Ni, Cr, bal Fe
500 Brin
For hard surfacing electrodes, wear resistant

RANALLOY TYPE A
M-964, C, alloy, bal Fe
For hard surfacing electrodes, wear resistant

RANALLOY TYPE B
M-964, C, alloy, bal Fe
For hard surfacing electrodes; wear resistant

RANALLOY TYPE B
M-1128, C, Mo, Ni, Cr, bal Fe
530 Brin
For hard surfacing electrodes, wear resistant

RANALLOY TYPE C
M-964; C, alloy, bal Fe
For hard surfacing electrodes; wear resistant

RANALLOY TYPE C.
M-1128; C, Mo, Ni, Cr, bal Fe.
480 Brin.
For hard surfacing electrodes; wear resistant.

RANDALL.
M-1155, Cu-graphite.
For bearings; sintered

RANDOLF METAL.
For dental alloy; corrosion resistant

RAN FH
M-912, M-501, 0.23-0.30 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, shafts, crankshafts, bolts, studs; oil hardened, shock resistant

RANGER D.R
M-69, 1.2 C, bal Fe
For drills, taps, cutters, drill rod, water hardening.

RANITE TYPE NO 4
M-1100, C, Si, Cr, Mo, Ti, B, bal Fe
Welded 520 Brin.
For hard facing electrodes, wear and shock resistant.

RANITE TYPE A
M-1100, 0.15 C, 0-15 Si, 0-15 Ti, 0-15 Cr, 0.15 Mo, B, bal Fe
Cast 300 Brin
For hard facing electrodes, high impact, moderate abrasion

RANITE TYPE B
M-1100, C, Si, Ti, Cr, Mo, B, bal Fe
Cast 444 Brin
For hard facing electrodes, wear and impact resistant

RANITE TYPE B-X
M-1100, C, Si, Ti, Cr, Mo, B, bal Fe
Cast 440 Brin
For hard facing electrodes, abrasion resistant

RANITE TYPE C
M-1100, C, Si, Ti, Cr, Mo, B, bal Fe.
Cast 600 Brin
For hard facing electrodes, for high abrasion

RANITE C X
M-1100, C, Cr, Fe
For hard surfacing electrode, abrasion resistant

RANITE TYPE D
M-1100, C, Si, Ti, Cr, Mo, B, bal Fe
Welded 630 Brin
For hard facing electrodes; wear and shock resistant

RANSCO ALLOY
M-1164, 2.5-3.25 C, 1.2 Si, 12-15 Ni, 5-7 Cu, bal Fe
Cast 20,000-35,000 TS, 125-200 Brin For diesel engine cylinder liner; centrifugally cast

RAN TUNG
M-1100, 60 WC in 40 tube binder
For hard facing electrodes, sintered

RAONEL 600
M-1209, 0.15 max C, 14-17 Cr, 6-10 Fe, 1 max Mn, 72 min Ni
Annealed 90,000 TS, 40,000 YS, 45 El, 65 RA
Cold Drawn 105,000-150,000 TS, 80,000-125,000 YS, 10-30 El, 30-60 RA
For regenerators, coolers, high temperature components and equipment
Good hot and cold workability

RAPIDE EXTRA B
M-1115, 0.65-0.80 C, 1 Co, 4.5 Cr, 17-19 W, 1.15 V, bal Fe
For cutters, taps, reamers, hobs, broaches, high speed steel, oil hardened

RAPIDE EXTRA-C
M-1115; 0.75-0.90 C, 4-5 Cr, 17-19 W, 1.0-1.5 V, 0.5-1.0 Co, bal Fe
For lathe and planer tools, milling cutters, taps, high speed steel, oil hardened.

RAPIDE EXTRA J.
M-1115; 0.7-0.9 C, 4-5 Cr, 17 14 W, 9-11 Co, 2 V, bal Fe
For lathe and planer tools, reamers, hobs, taps, broaches; high speed steel, oil hardened

RAPIDE L.
M 1115, 0.7 C, 19 W, 4 Cr, 2.2 V, bal Fe
For cutters, taps, reamers, hobs, broaches, drills, high speed steel, oil hardened

RAPID EXTRA
M-1114, C, 19 W, 4 Cr, 2.25 V, bal Fe
For tools, dies, cutters; high speed steel

RAPID EXTRA Mo
M-27, 0.8 C, 4 Cr, 6.5 W, 5 Mo, 2 V, bal Fe
For cutting tools, high speed steel.

RAPID FINISH.
M-69, 1.3 C, 0.75 Cr, 3.75 W, bal Fe
For plug gages, forming dies, punches, water hardening

RAPID FINISHING
M-261, C, alloy, bal Fe
For fast finishing tools, water hardened

RAPIDIT M
M-459, 1.1 C, 4.3 Si, 2.4 W, 2.4 Mo, 2.8 V, bal Fe
For welding rod, to repair high speed tools

RAPIDIT MA
M-459, 1.45 C, 4.3 Si, 2.4 W, 2.4 Mo, 2.8 V, bal Fe
For welding rod, to repair high speed tools

RAPIDIT W
M-459, 1.2 C, 0.35 Mn, 4.3 Cr, 10.5 W 4.3 V, bal Fe
For welding rod; to repair high speed steel

RAPIDIT WA
M-459, 1.6 C, 0.3 Mn, 4.3 Cr, 10.5 W, 4.3 V, bal Fe.
For welding electrode for repairing high speed tools

RAPID PANTHER
M-1114, 0.7 C, 19 W, 4 Cr, 2.25 V, bal Fe
For broaches, taps, reamers, hobs, lathe cutters, high speed steel, oil hardened

RAPID SPECIAL BNX
M-459, 0.8 C, 4 Cr, 0.3 Mo, 1.6 V, 8 W, 10 Co, bal Fe
For tools dies, cutters, high speed steel

RAPID SPEZIAL.
M-459, 0.7 C, 19 W, 4 Cr, 2.2 V, bal Fe.
For high speed cutters; high speed steel

RAPID SPEZIAL
M-1345, 0.95 C, W, Mo, bal Fe
For tools, dies, oil hardening

RAPID SPEZIAL BN
M-459, 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe
For drills, taps, reamers, hobs, high speed steel

RAUCHBERG
Germ., 66-75 %Cu, 15-19 Pb, 10-5 Sn, 1-5 Sb.
For bearings, corrosion resistant

RAUENLOY
M-1138, C, Cr, Mo, V, bal Fe.
For leaf springs; tough, oil hardened

RAVEN MST.
M-1182; 0.90 C, 1.6 Mn, bal Fe.
For punches, dies, crimpers, chisels, cutters; Type O2, non-deforming, oil hardened.

RAVEN NBS
M-1182, 0.70 C, 0.75 Cr, 1.5 Ni, 0.25 Mo, bal Fe.
For punches, dies, rollers, mandrels; Type L6; oil hardened.

RAXA 129
M-1353, C, 3 Cr, bal Fe
For oil refinery equipment; creep and heat resistant.

RAXA ATV
M-1353, 1.45 C, 1.4 Cr, 0.6 Mn, 0.4 Si, bal Fe.
For bearings, liners, sleeves, dies, water hardened, wear resistant

RAXA BKI
M 1353, 2.1 C, 11.5 Cr, 0.7 W, bal Fe
For blanking and forming dies, punches, oil or air hardened, non deforming

RAXA BKR
M-1353, C, Cr, bal Fe
For blanking and forming dies, punches; non-deforming, oil or air hardened

RAXA BKS
M-1353, 2.1 C 11.5 Cr, 0.3 Mn, 0.35 Si, bal Fe
For blanking and forming dies, punches, oil or air hardened, non-deforming

RAXA BKV
M 1353, 1.65 C, 11.5 Cr, 0.1 V, bal Fe
For blanking and forming dies, air hardened, non deforming

RAXA C10
M 1353, 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe
For lathe and planer tools, drills, reamers, taps, high speed steel

RAXA CMFR
M 1353, 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe
For gears, cams, camshafts, fasteners, case hardening steel

RAXA CNV3
M-1353, C, alloy, bal Fe
For gears, cams, machine tool parts, case hardening steel

RAXA CNV5
M 1353, C, alloy, bal Fe
For gears, bolts, machine tool parts, case hardening steel

RAXA CNZ3
M-1353, C, alloy, bal Fe
For gears, bolts, machine tool parts, case hardening steel

RAXA CNZ5
M-1353, 0.19 C, 0.2 Mo, 1.25 Cr, 3.75 Ni, bal Fe
For gears, bolts, cams, camshafts, case hardening steel, shock resistant

RAXA CRO
M-1353, 0.30 C, 1 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For cold work tools, upsetters, header dies; oil hardened, tough

RAXA CRW
M-1353, 0.30 C, 1.1 Cr, 0.18 V, 3.75 W, bal Fe
For cold work tools, upsetters, header dies; oil hardened, tough

RAXA CWV5/W.
M 1353; C, alloy, bal Fe
For gears, shafts, crankshafts; oil hardened.

RAXA DBV.
M-1353; 0.45 C, Cr, V, Si, bal Fe.
For gears, bolts, crankshafts, springs; oil hardened, shock resistant.

RAXA DBV/K.
M-1353; 0.61 C, 1.18 Cr, 0.1 V, bal Fe.
For gears, springs, crankshafts; oil hardened, shock resistant.

RAXA DBV/W.
M-1353; 0.38 C, Cr, V, Si, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant

RAXA EXTRA 1
M-1353; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe
For engravers' tools, taps, reamers; Type W1, water hardened.

RAXA EXTRA 2
M-1353; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe
For drills, taps, reamers, broaches; Type W1, water hardened

RAXA EXTRA 3
M-1353, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For drills, taps, reamers, cutters; Type W1; water hardened

RAXA EXTRA 4
M-1353, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
For drills, taps, reamers, broaches; Type W1, water hardened.

RAXA EXTRA 5
M-1353; 0.75 C, 0.25 max Si, 0.25 max Mn, bal Fe
For springs, tools, punches, dies, crimpers, drills, rails, hammers, tools, springs

RAXA EXTRA-EXTRA 1
M-1353, 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe
For engravers' tools, taps, reamers; Type W1; water hardened

RAXA EXTRA EXTRA 2
M-1353, 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 110,000 TS, 58,000 YS, 18 El, 38 RA, 210 Brin
For drills, taps, springs, tools, reamers, Type W1, water hardened

RAXA EXTRA-EXTRA 3
M-1353; 1.0 C, 0.25 max Mn, 0.25 max Si, bal Fe
Annealed 100,000 TS, 53,000 YS, 21 El; 42 RA, 200 Brin.
For drills, taps, cutters, broaches, hobs, Type W1, water hardened

RAXA EXTRA-EXTRA 4.
M-1353, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated. 190,000 TS, 145,000 YS, 10 El, 30 RA, 400 Brin
For drills, springs, punches, tools, Type W1; water hardened.

RAXA EXTRA-EXTRA 5
M-1353, 0.70 C, 0.25 max Si, 0.2 max Mn, bal Fe
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA, 355 Brin
For springs, rails, tools, hammers, axes, cutters, Type W1, water hardened

RAXA EXTRA-EXTRA 6
M-1353, 0.61 C, 0.25 Si, 0.65 Mn, bal Fe
Heat treated 160,000 TS; 114,000 YS; 12 El; 40 RA; 325 Brin
For rails, tools, springs, hammers, axes; water hardened

RAXA G15K.
M-1353; 0.25 C, 14.5 Cr, 0.7 Si, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 200 Brin.
For turbine blades, valves, pumps, surgical instruments, Type 420; stainless.

RAXA G17K
M-1353; 0.25 C, 17 Cr, 1.8 max Ni, bal Fe.
Annealed. 125,000 TS; 95,000 YS; 20 El, 55 RA; 260 Brin
For pumps, valves, marine hardware; Type 431; corrosion and heat resistant

RAXA G28NK
M-1353; 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
Cast 90,000 TS; 65,000 YS; 2 El; 212 Brin
Aged: 97,000 TS; 65,000 YS, 18 El; 210 Brin
For cylinder liners, bushings, valve seats and bodies, heat resistant, Type CC50

RAXA G30K
M-1353, 1.2 C, 1.3 Si, 29 Cr, bal Fe.
For rollers, crushers, rabble arms; heat and abrasion resistant

RAXA G30MK
M-1353, 1.2 C, 1.3 Si, 29 Cr, 2 Mo, bal Fe
For rollers, crushers, rabble arms, grate bars, heat and abrasion resistant

RAXA G188K
M-1353, 0.15 C, 1.5 Si, 18 Cr, 8.5 Ni, bal Fe.
Annealed 80,000 TS, 35,000 YS; 55 El; 75 RA; 150 Brin
Cold drawn. 180,000 TS, 15,000 YS; 10 El, 250 Brin
For chemical plant equipment, tanks, mixers; Type 302, stainless, austenitic.

RAXA G188SK
M-1353, 0.15 C, 18 Cr, 8.5 Ni, 0.2 S, bal Fe.
Annealed 80,000 TS, 40,000 YS; 50 El, 70 RA; 150 Brin
For screw machine products, shafts, fasteners, Type 303, stainless, free-cutting

RAXA G199K
M-1353, 0.15 C, 18 Cr, 9.5 Ni, 2 Mo, bal Fe
Annealed 85,000 TS, 35,000 YS, 50 El, 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks, Type 316, stainless, austenitic.

RAXA G199SK
M-1353, 0.15 C, 18 Cr, 9.5 Ni, 2 Mo, 0.2 S, bal Fe
Annealed 85,000 TS, 35,000 YS, 50 El, 65 RA, 160 Brin
For screw machine products, fasteners; stainless, austenitic, free-cutting

RAXA GARANT 10
M-1353, 0.85 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe
For lathe and planer tools, reamers, taps, hobs; high speed steel

RAXA GARANT 18
M-1353; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe
For drills, hobs, reamers, taps, broaches, high speed steel

RAXA GARANT 33
M-1353, 0.85 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe
For drills, hobs, reamers, taps, broaches; high speed steel

RAXA GARANT 50
M-1353, 0.79 C, 4.3 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, hobs, reamers, taps; high speed steel.

RAXA GARANT 55.
M-1353; 0.79 C, 18 W, 4.7 Co, 1.5 V, 4.3 Cr, bal Fe.
For reamers, broaches, taps, form cutters; high speed steel.

RAXA GARANT 70.
M-1353; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For engravers' tools, form cutters, high speed steel.

RAXA GARANT 100.
M-1353; 1.35 C, 4.3 Cr, Co, W, V, bal Fe.
For engravers' tools, form cutters, reamers; high speed steel.

RAXA GARANT 200.
M-1353; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

RAXA GARANT 300.
M-1353; 0.7 C, Co, V, Cr, W, bal Fe.
For lathe and planer tools, drills, taps, hobs, high speed steel.

RAXA GARANT II.
M-1353; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

RAXA GARANT III.
M-1353; 0.95 C, 4.3 Cr, W, V, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

RAXA GBS.
M-1353; 1.25 C, 1.15 Si, 0.70 Mn, 1.2 Cr, bal Fe.
For bearings, sleeves, liners, water hardened, wear resistant.

RAXA GC8.
M-1353, 0.3 C, 2.2 Si, 6 Cr, bal Fe
For oil refinery equipment; heat and creep resistant.

RAXA GC9
M-1353; 0.5 C, 1.5 Si, 17 Cr, bal Fe.
For oil refinery equipment; heat resistant

RAXA GC10.
M 1353; 0.6 C, 1.5 Si, 22 Cr, bal Fe
For oil refinery equipment; heat resistant.

RAXA GC11
M-1353, 0.6 C, 1.5 Si, 29 Cr, bal Fe.
For oil refinery equipment, rabble arms, heat resistant

RAXA GCN10.
M-1353, 0.4 C, 2 Si, 22 Cr, 9.5 Ni, bal Fe.
Cast: 85,000 TS; 45,000 YS, 35 El, 165 Brin.
For furnace parts, salt pots, retorts, heat treat boxes; Type HF; corrosion and heat resistant.

RAXA GCN12
M-1353; 0.4 C, 27 Cr, 4 Ni, 1.3 Si, bal Fe.
Cast: 90,000 TS; 65.000 YS; 2 El, 212 Brin
Heat treated: 97,000 TS; 65,000 YS, 18 El, 210 Brin.
For cylinder liners, bushings, valve seats, Type CC50; corrosion and heat resistant

RAXA GCN12X
M-1353, 0.4 C, 2 Si, 25 Cr, 19 Ni, bal Fe.
Cast: 75,000 TS; 50,000 YS; 17 El; 170 Brin
Aged: 85,000 TS; 50,000 YS; 10 El; 190 Brin.
For furnace parts, retorts, rabble arms, pots; Type HK; corrosion and heat resistant

RAXA GCV9.
M-1353; 0.5 C, 1.5 Si, 17 Cr, bal Fe.
For oil refinery equipment; heat resistant.

RAXA GCV11.
M-1353; 1.3 C, 1.5 Si, 29 Cr, bal Fe.
For rollers, crushers, grate bars; heat and wear resistant.

RAXA GL1
M-1353; 0.53 C, 0.9 Si, 0.9 Mn, bal Fe.
For gears, bolts, machine tool parts; water hardened.

RAXA GL2.
M-1353, 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough

RAXA GL3
M-1353; 0.55 C, 0.7 Cr, 1.65 Ni, 0.1 V, 0.18 Mo, bal Fe
For gears, bolts, fasteners, crankshafts; oil hardened, shock resistant.

RAXA GL4.
M-1353, 0.56 C, Cr, Ni, Mo, V, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant

RAXA HDS
M-1353; 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For cold work tools, headers, upsetters; oil hardened, tough

RAXA HDS/H
M-1353, 0.45 C, 1 Cr, 0.2 V, 1.85 W, bal Fe.
For cold work tools, headers, upsetters, oil hardened, tough

RAXA HM
M 1353; 0.45 C, Ni, Cr, W, bal Fe
For cold work tools, upsetters, punches, shears; oil hardened, tough

RAXA HSS
M-1353, 1.05 C, 1 Cr, 1.15 W, bal Fe
For bearings, cutters, liners, water hardened, wear resistant

RAXA HWA
M-1353, 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams and liners, mandrels, oil hardened, hot work steel

RAXA HWA SPEZIAL
M-1353, 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe
For extrusion rams and liners, mandrels; oil hardened, hot work steel.

RAXA KEV
M 1353, C, alloy, bal Fe
For machine tool parts, oil hardened

RAXA KLW
M 1353, C, alloy, bal Fe.
For machine tool parts, oil hardened.

RAXA KSM
M-1353, 1.0 C, 0.2 Si, 0.25 Mn, 0.1 V, bal Fe
Annealed. 100,000 TS; 53,000 YS; 21 El; 42 RA, 200 Brin
For springs, cutters, drills, taps, reamers, Type W2, water hardened.

RAXA MKS
M-1353, 1.0 C, 0.25 Si, 0.07 Mn, 1.1 Cr, bal Fe.
For bearings, liners, sleeves; water hardened, wear resistant.

RAXA MN12.
M-1353, 0.2 C, 13 Mn, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.

Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For turbine blades, valves, cutlery, surgical instruments; Type 420; stainless.

RAXA MSA.
M-1353; 0.9 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, dies, crimpers, upsetters; oil hardened, nondeforming.

RAXA MWA.
M-1353; 0.3 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For extrusion dies and rams, upsetters, headers; oil hardened, tough.

RAXA MWH.
M-1353, C, alloy, bal Fe.
For gears, shafts, axles, bolts; oil hardened, tough.

RAXA MWV.
M-1353; 0.45 C, Ni, Cr, bal Fe.
For crankshafts, gears, bolts; oil hardened, shock resistant.

RAXA NWP
M-1353, 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, fasteners, crankshafts; oil hardened, shock resistant.

RAXA PCO
M-1353, 0.40 C, 13 Cr, bal Fe
Annealed: 95,000 TS, 50,000 YS; 25 El, 55 RA, 196 Brin.
For valves, cutlery, surgical and dental instruments, Type 420; stainless

RAXA R10
M-1353, C, alloy, bal Fe
For machine tool parts

RAXA R15
M-1353, C, alloy, bal Fe
For machine tool parts

RAXA R60
M-1353, C, alloy, bal Fe
For machine tool parts

RAXA R70
M-1353, C, alloy, bal Fe
For machine tool parts

RAXA REC60
M-1353, C, Cr, bal Fe.
For machine tool parts.

RAXA RWS5
M-1353, C, W, bal Fe
For machine tool parts

RAXA RZM
M-1353, 1.4 C, 0.1 V, 0.3 Mn, 0.25 Si, bal Fe
For engravers tools, form cutters, taps, drills; water hardened, Type W2.

RAXA SPEZIAL 1
M-1353, 0.9 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated 190,000 TS; 145,000 YS; 10 El; 30 RA, 400 Brin.
For springs, tools, dies, drills, taps, Type W1, water hardened

RAXA SPEZIAL 2.
M-1353; 0.75 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated 185,000 TS, 140,000 YS; 15 El; 38 RA; 400 Brin
For springs, rails, hammers, dies, crimpers; Type W1, water hardened.

RAXA SPEZIAL 3.
M-1353; 0.67 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Heat treated: 172,000 TS; 125,000 YS; 14 El; 40 RA; 350 Brin
For springs, rails, hammers, axes, punches; water hardened.

RAXA SPEZIAL 4.
M-1353; 0.60 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 325 Brin.
For springs, bolts, hammers, axes, punches; water hardened.

RAXA SPEZIAL 5.
M-1353; 0.45 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For gears, bolts, fasteners, crankshafts; water hardened.

RAXA SPEZIAL 6
M-1353; 0.35 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 185 Brin.
For gears, bolts, fasteners, machine tool parts; water hardened

RAXA SPS
M-1353, 0.67 C, 1.3 Si, 0.5 Cr, bal Fe.
Heat treated: 170,000 TS; 125,000 YS; 15 El; 40 RA; 350 Brin
For punches, crimpers, riveters, water hardened, tough

RAXA SSWR
M-1353; 0.90 C, 0.25 Si, 0.8 Cr, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA, 400 Brin.
For springs, tools, cutters, drills, taps; Type W1; water hardened

RAXA UW10.
M-1353, C, alloy, bal Fe.
For machine tool parts

RAXA UW13
M-1353, C, alloy, bal Fe
For machine tool parts.

RAXA VS6
M-1353, C, alloy, bal Fe
For machine tool parts

RAXA WCH
M-1353, 0.45 C, W, Cr, V, bal Fe
For dies, tools, oil hardened

RAXA WCNU
M-1353; C, alloy, bal Fe
For machine tool parts.

RAXA WHW
M-1353, 0.55 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.8 W, bal Fe
For cold work tools, heading dies, upsetters, oil hardened, tough.

RAXA WP6
M-1353, C, alloy, bal Fe
For machine tool parts, oil hardened

RAXA WS1.
M-1353, 1.2 C, 0.20 Cr, 0.1 V, 1.0 W, bal Fe
For cutters, bearings, forming dies, oil or water hardened.

RAXA WSM
M-1353, C, alloy, bal Fe.
For machine tool parts; oil hardened.

RAXA WZR
M-1353, C, Cr, W, bal Fe.
For forging and heading dies; oil hardened.

RAXA ZHW
M-1353; C, alloy, bal Fe.
For machine tool parts.

RAXA ZVW.
M-1353, 1.42 C, W, V, bal Fe.
For bearings, engraving tools, cutters; oil hardened.

RAYMUR.
Cu-Ni.
For ornamental and corrosion resistant parts; corrosion resistant.

RAYO.
85 Ni, 15 Cr.
For resistance alloy; heat resistant.

R BRAND COPPER.
M-558; Fire refined copper ingot.
For remelting copper for copper alloy.s

RCA NO. 91.
M-1465; Ni-Co.
For electronic equipment; heat resistant.

RCA NO. 97.
M-1465; Ni-Co.
For electronic equipment; heat resistant.

RCA-N9.
M-1465; 0.10 C, 0.20 Mn, 0.16 Si, 0.05 Mg, bal Ni.
For filaments.

RCA-N91.
M-1465; 0.04 min C, 0.10 Si, 0.10 Mn, 20 Co, bal Ni.
For rectifier filaments.

RCA-N97.
M-1465; 40 Co, 0.16 Si, 0.10 Mn, 0.04 min C, bal Ni.
For rectifier filaments.

RCA-N100.
M-1465; 0.10 C, 2 W, 1 Al, 0.05 Mg, bal Ni.
For filaments.

R.C.C.B.
M-1118; 2.25 C, 13 Cr, bal Fe.
For tools, dies, non-deforming.

R CUPRO-NICKEL (70/30).
M-121; 30 Ni, 70 Cu.
For heavy current resistances; low specific resistance.

R CUPRO-NICKEL (80/20).
M-121; 20 Ni, 80 Cu.
For heavy current resistances; low specific resistance.

R CUPRO-NICKEL (90/10).
M-121; 10 Ni, 90 Cu.
For heavy current resistances; low specific resistance.

R.C.W. 2.
M-1118; 0.28 C, 9 5 W, 2.5 Cr, 0.1 V, bal Fe.
For hot work dies and tools; hot work steels.

R.C.W. 2VA.
M-1118; 0.6 C, 9 5 W, 2.5 Cr, 0.1 V, bal Fe.
For hot work dies and tools; hot work steels.

R.C.W.M.
M-1118; 0.5 C, 9.5 W, 2.5 Cr, 0 1 V, bal Fe.
For hot work dies and tools; hot work steels.

RD ALLOY.
U.S.; Cu alloy.
For brazing of tools; age-hardenable.

R.D.S. see CARPENTER R.D.S.

R.D.X.
M-240; 0.7-0.8 C, 0.2-0.3 Mo, bal Fe.
For tools, chisels, header dies; water hardening.

REACTAL.
M-419; 3.2 C, 2.2 Si, 1.5 Ni, 0.8 Cr, bal Fe.
Cast: 42,000-55,000 TS; 187 Brin.
For corrosion and heat resisting parts; corrosion and heat resistant castings.

READILY FUSIBLE ALLOY.
67 Zn, 33 Cu.
For brazing; high strength.

READY-MARK.
M-1172; 0.90 C, 1.2 Mn, 0.5 Cr, 0.2 V, 0.5 W, bal Fe.
AISI Type 01 oil hardening tool steel.

RECIDAL.
Italy; Al alloy.
For screw machine products, fasteners; free-cutting.

RECIDAL 55.
M-Italy; 5.3-5.7 Cu, 0.2-0.3 Pb, 0 2-0.3 Cd, 0 4-0.6 Zn, 0.30 Fe, 0.25 Si, bal Al
For screw machine products, fasteners
Free-cutting, corrosion resistant.

RECKHAMMER SSW.
Germany; 0.90 C, 0 80 Cr, 0.30 Mn, bal Fe.
For bearings, liners, cutters, sleeves; water hardened, wear resistant.

RECO 1.
M-1188; 24 Ni, 13 Al, 4 Cu, bal Fe.
For permanent magnets, electrical and magnetic equipment.
High permeability.

RECO 2A.
Holland; 7 Al, 20 Ni, 20 Co, 7 Cu, 6.5 Ti, bal Fe.
For permanent magnets.

RECO II A
M-1188, C, alloy, bal Fe.
For permanent magnets; high permeability.

RECO 3A.
M-1188, 19 Ni, 12 Co, 10 Al, 6 Cu.
For permanent magnets, electrical and magnetic equipment.
High permeability

RECORD
M-815; Sb, Sn, bal Pb
For bearings; Babbitt.

RECORD 66
M-336; 0.7 C, 5 W, 6 75 Mo, 4.25 Cr, 1.75 V, bal Fe.
For gear cutters, form cutters, cold or hot work dies; high speed steel.

RECORD-EMINENT.
M-336; 0 85 C, 18.5 W, 4.25 Cr, 2.5 V, 10 5 Co, bal Fe.
For tools, dies, cutters; high speed steel.

RECORD EXTRA.
M-336, 0 8 C, 18 W, 3 75 Cr, 1.25 V, 2.25 Co, bal Fe
260 Brin
For dies, tools for high speed production for turning and heavy cutting, sealing material; high speed steel.

RECORD STAR.
M-336; 0 7 C, 4 Cr, 14 W, 2 V, bal Fe.
For tools, cutters; high speed steel.

RECORD SUPERIOR.
M-336; 0.8 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, dies for boring, planing and slotting, taps, reamers, punches; high speed steel.

REDALOY.
M-216; 55 Cu, 1 max Pb, 2.25 Al, bal Zn.
Extruded: 85,000 TS, 25,000 YS; 20 El; B 80 Rock.
Drawn: 90,000 TS; 35,000 YS; 15 El, B 85 Rock.
For hardware, plumbing, fixtures.
Corrosion resistance.

REDALOY NO. 1.
M-122; 53.75-54.25 Cu, 3.3-3.5 Pb, bal Zn.
77,000-88,000 TS; 24,000-64,000 YS; 7-17 El; 11-22 RA; 70-100 Brin
For screw machine parts; free cutting.

REDALOY NO. 2.
M-122; 57.5-58 Cu, 3.3-3.5 Pb, bal Zn.
63,000-70,000 TS; 23,000-56,000 YS; 13-32 El; 16-29 RA; 65-100 Brin.
For screw machine parts; free cutting.

REDALOY NO. 3
M-122, 52-53.7 Cu, 0.4-0.6 Pb, bal Zn
For pressure die castings, high strength.

REDALOY NO. 8
M-122, 54 Cu, 3.4 Pb, bal Zn
Forgings. 77,000 TS; 18 El, Rockwell B64.
For forgings, hardware, free-cutting

RED ANCHOR
M-342, 0.95-1.1 C, bal Fe
For general tools, chasers, water hardened

RED ANCHOR DRILL ROD
M-342, M-115, 0.95-1.10 C, bal Fe
80,000 TS; 60,000 YS; 25 El; 50 RA
For anvils, dental tools, spindles, precision shafts for motors, water hardened

RED ARROW
M-73, Co-Cr-W-C
For cutting tools, bits; cast-to-shape

RED ARROW 48 S
M-73; 25-35 Cr, 10-25 W, 40-60 Co.
For roughing and finishing cutting tools; heat resistant, cast alloy

RED ARROW 101
M-73, C, alloy, bal Fe
For cutting tools, oil hardening

RED ARROW 202
M-73, 25-35 Cr, 10-25 W, 40-60 Co.
For roughing and finishing tools, cutters; cast alloy

RED ARROW 222
M-73, 25-35 Cr, 10-25 W, 40-60 Co
For roughing and finishing cutting tools, cast alloy.

RED ARROW 303
M-73, 25-35 Cr, 10-25 W, 40-60 Co
For roughing and finishing cutting tools, cast alloy

RED ARROW 333
M-73, 25-35 Cr, 10-25 W, 40-60 Co
For cutting tools, cast alloy

RED ARROW WELDING ROD
M-73, W-Cr-Co-C
For hard surfacing welding rod, cast alloy

RED BRASS
M-8, 85 Cu, 15 Zn
Tubes and sheets: 42,000-50,000 TS, 20,000-40,000 YS, 43-4 El, 68 RA
For salt water pipes, plumbing, hardware, corrosion resistant

RED BRASS
M-33, 80 Cu, 20 Zn
Plates and sheets, 43,000-85,000 TS; 18,000-60,000 YS, 50-4 El; 53-150 Brin
For pipes, hardware, corrosion resistant

RED BRASS.
M-33; 85 Cu, 15 Zn.
Annealed: 42,000 TS; 14,000 YS, 45 El.
Rolled: 70,000 TS; 58,000 YS; 5 El.
For plumbing, pipe, tubes, hardware; corrosion resisting.

RED BRASS 24.
M-8; 85 Cu, 15 Zn.
Soft: 40,000 TS; 15,000 YS; 50 El.
Hard: 69,000 TS; 55,000 YS; 10 El.
For plumbing pipe, condenser tubes, radiator cores, red brass.

RED BRASS 230.
M-8, M-279, 85 Cu, 15 Zn
Ann: 39,000-47,000 TS; 8000-19,000 YS; 43-48 El.
Cold rolled: 44,000-90,000 TS; 23,000-80,000 YS; 2-39 El
Golden color, stress-corrosion resistant brass.
For jewelry, pen caps, pencil ferrules, steam iron tubes

RED CASTING BRASS
M-165; 85 Cu, 5 Sn, 5 Pb, 5 Zn
Cast: 27,000 TS; 18 El
For castings, hardware, GM No. 4041 M.

RED CIRCLE
M-905, 3.2 C, 1.5 Si, bal Fe
For cast iron rolls; chilled.

RED CIRCLE
M-750, C, alloy, bal Fe
For maintenance and repair operations; oil hardening

RED CUT COBALT
M-115, M-34, 0.72 C, 17.25 W, 4 Cr, 4.5 Co, 1.0 V, 0.5 Mo, bal Fe
For cutting and forming tools, lathe tools, planer tools, reamers, taps, applicable for deep cutting, scaly material.

RED CUT COBALT B
M-115, M-34, 0.78 C, 18 W, 4 Cr, 8.75 Co, 1.85 V, 0.75 Mo, bal Fe.
For cutting and forming tools, reamers, taps; high speed steel.

RED CUT SUPERIOR
M-115, M-34, 0.5-0.8 C, 0.25-0.40 Si, 17.5-18.5 W, 3.75-4.25 Cr, 0.95-1.15 V, bal Fe
Annealed: 105,000 TS, 75,000 YS, 14 El, 17 RA, 255 Brin
For tools, blanking dies, chasers, forming tools and dies, lathe and planer tools, taps; high speed steel, wear and abrasion resistant

RED CUT SUPERIOR FM
M-115, 0.5-0.8 C, 17.5-18.5 W, 3.75-4.25 Cr, 0.95-1.15 V, bal Fe
Annealed: 105,000 TS, 75,000 YS, 14 El; 17 RA; 235 Brin
For blanking and forming dies, lathe tools, high speed steel, free-cutting

RED CUT SUPERIOR TEMPER "J"
M-115, 0.50-0.55 C, 17.5-18.5 W, 3.75-4.25 Cr, 0.95-1.15 V, bal Fe
For high speed cutting tools, blanking dies, forming tools, taps, wear and abrasion resistant.

RED CUT SUPERIOR TEMPER "M"
M-115, 0.61-0.65 C, 17.5-18.5 W, 3.75-4.25 Cr, 0.95-1.15 V, bal Fe
For high speed cutting tools, blanking dies, forming tools, taps, wear and abrasion resistant.

RED CUT SUPERIOR TEMPER "O"
M-115, 0.66-0.70 C, 17.5-18.5 W, 3.75-4.25 Cr, 0.95-1.15 V, bal Fe.
For high speed cutting tools, blanking dies, forming tools, taps, wear and abrasion resistant.

RED CUT SUPERIOR TEMPER "P."
M-115, 0.71-0.75 C, 17.5-18.5 W, 3.75-4.25 Cr, 0.95-1.15 V, bal Fe
For high speed cutting tools, blanking dies, forming tools, taps; wear and abrasion resistant.

RED DEVIL.
M-712; 0.07 C, bal Fe.
Welded: 68,000 TS; 56,000 YS; 30 El; 50 RA.
For welding rods; flux coated.

RED DEVIL 75.
M-712; 0.1 C, 0.6 Mo, bal Fe.
Welded: 74,000 TS; 62,000 YS; 32 El; 65 RA.
For welding rods; flux coated.

RED DEVIL 85.
M-712; C, 0.9 Mo, bal Fe.
Welded: 80,000 TS; 72,000 YS; 24 El; 47 RA.
For welding rods; flux coated.

RED (EINHEITS) BRASS.
Germ.; 89-83 Cu, 5-12 Zn, 3-10 Pb, 2-5 Sn.
Hard: 80,000 TS; 71,000 YS; 4 El; 135 Brin.
Soft: 41,000 TS; 18,000 YS; 47 El; 52 Brin.
For tubing, hardware; Tombac, free-cutting.

RED FOX 30.
M-430; 0.45 C, Si, W, 20 Cr, 8 Ni.
Normalized: 115,000 TS; 32 El; 42 RA.
For exhaust valves; max working temp. 1050°C.

RED FOX-309.
M-430, M-1724; 0.2 C, 23 Cr, 14 Ni, bal Fe.
Annealed: 75,000 TS; 30,000 YS; 40 El; 220 Brin.
For high temperature service, kilns, combustion chambers, salt pots, brazing fixtures.
AISI Type 309, austenitic. Heat and corrosion resistant.

RED FOX-310.
M-430, M-1724; 0.2 C, 25 Cr, 21 Ni, bal Fe.
Annealed: 87,000 TS; 36,000 YS; 54 El; B 85 Rock.
For high temperature service, furnace equipment, carburizing boxes, valves, pumps.
Heat and corrosion resistant.
AISI Type 310, austenitic.

RED GOLD.
75 Au, 15 Cu.
For jewelry, ornaments; corrosion resistant.

REDHARD HS.
M-1082; 0.7 C, 18 W, 4 Cr, 2 V, bal Fe.
For cutting tools; high speed steel.

REDHARD NF.
M-1082; 45 Co, 32 Cr, 18 W, 2.5 C, 2.1 other elements.
Cast: 73,000 TS; 650 Brin.
For cutting tools, form tools; nonferrous, heat and abrasion resistant.

REDI H.
M-1322; 0.45 C, Si, Cr, V, bal Fe.
For gears, bolts, springs, crankshafts; oil hardened, shock resistant.

RED INDIAN.
M-435; 0.35 C, 5 Cr, 4.5 W, 0.3 Mo, 0.3 V, 0.5 Co, 1 Si, bal Fe.
For die casting dies, extrusion dies and mandrels; hot work steel.

REDI SPEZIAL.
M-1322; 0.61 C, 1.18 Cr, 0.1 V, 0.75 Mn, bal Fe.
For springs, dies, tools; oil hardened, tough.

RED LABEL EXTRA.
M-373; C as desired, 0.25 Mn, 0.25 Si, V optional, 0.015 max P, 0.015 max S, bal Fe.
AISI Type W2 water hardening tool steel.

RED LABEL PEERLESS.
M-343; 0.6-0.7 C, 3-4 Cr, 18-20 W, 1.2-1.5 V, bal Fe.
For cutting tools for heaviest cuts at highest speeds; high speed steel.

RED METAL.
70 Cu, 20 Zn, 6 Pb, 4 Sn.
For hardware; free-cutting.

RED RAY.
85 Ni, 15 Cr.
For heating elements; heat resistant.

RED SABRE.
M-24; 1.5 C, 12 W, 5 V, 4.75 Cr, 5 Co, bal Fe.
For tool bits, cutters, dies; Type T15; high speed steel.

RED SHADOW.
M-783; 0.40 C, 3.1 Cr, 0.25 Mn, 0.25 V, 10 W, bal Fe.
For tools, dies; hot work steel.

RED SHADOW.
M-289; 0.8 C, 4 Cr, 5 Mo, 6.5 W, 2 V, bal Fe.
For milling cutters, reamers, broaches, hobs, drills; high speed steel, oil hardened.

RED STAR TAP.
M-34; 1.1 C, bal Fe.
For taps, drills, cutters; highest quality carbon tool steel.

RED STAR TOOL.
M-34, M-115; 0.6-1.2 C, bal Fe.
For tools, drills, punches; standard carbon tool steel.

RED STAR TUNGSTEN 10 TEMPER
M-115, M-34; 0.90-1.0 C, 0.35-0.50 Cr, 1.5-1.7 W, 0.06-0.10 V, bal Fe.
Annealed: 90,000 TS; 65,000 YS, 22 El; 42 RA; 190 Brin.
For taps, reamers, punches, dies, finished tools, gages; water hardening.

RED STAR TUNGSTEN 12 TEMPER
M-115, M-34, 1.25-1.15 C, 0.60-0.80 Cr, 1.5-1.7 W, 0.10-0.25 V, 0.25 Mo, bal Fe
Heat treated: 180,000-145,000 TS; 154,000-210,000 YS; 1-13 El; 5-36 RA; 420-302 Brin
For taps, reamers, punches, dies, finished tools, gages, water or oil hardening

RED STAR TUNGSTEN DRILL ROD.
M-342, M-115; 1.2 C, 1.6 W, 0.7 Cr, 0.25 Mo, 0.2 V, bal Fe.
For drill rod, water hardening

RED STREAK see SIMONDS RED STREAK.

RED STREAK ALNICO.
M-373; 0.10 C, 17.5 Ni, 11 Al, 13 Co, bal Fe.
For permanent magnets; Alnico No. 2.

RED TIP.
M-266; 61.5 Cu, 3 Pb, bal Zn.
Half hard. 62,000 TS; 53,000 YS, 25 El.
Annealed: 49,000 TS; 18,000 YS; 53 El.
For screw machine products; free-cutting.

RED TIP 201.
M-213; Zn, Pb, bal Cu
For screw machine products; free-cutting.

RED, WHITE AND BLUE.
M-1112, 0.9-1.0 C, bal Fe.
For tools, taps, drills; water hardened.

RED-X-5.
M-130; 1-2 Cu, 0.2-0.5 Mg, 0.2-0.6 Mn, 4.5-6.5 Si, bal Al.
Permanent mold: 32,000 TS; 20,000 YS; 3.5 El; 65 Brin.
Sand cast: 26,000 TS; 16,000 YS; 2.5 El; 60 Brin.
For forgings and castings; age-hardenable.

RED-X-6.
M-906; 1-2 Cu, 0.2-0.5 Mg, 0.4 Mn, 6 Si, bal Fe.
For light alloy castings; age-hardenable.

RED-X-8.
M-130; 2 Cu, 0.5 Mg, 0.4 Mn, 8 Si, bal Al.
Cast. 33,000 TS; 20,000 YS; 3 El; 65 Brin.
Heat treated: 42,000 TS; 26,000 YS; 1 El; 95 Brin.
For light alloy parts, permanent mold castings; heat treatable.

RED-X-8-5.
M-130; 5 Cu, 0.25 Mg, 8 Si, 0.3 Mn, bal Al.
For light alloy parts, pistons; age-hardenable.

RED-X-10.
M-130; 9.5-10.5 Si, 2 Cu, 0.6 Mg, 0.6 Mn, bal Al.
Permanent mold: 40,000 TS; 30,000 YS; 0.5 El; 105 Brin.
For light alloy parts, pistons; high fluidity.

RED X-11.
M-130; 1-2 Cu, 10.5-11.8 Si, 0.4-1 0 Mg, 0.6 max Zn, 0 8 Mn, bal Al.
Cast-F: 34,000 TS; 23,000 YS; 2 El; 80 Brin.
T6-Temper: 45,000 TS; 35,000 YS; 2 El; 100 Brin.
T51-Temper. 39,000 TS; 31,000 YS; 1 El; 90 Brin.
For light alloy castings; high fluidity.

RED-X-13.
M-130; 2 Cu, 0.7 Mg, 0.75 Mn, 12 Si, bal Al
Heat treated· 34,000-50,000 TS; 23,000-41,000 YS; 1.5-1 0 El; 85-110 Brin.
For permanent mold castings, crank cases, pistons; heat treatable.

RED-X-20
M-130; 1.5 Cu, 20.5 Si, 0.6 Mg, 0 4 Mn, 0 7 Ni, bal Fe.
F temper. 25,000 TS; 1 0 El; 90 Brin.
T7 temper: 38,000 TS; 1.0 El; 110 Brin
For permanent mold pistons; heat treatable.

REED BRASS.
U S., 69 Cu, 30 Zn, 1.0 Sn.
For pipes, tubes, fittings, condenser tubes; corrosion resistant

REED BRASS
M-1426, 67 Cu, 1 Sn, 32 Zn.
½ H-temper· 135 Brin
Spring temper. 195 Brin
For hardware, plumbing, corrosion resistant

REEX
Italy; 0 45-0.90 C, 11 Cr, 14 Ni, 1 Si, 2 W, bal Fe.
For valves, heat and corrosion resistant.

REFAX METAL.
M-1173, 3 2 C, 1 Ni, 0.8 Cr, 2 Si, bal Fe.
For valve bodies, cast iron.

REFLECTAL
M-116, 1.2 Mg, bal Al.
Annealed· 21,000 TS; 8000 YS, 24 El.
For boats, fan blades, window frames; corrosion resistant

REFLECTAL-05
M-541; 0.2-1 0 Mg, bal Al.
R-Temper· 10,000-15,000 TS; 5000 YS; 20-40 El; 25 Brin.
½ Hard· 16,000-20,000 TS; 15,000 YS; 12-15 El; 30 Brin.
For costume jewelry, mirrors, reflectors, watch cases, window frames.
Corrosion resistant.

REFLECTAL 5.
M-249, M-764, M-493; 0.3-1.0 Mg, bal Al.
Soft: 11,500 TS; 4500 YS; 35 El; 22 Brin.
¼ hard temper: 13,500 TS; 13,000 YS; 20 El; 32 Brin.
For mirrors, jewelry, reflectors, watch cases; corrosion resistant.

REFLECTAL 20.
M-249, M-541, M-493; 1.5-2.5 Mg, bal Al.
½ H-temper: 31,500 TS; 27,300 YS; 5 El; 65 Brin.
H-temper: 35,500 TS; 31,500 YS; 3 El; 70 Brin.
For window frames, door handles, costume jewelry, high corrosion resistance.

REFLECTAL 74.
M-624, M-541; 0.5-1.0 Mg, 0.2-1.0 Si, bal Al.
TA-14 Temper: 20,000-28,400 TS; 11,400-21,500 YS; 20-35 El; 55-75 Brin.
TA-16 Temper: 43,000 TS; 36,000 YS; 5 El; 100 Brin.
For marine structures and hardware, architectural applications.
Heat treatable, corrosion resistant.

REFLECTAL-107.
M-249, M-493; 0.2-1.0 Si, 0.2-1.0 Mg, bal Al.
Heat treated: 28,500-42,500 TS; 21,500-35,500 YS; 15-5 El; 80-100 Brin.
For ornamental trim, window frames, door handles; age-hardenable, corrosion resistant.

REFORMEND.
M-677; 0.2 C, bal Fe.
For welding electrodes; for cast iron.

REFRACTALOY 26
M-118; 0 08 max C, 16-20 Cr, 35-39 Ni, 16-22 Co, 3 Mo, 3 Ti, 0.3 max Al, 0.5-1.5 Si, 0.4-1.0 Mn, bal Fe.
Hardened: 170,000 TS; 100,000 YS, 18 El; 20 RA; 241-311 Brin.
For turbine blades and parts, bolts, springs; heat resistant to 1500°F, high creep strength.

REFRACTALOY 70.
M-118; 19-21 Ni, 28.5-31 5 Co, 19-21 Cr, 8 Mo, 4 W, 2 Mn, 0.8 Si, 0.08 max C, bal Fe.
Hardened: 132,000 TS; 87,000 YS, 3 El; 3 RA; 315 Brin.
For high temperature applications; resists heat over 1200°F.

REFRACTALOY 80.
M-118; 0.2 max C, 28.5-31 5 Co, 19.5-21.5 Cr, 19-21 Ni, 16 max Fe, 9-11 Mo, 4.5-5 5 W, 0 8 Mn, 0.8 Si
Cast. 83,000 TS, 57,000 YS; 8 El; 11 RA; 180 Brin.
Hardened· 100,000 TS; 84,000 YS; 3 El; 4 RA; 220 Brin.
For nozzle vanes, gas turbine parts, high ductility, creep strength and oxidation resistance.

REFRACTALOY B.
M-118; 25 Cr, 30 Ni, 8 Mo, bal Fe.
For combustion chambers, exhaust cones; high heat and corrosion resistant.

REFRACTORY.
Eng ; 0 05 C, 30 Co, 21 Ni, 14 Fe, 20 Cr, 8 Mo, 4 W.
For jet engine components; high strength, heat resistant.

REFRACTORY SOLDER.
Eng., 50 Cu, 50 Zn.
For solder; brazing

REGAL.
M-275; 1.35 C, 3.5 W, bal Fe.
For cutters, lathe tools, broaches; fast finishing steel.

REGAL.
M-1705; 1.55 C, 11.5 Cr, 1 0 V, 0.8 Mo, bal Fe.
High carbon, high chromium tool and die steel; air or oil hardening. AISI D2.

REGALT.
M-1339; 1.42 C, W, V, bal Fe.
For engravers' tools, forming and blanking dies; water or oil hardened.

REGEL-METALL.
Eng.; 83.3 Sn, 11.1 Sb, 5.6 Cu.
For bearings, bushings; anti-friction.

REGELMETALL WM 80.
80 Sn, Pb, Sb.
For bearings; antifriction metal.

REGENT.
M-1339; 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For blanking and forming dies; oil hardened, non-deforming.

REGENT.
M-1348; 2.1 C, 11.5 Cr, 0.30 Mn, bal Fe.
For forming and blanking dies, punches; oil hardened, non-deforming.

REGENT C.3.H.
M-1415; 0.15 C, bal Fe.
For plastic dies, hobbed dies; case hardened.

REGENT G.14.
M-1415, 1.5 C, 12 Cr, 0.25 V, 0.75 Mo, bal Fe.
For thread rolling dies, gages, broaches; non-deforming, air hardening

REGENT G.22.
M-1415, 0.5 C, 1 Cr, 0.5 V, 0.2 Mo, 3 Ni, 0.5 Mn, bal Fe.
For shear blades, punches, dies; oil hardened, tough.

REGENT I 18.
M-1415; 2 C, 12 Cr, bal Fe.
For punches, blanking and forming dies; oil hardened, non-deforming

REGENT J 7
M-1415; 0.5 C, 1 Mn, 1 Cr, 0.35 Mo, bal Fe.
For hand chisels, sates, cutters, tough, air hardened, non-tempering

REGENT J.15.
M-1415; 1.15 C, 1.5 W, 0.15 V, bal Fe
For taps, drills, reamers, cutters, threading dies; water hardened, wear resistant

REGENT L 5.
M-1415, 0.4 C, 0.5 Mn, 3.25 Ni, bal Fe.
For chisels, punches; tough, oil hardened.

REGENT N.1.
M-1415, 0.6 C, 2 Si, 0.25 V, 0.25 Mo, 0.74 Mn, bal Fe.
For punches, concrete breaker picks, chisels, oil hardened, tough

REGENT N.1 H.
M-1415, 0.35 C, 1.25 Cr, 4.25 Ni, bal Fe.
For plastic mold dies; air or oil hardened.

REGENT N.3.C
M-1415; 0.12 C, 1.25 Cr, 4 Ni, bal Fe.
For plastic mold dies, case hardened, tough.

REGENT N.13
M-1415, 0.40 C, 1.25 Cr, 1.75 Ni, 0.20 Mo, bal Fe.
For plastic mold and die casting dies, oil hardened, tough.

REGENT R.16
M-1415, 0.10 C, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For multiple dies, valves, cutlery; corrosion resistant; Type 410.

REGENT Z
M-1348; 2.1 C, 11.5 Cr, 0.70 W, bal Fe.
For forming and blanking dies, punches; oil hardened, non-deforming.

REGIN 3.
M-111; 0.48 C, 0.9 Si, 1.15 Cr, 0.25 Mo, 2.25 W, 0.15 V, bal Fe.
For chisels; dies; hot work steel. AISI S1.

REGIN 711.
0.5 C, 1.15 Cr, 2.5 W, 0.2 V, bal Fe
For shear blades, hot heading dies, chisels, hot work steel.

REGULAR.
M-73; 0.30-0.40 C, 13-14 Cr, 0.50 max Mn, bal Fe.
Heat treated 232,000-200,000 TS; 220,000-180,000 YS; 0-10 El; 0-20 RA; 505-400 Brin.
Annealed: 90,000 TS; 48,000 YS; 28 El; 60 RA; 170 Brin
For cutlery, bayonets, dies, gages, knives, swords, needles, clippers, pump rods, pistons, cold sets, granite points, stainless when hardened and polished

REGULAR POWER TRANSFORMER NO 72.
M-806; 0.03 C, 3.75 Si, bal Fe
Annealed 80,000 TS, 65,000 YS, 10 El
For radio and generators, good magnetic properties.

REGULAR-SS
M-73, 0.35 max C, 13.5 Cr, 0.35 Si, 0.35 Mn, bal Fe
Annealed: 90,000 TS, 48,000 YS; 28 El, 60 RA; 179 Brin
For valves, cutlery, surgical instruments, corrosion resistant.

REGULAR STAINLESS-420.
M-73, 0.3-0.4 C, 13-14 Cr, bal Fe
For chemical engineering equipment, cutlery, tools; stainless; Type 420

REGULAR STRAIGHT CARBON
M 261, 0.7-1.3 C, bal Fe
For tools, drills, taps, water hardening.

REGULAR TOOL
M-38, 0.7-1.2 C, bal Fe
For tools, drills, taps, water hardened.

REGULIT K
M-27, 2 C, 12 Cr, bal Fe.
For blanking and forming dies; oil hardened, non deforming

REGULIT KNL
M-27, 1.7 C, 12 Cr, Mo, V, W, bal Fe
For blanking and forming dies, air hardened, non-deforming

REGULIT KR
M-27, 2 C, 12 Cr, W, V, bal Fe
For blanking and forming dies, oil or air hardened, non-deforming

REGULUS.
U.S , 75 Pb, 25 Sb For acid valves, cocks, flanges, chemical apparatus; hard lead.

REGULUS METAL "A"
6-8 Sb, bal Pb.
For chemical plant equipment; hard lead.

REGULUS METAL "B"
8-10 Sb, bal Pb
For chemical equipment; hard lead.

REGULUS METAL "C."
10-12 Sb, bal Pb. For bearings; hard lead.

REGULUS METAL "D."
12 Sb, bal Pb.
For bearings; hard lead.

REGULUS VENUS.
Eng.; 50 Cu, 50 Sb.

REICHSBAHN "B."
Germ.; 85 Cu, 11 Sn, 4 Zn.
For railroad bearings; heavy duty.

REICHSBAHN "C."
Germ., 85 Cu, 9 Sn, 6 Zn.
For railroad valves, slides; high strength.

REICHSBAHN "D."
Germ.; 91 Cu, 5 Sn, 4 Zn.
For railroad pipe flanges, tough.

REICHSBAHN "E."
Germ.; 82 Cu, 10 Sn, 7 Zn, 1 Pb.
For machinery castings; free-cutting.

REICHSBAHN, EINHEITS RED BRASS "A."
Germ.; 85 Cu, 9 Sn, 6 Zn
For railroad hardware; high strength

REICHSBAHN "F."
Germ.; 85 Cu, 5 Sn, 8 Zn, 2 Pb
For machinery castings, free-cutting.

REICHSBAHN "G."
Germ.; 86 Cu, 10 Sn, 4 Pb
For railroad dynamo and cold rolled bearings; heavy duty

REICHSBAHN "H."
Germ., 77 Cu, 8 Sn, 15 Pb.
For railroad heavy duty bearings; heavy duty.

REICHSBAHN "I."
Germ., 79 Cu, 20 Sn, 1 Pb.
For car journal bearings, heavy duty.

REICHSBAHN "J."
Germ., 85 Cu, 14 Sn, 1 Pb
For railroad heavy duty bearings; heavy duty.

REICHSBAHN "K."
Germ.; 89 Cu, 10 Sn. For worm wheels; tough.

REICH'S BRONZE
Germ., 85 Cu, 7.5 Fe, 0.6 Al, 0.5 Mn.
For strong corrosion resistant parts, corrosion resistant

REINALUMINIUM.
M-116, 99 Al or 99.5 Al.
Annealed: 9000-16,000 TS, 40-30 El
Hard. 29,000 TS, 25,000 YS; 4 El.
For chemical apparatus, tanks, dairy industry, electrical parts; commercially pure Al.

REINALUMINIUM 2S.
M-1140, 99.0-99.4 Al.
S-O Temper: 14,000 TS; 7100 YS, 35 El.
S-H Temper 25,600 TS, 24,200 YS; 6 El
For cooking utensils, food and chemical processing equipment, wrought, corrosion resistant.

REINING BKV
M-1353; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies; air hardened, nondeforming.

REINING MSM
M-1353; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe
For punches, pneumatic tools; oil hardened, tough.

REINNICKEL.
M-297; 99.0-99.7 Ni.
Annealed: 65,000 TS; 18,000 YS; 50 El; 90 Brin.
Hard rolled: 113,000 TS; 108,000 YS; 2 El; 200 Brin.
For chemical and food-handling equipment; pure Ni corrosion resistant.

REIN-NICKEL GNi.
M-303; 1.5 Si, bal Ni.
For pump castings; corrosion and heat resistant.

REISHOLZ A22.
M-1335; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed: 73,000 TS; 41,000 YS; 22 El; 58 RA; 140 Brin.
For bolts, fasteners, gears, cams, camshafts; case hardening steel.

REISHOLZ A22E
M-1335, 0.28 C, Mn, bal Fe.
Hot rolled: 80,000 TS; 50,000 YS; 30 El; 56 RA; 165 Brin.
For bolts, fasteners, gears, machine tool parts; water hardened.

REISHOLZ A32E.
M-1335; 0.36 C, Mn, bal Fe
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 54 RA; 185 Brin.
For bolts, fasteners, machine tool parts, gears; water hardened

REISHOLZ A35.
M-1335, 0.35 C, 0.25 Si, 0.45 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El, 54 RA; 185 Brin
For gears, bolts, machine tool parts; water hardened.

REISHOLZ B44.
M-1335, 0.24 C, 1.15 Ni, 0.15 max Cr, bal Fe.
For gears, pinions, fasteners, shafts; oil hardened, shock resistant.

REISHOLZ B76.
M-1335; 0.35 C, 1.35 Ni, 0.6 max Cr, bal Fe.
For gears, pinions, fasteners, shafts, axles; oil hardened, shock resistant.

REISHOLZ B412.
M-1335, 0.24 C, Si, Mn, Ni, bal Fe
For gears, pinions, shafts, bolts; oil hardened, shock resistant.

REISHOLZ B412 Mo
M-1335, 0.24 C, Si, Mn, Ni, Mo, bal Fe.
For gears, shafts, bolts, studs, crankshafts, oil hardened, shock resistant

REISHOLZ BCD53T.
M-1335, 0.28 C, 1.25 Cr, 0.35 Mo, 1.95 Ni, bal Fe.
For gears, shafts, crankshafts, machine tool parts; oil hardened, shock resistant.

REISHOLZ BCD53W
M-1335, 0.34 C, 1.45 Cr, 0.25 Mo, 1.55 Ni, bal Fe.
For gears, shafts, machine tool parts; oil hardened, shock resistant.

REISHOLZ BCD54.
M-1335; 0.25 C, 1 Cr, 0.18 Mo, 1.5 Ni, bal Fe.
For gears, shafts, crankshafts, machine tool parts; oil hardened, shock resistant.

REISHOLZ BCD66
M-1335, 0.28 C, 1.15 Cr, 0.25 Mo, 1.15 Ni, bal Fe.
For gears, pinions, shafts, machine tool parts; oil hardened, shock resistant.

REISHOLZ BCD66T.
M-1335; 0.28 C, 1.05 Cr, 0.45 Mo, bal Fe.
For gears, pinions, shafts, machine tool parts; oil hardened, shock resistant.

REISHOLZ CE36.
M-1335; 0.36 C, 1.25 Mn, 1.15 Cr, bal Fe.
For forging dies, crankshafts, fasteners; oil hardened, tough.

REISHOLZ D39K.
M-1335; 0.17 C, Mo, V, bal Fe.
For gears, bolts, machine tool parts; case hardened.

REISHOLZ DC54.
M-1335; 0.24 C, 1.15 Cr, 0.25 Mo, 0.55 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

REISHOLZ DC84.
M-1335; 0.42 C, 1.1 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

REISHOLZ DE20.
M-1335; 0.20 C, 1.1 Mn, 0.25 Mo, 0.25 Si, bal Fe.
For gears, cams, camshafts, machine tool parts; case hardened, tough.

REISHOLZ DE46.
M-1335; 0.20 C, 0.25 Mo, 1.1 Mn, 0.25 Si, bal Fe.
For gears, cams, camshafts, machine tool parts; case hardened, tough.

REISHOLZ E36.
M-1335; 0.36 C, 0.25 Si, 1.25 Mn, bal Fe.
For gears, cams, camshafts, fasteners; water hardened.

REISHOLZ E46K.
M-1335; 0.20 C, 0.12 V, 1.45 Mn, 0.25 Si, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel, tough.

REISHOLZ E305
M-1335, 0.30 C, 0.37 Si, 0.45 Mn, bal Fe.
Hot rolled: 80,000 TS; 50,000 YS; 30 El; 56 RA; 165 Brin.
For gears, bolts, machine tool parts; water hardened.

REISHOLZ EF18.
M-1335; 0.19 C, 0.50 Si, 1.15 Mn, bal Fe
For gears, cams, machine tool parts; case hardened.

REISHOLZ EF46.
M-1335; 0.46 C, 0.9 Si, 0.9 Mn, bal Fe.
For gears, springs, punches, bolts, machine tool parts; water hardened.

REISHOLZ EF55W.
M-1335; 0.55 C, Cr, Mn, Si, bal Fe.
For gears, bolts, machine tool parts; oil hardened.

REISHOLZ EF60.
M-1335; 0.53 C, 0.8 Si, 1.05 Mn, bal Fe.
For gears, springs, bolts, fasteners; water hardened.

REISHOLZ M1.
M-1335; 0.12 C, 0.25 Si, 0.55 Mn, bal Fe.
Annealed: 65,000 TS; 48,000 YS; 28 El; 65 RA; 130 Brin.
For nails, rivets, screws, bolts, bushings; case hardened.

REISHOLZ M2.
M-1335; 0.22 max C, 0.20 Si, 0.30 Mn, bal Fe.
Annealed: 73,000 TS; 60,000 YS; 22 El; 58 RA; 150 Brin.
For fan blades, bushings, gears, shafts, rivets; case hardened.

REISHOLZ M[illegible]
M-1335; 0.25 max C, 0.20 Si, 0.30 Mn, bal Fe.
Hot rolled: 70,000 TS; 45,000 YS; 31 El; 58 RA; 145 Brin.
For gears, bolts, armature shafts, keys, brackets; water hardened.

REISHOLZ NI.
M-1335; 0.26 C, Cr, Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

REISHOLZ NIA.
M-1335; 0.22 C, 0.25 Si, 0.60 Mn, 2.25 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

REISHOLZ NIC.
M-1335, 0.22 C, 0.20 Si, 0.60 Mn, 1.5 Cr, bal Fe
For oil refinery equipment, gears, shafts; heat and creep resistant.

REISHOLZ NIN.
M-1335, 0.24 C, 2.5 Cr, 0.25 Mo, 0.8 max Ni, bal Fe.
For oil refinery equipment; heat and creep resistant

REISHOLZ NIT.
M-1335; 0.32 C, Cr, Ni, Mo, bal Fe
For gears, pinions, shafts; oil hardened, shock resistant.

REISHOLZ S22.
M-1335, 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed: 75,000 TS, 45,000 YS; 22 El, 58 RA; 140 Brin
For screws, bolts, camshafts, bushings, water hardened

REISHOLZ S35.
M-1335, 0.35 C, 0.25 Si, 0.55 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El, 53 RA; 185 Brin.
For armature shafts, brackets, gears, bolts; water hardened.

REISHOLZ S45
M-1335; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 98,000 TS, 58,000 YS, 24 El; 45 RA, 212 Brin
For axles, gears, bolts, bushings, water hardened.

REISHOLZ SK11H
M-1335, 0.20 C, 0.25 Si, 0.60 Mn, 0.30 Mo, bal Fe.
Annealed 75,000 TS, 42,000 YS; 20 El; 55 RA; 150 Brin
For gears, bolts, fasteners, rivets, case hardened.

REISHOLZ SK11R.
M-1335, 0.15 C, 0.25 Si, 0.65 Mn, 0.30 Mo, bal Fe
Annealed: 75,000 TS, 42,000 YS; 20 El; 55 RA; 150 Brin
For gears, bolts, fasteners, camshafts; case hardened

REISHOLZ SK12
M-1335, 0.16 C, 1.05 Cr, 0.45 Mo, 0.65 Mn, bal Fe
For camshafts, cams, bolts, gears; case hardened.

REISHOLZ SK12E
M-1335; 0.24 C, 1.25 Cr, 0.45 Mo, 0.55 Mn, bal Fe.
For gears, bolts, camshafts, crankshafts; oil hardened, tough

REISHOLZ SK12ES.
M-1335; 0.24 C, 1.35 Cr, 0.55 Mo, 0.20 V, bal Fe.
For die casting dies, gears, crankshafts; oil hardened, tough.

REISHOLZ SK12H.
M-1335; 0.20 C, 1.05 Cr, 0.45 Mo, 0.65 Mn, bal Fe.
For gears, bolts, camshafts, cams; case hardened.

REISHOLZ SK12R.
M-1335; 0.13 C, 0.85 Cr, 0.45 Mo, 0.55 Mn, bal Fe.
For gears, bolts, camshafts; case hardened.

REISHOLZ SK14R.
M-1335; 0.10 C, 1.1 Si, 1.8 Cr, 0.30 Mo, 0.30 V, bal Fe
For camshafts, cams, plastic mold dies; case hardened

REISHOLZ SK16
M-1335; 0.10 C, 2.25 Cr, 1.1 Mo, 0.50 Mn, bal Fe.
For plastic mold dies; case hardened

REISHOLZ SK20
M-1335; 0.22 C, 11.5 Cr, 1 Mo, 0.5 Ni, 0.3 V, bal Fe.
Annealed· 90,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened· 240,000 TS, 205,000 YS, 10 El, C 50 Rock.
For valves, bearings, cutlery, surgical instruments, pivots.
Corrosion resistant, hardenable.

REISHOLZ SK20W
M-1335, 0.20 C, 12 Cr, 1 Mo, 0.4 Ni, 0.3 V, 0.5 W, bal Fe
Annealed. 95,000 TS, 40,000 YS; 25 El; B 92 Rock
Hardened 235,000 TS; 100,000 YS, 11 El; C 48 Rock
For valves, bearings, cutlery, surgical instruments, gears
Corrosion resistant, hardenable

REISHOLZ SK30.
M 1335, 1.4 C, Mn, bal Fe
For bearings, cutters, engravers tools, Type W1. water hardened

REISHOLZ SK31H
M-1335, 0.18 C, 0.65 Cr, 0.15 Mo, 0.85 Mn, bal Fe
For gears, bolts, camshafts, cams, case hardened.

REISHOLZ SK31R.
M-1335, 0.15 C, 0.75 Cr, 0.15 Mo, 0.75 Mn, bal Fe
For gears, bolts, camshafts, cams, case hardened.

REISHOLZ SK32
M 1335, 0.16 C, 1.05 Cr, 0.25 Mo, 0.20 V, bal Fe
For gears, bolts, camshafts, cams, case hardened

REISHOLZ SK32R.
M-1335, 0.13 C, 1.05 Cr, 0.25 Mo, 0.55 Mn, bal Fe
For gears, bolts, camshafts, cams; case hardened.

REISHOLZ ST 35
M-1335; 0.17 max C, 0.35 max Si, 0.40 max Mn, bal Fe
Annealed 70,000 TS, 40,000 YS, 25 El, 60 RA, 145 Brin.
For rivets, nails, bolts, nuts, gears, shafts, case hardened.

REISHOLZ ST 45.
M-1335; 0.22 max C, 0.35 max Si, 0.45 max Mn, bal Fe.
Annealed· 73,000 TS; 42,000 YS; 22 El; 58 RA; 150 Brin.
For fan blades, gears, bolts, rivets, shafts, case hardened

REITHS ALLOY.
Germ ; 74.5 Cu, 11.6 Sn, 0.9 Pb, 4.9 Sb
For bearings; heavy duty.

REKFORD EMINENT.
M-336; C, Mn, Cr, W, V, Mo, Co, bal Fe.
For tools, dies; high speed steel.

REKORD-25.
M-387; 0.70 C, 4.5 Cr, 18.5 W, 0.6 max Co, 1.2 V, bal Fe
For lathe and planer tools, drills, reamers, hobs; high speed steel

REKORD 1939
M-387, 0.8 C, 0.2 Mo, 12.5 W, 0.8 Co, 2.5 V, 4 Cr, bal Fe.
For drills, reamers, broaches, taps, milling cutters, high speed steel.

REKORD BKO3
M-1346, 0.9 C, W, Co, V, 4 Cr, bal Fe
For lathe and planer tools, reamers, broaches; high speed steel

REKORD BKO5
M-1346; 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe
For lathe and planer tools, reamers, broaches, high speed steel.

REKORD BKO10.
M-1346, 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

REKORD BRKO
M-1346, 0.80 C, Co, Cr, Mo, V, W, bal Fe.
For lathe and planer tools, reamers, broaches, taps, high speed steel

REKORD BVK4
M-1346, 1.35 C, Co, Cr, Mo, V, W bal Fe
For engravers' tools, forming dies, broaches, taps, high speed steel

REKORD BVN
M 1346, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe
For engravers' tools, forming dies, broaches, taps, high speed steel

REKORD BWO18
M-1346, 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe
For lathe and planer tools, reamers, taps, hobs, high speed steel

RECORD EMINENT 28
M-387, 0.8 C, 4.5 Cr, 1 Mo, 10 Co 18.5 W, 1.6 V, bal Fe
For milling cutters, lathe and planer tools reamers; high speed steel

REKORD EXTRA 26
M 387, 0.80 C, 1.2 Mo, 2.5 Co, 4.5 Cr, 18.5 W, 1.6 V, bal Fe
For milling cutters, lathe and planer tools, reamers, high speed steel

RECORD Mo 50
M-1346; 0.85 C, Cr, V, Mo, W, bal Fe
For lathe and planer tools, reamers, broaches, hobs, high speed steel.

REKORD Mo 90
M 1346, 0.80 C, Cr V, Mo, W, bal Fe.
For lathe and planer tools, reamers, taps, drills; high speed steel.

REKORD SELECT
M-336, C, Mn, Cr, W, V, Mo, Cu, bal Fe.
For tools, dies.

REKORD SELECT-27.
M-387; 0.80 C, 1.2 Mo, 4.5 Cr, 18.5 W, 5.5 Co, 1.6 V, bal Fe.
For milling cutters, lathe and planer tools, drills; high speed steel.

REKORD SUPERIOR.
M-1346; 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, milling cutters, drills; high speed steel.

RELIANCE.
M-370; 0.95 C, 0.2 Si, 0.35 Mn, bal Fe.
Cold drawn flats and squares.
AISI Type W1 water hardening tool steel.

RELIANCE.
M-907; 0.25-0.40 C, bal Fe.
For steel castings; water hardening.

RELIANCE.
M-1061; 0.07-0.13 C, 0.2-0.5 Mn, 3.0-3.5 Ni, 1.4-1.6 Cu, bal Fe.
Rolled: 95,000 TS; 75,000 YS; 30 El; 60 RA; 183 Brin.
For oil well sucker rods; for severe service.

RELIANITE.
M-1440; 3.2 C, Si, Mn, bal Fe.
For housings, gears, shafts; nodular iron, ductile.

RELIT.
Russian; WC + Co.
For cutting tools; hard sintered alloy.

RELLEUM.
M-266; 2 Pb, 31 Zn, bal Cu.
For hardware, bolts, screw machine products; free-cutting.

RELY AWM1.
M-420; 89 Sn, 8 Sb, 3 Cu.
For bearings; Babbitt.

RELY C.M. 1.
M-420; 6 Cu, 84 Sn, 10 Sb.
For bearings; Babbitt.

RELY C.M.2.
M-420; 6 Cu, 72 Sn, 12 Pb, 10 Sb.
For bearings; Babbitt.

RELY C.M.3.
M-420; 3 Cu, 40 Sn, 42 Pb, 15 Sb.
For bearings; Babbitt.

RELY C.M.4.
M-420; 3 Cu, 31 Sn, 50 Pb, 16 Sb.
For bearings; Babbitt.

RELY C M.5.
M-420; 1 Cu, 15 Sn, 70 Pb, 14 Sb.
For bearings; Babbitt.

RELY C.M.6.
M-420; 6 Sn, 80 Pb, 14 Sb.
For bearings; Babbitt.

RELY "YZ."
M-420; 91.5 Sn, 3.5 Sb, 4.3 Cu, 0.5 Ni.
For bearings.

REMA.
M-52; 1 C, 1.2 Mn, 0.5 Cr, bal Fe.
For telephone switchboard equipment.

REMA.
M-908; 0.05 C, 0.20 Mn, 0.10 Si, bal Fe.
For hobbing molds; deep cavity molds for plastic industry.

REMA.
M-1067; 0.05 C, 0.2 Mn, 0.1 Si, bal Fe.
For hobbing molds; case hardening steel.

REMA HOBBING DIE.
M-52, M-385; 1 C, 1.2 Mn, 0.5 Cr, bal Fe.
For hobbing dies for plastics; oil hardened.

REMALLOY.
M-38, M-670; 17 Mo, 12 Co, bal Fe.
Bar: 126,000 TS; 50.000 TrS; 60 Rock C.
10,000 Residual flux
230 Coercive force
For permanent magnets; precipitation hardened.

REMALLOY.
M-1067; 0.10 C, 0.50 Mn, 0.6 Cr, 1.5 Ni, bal Fe.
For plastic dies, hobbing molds; case-hardening.

REMALLOY.
M-790; 0.7 C, 4 Cr, 18 W, 2 V, 12 Co, bal Fe.
For lathe and planer tools, reamers, broaches, taps, hobs; high speed steel, oil hardened.

REMALLOY.
M-908; 0.10 C, 0.50 Mn, 0.65 Cr, 1.5 Ni, bal Fe.
For hobbing molds, plastic molding dies; for heavy pressures.

REMALLOY 17.
M-22, M-205; 17 Mo, 12 Co, 71 Fe, 3 Mn.
For permanent magnets; high coercive force.

REMALLOY 20.
M-205, M-373; 67.7 Fe, 12 Co, 20 Mo, 0.3 Mn.
For receiver magnets; permanent magnet.
355 coercive force.

REMANIT.
M-459, 0.2 C, 13 Cr, 1.2 Mo, bal Fe.
For surgical instruments, knives, cutlery; corrosion resistant, hardenable.

REMANIT 8A.
M-459; 0.06 C, 18 Cr, 11 Ni, 0.3 Ti, bal Fe.
Annealed 85,000 TS; 35,000 YS; 55 El; B 80 Rock.
For welded structures, chemical plant equipment, tanks
Type 321 stainless steel, stabilized, austenitic.

REMANIT 11A
M-459; 0.2 C, 25 Cr, 21 Ni, bal Fe
Annealed. 86,000 TS, 35,000 YS, 55 El; B 85 Rock
For furnace equipment, heat treating boxes, valves, pumps.
Type 310 stainless steel, austenitic Heat and corrosion resistant.

REMANIT 1510.
M-1299; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Heat treated· 120,000-135,000 TS; 110,000-117,000 YS; 16-15 El, 63-58 RA; 220-240 Brin.
For cutlery, valves, turbine blades; Type 410; corrosion resistant.

REMANIT 1510 AB
M-459; 0.10 C, 15 Cr, 0.5 Ni, bal Fe.
For corrosion resistant parts; corrosion resistant.

REMANIT 1510 Al
M-459; 0.06 C, 13 Cr, 0.2 Al, bal Fe.
Annealed: 65,000 TS; 40,000 YS; 30 El; 160 Brin
For annealing boxes, quenching racks, oil burners, oil refining equipment.
Type 405 stainless steel, ferritic.
Good oxidation resistance.

REMANIT 1510 H.
M-1299; 0.12 max C, 14-18 Cr, bal Fe.
Annealed: 70,000 TS, 40,000 YS; 30 El; 55 RA; 150 Brin.
Cold drawn: 130,000 TS; 120,000 YS; 2 El; 185 Brin.
For oil refinery equipment, bolts, oil burners; Type 430; stainless, ferritic.

REMANIT 1520.
M-459; 0.2 C, 15 Cr, 0.5 Ni, bal Fe.
For corrosion resistant parts; corrosion resistant.

REMANIT 1540.
M-459; 0.4 C, 15 Cr, 0.2 Mo, bal Fe.
For corrosion resistant parts, knives; corrosion resistant

REMANIT 1610.
M-459; 0.10 C, 16 Cr, 0.2 Ni, bal Fe.
For corrosion resistant parts; corrosion resistant.

REMANIT 1610 S.
M-459, 0.10 C, 0.5 Si, 18 Cr, Ti, bal Fe.
For corrosion resistant parts; corrosion resistant.

REMANIT 1620.
M-459, 0.2 C, 16 Cr, 2 Ni, bal Fe.
For corrosion resistant parts, corrosion resistant

REMANIT 1710
M-459, 0.10 C, 17 Cr, 0.5 Ni, 1.8 Mo, bal Fe.
For corrosion resistant parts, knives; corrosion resistant

REMANIT 1710A
M-459; 0.10 C, 17 Cr, 0.5 Ni, 0.4 Mo, 0.2 S, bal Fe.
For corrosion resistant parts; corrosion resistant

REMANIT 1790 V
M-459, 0.9 C, 17.5 Cr, 1.2 Mo, 0.1 V, bal Fe
Annealed 110,000 TS; 65,000 YS; 18 El, 35 RA, 220 Brin
Heat treated 280,000 TS, 270,000 YS; 3 El; 15 RA; 555 Brin.
For bearings, valve parts, surgical instruments, stainless, hardenable

REMANIT 1810
M-459, 0.40 C, 29 Cr, bal Fe
Cast 90,000 TS, 65,000 YS; 2 El, 212 Brin
For cylinder liners, grate bars, valve seats and bodies, Type CC50, heat resistant

REMANIT 1810 SSI
M-459, 0.06 C 18 Cr, 10 Ni, 2 Mo, bal Fe
Annealed: 90,000 TS; 40,000 YS, 40 El, B 85 Rock
For chemical plant equipment, agitators, digesters, tanks
Type 18 12 Mo stainless steel, austenitic, nonmagnetic

REMANIT 1810 SSW
M-459, 0.05 C, 18 Cr, 10 Ni, 2.5 Mo, bal Fe
Annealed 85,000 TS, 35,000 YS, 45 El, B 85 Rock
For chemical plant equipment, agitators, digesters, tanks
Type 316 stainless steel, austenitic, acid resistant

REMANIT 1813 SSW
M-459, 0.07 C, 1.3 Mn, 17 Cr, 4.5 Mo, 13 Ni, bal Fe
Annealed 85,000 TS, 35,000 YS; 55 El, 70 RA, 160 Brin
For chemical plant equipment, mixers, agitators; Type 317, stainless, austenitic

REMANIT 1860 M.
M-459; 0.12 C, 9 Mn, 18 Cr, 5 Ni, bal Fe.
Annealed: 100,000 TS, 50,000 YS, 60 El, B 90 Rock.
For dairy and chemical plant equipment, springs, tubular furniture, trim.
Type 202 stainless steel, austenitic

REMANIT 1880.
M-459; 0.1 C, 18 Cr, 8 Ni, bal Fe.
For corrosion resistant parts; austenitic, stainless.

REMANIT 1880 A.
M-459; 0.15 C, 1.3 Mn, 18 Cr, 8.5 Ni, 0.15 S, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 40 El; 55 RA; 170 Brin.
For screw machine products, hardware; stainless, austenitic, free-cutting.

REMANIT 1880 FH.
M-459, 0.15 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS, 45 El; 65 RA; 160 Brin.
For chemical plant equipment; Type 302, stainless, austenitic.

REMANIT 1880S.
M-459, 0.09 C, 18 Cr, 8 Ni, 1.5 Ta, bal Fe.
For corrosion resistant parts; wrought quality.

REMANIT 1880 SEW.
M-459, 0.02 C, 18-20 Cr, 8-12 Ni, bal Fe.
Annealed. 85,000 TS; 30,000 YS; 60 El; 140 Brin.
For welded tanks, chemical plant equipment, kitchen apparatus
Type 304L stainless steel, austenitic.

REMANIT 1880SS
M-459, 0.09 C, 18 Cr, 8 Ni, 2 Mo, 1 Ta, bal Fe.
For textile industry; corrosion resistant.

REMANIT 1880SS
M-1299; 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Annealed 85,000 95,000 TS, 35,000-45,000 YS; 60-50 El, 75-60 RA, 150-190 Brin.
For chemical plant equipment, mixers, agitators, filters, Type 316, stainless, austenitic.

REMANIT 1880 SSEW
M-459, 0.03 C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed 85,000 TS, 35,000 YS, 50 El, B 82 Rock
For chemical plant equipment, agitators, digesters, valve trim
Type 316 L stainless steel, austenitic.

REMANIT 1880 SST
M-459, 0.1 C, 1.2 Mn, 18 Cr, 2.2 Mo, 12 Ni, 0.34 Ti, bal Fe.
Annealed 80,000 TS, 30,000 YS, 60 El; 80 RA; 140 Brin
Cold drawn 150,000 TS; 135,000 YS, 6 El; 300 Brin
For chemical plant equipment, digestors, evaporators, Type 316 Ti, stainless, austenitic.

REMANIT 1880 SSW
M-459, 0.07 C, 1.2 Mn, 18 Cr, 11 Ni, 2.2 Mo, bal Fe.
Annealed. 80,000 TS; 30,000 YS, 60 El, 80 RA; 140 Brin
Cold drawn 150,000 TS, 135,000 YS, 6 El; 300 Brin
For chemical plant equipment, digesters, evaporators; Type 316, stainless, austenitic

REMANIT 1880ST
M-1299, 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe.
Normalized 93,000 TS, 36,000 YS; 45 El; 60 RA; 165 Brin
Annealed: 87,000 TS; 33,000 YS; 57 El; 73 RA; 155 Brin
For chemical plant equipment, Type 321; austenitic, stainless.

REMANIT 1880 SW.
M-459; 0.07 C, 1 Mn, 18 Cr, 10 Ni, bal Fe.
Annealed. 85,000 TS; 35,000 YS, 60 El; 70 RA; 150 Brin
Cold drawn. 180,000 TS; 125,000 YS; 10 El; 330 Brin
For welded structures, architectural trim; Type 304, stainless, austenitic.

REMANIT 1990 S-Cr.
M-459; 0.1 C, 1.7 Si, 18 Cr, 8.5 Ni, bal Fe.
For stainless parts; stainless, austenitic.

REMANIT 1990 SS.-Cr
M-459; 0.1 C, 2.4 Si, 18 Cr, 9.5 Ni, 2 Mo, bal Fe.
For stainless parts; stainless, austenitic.

REMANIT 2525 SST.
M-459; 0.06 C, 1.2 Mn, 25 Cr, 2.2 Mo, 25 Ni, bal Fe.
For heat and corrosion resistant parts, furnace parts; heat and corrosion resistant.

REMANIT 2804 G.
M-459; 0.4 C, 1.2 Si, 27 Cr, 4 Ni, bal Fe.
For furnace parts, heat treat boxes; heat resistant.

REMANIT 2890 Mo
M-459; 1.3 C, 1.2 Si, 28 Cr, 2 Mo, bal Fe.
For valves, furnace parts; heat and corrosion resistant.

REMANIT ATS 1.
M-459; 0.10 C, 1.0-1.5 Mn, 0.3-0.6 Si, 15-17 Cr, 12-14 Ni, 1.2 Cb, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; B 80 Rock.
For welded structures and tanks, chemical plant equipment, digesters
Stainless steel, austenitic, stabilized for welding.

REMANIT G FEDER HARD.
M-459; 0.5 C, 29 Cr, 4.8 Mo, 62 Co, bal Fe.
For heat and corrosion resistant castings, corrosion and heat resistant.

REMANIT HB
M-459; 0.15 C, 1 Si, 1 Mn, 32 Mo, 64 Ni, bal Fe
For heat and corrosion resistant castings; heat and corrosion resistant.

REMANIT HC
M-459, 0.15 C, 15 Cr, 17 Mo, 60 Ni, 5 W, bal Fe.
For heat and corrosion resistant castings, pumps, valves.

REM ARMS HD-1000 DENSITY 6.8.
M-1698, Iron, sintered
As sintered: 23,000 TS; 12 El, Rf 40.
For low and medium stressed mechanical components, soft magnetic cores.
MPIF F-0000-S, ASTM B310-70, Type III Class A

REM ARMS HD-1000 DENSITY 7.0.
M-1698; Iron, sintered.
As sintered. 26,500 TS, 15 El; Rf 50.
For low and medium stressed mechanical components; soft magnetic cores
MPIF F-0000-S; ASTM B310-70, Type IV, Class A.

REM ARMS HD-1000 DENSITY 7.2.
M-1698, Iron, sintered.
As sintered: 29,500 TS; 20 El; Rf 55.
For low and medium stressed mechanical components; soft magnetic cores.
MPIF F-0000-T; ASTM B310-70, Type IV, Class A.

REM ARMS HD-1000 DENSITY 7.4.
M-1698; Iron, sintered.
As sintered: 35,000 TS; 24 El; Rb 20.
For low and medium stressed mechanical components; soft magnetic cores.
MPIF F-0000-T; ASTM B-310-70, Type V, Class A.

REM ARMS HD-1000 DENSITY 7.6.
M-1698; Iron, sintered
As sintered: 40,000 TS; 29 El; Rb 30.
For low and medium stressed mechanical components; soft magnet cores; this grade can be case hardened, plated and colored.
MPIF F-0000-U; ASTM B310-70, Type V, Class A.

REM ARMS HD-1003 DENSITY 6.8
M-1698, Medium carbon steel, sintered.
As sintered: 32,000 TS; 9 El; Rb 12
For medium stressed structural parts.
MPIF F-0000-S; ASTM B310-70, Type III, Class B

REM ARMS HD-1003 DENSITY 7.2
M-1698; Medium carbon steel, sintered.
As sintered. 43,000 TS, 11 El, Rb 37
Can be heat treated to 50,000-80,000 psi.
For medium stressed structural parts.
MPIF F-0000-T, ASTM B310-70, Type IV, Class B

REM ARMS HD-1007 DENSITY 6.8
M-1698, High carbon steel, sintered
As sintered: 46,000 TS, 4 El; Rb 44.
For highly stressed structural parts.
Heat treatable to 65,000-100,000 psi.
MPIF F-0008-S; ASTM B310-70, Type III Class C.

REM ARMS HD-1007 DENSITY 7.2
M-1698, High carbon steel, sintered
As sintered: 55,000 TS, 5 El; Rb 58
For highly stressed structural parts
Heat treatable to 65,000-100,000 psi
MPIF F-0008-T, ASTM B310-70, Type IV Class C.

REM ARMS HD-2020 DENSITY 6.8.
M-1698; Low nickel iron, sintered
As sintered 38,000 TS, 8 El, Rb 32.
Good strength and toughness, for small appliance parts
MPIF FN-0200-S; ASTM B484-70, Type II, Grade 1, Class A

REM ARMS HD-2020 DENSITY 7.0
M-1698, Low nickel iron, sintered
As sintered: 41,000 TS, 11 El, Rb 40.
Good strength and toughness, for small appliance parts
MPIF FN-0200-S, ASTM B484 70, Type II, Grade 1, Class A.

REM ARMS HD-2020 DENSITY 7.2
M 1698, Low nickel iron, sintered.
As sintered. 47,000 TS, 14 El, Rb 49.
Good strength and toughness, for gears, cams and small appliance parts.
MPIF FN-0200-T, ASTM B484-70, Type III, Grade 1, Class A

REM ARMS HD-2020 DENSITY 7.4.
M-1698, Low nickel iron, sintered.
As sintered. 53,000 TS, 18 El; Rb 60.
Good strength and toughness; for gears, cams and small appliance parts
MPIF FN-0200-T; ASTM B484-70, Type III, Grade 1, Class A.

REM ARMS HD-2027 DENSITY 6.8.
M-1698, Low nickel steel, sintered
As sintered: 72,000 TS, 3 El; Rb 74
Good strength and toughness; hardenable to Rc 40-45
MPIF FN-0208-S; ASTM B484-70, Type II, Grade I, Class C.

REM ARMS HD-2027 DENSITY 7.2
M-1698, Low nickel steel, sintered.
As sintered: 91,000 TS; 4 El; Rb 86.

Good strength and toughness;
hardenable to Rc 40-45.
MPIF FN-0208-T; ASTM B484-70 Type III,
Grade 1, Class C.

REM ARMS HD-2040 DENSITY 6.8.
M-1698, Medium nickel iron, sintered.
As sintered: 37,000 TS; 5 El; Rb 35.
For case hardening
MPIF FN-0400-T, ASTM B484-70, Type II,
Grade 2, Class A

REM ARMS HD 2040 DENSITY 7.2.
M-1698; Medium nickel iron, sintered.
As sintered 49,000 TS; 9 El; Rb 58
For case hardening
MPIF FN-0400-T; ASTM B484-70, Type III,
Grade 2, Class A.

REM ARMS HD-2047 DENSITY 6.8
M-1698, Medium nickel steel, sintered
As sintered 74,000 TS, 2 El; Rb 80
High strength, tough core,
hardenable to 120,000 160,000 psi
MPIF FN-0408-S, ASTM B484-70, Type II,
Grade 2, Class C

REM ARMS HD-2047 DENSITY 7.2
M-1698; Medium nickel steel, sintered
As sintered 95,000 TS, 3.5 El; Rb 87
High strength, tough core, hardenable to
120,000-160,000 psi
MPIF FN 0408-T, ASTM B484-70, Type III,
Grade 2, Class C

REM ARMS HD 2070 DENSITY 6.8
M-1698, High nickel iron, sintered
As sintered 65,000 TS, 4.5 El, Rb 64
High strength, fair ductility, easily swaged
or formed
MPIF FN-0700-S, ASTM B484-70, Type II,
Grade 3, Class A

REM ARMS HD 2070 DENSITY 7.2
M 1698, High nickel iron, sintered
As sintered 76,000 TS, 8 El, Rb 78
High strength, fair ductility,
easily swaged or formed
MPIF FN-0700-T, ASTM B484-70, Type III,
Grade 3, Class A.

REM ARMS HD-2076 DENSITY 6.8.
M 1698, High nickel steel, sintered
As sintered 94,000 TS, 3.5 El, Rb 86
High strength, heat treatable
MPIF FN-0705-S, ASTM B484-70, Type II,
Grade 3 Class C

REM ARMS HD-2076 DENSITY 7.2
M-1698, High nickel steel, sintered
As sintered· 105,000 TS, 4 El, Rc 20
High strength, heat treatable.
MPIF FN-0705 T, ASTM B484 70, Type III,
Grade 3, Class C

REM ARMS HD-2108 DENSITY 7.4.
M-1698, Air hardening nickel steel, sintered.
As sintered 150,000 TS, 4 El; Rc 40
For jobs requiring strong, wear-resisting parts.

REM ARMS HD-3050 DENSITY 7.0
M-1698, Remington alloy, sintered
As sintered: 32,000 TS; 12 El; Rb 30.
High ductility by single pressing.

REM ARMS HD-3050 DENSITY 7.2.
M-1698; Remington alloy, sintered
As sintered: 37,000 TS, 16 El; Rb 35.
High density and high ductility by single pressing.

REM ARMS HD-3050 DENSITY 7.4.
M-1698; Remington alloy, sintered.
As sintered: 47,000 TS; 25 El; Rb 50.
Good impact strength; high density and high
ductility; for case hardening, plating, coloring.

REM ARMS HD-3050 DENSITY 7.6.
M-1698; Remington alloy, sintered.
As sintered· 53,000 TS; 30 El; Rb 60.
Good impact strength; high density and high
ductility; for case hardening, plating, coloring.

REM ARMS HD-4058 DENSITY 6.6.
M-1698; Copper steel, sintered.
As sintered: 78,000 TS; 1 El; Rb 82.
Medium strength components.
ASTM B426-70, Grade 2, Type III.

REM ARMS HD-4058 DENSITY 6.8.
M-1698; Copper steel, sintered.
As sintered· 96,000 TS; 1 El; Rb 90.
Medium strength components.
ASTM B426-70, Grade 2, Type IV

REM ARMS HD-4058 DENSITY 7.0.
M-1698; Copper steel sintered.
As sintered. 105,000 TS; 2 El, Rb 96.
Medium strength components
ASTM B426-70, Grade 2, Type IV

REM ARMS HD-4058 DENSITY 7.2
M-1698, Copper steel, sintered
As sintered. 110,000 TS, 2 El, Rc 25.
For medium strength components.
ASTM B426-70, Grade 2, Type V

REMENDUR.
M 22; 49 Co, 2-5 V, bal Fe.
Remanence-21,500 gausses
Coercive force 20-60 oersteds.
Residual induction 16,000-21,500 gauss.
For magnetic devices, telephone switches.
Shows square hysteresis loop.
Non-directional properties, high curie temp.
Permanent magnet High residual induction.

REMIRAL
M-Germany, 0.5-2.0 Mg, bal Al
H25 Temper 30,000 TS, 25,000 YS.
For reflectors, automotive trim
Bright aluminum sheets.
Corrosion resistant

RE-MO 50/50
M-33, 47.9 Rh, 52.1 Mo.
Recrystallized. 150,000 TS; 123,000 YS; 350 VHN.
Wrought 240,000 TS, 210,000 YS; 600 VHN.
For nuclear and space propulsion applications,
thermocouple protection tubes, furnace resistance
heaters and inductors
High heat resistance

REMOUNT
M-1405, 1.3 C, 0.4 Mn, 0.2 Si, 0.1 V, bal Fe.
For wire drawing dies, cold forming tools,
water hardened, Type W2

REMY CE6
M-1339; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe
For gears, bolts, machine tool parts,
case hardened.

REMY CE8
M-1339, 0.16 C, 0.95 Cr, 1.15 Mn, bal Fe.
For gears, cams, camshafts, case hardened, tough.

REMY CEMo8.
M-1339; 0.22 C, 1.2 Cr, 0.25 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts;
case hardened, tough

REMY CEMo10.
M-1339; 0.24 C, 1.15 Cr, 0.25 Mo, 0.55 Mn, bal Fe.
For gears, bolts, machine tool parts;
oil hardened, shock resistant.

REMY CEN4.
M-1339, 0.19 C, 1.25 Cr, 0.20 Mo, 3.75 Ni, bal Fe.
For gears, bolts, camshafts, cams; case hardened,
shock resistant.

REMY CNLK.
M-1339; 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe.
For gears, bolts, machine tool parts;
oil hardened, shock resistant.

REMY EXTRA 50.
M-1339; 0.45 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS, 24 El; 45 RA;
212 Brin
For gears, bolts, machine tool parts; water hardened.

REMY EXTRA 60.
M-1339; 0.60 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe
Heat treated: 160,000 TS; 113,000 YS; 12 El;
40 RA, 325 Brin
For gears, rails, springs, machine tool parts,
water hardened

REMY EXTRA 70.
M-1339; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 175,000 TS, 128,000 YS; 12 El,
37 RA; 352 Brin.
For rails, punches, crimpers, axes; Type W1,
water hardened.

REMY EXTRA 80.
M-1339; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 190,000 TS, 145,000 YS, 12 El;
35 RA; 390 Brin.
For tools, springs, cutters, drills, taps;
Type W1; water hardened.

REMY EXTRA 100.
M-1339; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed: 100,000 TS; 53,000 YS, 21 El;
42 RA; 200 Brin.
For drills, taps, cutters, springs,
Type W1; water hardened.

REMY EXTRA 120.
M-1339, 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed· 110,000 TS; 56,000 YS, 18 El; 40 RA,
210 Brin.
For springs, taps, reamers, cutters, hobs, Type W1,
water hardened.

REMY EXTRA 130.
M-1339; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers' tools, taps, drills, cutters;
Type W1, water hardened

REMY EXTRA EDEL 7.
M-1339, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated· 175,000 TS; 128,000 YS; 12 El;
37 RA; 355 Brin.
For rails, tools, punches, axes, crimpers;
Type W1; water hardened.

REMY EXTRA EDEL 8.
M-1339; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated· 190,000 TS; 145,000 YS; 10 El;
30 RA; 400 Brin.
For cutters, drills, taps, springs, reamers;
Type W1, water hardened.

REMY EXTRA EDEL 10.
M-1339; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 20 El; 40 RA;
200 Brin.
For springs, tools, drills, taps, broaches;
Type W1; water hardened.

REMY EXTRA EDEL 10 SPEZIAL.
M-1339; 1.25 C, 1.15 Si, 1.2 Cr, 0.7 Mn, bal Fe.
For bearings, dies, cutters; water or oil hardened.

REMY EXTRA EDEL 12.
M-1339; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed· 110,000 TS; 55,000 YS; 18 El; 40 RA;
210 Brin.
For springs, tools, cutters, taps, reamers, drills;
Type W1; water hardened.

REMY DS.
M-1339; 0.45 C, Cr, V, Si, bal Fe.
For springs, gears, crankshafts, bolts, studs;
oil hardened, shock resistant .

REMY KP.
M-1339; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, crankshafts;
oil hardened, shock resistant.

REMY LDZ SPEZIAL.
M-1339, C, alloy, bal Fe.
For machine tool parts; oil hardened.

REMY MS70.
M-1339, 1.15 C, 0.65 Cr, 0.1 V, 0.30 Mn, bal Fe.
For dies, tools, punches, bearings; water hardened,
wear resistant

REMY MS75
M-1339, 1.15 C, 0.65 Cr, 0.1 V, bal Fe.
For cutters, forming and piercing dies;
oil or water hardened, wear resistant.

REMY NV50
M-1339; 0.42 C, 1.75 Mn, 0.1 V, bal Fe.
For punches, shears, gears, crankshafts;
oil hardened, tough.

REMY ONLK
M-1339, 0.45 C, 1.4 Cr, 0.7 Mo, 0.7 Mn, bal Fe.
For dies, gears, bolts, crankshafts; oil hardened,
tough.

REMY P6R
M-1339; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe
For gears, bolts, upsetters, shears, crimpers;
water or oil hardened, tough

REMY S30.
M-1339, 0.70 C, 1.7 Si, 0.70 Mn, bal Fe
Heat treated. 340,000 TS, 283,000 YS, 5 El, 20 RA;
600 Brin
For punches, chisels, springs, shear blades;
oil hardened.

REMY SPEZIAL 1 GESTO
M-1339; 1.05 C, 0.07 Mn, 0.25 Si, 1.1 Cr, bal Fe.
For bearings, liners, sleeves, cutters; water or
oil hardened, wear resistant.

REMY SPEZIAL 2
M-1339; 1.45 C, 0.60 Mn, 1.4 Cr, bal Fe.
For bearings, cutters, blanking and forming dies
oil hardened, wear and abrasion resistant.

REMY SPEZIAL 3
M-1339; 1.05 C, 1.0 Cr, 1.15 W, bal Fe.
For heading and blanking dies; oil hardened.

REMY SPEZIAL 4.
M-1339; 1.4 C, 0.30 Cr, 0.10 V, 0.30 Mn, bal Fe.
For blanking and forming dies, engravers tools;
water hardened, wear resistant.

REMY SPEZIAL 6.
M-1339; 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, 0.9 Si,
bal Fe.
For forging and heading dies, die casting dies;
oil hardened, tough.

REMY SPEZIAL 7.
M-1339; 0.45 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For forging and heading dies; oil hardened, tough.

REMY SPEZIAL 8.
M-1339; 1.05 C, 1.2 Cr, bal Fe.
For cutters, bearings, liners, sleeves; oil or water hardened.

REMY SPEZIAL 12.
M-1339; 1.25 C, 1.15 Si, 0.70 Mn, 1.2 Cr, bal Fe.
For bearings, cold working tools, liners, sleeves; oil hardened.

REMY SPEZIAL 13.
M-1339; 1.05 C, 1.0 Cr, 0.30 Mn, 0.25 Si, bal Fe.
For bearings, cold working tools, liners, sleeves; water hardened, wear resistant.

REMY SPEZIAL 14.
M-1339; 0.50 C, 0.95 Mn, 1.05 Cr, 0.1 V, bal Fe.
For springs, gears, bolts, punches; oil hardened, shock resistant.

REMY SPEZIAL 14H.
M-1339; 0.58 C, 1.0 Cr, 0.09 V, 0.95 Mn, bal Fe.
For springs, gears, bolts, crankshafts; oil hardened, shock resistant.

REMY WP4.
M-1339; 0.30 C, 1.1 Cr, 0.18 V, 3.75 W, 1.0 Si bal Fe.
For punches, forging dies, upsetters; oil hardened.

REMY WP12.
M-1339; 0.30 C, 2.4 Cr, 2 Co, 0.25 V, 8.5 W, bal Fe.
For extrusion rams, liners, punches; hot work steel, oil hardened.

REMY WPK45.
M-1339, 0.30 C, 2.35 Cr, 0.6 V, 4.2 W, bal Fe.
For extrusion rams and liners; oil hardened, tough.

REMY WPN.
M-1339, 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe
For heading and forming dies, punches; oil hardened.

REMY WS1.
M-1339; 1.20 C, W, bal Fe.
For bearings, heading dies, shear blades; oil or water hardened.

REMY WZK SPEZIAL.
M-1339, 0.30 C, 0.35 V, 2.65 Cr, 8.5 W, bal Fe.
For extrusion rams and liners, punches, shears; hot work steel, oil hardened

RENAL.
M-1359; 99.99 Al.
Soft: 13,000 TS; 5000 YS; 45 El, 23 Brin.
For electrical conductors; high electrical conductivity.

RENAULT ALLOY.
French; 88 Al, 2 Cu, 10 Zn.
For light alloy parts; non-hardenable.

RENAULT AT.2
M-689; 0.8 C, 0.3 Ni, 5 Cr, 0.7 Mo, 18.5 W, 1.3 V, bal Fe
For broaches, cutters, drills; high speed steel.

RENAULT AT.3.
M-689; 0.8 C, 0.3 Si, 0.3 Ni, 4.5 Cr, 6 Mo, 6.7 W, 1.6 V, bal Fe.
For tools, cutters, reamers, broaches, high speed steel.

RENAULT AT.4.
M-689; 0.8 C, 0.2 Ni, 5 Cr, 1.4 Mo, 19.5 W, 2 V, 5.2 Co, bal Fe.
For tools, cutters, hobs, reamers; high speed steel.

RENAULT AT.7.
M-689; 1.2 C, 0.35 Mn, 0.2 Ni, 1.35 Cr, bal Fe.
For tools; water hardening.

RENAULT AT.9.
M-689; 0.4 C, 0.4 Mn, 4.9 Ni, 0.4 Cr, 1.2 Mo, bal Fe.
For gears, shafts; tough.

RENAULT AT.12.
M-689; 1.9 C, 0.3 Mn, 0.7 Ni, 13 Cr, 0.3 Mo, bal Fe.
For tools, dies; nondeforming.

RENAULT AT.13.
M-689; 1.9 C, 0.4 Mn, 0.5 Ni, 12.5 Cr, 0.6 Mo, 0.8 W, 3.2 Co, bal Fe.
For tools, dies; nondeforming.

RENAULT AT.14.
M-689; 0.58 C, 0.67 Mn, 1.45 Ni, 0.67 Cr, 0.3 Mo, 0.12 V, bal Fe.
For forging dies, tools; oil hardening.

RENAULT AT.25.
M-689; 1.03 C, 1.82 Mn, 0.1 Ni, 0.13 V, 0.1 Cr, bal Fe.
For tools, dies; nondeforming.

RENAULT AT26.
M-689; 0.8 C, 0.3 Mn, 0.1 Ni, bal Fe.
For tools, drills, hobs, springs, punches, water hardened.

RENAULT AT.35.
M-689; 0.3 C, 0.6 Mn, 0.6 Ni, 3.3 Cr, 0.5 Mo, 12 W, 0.1 V, 2.5 Co, bal Fe.
For dies, tools; hot work steel.

RENAULT G.
M-689, 0.45 C, 1.15 max Si, 0.7 Mn, 14 Ni, 14 Cr, 0.3 Mo, 2.25 W, bal Fe
For exhaust valves; heat resistant.

RENAULT H.
M-689; 0.34 C, 0.4 Si, 0.75 Mn, 1.4 Ni, 0.92 Cr, bal Fe.
For gears, shafts, pinions; tough.

RENAULT P.
M-689; 1.25 C, 0.55 Mn, 0.45 Ni, 14 Cr, 1.2 Mo, 1.2 Co, bal Fe.
For valves; heat resistant

RENAULT R.
M-689; 0.55 C, 0.35 max Si, 0.45 Mn, 0.4 Ni, 14 Cr, bal Fe.
For pump parts; corrosion resistant.

RENAULT S
M-689, 0.14 C, 0.75 Mn, 1.4 Ni, 1 Cr, bal Fe
For gears, shafts, case-hardening

RENAULT WA
M-689, 0.4 C, 0.7 Mn, 0.5 max Ni, 1 Cr, 0.3 Mo, bal Fe.
For gears, shafts; oil hardening.

RENAULT WB
M-689, 0.35 C, 0.7 Mn, 0.4 max Ni, 1 Cr, 0.3 Mo, bal Fe.
For gears, shafts; oil hardening.

RENAULT WE.
M-689; 0.36 C, 0.7 Mn, 0.4 max Ni, 1 Cr, 0.3 Mo, bal Fe
For gears, shafts; oil hardening.

RENAULT WZ.
M-689; 0.42 C, 0.7 Mn, 0.5 Ni, 1 Cr, 0.3 Mo, bal Fe.
For gears, shafts; oil hardening.

RENE 41.
M-31 (and others); 0.12 C, 19 Cr, 11 Co, 10 Mo, 3 Ti, 1.5 Al, bal Ni.
Ht. Tr.: 160,000-206,000 TS; 120,000-154,000 YS; 14-18 El.
For jet engine components, after-burners, turbine wheels, bolts.
Age-hardenable, high heat and corrosion resistance.

RENE 62.
M-31; 1.1-1.4 Al, 2.1-2.5 Cb, 2.35-2.63 Ti, 8.5-9.5 Mo, 13.5-16.5 Cr, 21.0-24.0 Fe, 0.02-0.08 C, 0.25 max Mn, 0.01 B, bal Ni.
At R.T.: 205,000 TS; 160,000 YS; 6 El.
At 1400°F: 145,000 TS; 117,000 YS; 20 El.
For turbine components, jet engines, turbine wheels and frames.
Precipitation hardening, good weldability.
High corrosion, heat and oxidation resistance.

RENE 63.
M-31; 0.10 C, 14 Cr, 15 Co, 6 Mo, 3 W, 2.5 Ti, 3.8 Al, 0.015 B, bal Ni.
Ht. Tr.: 210,000 TS; 148,000 YS; 18 El.
At 1400°F: 155,000 TS; 138,000 YS; 4-9 El.
For jet engine and gas turbine parts, high temperature bolting.
High rupture strength. Corrosion, heat and oxidation resistant.

RENE 77.
M-31; 15 Cr, 5 Mo, 3.5 Ti, 4.4 Al, 0.02 B, 0.06 C, 15 Co, 0.04 Zr, bal Ni.
Cast: 125,000 TS; 110,000 YS; 8 RA.
At 1600°F: 85,000 TS; 75,000 YS; 12 RA.
For jet engine turbine blades.
High creep-rupture strength to 1800°F.
Resists hot sulfidation corrosion.

RENE 100.
M-31; 4.0-4.4 Ti, 5.3-5.7 Al, 9-10 Cr, 14-16 Co, 2.7-3.3 Mo, 1 max Fe, 0.02 B, 0.2 C, 1.0 V, 0.03-0.09 Zr, bal Ni.
Cast: 147,000 TS; 123,000 YS; 9 El; C 30-44 Rock.
At 1500°F: 144,000 TS; 118,000 YS; 6 El; 7.2 RA.
For turbine blades operating to 1900°F.
Excellent high temperature rupture strength and long-time stability.

RENNITE.
M-425; 0.9 C, 3.5 W, bal Fe.
For cutting tools; oil hardened.

RENNITE.
M-790; 0.7 C, 4 Cr, 18 W, 2 V, 12 Co, bal Fe
For lathe and planer tools, hobs, taps, reamers, broaches; high speed steel, oil hardened.

RENNY D150 MEISSELSTAHL.
M-1339; 0.38 C, Si, Cr, V, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

RENOWN.
M-73; 1.0 C, 0.1 Cr, 0.2 V, bal Fe.
For stamping dies, fine edged tools; water hardened.

RENYX, Al BASE.
M-125; 91.5 Al, 4 Ni, 4 Cu, 0.5 Si.
For die castings; corrosion resisting.

RENYX, Zn BASE.
M-125; 4 Al, 3 Cu, 92 Zn, 0.1 Mn.
For die castings; corrosion resisting.

REO EXTRA.
M-1705; 1.0 C, 0.35 Mn, 0.2 Si, 0.2 V, bal Fe.
Water hardening tool steel, AISI W2.

REO SPECIAL (W2, Grade 1).
M-1705; 1.0 C, 0.35 Mn, 0.2 Si, bal Fe.
Water hardening tool steel, AISI W2.

REOSTENE.
Eng.; Ni, Fe.
For resistances; heat resistant.

REO (W2, Grade 3).
M-1705; 1.0 C, 0.35 Mn, 0.2 Si, bal Fe.
Water hardening tool steel; AISI W2.

REPUBLIC 6-H-W.
M-97; 0.6 C, 4 Cr, 0.5 Mo, 0.8 V, 0.3 Ni, bal Fe.
For gripper and forming dies, flying shears; hot work steel.

REPUBLIC 07.
M-97, M-397; 0.8 C, 2.5 W, bal Fe.
For finishing tools for non-ferrous alloys, blanking dies; semi-high speed steel.
Formerly Republic Velvet.

REPUBLIC 10-HW see REPUBLIC H12.

REPUBLIC 12-HW see REPUBLIC A9.

REPUBLIC 17-4PH.
M-97; 0.07 max C, 15.5-17.5 Cr, 3.0-5.0 Ni, 0.15-0.45 Cb + Ta, 3.0-5.0 Cu, bal Fe.
H900-temper: 200,000 TS; 180,000 YS; 14 El; 50 RA; 432 Brin.
H925-temper: 190,000 TS; 175,000 YS; 14 El; 54 RA; 409 Brin.
For valves, ball bearings, pump gears, fasteners; stainless, heat treatable, martensitic.

REPUBLIC 17-7PH.
M-97; 0.09 max C, 16.0-18.0 Cr, 6.5-7.75 Ni, 0.75-1.5 Al, bal Fe.
Condition A· 130,000 TS; 40,000 YS; 30 El, 180 Brin
Condition RH950: 200,000 TS, 175,000 YS; 10 El; 30 RA, 440 Brin.
For conveyor chains, bearings, saw blades, pressure tanks, airframes; age hardenable, corrosion and heat resistant

REPUBLIC "35."
M-97, 0.12 C, 0.75 Mn, 0.10 Si, Cb & V, bal Fe.
Rolled 47,000 TS, 35,000 YS; 30 El.
Structural equipment, transportation equipment; weldable, tough

REPUBLIC "50"
M-97; 0.12 max C, 0.5-1.0 Mn, 0.5-1.0 Cu, 0.5-1.1 Ni, 0.10 min Mo, bal Fe.
Rolled· 70,000 TS; 50,000 YS; 22 El.
For agricultural implements, mine and railroad cars, truck and trailer bodies, tough, good weldability.

REPUBLIC "60."
M-97; 0.15 C, 0.5-1.0 Mn, 0.3-1.0 Cu, 0.10 min Mo, 0.3 Cr, 0.4-1.1 Ni, bal Fe
Rolled: 70,000 TS; 50,000 YS; 22 min El.
For welded structures, truck bodies, freight cars, mine cars; tough, good weldability.

REPUBLIC 65.
M-97; 0.12 C, 0.45 Mn, 0.20 Si, 1.0 Cu, 1.3 Ni, 0.2 Mo, bal Fe
Rolled: 89,000 TS, 67,000 YS; 18 El.
For welded structures, truck trailers, mine cars; tough, good weldability.

REPUBLIC "70."
M-97; 0.14 C, 0.75 Mn, 0.25 Si, 1.15 Cu, 1.5 Ni, 0.22 Mo, bal Fe.
Rolled: 96,000 TS; 73,000 YS, 17 El.
For welded structures, truck trailers, mine cars; tough, good weldability.

REPUBLIC "80."
M-97; 0.20 C, 1.0 Mn, 1.0-1.5 Cu, 0.2-0.3 Mo, 1.2-1.75 Ni, Cb, V, bal Fe.
Rolled: 100,000 TS; 80,000 YS; 18 min El.
For transportation equipment, truck bodies and truck trailers, railroad hopper cars; tough, weldable.

REPUBLIC 404 see REPUBLIC D 2.

REPUBLIC 550.
M-97; 0.4-0.5 C, 0.6-0.7 Mn, 1.5-1.65 Cr, 0.9-1.2 Mo, 0.3 V, bal Fe.
For hot bolts and rivet headers; hot work steel.

REPUBLIC A 2.
M-97; 1.0 C, 5.25 Cr, 0.25 V, 1.15 Mo, bal Fe.
For cold work dies, forming rolls, shear blades.
Type A 2 air hardening tool steel.

REPUBLIC A 4.
M-97; 1.0 C, 2.0 Mn, 0.9 Cr, 0.9 Mo, bal Fe.
Type A 4 air hardening tool steel.

REPUBLIC A-286.
M-97; 0.08 max C, 13.5-16.5 Cr, 24.0-27.0 Ni, 1.0-1.5 Mo, 1.9-2.35 Ti, 0.01 B, 0.35 max Al, 0.1-0.5 V, bal Fe.
Condition A: 93,000 TS, 36,000 YS; 48 El; 70 RA; 143 Brin
Condition STA: 145,000 TS; 100,000 YS; 24 El; 37 RA; 295 Brin.
For jet engine frames and casings, afterburner parts, fasteners, age hardenable, high heat resistance to 1200°F.

REPUBLIC A 441.
M-97; 0.22 max C, 1.2 Mn, 0.02 V, 0.2 Cu, bal Fe.
Rolled: 70,000 min TS; 50,000 min YP; 22 El.
For structural members, mine cars, booms, cranes, auto and bus bodies
High strength steel and weldability.

REPUBLIC ACME.
M-97; 0.3-0.5 C, 0.3 Si, 0.5 Mn, bal Fe.
For armature shafts, spindles, gears, pinions, water hardened

REPUBLIC AIRALOY see REPUBLIC A 4

REPUBLIC AIR HARDENING NO 30 see REPUBLIC H 21

REPUBLIC AIR HARDENING NO 40 see REPUBLIC H 24

REPUBLIC BERGER see REPUBLIC M7

REPUBLIC CC see REPUBLIC W5

REPUBLIC COBALT HIGH SPEED see REPUBLIC T4.

REPUBLIC COR-TEN
M-97; 0.12 max C, 0.2-0.5 Mn, 0.07-0.15 P, 0.25-0.75 Si, 0.25-0.55 Cu, 0.65 max Ni, 0.5-1.25 Cr, bal Fe.
Hot rolled: 70,000 TS; 50,000 YS, 22 El
For transport bodies, atmospheric corrosion resistant

REPUBLIC CV see REPUBLIC S1.

REPUBLIC D2
M-97; 1.55 C, 12 Cr, 0.75 Mo, 0.25 V, bal Fe.
For drawing and blanking dies, punches, shear blades, cold work steel.

REPUBLIC D3.
M-97; 2.2 C, 12 Cr, 0.25 V, bal Fe.
For drawing and blanking dies, shear blades; nondeforming.

REPUBLIC DOUBLE STRENGTH, GRADE 1.
M-97; 0.12 max, C, 0.5-1.0 Mn, 0.5-1.0 Cu, 0.5-1.0 Ni, 0.10 min Mo, bal Fe.
Hot rolled: 70,000 TS; 50,000 YS; 22 El.
For sheets, strips, plates for transportation equipment; resists atmospheric corrosion.

REPUBLIC DOUBLE STRENGTH, GRADE 1-A.
M-97; 0.30 max. C, 0.5-1.0 Mn, 0.5-1.5 Cu, 0.5-1.5 Ni, 0.20 max. Mo, bal Fe.
Normalized: 85,000 TS; 70,000 YS; 40 El.
For sheets, strips, plates for transportation equipment; resists atmospheric corrosion.

REPUBLIC DUMOST see REPUBLIC W2.

REPUBLIC EXTRA see REPUBLIC W1.

REPUBLIC EXTRA SPECIAL.
M-379; 0.65-1.40 C, bal Fe.
For machine shop tools, milling cutters, punches, dies, taps, lathe and planer tools, reamers; water hardened.

REPUBLIC EXTRA SPECIAL TRANSFORMER.
M-97; Si, bal Fe.
For transformers; high permeability.

REPUBLIC FAST FINISHING.
M-97; 1.35 C, 3.5 W, bal Fe.
For tools, cutters; for fast finishing cuts and smooth finish

REPUBLIC FASCUT see REPUBLIC M43.

REPUBLIC H11.
M-97, 0.35 C, 0.35 Mn, 1.0 Si, 5.0 Cr, 0.45 V, 1.30 Mo, bal Fe.
For forging dies, hot forming dies, parts for elevated temperature operation.
Air hardening; resists tempering, good fatigue properties.
Type H11 hot work tool steel.

REPUBLIC H12.
M-97, 0.35 C, 1.0 Si, 5.0 Cr, 0.25 V, 1.25 W, 1.5 Mo, bal Fe.
For punching, piercing, forming and gripper dies.
Type H12, hot work tool steel.

REPUBLIC H13.
M-97, 0.4 C, 1.0 Si, 5 Cr, 1 V, 1.2 Mo, bal Fe
For die casting dies, forging punches, mandrels; resists heat checking.
Type H13 hot work tool steel.

REPUBLIC H14.
M-97, 0.40 C, 0.3 Mn, 1.15 Si, 5.0 Cr, 5.0 W, 0.25 Mo, 0.50 Co, bal Fe.
Ultra high strength metal for severe hot working.
Type M14 hot work tool steel

REPUBLIC H21.
M-97, 0.30 C, 3.5 Cr, 9 W, 0.5 V, bal Fe.
For hot punches, dies; air hardening.
Type H21 hot work tool steel.

REPUBLIC H21M
M-97, 0.30 C, 2.75 Cr, 1.75 Ni, 9.5 W, 0.25 Mo, bal Fe.
For die casting dies, hot work dies, hot piercers.
Type H21 hot work tool steel.

REPUBLIC H24
M-97, 0.50 C, 3.0 Cr, 14 W, 0.5 V, bal Fe.
For blanking and forming dies, hot punches, extrusion mandrels; hot work steel for severe service
Type H24 hot work tool steel.

REPUBLIC H26.
M-97; 0.58 C, 0.3 Mn, 0.3 Si, 4.0 Cr, 1.1 V, 18.25 W, bal Fe.
Ultra high strength metal for severe hot working.
Type H26 hot work tool steel.

REPUBLIC H42.
M-97; 0.60 C, 4.0 Cr, 2.0 V, 6.0 W, 5 Mo, bal Fe.
For hot extrusion dies, hot forming dies, hot upsetting and piercing tools, hot shear blades.
Type H42 hot work tool steel.

REPUBLIC HC see REPUBLIC D3.

REPUBLIC HIGH SPEED see REPUBLIC H26.

REPUBLIC HOT WORK #11 see REPUBLIC H11.

REPUBLIC HP9-4-20.
M-97; 0.16-0.23 C, 0.2-0.4 Mn, 8.5-9.5 Ni, 0.65-0.85 Cr, 0.9-1.1 Mo, 0.06-0.12 V, 4.25-4.75 Co, bal Fe.
Heat treated: 200,000-250,000 TS, 190,000-220,000 TYS; 190,000 CYS, 12-15 El, 55 RA.
For solid fuel rocket motor cases, submarine hulls, pressure vessels, aircraft and aerospace structures.
Tough, shock resistant, good weldability.

REPUBLIC HP9-4-25.
M-97; 0.25 C, 8.50 Ni, 3.75 Co, 0.5 Cr, 0.5 Mo, 0.08 V, 0.2 Mn, bal Fe.
Heat treated: 200,000-250,000 TS; 190,000-220,000 YS; 12-15 El; 55-65 RA.
For solid fuel rocket motor cases, submarine hulls, pressure vessels, aircraft structural components
Weldable after heat treatment.

REPUBLIC HP9-4-30.
M-97; 0.29-0.34 C, 0.15-0.35 Mn, 0.10 max Si, 0.01 max S & P, 7-8 Ni, 0.9-1.1 Cr, 0.9-1.1 Mo, 0.06-0.12 V, 4-5 Co, bal Fe
Plate: 230,000 TS, 210,000 YS, 15 El, 40 RA
For solid fuel rockets, motor cases, submarine hulls, pressure vessels, aircraft structural components Weldable and formable.
High strength and toughness. Heat treatable.

REPUBLIC HP9-4-45
M-97; 0.45 C, 8.0 Ni, 3.75 Co, 0.3 Cr, 0.3 Mo, 0.1 V, bal Fe.
Heat treated: 250,000-290,000 TS, 235-000-250,000 YS; 7-9 El, 30-40 RA; 469-543 Brin.
For highly stressed rocket motor cases, aircraft structural components, landing gears, thin walled forged sections.
High yield strength and toughness.

REPUBLIC IXI HIGH SPEED see REPUBLIC T2

REPUBLIC L2
M-97; 0.45-0.55 C, 0.5-0.8 Mn, 0.8-1.0 Cr, 0.15-0.25 V, bal Fe
Heat treated: 185,000-260,000 TS; 165,000-240,000 YS, 15-6 El, 45-17 RA
For drive shafts, spindles, rear axles, knuckles; shock resistant.

REPUBLIC M.
M-97; 0.25 max C, 1.1-1.6 Mn, 0.30 max Si, 0.20 min Cu, bal Fe
Hot rolled: 75,000 TS, 50,000 YS; 20 El
For earth moving equipment, trucks and trailers, cars, low alloy-high strength steel.

REPUBLIC M1
M-97, 0.80 C, 3.75 Cr, 1.15 V, 1.5 W, 8.75 Mo, bal Fe.
For drills, reamers, lathe tools, milling cutters.
Type M1 high speed tool steel.

REPUBLIC M2
M-97, 0.79-0.86 C, 6-6.7 W, 4 Cr, 1.90 V, 5 Mo, bal Fe
For tools, reamers, cutters, lathe and planer tools, milling cutters; high speed steel.

REPUBLIC M3.
M-97; 1.10 C, 4.0 Cr, 3.0 V, 6.0 W, 5.0 Mo, bal Fe.
For drills, counter bores, reamers, taps, lathe tools, hobs, milling cutters.
Type M3 high speed tool steel.

REPUBLIC M4.
M-97; 1.28 C, 4.5 Cr, 4.0 V, 5.5 W, 4.5 Mo, bal Fe.
For drills, reamers, taps, threading dies, lathe tools
Type M4 high speed tool steel.

REPUBLIC M7.
M-97; 1.0 C, 8.75 Mo, 1.75 W, 4.0 Cr, 2.0 V, bal Fe.
For drills, reamers, broaches, lathe tools.
Type M7 high speed tool steel

REPUBLIC M10
M-97, 0.85 C, 4.0 Cr, 2.0 V, 8.0 Mo, bal Fe.
For drills, reamers, taps, counter bores, broaches, shear blades, lathe tools
Type M10 high speed tool steel.

REPUBLIC M43.
M-97, 1.1 C, 0.3 Mn, 0.3 Si, 4.25 Cr, 2.0 V, 1.75 W, 9.25 Mo, 8.25 Co, bal Fe.
For lathe tools and other tools operating at higher speed and higher temperature;
holds edge at higher temperature
TYPE M43 high speed tool steel.

REPUBLIC MT No 5 see REPUBLIC M3

REPUBLIC MT No 8 see REPUBLIC M1.

REPUBLIC M TUNGSTEN see REPUBLIC S3

REPUBLIC NAX
M-97, 0.08-0.15 C, 0.5-0.7 Mn, 0.6-0.9 Si, 0.5-0.6 Cr, 0.5-0.15 Zr, bal Fe
Rolled 70,000 TS, 50,000 YS, 150 Brin
For railroad and mine cars, truck bodies, good weldability and toughness

REPUBLIC O1
M-97 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe
For dies, taps, gauges, broaches, reamers, hobs, non-deforming, cold work steel.

REPUBLIC PH15-7Mo
M-97 0.09 max C, 14.0-16.0 Cr, 6.5-7.75 Ni, 0.75-1.5 Al, 2.0-3.0 Mo, bal Fe
Condition A: 150,000 TS, 65,000 YS; 25 El; 220 Brin
Condition RH950: 225,000 TS, 200,000 YS; 2-5 El; 460 Brin
For conveyor chains, bearings, pressure tanks, airframes, age hardenable, corrosion and heat resistant

REPUBLIC PLASTIC DIE
M-97, 0.08 max C, 0.10 max Mn, bal Fe
For plastic mold dies, hubbed cavity tools, water hardened, easy to hub.

REPUBLIC REPCO see REPUBLIC H14.

REPUBLIC RESCO see REPUBLIC H21M.

REPUBLIC RS 6Al-4V.
M-97, 6 Al, 4 V, bal Ti
Annealed. 130,000 min TS, 120,000 min YS, 10 min El, 30 min RA.
For aircraft and jet engine components, heat resistant, low density.

REPUBLIC RS 40
M-97; 0.10 max C, 0.05 max N, bal Ti.
Annealed: 60,000 TS; 45,000 YS; 25 El, 80 Rock B.
For non-structural aircraft parts;
for moderate to severe forming

REPUBLIC RS-55.
M-97; 0.10 max C, 0.20 Fe, 0.012 N, bal Ti.
Annealed: 72,000 TS; 60,000 YS; 22 El; 90 Rock B.
For non-structural aircraft parts; for moderate to severe forming.

REPUBLIC RS-70.
M-97; 0.10 max C, 0.015 N, 0.20 Fe, bal Ti.
Annealed. 90,000 TS; 75,000 YS; 20 El; 90 Rock B.
For moderate stressed aircraft parts; resists corrosion fatigue in sea water.

REPUBLIC RS-100.
M-97; 0.20 max C, 3 Mn, 1.5 Al, bal Ti.
Annealed: 110,000 TS; 100,000 YS, 12 El.
For aircraft and jet engine components, heat resistant to 1000°F

REPUBLIC RS-110
M-97, 3-4 Cr, 1-2 Fe, bal Ti.
Rolled. 120,000-160,000 TS, 110,000-130,000 YS; 12-8 El, 270-340 Brin.
For jet engine components; corrosion and heat resistant.

REPUBLIC RS-110A.
M-97, 0.10 max C, 8 Mn, 0.05 max N, bal Ti.
Annealed 120,000 min TS, 110,000 min YS, 10 min El, 28-34 Rock C.
For aircraft and jet engine components; heat resistant, low density.

REPUBLIC RS-110B.
M-97, 0.10 max C, 3 Mn, 2.5 Al, bal Ti.
Annealed 120,000 min TS; 110,000 min YS; 10 min El
For aircraft and jet engine components, heat resistant, low density

REPUBLIC RS-110C
M-97, 0.05 C, 0.017 N, 0.20 Fe, 5 Al, 2.5 Sn, bal Ti
Rolled 125,000 TS; 120,000 YS; 18 El, 40 RA
Annealed 115,000 TS, 110,000 YS, 10 El
For jet engine components, good weldability; for aircraft structural parts

REPUBLIC RS-120
M-97, 6-8 Mn, 0.2 max C, 0.7 max others, bal Ti.
Heat treated 130,000-170,000 TS, 120,000-160,000 YS, 7-18 El 280-380 Brin.
For aircraft skins, ducts, shrouds, jet engine parts; age hardenable.

REPUBLIC RS 120A
M-97, 0.10 max C, 0.15 Fe, 6 Al, 4 V, bal Ti.
Heat treated 136,000 TS; 127,000 YS, 10 El, 36 Rock C
For jet engine components, fasteners, good weldability, high notch toughness.

REPUBLIC RS-130
M-97, 4 Al, 4 Mn, bal Ti.
Annealed 140,000 min TS, 130,000 min YS; 10 min El, 30 min RA
For aircraft and jet engine components; heat resistant, low density.

REPUBLIC RS-135.
M 97, 0.10 max C, 6.3-7.3 Al, 3.5-4.5 Mo, 0.1-0.2 Fe, bal Ti
Heat treated 150,000 TS; 140,000 YS; 14 El; 32-38 Rock C.
For jet engine and missile components, heat treatable; used up to 1100°F.

REPUBLIC RS-140.
M-97; 2.75 Cr, 1.25 Fe, 5 Al, 0.08 C, bal Ti.
Ht. Tr.: 158,000 TS, 145,000 YS; 15 El; 45 RA; C 32-38 Rock.
For jet engine components.

REPUBLIC S1.
M-97; 0.5 C, 2.2 W, 1.2 Cr, 0.25 V, bal Fe.
For hot punches and dies, shear blades, pneumatic tools; hot work steel.

REPUBLIC S3.
M-97; 0.45-0.55 C, 0.9-1.1 Cr, 1.0-1.25 W, bal Fe.
For hand chisels, rivet sets, beading tools, cold cutters, shear blades; shock resistant.

REPUBLIC S4.
M-97; 0.55 C, 0.9 Mn, 1.8-2.2 Si, 0.3 Cr, 0.3 V, bal Fe
For cold punches, shears, pneumatic tools; tough, shock resistant.

REPUBLIC SILICON ARMATURE GRADE.
M-97, 0.50 Si, bal Fe.
For armatures; high permeability.

REPUBLIC SILICON ELECTRIC GRADE.
M-97, 1 Si, bal Fe.
For electric motors, high permeability

REPUBLIC SILICON, FIELD GRADE
M-97; 0.25 Si, bal Fe.
For armatures, electrical equipment, high permeability.

REPUBLIC SILICON, SPECIAL DYNAMO GRADE
M-97, 3.0 Si, bal Fe.
For electrical equipment; high permeability.

REPUBLIC SILICON, SPECIAL MOTOR GRADE.
M-97, 2.4 Si, bal Fe.
For electrical equipment, high permeability.

REPUBLIC SILICON, TRANSFORMER GRADE.
M-97, 3.5 Si, bal Fe
For transformers, high permeability.

REPUBLIC SPECIAL ALLOY TYPE "D."
M-397, M-97, 0.4 C, 1.5 Ni, 0.7 Cr, bal Fe
Oil treated 185,000-260,000 TS; 165,000-240,000 YS; 15-6 El, 45-17 RA
For drive shafts, spindles, tough

REPUBLIC SPECIAL AUTO TYPE A and
REPUBLIC SPECIAL AUTO TYPE D
see REPUBLIC L2

REPUBLIC SPECIAL MO see **REPUBLIC M2.**

REPUBLIC SPECIAL MO LOW CARBON
see **REPUBLIC H42.**

REPUBLIC SPECIAL OIL HARDENING
see **REPUBLIC O1.**

REPUBLIC SPECIAL PUNCH see **REPUBLIC S4.**

REPUBLIC SPECIAL TRANSFORMER.
M 97, 3.5 Si, bal Fe
For transformers, high permeability

REPUBLIC T1
M 97; 0.72 C, 0.3 Mn, 18 W, 4 Cr, 1 V, bal Fe.
For lathe tools, milling cutters, taps
Type T1 high speed tool steel

REPUBLIC T2
M-97, M-379, 0.8 C, 19 W, 4 Cr, 2 V, 0.75 Mo, bal Fe.
For tools, lathe cutters, roll turning tools, reamers, broaches; high speed steel.

REPUBLIC T4
M 97, M-379; 0.72 C, 18 W, 4 Cr, 1 V, 5.5 Co, 0.5 Mo, bal Fe.
For cutters for cast iron and hard, gritty surfaces; high speed steel.

REPUBLIC UA-6.
M-97; 0.6-0.7 C, 0.6 Mn, 1.0 Cr, 0.3 W, bal Fe.
For punches, dies, collets, shear blades, broaches; tough, shock resistant.

REPUBLIC UA-8.
M-97; 1.0 C, 0.35 Mn, 1.35 Cr, 0.35 Mo, bal Fe.
For forming and header dies, cold punches; Type L7; water hardened.

REPUBLIC VELVET see REPUBLIC O7.

REPUBLIC V-HW see REPUBLIC H13

REPUBLIC W1.
M-97; 0.65-1.2 C, 0.3 Mn, 0.25 Si, bal Fe
For cold heading and forming tools, drills, punches; Type W1; water hardened.

REPUBLIC W2
M-97, M-379; 0.85-1.6 C, 0.3 V, bal Fe
For cutting tools, dies, chisels, drills, shear blades; resists shock, fatigue and impact.
Formerly Republic Dumost

REPUBLIC W5.
M-97; 1.1 C, 0.6 Cr, bal Fe.
For dies, punches, cold work tools; water hardening.

REPUBLIC X-42-W
M-97; 0.21 max C, 1.25 Mn, 0.30 Si, Cd, V, bal Fe
Rolled. 60,000 TS; 42,000 YS; 24 El
For structural work, transportation equipment, heavy containers Weldable, formable

REPUBLIC X-45-W.
M-97; 0.22 max C, 1.25 Mn, 0.30 Si, Cb, V, bal Fe
Rolled· 60,000 TS; 45,000 YS; 22 El
For structural equipment, transportation equipment, heavy containers
Weldable, formable.

REPUBLIC X-50-W.
M-97; 0.22 max C, 1.35 Mn, 0.30 Si, Cb, V, bal Fe
Rolled: 65,000 TS; 50,000 YS, 22 El
For truck and trailer bodies, railroad cars, ordnance equipment. Weldable, formable.

REPUBLIC X-55-W
M-97, 0.25 max C, 1.35 Mn, 0.30 Si, Cb, V, bal Fe.
Rolled: 70,000 TS; 55,000 YS; 20 El
For structural work, cranes, booms, mine cars, bus and auto bodies Weldable, formable

REPUBLIC X-60-W.
M-97; 0.26 max C, 1.35 Mn, 0.30 Si, Cb, V, bal Fe.
Rolled: 75,000 TS; 60,000 YS, 18 El
For structural parts, earth moving equipment, truck and tractor parts, auto and bus bodies.
Weldable, formable

REPUBLIC X-65-W.
M-97, 0.26 max C, 1.35 Mn, 0.30 Si, Cb, V, bal Fe.
Rolled: 80,000 TS; 65,000 YS, 16 El
For structural work, railroad cars, bridge and building construction, cranes and booms.
Weldable, formable.

REPUBLIC X-70-W
M-97; 0.26 max C, 1.65 Mn, 0.30 Si, Cb, V, bal Fe.
Rolled. 85,000 TS; 70,000 YS; 14 El
For structural equipment, earth moving equipment, railroad hopper cars, truck and trailer bodies
Weldable, formable.

REPUBLIC XX SUPERIOR.
M-379, M-97; 0.9 C, 4 Cr, 0.4 Mo, 0.75 V, bal Fe.
For hot work tools, bolt and rivet grippers; hot

REPUBLIC YA-4.
M-97; 0.5 C, 0.6 Mn, 1.0 Cr, 0.2-0.3 W, bal Fe.
For tools, blacksmith tools, machine tool parts; shock resistant, tough.

RESISCO.
M-282, 91 Cu, 7 Al, 2 Ni.
Drawn. 100,000 TS; 85,000 YS; 11 El; 205 Brin.
For condensers, coolers; high corrosion resistant.

RESISTAC.
M-129; 90 Cu, 9 Al, 1 Fe.
Cast· 75,000 TS, 37,000 YS; 15 El; 20 RA; 135 Brin
Acid resisting castings and forgings; abrasion resisting

RESISTAC.
M-129; 88 Cu, 10 Al, 2 Fe.
For chemical apparatus; Al-Bronze

RESISTAC
M 129, 89 Cu, 10 Al, 1 Fe
Hot rolled. 100,000 TS, 60,000 YS, 6 El; 6 RA
For equipment, chemical apparatus, Al-Bronze.

RESISTAC NO 1
M-129, 8-11 Al, 5 max Fe, 5 max Ni, bal Cu.
Cast or rolled: 65,000 TS; 28,000 YS, 20 El, 20 RA, 120 Brin
For castings, gears, corrosion resistant

RESISTAC NO 2
M-129, 8-11 Al, 5 max Fe, 5 max Ni, bal Cu
Cast or rolled 75,000 TS; 32,000 YS; 25 El; 25 RA, 150 Brin
For castings, gears, corrosion resistant

RESISTAC NO 3.
M-129, 8-11 Al, 5 max Fe, 5 max Ni, bal Cu.
Cast 90,000 TS, 42,000 YS, 15 El, 15 RA, 185 Brin
Forged 95,000 TS, 45,000 YS, 17 El, 17 RA; 195 Brin
For castings, gears, pumps, impellers; corrosion resistant

RESISTAL
Eng., 90 Cu, 9 Al, 1 Fe
75,000 TS, 37,000 YS, 20 El
For gears, slides, corrosion resistant.

RESISTALOY
M-122, 59 Cu, 2 Al, 1 Ni, bal Zn
Cold drawn 112,750 TS, 85,000 YS, 8.5 El; 11.0 RA, 205 Brin
For shafts, bearings, bolts, nuts, studs, high tensile forgings, resists sea water corrosion.

RESISTALOY NO 12
M 122, 59 Cu, 1 Ni, 2 Al, bal Zn
Rolled 95,000 TS; 58,000 YS, 190 Brin.
For propeller shafts, boat hardware, marine applications, nickel brass

RESISTANCE NO 1
67 Ag, 33 Pt
For resistances; heat resistant

RESISTANCE NO 2.
85 Cu, 12 Mn, 3 Fe
For resistances, heat resistant

RESISTANCE NO 3
57 Cu, 26 Zn, 18 Ni
For resistances, corrosion resistant.

RESISTANCE NO. 4.
56 Cu, 26 Ni, 18 Zn, 1 Fe.
For resistances; corrosion resistant.

RESISTANCE, HIGH MAGNETIC.
70 Cr, 30 Ni.

RESISTANCE, LUNGE.
Eng.; 87-84 Cu, 12-14 Mn, 1.8-1.9 Fe.
For electrical resistors.

RESISTIN-1.
Eng.; 1.8 Fe, 11.7 Mn, 86.5 Cu.
For resistance alloy.

RESISTIN-2.
Eng., 3 Fe, 12 Mn, 85 Cu.
For resistance alloy.

RESISTO-CAST.
M-507; 3.5 C, 3.2 Si, 0.6 Mn, 0.067 S, 0.41 P, 0.29 Cr, 1.33 Ni, 0.2 Mo, 0.15 Cu, bal Fe.
For oxy-acetylene welding repair in cast iron castings.

RESISTO-LOY.
M-507, 3.5 C, 0.46 Si, 1.0 Mn, 29.3 Cr, 4.0 Mo, 0.3 Cu, bal Fe.
Coated, hardfacing electrode
As arc welded: 100,000 psi approx.; 58-60 Rc
For overlay or buildup on shovel teeth, dredging tools, plow shares, cement mill rings; valves for handling corrosive chemicals, good resistance to abrasion and corrosion

RESISTVAR 1.
M-1084, 45 Ni, 55 Cu
Electrical resistance alloy with negative temp. coefficient of resistance
Electrical Resistivity (nominal) 53 μ Cm
Temp coefficient of resistance (-18 to 100°C) -24 to -75 PPM/°C.
Thermal e m f against copper: 42 microvolts/°C.

RESOLUT 1.
M 1323, 2.1 C, 11.5 Cr, bal Fe
For blanking and forming dies, punches, oil or air hardened, non-deforming

RESOLUT 1E
M-1323, 2.1 C, 11.5 Cr, 0.7 W, bal Fe
For blanking, piercing, and forming dies, punches, oil or air hardened, non-deforming

RESOLUT 1W
M 1323, 1.65 C, 11.5 Cr, 0.1 V, bal Fe
For blanking, piercing, and forming dies, punches, air hardened, non deforming

RESOLUT 2
M-1323, 0.9 C, 1.9 Mn, 0.25 Si, 0.1 V, bal Fe
For punches, cutters, crimpers, forming dies, oil hardened, non-deforming

RESOLUT 3
M 1323, 1.25 C, 1.15 Si, 0.7 Mn, 1.2 Cr, bal Fe.
For bearings, liners, cutters; water hardened, wear resistant

RESOLUT 4
M-1323, 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe
For bearings, bushings, liners, cutters, water hardened, wear resistant

RESOURCE.
M-1411, 0.30 C, 13 Cr, bal Fe
For plastic mold dies; corrosion resistant.

RESULPHURIZED STOCK
M 377, C, 0.075 min S, 0.6-0.9 Mn, bal Fe.
For threading steel; bars and rods for threading purposes

RETORT.
M-210; 0.30-0.35 C, 0.40-0.80 Si, 0.60-0.80 Mn, bal Fe
For machinery parts, gears; castings.

REVALON.
M-238; 76 Cu, 22 Zn, 2 Al, 0.05 As.
Hard: 85,000 TS; 60,000 YS; 10 El.
Soft: 60,000 TS; 27,000 YS; 55 El.
For marine parts; hardware; tough.

REVERE NO. 100.
M-238; 99.90 + Cu.
Hard: 51,000 TS, 46,000 YS; 5-15 El; Rockwell B58.
Soft: 30,000 TS, 45 El.
For downspouts, bus bars, gutters; electrolytic, tough pitch.

REVERE NO. 101
M-238; 99.90 Cu, bal Ag.
Hard: 51,000 TS; 48,000 YS; 5-15 El; Rockwell B58.
Soft: 32,000 TS; 45 El.
For conductors, lake copper.

REVERE ALLOY NO. 103.
M-238, 99.9 Cu, Ag.
Hard: 52,000 TS, 48,000 YS; 5 El; 83 Brin.
Soft: 33,000 TS; 7000 YS; 40 El; 75 Brin.
For automobile radiators; silver bearing copper.

REVERE ALLOY NO. 107.
M-238; 99.96 Cu.
Hard 50,000 TS; 48,000 YS; 5 El.
Soft 32,000 YS, 8000 YS, 40 El.
For commercial products, deep drawn parts; oxygen-free.

REVERE NO. 111
M-238, 99.90 Cu + P.
Hard. 55,000 TS, 48,000 YS; 5-10 El; Rockwell B69.
Soft: 32,000 TS; 45 El.
For kettles, oil and water tubes, welded construction, phosphorized copper.

REVERE NO 112.
M-238, 0.007 P, bal Cu.
For high conductivity tubing

REVERE NO 113
M-238, 99.70 Cu + P, 0.3 As.
Hard 60,000 TS; 55,000 YS, 5 El, 228 Brin.
Soft: 36,000 TS; 10,000 YS, 40 El; 63 Brin.
For tubes, arsenical copper.

REVERE NO 114
M-238, 0.5 Te, bal Cu.
½-H temper 38,000 TS, 30,000 YS; 15 El.
H-temper 44,000 TS; 38,000 YS, 10 El.
F C Copper.

REVERE ALLOY NO 115
M 238, 99.9 Cu, 0.1 P
For welding and brazing

REVERE ALLOY NO. 116
M-238, 0.35 Si, bal Cu.
For welding and brazing.

REVERE NO 119
M-238, 5 Zn, 95 Cu
Hard: 55,000 TS; 39,000 YS; 5 El; 121 Brin.
Soft. 35,000 TS, 11,000 YS, 35 El.
For jewelry, primers, gilding bronze

REVERE ALLOY NO 121.
M-238, 90 Cu, 10 Zn.
Hard 60,000 TS, 55,000 YS, 20 El; B 60 Brin.
Soft 40,000 TS; 10,000 YS; 50 El; F 55 Brin.
For costume jewelry, screws, forgings; commercial bronze

REVERE ALLOY NO. 126.
M 238, 87 Cu, bal Zn.
For jewelry, ornaments; Red Brass 87%.

REVERE ALLOY NO. 130.
M-238; 85 Cu, 15 Zn.
Hard: 57,000 TS; 52,000 YS; 23 El; B 75 Brin.
Soft: 40,000 TS; 10,000 YS; 55 El; F 55 Brin.
For jewelry, name plates, tubing, hardware; red brass.

REVERE NO. 140.
M-238; 80 Cu, 20 Zn.
Hard: 85,000-98,000 TS; 55,000 YS; 5 El; 203 Brin.
Soft: 43,000-46,000 TS; 12,000 YS; 50 El; 57 Brin.
For bellows, jewelry, meters; red brass.

REVERE ALLOY NO 150.
M-238; 75 Cu, bal Zn.
Hard: 90,000 TS, 64,000 YS; 6 El.
Soft: 47,000 TS; 16,000 YS; 62 El.
For springs; Spring Brass.

REVERE ALLOY NO. 160.
M-238; 70 Cu, 30 Zn.
Hard· 70,000 TS; 52,000 YS; 30 El; B 80 Brin.
Soft: 48,000 TS, 16,000 YS; 65 El; F 65 Brin.
For cartridge cases, stampings; cartridge brass.

REVERE NO. 165
M-238, 68 Cu, 32 Zn.
Hard: 90,000 TS; 64,000 YS; 3 El, 187 Brin
Soft: 47,000 TS; 11,000 YS; 62 El; 62 Brin.
For drawn and spun parts; deep drawing and spinning brass.

REVERE ALLOY NO 170.
M-238, 66 Cu, 34 Zn.
Hard. 74,000 TS; 60,000 YS; 8 El; 80 B Brin
Soft: 47,000 TS; 15,000 YS; 62 El; 64 F Brin
For rivets, eyelets, electrical sockets; yellow brass

REVERE ALLOY NO. 170-A.
M-238, 65 Cu, bal Zn.
Hard· 90,000 TS; 55,000 YS; 15 El
Soft· 42,000 TS, 13,000 TS; 60 El
For rivets, fasteners, high strength.

REVERE NO 180
M-238, 60 Cu, 40 Zn
Hard· 88,000 TS; 80,000 YS; 12 El, 191 Brin.
Soft: 59,000 TS, 15,000 YS; 52 El, 64 Brin.
For architectural structures, panel sheets, condenser tubes; Muntz Metal

REVERE ALLOY NO 182.
M-238, 60 Cu, bal Zn
Hard. 80,000 TS; 57,000 YS; 20 El
Soft· 52,000 TS; 22,000 YS, 48 El.
For brazing, low M.P.

REVERE ALLOY NO 215
M-238, 73 Cu, 24.5 Zn, 2.5 Pb
Hard: 80,000 TS, 75,000 YS; 5 El.
Soft: 50,000 TS, 15,000 YS; 55 El.
For hardware, machinery parts, free-cutting.

REVERE ALLOY NO. 222
M-238; 66.5 Cu, 1.6 Pb, bal Zn.
For bushings, screw machine products; tubing, free-machining.

REVERE NO. 224.
M-238, 67 Cu, 32.25 Zn, 0.75 Pb.
Hard: 50,000 TS; 5 El.
Soft· 44,000 TS; 45 El.
For hardware, screw machine products; leaded brass, free cutting.

REVERE ALLOY NO. 227.
M-238; 64.5 Cu, 1 Pb, bal Zn.
Hard: 90,000 TS; 66,000 YS; 5 El.
Soft: 47,000 TS, 12,000 YS; 60 El.

REVERE NO. 235.
M-238; 63 Cu, 35 Zn, 2 Pb.
Hard: 85,000 TS; 50,000 YS; 5 El; 150 Brin.
Soft: 45,000 TS; 10,000 YS; 50 El; 60 Brin.
For watch parts, locks, heavy leaded brass.

REVERE ALLOY NO 238.
M-238; 61.3 Cu, 0.25 Pb, bal Zn.
For stamped parts; yellow brass.

REVERE NO. 240.
M-238; 61.5 Cu, 35.5 Zn, 3.0 Pb.
Hard: 65,000 TS, 15 El, B72 Rockwell.
Soft 50,000 TS, 50 El; B65 Rockwell.
For machining parts, screw machine products; free-cutting.

REVERE ALLOY NO. 247
M-238; 62 Cu, 1.75 Pb, bal Zn.
Hard 80,000 TS; 53,000 YS; 15 El
Soft. 50,000 TS; 17,000 YS, 49 El.
For rivets, gears, clock parts; free-cutting.

REVERE ALLOY NO 250.
M-238, 63 Cu, 0.75 Pb, bal Zn.
Hard 67,000 TS; 42,000 YS, 19 El.
Soft. 46,000 TS; 14,000 YS; 55 El
For machined cold headed parts, free-cutting.

REVERE ALLOY NO 252.
M-238, 61.5 Cu, 3.8 Pb, bal Zn
Hard· 63,000 TS, 44,000 YS, 13 El
Soft 43,000 TS; 14,000 YS, 52 El.
For valve bonnets, screw machine products; free-cutting

REVERE ALLOY NO 275
M-238, 59 Cu, 0.6 Pb, bal Zn
Soft 54,000 TS, 20,000 YS, 45 El
For print rolls, tube headers, leaded Muntz metal.

REVERE ALLOY NO. 277
M-238; 58 Cu, 2.75 Pb, bal Zn
Soft 60,000 TS, 20,000 YS, 30 El.
For architectural trim, hardware, free-cutting.

REVERE ALLOY NO 280
M-238, 38 Zn, 2 Pb, bal Cu
Soft 52,000 TS, 20,000 YS, 45 El, 72 Brin.
For hardware, plumbing goods, forgings; extruded, forging brass

REVERE ALLOY NO 283
M-238, 56.5 Cu, 41.25 Zn, 2.25 Pb
Soft 60,000 TS, 20,000 YS, 30 El, 116 Brin
For architectural, lock parts; free-cutting.

REVERE NO 285
M-238, 56 Cu, 41.25 Zn, 2.75 Pb.
Hard 70,000 TS, 55,000 YS, 10 El, 144 Brin.
Soft 50,000 TS, 15,000 YS, 20 El, 64 Brin.
For builders hardware, architectural work, architectural bronze

REVERE ALLOY NO. 305.
M-238, 4 max Sn, 0.2 P, 98.75 Cu.
Spring Temper 68,000-83,000 TS; 4 El; B 74-85 Rock
Soft. 34,000-50,000 TS, 47-50 El; F 50-67 Rock
For diaphragms, bellows, springs, fuse clips, lock washers, clutch discs.
High fatigue and corrosion resistance.
Grade E Phosphor Bronze

REVERE ALLOY NO 308.
M-238, 5 Sn, 0.2 P, bal Cu.
Spring Temper: 91,000-105,000 TS; 4 El; B 95 Rock.
Soft Temper. 40,000-55,000 TS; 57-64 El.
For diaphragms, bellows, springs, fuse clips, lock washers, clutch discs.
High fatigue and corrosion resistance.

REVERE ALLOY NO. 309.
M-238; 95 Cu, 1 Sn, bal Zn.
For jewelry; corrosion resistant.

REVERE ALLOY NO. 315.
M-238; 8 Sn, 0.2 P, bal Cu.
Spring Temper: 105,000-118,500 TS; 3 El; B 100 Rock.
Soft: 53,000-67,000 TS; 65-70 El; B 20-70 Rock.
For diaphragms, bellows, springs, fuse clips, lock washers, clutch discs.
High fatigue and corrosion resistance.
Grade D Phosphor Bronze.

REVERE ALLOY NO. 317.
M-238; 10 Sn, 0.2 P, bal Cu.
Hard Temper: 94,000-109,000 TS; 7 El; B 100 Rock.
Soft: 58,000-73,000 TS; 62-68 El; B 25-75 Rock.
For diaphragms, bellows, springs, fuse clips, lock washers, clutch discs.
High fatigue and corrosion resistance
Grade D Phosphor Bronze.

REVERE ALLOY NO 325.
M-238; 90 Cu, 9.5 Zn, 0.5 Sn.
Hard: 65,000 TS; 57,000 YS, 5 El; 140 Brin.
Soft: 45,000 TS; 10,000 YS; 42 El, 100 Brin.
For bearings, lamp connections, weatherstrip; heavy duty.

REVERE ALLOY NO. 327.
M-238; 90 Cu, 2 Sn, bal Zn.
For weather strip, corrosion resistant.

REVERE ALLOY NO 336.
M-238, 86 Cu, 0 5 Sn, bal Zn.
For jewelry; corrosion resistant.

REVERE ALLOY NO. 337.
M-238, 88 Cu, 2 Sn, bal Zn.
For jewelry; corrosion resistant.

REVERE NO 340
M-238; 87 Cu, 12 Zn, 1 Sn.
Hard: 80,000 TS; 4 El; 150 Brin.
Soft: 45,000 TS, 40 El, 100 Brin
For chains, chain bronze

REVERE ALLOY NO 342
M-238; 62.5-66 5 Cu, 1.5-2 5 Pb, 0 10 max Fe, bal Zn
Hard. 80,000 TS, 60,000 YS; 5 El, B 85 Rock.
Soft· 50,000 TS, 18,000 YS; 55 El, B 25 Rock.
For clock and watch backs, engraver's plates, gears, channel plates
High leaded brass, high machinability.

REVERE NO. 358.
M-238, 71 Cu, 28 Zn, 1 Sn, 0.03 As.
Hard. 100,000 TS; 98,000 YS; 3 El; 215 Brin.
Soft: 53,000 TS; 18,000 YS; 60 El, 53 Brin.
For condenser tubes, Admiralty Metal, corrosion resistant.

REVERE ALLOY NO. 362.
M-238; 71 Cu, 0.05 P, 1 Sn, bal Zn.
Hard: 10,000 TS; 80,000 YS; 3 El.
Soft· 53,000 TS; 22,000 YS; 65 El.
For condenser tubes, Phosphorized Admiralty, Metal.

REVERE ALLOY NO. 370
M-238; 62 Cu, 0.75 Sn, bal Zn.
Hard: 10,000 TS; 70,000 YS; 4 El.
Soft: 58,000 TS; 21,000 YS; 36 El.
For marine applications; Hard Naval Brass.

REVERE ALLOY NO. 380.
M-238; 60 Cu, 39.25 Zn, 0.75 Sn.
Hard: 82,000 TS; 55,000 YS; 20 El.
Soft: 60,000 TS; 22,000 YS; 45 El.
For propeller and pump shafts, piston rods; Roman Bronze.

REVERE NO. 381.
M-238; 60 Cu, 39.25 Zn, 0.75 Sn.
Hard: 70,000 TS; 55,000 YS; 25 El; 140 Brin.
Soft: 54,000 TS; 15,000 YS; 50 El.
For hardware, condenser tubes; Roman Bronze.

REVERE NO. 386.
M-238; 60 Cu, 39 Zn, 0.25 Pb, 0.75 Sn.
Hard: 75,000 TS, 39,000 YS; 15 El; 150 Brin.
Soft· 54,000 TS; 15,000 YS; 45 El; 83 Brin.
For condenser heads, forgings, Naval Brass.

REVERE ALLOY NO. 387.
M-238; 60 Cu, 0 75 Pb, 0.75 Sn, bal Zn.
Hard: 86,000 TS; 59,000 YS; 10 El.
Soft: 63,000 TS; 26,000 YS, 35 El.
For tube headers; Leaded Naval Brass.

REVERE ALLOY NO. 389
M-238; 60 Cu, 37.25 Zn, 2 Pb, 0.75 Sn.
Hard: 90,000 TS; 70,000 YS; 5 El.
Soft 58,000 TS; 20,000 YS; 35 El.
For forgings, screw machine products; Leaded Naval Brass, free cutting.

REVERE ALLOY NO. 411.
M-238; 9.5 Zn, 0 5 Sn, bal Cu.
Hard 65,000 TS, 62,000 YS, 5 El, B 76 Rock.
Soft: 45,000 TS, 14,000 YS, 42 El; F 55 Rock.
For bushings, weatherstrips, fuse clips.
Low coefficient friction. Good formability and good corrosion resistance.

REVERE NO 429
M-238; 95 Cu, 5 Al, 0 035 As.
Hard. 70,000 TS, 50,000 YS; 25 El; 150 Brin
Soft. 57,000 TS, 10,000 YS, 55 El.
For hardware, bushings; Al bronze.

REVERE NO. 430.
M-238, 7 Al, 2 Fe, bal Cu.
Soft. 75,000 TS, 42,000 YS; 30 El
Hard. 85,000 TS, 55,000 YS; 30 El.
For high strength plates for pressure vessels, Al-bronze, tough.

REVERE ALLOY NO. 432.
M-238, 78 Cu, 1 Si, bal Zn.
Hard: 109,000 TS; 73,000 YS; 4 El.
Soft. 56,000 TS, 14,000 YS, 61 El.
For oil coolers, Evaporator Brass No. 1.

REVERE ALLOY NO. 436.
M-238, 91 Cu, 7 Al, 2 Si
Hard· 95,000 TS, 53,000 YS; 25 El.
Soft· 85,000 TS, 43,000 YS; 35 El
For hardware, fittings, valve stems; Al bronze.

REVERE ALLOY NO. 443
M-238, 60 5 Cu, 0 25 Pb, 0.07 Mn, 0.07 Sn, bal Zn.
For coal screens; high strength.

REVERE ALLOY NO. 454
M-238, 58 Cu, 0 75 Fe, 0 5 Mn, 1.0 Sn, bal Zn.
Hard· 90,000 TS; 55,000 YS; 10 El; 185 Brin.
Soft: 65,000 TS; 27,000 YS; 35 El, 120 Brin.
For valve stems, clutch disks, pump parts; Mn bronze.

REVERE ALLOY NO. 456.
M-238, 58 Cu, 1 Sn, 1 Fe, 0.1 Si, bal Zn.
For bronze welding rod; working temperature 1600°F; low fuming

REVERE ALLOY 464.
M-238, 59-62 Cu, 0.5-1 0 Sn, bal Zn.
Hard· 75,000 TS, 53,000 YS; 20 El; B 82 Rock.
Soft: 57,000 TS; 25,000 YS; 64 El; B 55 Rock.
For propeller and pump shafts, piston rods, marine hardware, bolts, valve stems.
Naval brass. Corrosion resistant.

REVERE ALLOY NO. 469.
M-238; 56.7 Cu, 0.75 Pb, 1.75 Ni, 0.15 Mn, 1.2 Fe, 0.6 As, bal Zn.
Hard: 85,000 TS; 62,000 YS; 10 El.
Soft: 65,000 TS; 26,000 YS; 40 El.
For valve stems; Arsenical Bronze.

REVERE NO. 505.
M-238; 80 Cu, 20 Ni, 0.5 Fe, 0.7 max Mn.
Hard: 80,000 TS; 76,000 YS; 3 El; 152 Brin
Soft: 49,000 TS; 14,000 YS; 35 El; 64 Brin.
For condenser tubes, corrosion resistant tanks; 20% Cupro-Nickel.

REVERE ALLOY NO. 508.
M-128, 1.4 Fe, 0.3 Mn, 10 Ni, bal Cu.
For condenser and heat exchanger tubes, 90-10 Cupro-Nickel.

REVERE NO. 510.
M-238; 70 Cu, 30 Ni, 0.6 Fe, 1 0 max Mn
Hard: 84,000 TS; 80,000 YS; 4 El, 187 Brin.
Soft: 49,000 TS; 18,000 YS; 50 El; 60 Brin
For hardware, process equipment; 30% Cupro-Nickel.

REVERE ALLOY NO. 533.
M-238; 65.5 Cu, 18 Ni, 16 5 Zn.
Hard: 85,000 TS; 74,000 YS; 3 El; 87 B Rock.
Soft· 58,000 TS; 25,000 YS; 40 El, 85 F Rock.
For marine and auto trim, hardware; nickel, silver 18% A.

REVERE ALLOY NO 536.
M-238; 72 Cu, 0.15 Mn, 18 Ni, bal Zn.
For hollow ware, cutlery, trim, Nickel Silver; deep drawing.

REVERE ALLOY NO 540
M-238; 66 Cu, 12 Ni, bal Zn.
Hard: 95,000 TS; 80,000 YS, 3 El.
Soft. 53,000 TS; 17,000 YS; 46 El.
For jewelry, springs; 12% Nickel Silver

REVERE NO 545
M-238, 65 Cu, 25 Zn, 10 Ni.
Hard· 90,000 TS; 65,000 YS, 3 El: 152 Brin.
Soft 50,000 TS; 15,000 YS, 45 El, 70 Brin
For stampings, jewelry; Nickel Silver, 10%.

REVERE NO. 548.
M-238; 62 Cu, 33 Zn, 5 Ni
Hard: 85,000 TS, 60,000 YS, 2 El, 150 Brin
Soft 50,000 TS; 15,000 YS, 45 El, 70 Brin.
For jewelry, decorative trim; Nickel Silver, 5%

REVERE ALLOY NO. 555
M-238; 55 Cu, 18 Ni, 27 Zn
Hard: 100,000 TS; 85,000 YS; 3 El; 91 B Rock.
Soft: 60,000 TS; 27,000 YS, 40 El; 90 F Rock
For springs, trim, plumbing fixtures; nickel, silver 18% B

REVERE ALLOY NO. 560
M-238; 43 Cu, 13 Ni, bal Zn.
For elevator trim, springs, 13% Nickel Silver.

REVERE ALLOY NO 575
M-238; 66 Cu, 2 Pb, 12 Ni, bal Zn.
Hard· 78,000 TS; 75,000 YS, 5 El.
Soft: 55,000 TS; 18,000 YS; 40 El.
For key blanks, hardware, stampings; nickel silver

REVERE ALLOY NO. 580.
M-238; 65 Cu, 2 Pb, 10 Ni, 0.25 Mn, bal Zn
For washers, jewelry, panels; Leaded 10% Nickel Silver.

REVERE ALLOY NO. 770.
M-238; 53.5-56.5 Cu, 16.5-19.5 Ni, 0.10 max Fe, bal Zn.
Hard: 105,000 TS; 90 000 YS; 5 El; B 95 Rock.
Soft: 65,000 TS; 28,000 YS; 35 El; B 55 Rock.
For springs, marine hardware, jewelry, tableware, screw machine products. Corrosion resistant.

REVERE 1100.
M-238; 99.0 min Al.
O-temper: 13,000 TS; 5000 YS; 45 El; 23 Brin.
H 18-temper: 24,000 TS; 22,000 YS; 15 El; 44 Brin.
For trim, housings, containers, chemical equipment; commercially pure aluminum.

REVERE 1145.
M-238; 99.45 min Al
For wrappings, electrical condensers; foil.

REVERE 2014.
M-238; 0.8 Mn, 0.4 Mg, 0 8 Si, 4.4 Cu, bal Al.
O-temper 27,000 TS; 14,000 YS, 18 El; 45 Brin.
T 4-temper: 62,000 TS; 44,000 YS, 20 El; 105 Brin.
T 6-temper· 70,000 TS, 60,000 YS; 13 El; 135 Brin
For aircraft forgings, hardware, structural fittings; heat treatable, high strength.

REVERE 2017.
M-238, 0 5 Mn, 0 5 Mg, 4 Cu, bal Al.
O-temper: 26,000 TS, 10,000 YS, 22 El, 45 Brin.
T 4-temper· 62,000 TS, 40,000 YS; 22 El, 105 Brin.
For aircraft structures, fittings, screw machine products; heat treatable, good formability

REVERE 2024.
M-238, 0 6 Mn, 1 5 Mg, 4 5 Cu, bal Al.
O temper 27,000 TS, 11,000 YS, 22 El, 47 Brin.
T 4-temper 68,000 TS, 48,000 YS, 19 El; 120 Brin
For aircraft structures, heat treatable.

REVERE 3003
M-238; 1 2 Mn, bal Al
O-temper 16,000 TS, 6000 YS; 40 El, 28 Brin
H 14 temper 31,500 TS, 19,000 YS, 16 El, 40 Brin
H 18-temper· 29,000 TS, 26,000 YS; 10 El; 55 Brin
For structural work, tank cars, cooking utensils, heat exchangers, resists atmosphere corrosion.

REVERE 3004
M-238, 1.2 Mn, 1 Mg, bal Al
O-temper. 26,000 TS, 10,000 YS, 25 El, 45 Brin.
H 34 temper. 34,000 TS, 27,000 YS, 12 El; 63 Brin.
H 38 temper 40,000 TS, 34,000 YS, 6 El, 77 Brin
For fuel lines, fan blades, roofing, hydraulic tubing. high resistance to weather corrosion

REVERE 5005.
M-238, 0 8 Mg, bal Al.
O-temper 18,000 TS; 6000 YS; 30 El.
H 16 temper 26,000 TS; 25,000 YS; 5 El
H-32 temper. 29,000 TS; 27,000 YS; 5 El.
For light alloy parts, strip and tube.

REVERE 5050
M-238; 1.4 Mg, bal Al
O-temper 21,000 TS; 8000 YS, 24 El.
H-32 temper. 25,000 TS, 21,000 YS, 9 El
H-38 temper: 32,000 TS; 29,000 YS, 6 El
For light alloy parts; strip and tube.

REVERE 5051
M-238; 0 7 Mg, bal Al
O-temper. 18,000 TS; 6000 YS, 30 El.
H-16 temper: 26,000 TS; 25,000 YS; 5 El
H-32 temper 29,000 TS; 27,000 YS; 5 El.
For anodized parts

REVERE 5052.
M-238; 2.5 Mg, 0.25 Cr, bal Al.
O-temper: 27,000 TS; 12,000 YS; 30 El; 45 Brin.
H 34-temper: 37,000 TS; 31,000 YS; 14 El; 67 Brin.
H 38-temper: 41,000 TS; 36,000 YS; 8 El; 85 Brin.
For camera cases, deck housings, gasoline tanks, aircraft components, resists sea water corrosion.

REVERE 6061.
M-238; 1 Mg, 0.25 Cr, 0.6 Si, 0.25 Cu, bal Al.
O-temper: 18,000 TS; 8000 YS; 30 El; 30 Brin.
T 4-temper: 35,000 TS; 21,000 YS; 25 El; 65 Brin.
T 6-temper: 45,000 TS; 40,000 YS; 17 El; 95 Brin.
For structures, marine equipment, engine baffles, heat treatable, good weldability.

REVERE 6062
M-238; 0.25 Cu, 0.6 Si, 1.0 Mg, 0.06 Cr, bal Al
O-temper: 18,000 TS; 8000 YS; 30 El
T-4 temper: 35,000 TS; 21,000 YS; 25 El.
T-6 temper: 45,000 TS; 40,000 YS; 7 El.
For extrusions; age-hardened.

REVERE 6063.
M-238; 0.7 Mg, 0.4 Si, bal Al.
F-temper: 22,000 TS; 15,000 YS; 20 El; 42 Brin.
T 5-temper. 30,000 TS, 25,000 YS; 12 El; 65 Brin.
T 6-temper 35,000 TS, 30,000 YS; 12 El; 73 Brin.
For light alloy parts, moldings, trim, architecture; heat treatable, good corrosion resistance.

REVERE 6101
M-238; 0.4 max Fe, 0.3-0.6 Si, 0.4-0.8 Mg, bal Al.
Rolled 29,000 TS, 25,000 YS
For light alloy parts, corrosion resistant

REVERE E C
M-238; 99.45 min Al
O-temper 12,000 TS, 4000 YS
H-16 temper. 18,000 TS, 16,000 YS.
For electrical conductors

REVERE FS-1
M-238, 9 Al, 1 Zn, 0.3 Mn, bal Mg
For light alloy parts, sheets

REVERE PHOSPHOR BRONZE A
M-238, 5 Sn, 0.05 P, bal Cu
Hard 70,000 TS, 58,000 YS; 25 El, 78 B Rock
For springs, fuse clips, bellows, diaphragms; corrosion resistant; Revere Alloy No 308

REVERE PHOSPHOR BRONZE C.
M-238, 8 Sn, 0.05 P, bal Cu
Hard 93,000 TS, 72,000 YS, 10 El; 93 Rb
Soft 55,000 TS, 70 El, 75 Rf Brin
For springs, fuse clips, bellows, diaphragms, corrosion resistant, Revere Alloy No. 315.

REVERE PHOSPHOR BRONZE D
M-238, 10 Sn, 0.05 P, bal Cu
Hard 100,000 TS, 13 El, B 97 Rock
Soft: 66,000 TS; 68 El, B 55 Rock.
For springs, fuse clips, bellows, diaphragms, welding rod, corrosion resistant

REVERE PHOSPHOR BRONZE E.
M-238, 4 max Sn, 0.06 P, bal Cu.
Hard. 65,000 TS, 50,000 YS; 8 El, B 75 Rock.
Soft 40,000 TS; 14,000 YS; 48 El; F 60 Rock.
For springs, fuse clips, bellows, diaphragms, electrical contacts, metal hose, corrosion resistant.

REX.
M-1345; 0.56 C, 0.30 Cr, 0.18 Mo, 1.65 Ni, 0.10 V, bal Fe.
For forging and heading dies, punches; oil hardened, tough.

REX 3-V.
M-38; 1 C, 4 Cr, 14 W, 3 V, 0.75 Mo, bal Fe.
For turning tools; high speed steel.

REX 4-V.
M-38, 1.25 C, 4 Cr, 18.5 W, 4 V, 0.75 Mo, bal Fe.
For broaches, reamers, rifling tools; high speed steel.

REX 18-8.
M-38, 0.1 C, 18 Cr, 8 Ni, bal Fe.
For stainless parts; stainless steel.

REX 49
M-38; 1.1 C, 6.75 W, 3.75 Mo, 4.25 Cr, 2.0 V, 5.0 Co, bal Fe.
Hardened: C 64-69 Rock.
For special applications of twist drills, end mills, form cutters, lathe tools, reamers.
AISI Type M41 High speed tool steel.

REX 78.
M-1126, M-521; 0.07 C, 14 Cr, 18 Ni, 3.75 Mo, 0.65 Ti, 3.6 Cu, bal Fe.
Heat treated 94,000 TS; 49,000 YS; 39 El; 57 RA.
For gas turbine disks and blades, corrosion and heat resistant.

REX 95.
M-38, 0.80 C, 14 W, 4.0 Cr, 2.0 V, 0.75 Mo, 5.25 Co, bal Fe
Hardened: C 63-66 Rock.
For single point lathe tools, severe cutting operations, tools for stainless steels.
AISI Type T8 High speed tool steel.

REX 326
M-1126, 0.25 C, 17 Cr, 17 Ni, 2.5 Mo, 7 Co, 1.8 Cb, 3 Mn, bal Fe
For jet engine components; high heat resistance.

REX 326D
M-114, M-1126, 0.43 C, 14.3 Cr, 14.6 Ni, 2.2 W, 2.2 Mo, 9.5 Co, 2.8 Cb, bal Fe.
For valves, pump parts, corrosion and heat resistant

REX 327
M-1126, 0.20 C, 17 Cr, 17 Ni, 3 Mo, 7 Co, 0.8 Ti, 3 Cu, bal Fe.
For valves, pump parts; heat and corrosion resistant.

REX 337 A.
Eng., C, Ni, Cr, bal Fe
For high temperature applications, heat and corrosion resistant

REX 400.
English, 76 Ni, 19 Cr, 0.6 Al, 2.1 Ti, bal Fe.
For high temp. applications, heat resistant.

REX 440
M-38, 0.8 C, 4 Cr, 19.5 W, 2 V, 0.6 Mo, 12 Co, bal Fe
For cutting tools, lathe and cut-off tools; high speed steel, heavy duty.

REX 448.
M 531, 0.15 C, 0.75 Si, 0.75 Mn, 11.5 Cr, 0.75 Mo, 0.15 V, 0.45 Cb, bal Fe.
Annealed 70,000 TS, 35,000 YS, 30 El; B 80 Rock
For cutlery, surgical instruments, chemical plant equipment.
Corrosion and heat resistant

REX 448.
M-1126: 0.10 C, 11 Cr, 0.8 Mo, 0.8 Ni, 0.5 Cb, 0.2 V, 1.0 Mn, bal Fe.
For aircraft and jet engine components; corrosion and heat resistant.

REX 467.
M-521; 0.20 C, 0.7 Si, 1.0 Mn, 9.5 Ni, 14.5 Cr, 2.5 Cu, 2 Mo, 0.8 Ti, bal Fe.
For turbine blades in jet engines; high creep resistance, stainless.

REX 467.
M-1126; 0.20 C, 14 Cr, 10 Ni, 2 Mo, 0.8 Ti, 2.5 Cu, bal Fe.
For valves, pump parts; corrosion and heat resistant.

REX 539.
M-56; 0.37 C, 1.6 Si, 1.6 Mn, 1.8 Ni, 0.11 Cr, 0.5 Mo, 0.2 V, bal Fe.
Heat treated: 270,000 TS; 230,000 YS
For aircraft parts, high stress applications; ultra high tensile steel.

REX 939.
M-38; 1.0 C, 18 W, 4 Cr, 3 V, bal Fe
For reamers, hobs, taps, milling cutters, high speed steel.

REX 1059.
M-38; 1.2 C, 4 Cr, 4 V, 14 W, 0.75 Mo, bal Fe.
For cutting tools, planer and shaper tools; high speed steel

REX "A."
M-38; 0.4 C, 18 W, 4 Cr, bal Fe.
For punches, dies; hot work steel

REX AA.
M-38; 0.75 C, 0.3 Mn, 4.0 Cr, 1.15 V, 18 W, bal Fe.
Hardened: C 62-65 Rock.
For lathe cutting tools, drills, end mills, reamers, slotting saws, gear cutters.
AISI Type T1 High speed tool steel.

REX AAA.
M-38; 0.7 C, 17-19 W, 0.5 Mo, 4 Cr, 1 V, 5 Co, bal Fe.
For cutters, reamers, drills, hobs, broaches, taps, Type T4; high speed steel

REX AA-OX
M-38; 0.65 C, 0.3 Mn, 0.3 Si, 18 W, 4 Cr, 1.1 V, bal Fe.
Hardened: C 56-63 Rock
For dies, extrusion dies, cold header tools, die inserts, shear blades, pipe taps.
AISI Type T2 High speed tool steel.

REX AA-PX
M-38; C, alloy, bal Fe
For cutting tools; high speed steel

REX-A-LITE.
M-1017; C, Cr, Mn, Si, bal Fe.
Welded: 570 Brin.
For hard facing electrodes; abrasion resistant.

REX-A-LITE 1.
M-1017; Co, Cr, W.
Welded: 550 Brin.
For hard facing electrodes; abrasion and corrosion resistant.

REX-A-LITE 6.
M-1017; Co, Cr, W.
Welded: 440 Brin.
For hard facing electrodes; shock and impact resistant.

REXALLOY.
M-38; 33 Cr, 44 Co, 17 W, 2.2 C, 0.2 B, 1 Fe.
For cutting tools, gauges, wear strip, valves; cemented, cast.

REXALLOY 33.
M-38, 2.25 C, 17 W, 33 Cr, 44 Co, 0.75 Si, 2 max Fe.
Cast. 50,000-60,000 TS, 550-630 Brin.
For cutting tools, glass shear blades, plug gages; cast nonferrous alloy.

REXALLOY 108
M-38; Co-Cr-W.
For cutting tools, wear resistant parts; heat, wear and corrosion resistant.

REXALLOY A.
M-38, 1.2 C, 28 Cr, 4.5 W, 0.70 Mn, bal Co.
At 70°F: 118,000 TS; 87,000 YS; 0.5 El; 0 RA; 420 Brin.
At 1500°F: 59,000 TS, 7.4 El; 7.9 RA.
For valves, high temperature applications; heat resistant.

REXARC
M-1017; C, Mn, bal Fe.
Welded: 380 Brin.
For hard facing electrodes; wear resistant.

REXARC 1
M-1017, Ni
For welding electrodes for cast iron; machinable welds

REXARC 30
M-1017, C, Cr, Mn.
Welded Rockwell C30.
For hard facing electrodes; metallic coated.

REXARC 48.
M-1017, C, Cr, bal Fe.
Welded Rockwell C48
For hard facing electrodes.

REXARC 50
M-1017; C, Cr, bal Fe.
Welded Rockwell C50
For hard facing electrodes, impact and abrasion resistant

REXARC 55
M-1017, C, Cr, bal Fe
Welded Rockwell C55
For hard facing electrodes, shock resistant.

REXARC 65
M-1017, C, Cr, TiO, Mo, bal Fe.
Welded Rockwell C65
For hard facing electrodes; abrasion resistant

REXARC 520
M-1017, C, Cr, Mo, bal Fe
Welded: Rockwell C54
For hard facing electrodes, abrasion resistant.

REXARC MANGANESE M1.
M-1017, C, Mn, Ni, bal Fe.
Welded: Rockwell C35
For hard facing electrodes; build-up on Mn castings, wear resistant.

REXARC MANGANESE S-3.
M-1017, C, Mn, Ni, bal Fe.
Welded Rockwell C14-18
For hard facing electrodes; used on 13 Mn steel, wear resistant

REX BRONZE.
M-652; 80 Cu, 10 Sn, 10 Pb.
For castings.

REX CAST ALUMINUM
M-844; Cu, bal Al.
For welding rod; for Al alloys.

REX CAST IRON.
M-844; 3.0-3.5 C, 3.0-3.5 Si, bal Fe.
For welding rod; for cast iron.

REX CHAMPION.
M-38; 0.7 C, 14 W, 2 V, 4 Cr, bal Fe.
Heat treated: 160,000 TS; 600 Brin.
For cutting tools, drills, broaches, dies; high speed steel.

REXCOBALT.
French; C, alloy, bal Fe.
For tools.

REX COMPOSITION
M-652, 78-86 Cu, 3-6 Sn, 2-6 Pb, 5-14 Zn.
For castings; free-cutting.

REX I.A.
M-38, 0.9 C, 0.3 Mn, 0.3 Si, 3 Cr, 1.2 V, 1.5 W, 3.25 Mo, bal Fe.
Air or oil hardening tool steel; AISI M 52.

REX M 2
M-38, 0.83 C, 6.4 W, 4.1 Cr, 1.9 V, 5.0 Mo, bal Fe.
For tools, cutters, broaches, chasers, hobs; high speed steel. AISI M2

REX M2 HIGH CARBON.
M-38; 1.0 C, 6.4 W, 5.0 Mo, 4.15 Cr, 1.95 V, bal Fe.
Harden to C 62.5-66.5 Rock.
For boring tools, twist drills, milling cutters, threading tools, thread chasers, improved wear resistance
AISI Type M2 High speed tool steel

REX M2S
M-38, 0.85 C, 6.4 W, 5.0 Mo, 4.15 Cr, 1.95 V, bal Fe
Harden to C 61-67 Rock
Free machining, for form tools, drills, end mills, milling cutters, hobs, broaches.
AISI Type M2 High speed tool steel

REX M2S HIGH CARBON
M-38; 1.0 C, 6.4 W, 5.0 Mo, 4.15 Cr, 1.95 V, 0.15 S, bal Fe
Harden to C 62 66 Rock
Free machining type high speed steel.
For boring tools, drills, end mills, reamers, broaches, milling cutters, hobs
AISI Type M2 High speed tool steel.

REX M-3.
M-38, 1 C, 4 Cr, 2.5 V, 5.7 W, 5.0 Mo, bal Fe
For broaches, form tools, reamers, cut-off tools; high speed steel, oil hardened.

REX M3-1
M-38, 1.05 C, 4 Cr, 2.4 V, 6.25 W, 6.25 Mo, bal Fe
For lathe and planer tools, milling cutters, reamers, Type M3 high speed steel.

REX M3S-2.
M-38, 1.2 C, 0.3 Mn, 0.3 Si, 4 Cr, 6.25 W, 6.25 Mo, 0.15 S, bal Fe.
Hardened. 64-67 Rock C.
For form tools, milling cutters, hobs, cut-off tools, reamers, lathe tools.
High-speed steel, free-cutting.
Resistance to softening at high temperatures.

REX-M7.
M-38; 1.0 C, 0.3 Mn, 0.3 Si, 3.75 Cr, 1.75 W, 8.75 Mo, 2.0 V, bal Fe.
Hardened: 64-66 Rock C.
For twist drills, end mills, cutting tools, lathe tools, threading tools, hobs, reamers, taps, chasers, form cutters.
High speed steel. Improved wear resistance.
Type M7 tool steel

REX M33.
M-38; 0.90 C, 9.5 Mo, 1.75 W, 3.75 Cr, 1.25 V, 8.0 Co, bal Fe.
Hardened: C 63-68 Rock.
For tough machining and higher speed operations of drills, end mills, form cutters, lathe tools, taps, reamers.
AISI Type M33 High speed tool steel.

REX M42.
M-38, 1.1 C, 1.5 W, 9.5 Mo, 3.75 Cr, 1.15 V, 8.0 Co, bal Fe.
Hardened: C 64-69 Rock
For special purpose drills, end mills, form cutters, reamers, lathe tools.
AISI Type M42 High speed tool steel.

REXOR
M-750; 0.35 C, 0.7 Mn, 0.6 Cr, 0.35 Mo, 0.15 Si, 0.2 Ni, bal Fe.
Annealed: 107,000 TS; 80,000 YS; 22 El; 248 Brin
For chisels, pneumatic tools; tough, wear resistant.

REX SUPERCUT.
M-38; 0.77 C, 4 Cr, 18.5 W, 0.65 Mo, 2.0 V, 8.0 Co, bal Fe
For cutters, reamers, hobs, lathe and form tools; high speed steel, heavy duty

REX SUPERVAN
M-38, 0.85 C, 18.5 W, 4.0 Cr, 2.1 V, 0.75 Mo, bal Fe
Hardened C 63-66 Rock
For cutting tools, lathe tools, abrasion resistant cutters
AISI Type T2 High speed tool steel

REX-TMO
M-38, 0.85 C, 3.75 Cr, 1.15 V, 1.55 W, 8.7 Mo, bal Fe
For lathe and planer tools, milling cutters, hobs; high speed steel, Type M1

REX TMO-5
M-38, M-260, 0.7 C, 3.25-4.25 Cr, 1.25-2 W, 0.75 1.5 V, 7.5 9.5 Mo, (Co), bal Fe
For reamers, lathe tools, drills, broaches, dies, hot work dies, cutting tools; high speed steel, wear resistant

REX TMO-8
M-38, 0.9 C, 4 Cr, 2 V, 2 W, 9 Mo, 8 Co, bal Fe.
For cutting tools, reamers, milling cutters; high speed steel

REX-TMO-S
M-38, 0.85 C, 3.75 Cr, 1.15 V, 1.55 W, 8.7 Mo, 0.15 S, bal Fe.
For lathe and planer tools, reamers, hobs, broaches; high speed steel, free-cutting

REXTOX
Eng; Fe-Mn-Cu
For resistance alloy

REX-TUNG
M-1017, WC.
For hard facing electrodes, mild steel tube filled with WC.

REX VM
M-38, 0.90 C, 8.0 Mo, 4.0 Cr, 1.95 V, bal Fe.
Harden to C 58-66 Rock.
For broaches, center drills, lathe tools, end mills, thread chasers, hobs.
AISI Type M10 High speed tool steel.

REX VM DREADNAUGHT.
M-38, M-260; 0.86 C, 4 Cr, 2 V, 8 Mo, bal Fe.
For taps, drills, planer and boring tools; high speed steel.

REX VM-S.
M-38; 0.85 C, 4 Cr, 1.9 V, 8 Mo, 0.15 S, bal Fe.
For lathe and planer tools, reamers, hobs, broaches; high speed steel.

REXWELD 27.
M-38; 1.25 C, 28 Cr, bal Fe
Welded: 310 Brin.
For hard facing electrode; resists heat checking

REXWELD 33W
M 38; 2.2 C, 33 Cr, 18 W, 45 Co.
Welded: 600 Brin.
For hardfacing electrode; high abrasion resistance.

REXWELD 54
M-38; Fe-Ni-Cr.
For hard surfacing, cast welding rod.

REXWELD 57.
M-38, 4 C, 28 Cr, 8 Mo, bal Fe
Welded: 580 Brin
For hard facing electrode, pulverizers, abrasion and impact resistant

REXWELD 64
M-38; 0.75 C, 3.5 Si, 14.5 Cr, 73 Ni, 4 Fe, 3.5 B
For hard facing electrode; corrosion and wear resistant

REXWELD 66.
M-38; 55 Ni, 16.5 Cr, 17 Mo, 4.5 W, 6 Fe
Welded. 200-400 Brin
For hard facing alloy for shear blades and forging dies; resists thermal shock

REXWELD A
M-38, 1.0 C, 27.5 Cr, 2 Ni, 4.5 W, 1.5 Fe, 65 Co.
For hard facing electrode, corrosion and wear resistant

REXWELD B.
M 38; 1.65 C, 27.5 Cr, 7.5 W, 0.5 Mo, 1.5 Fe, 60 Co.
For hard facing electrode, corrosion and wear resistant.

REXWELD C.
M-38, 2.4 C, 29.5 Cr, 12 W, 0.5 Mo, 1.5 Fe, 55 Co.
For hard facing electrode; corrosion and wear resistant.

REXWELD VT
M-38; 0.30 C, 27 Cr, 3 Ni, 5.5 Mo, bal Co
Welded 300-400 Brin
For hard facing electrode; resists heat checking

REX Z METAL.
M-566, 2.4 C, 0.75 Mn, 1.0 Si, 0.18 Cu, bal Fe
Heat treated 75,000 TS, 50,000 YS, 8 El, 200 Brin
For chains, buckets, sprockets, pearlitic malleable iron

REYNOLDS 2S.
M-671, 99 min Al
O-temper: 13,000 TS, 5000 YS, 45 El, 23 Brin.
H14-temper 18,000 TS; 16,000 YS, 20 El, 32 Brin.
H18-temper· 24,000 TS, 22,000 YS, 15 El, 44 Brin.
For containers, tanks, auto body parts; wrought.

REYNOLDS 3S.
M-671; 1.2 Mn, bal Al.
O-temper: 16,000 TS; 6000 YS; 40 El; 28 Brin
H14-temper. 22,000 TS; 19,000 YS, 16 El; 40 Brin
H18-temper: 29,000 TS; 26,000 YS: 10 El; 55 Brin.
For structures, tank cars, pipes; wrought, resists atmospheric corrosion.

REYNOLDS 13.
M-671, 12 Si, bal Al.
Die cast· 37,000 TS; 18,000 YS; 1.8 El.
For sand and die castings; corrosion resistant.

REYNOLDS 14S.
M-671, 0.8 Si, 4.4 Cu, 0.8 Mn, 0.4 Mg, bal Al.
O-temper 27,000 TS; 14,000 YS; 18 El; 45 Brin.
T4-temper: 62,000 TS; 42,000 YS; 22 El; 105 Brin.
T6-temper: 70,000 TS, 60,000 YS; 13 El; 135 Brin
For aircraft forgings, wrought.

REYNOLDS 17S.
M-671; 4 Cu, 0.5 Mn, 0.5 Mg, bal Al.
O temper 26,000 TS; 10,000 YS; 22 El; 45 Brin.
T4-temper· 62,000 TS; 40,000 YS, 22 El; 105 Brin.
For aircraft structures; heat treatable

REYNOLDS 18S
M-671, 4 Cu, 0.5 Mg, 2 Ni, bal Al.
T61-temper 62,000 TS, 48,000 YS; 12 El; 120 Brin
For pistons, heat treatable

REYNOLDS 24S
M-671, 4.5 Cu, 0.6 Mn, 1.5 Mg, bal Al
O-temper 27,000 TS, 11,000 YS; 22 El; 47 Brin
T3-temper 69,000 TS, 48,000 YS, 19 El; 120 Brin
T36 temper 73,000 TS; 57,000 YS, 130 Brin.
For aircraft structures, heat treatable

REYNOLDS 25S
M 671, 0.8 Si, 4.5 Cu, 0.8 Mn, bal Al
T6-temper 58,000 TS, 37,000 YS, 19 El, 110 Brin.
For propellers, engine parts, hardware, heat treatable

REYNOLDS 32S
M-671, 12.5 Si, 0.9 Cu, 1 Mg, 0.9 Ni, bal Al
T6-temper 55,000 TS, 46,000 YS, 9 El, 120 Brin
For aircraft pistons; heat treatable

REYNOLDS 43
M-671, 5 Si, bal Al
Sand cast 19,000 TS, 9000 YS, 6 El; 40 Brin
Die cast· 30,000 TS, 14,000 YS, 7 El
For sand and die castings, corrosion resistant

REYNOLDS 52S
M-671; 2.5 Mg, 0.25 Cr, bal Al
O-temper 28,000 TS, 13,000 YS, 30 El, 45 Brin
H32-temper 34,000 TS, 27,000 YS, 18 El, 62 Brin
H34-temper 37,000 TS, 31,000 YS, 14 El, 67 Brin
For camera cases, deck housings, gasoline tanks, wrought, corrosion resistant

REYNOLDS 56S
M-671, 0.1 Mn, 5.2 Mg, 0.1 Cr, bal Al
O temper 42,000 TS, 22,000 YS, 35 El
H18-temper 62,000 TS, 58,000 YS; 6 El.
For rivets, fine wire, wrought.

REYNOLDS 63S
M-671, 0.4 Si, 0.7 Mg, bal Al
F-temper. 22,000 TS, 13,000 YS, 42 Brin
T5-temper 31,000 TS, 24,000 YS, 65 Brin.
T6 temper 35,000 TS, 30,000 YS, 73 Brin.
For light alloy parts; heat treatable.

REYNOLDS 85.
M-671; 4 Cu, 5 Si, bal Al
Die cast 40,000 TS; 22,000 YS; 3.5 El
For die castings, good machinability.

REYNOLDS 108
M-671; 4 Cu, 3 Si, bal Al.
Cast: 21,000 TS; 14,000 YS; 2.5 El; 55 Brin.

REYNOLDS 112.
M-671; 7 Cu, 1.7 Zn, bal Al.
Cast: 24,000 TS; 15,000 YS; 1.5 El; 70 Brin.
For sand castings; non-hardenable.

REYNOLDS 113.
M-671; 7 Cu, 2 Si, 1.7 Zn, bal Al
Sand cast: 24,000 TS, 15,000 YS; 1.5 El; 70 Brin.
For sand castings and permanent molds; non-hardenable.

REYNOLDS 122.
M-671, 10 Cu, 0.2 Mg, bal Al.
T2-temper: 27,000 TS, 20,000 YS; 1 El; 80 Brin.
T61-temper: 40,000 TS, 30,000 YS, 4 El, 115 Brin.
For sand castings, heat treatable

REYNOLDS 138.
M-671; 10 Cu, 4 Si, 0.3 Mg, bal Al.
Permanent mold cast: 32,000 TS, 24,000 YS, 1.5 El; 100 Brin.
For permanent mold castings; non-hardenable.

REYNOLDS 142
M-671, 4 Cu, 1.5 Mg, 2 Ni, bal Al
T21 temper. 27,000 TS, 18,000 YS, 1 El, 70 Brin.
T571-temper: 32,000 TS, 28,000 YS, 0.5 El; 85 Brin
T77-temper 28,000 TS; 25,000 YS, 3 El; 75 Brin.
For sand castings, heat treatable

REYNOLDS 152
M-671, 7 Cu, 5.5 Si, 0.3 Mg, bal Al
T524-temper. 29,000 TS, 16,000 YS, 1.0 El; 95 Brin
T74 temper. 35,000 TS, 26,000 YS, 0.5 El, 100 Brin
For permanent mold castings; heat treatable.

REYNOLDS 195
M-671, 4.5 Cu, 0.8 Si, bal Al
T4 temper 32,000 TS, 16,000 YS, 8.5 El, 60 Brin.
T6 temper 36,000 TS, 24,000 YS, 5 El, 75 Brin.
T62-temper 40,000 TS; 30,000 YS; 2 El; 95 Brin.
For sand castings, heat treatable

REYNOLDS 212
M-671, 8 Cu, 1.2 Si, bal Al
Cast 23,000 TS, 14,000 YS, 2 El, 65 Brin
For sand castings, non hardenable.

REYNOLDS 214
M-671, 3.8 Mg, bal Al.
Cast. 25,000 TS, 12,000 YS, 9 El, 50 Brin
For sand castings, corrosion resistant

REYNOLDS 218
M-671; 8 Mg, bal Al
Die cast 42,000 TS, 23,000 YS, 7 El.
For die castings, corrosion resistant.

REYNOLDS 220.
M-671, 10 Mg, bal Al
T4-temper: 46,000 TS, 25,000 YS, 14 El, 75 Brin.
For sand castings, heat treatable.

REYNOLDS 319.
M 671; 3.5 Cu, 6 Si, bal Al
Cast. 27,000 TS; 18,000 YS, 2 El; 70 Brin.
T6-temper. 36,000 TS; 24,000 YS; 2 El; 80 Brin.
For sand castings; heat treatable

REYNOLDS 333.
M-671, 3.8 Cu, 9 Si, 0.4 Mg, bal Al
T533-temper. 32,000 TS; 25,000 YS; 1 El; 100 Brin.
For permanent mold castings; heat treatable.

REYNOLDS 356.
M-671, 7 Si, 0.3 Mg, bal Al.
T51-temper: 25,000 TS; 20,000 YS; 2 El; 60 Brin.
T6-temper: 33,000 TS; 24,000 YS; 4 El; 70 Brin.
T7-temper: 34,000 TS; 30,000 YS; 2 El; 75 Brin.
For sand castings; heat treatable.

REYNOLDS 360.
M-671; 9.5 Si, 0.5 Mg, bal Al.
Die cast. 42,000 TS; 23,000 YS; 1.8 El.
For die castings; high fluidity.

REYNOLDS/380.
M-671; 3.5 Cu, 8.5 Si, bal Al.
Die cast: 45,000 TS; 25,000 YS; 2 El.
For die castings; good machinability.

REYNOLDS 406.
M-671, 2 Mn, bal Al.
Cast: 19,000 TS; 9000 YS; 12 El; 35 Brin.
For sand castings, corrosion resistant.

REYNOLDS 645
M-671; 2.7 Cu, 10.5 Zn, 1.2 Fe, bal Al.
Cast: 29,000 TS; 17,000 YS; 4 El, 70 Brin.
For sand castings; non-hardenable.

REYNOLDS 750.
M-671; 1 Cu, 1 Ni, 6.5 Sn, bal Al
T533-temper: 20,000 TS; 8500 YS; 10 El; 45 Brin.
For bearings, permanent mold castings; heat treatable

REYNOLDS NO. 2364.
M-671, 6 Si, 4 Cu, Fe, bal Al
For alloying aluminum; master alloy.

REYNOLDS NO 2393
M-671, 9 Si, 3.5 Cu, 0.75 Fe, bal Al
For alloying aluminum, master alloy.

REYNOLDS A17S
M-671, 2.5 Cu, 0.3 Mg, bal Al
T4-temper. 43,000 TS, 24,000 YS; 27 El, 70 Brin.
For rivets, aircraft structures; heat treatable.

REYNOLDS A51S
M-671; 1 Si, 0.6 Mg, 0.25 Cr, bal Al.
T6-temper 48,000 TS; 43,000 YS; 17 El, 100 Brin
For crankcases, connecting rods; heat treatable

REYNOLDS A-108.
M-671, 4.5 Cu, 5.5 Si, bal Al.
Permanent mold cast. 28,000 TS, 16,000 YS, 2 El, 70 Brin.
For permanent mold castings, good machinability.

REYNOLDS A132.
M-671; 0.8 Cu, 12 Si, 1.2 Mg, 2.5 Ni, bal Al.
T551-temper. 36,000 TS, 28,000 YS, 0.5 El, 105 Brin
T65-temper. 47,000 TS; 43,000 YS; 0.5 El; 125 Brin
For permanent mold castings; heat treatable.

REYNOLDS A214.
M-671, 3.8 Mg, 1.8 Zn, bal Al.
Permanent mold cast: 27,000 TS, 16,000 YS, 7 El, 60 Brin
For permanent mold castings; corrosion resistant.

REYNOLDS AS NO. 1.
M-671, Al alloy
For cold worked parts.

REYNOLDS AS NO 2
M-671; Al alloy.
For deep drawn parts.

REYNOLDS B195.
M-671, 4.5 Cu, 2.5 Si, bal Al.
T4-temper. 37,000 TS; 19,000 YS; 9 El; 75 Brin.
T6-temper 40,000 TS; 26,000 YS; 5 El; 90 Brin.
T7-temper: 39,000 TS; 20,000 YS; 4.5 El; 80 Brin.
For permanent mold castings; heat treatable.

REYNOLDS B214.
M-671; 1.8 Si, 3.8 Mg, bal Al.
Cast: 20,000 TS; 13,000 YS; 2 El; 50 Brin.
For sand castings; corrosion resistant.

REYNOLDS C113.
M-671; 7 Cu, 3.5 Si, bal Al.
Permanent mold cast: 30,000 TS; 28,000 YS; 1 El; 80 Brin.
For permanent mold castings; non-hardenable.

REYNOLDS F214.
M-671; 0.5 Si, 3.8 Mg, bal Al
Cast: 20,000 TS; 12,000 YS; 3 El; 50 Brin.
For sand castings; corrosion resistant.

REYNOLDS J51S.
M-671; 0.20-0.50 Si, 0.15-0.40 Cu, 0.40-0 80 Mg, 0.2 max Zn, bal Al.
For brazed shelves; age-hardened.

REYNOLDS METAL.
M-671; Al.
For foil.

REYNOLDS R-301.
M-671; 0 75-1.20 Si, 4-5 Cu, 0 7-1 0 Mn, 0.2-0.5 Mg, bal Al.
Annealed: 25,000 TS; 10,000 YS; 22 El.
Heat treated: 68,000 TS; 60,000 YS.
For light alloy parts, aircraft wings and fuselage; corrosion resistant

REYNOLDS R-305.
M-671; 0 9 Mg, bal Al.
O-temper: 18,000 TS, 6000 YS, 30 El; 28 Brin
18-temper 29,000 TS; 28,000 YS; 4 El, 41 Brin.
38-temper: 29,000 TS, 27,000 YS; 5 El; 51 Brin.
For light reflectors, refrigerator shelves, utensils; good forming properties

REYNOLDS R306.
M-671; 0 50-0.90 Si, 0 8-1 2 Mg, 0.10 max Cr, 0.6 max Fe, 0.25-0 75 Mn, bal Al
For light alloy parts.

REYNOLDS R307.
M-671; 0.30-0.80 Mn, 4 0-5.0 Mg, 0.25 max Cr, 0.7 max Fe, 0.25 max Cu, bal Al
For light alloy parts.

REYNOLDS R308.
M-671, 0.7 Si + Fe, 0.2 Cu, bal Al
For reflectors, reflector sheets.

REYNOLDS R-353
M-671; 1.25 Mg, 0.7 Si, 0.25 Cr, bal Al.
O-Temper: 16,000 TS; 7000 YS, 25 El.
T4-Temper: 33,000 TS; 20,000 YS; 22 El
T6-Temper: 39,000 TS; 33,000 YS; 14 El.
For forgings; age-hardenable; now called 53S alloy.

REYNOLDS R355.
M-671; 1 3 Cu, 5 Si, 0.6 Mg, bal Al.
T51-temper: 28,000 TS, 23,000 YS; 1.5 El; 65 Brin
T6-temper: 35,000 TS; 25,000 YS; 2.5 El; 80 Brin.
T61-temper: 39,000 TS; 35,000 YS; 1 El; 90 Brin.
For sand castings; heat treatable.

REYNOLDS R-361.
M-671; 1.0 Mg, 0.6 Si, 0.25 Cr, bal Al.
O-Temper: 18,000 TS; 8000 YS; 22 El.
T4-Temper: 35,000 TS; 21,000 YS; 22 El.
T6-Temper: 45,000 TS; 39,000 YS; 12 El.
For architectural and furniture fields, age-hardenable; now called 61S alloy.

REZISTAL FM-18-8.
M-38; 0.13-0.20 C, 18 Cr, 8 Ni, Mo, Se, bal Fe.
Annealed: 85,000-95,000 TS; 30,000-40,000 YS; 60-65 El; 75-65 RA; 130-170 Brin.
For stainless parts, bolts, screws; stainless,

REZISTAL KA2.
M-72; 0.15 max C, 0 40-0.65 Mn, 8-9.5 Ni, 17.5-19.0 Cr, bal Fe.
Heat treated: 85,000-95,000 TS; 30,000-40,000 YS; 55-60 El; 70-75 RA; 135-145 Brin.
For all welded construction which cannot receive the Strauss heat treatment after welding; radiators, lamps, food and cooking utensils; non-magnetic, austenitic.

REZISTAL VT
M-38; 0.25 C, 0.50 Mn, 2.5 Ni, 27 Cr, 5.5 Mo, bal Co.
Cast· 96,000 TS; 70,000 YS; 8 El; 15 RA; 290 Brin.
For jet engine components; heat resistant

REZISTAL X-40
M-38, 0.50 C, 10.5 Ni, 25.5 Cr, 7.5 W, bal Co.
At 70°F: 110,000 TS, 64,000 YS; 15.0 El; 23.4 RA; 270 Brin.
At 1500°F. 59,000 TS; 17.4 El.
For valves, high temperature applications, heat resistant.

REZISTAN.
M-1161; 3.2 C, Cr, Ni, Cu, Mo, Al, bal Fe
For pumps, valves, combustion chambers; alloy cast iron, corrosion resistant.

R.F F.
M-1118; 0.5 C, 0.7 Mn, 1.9 Si, 0.2 Mo, bal Fe.
For tools, dies, punches; tough

RG 5.
German; 85 Cu, 5 Sn, 7 Zn, 3 Pb.
For castings; pressure tight

R H 1.
M-1201; 0.8-0 9 C, 17-20 W, 3 5-5.0 Cr, 1.0 V, 3 Mo, bal Fe
620 Brin.
For welding rod for high speed steel; heat and wear resistant

RHEINDUR.
M-1548; 3 5-5 0 Cu, 0 5-1 0 Si, 0 5-1.0 Mn, 0 5-1 2 Mg, bal Al
Heat Treated· 57,000 71,000 TS, 50,000-54,000 YS; 10-12 El; 130-140 Brin
For fasteners, aircraft and jet engine components
Age-hardenable High strength

RHEINROHR 3CA2
M 625; 0 15 C, 0.75 Cr, 0 15 Mo, bal Fe.
For gears, shafts, cams, camshafts, case hardened, tough.

RHEINROHR 3DB22.
M-625; 0 13 C, 1 Cr, 0.25 Mo, 0.2 V, bal Fe.
For gears, shafts, cams, camshafts; case hardened, tough.

RHEINROHR 3HK5.
M-625, 0.2 C, 0.5 Si, 2.0-2.5 Cr, 1 Mo, bal Fe.
Rolled 71,000-92,500 TS; 42,700 YS; 12-18 El.
For superheater tubes, boiler ends, chemical tanks; heat resistant to 580°F.

RHEINROHR 9F2.
M-625; 0 44 C, Cr, Si, Mn, bal Fe.
For gears, shafts, crankshafts, bolts, studs; water or oil hardened

RHEINROHR 18/12 MS.
M-625; 0.10 C, 16-18 Cr, 10.5-13 Ni, 2.0-2.5 Mo, Ti = 4 × C, bal Fe.
Rolled: 78,000-107,000 TS; 35,600 YS; 45-40 RA.
For superheater tubes, boiler ends, chemical tanks;

RHEINROHR 18/12S.
M-625; 0.08 C, 16 Cr, 13 Ni, Cb, bal Fe.
Rolled: 78,000-107,000 TS; 31,300 YS; 50-40 El.
For superheater tubes, boiler ends, chemical tanks; heat resistant to 850°C.

RHEINROHR 230V.
M-625; 0.12 C, 5 Ni, bal Fe.
Rolled: 85,000-102,000 TS; 58,000 YS; 20 El.
For refrigeration components, bolts, fasteners; ductile at low temperature.

RHEINROHR C73.
M-625; 0.35 C, 0.27 Si, 0.50 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 183 Brn.
For gears, bolts, fasteners; water hardened.

RHEINROHR C1203.
M-625; C, alloy, bal Fe.
For machine tool parts; oil hardened, tough.

RHEINROHR CS65S.
M-625; 0.12 C, 1.15 Si, 2.5 Cr, 0.45 Mo, bal Fe.
Annealed: 65,000-85,000 TS; 36,000 YS; 21 El.
For superheater tubes, boiler ends, drums; heat resistant to 650°F.

RHEINROHR CuNi 47.
M-625; 0.20 C, Cu, Ni, bal Fe
For machine tool parts; case hardened.

RHEINROHR CuNi 52
M-625; 0.20 C, Cu, Ni, Mn, bal Fe.
For machine tool parts.

RHEINROHR CuNi 52 Mo.
M-625; 0.20 C, Cu, Ni, Mn, Mo, bal Fe.
For machine tool parts.

RHEINROHR CV18W
M-625; 0.2 C, 1 Si, 1.5-2.0 Cr, V, Mo, bal Fe.
Rolled: 71,000-92,500 TS, 42,700 YS; 25-20 El.
For superheater tubes, boiler ends, chemical tanks; heat resistant to 620°C.

RHEINROHR D33
M-625, 0.17 C, 1.05 Mn, 0.30 Si, bal Fe.
For gears, bolts, machine tool parts; case hardened.

RHEINROHR D45
M-625; C, alloy, bal Fe.
For machine tool parts; oil hardened, tough.

RHEINROHR D45V.
M-625; 0.1 C, 1.5 Cr, V, bal Fe
Rolled: 64,000-85,000 TS; 42,700 YS, 25-18 El.
Por petroleum cracking and ammonia synthesis equipment; heat resistant to 550°C.

RHEINROHR D73.
M-625; 0.40 C, 0.37 Si, 0.95 Mn, bal Fe.
For gears, bolts, machine tool parts, water hardened.

RHEINROHR D83.
M-625; 0.46 C, 0.35 Si, 0.80 Mn, bal Fe.
For gears, bolts, machine tool parts, water hardened.

RHEINROHR E33.
M-625; 0.14 C, 1.05 Mn, 0.3 Si, bal Fe.
For gears, shafts, machine tool parts; case hardening steel.

RHEINROHR E34SP.
M-625; 0.17 C, 1.05 Mn, 0.3 Si, bal Fe.
For gears, shafts, machine tool parts; case hardening steel.

RHEINROHR E35SP.
M-625; 0.19 C, 0.5 Si, 1.15 Mn, bal Fe.
For gears, machine tool parts; case hardening steel.

RHEINROHR E45.
M-625; 0.19 C, 1.15 Mn, 0.5 Si, bal Fe.
For gears, shafts, machine tool parts; case hardening steel.

RHEINROHR E45SP.
M-625; 0.22 C, 0.5 Si, 1.15 Mn, bal Fe.
For gears, shafts, machine tool parts; case hardening steel.

RHEINROHR E93.
M-625; 0.46 C, 0.96 Mn, 0.35 Si, bal Fe.
Hot rolled: 100,000 TS; 60,000 YS; 24 El; 45 RA; 215 Brin.
For gears, bolts, shafts, fasteners; water hardened.

RHEINROHR F1203.
M-625; C, alloy, bal Fe.
For machine tool parts; oil hardened.

RHEINROHR H-205.
M-625; C, bal Fe
For boiler plates.

RHEINROHR H-215.
M-625; C, bal Fe.
For boiler plates.

RHEINROHR H-215A.
M-625; C, bal Fe.
For boiler plates.

RHEINROHR H-316.
M-625, C, bal Fe.
For boiler plates.

RHEINROHR H-326.
M-625, C, bal Fe
For boiler plates

RHEINROHR H-437.
M-625, C, bal Fe
For boiler plates.

RHEINROHR HSB40
M-625, C, bal Fe.
For machine tool parts, water hardened.

RHEINROHR HSB45.
M-625, C, bal Fe
For machine tool parts; water hardened.

RHEINROHR HSB50.
M-625, C, bal Fe.
For machine tool parts; water hardened

RHEINROHR HSB50R.
M-625, C, bal Fe
For machine tool parts; water hardened.

RHEINROHR HSB55.
M-625, C, bal Fe.
For machine tool parts, water hardened.

RHEINROHR IK1
M-625, 0.1 C, 0.5 Ti, bal Fe.
Rolled: 48,000-60,000 TS; 21,400 YS; 22 El.
For chromium impregnation; for stainless surfaces.

RHEINROHR Mn47Mo.
M-625, 0.19 C, Mn, Mo, bal Fe.
For gears, bolts, camshafts, cams; case hardened.

RHEINROHR-MV12.
M-1658; 0.20 C, 12 Cr, 1 Mo, 0.3 V, bal Fe.
Annealed 95,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened: 240,000 TS, 205,000 YS; 10 El; C 50 Rock.
For valves, cutlery, bearings, surgical instruments.
Corrosion resistant, hardenable.

RHEINROHR-MVW12.
M-1658, 0.20 C, 12 Cr, 1 Mo, 0.3 V, 0.5 W, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened: 235,000 TS; 195,000 YS; 10 El; C 48 Rock.
For valves, bearings, cutlery, surgical instruments.
Corrosion resistant, hardenable.

RHEINROHR N1K.
M-625; 0.16 C, 2.25 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant.

RHEINROHR N8N.
M-625; 0.17 C, 2.7 Cr, 0.25 Mo, 0.15 V, bal Fe.
For camshafts, cams, oil refinery equipment; case hardened.

RHEINROHR N9.
M-625; 0.20 C, 3.25 Cr, 0.5 Mo, 0.5 V, bal Fe.
For die casting dies; oil hardened.

RHEINROHR N10.
M-625; 0.21 C, 3 Cr, 0.4 Mo, 0.8 V, 0.37 W, bal Fe.
For die casting dies; oil hardened.

RHEINROHR TH31.
M-625; 0.15 C, 0.30 Mo, 0.60 Mn, 0.25 Si, bal Fe.
For gears, bolts, machine tool parts; case hardening steel.

RHEINROHR TH32.
M-625; 0.13 C, 0.85 Cr, 0.45 Mo, bal Fe.
For machine tool parts, gears, pinions; case hardening steel.

RHEINROHR TS53.
M-625; 0.2 C, 0.5 Ti, bal Fe.
Rolled: 50,000-64,000 TS; 25,000 YS; 30-20 El.
For steam boilers; good creep strength.

RHEINROHR TS57.
M-625; C, alloy, bal Fe.
For machine tool parts; oil hardened.

RHEINROHR TSL.
M-625; C, alloy, bal Fe.
For machine tool parts; oil hardened

RHEINROHR TT.
M-625; 0.10 C, Mn, Al, bal Fe.
Rolled: 58,000-72,000 TS; 36,000 min YS; 22 min El.
For refrigeration equipment; ductile to −80°C.

RHEINROHR TTA23.
M-625; 0.15 C, 17 Mn, 3 Cr, bal Fe.
Rolled: 100,000-128,000 TS; 38,500 YS; 30 El.
For low temperature applications; ductile to −185°C.

RHENIUM.
M-133; 99.5 Re.
70,000 TS; 24 El.
For constituent of alloys and chemicals; electroplating.

RHEOTAN NO. 1.
Eng.; 84 Cu, 12 Mn, 4 Zn.
For resistances.

RHEOTAN NO. 2.
Eng.; 53 Cu, 18 Zn, 25 Ni, 5 Fe.
For resistances.

RHEOTAN NO. 3.
Eng.; 84 Cu, 2 Mn, 4 Zn, 12 Fe.
For resistances.

RHOMETAL.
M-108; 36 Ni, 64 Fe.
For high frequency electrical circuits; constant magnetic permeability.

RHOTANIUM.
Eng.; 90-60 Au, 10-40 Pd.
For jewelry; corrosion resistant.

RH SPECIAL.
M-114; 0.55 C, 0.35 Mn, 0.9 Si, 5.0 Cr, 0.25 V, 1.25 W, 1.25 Mo, bal Fe.
AISI Type A8 air hardening tool steel.

RICHARD PLASTIC BABBITT.
Eng.; 82.43 Sn, 9.77 Sb, 8.1 Cu.
For Babbitt, bearings; antifriction.

RICHARDS.
Eng.; 71.5 Sn, 25 Zn, 3.5 Al.
For aluminum solder.

RICHARD'S ALLOY.
Eng.; 96 Zn, 4 Al.
For die castings.

RICHARDS BRONZE.
England; 42 Zn, 1 Fe, 1-2 Al, bal Cu.
For marine hardware; corrosion resistant, high strength.

RICHARDSON'S SPECULUM.
Eng.; 65 Cu. 30 Sn, 2 As, 2 Si, 0.7 Zn.
For reflectors; high polish.

RICH GOLD METAL.
90 Cu, 10 Zn
For window screen wire; commercial bronze.

RICH LOW BRASS.
M-8, 15 Zn, Pb, Fe, bal Cu.
For hardware, fittings; red brass.

RICHLOY HI-TENSILE SOLDER NO. 3.
M-910; 20 Sn, 80 Pb
Cast: 7183 TS; 47 El.
For soft solder; M.P. 416°F.

RICHLOY HI-TENSILE SOLDER NO. 4.
M-910; 30 Sn, 70 Pb.
Cast 7883 TS, 42 El.
For soft solder, M P 390°F.

RICHLOY HI-TENSILE SOLDER NO. 5.
M-910; 40 Sn, 60 Pb
Cast: 9000 TS; 36 El.
For soft solder; M.P. 370°F.

RICHLOY HI-TENSILE SOLDER NO. 6
M-910, 50 Sn, 50 Pb.
Cast: 9412 TS; 34 El.
For soft soldier; M.P. 356°F.

RICHLOY HI-TENSILE SOLDER NO. 7.
M-910; 65 Sn, 35 Pb.
Cast: 9577 TS, 32 El.
For soft solder; M.P 360°F.

RIGOR.
M-111; 1 C, 0.6 Mn, 5.25 Cr, 1 1 Mo, 2 V, bal Fe.
For dies, for cold work AISI A2.

RIKEN 201.
M-1110; 5-7 Al, 0.1-0.5 Mn, 1 5 max Zn, bal Mg.
Rolled 31,000-37,000 TS, 3-10 El.
For light parts; wrought alloy.

RIKEN 202
M-1110, 8-11 Al, 0.1-0 5 Mn, 1.0 max Zn, bal Mg
Rolled: 37,000-42,500 TS, 5-7 El.
For light parts; wrought alloy.

RIKEN 203.
M-1110; 0.5 max Al, 0.5-2.5 Mn, 0.5 max Zn, bal Mg.
Rolled: 25,500-30,000 TS; 2 El.
For light parts; wrought alloy.

RIKEN 501.
M-1110; 3.5-6.5 Al, 0.1-0.5 Mn, 2 5-3.5 Zn, bal Mg.
Cast: 25,000 TS; 5 El.
For light parts; sand casting.

RIKEN 502A.
M-1110; 8-11 Al, 0.1-0.5 Mn, bal Mg.
Cast: 21,300 TS.
For light parts; sand casting.

RIKEN 502B.
M-1110; 8-11 Al, 0.1-0.5 Mn, bal Mg.
Cast: 28,500-30,000 TS.
For light parts; sand casting

RIKEN 601.
M-1110; 8-11 Al, 0.1-1.0 Mn, 0.2-1.0 Zn, bal Mg.
Die cast.
For light die castings; high strength.

RIM-ROLL NO. 9.
M-341; 1.05 C, 0.5 Cr, bal Fe.
For rolls; water hardened.

RIOK 5F5.
M-Russia; 1.5 C, 10 W, 4 Cr, 4.5 V, 6 Co, bal Fe.
Hardened: 65-68 Rock C.
For broaches, reamers, knitting and textile needles, form cutters.
High-speed steel, high red-hardness.

RI PREMIUM.
M-101; WC.
For cutting tools, for superalloys.
Sintered carbide, abrasion resistant.

RITA ALLOY.
M-354; 0.5 C, 0.9 Mn, 0.8 Cr, 1.5 Ni, bal Fe.
Oil quenched: 220,000 TS; 12 El; 40 RA; 444 Brin.
For structural purposes, gears; oil hardening

RITA ALLOY NO. 2
M-354; 0.2 C, 1.15 Mn, 0.5 Ni, 0.5 Cr, bal Fe.
Rolled: 85,000 TS; 174 Brin.
For gears, shafts; case hardening.

RITA ALLOY NO. 4.
M-354; 0.4 C, 0.9 Mn, 0.5 Cr, 0.5 Ni, bal Fe.
Heat treated: 223-461 Brin.
For gears, shafts; oil hardening

RITA ALLOY NO. 5.
M-354; 0.5 C, 1.2 Mn, 0.5 Ni, 0.6 Cr, bal Fe
Heat treated: 269-629 Brin
For gears, bolts, studs, axles; tough

RITA ALLOY NO 7
M-354; C, Mn, Cr, Ni, bal Fe
Oil treated 230,000 TS, 200,000 YS; 10 El; 35 RA; 650 Brin.
For tools, dies; oil hardened.

RITA CAR-VAN DIE.
M-354, 0.9 C, 0.2 V, bal Fe.
For tools, dies; oil hardened.

RITA CHROME VANADIUM
M-354, 0.6 C, 1.5 Cr, 0.2 V, bal Fe
For tools, taps, drills, oil hardened

RITA COBALT HIGH SPEED.
M-354, 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For tools, high speed cutters, high speed steel

RITA ELECTRIC TOOL.
M-354; 0.7 C, 1.8 Si, 0.5 Cr, bal Fe.
For tools, rock drills, chisels; oil hardened.

RITA ENDUR.
M-354, C, Si, V, Ni, Mo, bal Fe
For hobs, cutters, oil hardening

RITA EXTRA SPECIAL.
M-354; 0.7 C, 14 W, 4 Cr, 1 V, bal Fe
For tools, taps, drills, high speed steel.

RITA EXTRA TOOL.
M-354; 1 C, bal Fe.
For tools, taps, dies, punches, water hardened.

RITA HIGH SPEED
M-354; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe
For tools, high speed cutters; high speed steel.

RITA HOT-FORGING DIE NO. 1.
M-354; 0.5 C, 3-5 Cr, 1.5 W, bal Fe.
For hot forging dies; hot work steel.

RITA HOT-FORGING DIE NO. 2.
M-354; 0.5 C, 3 W, 0.2 V, bal Fe.
For hot forging dies; hot work steel.

RITA NOCHANGE OIL HARDENING.
M-354; 0.9 C, 1-2 Mn, 0.5 Cr, bal Fe.
For tools, dies, broaches, punches, taps; non-deforming.

RITA OIL HARDENING DRILL ROD.
M-354; 0.9 C, 1.2 Mn, 0.5 Cr, bal Fe.
For tools, drills, dies; non-deforming.

RITA SPECIAL DRILL ROD
M-354; 1.2 C, 0.2 V, bal Fe.
For tools, drills; water hardened.

RITA SPECIAL TOOL.
M-354, 1 C, 0.2 V, bal Fe.
For tools, dies, punches, taps; water hardened.

RITA STANDARD DRILL ROD.
M-354; 1-2 C, bal Fe
For tools, drills, taps, reamers, punches, pins, water hardened.

RITA STANDARD TOOL.
M-354; 1.0 C, bal Fe.
For tools, rock drills, die blocks; water or oil hardened.

RITA T.C.V. ALLOY
M-354, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, cutters, drills; high speed steel.

RITA THREE POINT.
M-354; C, W, Cr, Ni, bal Fe.
For tools, dies; non-deforming.

RITA VANADIUM DRILL ROD
M-354, 1.2 C, 0.5 Cr, 0.2 V, bal Fe.
Oil treated: 230,000 TS; 205,000 YS; 10 El; 40 RA; 444 Brin
For tools, drills, punches, oil or water hardened.

RIVER ACE 60
M-1541; 0.12 C, 0.35 Si, 1.10 Mn, 0.013 P, 0.013 S, 0.06 Cu, 0.20 Ni, 0.10 Mo, 0.26 V, bal Fe
91,900 TS, 78,000 YS; 40 El.
High strength low alloy steel for structural purposes.

RIVER ACE 70
M-1541, 0.12 C, 0.25 Si, 1.04 Mn, 0.016 P, 0.011 S, 0.24 Cu, 0.58 Ni, 0.43 Cr, 0.28 Mo, 0.03 V, 0.0031 B, bal Fe
103,000 TS, 91,900 YS, 22 El
High strength low alloy steel for structural purposes.

RIVER ACE KO
M-1541, 0.14 C, 0.28 Si, 0.85 Mn, 0.011 P, 0.011 S, 0.25 Cu, 0.87 Ni, 0.52 Cr, 0.46 Mo, 0.05 V, 0.0034 B, bal Fe
124,000 TS, 114,000 YS, 25 El
High strength low alloy steel for structural purposes.

RIVERSIDE NO 3
M-98, 18 Ni, 17 Zn, bal Cu
Rolled: 50,000-104,000 TS, 35,000-88,000 YS; 71-190 Brin
For watch cases, jewelry, emblems, nickel silver.

RIVERSIDE NO. 4.
M-98, 18 Ni, 22 Zn, bal Cu
Hard: 112,000 TS.
For springs, keys, fasteners, hardware; corrosion resistant, nickel silver.

RIVERSIDE NO. 6.
M-98, 18 Ni, 10 Zn, bal Cu
Rolled: 50,000-90,000 TS; 32,000-76,000 YS.
For deep drawn or spun parts; nickel silver.

RIVERSIDE NO. 7.
M-98; 18 Ni, 27 Zn, bal Cu.
Rolled: 70,000-123,000 TS; 37,000-83,000 YS.
For springs, bolts, studs; nickel silver.

RIVERSIDE NO. 8.
M-98; 2 Ni, 2 Pb, bal Cu.
Rolled: 250 Brin.
For hardware, marine parts; free-cutting, corrosion resistant.

RIVERSIDE NO. 10.
M-98; 10 Ni, 25 Zn, bal Cu.
Rolled: 50,000-105,000 TS; 33,000-71,000 YS.
For drawn and spun parts; nickel silver.

RIVERSIDE NO. 13.
M-98; 15 Ni, 1 Pb, 19 Zn, bal Cu.
Hard: 86,000 TS; 172 Brin.
For stampings; nickel silver, free-cutting.

RIVERSIDE NO. 16.
M-98; 10 Ni, 2 Pb, 23 Zn, bal Cu.
Hard: 87,000 TS; 176 Brin.
For hardware, marine parts; nickel silver, free-cutting.

RIVERSIDE NO. 20.
M-98; 12 Ni, 2 Pb, 21 Zn, bal Cu.
Hard: 86,000 TS; 222 Brin.
For keys, hardware; nickel silver, free-cutting.

RIVERSIDE 27.
M-98; 70 Cu, 30 Ni.
Soft: 57,000-70,000 TS; B 25-55 Rock.
½ Hard: 66,000-80,000 TS; B 76-85 Rock.
Spring: 84,000-94,000 TS; B 87-91 Rock.
For process machinery parts, heat exchangers, marine hardware.
Corrosion resistant, tough.

RIVERSIDE NO. 30.
M-98; 3.8-5.2 Sn, 0.03-0.05 P, bal Cu.
Soft: 40,000 TS; 56 Brin.
Hard: 87,000 TS; 185 Brin.
For springs, gears, bolts, bushings; P-bronze, corrosion resistant.

RIVERSIDE NO. 31.
M-98; 0 2 P, 4.3 Sn, 1-2 Pb, bal Cu.
Rolled: 50,000-100,000 TS
For gears, pinions, bolts; free machining

RIVERSIDE NO. 32.
M-98; 97.65 Cu, 2 Be, 0.35 Ni.
Heat treated: 65,000-200,000 TS; 0.5-50 El; 350 Brin.
For springs, gears; heat treatable.

RIVERSIDE NO. 39.
M-98; 97 Cu, 3 Sn.
Soft: 46,000 TS; 58 Brin.
Hard: 71,000 TS; 150 Brin.
For springs, pump rods, marine hardware; P-bronze, corrosion resistant.

RIVERSIDE NO. 40.
M-98; 97 Cu, 3 Sn.
Soft: 48,000 TS; 64 Brin.
Hard: 75,000 TS; 159 Brin.
Spring: 94,000 TS; 200 Brin.
For springs, clips; corrosion resistant.

RIVERSIDE NO. 47.
M-98; 7-9 Sn, 0.03-0.25 P, 0.15 Ni, 0.2 Zn, bal Cu.
Soft: 53,000 TS; 79 Brin.
Hard: 100,000 TS; 222 Brin.
For springs, diaphragms, pump parts, hardware, fasteners; P-bronze, corrosion resistant.

RIVERSIDE 61.
M-98; 70 Cu, 30 Zn.
Strip: 76,000 TS; 63,000 YS; 8% El; 156 Brinell.
Wire: 124,000 TS; 4% El.
For cartridge cases, lamp bodies, rivets, eyelets.
High strength and ductility.
Good corrosion resistance.

RIVERSIDE 62.
M-98; 85 Cu, 15 Zn.
Strip: 70,000 TS; 57,000 YS; 5 El; 140 Brinell.
Wire: 88,000 TS; 6 El.
For jewelry, badges, tags, dials, hardware.
High ductility, corrosion resistant.

RIVERSIDE 63.
M-98; 90 Cu, 10 Zn.
Strip: 61,000 TS; 54,000 YS; 5 El; 125 Brinell.
Wire: 74,000 TS; 4 El.
For jewelry, compacts, weather stripping, fasteners, screens.
Highly ductile, excellent cold workability, corrosion resistant.

RIVERSIDE 64.
M-98; 5 Zn, 95 Cu
Hard Strip: 56,000 TS; 50,000 YS; 4 El; 115 Brinell.
Wire: 65,000 TS.
For jewelry, emblems, medals, bullet jackets.
Excellent workability. Corrosion resistant.

RIVERSIDE 66.
M-98, 80 Cu, 20 Zn.
Strip 74,000 TS, 59,000 YS; 7 El; 156 Brinell.
Wire: 107,000 TS; 5 El
For medallions, battery caps clock dials.
Good ductility corrosion resistant.

RIVERSIDE 70
M-98; 87.5 Cu, 12 5 Zn
Strip· 66,000 TS, 56,000 YS; 5 El; 132 Brinell.
Wire: 83,000 TS; 5 El.
For jewelry, compacts, zippers, channels.
Highly ductile, good cold workability; corrosion resistant.

RIVERSIDE 78.
M-98, 92 Cu, 7 Zn, 1 Sn.
For base metal for gold plated electronic components. Plater metal

RIVERSIDE NO. 105.
M-98; 95 Cu, 4 Zn, 1 Sn.
Rolled· 38,000-80,000 TS
For fuse clips, electrical contacts; 38% elec. cond.

RIVERSIDE NO. 108.
M-98, 88 Cu, 10.25 Zn, 1 75 Sn.
Soft 49,000 TS; 62 Brin
½ Hard: 62,000 TS, 127 Brin.
Spring· 93,000 TS; 190 Brin
For conveyor chains, jewelry, novelties; wear and corrosion resistant

RIVERSIDE 109
M-98; 92 Cu, 5 85 Zn, 2 Sn.
For switches, relays, contacts. Good corrosion resistance.

RIVERSIDE 110.
M-98, 87.5 Cu, 10.25 Zn, 2.25 Sn.
For ring traveler wire on textile machines.
High strength wire, corrosion resistant.

RIVERSIDE 111
M-98; 90 Cu, 8.25 Zn, 1.75 Sn.
For electrical contacts, clips, fuses.
High strength and corrosion resistance.

RIVERSIDE NO. 120.
M-98; 1.95 Be, 0.35 Co, bal Cu.
Annealed: 70,000 TS; 53 El; 108 Brin.
Hard: 120,000 TS; 9 El; 250 Brin.
For springs, clips, bearings; corrosion resistant, age-hardenable.

RIVERSIDE NO. 209.
M-98; 10 Sn, 0.05 P, bal Cu.
Soft: 65,000 TS; 83 Brin.
Hard: 91,000 TS, 210 Brin.
For springs, bearings, diaphragms, welding rod; P-bronze, corrosion resistant.

RIVERSIDE NO. 209D.
M-98, 9-11 Sn, 0 03-0.25 P, bal Cu.
Soft: 58,000 TS; 71 Brin.
Hard: 109,000 TS; 250 Brin.
For springs, diaphragms, valves, pump rods; P-bronze, corrosion resistant.

RIVERSIDE NO. 400
M-98; 12 Ni, 21.5 Zn, 1.5 Pb, bal Cu.
For screw machine parts; free cutting.

RIVERSIDE NO. 401.
M-98; 10 Ni, 23.5 Zn, 1.5 Pb, bal Cu.
For screw machine parts; free cutting.

RIVERSIDE NO. 402
M-98, 12 Ni, 23 Zn, bal Cu.
Soft 60,000 TS, 32,000 YS; 73 Brin.
For marine parts, hardware; nickel silver, corrosion resistant

RIVERSIDE NO 403.
M-98, 15 Ni, 20 Zn, bal Cu.
Soft: 60,000 TS; 31,000 YS; 73 Brin.
For marine parts, hardware, nickel silver, corrosion resistant

RIVERSIDE NO. 405.
M-98, 10 Ni, 20 Zn, bal Cu
Soft 54,000 TS, 32,000 YS, 70 Brin.
For fasteners, bolts, marine hardware; nickel silver, corrosion resistant

RIVERSIDE NO 409
M 98, 56.5 Cu, 12 1 Ni, 31 5 Zn.
Hard 90,000 TS, 185 Brin
Spring 122,000 TS; 240 Brin.
For marine hardware, pump parts, cutlery; nickel silver, corrosion resistant

RIVERSIDE NICKEL SILVER NO 7.
M-98, 53 5-56.5 Cu, 16.5-19.5 Ni, 8.5-11.5 Zn.
Soft: 63,000 TS.
Hard: 106,500 TS.
For springs, silverware, cutlery; corrosion resistant.

RIVERSIDE PHOSPHOR BRONZE NO. 30.
M-98; 94 4 min Cu, 3.8-4.8 Sn, 0.05-0.35 P, 0.30 Zn, 0.10 Fe
Soft: 40,000-55,000 TS; 40 El.
Hard: 71,000-88,000 TS; 100 Brin.
For springs and contacts in radio and electrical equipment, ignition systems, worm wheels; resists salt water corrosion.

RIVERSIDE PHOSPHOR BRONZE NO. 47.
M-98, 91 min Cu, 7.5-8.5 Sn, 0 05-0.25 P, 0.20 Zn, 0.10 Fe.
Soft: 53,000-67,000 TS; 70 El.
Hard: 84,000-101,000 TS.
For spring contacts, gun fittings, fuse clips, screw propellers, worm wheels; used where forming and endurance requirements are severe

RIVERSIDE PHOSPHOR BRONZE NO. 209.
M-98; 90 Cu, 10 Sn, trace P.
135,000 TS; 115,000 YS; 1-70 El.
For screw propellers, fittings exposed to sea water, bearings; high resistance to corrosion and fatigue.

RK5.
M-Russia; 0.7 C, 18 W, 4 Cr, 1.2 V, 0.4 Mo, 5 Co, bal Fe.
Hardened: 64-66 Rock C.
For lathe and planer tools, reamers, cut-off tools and drills, broaches, hobs.
High-speed steel, high red-hardness.

RK10.
M-Russia; 0.8 C, 18 W, 4 Cr, 1.5 V, 0.5 Mo, 10 Co, bal Fe.
Hardened: 64-68 Rock C.
For cutters, lathe and planer tools, reamers, hobs, form cutters.
High-speed steel, high red-hardness.

RK15.
M-Russia; 0.8 C, 18 W, 4 Cr, 1 V, 0.6 Mo, 14 Co, bal Fe
Hardened: 64-66 Rock C.
For reamers, broaches, form cutters, lathe and planer tools, hobs, milling cutters.
High-speed steel, high red-hardness

R-M-20.
M-82a, 0 07 max C, 29 Ni, 20 Cr, 2-3 Mo, 4 Cu, bal Fe.
Cast: 65,000-75,000 TS; 28,000-38,000 YS; 50-35 El; 50-40 RA; 120-150 Brin.
For chemical plant equipment, mixers; resists mixed acids, austenitic.

RMI 0.2% Pd
M-1229, 0 08 C, 0 30 Fe 0 05 N, 0 02 Pd, 0.015 H, (sheet), (all values max), bal Ti.
R T., wrought, min: 50,000 TS, 40,000 YS; 22 El
At 800°F, typical 26,000 TS; 15,000 YS, 25 El.
At 1000°F, typical: 19,000 TS; 11,000 YS; 32 El.
For corrosion resistance in chemical industry where media is mildly reducing or varies between oxidizing and reducing.

RMI 1 Al 8V-5Fe
M-1229, 0.05 C, 0.08 N, 0 0125 H (all max values), 0.25-0 50 O, 0 8-1 8 Al, 4 0-6.0 Fe, 7 5-8.5 V, bal Ti
R.T. min. 210,000 TS; 200,000 YS, 6 El; (as heat treated).
For high strength fasteners, Alpha-beta-alloy.

RMI 3 Al-2 5V
M-1229, 0.05 C, 0 02 N, 0 30 Fe, 0 12 O, 0 0125 H, (all max values), 2 5-3 5 Al, 2.0-3 0 V, bal Ti
Cold worked, stress relieved tubing at room temp.: 125,000 TS, 105,000 YS; 10 El.
At 800°F. 55,000 TS, 40,000 YS, 22 El.
For aircraft hydraulic tubing and fittings.
Alpha-beta alloy.

RMI 4 Al-3Mo-1V
M-1229; 0.08 C, 0.25 Fe, 0.05 N, 0.015 H (all max values), 3 75-4 75 Al, 2.3-3.5 Mo, 0 5-1 5 V, bal Ti.
R.T min 125,000 TS; 115,000 YS; 10 El.
At 1000°F: 65,000 TS; 55,000 YS, 35 El.
Plate, sheet, strip; Alpha-beta alloy.
For aircraft uses requiring high strength and elevated temperature stability.

RMI 5Al-2 5 Sn.
M-1229, 0 08 C, 0.50 Fe, 0 05 N, 0.20 O, 0.175 H (billet) (all above values max), 4.0-6.0 Al, 2.0-3.0 Sn, bal Ti.
R T wrought min: 120,000 TS; 115,000 YS; 10 El

At 800°F, typical: 78,000 TS; 59,000 YS; 18 El.
At 1000°F, typical: 67,000 TS; 55,000 YS; 19 El.
For parts, requiring weldability, oxidation resistance, stability and strength at elevated temperatures. Alpha alloy.

RMI 5 Al-2.5 Sn ELI.
M-1229; 0.08 C, 0.15 Fe, 0.05 N, 0.12 O, 0.125 H (bar) (all above values max), 4.7-5.75 Al, 2.0-3.0 Sn, bal Ti.
R.T. Wrought, min: 105,000 TS; 100,000 YS; 10 El.
At −320°F, typical: 180,000 TS; 168,000 YS; 16 El.
At −423°F, typical: 229,000 TS; 206,000 YS; 15 El.
For use in high pressure cryogenic vessels at temperatures below −320°F,; Alpha alloy.

RMI 5Al-6Sn-2Zr, 1Mo-Si.
M-1229; 0.05 C, 0.03 N, 0.30 Fe, 0.15 O, 0 0125 H, (all above max values) 4.5-5.5 Al, 5.0-7.0 Sn, 1.5-2.5 Zr, 0.5-1.0 Mo, 0.15-0.35 Si, bal Ti.
R.T. Wrought: 145,000 TS, 126,000 YS; 12 El.
At 900°F: 102,000 TS; 76,000 YS; 17 El
For use where high creep strength and elevated temperature are required, as in jet engine components; Alpha alloy.

RMI 6Al-2Cb-1Ta-1Mo.
M-1229; 0.05 C, 0 03 N, 0.25 Fe, 0.10 O, 0.0125 H, (all above values max) 5.5-6.5 Al, 1 5-2.5 Cb, 0.5-1.5 Ta, 0.5-1 5 Mo, bal Ti.
R.T Wrought: 115,000-125,000 TS, 105,000-115,000 YS; 10 min El.
At 1000°F, typical: 70,000 TS, 55,000 YS, 15 El.
For parts requiring toughness, strength, weldability and resistance to sea water; Alpha alloy.

RMI 6Al-2Sn-4Zr-2Mo.
M-1229; 0 10 C, 0.05 N, 0.15 O, 0.25 Fe, 0 010 H (all max values), 5.5-6.5 Al, 1 75-2.25 Sn, 3.5-4.5 Zr, 1.75-2.25 Mo, bal Ti.
R.T. min: 130,000 TS; 120,000 YS; 10 El.
At 1000°F· 75,000 TS; 60,000 YS; 25 El
Alpha-beta alloy; good high temperature creep strength; for jet engine components.

RMI 6Al-4V.
M-1229, 0.08 C, 0.25 Fe, 0.05 N, 0 010 H (billet) (all above values max), 5 5-6 75 Al, 3.5-4.5 V, bal Ti.
R T. min: 130,000 TS; 120,000 YS, 10 El.
At 800°F· 90,000 TS, 75,000 YS, 17 El
For compressor blades, discs, rings for jet engines, aircraft components, pressure vessels.
Alpha-beta alloy.

RMI 6Al-4V ELI
M-1229; 0 08 C, 0.13 O, 0 010 H (Billet), 0 15 Fe (all max values), 5 5-6 5 Al, 3 5-4 5 V, bal Ti.
R.T. min: 130,000 TS; 120,000 YS, 10 El.
−320°F: 220,000 TS; 205,000 YS; 14 El.
−423°F: 265,000 TS; 250,000 YS, 6 El
Extra low interstitials permit use for high pressure cryogenic vessels down to −320°F.
Alpha-beta alloy.

RMI 6Al-6V-2Sn.
M-1229; 0.05 C, 0.04 N, 0 125 H (all max values), 5 0-6.0 Al, 5.0-6 0 V, 1 5-2.5 Sn, 0.35-1.0 Fe, 0.35-1.0 Cu, bal Ti
R.T. min· 150,000 TS, 140,000 YS; 8-20 El.
At 600°F· 135,000 TS; 117,000 YS.
For rocket engine cases, ordnance components, aircraft parts; Alpha-beta alloy.

RMI 7Al-4Mo.
M-1229; 0.08 C, 0.25 Fe, 0.05 N, 0 010 H (billet) (all max values), 6 5-7 5 Al, 3.5-4.5 Mo, bal Ti.
R.T. min: 145,000 TS; 135,000 YS; 10 El.
At 1000°F: 105.000 TS: 88.000 YS: 20 El.

RMI 8Al-1Mo-1V.
M-1229; 0 08 C, 0.05 N, 0.0125 H (billet) (all max values), 7.5-8.5 Al, 0.75-1.25 Mo, 0.75-1.25 V, bal Ti.
R.T. min: 135,000 TS; 125,000 YS; 10 El.
At 1000°F: 80,000 TS; 60,000 YS; 20 El.
Alpha-beta alloy; good creep property.
For aircraft and jet engine parts.

RMI 8Mn
M-1229; 0.08 C, 0.05 N, 0.015 H (sheet) (all max values), 6.5-9.0 Mn, bal Ti.
R.T. min: 120,000 TS; 110,000 YS; 10 El.
At 800°F: 87,000 TS; 66,000 YS; 20 El.
Sheet and plate for aircraft skin and structural components, Alpha-beta alloy.

RMI 13V-11Cr-3Al.
M-1229, 0 06 C, 0.05 N, 0 0175 H, 0.35 Fe, (all max values), 12.5-14 5 V, 10-12 Cr, 2.5-4.0 Al, bal Ti
R T. min 130,000 TS; 125,000 YS; 10 El.
At 1000°F: 100,000 TS, 75,000 YS; 35 El
Beta alloy; for high strength aircraft structures.

RMI 30
M-1229; 0.08 C, 0 25 Fe, 0.05 N, 0.010 max H (billet), (all max values), bal Ti.
R T (wrought) min. 40,000 TS; 30,000 YS; 25 El.
800°F (typical)· 20,000 TS; 13,000 YS, 26 El.
Commercially pure titanium, wrought.
For corrosion resistance in the chemical and marine industries, in airframe construction.

RMI 40
M-1229; 0 08, 0 25 Fe, 0 05 N, 0 010 H (billet) (all max values), bal Ti
R T, wrought, min 50,000 TS, 40,000 YS; 22 El.
800°F, typical 26,000 TS; 15,000 YS, 25 El
For corrosion resistance in the chemical and marine industries, in aircraft construction

RMI 55.
M 1229, 0 08 C, 0 25 Fe, 0.05 N, 0 010 H, (billet) (all max values) bal Ti
R T, wrought, min 65,000 TS, 55,000 YS, 20 El
At 800°F, typical. 29,000 TS, 17,000 YS; 18 El
At 1000°F, typical. 22,000 TS; 13,000 YS, 33 El.
For corrosion resistance in the chemical and marine industries and for aircraft construction

RMI 70
M-1229, 0 08 C, 0 40 Fe, 0 05 N, 0 010 H, (billet) (all max values), bal Ti.
R T wrought, min · 80,000 TS; 70,000 YS; 15 El.
At 800°F, typical· 34,000 TS; 21,000 YS, 22 El.
At 1000°F, typical. 27,000 TS, 16,000 YS, 29 El
For corrosion resistance in chemical and marine industries and for aircraft construction.

RMI Ti 38-6-44.
M-1229, 0.05 C, 0 03 N, 3 0-4 0 Al, 7 5-8 5 V, 5 5-6 5 Cr, 3 5 4 5 Mo, 3 5-4 5 Zr, 0 30 Fe, bal Ti.
Betal alloy; for heavy section, high strength forgings for airframe, cold headed rivets, high shear fasteners.

R-MONEL.
M-68; 63-70 Ni, 2.5 max Fe, 2.0 max Mn, 0 15 C, bal Cu
Cold drawn: 80,000-110,000 TS, 50,000-95,000 YS; 35 45 El; 65-50 RA, 145-130 Brin.
Hot rolled. 75,000-95,000 TS; 35,000-65,000 YS; 15-30 El; 210-165 Brin.
For automatic screw machine parts; free machining.

RM SPECIAL SEHR HART.
M-27: 1 5 C 0 65 Cr 7 5 W 0 4 V bal Fe

RNC CARBIMPHY.
M-771; Ni, Cr, bal Fe.
For heating elements, electrical resistances; good to 1100°C.

RNC SUPERIMPHY.
M-771; 80 Ni, 20 Cr.
For heating elements, radiators, electrical resistances; good to 1100°C.

R.N D
M-1175; 0.08 C, 1-1.25 Mn, bal Fe.
Welded: 55,000 TS; 45,000 YS; 33-40 El; 60-80 RA.
For welding rod.

ROBERTS-AUSTEN (PURPLE GOLD).
Eng; 79 Au, 21 Al
For jewelry; corrosion resistant.

ROBINS C.I. 25.
M-460; 3.4 T.C., 0.5 C.C., 2.5 Si, bal Fe.
Cast: 28,000 TS; 170-190 Brin.
For gray iron castings; Tr.S. 2000; Tr. def. 0.25".

ROBINS C.I 35G.
M-460; 3.3 T.C., 0.55 C.C., 2.3 Si, 0.3 Cr, bal Fe.
Cast: 35,000 TS; 190-230 Brin.
For cast iron gears; Tr.S 2200; Tr. def 0.30".

ROBINS C.I 35SG.
M-460, 3.3 T.C., 0.65 C.C., 2.3 Si, 1.1 Ni, bal Fe.
Cast: 35,000 TS; 210-240 Brin.
For cast iron gears, Tr.S. 2300; Tr. def 0.30".

ROBINS C.I. 50.
M-460; 3.1 T.C., 0.65 C.C., 2.4 Si, 0.75 Ni, 0.2 Cr, 0.5 Mo, bal Fe
Cast: 50,000 TS, 230 Brin
Heat treated. 70,000 TS; 270 Brin
For cast iron castings, gears; Tr S. 3000, Tr def. 0.40"

ROBINS COPPER-FREE NI-RESIST.
M 460; 2.5-3.0 T.C., 2.0-2.5 Si, 13.5-14.5 bal Fe.
Cast 25,000 TS, 120-140 Brin
For Tr S 2100, Tr def 0.60".

ROBINS E-5.
M-460, 3.3-3.5 C, 2.0-2.2 Si, 0.55-0.70 Mn, 0.9-1.1 Ni, 0.2-0.3 Mo, 0.1-0.3 Cr, bal Fe.
Cast 35,000 TS; 190-220 Brin
For Al melting pots; cast iron
For extrusions, forgings and pressings; corrosion resistant.

ROBINS HIGH CHROME NI-RESIST.
M-460; 2.5-3.0 T.C., 2.0-2.5 Si, 13.5-14.5 Ni, 5.5-6.5 Cu, 4-6 Cr, bal Fe
Cast 30,000 TS, 160-200 Brin
For stoker gates, flue dampers, Tr S 2400; Tr def 0.45".

ROBINS Ni HARD.
M-460, 3.3-3.6 C, 0.7-1.0 Si, 0.7-1.0 Mn, 4.25-4.75 Ni, 1.25-1.70 Cr, bal Fe.
Cast: 575-650 Brin.
For rolling mill guides, crusher segments, liners, rolls; cast iron.

ROBINS STANDARD NI-RESIST.
M-460; 2.5-3.0 T.C., 2.0-2.5 Si, 13.5-14.5 Ni, 5.5-6.5 Cu, 2-2.5 Cr, 0.9-1.1 Mn, bal Fe
Cast: 25,000 TS; 130-160 Brin.
For castings; non-magnetic; corrosion resistant.

ROBUST.
M-501; 0.5 C, 2.25 W, 1.5 Cr, 0.25 V, bal Fe.
For tools, dies, hot work dies; hot work steel.

ROBUST.
M-617; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, cutters; high speed steel

ROBUST 35.
M-912; 0.32-0.40 C, 1.2-1.5 Si, 1.2-1.5 Cr, 0.05-1.1 V, bal Fe.
For tools, dies; hot work steel.

ROBUST 40.
M-912; 0.4-0.5 C, 0.4-0.6 Mn, 1.2-1.5 Si, 1.2-1.5 Cr, 0.05-1.1 V, bal Fe.
For tools, dies, punches; shock resistant.

ROBUST 50.
M-501; 0.6 C, 1.18 Cr, 0.1 V, 0.8 Si, 0.75 Mn, bal Fe.
For gears, springs, crankshafts, fasteners; oil hardened, shock resistant.

ROBUST M.
M-912; 0.45 C, 1.1 Si, 1.2 Cr, 2.5 W, bal Fe.
For tools, dies; tough.

ROCH 2.
M-501; 0.6 C, 1.18 Cr, 0.1 V, bal Fe.
For bolts, springs, crankshafts; oil hardened, shock resistant.

ROCH 3.
M-501; 0.55 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For punches, crimpers upsetters, dies; oil hardened.

ROCH 4.
M-501; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe
For gears, shafts, bolts, studs, crankshafts; oil hardened, shock resistant.

ROCH 5.
M-501; 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies, punches, shears; oil or air hardened, nondeforming.

ROCH 6
M-501; 0.90 C, 1.9 Mn, 0.1 V, bal Fe
For punches, dies, crimpers, cutters, oil hardened, nondeforming.

ROCH 7
M-501, 0.30 C, W, Cr, V, bal Fe
For extrusion press rams, liners, upsetters; hot work steel, oil hardened.

ROCH 8.
M-501; 0.30 C, 1 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For extrusion rams, upsetters, punches, hot work steel, oil hardened.

ROCHETTE-UMCO50
M-1582, 0.05-0.12 C, 0.18 Ti, 0.6 Cb, 26-30 Cr, 47-52 Co, bal Fe
Wrought: 132,000 TS, 61,000 YS; 7 El, 6 RA; 350 Brin.
For furnace baffles, burner tips, sintering grates, quench baskets
Corrosion, heat, thermal shock resistant.

ROCHLING CEOT.
M-501, 0.45 C, 0.7 Mn, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe
For forging dies, crankshafts, machine tool parts; oil hardened, tough.

ROCHLING DOCo
M-912, M-501, 1.6 C, Cr, Co, Mo, V, bal Fe.
For cutters, forming and blanking dies; air hardened.

ROCHLING D SPEZIAL.
M 501, M-912, 1.25 C, 1.15 Si, 0.7 Mn, 1.2 Cr, bal Fe.
For bearings, sleeves, liners, bushings; water hardened, wear resistant.

ROCHLING ECMo100
M-501, M-912; 0.20 C, 1.15 Cr, 1.25 Mn, bal Fe.
For gears, bolts, machine tool parts; case hardened, tough.

ROCHLING ECN180.
M-501, M-912; 0.18 C, 2 Cr, 2 Ni, 0.5 Mn, bal Fe.
For gears, bolts, crankshafts; case hardened, shock resistant.

ROCHLING ECV150.
M-501, M-912; C, alloy, bal Fe.
For machine tool parts; oil hardened.

ROCHLING ES114.
M-501, M-912; 1.4 C, 0.25 Si, 0.30 Mn, 0.30 Cr, 0.1 V, bal Fe.
For bearings, bushings, cutters; oil hardened, wear resistant.

ROCHLING F1K.
M-501, M-912; 0.42 C, 0.65 Mn, 1.6 Cr, 0.1 V, bal Fe.
For gears, bolts, springs, shafts; oil hardened, shock resistant.

ROCHLING F2K.
M-501, M-912; 0.5 C, 0.95 Mn, 1.05 Cr, 0.1 V, bal Fe.
For springs, gears, bolts, shafts; oil hardened, shock resistant

ROCHLING F2KH.
M-501, M-912; 0.58 C, 1.05 Cr, 0.1 V, 0.95 Mn, bal Fe.
For springs, gears, dies, punches; oil hardened, shock resistant.

ROCHLING F1620.
M-912, M-501, 0.3 C, Cr, V, bal Fe.
For gears, shafts, bolts, fasteners; oil hardened, tough.

ROCHLING HOWG.
M-501, M-912; 0.55 C, 0.18 Mo, 1.65 Ni, 0.70 Cr, bal Fe.
For forging dies, headers, shears, punches; oil hardened, shock resistant.

ROCHLING K.
M-501, M-912, 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For dies, shears, cutters; water hardened, tough.

ROCHLING M10C.
M-501, M-912; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
For gears, bolts, machine tool parts; case hardened.

ROCHLING MC15.
M-912, M-501; 0.16 C, 0.95 Cr, 1.15 Mn, 0.25 Si, bal Fe.
For gears, bolts, camshafts, fasteners; case hardening steel.

ROCHLING MC20.
M-501, M-912, 0.20 C, 1.15 Cr, 1.25 Mn, 0.25 Si, bal Fe.
For gears, cams, camshafts, bolts; case hardening steel.

ROCHLING MFR.
M-501, M-912; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough

ROCHLING MM.
M-501, M-912; 0.50 C, 1.05 Cr, 3.25 Ni, 0.50 Mn, bal Fe.
For gears, bolts, crankshafts, fasteners, studs; oil hardened, shock resistant.

ROCHLING Mo 15.
M-501, M-912; 0.15 C, Cr, Mo, bal Fe.
For gears, cams, machine tool parts; case hardening steel, tough.

ROCHLING Mo 20.
M-501, M-912; 0.20 C, Cr, Mo, bal Fe.
For gears, cams, machine tool parts;

ROCHLING Mo 25.
M-501, M-912; 0.25 C, 1.0 Cr, 0.65 Mn, 0.2 Mo, bal Fe.
For gears, bolts, machine tool parts, shafts; water or oil hardened, tough.

ROCHLING Mo 35.
M-501, M-912; 0.33 C, 0.2 Mo, 0.65 Mn, 1.0 Cr, bal Fe.
For gears, bolts, machine tool parts, shafts; oil hardened, tough.

ROCHLING Mo 40.
M-501, M-912; 0.42 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts, shafts; oil hardened, tough.

ROCHLING Mo 50.
M-501, M-912, 0.50 C, 0.65 Mn, 1.0 Cr, 0.25 Mo, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, tough.

ROCHLING Mo 230.
M-501, M-912; 0.30 C, 2.5 Cr, 0.2 Mo, 0.15 V, bal Fe.
For gears, bolts, crimpers, crankshafts; oil hardened, tough.

ROCHLING Mo 240
M-912 M-501; 0.42 C, Cr, Mo, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

ROCHLING NG5A
M-501, M-912, 0.45 C, 1.35 Cr, 0.45 Mo, 0.8 V, 0.45 W, bal Fe.
For forging and header dies, punches, shears, oil hardened, shock resistant.

ROCHLING NGS
M-501, M-912; 0.30 C, Cr, Mo, Mn, V, bal Fe
For machine tool parts; oil hardened, tough

ROCHLING NGSA
M-501, M-912, 0.45 C, Cr, V, Mo, W, bal Fe.
For forging and beading dies, punches, shears; oil hardened, tough.

ROCHLING NH4.
M-501, M-912; 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe.
Cast: 90,000 TS; 65,000 YS, 2 El; 212 Brin.
For cylinder liners, bushings, valve seats and bodies; corrosion and heat resistant.

ROCHLING NH4G.
M-501, M-912, 0.4 C, 1.3 Si, 27 Cr, bal Fe.
Cast: 70,000 TS; 65,000 YS; 2 El; 190 Brin.
For furnace parts, grate bars, salt pots, skids; heat resistant.

ROCHLING NH8.
M-501, M-912; 0.27 C, 27 Cr, 11 Ni, 1.3 Si, bal Fe.
Cast 75,000 TS; 47,000 YS; 10 El; 25 RA; 205 Brin.
For salt pots, retorts, heat treat boxes, furnace parts; corrosion and heat resistant.

ROCHLING NH11
M-501, M-912; 0.15 C, 2 Si, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302, stainless, austenitic.

ROCHLING NH11G.
M-501, M-912; 0.4 C, 22 Cr, 9.5 Ni, bal Fe.
Cast: 85,000 TS; 45,000 YS; 35 El; 165 Brin.
For heat treat boxes, baskets, burner tips,

ROCHLING NH22.
M-501, M-912; 0.15 C, 2 Si, 24 Cr, 19 Ni, bal Fe.
Cast: 65,000 TS; 28,000 YS; 40 El; 50 RA; 130 Brin.
For furnace parts, heat treat boxes, retorts; Type CK20; corrosion and heat resistant.

ROCHLING NH22G.
M-501, M-912; 0.4 C, 2 Si, 25 Cr, 19 Ni, bal Fe.
Cast: 75,000 TS; 50,000 YS; 17 El; 170 Brin.
For furnace parts, retorts, rabble arms, dampers; Type HK; corrosion and heat resistant.

ROCHLING NH25G.
M-501, M-912; 0.4 C, 26 Cr, 14 Ni, bal Fe.
Cast: 75,000 TS; 47,000 YS; 17 El; 25 RA; 200 Brin.
For heat treat boxes, furnace parts, retorts, salt pots; Type HH; corrosion and heat resistant.

ROCHLING NH40.
M-501, M-912; 0.15 C, Ni, Cr, bal Fe.
For chemical plant equipment; corrosion resistant

ROCHLING NH40G.
M-501, M-912; 0.20 C, 38 Ni, 18 Cr, bal Fe.
For furnace parts, heat treat boxes, retorts, salt pots; corrosion and heat resistant

ROCHLING NH60.
M-501, M-912; 0.15 C, Cr, Ni, bal Fe.
For chemical plant equipment; corrosion resistant.

ROCHLING NH80.
M-501, M-912; 0.15 C, Ni, Cr, bal Fe.
For chemical plant equipment, corrosion resistant.

ROCHLING OCE12.
M-501, M-912, 0.76 C, Ni, bal Fe
For tools, dies.

ROCHLING OCE34
M-501, M-912, 0.79 C, Ni, bal Fe.
For tools, dies.

ROCHLING OCE57.
M-501, M-912, 0.83 C, Ni, bal Fe
For tools, dies.

ROCHLING PG1.
M-501, M-912; 0.35 C, Cr, Mo, V, bal Fe.
For forging and heading dies, punches, crimpers; oil hardened, tough.

ROCHLING PG3.
M-501, M-912; 0.30 C, Cr, Mo, V, bal Fe.
For forging and heading dies, punches, crimpers; oil hardened, tough.

ROCHLING PRIMA-H.
M-501; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers' tools, textile needles, taps; Type W1; water hardened.

ROCHLING PRIMA-MH.
M-501; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 18 El, 38 RA; 210 Brin
For springs, taps, tools, cutters, reamers; Type W1; water hardened.

ROCHLING PRIMA-ZAH.
M-501; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 200,000 TS; 150,000 YS; 10 El, 30 RA; 400 Brin.
For springs, taps, reamers, drills, hobs; Type W1; water hardened.

ROCHLING PRIMA-ZH.
M-501; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 200,000 TS; 150,000 YS; 8 El; 28 RA; 410 Brin.
For springs, taps, reamers, broaches; Type W1; water hardened.

ROCHLING R1.
M-501, M-912; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, bolts, machine tool parts; case hardened.

ROCHLING R2.
M-501, M-912; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed: 73,000 TS; 41,000 YS; 22 El; 58 RA; 160 Brin.
For gears, bolts, machine tool parts; case hardened.

ROCHLING R 2/3.
M-912, M-501; 0.28 C, 0.25 Si, 0.45 Mn, bal Fe.
Hot rolled: 80,000 TS; 50,000 YS; 30 El; 56 RA; 163 Brin.
For gears, bolts, machine tool parts; water hardened.

ROCHLING R3.
M-501, M-912; 0.35 C, 0.25 Si, 0.55 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 185 Brin.
For gears, bolts, machine tool parts; water hardened.

ROCHLING R4.
M-501, M-912; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled. 98,000 TS, 60,000 YS; 24 El; 45 RA; 212 Brin.
For gears, bolts, machine tool parts; water hardened.

ROCHLING R5
M-501, M-912, 0.53 C, 0.25 Si, 0.65 Mn, bal Fe.
Normalized: 100,000 TS; 65,000 YS; 19 El; 26 RA; 220 Brin.
For gears, bodies, machine tool parts; water hardened.

ROCHLING R6.
M-501, M-912; 0.60 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated 160,000 TS; 113,000 YS; 12 El; 40 RA; 325 Brin.
For gears, springs, hammers, rails, punches, water hardened

ROCHLING R 6/7.
M-501, M-912, 0.67 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated. 170,000 TS, 125,000 YS; 10 El; 35 RA; 360 Brin.
For gears, springs, rails, punches, axes; water hardened

ROCHLING R8.
M-501, M-912; 0.80 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated. 188,000 TS, 143,000 YS, 12 El; 35 RA; 390 Brin.
For springs, tools, drills, taps; Type W1; water hardened

ROCHLING RA2.
M-501, M-912; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin
For gears, bolts, machine tool parts; case hardened.

ROCHLING RA2W.
M-501, M-912, 0.10 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed 100,000 TS, 53,000 YS; 21 El; 42 RA; 200 Brin.
For gears, fasteners, machine tool parts; case hardened.

ROCHLING RAB1.
M-501, M-912; 0.40 C, Ni, Cr, Mo, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

ROCHLING RABW.
M-501, M-912; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

ROCHLING RAE2.
M-501, M-912; 0.13 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, camshafts; case hardened, shock resistant.

ROCHLING RAE3B.
M-501, M-912; 0.13 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, camshafts, cams; case hardened, shock resistant.

ROCHLING RAE5.
M-501, M-912; 0.13 C, 0.35 max Si, 0.50 max Mn, 1.1 Cr, 4.5 Ni, bal Fe.
For gears, bolts, camshafts, cams; case hardened, shock resistant.

ROCHLING RB9.
M-501, M-912; 0.55 C, 0.1-0.4 Si, 0.5-0.7 Mn, bal Fe.
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El; 40-54 RA; 231-229 Brin.
For crankshafts, gears, girders, bushings, bolts; water hardened.

ROCHLING RBF.
M-501, M-912; 0.46 C, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For axles, gears, bolts, crankpins; water hardened.

ROCHLING RBH.
M-501, M-912; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 174,000-122,000 TS; 128-000-82,000 YS; 12-22 El; 37-52 RA; 352-241 Brim
For springs, clutch disks, rails, wheels; water hardened.

ROCHLING RCC.
M-501, M-912; 2.1 C, 0.35 Si, 11.5 Cr, bal Fe.
For forming and blanking dies, punches; oil hardened, nondeforming.

ROCHLING RCC EXTRA.
M-912, M-501; 2.1 C, 11.5 Cr, 0.70 W, bal Fe.
For forming and blanking dies, punches; oil hardened, nondeforming.

ROCHLING RCCK.
M-501, M-912; 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For forming and blanking dies, punches; oil hardened, nondeforming.

ROCHLING RCC SPEZIAL.
M-501, M-912, 1.65 C, Cr, Mo, V, bal Fe.
For forming and blanking dies, punches; air hardened, nondeforming.

ROCHLING RCCW.
M-501, M-912; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For forming and blanking dies, punches; air hardened, nondeforming.

ROCHLING RCNH.
M-501, M-912; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

ROCHLING RCW2
M-501, M-912; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion press rams, dies and liners; oil hardened, tough.

ROCHLING RCW3.
M-501, M-912; 0.28 C, W, Cr, Ni, V, bal Fe.
For forging dies, upsetters, crimpers; oil hardened.

ROCHLING RE2.
M-501, M-912; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 55,000 YS; 25 El; 60 RA; 143 Brin.
For screws, bolts, nuts, rivets, gears, shafts; case hardened

ROCHLING RE2C.
M-501, M-912; 0.15 C, 0.65 Cr, 0.37 Mn, bal Fe.
For gears, bolts, camshafts, cams, bushings; case hardened.

ROCHLING RE2CW.
M-501, M-912; 0.13 C, 0.37 Mn, 0.25 Si, 0.50 Cr, bal Fe.
For gears, bolts, camshafts, cams, bushings; case hardened.

ROCHLING RE2W.
M-501, M-912; 0.10 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 64,000 TS; 48,000 YS; 28 El; 65 RA; 131 Brin.
For nails, rivets, case hardened parts, gears; case hardened.

ROCHLING RECN1.
M-501, M-912; 0.15 C, 1.55 Cr, 1.55 Ni, bal Fe.
For camshafts, cams, bolts, bushings; case hardened, tough

ROCHLING RECN2.
M-501, M-912; 0.18 C, 2 Cr, 2 Ni, 0.5 Mn, bal Fe.
For camshafts, cams, bolts, bushings; case hardened, shock resistant.

ROCHLING RECNW.
M-501, M-912, 0.15 C, 1.55 Cr, 1.55 Ni, bal Fe.
For camshafts, cams, bearings; case hardened, shock resistant

ROCHLING REN2
M-501, 0.13 C, Cr, Ni, bal Fe.
For machine tool parts, oil hardened.

ROCHLING RF6
M-501, M-912, 0.56 C, 0.55 Mn, 0.30 Si, bal Fe.
Heat treated 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El, 40-54 RA; 321 229 Brin.
For wheels, die blocks, rails, girders; water hardened.

ROCHLING RFA.
M-501, M-912; 0.55 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, punches; oil hardened, tough.

ROCHLING RFAW
M-501, M-912; 0.46 C, 1.7 Si, 0.65 Mn, bal Fe
For springs, punches; oil hardened, tough.

ROCHLING RFF.
M-501, M-912, 0.55 C, 1.7 Si, 0.7 Mn, bal Fe
For springs, punches; oil hardened, tough

ROCHLING RFFH.
M-501, M-912; 0.65 C, 1.7 Si, 0.7 Mn, bal Fe.
For springs, punches, oil hardened, tough

ROCHLING RFFW
M-501, M-912; 0.46 C, 1.7 Si, 0.65 Mn, bal Fe
For springs, punches; oil hardened.

ROCHLING RG6
M-501, M-912, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 174,000-122,000 TS; 128,000-82,000 YS, 12-22 El; 37-52 RA; 352-241 Brin.
For springs, clutch disks, die blocks, rails; water hardened; Type W1.

ROCHLING RG7
M-501, M-912; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 188,000-129,000 TS; 143,000-87,000 YS; 12-21 El; 35-50 RA; 388-255 Brin.
For drills, springs, reamers, taps, broaches; water hardened

ROCHLING RG8.
M-501, M-912; 0.88 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000-130,000 TS; 145,000-88,000 YS; 12-20 El; 35-50 RA; 390-260 Brin.
For drills, springs, reamers, taps, broaches, cutters; Type W1; water hardened.

ROCHLING RG10.
M-501, M-912, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 185,000-130,000 TS; 120,000-80,000 YS; 10-21 El; 30-47 RA; 375-270 Brin.
For cutters, taps, springs, drills, reamers; Type W1; water hardened.

ROCHLING RG11.
M-501, M-912, 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS, 55,000 YS, 18 El; 38 RA; 210 Brin
For springs, taps, reamers, drills, broaches; Type W1; water hardened.

ROCHLING RG12.
M-501, M-912; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For forming and blanking dies, engravers tools; Type W1, water hardened.

ROCHLING RGS1.
M-501, M-912, 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe
For header dies, rivet sets, upsetters; oil hardened, tough

ROCHLING RGS2
M-501, M-912; 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, bal Fe.
For forging dies, gears, bolts, punches; oil hardened, shock resistant.

ROCHLING RGS4
M-501, M-912, 0.56 C, 1.85 Ni, 0.1 V, 0.2 Mo, 0.8 Cr, bal Fe
For forging and header dies, punches, upsetters, shears; oil hardened, tough.

ROCHLING RH15
M-501, M-912, 1.2 C, 12.5 Mn, 0.4 Si, bal Fe.
For wear plates, rails, frogs, dipper teeth; wear and abrasion resistant.

ROCHLING RHB9
M-501, M-912, 0.55 C, 0.1-0.4 Si, 0.5-0.7 Mn, bal Fe.
Annealed 100,000 TS; 55,000 YS; 15 El, 22 RA; 180 Brin
For crankshafts, bolts, gears, crankpins; water hardened.

ROCHLING RKMV.
M-501, M-912, 1.0 C, 0.2 Si, 0.25 Mn, 0.10 V, bal Fe.
Heat treated 184,000-130,000 TS; 118,000-80,000 YS; 10-20 El; 30-45 RA; 375-270 Brin
For drills, springs, taps, broaches, reamers; Type W1; water hardened

ROCHLING RLB.
M-501, M-912; 0.15 C, 0.35 Si, 0.35 Mn, bal Fe.
Annealed: 70,000 TS; 55,000 YS; 25 El; 60 RA; 145 Brin.
For screws, bolts, gears, rivets, bushings; case hardened.

ROCHLING RM2.
M-501, M-912; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed: 75,000 TS; 63,000 YS; 22 El; 58 RA; 150 Brin.
For fan blades, bushings, bolts, gears, case hardened.

ROCHLING RM2/3.
M-501, M-912; 0.28 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 30 El; 56 RA; 165 Brin.
For camshafts, gears, bolts, keys, brackets; water hardened.

ROCHLING RM3.
M-501, M-912; 0.35 C, 0.25 Si, 0.55 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS, 30 El; 53 RA; 185 Brin
For gears, shafts, axles, bolts, fishplates; water hardened.

ROCHLING RM4.
M-501, M-912; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 98,000 TS; 60,000 YS, 24 El, 45 RA; 215 Brin
For axles, gears, bolts, bushings, tie rods; water hardened

ROCHLING RM5
M-501, M-912, 0.53 C, 0.25 Si, 0.65 Mn, bal Fe.
Annealed: 96,000 TS; 52,000 YS; 16 El; 23 RA; 170 Brin
For axles, bolts, gears, shafts; water hardened

ROCHLING RM6
M-501, M-912, 0.61 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated 160,000-115,000 TS, 113,000-77,000 YS; 12-23 El; 40-54 RA, 320-230 Brin.
For wheels, die blocks, girders, rails, springs, water hardened.

ROCHLING RM6/7
M-501, M-912, 0.80 C, 0.25 Si, 0.65 Mn, bal Fe
Heat treated. 188,000-130,000 TS; 143,000-87,000 YS, 12-21 El, 35-50 RA; 388-255 Brin
For springs, taps, drills, reamers, cutters, Type W1; water hardened.

ROCHLING RNO
M-501, M-912, 0.2 C, 0.4 Si, 12-14 Cr, bal Fe
Annealed: 95,000 TS, 50,000 YS; 25 El; 55 RA; 196 Brin.
For turbine blades, valves, cutlery, Type 420; stainless

ROCHLING RNO18.
M-501, M-912, 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed 125,000 TS, 95,000 YS; 20 El, 55 RA; 260 Brin.
For welded chemical plant equipment, Type 430 Ti; corrosion resistant

ROCHLING RNO25.
M-912, 0.15 max C, Cr, 2.5 Mo, 1.8 Ti, bal Fe.
For chemical plant equipment; corrosion and heat resistant.

ROCHLING RNO30EG
M-501, M-912; 1.2 C, 1.3 Si, 29 Cr, 2 Mo, bal Fe.
For crushers, rollers, baffles; heat and abrasion resistant.

ROCHLING RNO30G.
M-501, M-912; 1.2 C, 1.3 Si, 29 Cr, bal Fe
For crushers, rollers, baffles; heat and abrasion resistant.

ROCHLING RNOA17.
M-501, M-912; 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For screw machine products, bolts, screws; Type 430 F; corrosion resistant.

ROCHLING RNOB.
M-501, M-912; 0.8 C, 14 Cr, bal Fe.
For bearings, pivots, cutlery; corrosion and wear resistant.

ROCHLING RNOC.
M-501, M-912; 0.90 C, 18 Cr, 0.1 V, 1.2 Mo, bal Fe.
For bearings, cutlery, valves; corrosion and wear resistant.

ROCHLING-RNOD.
M-912; 0.16 C, 0.25 Cb, 11 Cr, 0.7 Mo, 0.6 Ni, 0.3 V, bal Fe
Annealed: 80,000 TS; 40,000 YS; 24 El; B 94 Rock.
Hardened: 200,000 TS; 175,000 YS; 13 El; C 46 Rock.
For gears, shafts, cutlery, surgical instruments, valves. Corrosion resistant, hardenable.

ROCHLING RNOF.
M-501, M-912; 0.30 C, 12-14 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El, 55 RA; 200 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; corrosion resistant.

ROCHLING RNOG.
M-501, M-912; 0.25 C, 0.7 Si, 14.5 Cr, 1.0 max Ni, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 55 RA; 200 Brin.
For valves, cutlery, surgical and dental instruments; corrosion resistant.

ROCHLING RNOH
M-501, M-912; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 55 RA; 200 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; corrosion resistant.

ROCHLING RNOM.
M-501, M-912; 0.17 C, Cr, Mo, bal Fe
For gears, pinions, camshafts, cams; case hardened.

ROCHLING-RNOMO.
M-501; 0.15 C, 13 Cr, 1.2 Mo, 1 Ni, bal Fe.
Annealed. 80,000 TS; 40,000 YS; 25 El; B 92 Rock.
For springs, table flatware, chemical plant and oil refinery equipment.
Corrosion resistant.

ROCHLING-RNOMO.
M-912; 0.22 C, 12.5 Cr, 1.1 Mo, bal Fe.
Annealed: 90,000 TS; 38,000 YS; 25 El; B 92 Rock.
Hardened: 240,000 TS; 205,000 YS; 9 El; C 50 Rock.
For valves, cutlery, bearings, surgical instruments.
Corrosion resistant, hardenable.

ROCHLING-RNOMOV.
M-912; 0.22 C, 11.5 Cr, 1 Mo, 0.5 Ni, 0.3 V, bal Fe.
Annealed: 85,000 TS, 40,000 YS; 25 El; B 92 Rock.
Heat Treated: 240,000 TS; 205,000 YS; 10 El; C 50 Rock.
For surgical instruments, cutlery, valves, bearings, shafts. Corrosion resistant, hardenable.

ROCHLING-RNOMOWV.
M-912; 0.22 C, 11.5 Cr, 1 Mo, 0.8 Ni, 0.3 V, 0.5 W, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 25 El; B 92 Rock.
Heat Treated: 240,000 TS; 205,000 YS; 10 El; C 48 Rock.
For valves, bearings, cutlery, knives, surgical instruments.
Corrosion resistant, hardenable.

ROCHLING RNOS.
M-501, M-912; 0.22 C, 17 Cr, 1.5 Ni, 0.4 Si, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431; corrosion and heat resistant.

ROCHLING RNOSG.
M-501, M-912; 0.25 C, 0.7 Si, 17 Cr, 1.8 max Ni, bal Fe.
Cast: 85,000 TS; 50,000 YS; 5 El; 10 RA; 200 Brin.
For furnace parts, heat treating boxes; corrosion resistant.

ROCHLING RNO SPEZIAL G.
M-501, M-912; 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
Cast: 90,000 TS; 65,000 YS; 2 El; 212 Brin.
For cylinder liners, bushings, valve seats and bodies; corrosion and heat resistant.

ROCHLING RNOT
M-501, M-912, 0.17 C, Cr, Ni, bal Fe
For chemical plant equipment; stainless.

ROCHLING RNOW.
M-501, M-912, 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS, 40,000 YS, 35 El, 70 RA; 155 Brin
For turbine blades, valves, cutlery; Type 410; corrosion resistant.

ROCHLING RNOW-W.
M-501, M-912; 0.12 max C, 14-18 Cr, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El, 50 RA; 150 Brin.
For oil refinery equipment, sinks, oil burners, Type 430, corrosion resistant.

ROCHLING RNOX.
M-501, M-912; 0.35 C, 16.5 Cr, 1.15 Mo, bal Fe.
For furnace parts, oil refinery equipment; heat and corrosion resistant.

ROCHLING ROT 40.
M-501, M-912; 0.28 C, 1 Cr, 1 Ni, 0.2 Mo, bal Fe.
For oil refinery equipment, corrosion and heat resistant

ROCHLING ROT 60.
M-501, M-912; 0.34 C, 1.55 Cr, 1.55 Ni, 0.2 Mo, bal Fe
For oil refinery equipment, valves, corrosion and creep resistant.

ROCHLING RPDW.
M-501, M-912; 0.33 C, 1.0 Cr, 0.65 Mn, 0.2 Mo, bal Fe.
For gears, bolts, oil refinery equipment; heat and creep resistant.

ROCHLING RPDZ.
M-501, M-912, 0.41 C, 1.0 Cr, 0.65 Mn, bal Fe.
For gears, bolts, shafts; oil hardened, tough.

ROCHLING RPDZW.
M-501, M-912; 0.41 C, 0.65 Mn, 1.0 Cr, bal Fe.
For gears, bolts, shafts; oil hardened, tough.

ROCHLING RR3.
M-501, M-912; 0.35 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 180 Brin.
For gears, shafts, axles, bolts, screws; water hardened.

ROCHLING RR4.
M-501, M-912; 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 98,000 TS; 58,000 YS; 24 El; 45 RA; 212 Brin.
For axles, gears, bolts, crankshafts; water hardened.

ROCHLING RR5.
M-501, M-912; 0.55 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe
Heat treated: 160,000 TS; 115,000 YS; 12 El; 40 RA; 320 Brin
For axles, die blocks, rails, crankpins, water hardened.

ROCHLING RR6.
M-501, M-912, 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Heat treated· 170,000 TS; 120,000 YS, 10 El, 35 RA, 350 Brin
For axles, die blocks, rails, crankshafts; water hardened.

ROCHLING RR7.
M-501, M-912, 0.75 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe
Heat treated· 180,000 TS, 140,000 YS, 15 El; 40 RA; 375 Brin
For springs, clutch discs, rails, girders; water hardened

ROCHLING RR8.
M-501, M-912; 0.90 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated· 185,000 TS; 120,000 YS; 10 El. 30 RA; 380 Brin
For springs, taps, reamers, drills, cutters; Type W1, water hardened

ROCHLING RSH
M-501, M-912, 1.05 C, 1.0 Cr, 0.30 Mn, bal Fe.
For bearings, bushings, liners, water hardened, wear resistant.

ROCHLING RT6 EXTRA
M-501, M-912, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated 175,000 TS, 128,000 YS, 12 El; 37 RA, 350 Brin
For wheels, die blocks, rails, girders, springs, water hardened.

ROCHLING RT7 EXTRA.
M-501, M-912, 0.75 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated· 175,000 TS, 128,000 YS, 12 El; 37 RA; 350 Brin.
For springs, die blocks, rails, girders; water hardened.

ROCHLING RT8 EXTRA.
M-501, M-912; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 190,000 TS, 145,000 YS; 12 El; 35 RA; 390 Brin.
For reamers, drills, springs, taps; water hardened.

ROCHLING RT9.
M-501, M-912, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 190,000 TS, 145,000 YS, 12 El; 35 RA; 390 Brin.
For reamers, drills, springs, taps, broaches; water hardened.

ROCHLING RT10EE.
M-501, M-912; 1.0 C, 0.25 Si, 0.30 Mn, 0.1 V, bal Fe.
Heat treated: 190,000 TS; 120,000 YS; 10 El; 30 RA; 400 Brin.
For springs, drills, taps, reamers, cutters; water hardened; Type W1

ROCHLING RT10 EXTRA.
M-501, M-912; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 120,000 YS; 10 El; 30 RA, 400 Brin.
For springs, drills, taps, reamers, cutters; Type W1; water hardened.

ROCHLING RT11 Cr.
M-501, M-912; 1.1 C, 0.40 Cr, 0.20 Si, 0.30 Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS, 21 El; 42 RA; 200 Brin.
For springs, drills, taps, cutters; water hardened; Type W1.

ROCHLING RT11 EXTRA
M-501, M-912; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, drills, reamers, cutters, taps; water hardened; Type W1.

ROCHLING RT12 EXTRA.
M-501, M-912; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe
For blanking and forming dies, reamers, taps, water hardened; Type W1.

ROCHLING RT14 Cr
M-501, M-912, 1.4 C, 0.30 Cr, 0.1 V, bal Fe.
For blanking and forming dies, reamers, taps; Type W1; water hardened.

ROCHLING RT14 EXTRA
M-501, M-912, 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe
For blanking and forming dies, Type W1; water hardened

ROCHLING RTC14
M-501, M-912, 1.05 C, 1.15 Cr, bal Fe.
For bearings, cutters, liners; water or oil hardened, wear resistant.

ROCHLING RTC20
M-501, M-912; 0.85 C, 1.75 Cr, 0.35 Mn, bal Fe.
Annealed 110,000 TS, 60,000 YS, 15 El, 30 RA; 200 Brin
For forming dies, cutters, bearings; oil hardened, abrasion resistant

ROCHLING RT EXTRA
M-501, M-912, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed 100,000 TS; 53,000 YS; 21 El; 42 RA, 200 Brin
For springs, taps, reamers, hobs, drills, cutters; Type W1, water hardened

ROCHLING RTK10.
M-501, M-912, 0.90 C, 0.80 Cr, 0.30 Mn, bal Fe
Heat treated 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin
For bearings, liners, sleeves, cutters; oil or water hardened, wear resistant.

ROCHLING RTS.
M-501, M-912, 1.15 C, 0.65 Cr, 0.10 V, bal Fe.
For heading and blanking dies, cutters; oil hardened, wear resistant.

ROCHLING RTW1.
M-501, M-912; 1.2 C, 0.20 Cr, 1.0 W, 0.10 V, bal Fe.
For heading and blanking dies, punches, oil hardened, tough.

ROCHLING RTW2.
M-501, M-912; 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, 0.9 Si, bal Fe.
For heading and blanking dies, cold work tools; oil hardened, tough

ROCHLING RTW3.
M-501, M-912; 1.3 C, 4.75 W, 0.20 max Cr, bal Fe.
For forming and drawing dies, reamers; water hardened, tough.

ROCHLING RTWK.
M-501, M-912; 0.55 C, 1.05 Cr, 0.18 V, 1.85 W, 0.9 Si, bal Fe.
For heading and blanking dies, cold work tools; oil hardened, tough.

ROCHLING RUS.
M-501, M-912; 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, forming and blanking dies; oil hardened, non-deforming.

ROCHLING RUS4.
M-501, M-912; 1.05 C, 0.9 Mn, 1.0 Cr, 1.15 W, bal Fe.
For header and blanking dies, form rolls; oil hardened, tough.

ROCHLING RVE.
M-501, M-912; 0.45 C, Cr, Si, bal Fe.
For bolts, gears, machine tool parts; oil hardened, tough.

ROCHLING RVE42.
M-501, M-912; 0.45 C, Cr, Ni, W, bal Fe.
For forging and heading dies, shears; oil hardened, tough.

ROCHLING RVE EXTRA.
M-501, M-912; 0.55 C, Cr, Ni, W, bal Fe.
For forging and heading dies, shears; oil hardened, tough.

ROCHLING RW2.
M-501, M-912, 1.05 C, 1.0 Cr, 0.3 Mn, bal Fe.
For bearings, cutters, liners, sleeves; water hardened, wear resistant.

ROCHLING RW3.
M-501, M-912; 1.0 C, 1.1 Cr, 0.07 Mn, bal Fe.
For bearings, cutters, liners, sleeves; water hardened, wear resistant.

ROCHLING RW3A.
M-501, M-912; 1.0 C, 1.1 Cr, 0.07 Mn, bal Fe.
For bearings, cutters, liners, sleeves; water hardened, wear resistant

ROCHLING RWA.
M-501, M-912; 0.30 C, 0.6 V, 4.25 W, 2.35 Cr, 0.3 Mn, bal Fe.
For extrusion rams, liners, punches, pneumatic tools; oil hardened, shock resistant.

ROCHLING RWS2.
M-501, M-912; 0.30 C, 0.18 V, 1.1 Cr, 3.75 W, bal Fe.
For header dies, shears, punches; oil hardened, tough.

ROCHLING RZF.
M-501, M-912; 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For punches, springs, chisels; oil hardened, shock resistant.

ROCHLING SGM.
M-501, M-912; 0.20 C, 13 Cr, 0.4 Mn, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, valves, cutlery; Type 420; stainless.

ROCHLING SGM2.
M-501, M-912; 0.30 C, 2.0 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For hot work tools, punches, upsetters; hot work

ROCHLING SGM4.
M-501, M-912; 0.28 C, W, Co, Cr, Mo, bal Fe.
For upsetters, punches, die casting, dies; oil hardened, tough.

ROCHLINGSTAHL 30.
M-501; 0.34 C, 1.4 Cr, 1.1 Al, 0.6 Mn, bal Fe.
For oil refinery parts; creep and heat resistant.

ROCHLINGSTAHL 32.
M-501; 0.5 C, 3.25 Ni, 1.05 Cr, 0.5 Mn, bal Fe.
For gears, bolts, crankshafts, machine tool parts; oil hardened, shock resistant.

ROCHLINGSTAHL 34.
M-501; 0.9 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, shears, form tools, upsetters; oil hardening, nondeforming.

ROCHLINGSTAHL BP21.
M-501; 0.15 C, 0.15-0.35 Si, 0.25-0.50 Mn, bal Fe.
For gears, fasteners, shafts, machine tool parts; case hardening steel.

ROCHLINGSTAHL BP22.
M-501; 0.15 C, 0.25 Si, 0.5 Mn, 0.65 Cr, bal Fe.
For gears, fasteners, machine tool parts; case hardening steel.

ROCHLINGSTAHL BP24.
M-501; 0.19 C, 1.25 Cr, 0.2 Mo, 3.75 Ni, bal Fe.
For gears, bolts, crankshafts, machine tool parts; case hardening steel, shock resistant.

ROCHLINGSTAHL BP25.
M-501, 0.20 C, 1.15 Cr, 1.25 Mn, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel, tough.

ROCHLINGSTAHL BP28
M-501; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel, tough

ROCHLINGSTAHL BP29
M-501, 0.55 C, 0.18 Mo, 0.7 Cr, 0.1 V, 1.65 Ni, bal Fe
For gears, bolts, crankshafts, oil hardened, shock resistant.

ROCHLINGSTAHL BP29 EXTRA
M 501; 0.56 C, 1.8 Ni, 0.8 Cr, 0.2 Mo, bal Fe
For gears, bolts, crankshafts, machine tool parts; oil hardened, shock resistant.

ROCHLINGSTAHL B S 2
M-912, 0.75-0.83 C, 0.5-0.7 Mn, 0.25-0.40 Si, bal Fe
For punches, springs, tools; water hardening.

ROCHLINGSTAHL CEOT.
M-912, 0.38-0.45 C, 0.9 Mn, 1.7 Cr, 0.8 Mo, 0.35 V, bal Fe.
For tools, dies, hot work steel

ROCHLINGSTAHL D SPECIAL.
M-912, 0.96-1.0 C, 1.9-2.1 Cr, bal Fe.
For tools, dies, bearings, oil hardening.

ROCHLINGSTAHL ES
M-912, 1.3-1.5 C, 0.3 Mn, 0.5-0.8 Cr, bal Fe.
For tools, dies, drills; water hardening.

ROCHLINGSTAHL FVC.
M-912; C, Cr, V, Mn, bal Fe.
For gears, bolts, crankshafts, oil hardened.

ROCHLINGSTAHL FVM45.
M-912, 0.42 C, 0.25 Si, 1.75 Mn, 0.1 V, bal Fe.
For springs, punches, crimpers, upsetters; oil hardened, tough.

ROCHLINGSTAHL MFR.
M-912; 0.42-0.5 C, 0.8-1.1 Mn, 0.8-1.1 Cr, 0.25-0.4 Mo, bal Fe

ROCHLINGSTAHL NGS.
M-912; 0.25-0.33 C, 0.9 Mn, 1.8 Cr, 1 Mo, 0.6 V, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL NGSA.
M-912; 0.4-0.5 C, 1.2-1.5 Cr, 0.5 W, 0.5 Mo, 0.85 V, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL PG3.
M-912; 0.27 C, 2.9 Cr, 2.5 Mo, 0.4 V, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL PWD.
M-912; 0.23-0.28 C, 0.35-0.5 Cr, 4-4.5 Ni, 1.15-1.25 Mo, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL PWD6.
M-912; 0.24-0.32 C, 0.6-0.9 Cr, 2.2-2.5 Ni, 0.6 Mo, 0.3 V, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL PWD13.
M-912; 0.22-0.30 C, 0.6-0.9 Cr, 1.2-1.5 Ni, 0.2-0.4 Mo, 0.2 V, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL PWDN.
M-912; 0.25-0.32 C, 0.6-0.8 Cr, 4.5 Ni, 3.8-4.3 W, 0.65-0.85 Mo, bal Fe.
For tools, dies, hot work steel.

ROCHLINGSTAHL RAB1.
M-912; 0.35-0.38 C, 1.4 Cr, 4.5 Ni, bal Fe
For tools, dies, gears, shafts; shock resistant.

ROCHLINGSTAHL RABW.
M-912, 0.42-0.50 C, 1.4 Cr, 3.5 Ni, bal Fe.
For tools, dies, gears, shafts; oil hardening.

ROCHLINGSTAHL RAN.
M-912, 0.4-0.5 C, 0.5-0.8 Mn, 1.2-1.5 Cr, 1.1-1.4 Ni, bal Fe
For tools, dies; hot work steel.

ROCHLINGSTAHL RB7.
M-912; 0.68-0.75 C, 0.20-0.35 Mn, 0.1-0.2 Si, bal Fe.
For springs, tools; water hardening.

ROCHLINGSTAHL RCC.
M-912, 1.8-2.1 C, 12-13 Cr, bal Fe.
For tools, dies, punches; non-deforming

ROCHLINGSTAHL RCNW.
M-912, 0.33-0.38 C, 1.4 Cr, 4-4.5 Ni, 0.9-1.1 W, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL RCW2.
M-912; 0.24-0.30 C, 2.2-2.8 Cr, 9-10 W, bal Fe.
For tools, dies, hot work steel.

ROCHLINGSTAHL RGS4.
M-912, 0.53-0.60 C, 0.7 Cr, 1.75-2.0 Ni, 0.8 Mo, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL RKMV.
M-912; 0.95-1.0 C, bal Fe.
For tools, dies, taps, drills, water hardening

ROCHLINGSTAHL RLB.
M-912; 0.11-0.18 C, 0.25-0.40 Mn, 0.2-0.3 Si, bal Fe.
For gears, pinions, shafts; case hardening.

ROCHLINGSTAHL R R.7.
M-912; 0.7-0.8 C, 0.6-0.8 Mn, 0.3 Si, bal Fe.
For punches, springs, tools; water hardening,

ROCHLINGSTAHL RSH.
M-912; 1.0-1.1 C, 0.8-1.0 Cr, bal Fe.
For tools, dies, bearings; water or oil hardening

ROCHLINGSTAHL RSV.
M-912; 0.78-0.85 C, 4.5 Cr, 12.5 W, 8 Mo, 1.9 V, bal Fe.
For tools, dies, cutters; high speed steel.

ROCHLINGSTAHL RSZ.
M-912; 0.72-0.80 C, 4.5 Cr, 11.5 W, 0.5 Mo, 0.8-1.0 V, bal Fe.
For tools, dies, cutters; high speed steel.

ROCHLINGSTAHL RSZ SPECIAL.
M-912; 0.75-0.83 C, 4.5 Cr, 10.5-11.5 W, 0.7 Mo, 1.4 V, bal Fe.
For tools, dies, cutters; high speed steel.

ROCHLINGSTAHL RT7.
M-912; 0.7-0.8 C, 0.22-0.32 Mn, 0.08-0.15 Si, bal Fe.
For tools, springs, punches; water hardening.

ROCHLINGSTAHL RT7 Cr.
M-912; 0.7-0.79 C, 0.45-0.55 Cr, bal Fe.
For tools, dies, punches; water hardening.

ROCHLINGSTAHL RT11.
M-912; 1.05-1.15 C, 0.15-0.25 Mn, 0.20 Si, bal Fe.
For tools, drills, taps; water hardening.

ROCHLINGSTAHL RT11 Cr.
M-912; 1.0-1.1 C, 0.2-0.4 Cr, bal Fe.
For tools, dies, water hardening.

ROCHLINGSTAHL RT14 Cr.
M-912; 1.35-1.45 C, 0.4-0.6 Cr, bal Fe.
For tools, dies; oil hardening.

ROCHLINGSTAHL RTC14.
M-912, 0.95-1.05 C, 0.6-0.8 Mn, 0.75-0.95 Cr, bal Fe
For tools, dies, bearings; water or oil hardening.

ROCHLINGSTAHL RTC14 Mo.
M-912; 1.1-1.2 C, 1.15-1.30 Cr, 0.2-0.3 Mo, bal Fe.
For tools, dies, bearings, oil or water hardening.

ROCHLINGSTAHL RTC20.
M-912, 0.88-0.95 C, 2 Cr, bal Fe.
For tools, dies; oil hardening

ROCHLINGSTAHL RTK10.
M-912; 1-1.1 C, 1-1.25 Cr, bal Fe.
For tools, dies; oil hardening.

ROCHLINGSTAHL RTS.
M-912, 1.1-1.2 C, 0.5-0.8 Cr, 0.07-0.12 V, bal Fe.
For tools, dies, reamers, drills, water hardening

ROCHLINGSTAHL RTW1.
M-912, 1.2 C, 0.2 Cr, 1.2 W, bal Fe.
For tools, dies; oil hardening.

ROCHLINGSTAHL RTW2.
M-912; 0.33-0.4 C, 1 Si, 1.1 Cr, 2.6-3.0 W, bal Fe.
For tools, dies; tough.

ROCHLINGSTAHL RTW3 SPECIAL.
M-912, 1.3-1.4 C, 0.7 Cr, 4.6-5.0 W, bal Fe.
For tools, dies, cutters, oil hardening.

ROCHLINGSTAHL RTWK.
M-912; 0.60-0.65 C, 1-1.5 Cr, 2.5 W, 0.2 V, bal Fe.
For tools, dies; shock resistant.

ROCHLINGSTAHL RUS.
M-912; 0.85-0.95 C, 1.7-1.9 Mn, 0.2 Cr, 0.2 V, bal Fe.
For tools, dies, cutters, punches; oil hardening, non-deforming.

ROCHLINGSTAHL RUS2.
M-912; 1.0-1.1 C, 0.9-1.1 Cr, 1.2-1.4 Si, bal Fe.
For tools, dies, chisels, hammers; tough, shock resistant.

ROCHLINGSTAHL RUS4.
M-912; 0.95-1.1 C, 1.4-1.6 Cr, 0.9-1.1 W, bal Fe.
For tools, dies; oil hardening

ROCHLINGSTAHL RWA.
M-912; 0.25-0.35 C, 2.2-2.5 Cr, 4-4.5 W, 0.6 V, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL RWM.
M-912; 0.5-0.58 C, 0.5 Si, 0.5 Mn, bal Fe.
For tools, dies; for hot work.

ROCHLINGSTAHL RWS.
M-912; 0.33-0.36 C, 3.4 Cr, 2.8 W, 0.3 V, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL RWS2.
M-912; 0.24-0.28 C, 1.2 Cr, 4.5 W, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL RWS4.
M-912; 0.32-0.38 C, 0.9 Si, 1.5 Cr, 4.5 W, 0.5 Mo, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL S.
M-912; 0.25-1.35 C, 0.3 Mn, 0.15 Si, bal Fe.
For tools, jigs. fixtures; water hardening.

ROCHLINGSTAHL SGM2.
M-912; 0.31-0.35 C, 2.2-2.8 Cr, 8 W, 0.5 V, 2.5 Co, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL SGM4.
M-912; 0.24-0.30 C, 1.3-1.6 Cr, 5 W, 0 7 Mo, 5 Co, 1.5 Cu, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL SKSV.
M-912; 0.65-0.73 C, 0.6 W, 0.15 V, bal Fe.
For tools, dies, punches, crimpers; tough.

ROCHLINGSTAHL T76.
M-912; 1.45-1.55 C, 0.6-0.8 Cr, 7-9 W, 0 4 V, bal Fe.
For tools, dies, cutters; oil hardening.

ROCHLINGSTAHL WNC
M-912; 0.35-0.40 C, 1.3-1.5 Cr, 3.2-3.6 Ni, 5.5 W, bal Fe.
For tools, dies; hot work steel.

ROCHLINGSTAHL WWS.
M-912; 0.50-0.57 C, 0.8-1.0 Mn, 0.8-1.0 Si, bal Fe
For tools, dies; hot work steel.

ROCHLINGSTAHL ZK.
M-912; 1.6 C, 2 Cr, bal Fe.
For tools, dies; oil hardening.

ROCHLING VC140.
M-501, M-912; 0.41 C, 1.1 Cr, 0.70 Mn, 0.25 Si, bal Fe.
For gears, bolts, shafts, axles; oil hardened, tough.

ROCHLING VC170.
M-501, M-912; 0.36 C, 1.6 Cr, 0.45 Mn, 0.25 Si, bal Fe.
For gears, bolts, shafts, axles; oil hardened, tough.

ROCHLING VM80.
M-501, M-912; 0 20 C, 0.95 Mn, 0.38 Si, bal Fe.
For gears, bolts, camshafts, cams; case hardened.

ROCHLING VM90.
M-501, M-912; 0.30 C, 0.95 Mn, 0.38 Si, bal Fe.
Hot rolled: 85,000 TS; 55,000 YS; 30 El; 55 RA; 180 Brin.
For gears, bolts, shafts, axles; water hardened.

ROCHLING VM100.
M-501, M-912; 0.40 C, 0.38 Si, 0.95 Mn, bal Fe.
Hot rolled: 90,000 TS; 58,000 YS; 27 El; 50 RA; 200 Brin.

ROCHLING VM125.
M-501, M-912; 0.30 C, 1.25 Mn, 0.3 max Cr, bal Fe.
For gears, bolts, camshafts, crankshafts; water hardened, tough.

ROCHLING VM135.
M-501, M-912; 0.36 C, 1.35 Mn, 0.25 Si, bal Fe.
For gears, bolts, camshafts, crankshafts; water hardened, tough.

ROCHLING VME.
M-501, M-912; 0.45 C, Si, Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA 212 Brin.
For axles, gears, bolts, shafts; water hardened.

ROCHLING VMS140.
M-501, M-912; 0.46 C, 0.90 Si, 0 90 Mn, bal Fe
For gears, dies, fasteners, crankshafts; oil hardened, tough.

ROCHLING VMS160.
M-501, M-912; 0.53 C, 0.90 Si, 0 90 Mn, bal Fe
For dies, upsetters, crankshafts; oil hardened, tough

ROCHLING VMV125.
M-501, M-912; 0.27 C, Mn, Cr, V, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

ROCHLING VMV140.
M-501, M-912, 0 42 C, 1.75 Mn, 0.1 V, bal Fe.
Hot rolled: 97,000 TS, 59,000 YS; 40 El; 200 Brin
For punches, forming dies, upsetters; oil hardened, tough.

ROCHLING WP3.
M-501, M-912; 0.13 C, 0.35 max Si, 0.50 max Mn bal Fe.
Annealed: 70,000 TS; 55,000 YS; 25 El; 60 RA 145 Brin
For nails, rivets, screws, camshafts; case hardened

ROCHLING WWS.
M-501, M-912; 0 53 C, 0.80 Si, 1.05 Mn, bal Fe
Heat treated: 160,000 TS; 112,000 YS, 12 El; 40 RA; 320 Brin.
For gears, bolts, shafts, axles; water hardened.

ROCHLING ZK.
M-501, M-912, 1.45 C, 0.25 Si, 0.60 Mn, 1.4 Cr bal Fe.
For bearings, cutters, liners, sleeves; oil or water hardened, wear resistant

ROCKALOY GRADE A.
M-829, WC + Co.
For cutting tools; carbide.

ROCKALOY NO. 110.
M-829; WC + Co.
For cutting tools; carbide.

ROCKALOY NO 111.
M-829; WC + Co.
For cutting tools; carbides.

ROCKALOY NO 112.
M-829; WC + Co.
For cutting tools; carbides.

ROCKET.
M-688; C, alloy, bal Fe.
For tools, dies; wear and abrasion resistant, air or oil hardening.

ROCKRITE.
M-957; 1.0 C, 1.0 Cr, bal Fe.
For bearings, liners; SAE-52100 tubing.

ROCKWELL.
M-1705; 0.6 C, 0.7 Mn, 1.85 Si, 0.2 V, 0.45 Mo, bal Fe.
Shock resisting tool steel: oil or water hardening.

ROCOLOY 270.
M-U.S.; 0.4 C, 1.3 Si, 1.35 Cr, 0.8 Ni, 0.5 Mo, 0.3 W, 0.15 V, 1.35 Co, bal Fe.
Ht. Tr.: 325,000 TS; 270,000 YS; 7 El; C 55 Rock.
For high strength, corrosion resistant parts, fasteners, rocket motor cases.
Heat treatable. High strength.

RODAR.
M-61; 29 Ni, 17 Co, 0.3 Mn, bal Fe.
Annealed: 80,000 TS; 30,000 YS; Rockwell B82.
Cold drawn: 90,000 TS; 50,500 YS; 250 Brin.
For metal to glass seals; resists thermal shock.

RODNEY TYPE R215.
M-1663; 0.10 C, 15 Mn, 0.65 Si, 0.75 Ni, 18 Cr, 0.40 N, bal Fe.
Annealed: 125,000 TS; 70,000 YS; 45 El; B 98 Rock.
For nonmagnetic cables, computer components, vacuum chambers.
Austenitic, high strength, nonmagnetic. Corrosion and heat resistant.

ROESCH.
Eng.; 50 Zn, 49 Sn, 0.7 Sb, 0.2 Cu.
For aluminum solder.

ROGER METAL.
M-700; C, Cr, Ni, bal Fe.
For stainless parts; corrosion resistant.

ROHMIUM.
Al alloy.
For light alloy parts.

ROHN.
50 Ni, 30 Cr, 17 Fe.
For resistances, heat and corrosion resistant parts; non-scaling, heat resistant.

ROHRENWERK HMS 42.
M-625; 0.18 C, bal Fe.
Rolled: 57,000-72,000 TS; 34,000-40,000 YS;
For gears, cams, camshafts; case hardening steel.

ROLEY 275.
M-1288; 0.95 C, W, Mo, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, reamers, broaches, drills, hobs; high speed steel.

ROLEY 300.
M-1288; 0.82 C, 4.1 Cr, 0 85 Mo, 1.6 V, 8.7 W, bal Fe
For lathe and planer tools, drills, hobs; high speed steel.

ROLEY BA.
M-1288; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

ROLEY BA88.
M-1288; 0.15 max C, 18 Cr, 8.5 Ni, 0.2 S, bal Fe.
For screw machine products, fasteners; Type 303; stainless, free-cutting.

ROLEY B SPEZIAL.
M-1288; 0.1 max C, 2 Si, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks, filters, mixers; Type 302; stainless, austenitic.

ROLEY B SUPER.
M-1288; 0.1 max C, 2 Si, 2 Mo, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El; 300 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

ROLEY CM2.
M-1288; 0.35 C, 16.5 C, 1.15 Mo, bal Fe.
For oil refinery and chemical plant equipment; corrosion resistant.

ROLEY CME2.
M-1288; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, cams, camshafts; case hardened, tough.

ROLEY CME3.
M-1288; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
For gears, bolts, machine tool parts; case hardened.

ROLEY CN12.
M-1288; 0.10 max C, 12.5 Cr, 12 Ni, bal Fe.
For valves; corrosion and heat resistant.

ROLEY CNM.
M-1288; 0.07 max C, 17 Cr, 4.75 Mo, 13 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 170 Brin.
For acid resistant chemical plant equipment, tanks; Type 317; stainless, austenitic.

ROLEY CRP2.
M-1288; 0.40 C, Cr, Mn, Mo, bal Fe.
For machine tool parts, bolts, gears; oil hardened, tough.

ROLEY CT.
M-1288; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 80,000 TS, 35,000 YS; 55 El; 75 RA; 150 Brin.
Cold drawn. 180,000 TS, 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks; Type 321; stainless, austenitic.

ROLEY CT2N.
M-1288; 0.12 max C, 18 Cr, 9 5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
For welded chemical plant equipment; Type 347; stainless, austenitic.

ROLEY CU.
M-1288; 0 07 max C, 17.5 Cr, 2.0 Mo, 17.5 Ni, Ti = 7 × C, bal Fe.
For valves, chemical plant equipment, welded parts; austenitic, stainless.

ROLEY DSA.
M-1288; 1.42 C, W, V, bal Fe
For cutters, engravers' tools; water hardened, wear resistant.

ROLEY DSA SPEZIAL.
M-1288; 1.3 C, 4.75 W, 0.2 max Cr, 0.3 Mn, bal Fe.
For engravers' tools, forming and blanking dies; water hardened, wear resistant.

ROLEY ECR15.
M-1288; 0.16 C, 1.15 Mn, 0.95 Cr, bal Fe.
For gears, bolts, machine tool parts; case hardened, tough

ROLEY ECR20.
M-1288; 0.20 C, 1.25 Mn, 1.15 Cr, 0.25 Si, bal Fe.
For gears, bolts, camshafts, cams; case hardened, tough.

ROLEY EFW.
M-1288; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, bolts, fasteners, machine tool parts; case hardened.

ROLEY ERJ 15.
M-1288; 0.15 C, 1.55 Cr, 1.55 Mn, bal Fe.
For gears, cams, camshafts; case hardened, tough.

ROLEY ERJ 20.
M-1288; 0.18 C, 2 Cr, 2 Ni, 0.5 Mn, bal Fe.
For gears, cams, camshafts; case hardened, tough.

ROLEY ERJ 25.
M-1288; 0.13 C, 0.7 Cr, 2.5 Ni, 0.5 max Mn, bal Fe.
For gears, cams, camshafts; case hardened, tough.

ROLEY ERJ 35.
M-1288; 0.14 C, 3.5 Ni, 0.7 Cr, bal Fe.
For gears, cams, camshafts; case hardened, tough.

ROLEY ERJ 45.
M-1288; 0.13 C, 1.1 Cr, 4.5 Ni, bal Fe.
For gears, bolts, camshafts, fasteners; case hardened, tough.

ROLEY ERM 15.
M-1288; 0.15 C, Cr, Mo, bal Fe.
For gears, cams, camshafts; case hardened, tough

ROLEY ERM 20.
M-1288; 0.20 C, Cr, Mo, bal Fe.
For gears, cams, machine tool parts; case hardened, tough.

ROLEY ESPH.
M-1288; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engraving tools, cutters, broaches; Type W1; water hardened.

ROLEY ESPZH.
M-1288; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, reamers, hobs, cutters; Type W1; water hardened.

ROLEY EXTRA HART.
M-1288; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, drills, taps, reamers; Type W1; water hardened.

ROLEY EXTRA MH.
M-1288; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 18 El; 38 RA; 210 Brin.
For springs, drills, reamers, taps; Type W1; water hardened.

ROLEY EXTRA SEHR ZAH.
M-1288; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, rails, cutters, tools, axes, hammers; Type W1; water hardened.

ROLEY EXTRA SPEZIAL MH.
M-1288; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 18 El; 40 RA; 210 Brin.
For springs, taps, reamers, hobs, broaches; Type W1; water hardened.

ROLEY EXTRA SPEZIAL SEHR ZAH.
M-1288; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA: 355 Brin.
For springs, rails, hammers, tools, axes; Type W1; water hardened

ROLEY EXTRA SPEZIAL ZAH.
M-1288; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, drills, cutters, taps, punches; Type W1; water hardened.

ROLEY EXTRA SPEZIAL ZH.
M-1288; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, cutters, drills, taps, reamers; Type W1; water hardened.

ROLEY EXTRA ZAH.
M-1288; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, cutters, drills, taps, reamers; Type W1; water hardened.

ROLEY EXTRA ZH.
M-1288; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, cutters, drills, hobs, reamers, taps; Type W1; water hardened.

ROLEY EZH.
M-1288; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS, 21 El; 42 RA; 200 Brin.
For springs, drills, cutters, taps; Type W1; water hardened.

ROLEY FAM.
M-1288, 0.46 C, Mn, bal Fe.
Hot rolled: 98,000 TS; 60,000 YS, 24 El; 45 RA; 212 Brin.
For gears, bolts, machine tool parts; water hardened.

ROLEY GW.
M-1288; 1.2 C, W, V, bal Fe.
For cutters, forming dies; water hardened

ROLEY GWA.
M-1288; 1.05 C, 1.2 Cr, bal Fe.
For bearings, bushings, sleeves, liners; water hardened, wear resistant.

ROLEY GWK.
M-1288; 1.25 C, 1.15 Si, 0.7 Mn, 1.2 Cr, bal Fe
For bearings, cutters, bushings, liners; water or oil hardened

ROLEY GWV.
M-1288; 1.15 C, 0.65 Cr, 0.1 V, bal Fe.
For bearings, bushings, liners; water hardened

ROLEY HIR15 W/R.
M-1288; 0.28-0.35 C, 0.5 Cr, 1.5 Ni, bal Fe
For gears, bolts, fasteners; oil hardened, shock resistant.

ROLEY HIR25.
M-1288, 0.36 C, 0.7 Cr, 2.5 Ni, 0.6 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, shock resistant.

ROLEY HIR35.
M-1288; 0.22-0.34 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, machine tool parts; oil hardened, shock resistant.

ROLEY HIR45.
M-1288; 0.35 C, 0.6 Mn, 1.3 Cr, 4.5 Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

ROLEY HMN15.
M-1288; 0.30 C, 1.35 Mn, 0.25 Si, bal Fe.
For gears, bolts, machine tool parts; water hardened, tough

ROLEY HMV35.
M-1288; 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
For punches, crimpers, gears, bolts; oil hardened, tough.

ROLEY HMV42.
M-1288; 0.42 C, 1.75 Mn, 0.1 V, bal Fe.
For punches, crimpers, rivet sets; oil hardened, tough.

ROLEY HMV50.
M-1288; 0.50 C, 0.85 Mn, 1.0 C, 0.1 V, bal Fe.
For springs, gears, bolts, shafts; oil hardened, shock resistant.

ROLEY HRIM20.
M-1288; 0.30 C, 2.0 Cr, 0.3 Mo, 2.0 Ni, bal Fe.
For forging dies, upsetters, crimpers; oil hardened, tough.

ROLEY HRM15.
M-1288; 0.25 C, 1.0 Cr, 0.65 Mn, 0.2 Mo, bal Fe.
For gears, bolts, shafts; oil hardened, tough.

ROLEY HRM35.
M-1288; 0.33 C, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

ROLEY HRM40.
M-1288; 0.42 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

ROLEY HRM45.
M-1288; 0.42 C, Cr, Mo, bal Fe.
For gears bolts, machine tool parts; oil hardened, tough.

ROLEY HRMV25.
M-1288; 0.30 C, 2.5 Cr, 0.2 Mo, 0.15 V, bal Fe.
For forging dies, upsetters, header dies; oil hardened, tough

ROLEY KGS.
M-1288; 1.0 C, 1.55 Cr, 0.35 Mn, bal Fe.
For bearings, cutters, bushings; oil or water hardened, wear resistant.

ROLEY KL3.
M-1288, 1.0 C, 0.35 Mn, 1.55 Cr, bal Fe.
For bearings, bushings, cutters; oil or water hardened, wear resistant.

ROLEY KLR.
M-1288, 1.45 C, 0.6 Mn, 1.4 Cr, bal Fe.
For engravers' tools, blanking dies, bearings; oil or water hardened, wear resistant.

ROLEY KLS
M-1288; 1.05 C, Cr, bal Fe
For bearings, bushings, cutters; water hardened, wear resistant.

ROLEY KSA.
M-1288; 0.90 C, 1.9 Mn, 0.1 V, 0.25 Si, bal Fe.
For punches, dies, cutters, shears; oil hardened, non-deforming.

ROLEY L1.
M-1288; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, cutlery, valves; Type 410; corrosion resistant.

ROLEY L2.
M-1288; 0.12 max C, 13 Cr, 0.4 Si, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, cutlery, valves; Type 410; corrosion resistant.

ROLEY L3.
M-1288; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, cutlery, valves, surgical instruments; Type 410; corrosion resistant.

ROLEY M1.
M-1288; 0.20 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, valves, cutlery, surgical instruments; Type 420; corrosion resistant.

ROLEY M2.
M-1288; 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431.

ROLEY M3.
M-1288; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 50 RA; 200 Brin.
For valves, cutlery, surgical instruments; Type 420; corrosion resistant.

ROLEY M3E.
M-1288; 0.90 C, 18 Cr, 1.15 Mo, 1.0 V, bal Fe.
Annealed: 107,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin.
Heat treated. 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin.
For cutlery, valves, ball bearings, surgical instruments; Type 440 B, corrosion resistant.

ROLEY M4
M-1288; 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
For screw machine products, bolts, shafts, fasteners; Type 416; corrosion resistant, free-cutting.

ROLEY MA3.
M-1288; 0.60 C, 0.65 Mn, 0.38 Si, bal Fe.
For machine tool parts, shafts, gears; water hardened.

ROLEY MA4.
M-1288; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled. 98,000 TS; 60,000 YS; 24 El; 45 RA; 212 Brin.
For machine tool parts, gears, bolts; water hardened.

ROLEY MA5.
M-1288; 0.25 C, 0.25 Si, 0.45 Mn, bal Fe.
Hot rolled: 70,000 TS; 45,000 YS; 31 El; 58 RA, 145 Brin.
For machine tool parts, fasteners, shafts; water hardened.

ROLEY MA6.
M-1288, 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 20 El; 56 RA; 145 Brin.
For gears, fasteners, machine tool parts; case hardening steel.

ROLEY Mo-1.
M-1288; 0.70 C, Mo, Cr, W, V, bal Fe.
For lathe and planer tools, reamers, drills, taps; high speed steel.

ROLEY Mo-2.
M-1288; 0.85 C, W, Mo, bal Fe.
For lathe and planer tools, reamers, drills, taps; high speed steel.

ROLEY Mo-3.
M-1288; 0.88 C, Co, W, Mo, Cr, V, bal Fe.
For lathe and planer tools, drills; high speed steel.

ROLEY Mo-4.
M-1288; 1.15 C, Co, W, Mo, Cr, V, bal Fe.
For engravers' tools, form cutters, broaches, reamers; high speed steel.

ROLEY NALH.
M-1288; 0.34 C, 1.4 Cr, 1.1 Al, bal Fe.
For oil refinery equipment; heat and creep resistant.

ROLEY NALJ.
M-1288; 0.33 C, 1.1 Al, 1.7 Cr, 0.5 Mn, 1.1 Ni, bal Fe.
For oil refinery equipment; heat and creep resistant.

ROLEY NALM.
M-1288; 0.32 C, 1.1 Al, 1.1 Cr, 0.18 Mo, bal Fe.
For oil refinery equipment; heat and creep resistant.

ROLEY NALW.
M-1288; 0.27 C, 1.1 Al, 1.4 Cr, 0.6 Mn, bal Fe.
For oil refinery equipment; heat and creep resistant.

ROLEY NMV.
M-1288; 0.31 C, 2.35 Cr, 0.18 Mo, 0.13 V, bal Fe.
For forging and header dies, upsetters; oil hardened, tough.

ROLEY P1D.
M-1288; 0.46 C, Ni, Cr, W, bal Fe.
For forging and heading dies, upsetters; oil hardened, tough.

ROLEY P2.
M-1288; 0.50 C, 3.25 Ni, 1.05 Cr, 0.50 Mn, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

ROLEY P3.
M-1288; 0.45 C, 0.70 Mn, 0.30 V, 1.4 Cr, 0.7 Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

ROLEY P6.
M-1288; 1.1 C, 0.4 Cr, 0.3 Mn, 0.2 Si, bal Fe.
For bearings, cutters, bushings; water hardened, wear resistant.

ROLEY P7.
M-1288; 1.05 C, 1.0 Cr, 0.30 Mn, 0.25 Si, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant.

ROLEY P8.
M-1288; 0.90 C, 0.80 Cr, 0.30 Mn, 0.30 Si, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant.

ROLEY PRIMA SEHR ZAH.
M-1288; 0.45 C, 0.3-0.8 Mn, 0.25-0.50 Si, bal Fe.
Hot rolled: 98,000 TS; 60,000 YS; 24 El; 55 RA; 212 Brin.
For axles, gears, bolts, bushings, crankshafts; water hardened.

ROLEY PRIMA WEICH.
M-1288; 0.35 C, 0.25-0.50 Si, 0.25-0.80 Mn, bal Fe.
Hot rolled: 84,000 TS; 54,000 YS; 30 El; 53 RA; 183 Brin.
For gears, shafts, axles, bolts, screws; water hardened.

ROLEY PRIMA ZAH.
M-1288; 0.60 C, 0.25-0.50 Si, 0.25-0.80 Mn, bal Fe.
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El; 40-54 RA; 320-230 Brin.
For wheels, die blocks, rails, girders; water hardened.

ROLEY SAO.
M-1288; 0.90 C, 0.10 V, 1.9 Mn, bal Fe.
For punches, forming and blanking dies, shear blades; oil hardened, non-deforming

ROLEY SF.
M-1288; 0.65 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, punches, upsetters; oil hardened, tough.

ROLEY SK.
M-1288; 0.55 C, 0.90 Si, 0.30 Mn, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For cold heading and forming dies; oil hardened, tough.

ROLEY SP2.
M-1288; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, chisels, punches, pneumatic tools; oil hardened, shock resistant.

ROLEY SP2W.
M-1288; 0.53 C, 0 80 Si, 1.05 Mn, bal Fe.
For crankshafts, bolts, gears, axles; water hardened, tough.

ROLEY SPEZIAL.
M-1288; 0 86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe
For lathe and planer tools, drills; high speed steel.

ROLEY SUPER.
M-1288; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For forming and blanking dies, cutters; high speed steel.

ROLEY SUPER 3.
M-1288; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

ROLEY SUPERIOR.
M-1288; 1 05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe
For heading and blanking dies, form tools; oil hardened, wear resistant.

ROLEY SUPER SPEZIAL.
M-1288, 0 65 C, W, Co, 4 Cr, V, Mo, bal Fe.
For lathe and planer tools, reamers, punches, taps; high speed steel.

ROLEY SVA.
M-1288; 1.0 C, 0 10 V, 0.25 Mn, 0.20 Si, bal Fe.
For blanking and forming dies; Type W2; water hardened.

ROLEY T70.
M-1288; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed· 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, dairy and food equipment, Type 430 Ti; corrosion resistant.

ROLEY TO1.
M-1288; 1.35 C, W, Co, bal Fe.
For engravers' tools, forming and blanking dies; oil hardened, wear resistant.

ROLEY TO2.
M-1288; 0 79 C, 4.7 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, cutters, reamers, drills; high speed steel.

ROLEY TO3.
M-1288; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, cutters, reamers, taps; high speed steel.

ROLEY TO4.
M-1288; 0.80 C, 4 Cr, Co, Mo, W, V, bal Fe.
For lathe and planer tools, broaches; high speed steel.

ROLEY TO SUPER.
M-1288; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, form cutters, drills; high speed steel

ROLEY UDL.
M-1288; 0.38 C, 1.05 Cr, 0.1 V, 0.95 Mn, bal Fe.
For gears, bolts, springs, crankshafts; oil hardened, shock resistant.

ROLEY UDW.
M-1288; 0.38 C, Si, Cr, V, bal Fe.
For gears, bolts, springs; oil hardened, shock resistant.

ROLEY UDWM.
M-1288; 0.61 C, 1.18 Cr, 0.10 V, 0.75 Mn, 0.85 Si, bal Fe.
For springs, punches, crankshafts; oil hardened, shock resistant.

ROLEY UK.
M-1288; 0.55 C, 0.90 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For heading and blanking dies, cold work tools; oil hardened, tough.

ROLEY UKL.
M-1288; 0.67 C, 1.3 Si, 0.50 Mn, 0.50 Cr, bal Fe.
For punches, springs, pneumatic tools; oil hardened, tough.

ROLEY UKS.
M-1288; 0.45 C, Si, Cr, V, bal Fe.
For gears, bolts, crankshafts, springs; oil hardened, shock resistant.

ROLEY UKW(D).
M-1288, 0.35 C, 0.90 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For heading and forming dies, cold work tools; oil hardened, tough.

ROLEY WB10.
M-1288; 0.25 C, 1.15 Cr, 0.25 Mo, 0.55 Mn, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, tough.

ROLEY WB20
M-1288; 0.24 C, 1.35 Cr, 0.55 Mo, 0.20 V, bal Fe.
For die casting dies, punches; oil hardened, tough.

ROLEY ZC10.
M-1288, 0.41 C, 0.25 Si, 0.70 Mn, 1.1 Cr, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

ROLEY ZCMo10
M-1288; 0.50 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, 0.25 Si, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

ROLEY ZIM EXTRA.
M-1288; 1.4 C, 0.30 Cr, 0.10 V, 0.30 Mn, bal Fe.
For engravers' tools, cutters, bearings; water or oil hardened, wear resistant.

ROLEY ZIM SPEZIAL.
M-1288, 1.4 C, 0.30 Cr, 0.10 V, 0.30 Mn, bal Fe.
For engravers' tools, cutters, form tools; oil hardened, wear resistant.

ROLLED AUGER.
M-289; C, bal Fe.
For tools; water hardened.

ROLLE MA-356.
M-1501; 6.5-7.5 Si, 0.20-0.75 Mg, 0.03-0.25 Be, 0.20 Ti, 0.2 Cu, 0.1 Mn, 0.1 Zn, bal Al.
Cast: 40,000 TS; 30,000 YS; 5 El; 60 Brin.
Heat treated: 50,000 TS; 40,000 YS; 2 El; 70 Brin.
For gear cases, housings, crankcases, oil pans, airframe fittings; age-hardenable, high strength, corrosion resistant.

ROLLODUR 1.
M-1247; 13 Cr, 10 W, 1.5 C, bal Fe.
For milling cutters, tools; cast to shape.

ROLLODUR 2.
M-1247; 13 Cr, 4 W, 1.5 C, bal Fe.
For milling cutters, tools; cast to shape.

ROLLODUR 44-22.
M-1247; 1.4 C, 4 W, Cr, Mo, Co, V, bal Fe.
For cutting tools, milling cutters; cast to shape, abrasion resistant.

ROLLODUR 108-32.
M-1247; 1.8 C, 10 W, Cr, Mo, Co, V, bal Fe.
For cutting tools; abrasion resistant.

ROLLOY.
M-170; 2.5-3.5 T.C., 4.5 Ni, 1.5 Cr, bal Fe.
Cast: 570-650 Brin.
For wear resistant castings; wear resistant.

ROLLSCHEN 1 Cr 5 Ni.
M-1240; 0.2 C, 1 Cr, 0.5 Ni, bal Fe.
Heat treated: 78,000-125,000 TS; 50,000 YS; 16 El; 55 RA; 170-250 Brin.
For gears, shafts, pinions, cams, camshafts; tough, case-hardening steel.

ROLLSCHEN 1 Cr 10 Ni.
M-1240; 0.2 C, 0.1 Cr, 1.0 Ni, bal Fe.
Heat treated: 107,000-148,000 TS; 85,000 YS; 12 El; 45 RA; 210-250 Brin.
For gears, shafts, cams, pinions, camshafts; case hardening

ROLLSCHEN 1 Cr 15 Ni.
M-1240; 0.2 C, 0.1 Cr, 1.5 Ni, bal Fe.
Heat treated: 135,000-176,000 TS; 99,600 YS; 10 El; 40 RA; 220-260 Brin.
For gears, shafts, pinions, camshafts; case hardening.

ROLLSCHEN 1 Cr 20 Ni.
M-1240; 0.2 C, 0.1 Cr, 2.0 Ni, bal Fe.
Heat treated: 162,000-205,000 TS; 114,000 YS; 7 El; 35 RA; 235-300 Brin.
For gears, shafts, camshafts; tough, case hardening.

ROLLSCHEN 2 Mo 4.
M-1240; 0.2 C, 0.4 Mo, bal Fe.
Heat treated: 78,300-98,500 TS; 50,000 YS; 16 El; 60 RA.
For gears, shafts, pinions; case hardening.

ROLLSCHEN 3 Cr 5 Ni.
M-1240; 0.4 C, 0.3 Cr, 0.5 Ni, bal Fe.
Heat treated: 85,500-99,500 TS; 57,000 YS; 19 El; 55 RA; 210-230 Brin.
For gears, shafts, crankshafts; oil hardening, tough.

ROLLSCHEN 3 Cr 10 Mo 10.
M-1240; 0.3 C, 1.0 Cr, 1.0 Mo, bal Fe.
Heat treated: 121,000-142,000 TS; 107,000 YS; 15 El; 50 RA.
For gears, shafts, axles; oil hardening, tough.

ROLLSCHEN 3 Cr 10 Ni.
M-1240; 0.4 C, 0.3 Cr, 1.0 Ni, bal Fe.
Heat treated: 99,000-121,000 TS; 71,000 YS; 15 El; 55 RA; 230-250 Brin.
For gears, shafts, crankshafts; oil hardening, tough.

ROLLSCHEN 3 Cr 15 Ni.
M-1240; 0.4 C, 0.3 Cr, 1.5 Ni, bal Fe.
Heat treated: 107,000-128,000 TS; 85,000 YS; 14 El; 55 RA; 240-260 Brin.
For gears, shafts, crankshafts; oil hardening, tough.

ROLLSCHEN 3 Cr 15 Ni 12 Mo Al.
M-1240; 0.3 C, 1.5 Cr, 0.8 Ni, 0.3 Mo, 1 Al, bal Fe.
Heat treated: 114,000-142,000 TS; 85,000 YS; 14 El; 40 RA; 250 Brin
For gears, pinions, cams, shafts; nitriding steel.

ROLLSCHEN 3 Cr 20 Ni.
M-1240; 0.4 C, 0.3 Cr, 2 Ni, bal Fe.
Heat treated: 121,000-142,000 TS; 100,000 YS; 14 El; 50 RA; 260-280 Brin.
For gears, shafts, crankshafts; oil hardening, tough.

ROLLSCHEN 3 Cr Ni 10 Mo.
M-1240; C, 0.3 Cr, Ni, 1 Mo, bal Fe.
Heat treated: 128,000-148,000 TS; 107,000 YS; 12 El; 50 RA; 230-260 Brin.
For gears, shafts, crankshafts; oil hardening, tough.

ROLLSCHEN 3 Cr Ni 15 Mo.
M-1240; C, 0.3 Cr, Ni, 1.0 Mo, bal Fe.
Heat treated: 148,000-176,000 TS; 121,000 YS; 9 El; 45 RA; 245 Brin.
For gears, shafts, crankshafts; oil hardening, tough.

ROLLSCHEN 3 Cr Ni 20 Mo.
M-1240; C, 0.3 Cr, Ni, 1.0 Mo, bal Fe.
Heat treated: 169,000-197,000 TS; 141,000 YS; 9 El; 40 RA; 260 Brin.
For gears, shafts, axles; oil hardening, tough.

ROLLSCHEN 4 Cr 10 Mo 4.
M-1240; 0.4 C, 1.0 Cr, 0.4 Mo, bal Fe.
Heat treated: 128,000-148,000 TS; 107,000 YS; 12 El; 45 RA.
For gears, shafts, axles; oil hardening, tough.

ROLLSCHEN 5 Cr Si.
M-1240; 0.5 C, 0.7 Mn, 1.2 Si, bal Fe.
Heat treated: 220,000-250,000 TS; 185,000 YS; 4 El; 18 RA.
For springs; oil hardening.

ROLLSCHEN 5 Mn Si.
M-1240; 0.5 C, 0.7 Mn, 1.2 Si, bal Fe.
Heat treated: 184,000-214,000 TS; 148,000 YS; 7 El; 20 RA.
For springs; oil hardening.

ROLLSCHEN 5 Ni 12 Cr 8 Mo 3.
M-1240; 0.5 C, 1 Cr, 1.7 Ni, 0.3 Mo, bal Fe.
Heat treated: 190,000-200,000 TS.
For gears, shafts, crankshafts, axles; oil hardening, shock resistant.

ROLLSCHEN 5 Ni 12 Cr 8 Mo 7.
M-1240; 0.5 C, 1 Cr, 1.7 Ni, 0.7 Mo, bal Fe.
Heat treated: 220,000-240,000 TS.
For gears, shafts, crankshafts, axles; oil hardening, shock resistant.

ROLLSCHEN WA EXTRA.
M-1240; 0.5 C, 0.7 Si, 1.5 Cr, 0.5 Mo, 0.3 V, bal Fe.
Heat treated: 156,000-184,000 TS.
For gears, shafts, crankshafts, axles; oil hardening, shock resistant.

ROLLSCHEN WAG46.
M-1240; 0.4 C, 1 Si, 5.5 Cr, 0.8 Mo, 0.5 V, bal Fe.
Heat treated: 185,000-205,000 TS.
For tools, dies, punches; oil hardening, shock resistant.

ROL-MAN.
M-180; 11-14 Mn, 1-1.3 C, bal Fe.
130,000-160,000 TS; 35-50 El; 180 Brin.
For woven wire screens, wear plates, pins, bushings, stokers; austenitic steel, non-magnetic.

ROMA BRONZE.
Eng.; 59 Cu, 41 Zn, 0.4 Pb, 0.2 Al, traces Fe.
For hardware, nuts, bolts; free-cutting.

ROMAN BRONZE.
M-238; 39 Zn, 0.75 Sn, bal Cu.
For hardware, welding rod; high strength.

ROMANIUM.
Eng.; 0.25 Cu, 1.75 Ni, 0.15 Sn, 0.17 W, 97.43 Al.
Hard rolled: 47,500 TS; 5 El.
Annealed: 34,000 TS; 19.4 El.
For light alloy parts

ROMILLY BRASS.
England; 29 Zn, 0.2 Sn, 0.3 Pb, bal Cu.
For fittings, hardware; free-cutting, corrosion resistant.

RONENSIL.
M-912; 8-9 Cr, 12 Mn, bal Fe.
For tableware, household utensils; non-magnetic.

RONENSIL.
M-501; C, 16 Mn, 7-9 Cr, 1 Mo, bal Fe.
For stainless steel parts; stainless.

RONIA METAL.
Cu, Zn, Co, Mn, P.
For hardware; corrosion resistant.

ROOFLOY.
M-314; 0.02 Ca, 0.02 Mg, 0.02 Sn, bal Pb.
For roofing; rolled sheet.

RORSCHACH 23S.
M-1140; 3.5-4.5 Cu, 0.2-0.9 Si, 0.8-1.5 Mn, 0.8-1.5 Mg, bal Al.
For light alloy parts; age-hardened.

RORSCHACH 26S.
M-1140; 3.5-4.5 Cu, 1 max Si, 0.2-1.0 Mg, 0.2-1.0 Mn, bal Al.
For light alloy parts; age-hardened.

RORSCHACH 65S.
M-1140; 0.5-1.0 Si, 0.2-1.0 Mn, 0.15-0.40 Cr or Cu, 0.5-1.0 Mg, bal Al.
For light alloy parts.

RORSCHACH A4S.
M-1140; 1 max Mg, 0.5-1.0 Mn, bal Al.
For light alloy parts.

RORSCHACH A56S.
M-1140; 4-6 Mg, 0.4 max Mn or Cr, bal Al.
For light alloy parts; corrosion resistant.

RORSCHACH A57S.
M-1140; 2 max Mg, 0.5 max Mn or Cr, bal Al.
For light alloy parts; corrosion resistant.

RORSCHACH AR-A4S.
M-1140, 1 Mn, 0.7 Mg, bal Al.
O-temper: 17,000 TS; 5700 YS; 25 El; 40 Brin.
½ H-temper: 28,500 TS; 21,000 YS; 7 El; 60 Brin.
H-temper: 31,400 TS; 30,000 YS; 5 El; 70 Brin.
For roofing; good formability.

RORSCHACH AR-A57S.
M-1140; 1.5 Mg, bal Al.
O-temper: 18,500 TS; 7100 YS; 35 El; 30 Brin.
½ H-temper: 30,000 TS; 28,500 YS; 6 El; 60 Brin.
H-temper: 35,000 TS; 34,000 YS; 4 El; 70 Brin.
For chemical drums, architectural trim; good formability.

RORSHACK 3S
M-1140; 1.0-2.0 Mn, bal Al.
Soft: 18,500 TS; 10,000 YS; 30 El; 25 Brin.
Hard: 33,500 TS; 31,500 YS; 4 El; 60 Brin.
For food, textile and marine equipment; corrosion resistant.

RORSHACK 4S.
M-1140; 0.5-1.5 Mg, 0.5-1.5 Mn, bal Al.
Soft: 28,500 TS; 10,000 YS; 17 El; 40 Brin.
Hard: 45,500 TS; 34,200 YS; 4 El; 90 Brin.
For transport and marine equipment; stronger than 3S.

RORSHACK 17S.
M-1140; 4 Cu, 0.5 Mg, 0.5 Mn, bal Al.
O-temper: 32,700 TS; 32,700 YS; 18 El; 45 Brin.
T6-temper: 64,000 TS; 42,700 YS; 17 El; 110 Brin.
For aircraft and transport equipment and parts, structures; age-hardenable

RORSHACK 17S CLAD.
M-1140; 4 Cu, 0.5 Mg, 0.5 Mn, bal Al.
O-temper: 31,000 TS; 14,200 YS; 18 El; 45 Brin.
T6-temper: 59,800 TS; 39,800 YS; 17 El; 110 Brin.
RT-temper: 64,000 TS; 45,500 YS; 11 El; 115 Brin.
For aircraft structures, fuselage, wings; clad, age-hardenable.

RORSHACK 24S.
M-1140; 4.2 Cu, 1.5 Mg, 0.5 Mn, bal Al.
O-temper: 37,000 TS; 18,500 YS; 14 El; 45 Brin.
T-temper: 69,700 TS; 49,800 YS; 15 El; 110 Brin.
RT-temper: 71,100 TS; 59,800 YS; 9 El; 115 Brin.
For aircraft structures, fuselage, wings; age-hardenable.

RORSHACK 24S CLAD.
M-1140; 4.2 Cu, 1.5 Mg, 0.5 Mn, bal Al.
O-temper: 34,200 TS; 14,200 YS; 14 El.
T-temper: 66,800 TS; 45,500 YS; 15 El.
RT-temper: 68,300 TS; 47,000 YS; 9 El.
For aircraft structures, fuselage, wings; age-hardenable, clad.

RORSHACK 51S.
M-1140; 1 Si, 0.5-1.0 Mg, 0.2-1.0 Mn, bal Al.
O-temper: 18,500 TS; 11,400 YS; 22 El; 25 Brin.
W-temper: 38,400 TS; 24,400 YS; 10 El; 90 Brin.
T-temper: 47,000 TS; 38,400 YS; 11 El; 100 Brin.
For ship building and transportation industries; corrosion resistant.

RORSHACK 57S.
M-1140; 2.5 Mg, 0.25 Cr, bal Al.
O-temper: 31,300 TS; 19,900 YS; 25 El; 45 Brin.
H-temper: 45,500 TS; 39,800 YS; 4 El; 95 Brin.
For architectural trim, refrigerator trays; wrought.

RORSHACK 61S.
M-1140, 0.6 Mg, 1 Si, 0.25 Cr, bal Al
O-temper: 19,900 TS; 11,400 YS; 20 El; 45 Brin.
W-temper: 42,700 TS; 35,500 YS; 17 El; 95 Brin.
RT-temper: 54,100 TS, 45,500 YS; 7 El; 105 Brin.
For structures, age-hardenable

ROSE 3X.
M-1305, 0.85 C, 0.4 Si, 0.6 Mn, bal Fe
Heat treated. 130,000-190,000 TS; 90,000-145,000 TS; 20-12 El; 50-35 RA; 255-390 Brin
For tools, springs, punches, gages; Type W1; water hardened.

ROSE FUSIBLE ALLOY-1
England; 50 Bi, 22 Sn, 28 Pb
For safety plugs, fuses; M.P. 79°C.

ROSE FUSIBLE ALLOY-2.
England; 35 Bi, 30 Sn, 35 Pb.
For safety plugs, fire extinguishers; M.P. 98°C

ROSEIN.
England, 40 Ni, 30 Al, 20 Sn, 10 Ag.
For jewelry, ornaments; corrosion resistant.

ROSE LABEL
1.24 C, 0.27 Mn, bal Fe.
For tools, cutters; water hardened.

ROSENHAIN-ARCH-BUTT ALLOY.
72 Al, 25 Zn, 3 Cu.
For strong light alloy parts; non-hardenable.

ROSIN.
Eng.; 40 Ni, 30 Al, 20 Sn, 10 Ag.
For jewelry and ornamental articles.

ROSS ALLOY.
Eng.; 68 Cu, 32 Sn.
For reflectors; "Rotguss."

ROSSLYN METAL.
M-1122; stainless-clad copper.
Rolled: 80,000-86,000 TS; 37,000-50,000 YS; 31-60 El.
For cooking utensils, kettles, heat exchangers; formerly "Amclad."

ROSS-MEEHAN.
M-82a; C, alloy, bal Fe.
For steel castings.

ROSTHORN-WILN BRASS.
England; 31.9 Zn, bal Cu.
For condenser tubes, stampings, hardware; high ductility.

ROSTODUR R3.
M-1325; 0.20 C, 13 Cr, 1 Mo, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; B 82 Rock.
Hardened: 235,000 TS; 200,000 YS; 10 El. C 50 Rock.
For valves, cutlery, bearings, surgical instruments.
Corrosion resistant, hardenable.

ROSTODUR R7.
M-1325; 0.15 C, 13 Cr, 1 Mo, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 15 El; B 93 Rock.
For springs, chemical plant and oil refinery equipment, table flatware.
Corrosion resistant.

ROTAS.
M-498; 0.15-0.25 C, bal Fe.
For case-hardened parts; case-hardening steel.

ROTGUSS.
Germ.; 93-82 Cu, 4-10 Sn, 3-10 Zn, 1-2 Pb.
For cast fittings, valves, hardware; free-cutting.

ROTGUSS 4.
M-1420; Zn, bal Cu.
Cast: 26,000-29,000 TS; 15 El; 50 Brin.
For hardware; brass.

ROTGUSS 5.
M-1420; Zn, bal Cu.
Cast: 21,000-29,000 TS; 10 El; 60 Brin.
For hardware; brass.

ROTGUSS 8.
M-1420; Zn, bal Cu.
Cast: 21,000-29,000 TS; 8 El; 70 Brin.
For hardware; brass.

ROTGUSS 10.
M-1420; Zn, bal Cu.
Cast: 29,000-36,000 TS; 12 El; 70 Brin.
For hardware; brass.

ROTGUSS RED BRONZE.
Germany; 4-10 Sn, 3-10 Zn, Pb, bal Cu.
For hardware, fittings; free-cutting, castings.

ROTOR-11.
M-1348, 1.2 C, 0.20 Cr, 0.10 V, 1.0 W, bal Fe.
For blanking and forming dies, headers, oil hardened, abrasion resistant.

ROTOR LDP.
M-1318; 1.05 C, 1.15 W, 0.90 Mn, 1.0 Cr, bal Fe.
For bearings, cutters, bushings; oil or water hardened, wear resistant.

ROTOR N.
M-1318; 1.05 C, 0.65 Cr, 0.10 V, 0.30 Mn, bal Fe.
For bearings, bushings, cutters; water hardened, tough.

ROTOR SPEZIAL N.
M-1318; 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For bearings, cutters, liners, forming dies; oil or water hardened.

ROTOXIT.
Eng.; < 4 Si, bal Cu.
For chemical apparatus; corrosion resistant.

ROTPUNKT.
M-1331; 0.90 C, W, Mo, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, hobs, taps, reamers; high speed steel.

ROTPUNKT DMo5.
M-1331; 0.7 C, W, Mo, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, hobs, broaches; high speed steel.

ROTPUNKT DMo5Co.
M-1331; 0.7 C, W, Mo, 4 Cr, V, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel.

ROTPUNKT K5.
M-1331; 0.7 C, W, Mo, 4 Cr, V, bal Fe.
For lathe and planer tools, hobs, broaches; high speed steel.

ROTUNG D.
M-1246; W, Cu. For electrical contacts; tungsten impregnated with copper.

ROTUNG P.
M-1246; W, Cu. For electrical contacts; tungsten impregnated with copper.

ROULZ.
Germ.; 35-50 Cu, 25-30 Ni, 20-40 Ag.
For ornamental and corrosion resistant pens; corrosion resistant.

ROXO.
M-753; 0.4 C, 2.4 Si, bal Fe.
For castings; cast iron

R-P.
M-40; 0.65 C, 0.8 Mn, 1.95 Si, bal Fe.
For tools; oil hardening.

R.R. 50.
M-106; 0.8-2.0 Cu, 0.05-0.2 Mg, 1.5-2.8 Si, 0.8-1.4 Fe, 0.8-1.7 Ni, 0.05-0.3 Ti, bal Al.
Sand cast: 22,400-27,800 TS; 14,500-16,800 YS; 2-4 El; 60-70 Brin; 1.6 Izod.
General purpose sand or chill cast aluminum.
Gen. Eng. BS 1490 LM 23-P; BS 2L51.

R.R. 250.
M-106; 4.5-5.5 Cu, 0.2-0.3 Mn, 0.8-1.2 Ni, 0.15-0.25 Ti, 0.1-0.4 Sb, 0.1-0.4 Co, bal Al.
Sand cast: 31,400-35,800 TS; 29,000 YS, 0-2 El; 90-100 Brin; 0.6 Izod.
Modified "Y" alloy for service up to 250°C.

R.R. 350.
M-106; 4.5-5.5 Cu, 0.2-0.3 Mn, 1.3-1.8 Ni, 0.15-0.25 Ti, 0.1-0.4 Sb, 0.1-0.4 Co, 0.1-0.3 Zr, bal Fe.
Sand cast: 31,400-35,800 TS; 29,000 YS; 0-2 El; 90-100 Brin; 0.6 Izod.
Modified "Y" alloy for service up to 350°C.

R.R. 408.
M-106; same as R.R. 250

R.R. 515.
M-106; same as R.R. 350.

R.R. ALLOY C.242.
M-239; 0.3 C, 20 Cr, 10 Co, 10 Mo, 1.0 max Fe, bal Ni.
For high temperature applications; heat and corrosion resistant.

RRAC7.
M-426; 4.6 Sn, 1.6-2.0 Ni, 0.7-0.9 Mn, 0.4-0.8 Sb, 0.4-0.6 Si, 0.35-0.50 Mg, bal Al.
For bearings; for engine bearings.

RRAC9.
M-426; 55.5-70.0 Sn, 1.5-1.8 Ni, 0.6-0.9 Cu, 0.7-1.0 Mg, 0.15-0.35 Si, 0.20-0.45 Fe, bal Al.
For bearings; connecting rods.

RS 1 SPEZIAL.
M-459; C, bal Fe.
For steel trimming and weld steel.

RS 2 SPEZIAL.
M-459; C, bal Fe.
For steel trimming and weld steel.

RS 3.
M-459; C, bal Fe.
For steel trimming and weld steel.

RS 4.
M-459; C, bal Fe.
For steel trimming and weld steel.

RS 115.
M-1633; 85 Cu, 5 Sn, 5 Pb, 5 Zn.
Bar: 32,000-43,000 TS; 15,000-24,000 YS; 20-35 El; 55-65 Brin.
For bearings, bushings, sleeves, liners.
Ounce metal, Free machining.

RS 123.
M-1633; 81 Cu, 3 Sn, 7 Pb, 9 Zn.
Bar: 29,000-39,000 TS; 13,000-17,000 YS; 18-30 El; 50-60 Brin.
For bearings, bushings, liners, sleeves.
Good embeddability.

RS 194.
M-1633; 81 Cu, 19 Sn.
Bar: 40,000-48,000 TS; 150-170 Brin.
For bearings, bushings, linings.
Bridge Bronze, corrosion resistant.

RS 197
M-1633; 85 Cu, 14 Sn, 1 Zn.
Bar: 30,000-39,000 TS; 1-3 El.
For bearings, bushings, sleeves.
Corrosion resistant.

RS 198.
M-1633, 83 Cu, 14 Sn, 3 Zn
Bar: 32,000 TS; 23,000 YS; 12 El; 75 Brin.
For bearings, bushings, sleeves.
Navy H, corrosion resistant.

RS 205.
M-1633; 89 Cu, 10 Sn, 2 Pb.
Bar: 35,000 TS; 21,000 YS; 12 El; 85 Brin.
For worm wheels, gears, shafts
Gear Bronze, corrosion resistant, free-machining.

RS 206.
M-1633; 88 Cu, 10 Sn, 2 Pb.
Bar: 36,000-46,000 YS; 18,000-26,000 YS; 15-25 El; 65-80 Brin.
For bearings, bushings, liners.
Leaded Gun Metal, good embeddability.

RS 210
M-1633; 88 Cu, 10 Sn, 2 Zn.
Bar: 40,000-50,000 TS; 20,000-25,000 YS; 20-35 El; 60-75 Brin.
For bearings, bushings, liners, gears.
Gun Metal, corrosion resistant.

RS 215
M-1633; 87 Cu, 10 Sn, 1 Pb, 2 Zn.
Bar: 37,000-47,000 TS; 17,000-22,000 YS; 18-25 El
For bearings, bushings, liners.
Commercial Gun Metal, corrosion resistant.

RS 225.
M-1633; 88 Cu, 8 Sn, 4 Zn.
Bar: 47,000-51,000 TS; 18,000-23,000 YS; 65-80 Brin; 25-35 El.
For bearings, bushings, gears.
Navy G. Bronze, corrosion resistant.

RS 230.
M-1633; 87 Cu, 8 Sn, 1 Pb, 4 Zn.
Bar: 36,000-45,000 TS; 16,000-24,000 YS; 18-30 El; 60-75 Brin.
For gears, bushings, bearings,
Leaded Navy G. Bronze.

RS 245.
M-1633; 88 Cu, 6 Sn, 1 Pb, 4 Zn.
Bar: 36,000-48,000 TS; 16,000-21,000 YS; 25-40 El; 60-72 Brin.
For bearings, bushings, liners.
Navy M. bronze, corrosion resistant.

RS 305.
M-1633; 80 Cu, 10 Sn, 10 Pb.
Bar: 27,000-37,000 TS; 15,000-22,000 YS; 10-20 El; 55-70 Brin.
For bearings, bushings, liners.
Corrosion resistant, good embeddability.

RS 311.
M-1633; 84 Cu, 8 Sn, 8 Pb.
Bar: 25,000-32,000 TS; 7-11 El.
For bearings, bushings, liners.
Corrosion resistant, good embeddability.

RS 315.
M-1633; 83 Cu, 7 Sn, 7 Pb, 3 Zn.
Bar: 30,000-38,000 TS; 17,000-21,000 YS, 12-20 El; 55-65 Brin.
For bearings, bushings, liners.
Bearing Bronze, corrosion resistant.

RS 319
M-1633; 78 Cu, 6 Sn, 16 Pb.
Bar: 25,000-33,000 TS; 14,000-20,000 YS; 10-18 El; 50-60 Brin.
For bearings, bushings, liners.
Semi-Plastic Bronze, good embeddability.

RS 321.
M-1633; 71 Cu, 7 Sn, 21 Pb.
Bar: 24,000-31,000 TS; 15,000 YS; 15 El; 55 Brin.
For bearings, bushings, liners.
Hi-Leaded Tin Bronze.

RS 323.
M-1633, 70 Cu, 5 Sn, 25 Pb.
Bar: 23,000-30,000 TS; 11,000-16,000 YS; 7-16 El; 42-45 Brin.
For bearings, bushings, liners.
Hi-Leaded Tin Bronze.

RS 326.
M-1633; 85 Cu, 5 Sn, 9 Pb, 1 Zn.
Bar: 25,000-32,000 TS; 12,000-18,000 YS; 8-12 El; 60 Brin.
For bearings, bushings, liners.
Corrosion resistant.

RS 327.
M-1633; 75 Cu, 5 Sn, 20 Pb.
Bar: 22,000-30,000 TS; 7-10 El.
For bearings, bushings, liners.
Corrosion resistant. Good embeddability.

RS 410.
M-1633; 56 Cu, 2 Sn, 9 Pb, 20 Zn, 12 Ni.
Bar: 34,000-40,000 TS; 17,000-20,000 YS; 25 El; 50-60 Brin.
For bushings, bearings, liners.
Nickel Silver, corrosion resistant.

RS 415A.
M-1633; 87 Cu, 3 Fe, 9 Al.
Bar: 60,000-75,000 TS; 23,000-28,000 YS; 15-25 El; 90-125 Brin.
For gears, bushings, bearings, shafts.
Aluminum Bronze, corrosion resistant, tough.

RS 415B.
M-1633; 88 Cu, 1 Fe, 10 Al.
Bar: 70,000-85,000 TS; 25,000-30,000 YS; 20-35 El; 100-140 Brin.
For gears, bushings, bearings, shafts.
Aluminum Bronze, corrosion resistant, tough.

RS 415 C.
M-1633; 83 Cu, 2 Ni, 4 Fe, 11 Al.
Bar: 85,000-95,000 TS; 30,000-41,000 YS; 12-20 El; 160-195 Brin.
For bearings, liners, bushings, shafting.
Aluminum Bronze, corrosion resistant.

RS 415 D.
M-1633; 81 Cu, 4 Ni, 4 Fe, 11 Al.
Bar: 95,000 TS; 45,000 YS; 7 El; 195 Brin.
For bushings, bearings, liners, shafting.
Corrosion resistant. Aluminum Bronze.

RS 421.
M-1633; 58 Cu, 40 Zn, 1 Fe, 1 Al, 0.25 Mn.
Bar: 70,000-88,000 TS; 28,000-40,000 YS; 20-35 El; 90-120 Brin.
For bearings, bushings, sleeves, shafting, impellers.
Manganese Bronze, corrosion resistant.

RS 423.
M-1633; 64 Cu, 24 Zn, 3 Fe, 5 Al, 4 Mn.
Bar: 90,000-100,000 TS; 45,000-55,000 YS; 18-30 El; 160-200 Brin.
For bushings and bearings, shafting.
Manganese Bronze, corrosion resistant.

RS 424.
M-1633; 64 Cu, 24 Zn, 3 Fe, 5 Al, 4 Mn.
Bar: 11,000-120,000 TS; 65,000-90,000 YS; 12-20 El; 170-225 Brin.
For bushings and bearings, shafts.
Corrosion resistant. Manganese Bronze.

RS 500.
M-1633; 5 Zn, 1.5 Ni, 2.5 Fe, 1.5 Al, 3-5 Si, 0.25 Mn, bal Cu.
Bar: 45,000-65,000 TS; 20,000-35,000 YS; 15-40 El; 55-90 Brin.
For bushings and bearings, shafts.
Silicon Bronze, corrosion resistant.

R-S "A" METAL.
M-475; 3.2 C, Mn, Si, bal Fe.
For machinery castings, gears; abrasion resistant, cast iron.

R-S "H' 'METAL.
M-1475, C, alloy, bal Fe.
For valves; abrasion and corrosion resistant.

RS LEGIERUNG.
M-1548; 0.7-1.2 Si, 0.7-1.2 Mn, 0.8-1.2 Mg, bal Al.
Heat Treated: 40,000-51,000 TS; 28,000-43,000 YS; 5-10 El; 75-95 Brin.
For general structures, scaffolds, rails, booms, transmission towers.
Age-hardenable, good strength and fabricability.

R.S.V.
M-1118; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, dies, cutters, reamers; high speed steel.

R.T. 6.
M-1118; 0.7-0.8 C, bal Fe.
For tools, punches, springs; water hardened.

R.T. 7.
M-1118; 0.7-0.8 C, bal Fe.
For tools, punches, springs; water hardened.

R.T. 8.
M-1118; 0.9-1.0 C, bal Fe.
For tools, drills, springs; water hardened.

R.T. 10.
M-1118; 0.9-1.0 C, bal Fe.
For tools, taps, drills, punches; water hardened.

R.T. 10.
M-1118; 1.05-1.15 C, bal Fe.
For tools, taps, drills, punches; water hardened.

R-Therm 20-12 Mo.
M-1331; 0.20 C, 12 Cr, 1.2 Mo, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 24 El; B 94 Rock.
Hardened: 220,000 TS; 180,000 YS; 12 El; C 48 Rock.
For gears, cutlery, surgical instruments, valves, bearings.
Corrosion resistant, hardenable.

R-Therm 2012 MoWV.
M-1331; 0.22 C, 11.5 Cr, 1 Mo, 0.5 Ni, 0.3 V, 0.5 W, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened: 235,000 TS; 200,000 YS; 10 El; C 50 Rock.
For valves, cutlery, bearings, surgical instruments.
Corrosion resistant, hardenable.

RTS see JESSOP RTS.

R.T.W. 2.
M-1118; 0.5 C, 1.5 Cr, 2.25 W, 0.2 V, bal Fe.
For tools, hot work dies; hot work steel.

R.T.W. 3.
M-1118; 1.3 C, 4.5 Cr, bal Fe.
For tools, dies; air or oil hardened.

RUBEL BRONZE "D.W."
M-2; 40-55 Cu, 3-15 Ni, 1-3 Mn, 1-2 Fe, 0.5-3.0 Al, bal Zn.
Cast: 60,000 TS; 30 El; 90 Brin.
Hot pressed: 75,000 TS; 30 El; 100 Brin.
For printing rolls; corrosion resistant.

RUBEL BRONZE H-1.
M-2; 41 Cu, 48 Zn, 11 Mn + Ni + Fe + Al.
Cast: 99,000 TS; 8 El; 160 Brin.
Hot pressed: 105,000 TS; 12 El; 190 Brin.
For propellers, piston rings, valves, rotor covers, shrinking rings; high strength, non-corrosive.

RUBEL BRONZE H-2.
M-2; 50 Cu, 42 Zn, 8 Mn, + Ni + Fe + Al.
Cast: 82,000 TS; 8 El; 150 Brin.
Hot pressed: 105,000 TS; 15 El; 170 Brin.
For bearing bushings, piston rods, gears, valve stems; high strength, non-corrosive.

RUBEL BRONZE "H-2 W."
M-2; 40-55 Cu, 3-15 Ni, 1-3 Mn, 1-2 Fe, 0.5-3.0 Al, bal Zn.
Cast: 70,000 TS; 10 El; 140 Brin.
Hot pressed: 90,000 TS; 25 El; 160 Brin.
For bearings, bushings; corrosion resistant.

RUBEL BRONZE "L."
M-2; 40-55 Cu, 3-15 Ni, 1-3 Mn, 1-2 Fe, 0.5-3.0 Al, bal Zn.
Cast: 60,000 TS; 30 El; 90 Brin.
Hot pressed: 80,000 TS; 35 El; 115 Brin.
For bearings, bushings; corrosion resistant.

RUBEL BRONZE "L.W."
M-2; 40-55 Cu, 3-15 Ni, 1-3 Mn, 1-2 Fe, 0.5-3.0 Al, bal Zn.
Cast: 60,000 TS; 25 El; 100 Brin.
Hot pressed: 80,000 TS; 30 El; 120 Brin.
For bearings, bushings; corrosion resistant.

RUBEL BRONZE W-1.
M-2; 50 Cu, 41 Zn, 9 Mn + Ni + Fe + Al.
Cast: 70,000 TS; 20 El; 100 Brin.
Hot pressed: 85,000 TS; 25 El; 110 Brin.
For construction material for turbines, marine engines and locomotives; high strength, non-corrosive.

RUBEL BRONZE W-2.
M-2; 51 Cu, 43 Zn, 6 Mn + Ni + Fe + Al.
Cast: 70,000 TS, 18 El, 110 Brin.
Hot pressed: 85,000 TS; 22 El, 120 Brin.
For propellers, centrifugal drums, bearing bushings, steam and safety jackets; high strength, non-corrosive.

RUBEL BRONZE "W-3."
M-2; 40-55 Cu, 3-15 Ni, 1-3 Mn, 1-2 Fe, 0.5-3 0 Al, bal Zn.
Cast: 65,000 TS; 15 El; 105 Brin.
Hot pressed: 75,000 TS; 20 El; 115 Brin.
For die forgings, rods, tubes, propellers; corrosion resistant.

RUBELIT.
M-2; 40-55 Cu, 1-3 Mn, 3-15 Ni, 1-2 Fe, 0.5-3.0 Al, bal Zn
Hot pressed: 69,000-76,000 TS; 20-5 El; 130-190 Brin.
For bushings for bearings, piston bolts, valve guides, corrosion resistant.

RUBEL METAL.
Eng; 50-55 Cu, 40 Zn, 4-5 Fe + Mn.
60,000 TS.
For fittings, hardware; tough with high ductility.

RUBIS BA1.
M-1323; 0.50 C, 1 05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, forging dies, crankshafts; oil hardened, shock resistant.

RUBIS HKP
M 1323, 1 0 C, 0 1 V, 0.25 Mn, 0 20 Si, bal Fe.
For blanking dies, bearings, cutters; Type W2; water hardened.

RUHRLIT KOBALT 5.
M-1311; 0.79 C, 4.7 Co, 4 3 Cr, 0 75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, reamers, taps, drills; high speed steel.

RUHRLIT KOBALT 10.
M-1311, 0 72 C, 10 Co, 4.2 Cr, 0 8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, hobs, milling cutters, high speed steel.

RUHRLIT KOBALT 135
M-1311, 1 3 C, 4 3 Cr, 0.85 Mo, 3 8 V, 12 W, bal Fe.
For engraving tools, lathe and planer cutters, hobs; high speed steel.

RUHRLIT NH18.
M-1311, 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers; high speed steel.

RUHRLIT NH260.
M-1311; 0 86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, drills, taps; high speed steel.

RUHRLIT NHMO.
M-1311; 0.85 C, 4 1 Cr, Mo, W, V, bal Fe.
For lathe and planer tools, reamers, hobs, drills; high speed steel.

RUHRLIT S32.
M-1311; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, drills; high speed steel.

RUHRLIT SS20.
M-1311; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, drills, reamers, hobs; high speed steel.

RUHRLIT SS150.
M-1311; 1.35 C, Co, Cr, V, W, bal Fe.
For reamers, broaches, milling cutters; high speed steel.

RUHRLIT SS315.
M-1311; 0.95 C, Cr, W, Mo, bal Fe.
For reamers, broaches, milling cutters; high speed steel.

RUHRLIT SS460.
M-1311; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe
For engraving tools, milling cutters, broaches; high speed steel

RUHRSTAHL MI.
M-1382, 0.17 max C, 0.30 Si, 0.30 Mn, bal Fe.
Annealed: 70,000 TS, 55,000 YS; 25 El; 60 RA; 140 Brin.
For gears, pinions, machine tool parts, rivets; case hardened.

RUHRSTAHL MII
M-1382, 0.23 max C, 0.30 Si, 0.30 Mn, bal Fe.
Annealed. 75,000 TS; 60,000 YS; 22 El, 58 RA; 150 Brin.
For fan blades, bushings, bolts, nuts, rivets; water hardened

RULE BRASS 238
M-8, 35 Zn, 2.5 Pb, bal Cu
Soft 45,000 TS, 50 El.
Hard 73,000 TS, 7 El.
For screw machine products, bolts, nuts, screws; free cutting.

RUNE.
M-111, 1.4 C, 0.45 Cr, bal Fe
For razors; water hardening

RUPEE (SILVER).
91.6 Ag, 8.3 Cu
For coinage, corrosion resistant

R.U.S
M-1118, 0.95 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe
For tools, dies; non-deforming

RUSCAR
M-405; Pb, Sn, Sb
For antifraction bearings, Babbitt.

RUSELITE
M-99, M-1476; 4 Cu, 2 Cr, 2 Mo, 0.2 Ti, bal Al.
Die cast. 40,000 TS; 6 El.
Annealed: 30,000 TS, 20 El
For hardware, fixtures, housings, cases; corrosion resistant

RUSELITE NO 500.
M-99, 94.5 Al, 4 Cu, 1.25-1.50 Cr, 0.2 Mo, 0.2 Ti
For hardware, fixtures, corrosion resistant.

RUSSIAN-1.
Russia; 64 Cu, 18 Ni, 18 Zn, 0.3 Fe, 0.3 Pb.
For ornaments, corrosion resisting white metal parts, corrosion resistant.

RUSSIAN-2.
Russia; 1.3 Cu, 26.5 Zn, 72.2 Sn.
For bearings; anti-friction.

RUSSIAN-3.
Russia; 66-78 Cu, 21-34 Zn, 0-1 Sn.
For condenser tubes; high ductility.

RUSSIAN PACKING.
Russia; 98.5 Zn, 0.98 Sn, 0.32 Pb, 0.16 Fe.
For bearings; will not resist heat or live steam.

RUSTLESS 5.
M-100; 0.10 max C, 4-6 Cr, 1.0 max Mn, 1.0 max Si, bal Fe.
Annealed: 70,000 TS; 26,000 YS; 36 El; 69 RA; 135 Brin.
Worked: 90,000 TS; 80,000 YS; 20 El; 70 RA; 190 Brin.
For bolts, nuts, corrosion resistant.

RUSTLESS 8-20.
M-100; 0.25 max C, 7-10 Cr, 19-23 Ni, bal Fe.
Annealed 75,000 TS; 30,000 YS; 50 El, 70 RA; 125 Brin.
For valves; heat and corrosion resistant.

RUSTLESS 12.
M-100; 0.15 max C, 11.5-13.5 Cr, 1.0 max Mn, 1.0 max Si, bal Fe
Annealed 78,000 TS, 40,000 YS; 35 El; 73 RA; 148 Brin.
For valves, bolts, corrosion resistant.

RUSTLESS 12-2
M-100; 0.15 max C, 11.5-13.5 Cr, 1.25-2.50 Ni, bal Fe
Annealed· 115,000 TS; 93,000 YS; 20 El; 65 RA; 245 Brin
For valves, bolts, corrosion resistant.

RUSTLESS 12 Al
M-100, 0.08 max C, 11.5-13.5 Cr, 0.10-0.30 Al, bal Fe
Annealed. 75,000 TS; 45,000 YS, 30 El; 70 RA; 165 Brin.
For turbine blades; corrosion resistant.

RUSTLESS 12 FM
M-100; 0.15 max C, 12-14 Cr, 0.6 max Mo, 0.18-0.35 S, bal Fe.
Annealed· 78,000 TS, 40,000 YS, 31 El; 62 RA; 148 Brin
For screw machine parts, free cutting

RUSTLESS 12 T.
M-100; 0.15 max C, 11.5-13.0 Cr, 1.0 max Mn, 1.0 max Si, bal Fe.
Annealed. 78,000 TS, 40,000 YS, 35 El, 73 RA; 148 Brin.
For turbine blades; corrosion resistant.

RUSTLESS 13 C 35.
M-100, C, 12-14 Cr, 1.0 max Si, 1.0 max Mn, bal Fe
Annealed 98,000 TS; 60,000 YS; 28 El, 65 RA; 170 Brin.
Hardened· 250,000 TS, 225,000 YS, 8 El, 25 RA; 500 Brin
For surgical and dental instruments, corrosion resistant

RUSTLESS 13HC
M-100, 0.40 max C, 13-15 Cr, bal Fe.
For cutlery, ball bearings, valve trim, corrosion resistant.

RUSTLESS 13HC35.
M-100; 0.40 max C, 12-14 Cr, 0.5 max Ni, bal Fe.
Annealed. 85,000 TS; 40,000 YS; 34 El; 68 RA; 160 Brin.
Hardened· 250,000 TS; 190,000 YS, 3 El; 5 RA; 500 Brin.
For cutlery, scissors, surgical instruments; corrosion resistant.

RUSTLESS 15.
M-100; 0.12 max C, 14-16 Cr, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 35 El; 70 RA; 152 Brin.
Cold drawn: 110,000 TS; 95,000 YS; 12 El; 65 RA; 220 Brin.
For cold upset screw products, auto and refrigerator trim; non-hardenable, weldable.

RUSTLESS 16-2.
M-100; 0.2 max C, 15-17 Cr, 1.25-1.75 Ni, 1.0 max Mn, 1.0 max Si, bal Fe.
Annealed: 120,000 TS; 95,000 YS; 21 El; 60 RA; 245 Brin.
For bolts, shafting; corrosion resistant.

RUSTLESS 16-6.
M-100; 0.12-0.20 C, 15-17 Cr, 5-7 Ni, bal Fe.
Stainless.

RUSTLESS 17.
M-100; 0.12 max C, 14-18 Cr, 0.5 max Ni, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 75 RA; 140 Brin.
Worked: 100,000 TS; 10 El; 60 RA; 250 Brin.
For trim, ornaments, screws; stainless, non-hardening.

RUSTLESS 17-7.
M-100; 0.10-0.20 C, 16-18 Cr, 6-8.5 Ni, 2.0 max Mn, 1.0 max Si, bal Fe
Annealed: 105,000 TS; 45,000 YS; 55 El; 68 RA; 165 Brin.
Worked: 325,000 TS; 300,000 YS.
For stainless parts, springs, wire cloth; stainless, non-magnetic.

RUSTLESS 17-C-60.
M-100; 0.6-0.7 C, 16-18 Cr, 1.0 max Mn, 1.0 max Si, bal Fe.
Annealed: 105,000 TS; 65,000 YS; 23 El, 50 RA; 205 Brin.
For cutlery; wear resistant.

RUSTLESS 17-C-80.
M-100, 0.7-0.9 C, 16-18 Cr, 1.0 max Mn, 1.0 max Si, bal Fe.
Annealed: 107,000 TS; 62,000 YS; 19 El; 40 RA; 220 Brin.
For cutlery; wear resistant.

RUSTLESS 17-C-100.
M-100; 0.95 C, 16-18 Cr, 1.0 max Mn, 1.0 max Si, bal Fe.
Annealed: 110,000 TS; 60,000 YS; 15 El; 30 RA; 230 Brin.
Hardened: 288,000 TS; 275,000 YS; 2 El; 10 RA; 580 Brin.
For cutlery; wear resistant.

RUSTLESS 17FM.
M-100; 0.12 max C, 0.15 min S, 14-18 Cr, 0.5 max Ni, bal Fe.
Annealed: 75,000 TS; 34 El; 62 RA; 140 Brin.
Worked: 100,000 TS; 8 El; 58 RA; 250 Brin.
For screws, bolts; free cutting, stainless.

RUSTLESS 17HC60.
M-100; 0.65 C, 14-18 Cr, 0.5 max Ni, bal Fe.
Heat treated: 100,000-270,000 TS; 27-2 El; 55-3 RA; 190-575 Brin.
For cutlery, scissors, valve trim; stainless, hardenable.

RUSTLESS 17HC90.
M-100; 1.0 C, 14-18 Cr, 0.5 max Ni, bal Fe.
Heat treated: 105,000-285,000 TS; 21-1.5 El; 42-2 RA; 200-625 Brin.
For cutlery, scissors, valve trim; stainless, hardenable.

RUSTLESS 18-8.
M-100; 0.08-0.20 C, 2.0 max Mn, 1.0 max Si, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000 TS; 30,000 YS; 60 El; 70 RA; 150 Brin.
Worked: 250,000 TS; 225,000 YS.
For screws, bolts, stainless parts; stainless.

RUSTLESS 18-8 Cb.
M-100; 0.10 max C, 17-19 Cr, 9-12 Ni, Cb = 8 × C, bal Fe
Annealed: 87,000 TS; 32,000 YS; 50 El; 70 RA; 165 Brin.
For welded parts; stainless.

RUSTLESS 18-8FM (SELENIUM).
M-100; 0.20 max C, 1.0 max Mn, 0.10-0.35 Se, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 88,000 TS; 33,000 YS; 54 El; 60 RA; 165 Brin.
For shafting, valve parts; stainless, free cutting.

RUSTLESS 18-8FM (SULPHUR).
M-100, 0.20 max C, 2.0 max Mn, 1.0 max Si, 0.18-0.35 S, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 88,000 TS, 33,000 YS; 54 El, 60 RA; 165 Brin.
For shafting, valve parts, stainless, free cutting.

RUSTLESS 18-8 Ti.
M-100, 0.10 max C, 17-19 Cr, 8-11 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 30,000 YS; 55 El; 70 RA; 150 Brin
For welded parts; stainless.

RUSTLESS 18-12-3 Mo.
M-100, 0.10 max C, 16-18 Cr, 10-14 Ni, 1.75-2.50 Mo, bal Fe
Annealed: 85,000 TS, 30,000 YS; 60 El, 70 RA; 150 Brin.
For process industries, stainless parts; heat and corrosion resistant.

RUSTLESS 18-12-4 Mo
M-100; 0.10 max C, 17.5-20.0 Cr, 10-14 Ni, 3-4 Mo, bal Fe
Annealed 85,000 TS; 30,000 YS; 60 El; 70 RA; 150 Brin
For stainless parts; heat and corrosion resistant.

RUSTLESS 18-12MD
M-100; 0.09 max C, 16-20 Cr, 14 max Ni, 2-4 Mo, bal Fe
85,000-225,000 TS, 50,000-200,000 YS, 55-5 El; 70-55 RA; 140-400 Brin.
For heat resistant parts; heat and corrosion resistant

RUSTLESS 20-10.
M-100, 0.08 C, 20-22 Cr, 10-12 Ni, 2.0 max Mn, 1.0 max Si, bal Fe
Annealed: 95,000 TS; 60 El; 70 RA; 140 Brin.
Worked: 225,000 TS, 5 El; 55 RA; 400 Brin.
For welding wire, milk and food handling equipment, austenitic; Stainless Type 307.

RUSTLESS 21.
M-100, 0.35 max C, 18-23 Cr, bal Fe.
Annealed: 77,000 TS; 50,000 YS, 34 El; 63 RA; 170 Brin.
For stainless parts, oil-burner sleeves, nozzles; non-hardenable, not welded.

RUSTLESS 25-12.
M-100, 0.20 max C, 22-24 Cr, 12-15 Ni, 2.0 max Mn, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 50 El; 60 RA; 170 Brin.
For high temperature service and severe chemical corrosion; heat and corrosion resistant.

RUSTLESS 25-20.

M-100; 0.25 max C, 2.0 max Mn, 1.5 max Si, 24-26 Cr, 19-22 Ni, bal Fe.

Annealed: 90,000 TS; 40,000 YS; 50 El; 66 RA; 170 Brin.

For welding electrodes, furnace parts; resists heat to 2000°F.

RUSTLESS 27.

M-100; 0.35 max C, 23-27 Cr, 1.0 max Mn, 1.0 max Si, bal Fe

Annealed: 80,000 TS; 40,000 YS; 27 El; 60 RA; 175 Brin.

For exhaust manifolds, furnace parts; heat resistant.

RUSTLESS 29-9.

M-100; 0.25 max C, 27-31 Cr, 8-10 Ni, bal Fe.

Stainless Type 312.

RUSTLESS RR-11.

M-100, 0.07 max C, 10-12 Cr, bal Fe.

Annealed: 75,000 TS, 55,000 YS; 28 El; 65 RA; 170 Brin

Tempered: 100,000 TS; 80,000 YS; 22 El, 65 RA; 207 Brin.

For railroad and coal industry equipment; corrosion resistant, readily weldable.

R.V M

M-1724; 1.55 C, 11.5 Cr, 0.75 Mo, 0.25 V, bal Fe.

Air or oil hardening non-distorting complex alloy steel; for hot shear blades, tube expanders, swaging dies, cold drawing dies, press tools.

RYALLOY

M-240, 0.85-1.0 C, 1.6-1.9 Mn, 0.20-0.30 Mo, bal Fe.

For gauges, broaches, punches, shears, upsetters; Type O2; oil hardened.

RY-ALLOY DRILL.

M-240, 0.95 C, 1.6 Mn, 0.25 Si, 0.25 Mo, bal Fe

AISI Type O2 oil hardening tool steel.

RY-ALLOY FLAT

M-240, 0.90 C, 1.2 Mn, 0.3 Si, 0.5 Cr, 0.5 W, bal Fe

AISI Type O1 oil hardening tool steel.

RYANITE

M-464, 3.2 C, 2.4 Si, 1.5 Ni, 4 Cr, bal Fe.

Cast: 38,000-40,000 TS, 225-250 Brin

Heat treated. 60,000-70,000 TS; 425-450 Brin.

For dies, brake drums, dies for sheet metal fabrication, cast iron.

RYANITE NO 2

M-464, 3.4 C, 1.5 Ni, 0.5 Cr, bal Fe

For crankcases, cylinder blocks, cylinder barrels; cast iron.

RY-AX

M-240; 0.41 C, 1.55 Mn, 0.127 S, bal Fe.

Heat treated: 125,000-100,000 TS, 75,000-60,000 YS; 20-16 El; 50-45 RA; 225-228 Brin.

For axles, shafts, spindles; heat treated alloy steel.

RYCASE

M-240; 0.10-0.20 C, 1.0-1.3 Mn, bal Fe.

Heat treated: 82,000-119,000 TS; 64,000-99,000 YS; 19-22 El; 38-62 RA; 154-198 Brin.

For screw stock, carburized parts; free cutting, carburizing steel.

RYCO 44

M-240; 0.40-0.48 C, 1.35-1.65 Mn, bal Fe.

Hot rolled: 90,000 TS; 70,000 YS; 20 El; 50 RA; 225 Brin.

Cold drawn: 125,000 TS; 100,000 YS; 10 El; 30 RA; 269 Brin.

For spindles, axles, gears, studs, tie rods; tough, shock resistant.

RYCUT 20.

M-240; 0.20 C, 0.2 Pb, 0.5 Cr, 0.2 Mo, 0.6 Ni, 0.8 Mn, bal Fe.

Rolled: 92,000 TS; 65,000 YS; 24 El; 61 RA; 192 Brin.

For gears, spindles, cams, shafts, bushings; free-cutting, case hardening steel.

RYCUT 40.

M-240, 0.40 C, 0.15-0.35 Pb, 0.9 Cr, 0.2 Mo, 0.9 Mn, bal Fe.

Annealed: 88,000 TS; 61,000 YS; 25 El; 58 RA; 187 Brin.

Heat treated: 125,000-110,000 TS; 105,000-85,000 YS; 16-18 El; 50-45 RA; 328-248 Brin.

For gears, axles, cams, studs, wrenches, arbors; free-cutting, leaded 4140 steel.

RYCUT 47.

M-240; 0.47 C, 0.25 Pb, 0.9 Mn, 0.6 Ni, 0.5 Cr, 0.2 Mo, bal Fe

Annealed: 98,000 TS, 57,000 YS, 22 El; 49 RA; 197 Brin.

For arbors, axles, gears, shafts; free-cutting, oil hardened.

RYCUT 50

M-240; 0.5 C, 1 Mn, 1 Cr, 0.25 Mo, 0.2 Pb, bal Fe.

Annealed. 105,000 TS; 68,000 YS; 19 El; 50 RA; 202 Brin.

Heat treated: 140,000 TS; 120,000 YS, 15 El; 45 RA; 321 Brin.

For gears, shafts, spindles, axles, tools, wrenches; oil hardened, tough.

RY-CUT HEAT TREATED.

M 240, 0.38-0.53 C, Cr, Mo, Pb, bal Fe

Pre hardened bar stock, low alloy steel.

RY-DIE.

M-240, 1 C, 0.6 Mn, 5.2 Cr, 1.1 Mo, 0.25 V, bal Fe.

Heat treated: 154,000-251,000 TS; 13-5 El; 36-3 RA; 360-500 Brin.

For blanking and forming dies, shear blades; Type A2; air hardened, non-deforming.

RYERSON ABRASION RESISTING STEEL

M-240, C, alloy, bal Fe

For chutes, buckets, pulverizers, mixers, scraper blades, water hardened, wear and abrasion resistant.

RYERSON CARBON

M-240; 1.00 C, Mn, Si, bal Fe.

AISI Type W1 water hardening tool steel.

RYERSON H T M

M-240, 0.40 C, 1.12 Cr, 2.3 Ni, 0.4 Mo, bal Fe.

Heat treated: 140,000-298,000 TS; 105,000-237,000 YS; 20-12 El; 56-38 RA, 321-578 Brin.

For gears, worms, shafts, forming rolls; tough, shock resistant

RYERSON V.D.

M-240; 0.95 C, 0.18 V, 0.4 Mn, 0.25 Si, bal Fe.

For punches, pneumatic and hand chisels; water hardened; Type W2.

RYNALOY.

M-1211; 2.5 max C, 20 Ni, 1.8 min Cr, 6 max Si, 1 max Mn, bal Fe.

For ball and socket joints in aircraft exhaust systems; anti-galling, for use up to 1800°F.

RYOLITE SPECIAL HIGH SPEED TOOL STEEL.

M-240; 0.7 C, 18 W, 4 Cr, 5 Co, bal Fe.

For high speed tools and cutters; high speed steel.

RYTENSE AA.
M-240; 0.4 C, 1.55 Mn, 1.12 S, bal Fe.
Annealed: 118,000 TS; 68,000 YS; 23 El; 48 RA; 229 Brin.
Heat treated: 200,000 TS; 174,000 YS; 11 El; 38 RA; 415 Brin.
For gears, cams, arbors, rollers, bushings, wrenches, shafts; good machinability.

S-495 ALLOY.
M-1; 0.43 C, 19-24 Ni, 14-18 Cr, 4 W, 3.5 Mo, 3.6 Cb, bal Fe.
Rolled: 135,000 TS; 82,000 YS; 13 El; 15 RA.
For engine parts; heat resistant.

S-497 ALLOY.
M-1; 0.40-0.50 C, 19-21 Co, 15 Cr, 20 Ni, 4 Mo, 4 W, 4 Cb, bal Fe.
For gas turbine parts; heat resistant.

S-588 ALLOY.
M-1; 0.45 C, 0.5 Mn, 20 Cr, 20 Ni, 4 Mo, 4 W, 4 Cb, bal Fe.
For jet engines, turbines; heat resistant to 1500°F.

S-590 ALLOY.
M-1; 0 43 C, 1.6 Mn, 20 Cr, 20 Ni, 20 Co, 4.5 Mo, 4 W, 4 Cb, bal Fe.
For jet engines, turbines, wheels and buckets; heat resistant to 1500°F.

S-816 ALLOY.
M-1; 0.3-0.45 C, 18-22 Ni, 18-22 Cr, 3.5-5 0 Mo, 3.5-8.0 W, 2.5-4 Cb, 4 Fe, 38 Co min.
For jet engine parts, buckets for gas turbines; heat resistant, forging alloy.

SA.
M-459; 0.6 C, 2 Si, 9 Mn, bal Fe.
For springs.

SA-32.
M-1008; 0.2 C, 20 Cr, 12 Ni, bal Fe.
For furnace parts; resists heat to 1400°F.

SA200.
M-459; 0.8 C, 12 W, 4 Cr, 2.5 V, 0 85 Mo, bal Fe.
For milling cutters, lathe and planer tools, reamers; high speed steel, oil hardened.

SA 300.
M-459; 0.7 C, 4 Cr, 1 V, 9 Mo, 1.5 W, bal Fe.
For heavy duty drills, saw segments; high speed steel.

SA500.
M-459; 1.3 C, 4 Cr, 0.8 Mo, 4 V, 12 W, bal Fe.
For milling cutters, lathe and planer tools, drills, hobs; high speed steel, oil hardened.

SA900.
M-459; 1 5 C, 4.25 Cr, 0.65 Mo, 4.25 V, 12.5 W, 5 Co, bal Fe.
For tools, dies; cutters; high speed steel.

SABECO NO. 5.
M-966; 69-71 Cu, 4.5-5.5 Sn, 24-26 Pb
22,600 TS; 10 El; 9.5 RA, 52 Brin.
For light or medium load bearings, or water lubricated bearings, bearing bronze.

SABECO NO 9.
M-966; 69-71 Cu, 8.5-9.5 Sn, 20-22 Pb.
25,100 TS; 9.5 El; 8.3 RA; 60 Brin.
For heavy load bearings; bearing bronze.

SABECO NO. 11.
M-966; 69-71 Cu, 10.5-11.5 Sn, 18-20 Pb.
26,500 TS; 6 El; 6.5 RA; 66 Brin.
For extra heavy pressure bearings; bearing bronze.

SABECO NO. 11 H G.
M-966; 69-71 Cu, 10.5-11.5 Sn, 18-20 Pb.
27,300 TS; 4.3 El; 3.5 RA; 78 Brin.
For worm wheels, clutch shifter shoes, heavy bearings; bearing bronze.

SABECO NO. 14.
M-966; 70 Cu, 14 Sn, 16 Pb.
Cast: 27,300 TS; 4.2 El; 3.5 RA; 78 Brin.
For bearings, bushings.

SABECO NO. 16.
M-221; 69-71 Cu, 15.5-16.5 Sn, 13.5-14.5 Pb.
Cast: 32,250 TS, 22,500 YS; 1 El; 1.5 RA; 119 Brin.
For friction rings, heavy duty bearings; tough.

SABECO NO. 16.
M-966; 15-16.5 Sn, 13 5-14.5 Pb, bal Cu.
Cast: 32,250 TS, 1 El; 1.5 RA, 119 Brin.
For friction rings, heavy duty bearings; Babbitt.

SABEN.
M-618; 0.7 C, 14 W, 4 Cr, 1 V, bal Fe.
For punches, nail dies, drills, taps; high speed steel, oil hardened.

SABEN EXTRA
M-618; C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, dies, cutters; high speed steel.

SABEN KERAU.
M-618; C, 19 W, 4 Cr, 2 25 V, bal Fe.
For tools, dies, cutters; high speed steel.

SA-BEST EXTRA STANDARD.
M-357, 0 7-1 2 C, bal Fe.
For tools and dies, water hardening

SABEX
M-618, 0.25-0 35 C, 1.5 2.0 Ni, 2 0-2.5 Cr, 9-10 W, 0 15 V, bal Fe
For heading dies, extrusion mandrels and liners; hot work steel, oil hardened

SABRE
M-435, 1 25 C, 0 30 Si, 0 30 Mn, 10 W, 4.25 Cr, 2.5 Mo, 4 3 V, 5 5 Co, bal Fe.
For tool bits, form tools, form and blank dies, high red hardness, high speed steel.

S A BRILLIANT
M 333; 0 7 C, 18 W, 4 Cr, 1 V, bal Fe
For drills, lathe and planer tools; high speed steel.

SABUS
M-618, 0 7 C, 22 W, bal Fe
For glass cutting knives, drills, milling cutters, saws; super high speed steel.

SA-CN
M-333; 0 5 C, 2 5 W, bal Fe
For bolt heading dies, hot work punches, hot work steel

S.A DURABIL
M-333, 0.45 C, 1 25 Cr, 2.25 W, 0.2 V, bal Fe.
For hot work dies; impact resistant; hot work steel

SAE 300 (7Q5).
M-106, 6 25-7 75 Cu, 0 15-0 4 Mg, 5 0-6 0 Si, 0 7 max Fe, 0 6 max Mn, 0.5 max Ni, bal Al.
Chill cast· 42,500-49,000 TS; 40,000-47,000 YS; 0-1 El; 100-160 Brin, 0.5 Izod.
General purpose, chill cast only, good strength but low shock resistance; heat treatable.

SAE 4626.
0.24-0 29 C, 0 45-0 65 Mn, 0.2-0.35 Si, 0 70-1.0 Ni, 0.15-0 25 Mo, bal Fe
Normalized· 83,000 TS; 56,000 YS; 29 El; 165 Brin.
Oil hardened: 170,000 TS; 122,000 YS; 15 El, 350 Brin.
For case hardened gears, pinions, cams, camshafts. Case hardening.

SAE EX1.
M-68; 0.15-0.21 C, 0.35-0.60 Mn, 0.3 Si, 4.8-5.3 Ni, 0.2-0.3 Mo, bal Fe.
Hardened: 200,000 TS; 155,000 YS; 15 El; 60 RA; C 43 Rock.
For heavy duty parts in earth moving equipment, and trucks, rotary and percussion rock bits, ring gears, transmissions.
High strength and toughness. Shock resistant. Heavy duty carburizing steel.

SAE EX2.
M-68; 0.65-0.75 C, 0.25-0.45 Mn, 0.20-0.35 Si, 0.70-1.0 Ni, 0.15-0.30 Cr, 0.08-0.15 Mo, bal Fe.
Heat treated: 60 min Rock C.
For stress-bearing applications, spindles, rolls, bearings.
Wear resistant, shock resistant.

SAFLEX.
M-237; bimetal.
For thermostatic bimetal; active from 500-800°F.

SAGAMORE.
M-1; 1 C, 5 Cr, 1 Mo, 0.3 V, bal Fe.
For dies, tools, cold work dies, blanking, forming; cold work steel, air hardening, non-deforming.

SAGAMORE EZ
M-1, 1.0 C, 0.5 Mn, 0.25 Si, 5 Cr, 1 Mo, 0.25 V, 0.12 S, bal Fe.
For blanking and forming dies, slitter cutters, thread roller dies, gages, punches, forming rolls.
Air hardening, free-cutting
Type A2 nonderforming tool steel.

SAGAMORE V
M-1; 2.4 C, 5.25 Cr, 4.25 V, 1.1 Mo, bal Fe.
Air hardening tool steel, good wear resistance; AISI A7

SA GREY LABEL
M-333, 0.5 C, bal Fe
For drop forge dies

SAHIB
M-502, C, bal Fe.
For tools

SA HY-PRO.
M-333, 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For cutting tools, high speed steel

SA HY PRO DIE STEEL.
M-333, 1.5 C, 13 Cr, bal Fe
For dies, non-deforming

SAINT JUERY EXTRA
M-1119, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, dies, cutters; high speed steel.

SALAMANDRE D 1
M-1546, 1.0 C, 1.65 Cr, 0.5 Ni, 0.15 V, bal Fe.
Ht Tr . 200,000 TS; 185,000 YS, 3 El; 444 Brin.
For rollers, bearings, cams, bushings, sleeves, cutting tools, punches.
Cold work steel, oil hardening.

SALGE ANTIFRICTION METAL.
Eng , 86 Zn, 9.9 Sn, 4.0 Cu, 1.1 Pb.
For bearings, anti-friction.

SA LILY BRAND.
M-333; C, alloy, bal Fe.
For brass working dies

SALLIT'S SPECULUM.
65 Cu, 31 Sn, 4 Ni.
For metallic mirrors; corrosion resistant.

SAM ALLOY.
11 Mischmetal, 1.5 Cu, 1.25 Ni, 1 Mn, 0.3 Cr, 0.02 Ti, bal Al.
Cast: 15,000 TS; 0.5 El; 52 Brin.
Forged: 10.0 El; 62 Brin.
For aircraft engine components; high temperature resistance to 600°F.

S.A.M.B.
M-338; 0.2-1.0 Al, 56-59 Cu, 0.8-1.2 Fe, 0.2-2.0 Mn, 0.8-1.5 Sn, bal Zn.
75,000 TS; 35,000 YS; 20 El; 140 Brin.
For extrusions; corrosion resistant.

SAMLEGIERUNG.
13 Mn, 10.2 Si, 5.8 Al, 2.5 C, 0.3 Cu, bal Fe.

SAMPSON.
Eng.; 0.43 C, 0.43 Mn, 1.22 Ni, 0.43 Cr, bal Fe.
For tools, gears, oil hardened.

SAMPSON METAL.
88 Zn, 4 Cu, 8 Al
For bearings; anti-friction.

SA-N-65.
M-333; 0.5 C, 0.9 Cr, 0.2 V, bal Fe.
For rivet sets; punches; shock resistant.

SA-N-88.
M-333; C, alloy, bal Fe.
For hobs, punches; tough.

SANBRON AA
M-618, 0.1 C, 18 Cr, 8 Ni, bal Fe.
Annealed· 85,000 TS; 35,000 YS, 40 El, 55 RA; 150 Brin.
For trim, cabinets, hospital equipment; Type 302; stainless, austenitic.

SANBRON BB.
M-618, 0.15-0.35 C, 1 Ni, 12 min Cr, bal Fe.
Heat treated: 100,000-116,000 TS; 20 min El; 45 min RA, 207-235 Brin
For propeller blades, pump rods, valve parts; corrosion resistant, hardenable.

SANBRON CC.
M-618, 0.15 C, 1 Ni, 12 min Cr, bal Fe.
Heat treated: 103,000-116,000 TS; 20 min El; 45 min RA, 207-235 Brin
For chemical plant equipment; corrosion resistant, hardenable.

SANBRON DD
M-618; 0.25 max C, 1 min Ni, 16-20 Cr, bal Fe.
Heat treated· 123,000 TS; 20 min El; 25 min RA; 241 Brin
For chemical plant equipment; corrosion resistant, hardenable

SANBRON EE.
M-618; 0.15 max C, 1 max Ni, 12 max Cr, bal Fe.
Heat treated· 67,000-90,000 TS; 15 min El, 150 Brin
For corrosion resistant parts; corrosion resistant, hardenable.

SANBRON FF.
M-618; 0.25-0.35 C, 12.0-12.5 Cr, bal Fe.
Heat treated· 177,000 min TS; 8 min El; 25 min RA; 341-415 Brin
For surgical instruments, cutlery, knives; corrosion resistant, hardenable.

SANBRON H.S. NO. 1.
M-618, 0.65 C, 10 W, 3.0-3.5 Cr, 0.25 V, bal Fe.
For cold heading dies; high speed steel, oil hardened.

SANBRON H.S. NO. 2.
M-618; 0.45 C, 10 W, 3.5 Cr, 0.25 V, bal Fe.
For hot heading dies; hot work steel, oil hardened.

SANCY.
M-1115, 1.5-2.0 C, 11-13 Cr, bal Fe.
For forming and blanking dies, punches; oil or air hardened, non-deforming.

SANDERSON NO. 1.
M-618; 0.10-0.14 C, 0.08-0.12 Si, 0.7-0.9 Mn, bal Fe.
Heat treated: 61,000-78,500 TS; 45,000-55,000 YS; 49-44 El; 67-33 RA; 163-180 Brin.
For gears, pinions, shafts, machinery parts; case hardening steel.

SANDERSON NO. 2.
M-618; 0.15-0.18 C, 0.10-0 15 Si, 0.7-0.9 Mn, bal Fe.
Hot rolled: 83,000 TS; 67,000 YS; 37 El; 55 RA; 163 Brin.
Heat treated: 95,000 TS; 67,000 YS; 28 El; 60 RA; 180 Brin.
For gears, cams, shafts, machinery parts; case hardening steel.

SANDERSON 476.
M-618; 1.5 C, 11.5 Cr, 0 75 Mo, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming

SANDERSON 476 HEAVY DUTY.
M-618; 1.85 C, 11-12 Cr, 0.33 V, 0.7 Mn, bal Fe.
For blanking and forming dies, threading dies; oil hardened, non-deforming.

SANDERSON 476 SPECIAL.
M-618, 2.25 C, 13 Cr, bal Fe.
For blanking and forming dies, punches, oil hardened, non-deforming.

SANDERSON 3890.
M-618; 0.40-0.50 C, 0.5-0 7 Mn, bal Fe.
Annealed: 92,000 TS; 50,000 YS; 22 El; 40 RA; 200 Brin.
Heat treated: 105,000 TS; 67,000 YS; 25 El; 48 RA; 204 Brin.
For crankshafts, axles, steering rods, bolts; water hardened.

SANDERSON 4379 NON-STAIN
M-618, 0.28-0.35 C, 12.75-13 50 Cr, 0 45-0.55 Ni, bal Fe.
Heat treated: 168,000-228,000 TS; 153,000-219,000 YS; 17 El; 53 RA; 321 Brin.
For surgical instruments, cutlery, ball and roller bearings; corrosion resistant, hardenable.

SANDERSON B.883.
M-618; 0 35-0.40 C, 2.75-3.10 Ni, 0.5 Cr, 0.25 Mo, bal Fe.
Annealed: 112,000 TS, 90,000 YS; 25 El; 63 RA; 200 Brin.
Heat treated: 266,000 TS; 221,000 YS; 14 El; 39 RA; 500 Brin.
For gears, shafts, crankshafts, bolts, tough, shock resistant

SANDERSON CHROME-VANADIUM.
M-618; 0 28-0.35 C, 0.2-0.3 Cr, 0 25 V, bal Fe.
Annealed: 90,000 TS, 50,000 YS; 25 El; 45 RA; 180 Brin.
For valve plates for high pressure cylinders; water hardened, tough.

SANDERSON D70 MAGNET STEEL.
M-618; 0.7 C, 6 W, bal Fe.
For permanent magnet.

SANDERSON DOUBLE SPECIAL.
M-38; 1.3 C, 3.6 W, 0.25 Cr, bal Fe.
For finishing tools, drawing dies, also Crucible Double Special.

SANDERSON EXTRA.
M-38; 1-1.1 C, 0.25 Mn, bal Fe.
For punches, dies, cutters, general tools; water hardening.

SANDERSON EXTRA 3½.
M-38; 1 C, bal Fe.
For dies; cold heading dies.

SANDERSON EXTRA 4½.
M-38; 1 C, bal Fe.
For dies for wood screws; water hardening.

SANDERSON N.2832.
M-618; 0.15-0.20 C, 2.75-3.50 Ni, 0 5 Mn, bal Fe.
Annealed: 80,000 TS; 67,000 YS; 38 El; 52 RA; 163 Brin.
Heat treated: 100,000 TS; 71,000 YS, 32 El; 68 RA; 217 Brin.
For gears, shafts, machine tool parts, fixtures; case hardening steel, shock resistant.

SANDERSON N.2834.
M-618; 0 30-0.35 C, 0.6 Mn, 4.75-5.00 Ni, bal Fe.
Heat treated: 145,000-237,000 TS; 103,000-224,000 YS; 22-14 El; 61-47 RA; 311-444 Brin.
For gears, axles, crankshafts, propeller shafts; oil hardened, shock resistant.

SANDERSON N.3603
M-618; 0 15 C, 0 15 Si, 0.60 Mn, 5 Ni, bal Fe.
Hot rolled: 96,000 TS; 71,000 YS; 34 El; 48 RA; 217 Brin.
Heat treated 179,000 TS; 156,000 YS; 14 El; 42 RA; 350 Brin.
For shafts, camshafts, cams, fixtures; case hardening steel, shock resistant.

SANDERSON N 5366.
M-618; 0 30-0.35 C, 0 6 Mn, 2.75-3.25 Ni, bal Fe.
Heat treated: 127,000-134,000 TS; 112,000-123,000 YS; 23-20 El, 60-55 RA; 228-255 Brin
For valves, gears, crankshafts, axles; oil hardened, tough.

SANDERSON NK2237
M-618, 0 35 C, 0.4 Si, 0.5 Mn, 1.25 Ni, 1.0 Cr, bal Fe.
Normalized· 107,000 TS; 78,000 YS; 25 El; 42 RA; 215 Brin.
Heat treated: 256,000 TS, 417 Brin.
For gears, shafts, crankshafts; oil hardened, tough and wear resistant.

SANDERSON NK2833.
M-618, 0 28-0.35 C, 0.7 Mn, 1 9-2.2 Ni, 0.95-1 05 Cr, bal Fe
Heat treated 134,000-266,000 TS; 89,000-224,000 YS; 25-5 El; 55-6 RA; 277-247 Brin
For gears, shafts, crankshafts; oil hardened, tough and wear resistant

SANDERSON NK8053
M-618; 0.13-0.17 C, 0.6 Mn, 3.0-3.5 Ni, 0.6-0.75 Cr, bal Fe.
Heat treated· 112,000-134,000 TS; 89,000-112,000 YS; 13-15 El; 30-35 RA; 217-285 Brin.
For gears, chain wheels, cams, shafts; case hardening steel, shock and wear resistant.

SANDERSON NK8055
M-618; 0.30-0.35 C, 0 6 Mn, 3.0-3.5 Ni, 0.7-0.9 Cr, bal Fe
Annealed: 96,000 TS; 60,000 YS; 24 El; 48 RA; 196 Brin.
Heat treated: 134,000 TS; 116,000 YS; 21 El; 59 RA; 275 Brin.
For turnbuckles, crankshafts, bolts, gears; shock resistant, oil hardened.

SANDERSON NK8073.
M-618; 0.30-0.35 C, 0.5 Mn, 4.25-4.75 Ni, 1.25-1.50 Cr, bal Fe.
Oil hardened: 256,000 TS; 224,000 YS; 10 El; 25 RA; 500 Brin.

Air hardened: 246,000 TS; 212,000 YS; 15 El; 30 RA; 447 Brin.
For inlet valves, gears, bolts, crankshafts; shock resistant, oil or air hardened.

SANDERSON SPECIAL.
M-38; 1.1 C, 0.2 Cr, bal Fe.
For cutting tools, taps, reamers; water hardening.

SANDERSON SPECIAL.
M-618; 0.9 C, bal Fe.
For tools, drills; water hardened.

SANDERSON SPECIAL DRILL ROD.
M-38; 1.25 C, 0.25 Mn, bal Fe.
For tools, punches; drill rod

SANDERSON SS8085.
M-618; 0.5 C, 1.75-1.20 Si, 0.6-0.8 Mn, bal Fe.
Heat treated: 212,000-235,000 TS; 190,000-212,000 YS; 8-12 El; 25-30 RA.
For auto springs; tough, shock resistant.

SANDERSON TOOL.
M-38; 0.07-1.2 C, bal Fe.
For punches, dies, general tools; water hardening.

SANDERSON TUNGSTEN TAP.
M-38; 1.1 C, 1.4 W, bal Fe.
For cutting tools, fast finishing.

SANDERSON XX.
M-903, 0.9 C, 1 Cr, bal Fe.
For burnishing tool; water hardening.

SANDOW
M-173, 0.4 C, 0.9 Cr, 0.2 Mo, bal Fe.
Heat treated: 125,000 TS; 110,000 YS; 19 El; 47 RA, 293 Brin.
For axles, gears, crane hooks, mandrels, tough, oil hardened.

SANDUSKY NO. 5
M-295, C, 1.25-1 5 Ni, bal Fe.
Cast 25,000-40,000 TS; 180-250 Brin.
For cast iron rolls; centrifugal casting

SANDUSKY 55.
M-295, 1.3 Fe, 20.1 Ni, 1.0 Mn, bal Cu.
Cast: 75,900 TS, 55,600 YS; 14 El, 140 Brin.
Tubes for marine propulsion shaft sleeves and for paper machine roll application.

SANDUSKY ALLOY 63.
M-295; 0.08 max C, 19.5-23.5 Cr, 8.0-12.0 Ni, 2 0-4 0 Mo, 2.0 Mn, 0.50 max Ti, 0.25 max N, bal Fe.
Cast: 92,700 TS; 54,200 YS; 43 El, 182 Brin.
Tubes for paper machine roll application.

SANDUSKY I N.
M-295; 85-87 Cu, 4-6 Sn, 3-5 Zn, 4-6 Pb, 0.5-1 0 Ni.
35,000-45,000 TS; 15,000 YS; 20-25 El; 60-70 Brin.
For rolls, cylinders, liners, shaft sleeves, bushings; centrifugal castings.

SANDUSKY SA-351.
M-295; 0.08 max C, 18-21 Cr, 8-11 Ni, bal Fe.
Cast: 75,000 TS; 40,000 YS; 55 El; 156 Brin.
Annealed: 77,000 TS, 37,000 YS; 55 El; 140 Brin.
For pumps, valves, impellers, food processing equipment, digesters, mixers; corrosion resistant, austenitic, non-magnetic.

SANDVIK 1B.
M-101; 0.06 max C, bal Fe.
Normalized: 50,000 TS; 38,000 YS; 44 El; 67 RA; 100 Brin.
For flexible tubing, deep drawn parts, tin plate containers; ductile.

SANDVIK 1C27.
M-101, M-101a, M-101b; 0.08 max C, 0.3 Si, 0.3 Mn, 13.5 Cr, bal Fe.
Ferritic-martensitic chromium corrosion resistant steel; weldable.
For heat exchanger tubes.
W. Nr. 1.4000; AISI (405).

SANDVIK 1C34.
M-101, M-101a, M-101b; 0.05 C, 0.3 Si, 0.3 Mn, 17.0 Cr, bal Fe.
Chromium stainless steel wire for cold heading; Werkstoff Nr. 4016; AISI 430.
Also used as MIG, TIG welding wire.

SANDVIK 1C345.
M-101, M-101a, M-101b; 0 08 C, 0.5 Si, 0.5 Mn, 16.7 Cr, 1.8 Mo, 0.6 Ti, bal Fe.
Ferritic stabilized stainless tubing.
For heat exchangers, gas preheaters, evaporators.
DIN X8 Cr Mo Ti 17; Werkstoff Nr. 1.4523.

SANDVIK 1DT.
M-101; 0 07 max C, 0 03 Si, 0.15 Mn, bal Fe.
Normalized: 46,000 TS; 31,000 YS; 52 El; 79 RA; 90 Brin.
For lamp globes, housings, deep drawn parts; ductile.

SANDVIK 1DTR.
M-101, 0.07 max C, 0.03 Si, 0.15 Mn, bal Fe.
For magnetic purposes; low coercive force.

SANDVIK 1HS49.
M-101, M-101a, M-101b, 0.05 C, 0.5 Si, 1.9 Mn, 2.0 Ni, 0.55 Mo, bal Fe.
Wire as filler metal for welding low carbon, low alloy steels.

SANDVIK 1S15.
M-101; 0 05 max C. 1.5 Si, 0.1 Cu, bal Fe.
Annealed: 64,000 TS, 36 El.
For relays, small transformers and electric motors; dynamo iron, high permeability.

SANDVIK 1S35
M-101; 0.06 C, 3.4 Si, bal Fe.
Annealed: 85,000 TS; 36 El.
For relay cores, transformers; magnetic iron, high permeability.

SANDVIK 1XR17.
M-101, M-101a, M-101b; 0.010 max C, 0.4 Si, 1.8 Mn, 0 015 max P, 0 015 max S, 20 Cr, 9 5 Ni, bal Fe.
Drawn wire for MIG, TIG, and submerged arc welding of 18-8 stainless steel.

SANDVIK 2 C-34.
M-101; 0.13 C, 17 Cr, bal Fe.
Annealed: 78,000 TS; 47,000 YS; 36 El; 66 RA; 165 Brin.
At 800°C: 6,720 TS; 90 El, 99 RA.
For use where material is to be subjected to hot bending or welding, superheater tubes; cutlery; resists corrosion of HNO_3 but not of HCl or H_2SO_4; stainless.

SANDVIC 2C344.
M-101, M-101a, M-101b; 0.10 C, 0.9 Si, 0.3 Mn, 17.5 Cr, 1.0 Al, bal Fe.
Ferritic, aluminum-alloyed stainless tubing.
For gas preheaters, furnace conveyor rollers, soot blower tubes; good scaling resistance.
Werkstoff Nr. 1.4742.

SANDVIK 2LS.
M-101; 0.10 C, 0.15 Si, 0.4 Mn, 0.2 Cr, 0.3 max Cu, bal Fe.
Normalized: 57,000 TS; 40,000 YS; 45 El; 70 RA; 110 Brin.
For machine parts; case hardening steel.

SANDVIK 2 N-3 Cl.

M-101; 0.08-0.13 C, 0.35-0.60 Mn, 0.5-0.8 Cr, 2.75-3.5 Ni, bal Fe.

Annealed: 80,000-95,000 TS; 38,000-55,000 YS; 32-38 El; 60-70 RA; 160-195 Brin.

Hardened: 130,000-156,000 TS; 100,000-130,000 YS; 18-24 El; 58-65 RA; 285-350 Brin.

For gears, wheels, piston rods, cam shafts, steering arms, levers; case-hardening steel.

SANDVIC 2N9.

M-101, M-101a, M-101b; 0.08 C, 0.2 Si, 0.5 Mn, 0.02 max P, 0.02 max S, 9.3 Ni, bal Fe.

R.T.: 108,000 TS; 99,000 YS; 25 El.

-320°F: 149,000 TS; 135,000 YS; 25 El.

Weldable, for containers for low temperature operation, liquified gases.

SANDVIK 2R16.

M-101, M-101a, M-101b; 0.020 max C, 0.3 Si, 1.0 Mn, 0.015 max P, 0.015 max S, 19.5 Cr, 10.5 Ni, bal Fe.

Drawn wire for MIG, TIG, and submerged arc welding of 18-8 stainless steel.

Werkstoff Nr. 4302/4316; AISI 304L.

SANDVIK 2R17.

M-101, M-101a, M-101b; 0.020 max C, 0.4 Si, 1.8 Mn, 0.015 max P, 0.015 max S, 20.5 Cr, 10.0 Ni, bal Fe.

Drawn wire for MIG, TIG and submerged arc welding of austenitic stainless steels.

SANDVIK 2R61.

M-101, M-101a, M-101b; 0.02 max C, 0.4 Si, 1.4 Mn, 0.015 P, 0.015 S, 18.5 Cr, 10.5 Ni, 2.7 Mo, bal Fe.

Drawn wire for MIG, TIG and submerged arc welding of stainless steel. AISI 316L.

SANDVIK 2R62.

M-101, M-101a, M-101b, 0.02 max C, 0.35 Si, 1.8 Mn, 0.015 max P, 0.015 max S, 19.5 Cr, 13.0 Ni, 2.2 Mo, bal Fe.

Drawn wire for MIG, TIG and submerged arc welding of stainless steel.

Similar to AISI 316/317.

SANDVIC 2R63.

M-101, M-101a, M-101b, 0.02 max C, 0.35 Si, 1.8 Mn, 0.015 max P, 0.015 max S, 18.0 Cr, 12.0 Ni, 2.8 Mo, bal Fe.

Drawn wire for MIG, TIG and submerged arc welding of 316 type stainless steel.

Werkstoff Nr. 4403/4430; AISI 316L

SANDVIK 2RE10.

M-101, M-101a, M-101b; 0.02 max C, 0.30 max Si, 1.75 Mn, 24.5 Cr, 20.5 Ni, 0.30 max Mo, bal Fe.

Austenitic stainless steel with special resistance to oxidizing conditions as in nitric acid, used in chemcal plants.

SANDVIK 2RK65

M-101, M-101a, M-101b; 0.02 max C, 1.8 Mn, 19.5 Cr, 25.0 Ni, 4.5 Mo, 1.5 Cu, bal Fe.

Tube, ann: 71,000-107,000 TS; 31,000 min YS; 40 min El.

Austenitic stainless with high resistance to sulphuric acid, phosphoric acid, for heating coils, heat exchanger tubes, in chemical tanks.

SANDVIK 2RN65.

M-101, M-101a, M-101b; 0.020 max C, 0.45 Si, 1.8 Mn, 17.5 Cr, 24.0 Ni, 4.7 Mo, bal Fe.

Tube, ann: 71,000-107,000 TS; 31,000 min YS; 40 min El; 165 VDH, (approx.).

Austenitic stainless steel tubes, high resistance to general corrosion, especially sulphuric acid and chlorides; for textile, pulp and paper industries.

SANDVIK 2S.

M-101; 0.10 C, 0.15 Si, 0.4 Mn, bal Fe.

Normalized: 57,000 TS; 39,000 YS; 45 El; 70 RA; 110 Brin.

For boiler and locomative tubes; also case hardening steel.

SANDVIK 3HS32.

M-101, M-101a, M-101b; 0.15 C, 0.15 Si, 0.95 Mn, 1.35 Cr, 0.90 Mo, 0.25 V, bal Fe.

Tube: 135,000-164,000 TS; 114,000 YS; 10 El; 290-340 VDH.

Bainitic high strength steel tubes.

For mechanically loaded tubular construction.

Werkstoff Nr. 1.7734.

SANDVIK 3L7.

M-101; 0.12 C, 0.15 Si, 0.7 Mn, bal Fe.

Normalized: 64,000 TS; 44,000 YS; 42 El; 72 RA; 125 Brin.

For bus bodies; good welding properties.

SANDVIK 3LS.

M-101; 0.15 C, 0.15 Si, 0.5 Mn, bal Fe.

Normalized: 60,000 TS; 40,000 YS; 41 El; 65 RA; 115 Brin.

For machine parts, gears, shafts; case hardened steel.

SANDVIK 3 Mo

M-101, M-101a, M-101b; 0.15 C, 0.2 Si, 0.7 Mn, 0.02 max P, 0.02 max S, 0.33 Mo, bal Fe.

For tubes exposed to steam temperature

Yield point at 570°F: 31,500 psi min.

Yield point at 930°F: 21,500 psi min

DIN 15Mo3

SANDVIK 3Mo1

M-101; 0.15 C, 0.5 Mo, bal Fe

Annealed: 68,000 TS, 47,000 YS; 38 El, 135 Brin.

For boiler and superheater tubes for steam; for steam temperatures up to 900°F.

SANDVIK 3R12

M-101, M-101a, M-101b; 0.030 max C, 0.45 Si, 0.8 Mn, 18.5 11.0 Ni, bal Fe.

1% offset yield, 210°F: 24,200 psi min.

1% offset yield, 1110°F: 15,600 psi min

Low carbon austenitic stainless, weldable, for tubing for food and dairy plants, breweries, chemical and nuclear power plants

Werkstoff Nr. 1.4306, 1.4316, AISI 304L.

SANDVIK 3R13

M-101, M-101a, M-101b, 0.03 C, 0.45 Si, 0.85 Mn, 18.0 Cr, 12.5 Ni, bal Fe.

Austenitic stainless steel wire for cold-heading, Werkstoff Nr. 4306, AISI 305.

SANDVIK 3R19

M-101, M-101a, M-101b, 0.030 C, 0.45 Si, 0.8 Mn, 18.5 Cr, 11.0 Ni, 0.18 N, bal Fe

0.2% offset yield, 68°F 42,700 psi min

0.2% offset yield, 750°F: 21,300 psi min.

Used largely for tubing carrying gas or fluid under pressure Werkstoff Nr. 1.4311

SANDVIK 3R60.

M-101, M-101a, M-101b, 0.030 max C, 0.6 Si, 1.7 Mn, 17.0 Cr, 13.6 Ni, 2.8 Mo, bal Fe

1% offset yield at 390°F: 21,300 psi min.

1% offset yield at 1110°F. 14,200 psi min.

Austenitic stainless tube steel, improved corrosion resistance, weldable

Miscellaneous tubing applications where corrosion resistance is major requirement.

Werkstoff Nr. 1.4435; AISI 316L.

SANDVIK 3R64.

M-101, M-101a, M-101b; 0.03 C, 0.45 Si, 1.8 Mn, 18.5 Cr, 14.5 Ni, 3.5 Mo, bal Fe.

Annealed: 85,000 TS; 45,000 YS; 60 El; B80 Rock.
For paper and pulp mill equipment, chemical plant equipment, acid tanks, digesters, evaporators.
Austenitic, stainless, Type 317L.

SANDVIK 3R67.
M-101, M-101a, M-101b; 0.025 max C, 0.4 Si, 1.8 Mn, 0.015 max P, 0.15 max S, 19.0 Cr, 13.5 Ni, 3.3 Mo, bal Fe.
Drawn wire for MIG, TIG and submerged arc welding of Type 317 stainless steels. AISI 317.

SANDVIK 3RE13.
M-101, M-101a, M-101b; 0.025 max C, 0.4 Si, 1.8 Mn, 0.015 max P, 0.015 max S, 24.0 Cr, 13.5 Ni, bal Fe.
Wire for MIG, TIG and submerged arc welding of stainless steel. AISI 309.

SANDVIK 3RE60.
M-101, M-101a, M-101b; 0.30 max C, 1.65 Si, 1.5 Mn, 18.5 Cr, 4.7 Ni, 2.7 Mo, bal Fe.
Tube: 92,000-128,000 TS; 64,000 min YS; 30 El; 260 VDH.
Ferritic-austenitic stainless with high resistance to stress corrosion and intergranular corrosion; largely for heat exchanger tubes.

SANDVIK 3RN14.
M-101, M-101a, M-101b; 0.03 C, 0.45 Si, 0.85 Mn, 16.5 Cr, 18.0 Ni, bal Fe.
Austenitic stainless steel wire for cold-heading.

SANDVIK 3RS17.
M-101, M-101a, M-101b; 0.025 max C, 0.85 Si, 1.8 Mn, 20.6 Cr, 9.7 Ni, bal Fe.
Austenitic stainless steel wire for metallizing; also for welding using MIG methods

SANDVIK 3RS61.
M-101, M-101a, M-101b; 0.025 max C, 0.85 Si, 1.7 Mn, 0.015 max P, 0.015 max S, 18.5 Cr, 10.5 Ni, 2.7 Mo, bal Fe.
Drawn wire for MIG welding of Type 316 stainless steel Werkstoff Nr 4403/4430.

SANDVIK 3RS62.
M-101, M-101a, M-101b, 0.025 max C, 0.85 Si, 1.8 Mn, 19.5 Cr, 13 Ni, 2.3 Mo, bal Fe.
Austenitic stainless steel wire for metallizing, similar to AISI 316L. Also used for MIG welding.

SANDVIK 4C27A.
M-101; 0.20 C, 0.9 Ni, 1.0 Mn, 0.18 S, 12-14 Cr, 1.3 Mo, bal Fe
Annealed: 95,000 TS, 50,000 YS; 25 El; 55 RA; 195 Brin.
Cold drawn: 105,000 TS; 85,000 YS, 17 El; 50 RA; 215 Brin.
For cutlery, valves, turbine blades, gages, gears; stainless, hardenable.

SANDVIK 4C54.
M-101, M-101a, M-101b; 0.18 C, 0.5 Si, 0.8 Mn, 27.0 Cr, bal Fe.
Ferritic chromium stainless steel.
Yield strength at 1110°F: 15,500 psi min.
Good resistance to scaling, sulphurous gases, oil-ash corrosion at elevated temperatures; for pyrometer protection tubes, soot-blowing, tubes, heat exchangers.
Werkstoff Nr. (1.4083); AISI 446.

SANDVIK 4HSL31.
M-101, M-101a, M-101b; 0.18 C, 0.25 Si, 0.75 Mn, 1.5 Cr, 0.40 Mo, 0.03 Al, 0.004 B, bal Fe.
Tube: 121,000-142,000 TS; 100,000 YS; 15 El.
Bainitic high strength steel tube.
For mechanically loaded tubular construction.

SANDVIK 4L7.
M-101; 0.20 C, 0.7 Mn, bal Fe.
Normalized: 71,000 TS; 51,000 YS; 33 El; 67 RA; 140 Brin.
For bake oven tubes, boiler and superheater tubes for steam; steam temperature up to 850°F.

SANDVIK 4LM.
M-101; 0.20 C, 1.45 Mn, bal Fe.
Normalized: 81,000 TS; 48,000 YS; 28 El; 160 Brin.
For weldable tubes, engineering purposes; tough.

SANDVIK 4LS.
M-101; 0.20 C, 0.2 Si, 0.1 Mn, bal Fe.
Normalized: 65,000 TS; 46,000 YS; 38 El; 60 RA; 130 Brin.
For gears, pinions, shafts; case hardening steel.

SANDVIK 4N2C34.
M-101, M-101a, M-101b; 0.20 C, 0.3 Si, 0.5 Mn, 16.6 Cr, 2.2 Ni, bal Fe.
Martensitic stainless steel, hardenable to about 205,000 psi TS.
For stainless structural parts requiring high strength; good to about 900°F.
Werkstoff Nr. 1.4057; AISI 431.

SANDVIK 5LMV.
M-101, M-101a, M-101b; 0.25 C, 0.25 Si, 1.4 Mn, 0.10 V, bal Fe.
Normalized: 60,000-75,000 TS; 45,000 min YS; 22 El; 180-220 Brin.
Hardened: 78,000-95,000 TS; 70,000 min YS; 13 El, 240-280 Brin.
Mechanical tubing, weldable, for tubular load carrying structures. Werkstoff Nr (1.5213).

SANDVIK 5R10
M-101, M-101a, M-101b, 0.05 max C, 0.45 Si, 0.45 Mn, 18.5 Cr, 9.3 Ni, bal Fe.
Ann. 102,000 TS, 50,000 YS; 55 El
Half hard: 156,000 TS; 128,000 YS; 17 El.
General purpose stainless steel for food, soft drink, brewery, dairy plants and for chemical plants. Werkstoff Nr. 4301; AISI 304.

SANDVIK 5R60
M-101, M-101a, M-101b; 0.05 max C, 0.6 Si, 1.7 Mn, 17.4 Cr, 13.4 Ni, 2.7 Mo, bal Fe.
Austenitic stainless with excellent corrosion resistance, for use in food and beverage plants, textile, chemical plants
Werkstoff Nr 4436; AISI 316

SANDVIK 5RA50
M-101, M-101a, M-101b, 0.05 max C, 0.45 Si, 1.8 Mn, 0.030 max P, 0.20 S, 18.0 Cr, 10.0 Ni, 0.5 Mo, bal Fe.
Austenitic stainless steel; for food and chemical processing equipment, free machining type.
Werkstoff Nr (1.4305); AISI 303.

SANDVIK 6C27.
M-101; 0.30 C, 14 Cr, bal Fe
Annealed: 104,000 TS; 74,000 YS, 28 El; 55 RA; 255 Brin.
For electric razors; stainless, martensitic, hardenable.

SANDVIK 6HS63.
M-101, M-101a, M-101b; 0.30 C, 0.25 Si, 0.55 Mn, 1.0 Cr, 3.3 Ni, 0.25 Mo, bal Fe.
Ann: (approx) 107,000 TS, 230 VDH.
Hardened: 156,000-199,000 TS; 128,000-149,000 YS; 10-12 El.
Steel tubing, hardenable.
For internal gears, female splined couplings.
Werkstoff Nr. (1.5755).

SANDVIK 6LM.
M-101; 0.3 C, 0.2 Si, 1.35 Mn, bal Fe.
Normalized: 92,000 TS; 62,000 YS; 32 El; 61 RA; 180 Brin.
For bicycle tubes, hollow blooms; water hardening, for cold drawing.

SANDVIK 6R42.
M-101, M-101a, M-101b; 0.06 max C, 0.4 Si, 1.3 Mn, 0.025 max P, 0.020 max S, 19.5 Cr, 9.5 Ni, 0.9 Nb, bal Fe.
Niobium stabilized wire for MIG, TIG, and submerged arc welding of austenitic stainless steels.
Werkstoff Nr. 4551.

SANDVIK 6R60.
M-101, M-101a, M-101b; 0.04 max C, 0.6 Si, 1.7 Mn, 17.5 Cr, 12.6 Ni, 2.8 Mo, bal Fe.
Austenitic stainless hard drawn wire for springs; 0.013-0.124 in dia. wire has 220,000-277,000 psi TS; very good corrosion resistance.
Werkstoff Nr. 4436; AISI 316.

SANDVIK 6R81.
M-101, M-101a, M-101b; 0.06 max C, 0.4 Si, 1.3 Mn, 0.025 max P, 0.020 max S, 19.0 Cr, 11.0 Ni, 2.7 Mo, bal Fe.
Niobium stabilized wire for MIG, TIG, and submerged arc welding of austenitic stainless steels.
Werkstoff Nr. 4576.

SANDVIK 7C27Mo2
M-101; 0.35 C, 13.5 Cr, 0.4 Ni, 1.2 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For valves, cutlery, oil refinery equipment; corrosion resistant.

SANDVIK 7L.
M-101; 0.35 C, 0.2 Si, 0.5 Mn, bal Fe.
Normalized: 82,000 TS; 54,000 YS, 31 El; 50 RA, 170 Brin.
For mechanical parts, axles, hydraulic cylinders; water hardened.

SANDVIK 7R60.
M-101, M-101a; M-101b; 0.55 C, 0.6 Si, 1.7 Mn, 0.020 max P, 0.020 max S, 16.5 Cr, 13.5 Ni, 2.3 Mo, bal Fe.
1% proof stress at 750°F: 22,800 psi min.
1% proof stress at 1290°F: 18,500 psi min.
Austenitic stainless with molybdenum; Good hot strength and resistance to scaling; for steam pipes and super heater tubes.
ASTM A213 Gr. TP 316 H, etc.

SANDVIK 7RE12
M-101, M-101a, M-101b; 0.055 C, 0.3 Si, 1.5 Mn, 0.015 max P, 0.015 max S, 25.5 Cr, 21.0 Ni, bal Fe.
Wire for MIG, TIG and submerged arc welding of Type 310 stainless steel.
Werkstoff Nr, 4842; AISI 310.

SANDVIK 8R30.
M-101, M-101a, M-101b; 0.08 max C, 0.6 Si, 1.5 Mn, 0.020 max P, 0.020 max S, 17.5 Cr, 11.5 Ni, Ti = 5 × % C min, bal Fe.
1% proof stress at 750°F: 23,500 psi min.
1% proof stress at 1290°F: 17,800 psi min.
Austenitic stabilized stainless for steam pipes and superheater tubes for temperatures up to about 800°C (1470°F).
Werkstoff Nr. 4541.

SANDVIK 8R40.
M-101, M-101a, M-101b; 0.08 max C, 0.45 Si, 1.8 Mn, 0.020 max P, 0.020 max S, 17.5 Cr, 11.5 Ni, Nb = 10 × % C min, bal Fe.
1% proof stress at 750°F: 27,000 psi min.
1% proof stress at 1290°F: 20,500 psi min.
Austenitic stabilized stainless for super heater tubes for temperatures up to about 1290°F.
Werkstoff Nr. 1.4550.

SANDVIK 8R41.
M-101, M-101a, M-101b; 0.08 max C, 0.45 Si, 1.3 Mn, 0.020 max P, 0.020 max S, 16.5 Cr, 13.0 Ni, Nb = 10 × % C, bal Fe.
1% proof stress at 750°F: 27,000 psi min.
1% proof stress at 1290°F: 20,500 psi min.
Austenitic stabilized stainless; mainly used for steam pipes and super heater tubes to temperatures of about 1290°F.
Werkstoff Nr. 4961.

SANDVIK 8R42.
M-101, M-101a, M-101b; 0.06 max C, 0.4 Si, 1.3 Mn, 19.5 Cr, 9.5 Ni, 0.9 Nb, bal Fe.
Stabilized austenitic stainless steel wire for metallizing.

SANDVIK 8R70.
M-101, M-101a, M-101b; 0.08 max C, 0.5 Si, 1.8 Mn, 17.0 Cr, 13.0 Ni, 2.2 Mo, Ti = 5 × % C min, bal Fe.
Stabilized austenitic stainless steel; very good corrosion resistance even at elevated temperatures; for food and chemical industries.
Werkstoff Nr. (1.4571).

SANDVIK 8R81.
M-101, M-101a, M-101b; 0.06 max C, 0.45 Si, 1.3 Mn, 19 Cr, 11 Ni, 2.8 Mo, 0.9 Nb, bal Fe.
Austenitic stainless steel wire for metallizing.

SANDVIK 10L.
M-101, 0.5 C, 0.25 Si, 0.5 Mn, bal Fe.
Normalized: 100,000 TS; 63,000 YS; 28 El, 41 RA; 205 Brin.
For tubes, gears, shafts, water hardened

SANDVIK 10RA50.
M-101, M-101a, M-101b; 0.08 C, 0.65 Si, 1.6 Mn, 0.030 max P, 0.30 S, 17.5 Cr, 9.5 Ni, 0.5 Mo, bal Fe
Austenitic free-machining stainless steel.
For shafts, pins, bolts, studs, screws, etc., that require much machining but must be stainless

SANDVIK 10RE21.
M-101; 0.08 C, 0.45 Si, 0.45 Mn, 26.3 Cr, 5.0 Ni, 1.45 Mo, bal Fe.
Annealed. 105,000 TS, 80,000 YS, 25 El, 230 Brin.
For valves, valve fittings, pump parts.
Type 329 heat resistant steel.

SANDVIK 11.
M-101; 0.60 C, 0.20 Si, 0.30 Mn, bal Fe.
Heat treated: 115,000-160,000 TS; 77,000-113,000 YS; 23-12 El; 54-40 RA; 229-320 Brin.
For wheels, die blocks, girders, rails, discs; water hardened.

SANDVIK 11L.
M-101; 0.6 C, 0.25 Si, 0.5 Mn, bal Fe.
Normalized: 107,000 TS; 63,000 YS; 26 El; 37 RA; 225 Brin.
For springs, typewriter parts; water hardened, for cold drawing.

SANDVIK 11R51.
M-101a; 0.09 C, 8 Ni, 17 Cr, 1.1 Si, 1.25 Mn, 0.7 Mo, bal Fe.
Rolled: 299,000 TS; 277,000 YS; 2-4 El.
Tempered: 341,000 TS; 327,000 YS; 1-4 El.
For springs for instruments; high fatigue life and tensile strength

SANDVIK 12.
M-101; 0.63 C, 0.25 Si, 0.35 Mn, bal Fe.
Normalized: 114,000 TS; 64,000 YS; 24 El; 33 RA; 240 Brin.
For tools, mechanical parts; water hardened.

SANDVIK 12C27.
M-101, M-101a, M-101b; 0.58 C, 0.35 Si, 0.35 Mn, 14.0 Cr, bal Fe.
Chromium stainless strip steel; hardenable.
For cutlery, surgical knives, food processing knives; in thin strips for razor blades.

SANDVIK 12R10
M-101, M-101a, M-101b; 0.10 C, 0.45 Si, 0.45 Mn, 18 Cr, 9 Ni, bal Fe
Hard drawn stainless steel wire for springs; .013-.125 in dia: 256,000-313,000 psi TS
Werkstoff Nr. 4300; AISI 302.

SANDVIK 12R10HV.
M-101, M-101a, M-101b; 0.10 C, 0.45 Si, 0.45 Mn, 18 Cr, 9 Ni, bal Fe.
Vacuum melted austenitic hard drawn spring wire· 0.013-125 dia has 256,000-313,000 psi. TS, very good fatigue properties
Werkstoff Nr. 4300; AISI 302.

SANDVIK 12R11.
M-101; 0.10 C, 0.45 Si, 0.45 Mn, 18 Cr, 7.7 Ni, bal Fe
Annealed: 110,000 TS, 40,000 YS, 60 El, B85 Rock.
Available in 8 other tempers
For aircraft structural members, trailer bodies, wheel covers, diaphragms, springs.
Type 301 stainless, austenitic

SANDVIK 12R72HV.
M-101, M-101a, M-101b, 0.10 C, 0.5 Si, 1.8 Mn, 0.020 max P, 0.010 max S, 15.0 Cr, 15.0 Ni, 1.2 Mo, 0.40 Ti, 0.006 B, bal Fe.
1% proof stress at 750°F. 27,700 psi min.
1% proof stress at 1200°F: 25,600 psi min
Austenitic Mo-Ti stabilized Ni-Cr stainless for steam or superheater tubes or other parts at temperatures up to about 1380°F

SANDVIK 12 W 12-C 1.
M-101, 0.65 C, 5.5-6.0 W, bal Fe
For magnetic parts, magnetic steel.

SANDVIK 13
M-101; 0.70 C, 0.3 Si, 0.45 Mn, bal Fe
Normalized· 117,000 TS; 64,000 YS; 23 El; 30 RA; 250 Brin
For piston rings, umbrella ribs, clicker dies, water hardened.

SANDVIK 13LM.
M-101; 0.75 C, 0.65 Mn, bal Fe
Annealed· 175 Brin
For springs, oil or water hardened.

SANDVIK 13M.
M-101, M-101a, M-101b; 0.75 C, 0.2 Si, 0.65 Mn, bal Fe.
Bainite hardened strip steel; 192,000-228,000 TS; 171,000-199,000 YS; 6-8.5 El; 41-47 Rock C
For stamped and lightly formed parts
Werkstoff Nr. 0605/1 1248, AISI 1074.

SANDVIK 14BSA
M-101, M-101a, M-101b; 0.68 C, 0.25 Si, 0.85 Mn, 0.015 max P, 0.15 S, bal Fe
Free machining, water hardening, carbon steel; for shafts, pins, screws, studs, miscellaneous hardware.

SANDVIK 14N3.
M-101; 0.75 C, 2.6 Ni, bal Fe.
Heat treated: 199,000 TS.
For wood band saws; oil hardened.

SANDVIK 14NC.
M-101; 0.75 C, 0.15 Cr, 0.5 Ni, bal Fe.
Heat treated: 192,000 TS.
For wood band saws, chain saws; oil hardened.

SANDVIK 14P.
M-101, 0.75 C, 0.2 Pb, bal Fe.
Rolled· 120,000 TS.
For clock and watch parts; free-cutting.

SANDVIK 14S1C1.
M-101; 0.75 C, 0.35 Cr, 1.4 Si, bal Fe.
Heat treated: 127,000 TS.
For springs, friction saws, flapper valves; oil hardened.

SANDVIK 15RE10
M-101, M-101a, M-101b; 0.12 C, 0.55 Si, 1.8 Mn, 24.5 Cr, 20.5 Ni, bal Fe.
0.2% offset yield at 1290°F: 17,000 psi min,
Austenitic stainless, weldable, good resistance to oxidation at elevated temperatures, for heat exchanger tubes, furnace parts.
Werkstoff Nr 1.4845; AISI 310.

SANDVIK 15RE12
M-101, M-101a, M-101b; 0.12 C, 0.45 Si, 1.8 Mn, 0.015 max P, 0.015 max S, 26.0 Cr, 21.0 Ni, bal Fe
Wire for MIG, TIG and submerged arc welding of Type 310 stainless steel
Werkstoff Nr 4842; AISI 310

SANDVIK 15VDT.
M-101, 0.80 C, 0.1 V, bal Fe.
Drawn 100,000 TS.
For wire for latch needles; water hardened.

SANDVIK 17
M-101, 1.0 C, 0.25 Si, 0.45 Mn, bal Fe.
For tools, springs, valves, doctor blades, water hardening

SANDVIK 17AP
M-101; 1.0 C, 0.2 Pb, 0.05 S, 0.025 P, bal Fe.
Annealed 82,000 TS.
For watch parts, machinery parts; free-cutting, oil hardened.

SANDVIK 17C
M-101; 1.0 C, 0.15 Cr, 0.3 Si, 0.3 Mn, bal Fe.
Annealed 85,000 TS, 185 Brin.
For tools, saws, springs, piston skirt expanders; water hardening

SANDVIK 17VDT.
M 101, 1.0 C, 0.1 V, bal Fe.
For needle wire, oil hardened.

SANDVIK 18C283
M-101, 1.05 C, 14 Cr, 0.5 Mo, 0.5 Co, 0.25 Cu, bal Fe.
Annealed: 125,000 TS, 250 Brin.
For knives, ball bearings, ball point pens, stainless, hardenable.

SANDVIK 18RM11
M-101, M-101a, M-101b, 0.15 C, 0.4 Si, 6.0 Mn, 18.0 Cr, 8.0 Ni, bal Fe.
Austenitic stainless steel wire for metallizing and for welding. Werkstoff Nr. 4370

SANDVIK 20
M-101, 1.15 C, 0.25 Si, 0.35 Mn, bal Fe.
For needles, cutters, tools; water hardening.

SANDVIK 20P.
M-101, 1.15 C, 0.2 Pb, bal Fe.
For reeds in musical boxes; water hardened.

SANDVIK 20W.
M-101; 1.15 C, 0.15 W, bal Fe.
For watch mainsprings; oil hardened.

SANDVIK 20 WIW.
M-101; 1.15 C, 0.5 W, 1 V, bal Fe.
For tools, dies; water hardening.

SANDVIK 21C.
M-101; 1.25 C, 0.15 Cr, 0.2 Si, 0.35 Mn, bal Fe.
For razor blades, band saws; water hardening.

SANDVIK 21T10.
M-101; 1.25 C, 0.25 Cr, 1.75 W, 0.1 V, bal Fe.
210 Brin.
For tools, cutters, saw blades; fast finishing steel.

SANDVIK 21T10P.
M-101; 1.25 C, 0.25 Cr, 1.75 W, 0.1 V, 0.2 Pb, bal Fe.
For dental burs, saw blades; Ledloy.

SANDVIK 22C.
M-101, M-101a, M-101b; 1.29 C, 0.2 Si, 0.3 Mn, 0.15 Cr, bal Fe.
Strip steel, designed for metal band saws, hardenable.

SANDVIK CORONA 62.
M-101, M-101a, M-101b; 0.80 C, 0.3 Si, 0.3 Mn, 4.0 Cr, 5.0 Mo, 6.3 W, 2.0 V, bal Fe.
High speed steel metal band saw steel AISI M2.

SANDVIK CORONA 67.
M-101, M-101a, M-101b; 0.92 C, 0.3 Si, 0.3 Mn, 4.0 Cr, 2.0 Mo, 1.0 W, 2.25 V, bal Fe.
Air or oil hardening metal band strip steel.

SANDVIK HARDFLEX 11L.
M-101, M-101a, M-101b; 0.55 C, 0.25 Si, 0.5 Mn, bal Fe.
Bainite hardened stripsteel: 128,000-164,000 TS; 107,000-142,000 YS, 10-14 El, 27-36 Rock C.
For stamped and lightly formed parts.
Werkstoff Nr. 1.1210; (AISI 1055).

SANDVIK HARDFLEX 13LM.
M-101, M-101a, M-101b; 0.65 C, 0.2 Si, 0.75 Mn, bal Fe.
Bainite hardened strip steel: 192,000-228,000 TS; 171,000-199,000 YS; 6-8.5 El; 41-47 Rock C.
For stamped and lightly formed parts
Werkstoff Nr 0603/1.1231, AISI 1065.

SANDVIK HT3.
M-101; 0.10 max C, 5 Cr, bal Fe.
Annealed: 70,000-72,000 TS; 28,000-30,000 YS; 28-36 El; 65-70 RA; 135-160 Brin.
For oil refinery equipment; Type 502, heat and creep resistant.

SANDVIK HT5.
M-101; 0.12 C, 0.9 Cr, 0.55 Mo, bal Fe
Annealed: 74,000 TS; 46,000 YS; 30 El; 65 RA; 170 Brin.
For boiler and superheater tubes; for steam temperature up to 950°F.

SANDVIK HT7.
M-101; 0.08 C, 9 Cr, 1 Mo, 0.7 Si, bal Fe.
Annealed: 92,000 TS; 67,000 YS, 30 El, 73 RA; 195 Brin.
For tubes in oil refineries and superheaters.

SANDVIK HT8
M-101; 0.12 C, 2.25 Cr, 1 Mo, bal Fe.
Annealed: 75,000 TS; 50,000 YS; 33 El; 76 RA; 170 Brin.
For boiler and superheater tubes; for steam temperature up to 1005°F.

SANDVIK HT9.
M-101, M-101a, M-101b; 0.20 C, 0.3 Si, 0.55 Mn, 0.02 max P, 0.02 max S, 12.0 Cr, 0.5 Ni, 1.0 Mo, 0.3 V, 0.5 W, bal Fe.
At 570°F: 57,000 min YS.
At 930°F: 43,000 min YS.
Ferritic chromium steel for super heater tubes for temperatures up to about 1200°F.
Werkstoff Nr. 1.4935.

SANDVIK HT91.
M-101, M-101a, M-101b, 0.20 C, 0.3 Si, 0.55 Mn, 0.02 max P, 0.02 max S, 12.0 Cr, 0.5 Ni, 1.0 Mo, 0.3 V, bal Fe.
0.2% proof stress at 570°F: 57,000 psi.
0.2% proof stress at 930°F: 43,000 psi.
Ferritic chromium steel for superheater tubes to operate up to about 1200°F.
Werkstoff Nr. 1.4922

SANDVIK ON50HV.
M-101; 0.02 max C, 0.08 max Si, 0.45 Mn, 51 Ni, bal Fe.
Soft magnetic iron-nickel alloy.
Low coercive force; high permeability; co-efficient of expansion same as lead glass; for reed relays.

SANDVIK SANICRO 30
M-101, M-101a, M-101b; 0.030 max C, 0.55 Si, 0.55 Mn, 0.015 max P, 0.015 max S, 0.10 max Cu, 20.0 Cr, 34.0 Ni, 0.35 Ti, 0.30 Al, bal Fe
Nickel-iron-chromium alloy tube, wire.
Good resistance to oxidation, stress corrosion, gases as elevated temperature
Werkstoff Nr 1.4876; ASTM B163 Alloy 800.

SANDVIK SANICRO 31.
M-101, M-101a, M-101b; 0.04 C, 0.55 Si, 0.55 Mn, 0.015 max P, 0.015 max S, 0.10 max Cu, 21.0 Cr, 31.0 Ni, 0.35 Ti, 0.30 Al, bal Fe.
Nickel-iron-chromium alloy bar, tube, strip, wire.
High resistance to scaling in air, to carburization, to nitrogen absorption, to stress corrosion; used in petroleum industry.
Werkstoff Nr 1.4876; ASTM B163, B407, B408, B409

SANDVIK SANICRO 70
M-101, M-101a, M-101b, 0.030 max C, 0.35 Si, 0.55 Mn, 0.015 max P, 0.010 max S, 16.0 Cr, 74 Ni, 9 Fe.
Austenitic nickel base alloy; good resistance to scaling, carburizing and steam at elevated temperatures.
Werkstoff Nr 2.4816; ASTM B163, B166, B167.

SANDVIK SANICRO 71
M-101, M-101a, M-101b, 0.55 C, 0.35 Si, 0.8 Mn, 0.015 max P, 0.015 max S, 0.10 max Cu, 16.0 Cr, 72.5 Ni, 9.5 Fe, 0.35 Ti, 0.25 Al
Austenitic nickel base alloy; good resistance to attack by most gases at elevated temperature.
Werkstoff Nr. 2.4816; ASTM B163, B166, B167.

SANDVIK SANICRO 72.
M-101, M-101a, M-101b; 0.030 max C, 0.20 Si, 3.0 Mn, 0.010 max P, 0.010 max S, 20.0 Cr, 72.5 Ni, 0.32 Ti, 1.0 max Fe, 2.5 Nb
Wire for MIG, TIG and submerged arc welding of nickel base alloys, stainless steels and carbon steels.

SANDVIK TITANIUM 9.
M-101; 0.15 max Fe, 0.035 max C, 0.01 max N, 0.09 max O, 0.005 max H, bal Ti.
Very high purity titanium; for parts and tubing for nuclear reactors, sea water, acids, plating equipment; also used in wire form for welding titanium.

SANDVIK TITANIUM 20.
M-101; 0.30 max Fe, 0.05 max C, 0.03 max N, 0.20 max O, 0.015 max H, bal Ti.
High purity titanium; for chemical industry, pulp and paper industry, electroplating racks, food industry, heat exchangers.

SANDVIK ZIRCALOY 2.
M-101, M-101a, M-101b; 1.20-1.70 Sn, Fe + Cr + Ni = 0.18-0.38, bal Zr (high purity).
For fuel element canning tubes in nuclear reactors. ASTM B353.

SANDVIK ZIRCALOY 4.
M-101, M-101a, M-101b; 1.20-1.70 Sn, Fe + Cr = 0.28-0.37, bal Zr (high purity).
For fuel element canning tubes in nuclear reactors, ASTM B353.

SANICRO see SANDVIK SANICRO.

SA N-N.
M-333; 0.5 C, 2 W, bal Fe.
For gripper dies, piercers; hot work steel.

SA NON PA-REIL.
M-333; 0.9 C, 1.2 Mn, bal Fe.
For dies, punches, upsetters, crimpers;
Type O1; non-deforming

SANS RIVAL.
M-1119; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe
For tools, dies, cutters, high speed steel.

SA/O
M-459; C, Si, Mn, bal Fe.
For springs; oil hardening

S A.P. 865
M-555, M-249, M-1605; 13-14 Al_2O_3, bal Al.
Sintered 49,000 TS; 35,000 YS; 8 El; 105 Brin.
At 930°F· 16,000 TS; 13,500 YS; 2 El.
For compressor blades, engine components, heat exchangers, pistons, cylinder heads.
High creep resistant Sintered powder. Dispersion hardened.

S.A P. 895
M-249, M 1605, M-555, 10-11 Al_2O_3, bal Al
At 70°F. 43,000 TS, 29,000 YS, 16 El, 100 Brin.
For compressor blades, engine components, heat exchangers, pistons, cylinder heads
Sintered powder Dispersion hardened.

S A P. 930
M-249, M-1605, M-555; 7 Al_2O_3, bal Al.
At 70°F. 36,000 TS, 23,000 YS, 20 El; 90 Brin
At 750°F. 12,100 TS; 11,200 YS; 5.7 El.
For compressor blades, engine components, heat exchangers, cylinder heads, pistons
Strong high temperature material Sintered powder Dispersion hardened

SAPHIR
M-1120; 1.0-1.2 C, bal Fe
For drills, taps, reamers, shears, punches; Type W1, water hardened

SARATOGA.
M-1; 0.90 C, 0.38 Si, 0.50 W, 1.2 Mn, 0.5 Cr, bal Fe
Oil hardenable to 652-302 Brinell.
For plastic mold dies, bolster dies, slitting cutters, taps, reamers, broaches, plug gages, threading dies, Izod 6-96.

SARDO.
M-344; 1.5 C, 13 Cr, bal Fe.
For tools, dies, non-deforming, air hardening.

SASHCHAIN.
92-95 Cu, 8-5 Sn.
For sash chain; bronze.

SATAN.
M-365; 0.23 C, 0.60 Mn, 1.25 Si, 10.0 Cr, 0.75 Ni, 1.0 V, 0.45 W, 0.45 Mo, bal Fe.
Hot work tool steel, chromium type.

SATCO.
M-88; 97.5 Pb, bal Ca, Sn, etc.
27 Brin.
For bearings, crosshead gibs, trailer and driving boxes; white metal, for high speeds and heavy loads.

SATCO.
M-958; 94-98 Pb, 1-2 Sn, Ca + hardeners.
Cast· 8-12 El; 22-24 Brin.
For bearings; lining for steel backed bearings.

SATMUMETAL.
M-108; 53-58 Ni, bal Fe.
Max. permeability 240,000.
Flux density 15,000, coercive force 0.025.
Initial permeability 65,000.
For small distribution transformers, instrument transformers, ground leakage protective devices, torroids
Soft magnetic alloy.

S.A T T. SPECIAL.
M-333; 1.2 C, 0.75 Cr, 1.5 W, 0.2 Mo, bal Fe.
For tools, cutters; oil hardening.

SATURN
M-114, 1.25 C, 3.5 W, bal Fe.
For wire drawing plates, dies, cutting tools, chasers, drills; fast finishing steel.

SAUBRON HOT DIE
M-618, C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe
For hot dies, hot die steel.

SAUREFEST alloys see JUNKER

SAUT-DU-TARN NO. 1.
M-1119, 0.9-1.0 C, bal Fe.
For tools, drills, punches; water hardened.

SAUT-DU-TARN NO. 2
M-1119, 1.1 C, bal Fe
For tools, drills; water hardened.

SAUT-DU-TARN 18 CD 4F
M-1494; 0.14-0.25 C, 0.80-1.2 Cr, 0.15-0.30 Mo, bal Fe.
Heat treated. 165,000-222,000 TS; 92,000 YS; 8 RA.
For gears, bolts, cams, camshafts; oil hardened, tough

SAUT-DU-TARN 25 CD 4F
M-1494; 0.22-0.30 C, 0.80-1.2 Cr, 0.15-0.30 Mo, bal Fe
Heat treated 186,000-242,000 TS, 107,000 YS; 3 RA.
For gears, bolts, crankshafts; oil hardened, tough.

SAUT-DU-TARN 30.NC.11F.
M-1494, 0.25-0.35 C, 0.60-0.90 Cr, 2.5-3.0 Ni, bal Fe
Heat treated: 128,000-157,000 TS, 107,000 YS; 8 RA
For gears, bolts, crankshafts, oil hardened, shock resistant.

SAUT-DU-TARN 35 CD 4F
M-1494; 0.30-0.39 C, 0.80-1.2 Cr, 0.15-0.30 Mo, bal Fe.
Heat treated: 221,000-245,000 TS; 2 RA.
For gears, bolts, crankshafts; oil hardened, tough.

SAUT-DU-TARN 35.NC 15H.
M-1494; 0.30-0.38 C, 1.5-1.9 Cr, 3.5-4.0 Ni, bal Fe.
Heat treated: 242,000 TS; 5 RA.
For gears, bolts, crankshafts; oil hardened, shock resistant.

SAUT-DU TARN 35.NCD.6F
M-1494, 0.30-0.38 C, 0.8-1.2 Cr, 1.2-1.6 Ni, 0.15-0.30 Mo, bal Fe.
Heat treated: 165,000-200,000 TS; 144,000 YS.
For gears, bolts, crankshafts; oil hardened, shock resistant.

SAUT-DU-TARN 35.NCD.12H.
M-1494; 0.25-0.35 C, 0.70-1.2 Cr, 2.7-3.3 Ni, 0.25-0.45 Mo, bal Fe.
Heat treated: 150,000 TS; 127,000 YS.
For gears, bolts, crankshafts; oil hardened, shock resistant.

SAUT-DU-TARN 45.S7.
M-1494; 0.40-0.50 C, 1.6-2.1 Si, 0.4-0.8 Mn, bal Fe.
Heat treated: 192,000-242,000 TS; 150,000 YS; 3 El; 241 Brin.
For springs, torsion bars; oil hardened, tough.

SAUT-DU-TARN 55.S6.
M-1494; 0.55 C, 1.6-2.1 Si, 0.6-1.0 Mn, bal Fe
Heat treated: 186,000-213,000 TS, 170,000 YS, 2 El, 270 Brin.
For springs, torsion bars; oil hardened, tough.

SAVA-Y.
M-541, M-1220; 3.8-4.2 Cu, 1.3-1.7 Mg, 1.8-2.3 Ni, bal Al.
Cast: 36,000-47,000 TS, 32,700-42,700 YS, 0.5 El; 100-115 Brin.
For pistons, cylinder heads; age hardenable, heat resistant.

SAVILLE B-1.
M-486; 0.55 C, 0.6 Mn, bal Fe.
For rifle barrels, gear wheels, housings; water hardening.

SAVILLE BEST CAST STEEL
M-486; 0.7-1.2 C, 0.3 Mn, bal Fe
For blanking and forming dies, shear blades, water hardening.

SAVILLE CAST.
M-486; 0.7-1.2 C, 0.3 Mn, bal Fe
For punches, shear blades, chisels, files, water hardening

SAVILLE CAST STEEL WARRANTED.
M-486; 0.7-1.2 C, 0.3 Mn, bal Fe.
For wood working tools, punches, drills, taps, water hardening.

SAVILLE CROWN.
M-486; 0.44 C, 0.35 Mn, 1.3 Cr, 0.15 V, 2.3 W, bal Fe.
For punches, chipping chisels, pneumatic tools; tough, shock resistant

SAVILLE F 2.
M-486; 0.57 C, 0.7 Cr, 0.2 V, bal Fe.
For die casting dies, hot steel die

SAVILLE F.7
M-486, 0.48 C, 1.5 Cr, 1.2 W, 0.12 V, 0.7 Ni, bal Fe
For chisels, rivet snaps, beading tools; shock resistant.

SAVILLE G-0.
M-486; 0.33 C, 0.5 Mn, 3.5 Ni, 0.75 Cr, bal Fe.
For bearing caps, valve rockers, propeller shafts; shock resistant.

SAVILLE G-1 SPECIAL.
M-486; 0.32 C, 0.5 Mn, 4.1 Ni, 1.2 Cr, 0.25 Mo, bal Fe.
For gears, pinions, shafts; tough.

SAVILLE G-2.
M-486; 0.42 C, 1.3 Si, 13 Ni, 13 Cr, 2.5 W, bal Fe.
At 70°F. 106,000 TS; 31 El.
At 1100°F: 66,000 TS; 35 El.
At 1500°F. 32,000 TS; 55 El.
For aircraft engine exhaust valves; austenitic, resists shock at high temperature.

SAVILLE G-14.
M-486; 0.39 C, 4.1 Ni, 1.3 Cr, 0.3 Mo, bal Fe.
For chisels, cold punches, press tools; shock resistant.

SAVILLE G-18 B.
M-486; 0.4 C, 1 Si, 13 Ni, 13 Cr, 0.10 Co, 3 Nb, 2.5 W, 2 Mo, bal Fe.
At 70°F: 92,000 TS; 40 El.
At 1300°F: 56,000 TS; 12 El.
At 1500°F: 44,000 TS, 9 El.
For aircraft engine exhaust valves; austenitic, high hot strength.

SAVILLE H-27.
M-486, 0.37 C, 0.6 Mn, 3 Cr, 0.9 Mo, 0.2 V, bal Fe.
190,000 TS; 12 El; 435 Brin.
For crankshafts, air-screen shafts; shock resistant, nitriding steel.

SAVILLE H-30.
M-486; 0.6 C, 0.6 Mn, 0.6 Cr, bal Fe.
Heat treated: 110,000-130,000 TS; 80,000-90,000 YS; 15-12 El; 300-341 Brin.
For cylinder liners, gears, axles; water hardening.

SAVILLE H-42
M-486, 1.65 C, 0.45 Mn, 13 Cr, 0.7 Mo, 0.3 V, bal Fe.
For burnishing rolls, shear blades, master hobs; air hardening, nondeforming

SAVILLE H-44
M-486, 1.0 C, 0.7 Mn, 1.45 Cr, bal Fe
For press tools, shear blades, cold rolls; cold work steel

SAVILLE J 23
M-486, 0.36 C, 0.4 Si, 2.6 Cr, 1 V, 1.8 W, 4.3 Mo, bal Fe.
For die casting dies, swaging dies; hot die steel

SAVILLE J-32
M-486, 0.32 C, 4 Ni, 1.5 Cr, 5.8 W, 0.35 V, bal Fe.
For hot punches, stamping dies, hot work steel

SAVILLE K 18.
M-486; 0.32 C, 0.95 Si, 5 Cr, 1.4 W, 1.7 Mo, bal Fe.
For die casting dies, hot die steel

SAVILLE KSA
M-486, 0.9 C, 1.85 Mn, 0.45 Cr, 0.45 W, bal Fe
For gauges, taps, dies, chasers, cams, pawls; non-deforming, oil hardening

SAVILLE O.K.
M-486, 0.44 C, 1.3 Cr, 2.3 W, 0.7 Si, 0.15 V, bal Fe.
For die and punches for hot work, resists heat checking.

SAVILLE PERMABRITE
M-486; 0.10-0.14 C, Cr, Ni, bal Fe.
For stainless steel parts, austenitic super-stainless

SAVILLE RUSTLESS IRON
M-486, 0.15 C, Cr, Ni, bal Fe
For stainless parts, stainless, dead soft type

SAVILLE STAINLESS STEEL.
M-486, 0.28-0.32 C, Cr, Ni, bal Fe.
For stainless parts; stainless, hardening quality.

SAVILLE S V.I.
M-486; 0.32 C, 4.1 Ni, 1.3 Cr, 0.2 Mo, bal Fe.
Hardened: 215,000 TS, 190,000 YS; 12 El; 477 Brin.
For plastic molding dies; shock resistant, air hardening.

SAVILLE WPS.
M-486; 2.3 C, 0.35 Mn, 13 Cr, bal Fe.
For gauges, shear blades, thread rollers; resists wear and corrosion, non-deforming.

SAVILLE XLD.
M-486; 0.82 C, 5 Cr, 0.6 Mo, 1.7 V, 22 W, 17 Co bal Fe.
For turning, planing and boring tools; high speed steel.

SA/W.
M-459; C, Si, Mn, bal Fe.
For springs; oil hardening.

SA-WHITE LABEL.
M-333; 0.9 C, bal Fe.
For taps, drills, forming and blanking dies; water hardening.

SAXONIA METAL.
England; 84.8 Zn. 5.3 Sn, 6 Cu, 3 Pb, 0.2 Al.
For bearings; will not resist heat or live steam.

SA-YELLOW LABEL.
M-333; 0.8 C, 0.9 Cr, 0.2 V, bal Fe.
For punches, dies, shear blades; oil hardening.

S-BABBITT.
M-815, M-314; 15 Sb, 1 As, 1 Sn, 0.5 Cu, bal Pb.
At 70°F: 10,350 TS; 2 El; 20 Brin.
At 392°F: 1260 TS; 95 El.
For bearings, liners; Babbitt.

SC.
M-459; C, Cr, Si, Mn, bal Fe.
For springs; oil hardening.

SC-6.
M-1200; 0.50 C, 0.7 Mn, 1.5 Ni, 0.75 Cr, 0.5 Mo, bal Fe.
Normalized: 180,000 TS; 140,000 YS; 8 El; 12 RA; 240 Brin.
For gears, pinions, shafts, axles; oil hardened, shock resistant.

S.C.C.-210.
M-1295; 0.10 Al, 0.34 C, 0.62 Co, 0.09 Fe, 0.06 Mn, 0.21 Mg, bal Ni.
For filaments for battery tubes.

S.C.C.-213.
M-1295; 1.9 Al, 2.1 U, 1.0 W, bal Ni.
For filaments and grids.

S.C.C.-213M.
M-1295; 1 Al, 0.25 C, 2 Mo, bal Ni.
For grid wire.

S.C.C.-531.
M-1295; 19 Co, 2.5 Fe, 1.5 Si, bal Ni
For rectifier filaments.

S.C.C.-925C.
M-1295; 1.9 Al, trace C, bal Ni.
For filaments for battery tubes.

S.C.C.-C43.
M-1295; 0.10 Mn, 3.5 Si, bal Ni.
For rectifier filaments.

S.C.C.-W4.
M-1295; 0.04 C, 0.9 Co, 0.03 Fe, 0.02 Cu, bal Ni.
For filaments and grids; heat resistant.

SCEPTRE BRASS.
62 Cu, 36 Zn, 1.4 Fe, 1.1 Al, 0.07 Pb.
For ornamental parts, hardware; high strength

SCHENK DGZnA14Cul (Z400).
M-1453; 3.5-4.3 Al, 0.6-1.0 Cu, 0.02-0.05 Mg, bal Zn.
Die cast: 38,000 TS; 2 El; 80 Brin.
For ornaments, instrument housings; high strength.

SCHENK DGZnA14 (Z400).
M-1453; 3.5-4.3 Al, 0.6 max Cu, 0.02-0.05 Mg, bal Zn.
Die cast: 36,000 TS; 1.5 El; 70 Brin.
For ornaments, instrument housings, high strength.

SCHENK DMgA1911.
M-1453; 7.6-10.0 Al, 0.1-1.0 Zn, 0.1-0.6 Mn, bal Mg.
Die cast: 22,000-31,000 TS; 1.0-0.2 RA; 55 Brin.
For instrument housings.

SCHENK GA1CuSi NO. 223.
M-1453; 4-7 Cu, 2-4 Si, bal Al.
Sand cast: 23,000-30,000 TS; 17,000-23,000 YS; 0.5-2 El; 75-100 Brin.
For aircraft castings; age-hardenable.

SCHENK GA1Mg3(Cu) NO. 241.
M-1453; 1.5-4.0 Mg, bal Al.
Sand cast; 20,000-27,000 TS; 11,000-14,500 YS; 6-2 El; 50-65 Brin.
For marine castings; corrosion resistant.

SCHENK GA1Mg3HY31.
M-1453; 1.5-3.5 Mg, bal Al.
Sand cast: 19,900-27,000 TS; 11,400-14,300 YS; 8-3 El; 50-60 Brin.
For marine castings; corrosion resistant.

SCHENK GA1Mg5HYD51.
M-1453; 4.5-5 5 Mg, 0.1-0.5 Mn, bal Al.
Sand cast: 22,800-28,000 TS; 12,000-14,000 YS, 5-2 El; 55-70 Brin.
For marine castings; corrosion resistant.

SCHENK GA1MgMn.
M-1453; 1.5-3 0 Mg, 0.6-1 3 Mn, 0.5 Fe, bal Al.
Sand cast: 20,000-27,000 TS; 11,400-14,300 YS; 8-3 El; 50-60 Brin.
For marine and chemical industry castings; corrosion resistant.

SCHENK GA1Si
M-1453; 11.0-13.5 Si, 0 3-0.5 Mn, 0.15 Ti, 0 6 Fe, bal Al
Sand cast: 24,200-31,000 TS; 11,400-12,800 YS; 8-4 El; 50-60 Brin.
For automotive castings; corrosion resistant.

SCHENK GA1Si5Mg.
M-1453; 0.4-0.6 Si, 0 5-0.8 Mg, 0.2-0.6 Mn, bal Al.
Sand cast: 21,000-27,000 TS; 14,000-19,000 YS; 3-1 El; 60-70 Brin.
For light alloy parts.

SCHENK GA1Si6Cu3 NO. 225.
M-1453, 5.5-7.0 Si, 2 0-4.0 Cu, 0.4-0.6 Mn, bal Al.
Sand cast: 23,000-30,000 TS; 11,000-23,000 YS; 3-1 El; 65-80 Brin.
For pressure tight castings; corrosion resistant.

SCHENK GA1Si9(Cu) NO. 232.
M-1453; 7-11 Si, 0 2-0 5 Mn, bal Al.
Sand cast: 21,000-29,000 TS, 14,000-20,000 YS; 3-1 El; 65-85 Brin.
For pressure tight castings; corrosion resistant.

SCHENK GA1SiCu NO. 234.
M-1453; 5-6 Si, 1.2-1.6 Cu, 0 4-0.6 Mg, bal Al.
Sand cast 23,100-31,000 TS; 14,000-20,000 YS, 3-1 El; 65-85 Brin.
For instrument housings; corrosion resistant.

SCHENK GA1Si(Cu) NO. 231.
M-1453; 11-13 Si, bal Al
Sand cast: 15,000-31,000 TS, 11,000-14,500 YS; 4-1 El; 50-60 Brin.
For pressure proof castings; corrosion resistant.

SCHENK GA1SiMg.
M-1453; 9-10 Si, 0.25-0 40 Mg, 0.3-0.5 Mn, 0.15 Ti, 0.6 Fe, bal Al.
Sand cast: 20,000-39,000 TS; 12,700-15,700 YS; 5-2 El; 55-65 Brin.
For automotive castings; corrosion resistant.

SCHENK GA1SiMg(Cu) NO. 233.
M-1453; 8.5-10.5 Si, 0.2-0.4 Mg, bal Al.
Sand cast: 27,000-35,000 TS; 13,000-16,000 YS; 5-2 El; 55-65 Brin.
For pressure tight castings; corrosion resistant.

SCHENK GA1ZnCu NO. 212.
M-1453; 3-5 Cu, 4-8 Zn, 1.2 Fe, 0.6 Mn, 1.5 max Si, bal Al.
Sand cast: 21,000-30,000 TS; 13,000-19,000 YS; 3-1 El; 65-80 Brin.
For light alloy parts.

SCHENK GDA1Mg9.
M-1453; 6-10 Mg, 0.2-0.7 Mn, bal Al.
Die cast: 27,000-38,000 TS; 3-1 El; 65-85 Brin.
For marine castings; corrosion resistant.

SCHENK GDA1MgSi.
M-1453; 0.3-2.5 Mg, 1.5-5.0 Si, 1.5 max Mn, bal Al
Die cast: 22,800-27,000 TS; 3-1 El; 55-70 Brin.
For marine castings, housings; corrosion resistant

SCHENK GDA1Si7.
M-1453; 6-10 Si, 0.2-0.7 Mn, 0.5 max Mg, bal Al.
Die cast: 24,000-35,000 TS; 3-1 El, 55-75 Brin.
For thin wall castings; corrosion resistant.

SCHENK GDA1Si13.
M-1453; 11-13 Si, 0.2-0.7 Mn, 0.5 max Mg, bal Al.
Die cast: 28,000-36,000 TS; 3-1 El; 60-80 Brin.
For thin wall castings; corrosion resistant.

SCHENK GDA1Si(Cu) NO. 231.
M-1453; 11-13 Si, 0.5 Mn, bal Al
Die cast. 26,000-36,000 TS; 3-1 El; 55-75 Brin.
For pressure tight castings, corrosion resistant.

SCHENK GDA1SiCu NO 31'.
M-1453; 5.0-6.5 Si, 2-3 Cu, 0.2-0.6 Mn, bal Al.
Die cast 27,000-33,000 TS, 2.5-1.0 El; 55-75 Brin.
For instrument housings; corrosion resistant.

SCHENK GMgA13Zn.
M-1453; 2.6-3.4 Al, 0.6-1.4 Zn, 0.1-0.5 Mn, bal Mg.
Sand cast: 20,000-24,200 TS, 7000-8500 YS, 10-5 El; 40-50 Brin.
For light alloy parts; Type AZ31

SCHENK GMgA14Zn
M-1453; 3.3-4.1 Al, 2.3-3.1 Zn, 0.1-0.5 Mn, bal Mg
Sand cast 24,000-31,000 TS; 10,000-12,800 YS; 3 El; 45 Brin.
For light alloy parts; Type AZF.

SCHENK GMgA16Zn
M-1453; 5.3-6.1 Al, 2.3-3.1 Zn, 0.1-0.5 Mn, bal Mg
Sand cast: 18,600 TS; 11,500 YS, 1.5 El: 60 Brin
For light alloy parts; Type AZG.

SCHENK GMgA19
M-1453, 7.8-8.8 Al, 0.1-0.8 Zn, 0.1-0.5 Mn, bal Mg.
Sand cast: 24,000 TS, 13,000 YS; 4 El, 55 Brin.
For light alloy parts; Type A9V.

SCHIRM ZAH.
M-614; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 190,000 TS; 140,000 YS; 10 El; 30 RA; 400 Brin
For springs, taps, reamers, broaches, drills; Type W1; water hardened

SCHIRM ZH.
M-614; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, reamers, drills, lathe tools; Type W1; water hardened.

SCHMIDTCLEMENS PHM etc.
see MARKER or MAERKER.

SCHMIDT LOCOMOTIVE BEARING
Eng.; 86 Cu, 14 Sn.
For bearings; bronze.

SCHMIDT TSS.
M-196; 2.4-4.0 Mg, 0.4 max Mn, 0.3 max Cr, bal Al.
Soft: 28,000 TS; 13,000 YS; 30 El; 47 Brin.
Hard: 40,000 TS; 35,000 YS; 10 El; 73 Brin.
For aircraft tanks and fittings, fuel lines, marine parts; resists sea water corrosion.

SCHNEIDER 0.5 FO8.
M-533, 0.15 C, 0.25 Si, 0.50 Mn, 0.55, 0.55 Mo, bal Fe.
Normalized: 65,000 TS; 40,000 YS; 22 El.
For turbine vanes, oil refinery equipment; tough, shock resistant.

SCHNEIDER, 1.
M-1301; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Heat treated: 120,000-135,000 TS; 110,000-117,000 YS; 16-15 El; 63-58 RA; 220-240 Brin.
For cutlery, valves, turbine blades; Type 410; corrosion resistant

SCHNEIDER 1A.
M-1301; 0.15 min C, 12-14 Cr, bal Fe
Annealed: 88,000 TS; 40,000 YS; 32 El; 68 RA; 170 Brin
Heat treated: 256,000 TS; 190,000 YS, 6 El; 10 RA; 540 Brin
For cutlery, valve trim, springs, turbine blades; Type 420; stainless, hardenable

SCHNEIDER 1F 3/4.
M-533; 0.28 min C, 0.4 max Si, 0.6-0.9 Mn, 0.7-1.1 Cr, bal Fe.
Hardened. 270,000-182,000 TS, 210,000-142,000 YS; 4-9 El
For gears, shafts, water hardening.

SCHNEIDER 1F 4/5
M-533, 0.33 min C, 0.4 max Si, 0.6-0.9 Mn, 0.7-1.1 Cr, bal Fe
Hardened 220,000-148,000 TS, 189,000 128,000 YS, 5-10 El, 50 Brin.
For tools, gears, shafts, water hardening

SCHNEIDER 1 (Ni)
M-1301, 0.15 max C, 12-14 Cr, 1.25-2.5 Ni, 0.07 min P, S, or Se, bal Fe
Annealed 75,000 TS, 40,000 YS, 30 El, 60 RA; 155 Brin
Cold drawn 100,000 TS, 85,000 YS, 13 El, 50 RA; 205 Brin
For screw machine products, valve trim, pump shafts; Type 416, free-cutting, stainless.

SCHNEIDER 1S
M 1301, 0.08 max C, 11.5-13 Cr, 0.1-0.3 Al, bal Fe
Normalized 71,000 TS, 42,600 YS, 22 El; 70 RA, 150 Brin
Heat treated: 175,000 TS; 145,000 YS; 21 El; 64 RA, 352 Brin
For oil refinery and chemical plant equipment; Type 405, corrosion resistant

SCHNEIDER 1.1 FO8
M-533, 0.13 C, 0.25 Si, 0.50 Mo, 1.0 Cr, 0.55 Mo, bal Fe
Normalized: 65,000 TS, 40,000 YS, 22 El
For oil refinery equipment, heat exchanger tubes; tough, creep resistant.

SCHNEIDER 1.3 FOV
M-533; 0.24 C, 0.3 Si, 0.5 Mn, 1.25 Cr, 0.60 Mo, 0.25 V, bal Fe
Heat treated: 121,000 TS, 101,000 YS; 12 El.
For bolts, fasteners, turbine rotors and discs; operating temperature 530°C max.

SCHNEIDER 1.4DF3
M-533; 0.35 min C, 0.6-0.9 Mn, 0.8-1.2 Cr, 1.2-1.6 Ni, bal Fe
Hardened: 235,000-170,000 TS; 215,000-148,000 YS; 6-10 El.
For gears, shafts; tough.

SCHNEIDER 1.4DF5.
M-533; 0.25 min C, 0.6-0.9 Mn, 0.8-1.2 Cr, 1.2-1.6 Ni, bal Fe.
Hardened: 225,000-158,000 TS; 191,000-135,000 YS; 6-11 El.
For tools, gears, shafts; tough.

SCHNEIDER 1.4DF6.
M-533; 0.2 min C, 0.6-0.9 Mn, 0.8-1.2 Cr, 1.2-1.6 Ni, bal Fe.
Hardened. 200,000-142,000 TS; 170,000-122,000 YS; 7-12 El.
For case hardened parts, gears, shafts, tough.

SCHNEIDER 1.4DF7C.
M-533; 0.16 min C, 0.6-0.9 Mn, 0.8-1.2 Cr, 1.2-1.6 Ni, bal Fe.
Hardened: 184,000-128,000 TS; 155,000-110,000 YS; 8-13 El; 60 RA.
For case hardened parts, gears, shafts, tough

SCHNEIDER 1.4DF8C.
M-533; 0.10 min C, 0.6-0.9 Mn, 0.8-1.2 Cr, 1.2-1.6 Ni, bal Fe.
Hardened. 162,000-121,000 TS; 140,000-92,000 YS, 9-14 El
For case hardened parts, tough

SCHNEIDER 2
M-1301; 0.15 min C, 12-14 Cr, bal Fe
Annealed. 88,000 TS; 40,000 YS; 32 El, 68 RA, 170 Brin
Heat treated· 256,000 TS; 190,000 YS, 6 El; 10 RA; 540 Brin.
For cutlery, valve trim, turbine blades; Type 420, stainless hardenable.

SCHNEIDER 2DFO3
M-533, 0.25 C, 2.25 Ni, 0.55 Cr, 0.40 Mo, bal Fe
Heat treated 120,000 TS, 100,000 YS, 15 El.
For bolts, fasteners, gears, shafts, oil hardened, shock resistant

SCHNEIDER 2.2 FO
M-533, 0.10 C, 0.30 Si, 0.50 Mn, 2.2 Cr, 1.0 Mo, bal Fe
Heat treated 60,000 TS, 30,000 YS, 20 El
For heat exchanger tubes, oil refinery equipment, creep and shock resistant

SCHNEIDER 3.
M-1301, 0.15 max C, 12-14 Cr, bal Fe
Annealed 88,000 TS, 40,000 YS, 32 El, 68 RA; 170 Brin
Heat treated 256,000 TS, 190,000 YS; 6 El, 10 RA, 540 Brin
For cutlery, valve trim, turbine blades, Type 420, stainless, hardenable

SCHNEIDER 3FDO1
M-533; 0.33 min C, 0.6-1.0 Mn, 2.5-3.0 Cr, 1.2-1.6 Ni, 0.2-0.4 Mo, bal Fe
Hardened: 255,000-185,000 TS, 225,000-162,000 YS; 5-8 El.
For gears, pinions, shafts, tough

SCHNEIDER 3FO.
M-533; 0.25 C, 3.0 Cr, 0.5 Mo, bal Fe.
Normalized· 100,000 TS, 72,000 YS; 16 El.
For turbine rotors, oil refinery equipment; good creep properties

SCHNEIDER 4.
M-62; 0.2 C, 15-17 Cr, 1.25-2.5 Ni, bal Fe.
Heat treated: 100,000-135,000 TS; 78,000-112,000 YS; 25-15 El; 60-45 RA; 240-280 Brin
For pump spindles, propeller shafts, aircraft structures; Type 431; stainless, hardenable.

SCHNEIDER 5.1B.
M-1301; 0.12 max C, 14-18 Cr, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 30 El; 55 RA; 150 Brin
Cold drawn. 130,000 TS; 120,000 YS; 2 El; 185 Brin.
For oil refinery equipment, bolts, kitchen sinks; Type 430, stainless, ferritic.

SCHNEIDER 11
M-1301; 0.08-0.20 C, 2 max Mn, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed. 85,000 TS; 35,000 YS, 60 El; 70 RA; 150 Brin.
Cold drawn: 125,000 TS, 95,000 YS; 22 El; 55 RA, 277 Brin
For oil refinery chemical plant equipment; Type 302; stainless, austenitic.

SCHNEIDER 11DS.
M-1301; 0.08 max C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe
Annealed· 90,000 TS; 45,000 YS; 60 El; 135 Brin
Cold drawn· 180,000 TS, 150,000 YS, 10 El; 330 Brin
For chemical plant equipment, welded structures; Type 304, stainless, austenitic

SCHNEIDER 13
M-1301, 0.08-0.20 C, 17-19 Cr, 8-10 Ni, 2-3 Si, 2 max Mn, bal Fe
Annealed 90,000 TS, 40,000 YS, 50 El, 65 RA; 160 Brin
For chemical plant equipment, austenitic, stainless; Type 302B.

SCHNEIDER 13 FF
M-533, 2.25 C, 13 Cr, bal Fe
For tools, dies, non-deforming

SCHNEIDER 14
M-1301, 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Annealed· 85,000-95,000 TS, 35,000-45,000 YS, 60-50 El; 75-60 RA, 150-190 Brin
For acid-resistant chemical plant equipment; Type 316, stainless, austenitic

SCHNEIDER 14S
M-1301, 0.10 max C, 18-20 Cr, 11-14 Ni, 3-4 Mo, bal Fe
Annealed 85,000-95,000 TS, 35,000-45,0000 YS, 60-50 El, 75-60 RA; 150-190 Brin
For acid resistant chemical plant equipment, Type 317, stainless, austenitic.

SCHNEIDER 14S-Ti
M-1301, 0.10 max C, 16-18 Cr, 10-14 Ni, 1.7-2.7 Mo, Ti = 10 × C, bal Fe
Annealed 85,000-95,000 TS, 35,000-45,000 YS, 60-50 El, 75-60 RA; 150-190 Brin
For acid resistant chemical plant equipment; Type 316 Ti; stainless, austenitic.

SCHNEIDER 15
M-1301, 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe.
Normalized 93,000 TS, 36,000 YS, 45 El, 60 RA; 165 Brin.
Annealed 87,000 TS, 36,000 YS, 57 El, 73 RA, 155 Brin
For chemical plant equipment, welded structures; Type 321, austenitic, stainless.

SCHNEIDER 31.
M-1301, 0.25 C, 23-30 Cr, 3-5 Ni, bal Fe.
Normalized. 93,000 TS; 71,000 YS, 20 El, 48 RA; 210 Brin.
For valves, pumps, furnace equipment; Type 327; heat resistant.

SCHNEIDER 60.
M-1301; 0.2 max C, 22-24 Cr, 12-15 Ni, 2 max Mn, 1 max Si, bal Fe.
Annealed: 85,000-95,000 TS; 40,000-50,000 YS; 45-55 El; 150-185 Brin.
For heat treating boxes, oil refinery and chemical plant equipment; Type 309; austenitic, heat resistant.

SCHNEIDER 61.
M-1301; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El; 65 RA; 180 Brin.
At 1200°F; 57,000 TS; 22,000 YS; 32 El; 45 RA:
For furnace parts and equipment, valves, pumps; Type 310; austenitic, heat resistant

SCHNEIDER 63.
M-1301; 0.25 max C, 23-26 Cr, 19-22 Ni, 1.5-3.0 Si, bal Fe.
Annealed· 100,000 TS; 50,000 YS; 45 El; 60 RA; 185 Brin.
For furnace parts, radiant tubes, heat treating boxes; Type 314; oxidation resistant.

SCHNEIDER A8B
M-533; 0 22 C, 0.35 Si, 0 65 Mn, bal Fe.
Annealed. 70,000 TS, 38,000 YS; 21 El.
For gears, cams, machine tool parts; case hardening steel.

SCHNEIDER A9/10B.
M-533; 0.18 C, 0 25 Si, 0 60 Mn, bal Fe.
Annealed: 61,000 TS; 35,000 YS, 24 El.
For gears, cams, machine tool parts; case hardening steel

SCHNEIDER A10/11B.
M-533; 0 16 C, 0.20 Si, 0 55 Mn, bal Fe.
Annealed: 53,000 TS; 31,000 YS; 26 El.
For gears, cams, machine tool parts, case hardening steel.

SCHNEIDER A11B.
M-533, 0.14 C, 0.20 Si, 0 45 Mn, bal Fe
Annealed: 47,000 TS; 29,000 YS, 30 El.
For gears, cams, machine tool parts; case hardening steel

SCHNEIDER C1.
M-533; 0.7-1.2 C, bal Fe
For tools, dies, drills; water hardened

SCHNEIDER C2-C2B.
M-533; 1 1 C, bal Fe.
For tools, drills, taps; water hardened

SCHNEIDER C4.
M-533, 0.95 C, bal Fe.
For tools, punches, springs, water hardened

SCHNEIDER C5.
M-533; 0 75 C, bal Fe.
For tools; springs; water hardened.

SCHNEIDER C6-C6S.
M-533; 0.75 C, bal Fe
For tools; springs; water hardened.

SCHNEIDER C.9.
M-533; 0.9-1.0 C, bal Fe.
For tools, cutters, drills, water hardening.

SCHNEIDER C.10.
M-533; 1.05-1.15 C, bal Fe.
For tools, cutters; water hardening.

SCHNEIDER C 12.
M-533; 1.20 C, bal Fe.
For tools, cutters; water hardening

SCHNEIDER CMP.
M-533; 0.95 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies, cutters; non-deforming.

SCHNEIDER DFO.
M-533; 0.30 C, 2.5 Ni, 0.7 Cr, 0.3 Mo, bal Fe.
Annealed: 100,000 TS; 72,000 YS; 14 El.
For rotors and rotor discs; ferritic, shock resistant.

SCHNEIDER FLO6.
M-533; 0.15 C, 1.25 Si, 0.5 Mn, 1.0 Cr, 0.55 Mo, bal Fe.
Normalized: 83,000 TS; 58,000 YS; 20 El.
For oil refinery equipment, heat exchangers; creep and shock resistant.

SCHNEIDER FLOV.
M-533, 0.18 C, 1.0 Si, 0.5 Mn, 1.25 Cr, 1.1 Mo, 0.45 V, bal Fe.
Heat treated 121,000 TS; 101,000 YS; 12 El.
For bolts, turbine discs and rotors; used up to 575°C.

SCHNEIDER FO3.
M-533, 0.42 min C, 0.6-0.9 Mn, 0.8-1.2 Cr, 0.15-0.35 Mo, bal Fe
Hardened 185,000 TS; 155,000 YS; 8 El; 40 RA.
For gears, pinions, shafts, tough.

SCHNEIDER FO4
M-533, 0.34 min C, 0.6-0.9 Mn, 0.8-1.2 Cr, 0.15-0.35 Mo, bal Fe.
Hardened· 245,000-162,000 TS; 201,000-141,000 YS; 5-10 El, 45 RA
For gears, pinions, shafts, tough.

SCHNEIDER FO 5/6
M-533, 0.25 min C, 0.6-0.9 Mn, 0.8-1.2 Cr, 0.15-0.35 Mo, bal Fe
Hardened: 225,000-142,000 TS; 180,000-107,000 YS; 6-12 El, 50 RA.
For gears, shafts, tough

SCHNEIDER FO 6/7 S
M-533, 0.18-0.25 C, 0.4-0.7 Mn, 0.8-1.2 Cr, 0 15-0 35 Mo, bal Fe.
Hardened 128,000-100,000 TS, 106,000-69,000 YS; 13-15 El, 53 RA
For case hardened parts, gears, shafts, tough.

SCHNEIDER FO7C.
M-533, 0.18 min C, 0 6-0.9 Mn, 0 8-1 2 Cr, 0 15-0.35 Mo, bal Fe.
Hardened. 198,000-130,000 TS, 161,000-114,000 YS, 7-13 El
For case hardened parts, gears, shafts, tough.

SCHNEIDER FO8C.
M-533; 0 12 min C, 0 6-0.9 Mn, 0.8-1 2 Cr, 0.15-0.35 Mo, bal Fe
Hardened: 160,000 TS, 130,000-100,000 YS; 9-14 El.
For gears, shafts; case hardening steel.

SCHNEIDER FOV.
M-533; 0.25 C, 0.3 Si, 0.6 Mn, 1 0 Cr, 1.0 Mo, 0 25 V, bal Fe.
Normalized. 101,000 TS; 78,000 YS, 16 El.
For turbine rotors and discs; used up to 575°C.

SCHNEIDER F P.
M-533; 0.5 C, 1 5 Cr, 2.2 W, 0.2 V, bal Fe
For hot work dies and tools, hot work steel.

SCHNEIDER F.P.B.
M-533; 0 5 C, 1.5 Cr, 2.2 W, 0.2 V, bal Fe.
For hot work dies and tools; hot work steel.

SCHNEIDER FR.
M-533; 0.95-1.1 C, 0.4 max Si, 0.4 max Mn, 1.3-1.6 Cr, bal Fe.
Hardened: 620 Brin.
For tools, dies, cutters; oil or water hardening.

SCHNEIDER M.L.
M-533; 0.5 C, 0.7 Mn, 1.9 Si, 0.2 Mo, bal Fe.
Hardened: 190,000 TS; 160,000 YS; 7 El; 40 RA.
For tools, dies, punches; tough.

SCHNEIDER M.L.S.
M-533; 0.5 C, 0.7 Mn, 1.9 Si, 0.2 Mo, bal Fe.
For tools, dies, punches; tough.

SCHNEIDER MO7.
M-533; 0.15 C, 1.0 Mn, 0.25 Si, 0.55 Mo, bal Fe.
Normalized: 70,000 TS; 36,000 YS; 20 El.
For camshafts, gears, oil refinery equipment; case-hardening, tough.

SCHNEIDER P2.
M-533; 1.3 C, 4.5 W, bal Fe
For tools, dies; oil hardened.

SCHNEIDER S.3.
M-533; 0.8 C, 18 W, 4 Cr, 1 V, bal Fe
For drills, reamers, broaches, form tools, cutters, lathe and planer tools
Type T1 high-speed steel.

SCHNEIDER S.3V
M-533, 0.8 C, 19 W, 4 Cr, 2.25 V, bal Fe
For tools, dies, cutters, hobs, drills, reamers, broaches
Type T2 high speed steel

SCHNEIDER S I S
M-533; C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe
For hot work dies and tools, hot work steel

SCHNEIDER S I S B.
M-533, C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe
For hot work dies and tools, hot work steel

SCHNEIDER S I S B-S I
M-533, C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe
For hot work dies and tools; hot work steel

SCHNEIDER SO3-M2
M-533, 0.7 C, 3.9-4.3 Cr, 6.6-6.75 W, 4.75-5.25 Mo, 2 V, bal Fe
For tools, cutters; high speed steel

SCHNEIDER SS4
M 533, 0.7 C, 18 W, 5 Co, 4 Cr, 1.3 V, bal Fe.
For lathe and planer tools, drills, taps, reamers, hobs, high speed steel, oil hardened

SCHNEIDER S S 8
M-533, 0.7 C, 18 W, 9 Co, 1 Mo, 4 Cr, 2 V, bal Fe
For tools, dies, cutters, high speed steel

SCHOELLER ARWA
M-616; 0.06 C, 11.5-14.5 Cr, 0.1-0.3 Al, bal Fe
Annealed: 70,000 TS, 42,000 YS, 30 El, 160 Brin.
For annealing boxes, oil refinery equipment, quenching racks, furnace parts
Type 405 stainless steel, corrosion and heat resistant

SCHOELLER ARWKN
M-616, 0.10 C, 14-18 Cr, bal Fe.
Annealed 75,000 TS; 45,000 YS, 28 El; 145 Brin.
Cold Rolled 120,000 TS, 95,000 YS, 12 El, 195 Brin.
For automotive trim, kitchen sinks, oil burners, furnace parts, fasteners
Type 430 stainless steel, non-hardenable

SCHOELLER MAO
M-616; 0.08 C, 19 Cr, 10 Ni, bal Fe
Annealed. 85,000 TS; 35,000 YS, 60 El; B 80 Rock
For chemical plant equipment, tanks, evaporators, digesters.
Type 304 stainless steel austenitic

SCHOELLER MAO SUPERIOR.
M-616; 0.02 C, 19 Cr, 11 Ni, bal Fe.
Annealed: 77,000 TS; 29,000 YS, 60 El; B 78 Rock.
For welded structures, chemical plant equipment, evaporators, digesters.
Type 304L stainless steel, austenitic.

SCHOELLER MAOY.
M-616; 0.06 C, 19 Cr, 11 Ni, bal Fe.
Annealed 85,000 TS; 35,000 YS; 60 El; 150 Brin.
For architectural molding and trim, chemical and pharmaceutical plant equipment, tanks, evaporators
Type 304 stainless steel, austenitic.

SCHOELLER MASD.
M-616, 0.10 C, 18 Cr, 8 Ni, 2 Mo, bal Fe
Annealed. 78,00 TS, 30,000 YC, 58 El; B 80 Rock.
For chemical and dairy equipment, acid tanks, evaporators
Type 18-8 Mo stainless steel, austenitic acid resistant

SCHOELLER MASN
M-616; 0.1 C, 17 Cr, 13 Ni, 3 Mo, 0.8 C, bal Fe
Annealed: 85,000 TS; 40,000 YS, 50 El; B 82 Rock.
For welded structures and tanks, chemical plant equipment, mixers, digesters
Type 318 stainless steel, acid resistant, austenitic.

SCHOELLER MASO
M-616, 0.10 C, 18 Cr, 13 Ni, 2 Mo, bal Fe
Annealed: 80,000 TS, 30,000 YS, 60 El, B 80 Rock
For chemical plant equipment, agitators, digesters, evaporators.
Type 316 stainless steel, austenitic

SCHOELLER MASO SUPERIOR
M-616; 0.03 C, 0.7 Si, 1.6 Mn, 18 Cr, 13 Ni, 2 Mo, bal Fe
Annealed: 80,000 TS, 30,000 YS, 60 El, B 78 Rock
For chemical plant equipment, tanks, containers, evaporators, digesters
Type 3161 stainless steel, acid resistant, austenitic.

SCHOELLER MASOY
M 616, 0.06 C, 18 Cr, 13 Ni, 3 Mo, bal Fe.
Annealed 80,000 TS, 32,000 YS, 50 El, B 80 Rock.
For chemical plant equipment, tanks, evaporators, digesters, acid containers
Type 316 & 319 stainless steel, austenitic, acid resistant

SCHOELLER MASOY SUPERIOR
M-616, 0.04 C, 0.6 Si, 1.7 Mn, 17-18 Cr, 12-14 Ni, 2-3 Mo, bal Fe
Annealed 80,000 TS, 30,000 YS, 60 El; B 78 Rock
For chemical plant equipment, acid containers, digesters, tanks, evaporators.
Type 316L stainless steel, austenitic, acid resistant

SCHOELLER MASwY.
M-616, 0.12 C, 18 Cr, 12 Ni, 2 Mo, bal Fe.
Annealed 80,000 TS, 30,000 YS, 60 El, B 80 Rock.
For chemical plant equipment, acid tanks, evaporators, digesters.
Austenitic, acid resistant Type 18-12 Mo stainless steel.

SCHOELLER R1
M-616, 0.20 C, 24 Cr, 20 Ni, bal Fe.
Annealed. 100,000 TS, 50,000 YS, 45 El; B 90 Rock.
For furnace parts, heat treating boxes, fixtures, hardware, radiant tubes.
Type 314 stainless steel, heat and corrosion resistant

SCHOELLER R9.
M-616, 0.15 C, 18 Cr, 10 Ni, 2 Si, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El, B 85 Rock.
For heat treating furnaces and fixtures, tube supports, radiant tube heating elements.
Type 302 B and 309 B stainless steel, corrosion and heat resistant. Austenitic

SCHOLLER 1116S.
M-1308; 0.75 C, 0.4 Si, 0.6 Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 370 Brin.
For punches, crimpers, rails, springs; water hardened.

SCHOLLER AMC
M-1308; 0.50 C, 1 Cr, 0.2 Mo, bal Fe.
For gears, pinions, crankshafts, bolts, studs; oil hardened, shock resistant.

SCHOLLER ARG.
M-1308; 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For gears, shafts, crankshafts, fasteners, bolts; oil hardened, shock resistant.

SCHOLLER ARH HART.
M-1308; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 200 Brin.
For cutlery, valves, surgical and dental instruments; Type 420; stainless, hardenable.

SCHOLLER ARH ZAH.
M-1308; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 200 Brin.
For cutlery, valves, surgical and dental instruments; Type 420; stainless, hardenable.

SCHOLLER ARKS.
M-1308; 0.12 max C, 16.5 Cr, 0.25 Mo, bal Fe.
Annealed: 80,000 TS; 50,000 YS, 25 El, 50 RA; 150 Brin.
For oil refinery equipment, Type 430 Mo; corrosion resistant.

SCHOLLER ARL.
M-1308; 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431; corrosion and heat resistant.

SCHOLLER ARW.
M-1308; 0.12 max C, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For turbine blades, cutlery, valves, instruments, Type 310; stainless.

SCHOLLER ARWDT.
M-1308; 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe.
Annealed. 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery and chemical plant equipment, welded structures; heat and corrosion resistant

SCHOLLER ARWK.
M-1308; 0.1 max C, 17 Cr, bal Fe
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, sinks, dairy equipment; Type 430; corrosion resistant.

SCHOLLER ARWKT.
M-1308; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For welded oil refinery and dairy equipment; Type 430 Ti; corrosion resistant.

SCHOLLER ARZ.
M-1308; 0.2 C, 13 Cr, 0.3 Mn, 0.4 Si, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 200 Brin.
For cutlery, valves, turbine blades, surgical instruments; Type 420; corrosion resistant.

SCHOLLER AS2.
M-1308; 0.25 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 50 El; 70 RA; 170 Brin.
For chemical plant equipment; Type 302; stainless, austenitic.

SCHOLLER AS2W.
M-1308; 0.07 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 304; stainless, austenitic.

SCHOLLER AS4W.
M-1308; 0.05 C, 17.5 Cr, 11 Ni, 2.7 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, mixers; Type 316, stainless, austenitic.

SCHOLLER ASA.
M-1308; 0.08 C, 12 Cr, 12 Ni, bal Fe.
For valves, stainless.

SCHOLLER BM25.
M-1308; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed: 73,000 TS, 41,000 YS; 22 El; 58 RA; 140 Brin.
For gears, machine tool parts; case hardening steel.

SCHOLLER BM35
M-1308, 0.35 C, 0.55 Mn, 0.25 Si, bal Fe.
Hot rolled: 85,000 TS, 54,000 YS; 30 El; 53 RA; 185 Brin
For gears, bolts, fasteners, shafts, water hardened.

SCHOLLER BM45
M-1308, 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled 98,000 TS, 59,000 YS; 24 El; 45 RA; 212 Brin
For bolts, gears, machine tool parts; water hardened.

SCHOLLER BM60
M-1308, 0.61 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated 160,000 TS; 113,000 YS; 12 El; 40 RA, 325 Brin
For rails, springs, punches, crimpers, fasteners; water hardened.

SCHOLLER BRU1.
M-1308; 0.45 C, Cr, Ni, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant

SCHOLLER CVS
M-1308, 0.42 C, Cr, Mo, bal Fe
For gears, bolts, crankshafts, fasteners; oil hardened, tough

SCHOLLER DHS
M-1308, 0.85 C, W, Mo, Cr, V, bal Fe.
For lathe and planer tools, reamers, drills, taps; high speed steel.

SCHOLLER DS
M 1308, 0.42 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

SCHOLLER DSB
M-1308, 0.42 C, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, pinions, bolts, studs, shafts; oil hardened, tough.

SCHOLLER DW
M-1308; 0.30 C, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For cold work tools, header dies, punches; oil hardened, tough.

SCHOLLER EC1.
M-1308; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
For bolts, gears, machine tool parts; case hardening steel.

SCHOLLER ECM.
M-1308; 0.20 C, Cr, Mo, bal Fe.
For gears, cams, camshafts; case hardening steel.

SCHOLLER ED.
M-1308; 0.15 C, 1.2 Cr, 0.2 Mo, bal Fe.
For gears, bolts, oil refinery equipment; case hardened, heat and creep resistant.

SCHOLLER EN1.5.
M-1308; 0.13 C, 0.2 Cr, 1.5 Ni, bal Fe.
For gears, bolts, fasteners, shafts; case hardened, shock resistant.

SCHOLLER ENC1.
M-1308; 0.15 C, 1.55 Cr, 1.55 Ni, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel, tough.

SCHOLLER ENC2.
M-1308; 0.18 C, 2 Cr, 2 Ni, 0.5 max Mn, bal Fe.
For gears, pinions, fasteners, cams, shafts; case hardening steel, shock resistant.

SCHOLLER ENC3.
M-1308; 0.13 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, cams, camshafts, machine tool parts, case hardening steel, shock resistant.

SCHOLLER ENC4.
M-1308; 0.13 C, 1.1 Cr, 4.5 Ni, bal Fe
For gears, cams, camshafts, machine tool parts; case hardening steel, shock resistant.

SCHOLLER EXTRA MH
M-1308, 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed. 110,000 TS, 58,000 YS; 18 El; 40 RA; 210 Brin
For springs, tools, cutters, taps, drills; Type W1; water hardened

SCHOLLER EXTRA WEICH
M-1308, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated 175,000 TS; 128,000 YS; 12 El; 37 RA, 355 Brin.
For springs, rails, tools, punches; Type W1; water hardened

SCHOLLER EXTRA ZAH.
M-1308, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated 190,000 TS, 145,000 YS; 10 El, 30 RA, 400 Brin
For springs, tools, drills, taps, reamers; Type W1; water hardened

SCHOLLER EXTRA ZH
M-1308, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS, 21 El; 42 RA; 200 Brin.
For springs, taps, drills, hobs, reamers; Type W1; water hardened

SCHOLLER FCR.
M-1308; 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For punches, crimpers, upsetters; water or oil hardened

SCHOLLER FLA.
M-1308; 0.13 C, 0.35 max Si, 0.50 max Mn, 0.2 Cr, 1.5 Ni, bal Fe.
For gears, shafts, machine tool parts; case hardening steel, tough.

SCHOLLER FSH.
M-1308; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, shafts, machine tool parts; case hardening steel.

SCHOLLER HCN2.
M-1308; 0.27 C, Mn, Cr, bal Fe.
For gears, bolts, machine tool parts; oil or water hardened.

SCHOLLER HCN3 W/H.
M-1308; 0.28-0.35 C, 0.7 Cr, 2.5 Ni, 0.6 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, shock resistant.

SCHOLLER HCN4 W/H.
M-1308; 0.22 C, 0.6 Mn, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened.

SCHOLLER HLDH.
M-1308; 0.38 C, Si, Cr, V, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

SCHOLLER HLDW.
M-1308; 0.45 C, Si, Cr, V, bal Fe.
For gears, bolts, crankshafts, springs; oil hardened, shock resistant.

SCHOLLER HMC.
M-1308; 0.33 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, fasteners, shafts; oil hardened, shock resistant.

SCHOLLER HNC1.5.
M-1308; 0.28-0.35 C, 0.5 Cr, 0.6 Mn, 1.5 Ni, bal Fe.
For gears, bolts, fasteners, shafts; oil hardened, shock resistant.

SCHOLLER KHP.
M-1308; 0.45 C, 1.4 Cr, 0.70 Mo, 0.30 V, bal Fe.
For forging and heading dies, shears, upsetters; oil hardened, tough.

SCHOLLER KLI.
M-1308; 1.0 C, 1.55 Cr, 0.35 Mn, 0.3 Si, bal Fe.
For bearings, cutters, liners; water or oil hardened, wear resistant.

SCHOLLER KW10
M-1308, 0.09 C, 14 Cr, bal Fe.
Annealed 75,000 TS; 50,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, valves, cutlery; Type 403; corrosion resistant.

SCHOLLER KW10 SPEC.
M-1308; 0.20 C, 14 Cr, 1.0 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, valves, cutlery; Type 420Mo; corrosion resistant, hardenable

SCHOLLER KW20.
M-1308; 0.07 C, 17.5 Cr, bal Fe.
Annealed. 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin
For oil refinery equipment, sinks, soot blowers; Type 430, corrosion resistant

SCHOLLER KW40.
M 1308; 0.40 C, 13.5 Cr, bal Fe.
Annealed. 100,000 TS; 55,000 YS; 23 El; 52 RA; 200 Brin
For valves, cutlery, surgical and dental instruments; Type 420; corrosion resistant.

SCHOLLER KW80.
M-1308, 0.75-0.95 C, 16-18 Cr, bal Fe.
Annealed. 107,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin
Heat treated: 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin.
For cutlery, valves, ball bearings, surgical instruments; Type 440B; corrosion resistant, hardenable.

SCHOLLER KW100.
M-1308; 0.95-1.2 C, 16-18 Cr, bal Fe.
Annealed: 110,000 TS; 65,000 YS; 15 El; 30 RA; 240 Brin.
For cutlery, valves, ball bearings, surgical instruments; Type 440C; corrosion resistant, hardenable.

SCHOLLER KWA.
M-1308; 0.08 C, 17 Cr, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, sinks, soot blowers; Type 430; corrosion resistant.

SCHOLLER KWB.
M-1308; 0.16 C, 17 Cr, 2 Ni, 1.2 Mo, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431; corrosion resistant.

SCHOLLER KWZ.
M-1308; 0.12 max C, 14-18 Cr, S, Mo, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For screw machine products; corrosion resistant, free-cutting.

SCHOLLER LES.
M-1308; 0.15 C, 0.35 Si, 0.6 Mn, bal Fe.
Annealed: 70,000 TS, 55,000 YS; 25 El; 60 RA; 145 Brin.
For nails, rivets, screws, bolts, cams, case hardened.

SCHOLLER LM1.
M-1308; 0.13 C, 3.5 Ni, 0.7 Cr, bal Fe.
For gears, cams, camshafts; case hardening steel, tough.

SCHOLLER LM2.
M-1308; 0.13 C, 2.5 Ni, 0.7 Cr, bal Fe.
For gears, cams, machine tool parts; case hardening steel, tough.

SCHOLLER LM3 W/H.
M-1308; 0.22-0.30 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, shafts, fasteners; oil hardened, tough.

SCHOLLER MA0
M-1308; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; stainless, austenitic; Type 304.

SCHOLLER MA1.
M-1308; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

SCHOLLER MA3.
M-1308; 0.10 max C, 12.5 Cr, 12 Ni, bal Fe
For valves, pump parts; corrosion and heat resistant.

SCHOLLER MACDW.
M-1308, 0.07 max C, 17.5 Cr, 2 Mo, 17.5 Ni, 2 Cu, Ti = 7 × C, bal Fe.
For valves, pump parts; corrosion and heat resistant.

SCHOLLER MAG.
M-1308; 0.15 S. 1.5 Si, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS, 55 El, 75 RA; 150 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

SCHOLLER MAN.
M-1308; 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
For welded chemical plant equipment, tanks, mixers; Type 347; stainless, austenitic.

SCHOLLER MAS.
M-1308; 0.07 max C, 18 Cr, 2 Mo, 10.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 60 RA; 165 Brin.
For acid resistant chemical plant equipment, tanks; Type 316; stainless, austenitic.

SCHOLLER MASBW.
M-1308, 0.07 max C, 17 Cr, 4.75 Mo, 13 Ni, bal Fe.
Annealed. 90,000 TS; 40,000 YS; 45 El; 55 RA; 180 Brin.
For acid resistant chemical plant equipment; Type 317; stainless, austenitic.

SCHOLLER MASW.
M-1308, 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed. 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin
For welded acid resistant chemical plant equipment; Type 316 Ti; stainless, austenitic.

SCHOLLER MASWS.
M-1308; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For welded acid resistant chemical plant equipment; Type 316 Ti; stainless, austenitic

SCHOLLER MAT.
M-1308; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For welded acid resistant chemical plant equipment; Type 321; stainless, austenitic

SCHOLLER MNF.
M-1308, 0.46 C, Mn, bal Fe.
Hot rolled: 98,000 TS, 59,000 YS; 24 El; 45 RA, 212 Brin
For axles, gears, bolts, bushings; water hardened.

SCHOLLER MS
M-1308; 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For drawing and forming dies, cutters; water or oil hardened.

SCHOLLER NSW.
M-1308, 0.30 C, W, Cr, V, bal Fe
For dies, tools, upsetters; oil hardened

SCHOLLER OF56.
M-1308, 0.56 C, 0.30 Si, 0.55 Mn, bal Fe
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS, 12-23; 40-54 RA; 320-230 Brin.
For die blocks, girders, clutch discs; water hardened.

SCHOLLER PM
M-1308; 1.4 C, 0.25 Si, 0.30 Mn, 0.10 V, bal Fe.
For engravers' tools, cutters, forming and blanking dies; Type W2; water hardened.

SCHOLLER PRIMA 100
M-1308; 1.3 C, 0.25 Si, 0.25 Mn, bal Fe
For engravers' tools, cutters, forming and blanking dies, Type W1, water hardened.

SCHOLLER PRIMA WEICH
M-1308; 0.70 C, 0.20 Si, 0.20 Mn, bal Fe.
Heat treated: 175,000-122,000 TS; 128,000-82,000 YS; 12-22 El; 37-52 RA; 350-240 Brin
For wheels, die blocks, girders, springs, rails; Type W1; water hardened.

SCHOLLER PRIMA ZAH.
M-1308; 0.85 C, 0.20 Si, 0.20 Mn, bal Fe.
Heat treated: 200,000-135,000 TS; 150,000-90,000 YS; 10-20 El; 30-45 RA; 400-270 Brin.

For drills, springs, taps, reamers, cutters;
Type W1; water hardened.

SCHOLLER PRIMA ZH.
M-1308; 0.60 C, 0.40 Si, 0.60 Mn, bal Fe.
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El; 40-54 RA; 320-230 Brin.
For springs, tools, clutch discs, die blocks; water hardened.

SCHOLLER S200.
M-1308; 0.25 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, studs, machine tool parts; oil hardened, tough.

SCHOLLER S200H.
M-1308; 0.33 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts, shafts; oil hardened, tough.

SCHOLLER S200W.
M-1308; 0.25 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

SCHOLLER SAS2.
M-1308; 0.05 C, 18 Cr, Cb, 9 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, mixers, agitators; Type 347; stainless, austenitic.

SCHOLLER SAS4.
M-1308; 0.07 C, 17.5 Cr, 9.5 Ni, 1.5 Mo, Cb, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For welded acid resistant chemical plant equipment; stainless, austenitic.

SCHOLLER SAS4MN.
M-1308; 0.07 C, 17.5 Cr, 11.5 Ni, 2.7 Mo, Cb, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For welded acid resistant chemical plant equipment; Type 316 Cb; stainless, austenitic.

SCHOLLER SAS5.
M-1308; 0.05 C, 17.5 Cr, 14.5 Ni, 4.5 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 180 Brin.
For acid resistant chemical plant equipment; Type 317; stainless, austenitic.

SCHOLLER SAST2.
M-1308; 0.07 C, 18 Cr, 8.5 Ni, Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For chemical plant equipment; Type 321; stainless, austenitic.

SCHOLLER SAST4.
M-1308; 0.07 C, 17.5 Cr, 11 Ni, 2.7 Mo, Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For welded acid resistant chemical plant equipment; Type 316 Ti; stainless, austenitic.

SCHOLLER SAWM.
M-1308; 1.15 C, 0.65 Cr, 0.10 V, bal Fe.
For bearings, cutters; oil hardened, wear resistant.

SCHOLLER SC1.
M-1308; 0.90 C, 1.15 Si, 1.2 Cr, 0.70 Mn, bal Fe.
For punches, shears, upsetters, dies; oil hardened, tough.

SCHOLLER SC2.
M-1308; 1.25 C, 1.15 Si, 0.70 Mn, 1.2 Cr, bal Fe.
For cutters, bearings, upsetters; oil hardened, tough.

SCHOLLER SG.
M-616; 0.4 C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe.
For extrusion rams and liners, punches, upsetters; hot work steel, oil hardened.

SCHOLLER SGH.
M-616; 0.4 C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe.
For extrusion rams and liners, punches, upsetters; hot work steel, oil hardened.

SCHOLLER SGHV.
M-1308; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, 0.30 Mn, bal Fe.
For extrusion press tools and dies, punches, shears; hot work steel, oil hardened.

SCHOLLER SHM.
M-1308; 0.65 C, 1.15 Si, 1.0 Mn, bal Fe.
For springs, dies, shears, punches; oil hardened, tough.

SCHOLLER SKVL.
M-1308; 0.08 C, 17.5 Cr, 1.2 Mo, bal Fe.
Annealed: 120,000 TS; 90,000 YS; 22 El; 57 RA; 250 Brin.
For pumps, marine hardware, valves; corrosion resistant.

SCHOLLER SNK3.
M-1308; 1.0 C, 0.10 V, 0.25 Mn, 0.20 Si, bal Fe.
For cutters, dies, tools; Type W2; water hardened.

SCHOLLER SPZ.
M-1308; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
Heat treated: 340,000 TS; 280,000 YS; 5 El; 20 RA; 600 Brin.
For springs, punches, chisels, shears; oil hardened, tough.

SCHOLLER TAMB.
M-1308, 1.2 C, 0.20 Cr, 0.10 V, 1.0 W, bal Fe.
For cold work tools, heading dies; oil hardened, tough.

SCHOLLER U3.
M-1308; 0.55 C, 0.90 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For heading and forging dies, punches; oil hardened, tough.

SCHOLLER V132S.
M-1308; 0.42 C, 0.25 Si, 1.75 Mn, 0.1 V, bal Fe.
For punches, dies, crimpers, gauges; oil hardened, tough.

SCHOLLER V230.
M-1308; 1.45 C, 1.4 Cr, 0.60 Mn, bal Fe.
For cutters, blanking and forming dies; oil hardened, abrasion resistant.

SCHOLLER VC135.
M-1308; 0.40 C, 0.70 Mn, 1.0 Cr. bal Fe.
For machine tool parts; oil hardened.

SCHOLLER VCMV.
M-1308; 0.30 C, 0.55 Mn, 2.5 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant.

SCHOLLER VCV230.
M-1308; 0.58 C, 1.05 Cr, 0.1 V, 0.95 Mn, bal Fe
For springs, punches, forging and heading dies; oil hardened, shock resistant

SCHOLLER VNC1.
M-1308; 0.34 C, 1.55 Cr, 1.55 Ni, 0.2 Mo, bal Fe.
For die casting dies, plastic mold dies; oil hardened, tough.

SCHOLLER VNC2.
M-1308; 0.30 C, 2.0 Cr, 0.3 Mo, 2.0 Ni, bal Fe.
For die casting and plastic mold dies; oil hardened, tough.

SCHOLLER VPN.
M-1308; 0.56 C, Ni, Cr, Mo, V, bal Fe.
For forging and upsetting dies, punches; oil hardened, tough.

SCHOLLER WKL.
M-1308; 1.05 C, Cr, bal Fe.
For cutters, bearings, liners; oil or water hardened, wear resistant.

SCHOLLER WU.
M-1308; 0.30 C, 2.0 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion dies, rams and liners, punches; hot work steel, oil hardened.

SCHOMBERG ALLOY.
87 Zn, 10 Sn, 3 Cu.
For bearings; anti-friction.

SCHOMBERG BEARING.
59 Zn, 40 Sn, 0.4 Cu, 0.2 Pb, 0.2 Fe.
For bearings; anti-friction.

SCHULZ.
Germ.; 31 Co, 15 Cr, 35 W, 2 Fe, 10 Mo, 0.7 C
For tools; corrosion and heat resistant.

SCHULZ ALLOY.
91 Zn, 6 Cu, 3 Al.
For die castings, ornamental parts; free-cutting.

SCHWABENSTAHL.
M-1383; C, alloy, bal Fe.
For machine tool parts; oil hardened.

SCHWARZPUNKT.
M-1331; 1.0 C, Cr, W, Mo, V, bal Fe.
For cutters, dies, reamers; oil hardened.

SCHWEISTAHL 5H.
M-1314; 0.55 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Heat treated. 155,000 TS; 110,000 YS; 14 El; 45 RA; 320 Brin.
For gears, bolts, crankshafts, axles; water hardened.

SCHWERMETALL.
M-1246; W alloy.
Sintered: 72,000-85,000 TS; 220-250 Brin
For gyros, counterweights, radioactive shields, sintered, heavy alloy

SCIMITARS.
M-135; 18 Ni, 30 Zn, bal Cu
For domestic utensils, ornaments; nickel silver

SCLERON.
M-116; 1.5 Cu, 4 Si, bal Al.
Heat treated: 58,000-72,000 TS; 42,000-50,000 YS, 15-10 El; 100-135 Brin.
For small structural parts, age-hardened.

SCLERON NO. 1.
M-320, M-116; 0.1 Li, 4 Cu, bal Al.
42,500 TS; 15-20 El
For connecting rods, machine construction, similar to "Aeron."

SCOAVAC-VAA1.
M-1714; 2.6 C, 0.65 Mn, 0.60 Si, 0.5 max Ni, 15.0 Cr, 2.6 Mo, bal Fe.
Vacuum refined and degassed; usually heat treated.
For large castings (five inch max thickness) for tough operations as large sand-pump impellers, chute liners, ball mill liners.

SCOAVAC-VAA3.
M-1714; 3.4 C, 0.85 Mn, 0.55 Si, 15.0 Cr, 2.75 Mo, bal Fe.
Vacuum refined and degassed; heat treated castings to three inch max thickness.
Good abrasion resistance; for sand-pump impellers, pump castings, chute-liners, sand and shot blasting equipment, equipment handling clay products.

SCOAVAC-VAB1.
M-1714; 2.55 C, 0.85 Mn, 0.85 Si, 0.5 max Ni, 29.0 Cr, bal Fe.
Vacuum refined and degassed; heat treated casting for slurry pumps and similar abrasive conditions.

SCOAVAC-VCA1.
M-1714; 0.15 C, 1.0 Mn, 1.5 Si, 1.0 Ni, 11.5-14.0 Cr, 0.5 Mo, bal Fe
Vacuum refined and degassed casting; normalized and tempered: 90,000 TS; 65,000 YS; 18 El.
Corrosion resistant, hardenable; for steam valves, turbine parts.
ASTM A296– CA-15; ACI CA-15.

SCOAVAC-VCA2.
M-1714; 0.15 C, 1.0 max Mn, 1.0 max Si, 1.0 max Ni, 12.5 Cr, 0.5 max Mo, bal Fe.
Vacuum refined and degassed, normalized and tempered 100,000 min TS, 67,000 min YS; 11 El; 200-400 Brin (as required).
Corrosion resistant, for pump impellers, valve wedges, valve seat rings

SCOAVAC-VCA3
M-1714, 0.2-0.4 C, 1.0 Mn, 1.5 Si, 1.0 Ni, 11.5-14.0 Cr, 0.5 Mo, bal Fe
Vacuum refined and degassed casting, normalized and tempered: 100,000 TS, 70,000 YS; 15 El
Corrosion resistant, hardenable, cutlery type: for knives, cutlery, scissors, shears
ASTM A296 CA-40, ACI CA-40

SCOAVAC-VCB
M-1714, 0.30 max C, 1.0 max Mn, 1.5 max Si, 2.0 max Ni, 19.5 Cr, 0.5 max Mo, bal Fe
Vacuum refined and degassed, normalized: 65,000 min TS, 30,000 min YS.
Excellent resistance to corrosion by nitric acid, alkaline solutions, and many organic chemicals, for pump parts, valve bodies and valve parts
ACI CB 30

SCOAVAC-VCF1.
M-1714, 0.03 max C, 1.5 max Mn, 2.0 max Si, 9.0 Ni, 19.0 Cr, bal Fe
Vacuum refined and degassed; water quenched 65,000 min TS, 28,000 min YS; 35 min El
Excellent resistance to corrosion by strongly oxidizing media, for valve bodies, valve parts and pump parts ACI CF-3

SCOAVAC-VCF2.
M-1714; 0.30 max C, 1.5 max Mn, 1.5 max Si, 9.0 Ni, 19.0 Cr, 3.0 Mo, bal Fe
Vacuum refined and degassed, water quenched, 70,000 min TS; 30,000 min YS, 30 min El
Good resistance to corrosion by reducing media, also resistant to pitting corrosion, for valve bodies, valve parts and pump parts.

SCOAVAC-VCF3
M-1714, 0.08 max C, 1.5 max Mn, 2.0 max Si, 9.0 Ni, 19.0 Cr, bal Fe
Vacuum refined and degassed; water quenched 60,000 min TS, 28,000 min YS, 35 min El.
Excellent resistance to corrosion by strongly oxidizing media; for valve bodies, valve parts and pump parts.

SCOAVAC-VCF4.
M-1714, 0.08 max C, 1.50 max Mn, 2.0 max Si, 9.0 Ni, 19.0 Cr, 3.0 Mo, bal Fe
Water quenched. 70,000 min TS; 30,000 min YS; 30 min El
Good resistance to corrosion by reducing media; resistant to pitting corrosion
Vacuum refined and degassed austenitic stainless; for valve bodies, valve parts and pump parts.
ACI CF-8M

SCOAVAC-VCF4(b).
M-1714; 0.08 max C, 1.5 max Mn, 2.0 max Si, 9.0 Ni, 19.0 Cr, 3.0 Mo, 0.3 S, bal Fe.
Water quenched: 70,000 min TS; 30,000 min YS; 25 min El.
Vacuum refined and degassed, free machining grade; good resistance to corrosion and pitting corrosion.
For valve bodies, valve parts and pump parts.

SCOAVAC-VCF4(c).
M-1714; 0.08 max C, 1.5 max Mn, 2.0 max Si, 9.0 Ni, 19.0 Cr, 3.0 Mo, Nb = 8 × %C min, bal Fe.
Water quenched: 70,000 min TS, 30,000 min YS; 30 min El.
Vacuum refined and degassed, niobium stabilized; good resistance to corrosion by reducing media and to pitting corrosion; weldable; good high temperature properties.

SCOAVAC-VCF5.
M-1714; 0.08 max C, 1.5 max Mn, 2.0 max Si, 9.0 Ni, 19.0 Cr, Nb = 8 × %C min, bal Fe
Water quenched: 70,000 min TS; 30,000 min YS; 30 min El.
Vacuum refined and degassed; excellent resistance to corrosion by strongly oxidizing media
Niobium stabilized for improved welding and high temperature properties.

SCOAVAC VCF7(b).
M-1714, 0.16 C, 1.5 Mn, 2.0 Si, 0.04 S, 0.17 P, 9-12 Ni, 18-21 Cr, 1.5 Mo, 0.2-0.35 Se, bal Fe.
Vacuum refined and degassed casting, water quenched 70,000 TS, 30,000 YS, 25 El.
Free machining austenitic stainless; for stainless parts that require considerable machining.
ASTM A296 CF-16F(a).

SCOAVAC-VCG1
M-1714; 0.08 max C, 1.5 max Mn, 1.5 max Si, 11.0 Ni, 19.0 Cr, 4.0 Mo, bal Fe
Vacuum refined and degassed, water quenched: 70,000 min TS; 35,000 min YS; 25 min El
Resistant to corrosion by reducing media, resistant to pitting corrosion even at elevated temperatures; for valve parts, valve bodies, and pump parts

SCOAVAC-VCH3.
M-1714; 0.2 C, 1.5 Mn, 2.0 Si, 12-15 Ni, 22-26 Cr, bal Fe.
Vacuum refined and degassed casting, water quenched 70,000 TS; 30,000 YS, 30 El.
Austenitic stainless; for specialized application in the chemical and paper industries
ACI CH-20, ASTM A296 CH-20

SCOAVAC-VCM1
M-1714, 0.05 max C, 1.5 max Mn, 1.5 max Si, 29.0 Ni, 20.0 Cr, 3.0 Mo, 3.5 Cu, bal Fe
Vacuum refined and degassed, water quenched: 62,000 min TS, 25,000 min YS; 35 min El
Good resistance to sulphuric acid, dilute hydrochloric acid, nitric acid, hot chloride salt solutions and many other reducing chemicals, for valve bodies, valve parts and pump parts.
ASTM A296 CN-7M; ACI CN-7M.

SCOAVAC-VCN1
M-1714; 0.3 max C, 1.5 max Mn, 2.0 max Si, 1.0 max Fe, bal Ni
Vacuum refined and degassed
As cast. 50,000 min TS, 18,000 min YS; 10 min El.
Useful in equipment handling corrosives, such as caustics when it is necessary to avoid contamination of a product by copper or iron.

SCOAVAC-VCN2.
M-1714; 0.35 max C, 1.5 max Mn, 2.0 max Si, 3.5 max Fe, 30.0 Cu, bal Ni,
Vacuum refined and degassed.
As cast: 65,000 min TS; 30,000 min YS; 25 min El.
For general applications requiring corrosion resistance at elevated temperatures; for valve bodies, parts of hydraulic chemical and food equipment, marine fittings.
ASTM A296 M-35.

SCOAVAC-VCN3.
M-1714; 0.12 max C, 1.0 max Mn, 1.0 max Si, 1.0 max Cr, 30.0 Mo, 6.0 max Fe, 2.5 max Co, 0.6 max V, bal Ni.
Vacuum refined and degassed.
As cast: 72,000 min TS; 46,000 min YS; 6 min El.
Resistant to hydrochloric acid, non-oxidizing acids and salts, and reducing chloride salts.
For valve bodies, valve parts and pump parts.
ASTM A296 N-12M.

SCOAVAC-VPH1.
M-1714; 0.07 max C, 1.0 max Mn, 1.0 max Si, 4.0 Ni, 17.0 Cr, 4.0 Cu, 0.30 Nb, bal Fe.
Vacuum refined and degassed, precipitation hardened: 180,000 min TS; 160,000 min YS; 6 min El.
For parts requiring good corrosion resistance and high strengths up to 600 F (315°C).

SCOAVAC-VRA2
M-1714, 0.20 C, 0.35-0.65 Mn, 1.0 Si, 8-12 Cr, 0.9-1.2 Mo, 0.5 Ni, 0.5 Cu, 0.1 W, bal Fe.
Vacuum refined and degassed casting; normalized and tempered: 90,000 TS; 60,000 YS; 18 El.
Corrosion resistant, hardenable, resistant to oxidation at temperatures up to 650°C; for valves, fittings and piping and pressure containing parts from sub-zero to 600°C.
ACI HA, ASTM A217 C12.

SCOAVAC-VRC1
M-1714; 0.50 C, 1.0 Mn, 2.0 Si, 4.0 Ni, 26-30 Cr, 0.5 Mo, bal Fe
Vacuum refined and degassed stainless casting
As cast: 55,000 TS
Limited strength but has good resistance to oxidation and to flue gases containing sulphur at temperatures up to 1100°F
ASTM A297 HC; ACI HC

SCOAVAC-VRH4(a).
M-1714; 0.50 max C, 2.0 max Mn, 2.0 max Si, 12.0 Ni, 25.0 Cr, 0.50 max Mo, bal Fe
Vacuum refined and degassed; partially ferritic: 75,000 min TS, 35,000 min YS; 10 min El
For high temperature service parts subject to changes in temperature or stress, grate bars, furnace parts, retorts, tube hangers and supports.

SCOAVAC-VRH4(b)
M-1714, 0.50 max C, 2.0 max Mn, 2.0 max Si, 12.0 Ni, 25.0 Cr, 0.50 max Mo, bal Fe
Vacuum refined and degassed, wholly austenitic: 75,000 min TS, 35,000 min YS, 10 min El
For high temperature service parts at constant temperature and stress where creep strength is controlling factor, furnace parts

SCOAVAC-VRK4
M-1714, 0.40 C, 2.0 max Mn, 2.0 max Si, 20.0 Ni, 25.0 Cr, 0.5 max Mo, bal Fe
As cast: 65,000 min TS; 35,000 min YS; 10 min El.
Vacuum refined and degassed, good resistance to corrosion by hot gases including sulphur bearing gases, good high temperature strength; for retorts, radiant tubes, heat treating trays,

SCOAVAC-VRP.
M-1714; 0.35 C, 2.0 max Mn, 2.0 max Si, 25.0 Ni, 20.0 Cr, 0.5 max Mo, bal Fe.
Vacuum refined and degassed.
As cast: 63,000 min TS; 35,000 min YS; 8 min El.
Good high temperature corrosion resistant properties; for brazing fixtures, furnace beams and parts, radiant tubes and tube supports.

SCOAVAC-VRU.
M-1714; 0.55 C, 2.0 max Mn, 2.5 max Si, 39.0 Ni, 19.0 Cr, 0.5 max Mo, bal Fe.
Vacuum refined and degassed.
As cast: 65,000 min TS; 35,000 min YS; 10 min El.
Good high temperature corrosion resistant properties; for furnace beams and parts, tube supports, torch nozzles and trays.
ACI HU; ASTM A297 HU.

SCOAVAC-VRW2.
M-1714; 0.35-0.75 C, 2.0 Mn, 2.5 Si, 58-62 Ni, 10-14 Cr, 0.5 Mo, bal Fe
Vacuum refined and degassed casting.
As cast: 60,000 TS.
For furnace parts, cyanide pots, gas retorts, muffles that operate up to 1050°C in low sulphur environment.
ASTM A297 HW; ACI HW.

SCOAVAC-VRX.
M-1714; 0.35-0.75 C, 2.0 Mn, 2.5 Si, 64-68 Ni, 15-19 Cr, 0.5 Mo, bal Fe.
Vacuum refined and degassed casting
As cast: 60,000 TS.
For high temperature equipment as carburizing boxes, retorts, quenching fixtures, annealing trays, burner parts operating up to 1150°C. where corrosion must be minimized.
ASTM A296 CW-12M.

SCOAVAC-WCW1.
M-1714; 0.12 C, 1.0 Mn, 1.5 Si, 15-20 Cr, 16-20 Mo, 7.5 Fe, 5.25 W, 2.5 Co, 0.4 V, bal Ni.
Vacuum refined and degassed casting.
As cast: 72,000 TS; 46,000 YS; 4 El.
Good corrosion resistance for such chemicals as wet chloride, ferric chloride, hot acetic acid
ASTM A296 CW-12M

SCOOTER.
M-478, 0.15 C, 0.3 S, bal Fe.
Drawn: 89,600 TS, 15 El; 45 RA.
For general purposes; free-cutting steel

SCOOTER CASE.
M-478; 0.10 C, 1.0-1.5 Mn, 0.4 S, bal Fe.
For cams, gears, fasteners; case hardened

SCOTT.
M-1705; 2.25 C, 0.35 Mn, 0.5 Si, 11.5 Cr, 0.2 V, 0.8 Mo, bal Fe.
High carbon, high chromium tool and die steel; air or oil hardening. AISI D4.

SCOTTS ACME
0.4 C, bal Fe.
For shafting; water hardening.

SCOVILLE 7% NICKEL-SILVER 743
M-102; 65 Cu, 7 Ni, 28 Zn.
Soft: 54,000 TS; 24,000 YS, 65 El
Hard: 98,000 TS; 4 El.
For wire products; corrosion resistant;

SCOVILL ALLOY 169 YELLOW BRASS, 65% 270.
M-102; 65 Cu, bal Zn.
Annealed: 49,000 TS; 57 El.
Hard: 74,000 TS; 8 El.
For socket shells, pins, rivets; excellent cold working.

SCOVILL ALLOY 280 MUNTZ METAL.
M-102; 61.5 Cu, 0.3 max Pb, bal Zn.
Annealed: 54,000 TS; 45 El.
Hard: 70,000 TS; 10 El.
For heat exchanger tubes; excellent hot working.

SCOVILL ALLOY 314.
M-102; 89 Cu, 2 Pb, 1 Ni, 8 Zn.
Soft: 37,000 TS
Hard: 62,000 TS.
For hardware; leaded commercial bronze, free-cutting.

SCOVILL ALLOY 320.
M-102; 85 Cu, 1.8 Pb, 13.2 Zn.
Soft. 40,000 TS.
Hard: 65,000 TS
For hardware; leaded red brass, free-cutting.

SCOVILL 322 HIGH LEADED BRASS (TUBE) 67%
M-102; 67 Cu, 1.8 Pb, 31.2 Zn.
Free-cutting.

SCOVILL 325 LANCASHIRE BRASS.
M-102; 72-75 Cu, 2.5-3.0 Pb, bal Zn.
Annealed 43,000 TS, 50 El.
Hard. 73,000 TS, 8 El
For watch and clock parts, free cutting

SCOVILL 342 HIGH LEADED BRASS-65%.
M-102, 65 Cu, 2.2 Pb, 32.8 Zn
For screw machine products, hardware; free-cutting.

SCOVILL 350.
M-102; 1 Pb, 61 Cu, bal Zn
Soft 54,000 TS, 40 El
Hard: 80,000 TS; 6 El
For screw machine products, free-cutting

SCOVILL ALLOY 360
M-102, 2.5-3.75 Pb, 60-63 Cu, bal Zn
Annealed 49,000 TS, 53 El; 58 RA.
½ Hard: 58,000 TS, 25 El
For screw machine parts, free cutting.

SCOVILL 403 GILDING BRONZE
M-102; 95 Cu, 2 Sn, 3 Zn.

SCOVILL 405 PENNY BRONZE.
M-102, 95 Cu, 1 Sn, 4 Zn.
For coins, corrosion resistant.

SCOVILL ALLOY 413 TIN BRASS (1%).
M-102, 90.5 Cu, 1 Sn, bal Zn.
Annealed 41,000 TS; 42 El.
Hard 67,000 TS, 4 El
For costume jewelry, springs; for decorative purposes.

SCOVILL ALLOY 415 TIN BRASS (2%)
M-102, 90.5 Cu, 2 Sn, bal Zn.
Annealed 45,000 TS, 55 El.
Hard 70,000 TS, 3 El
For costume jewelry, spring properties.

SCOVILL ALLOY 419.
M-102; 89 Cu, 6.5 Zn, 4.5 Sn
Annealed 40,000 TS, 20 El
For optical instruments, spring properties

SCOVILL ALLOY 430 SPRING BRONZE
M-102, 86.5 Cu, 2-1 Sn, bal Zn.
Annealed. 50,000 TS; 55 El
Hard. 94,000 TS, 1 El.
For springs, diaphragms; tough.

SCOVILL 434 SPRING BRONZE 0.8%.
M-102; 85 Cu, 0.8 Sn, 14.2 Zn
For springs; corrosion resistant.

SCOVILL ALLOY 445.
M-102; 71 Cu, 1.0 Sn, 28 Zn, 0.3 P.
Soft: 50,000 TS; Rockwell B54.
Hard: 84,000 TS; Rockwell B84.
For springs, diaphragms; Phosphorized Admiralty.

SCOVILL ALLOY 464.
NAVAL BRASS (A).
M-102; 60 Cu, 0.75 Sn, 0.2 Pb, bal Zn.
Annealed: 58,000 TS; 45 El.
Hard: 80,000 TS; 20 El.
For marine hardware, valve stems, rivets; corrosion resistant; "Scobronze."

SCOVILL ALLOY 482.
NAVAL BRASS (LOW LEADED) (B).
M-102; 60.5 Cu, 0.75 Sn, 0.75 Pb, bal Zn.
Annealed: 63,000 TS; 35 El.
Hard: 86,000 TS; 10 El.
For marine hardware; corrosion resistant.

SCOVILL ALLOY 485.
NAVAL BRASS (HIGH LEADED) (C).
M-102; 60 Cu, 0.75 Sn, 1.75 Pb, bal Zn.
Annealed: 58,000 TS; 29 El.
Hard: 88,000 TS; 9 El.
For screw machine products; corrosion resistant, free-cutting.

SCOVILL ALLOY 510
M-102; 95 Cu, 5 Sn, 0.35 max P.
Soft: 50,000 TS, Rockwell F77.
Hard 86,000 TS; Rockwell B87.
For springs; tough, P-Bronze.

SCOVILL ALLOY 521.
M-102, 92 Cu, 8 Sn, 0.25 max P
Soft: 58,000 TS; Rockwell F80.
Hard 95,000 TS; Rockwell B93
For springs, tough; P-Bronze.

SCOVILL 651 LOW SILICON BRONZE TYPE B
M-102; 98 Cu, 2 Si.

SCOVILL ALLOY 675.
MANGANESE BRONZE (A).
M-102, 58.5 Cu, 0.1 Sn, 0.1 Fe, 0.3 Mn, bal Zn
Annealed 65,000 TS; 33 El.
Hard: 84,000 TS; 19 El
For valve stems, welding rod, condenser plates; excellent hot working

SCOVILL 706 CUPRO NICKEL 10%
M-102; 88.6 Cu, 1.4 Fe, 10 Ni

SCOVILL ALLOY 710
M-102; 80 Cu, 20 Ni.
Soft: 49,000 TS; Rockwell F73.
Hard: 72,000 TS, Rockwell B81.
For condenser tubing, corrosion resistant.

SCOVILL ALLOY 715
M-102, 70 Cu, 30 Ni.
Soft 58,000 TS; Rockwell F80.
Hard. 80,000 TS; Rockwell B84
For condenser tubing; corrosion resistant.

SCOVILL 735 NICKEL SILVER 72-18.
M-102; 72 Cu, 18 Ni, 10 Zn.
Corrosion resistant.

SCOVILL ALLOY 743 NICKEL SILVER (8%).
M-102; 64.8 Cu, 8 Ni, bal Zn.
Annealed: 47,000 TS; 53 El.
Hard: 93,000 TS; 3 El.
For strip products; excellent cold working;

SCOVILL 745.
M-102; 64 Cu, 10 Ni, 26 Zn
Soft. 55,000 TS; 210,000 YS; 54 El.
Hard: 102,000 TS; 100,000 YS; 7 El.
For resistance wire springs, cutlery, hardware; Nickel-Silver;

SCOVILL ALLOY 752.
M-102; 65 Cu, 18 Ni, 17 Zn.
Soft: 58,000 TS; Rockwell F85.
Hard: 85,000 TS; Rockwell B87.
For hardware; nickel silver.

SCOVILL ALLOY 754 NICKEL SILVER (15%).
M-102; 64.8 Cu, 15 Ni, bal Zn.
Annealed: 54,000 TS; 42 El.
Hard: 90,000 TS; 2 El.
For costume jewelry; corrosion resistant.

SCOVILL ALLOY 757 NICKEL SILVER (12%).
M-102; 64.8 Cu, 12 Ni, bal Zn.
Annealed: 53,000 TS; 46 El.
Hard 88,000 TS; 3 El.
For hollow ware; corrosion resistant.

SCOVILL ALLOY 770
NICKEL SILVER (18%) (B).
M-102; 55 Cu, 18 Ni, bal Zn.
Annealed: 60,000 TS; 40 El.
Hard: 100,000 TS; 3 El.
For resistance wire, springs, optical goods; corrosion resistant.

SCOVILL ALLOY 787
ALUMINUM BRASS TYPE B.
M-102; 78 Cu, 2.1 Al, 0.035 As, bal Zn.
Annealed 60,000 TS, 55 El.
For condensers, distiller tubes; corrosion resistant;

SCOVILL 788
M-102; 64 Cu, 1 Pb, 12 Ni, 23 Zn.
Soft 60,000 TS; 28,000 YS; 43 El.
Hard. 104,000 TS, 101,000 YS; 4 El.
For watch blanks, screw machine parts; Nickel-Silver;

SCOVILL NO. 1032.
M-102, 0.25 S, bal Cu
Cold drawn: 53,000 TS; 50,000 YS; 10 El; 107 Brin
For cable clamps, radio parts, prongs; free-cutting, high electrical conductivity.

SCOVILL NO. 3105
M-102, 0.4 Mn, 0.5 Mg, bal Al.
0-Temper: 18,000 TS, 7000 YS; 25 El, 32 Brin
H14-Temper: 25,000 TS; 23,000 YS; 6 El; 45 Brin
For siding, general purpose sheet.
Non-heat treatable.

SCOVILL ADMIRALTY 445.
M-102, 0.06 max Fe, 0.075 max Pb, 0.90 min Sn, 70 min Cu, bal Zn.
Soft: 55,000 TS, 65 El, 50 Brin
Hard 105,000 TS; 2 El, 175 Brin.
For condenser tubes for polluted fresh or sea water; corrosion resistant.

SCOVILL CARTRIDGE BRASS, 260
M-102, 70 Cu, 30 Zn.
Annealed 47,000 TS, 62 El.
Hard 76,000 TS; 8 El.
For cartridge cases, high conductivity

SCOVILL COMMERCIAL BRONZE, ALLOY 220.
M-102, 89-91 Cu, bal Zn
Annealed. 37,000 TS, 45 El
Hard: 60,000 TS; 5 El.
For hardware, bullet jackets, deep drawing.

SCOVILL EXTRA HIGH LEADED BRASS 356.
M-102; 63 Cu, 2.5 Pb, bal Zn.
Annealed 49,000 TS, 52 El.
Hard: 74,000 TS; 7 El
For clock gears, plates; free-cutting

SCOVILL FORGING BRASS, ALLOY 377.
M-102; 58-61 Cu, 1.5-2.5 Pb, bal Zn.
Forged: 55,000 TS, 40 El.
For hardware, forgings.

SCOVILLS HARDWARE BRONZE.
M-102; 84-86 Cu, 1.2-2.5 Pb, bal Zn.
Annealed: 35,000 TS; 25 El; 71 RA.
Drawn: 45,000 TS; 19,000 YS; 10 El; 60 RA.
For hardware parts, screw machine parts; "Scovill No. 197 Alloy"; free from season cracking.
CDA 316.

SCOVILL HIGH BRASS, 270.
M-102; 64.5-66.5 Cu, 0.3 max Pb, bal Zn.
Annealed: 48,000 TS; 60 El.
Hard: 74,000 TS; 8 El; 150 Brin.
For deep drawing, spinning, stamping; high ductility.

SCOVILL HIGH LEADED BRASS 353.
M-102; 63 Cu, 1.8 Pb, bal Zn.
Annealed: 49,000 TS; 50 El.
Hard: 74,000 TS; 7 El.
For clock and instrument frames; free-cutting.

SCOVILL LEADED MUNTZ METAL 380.
M-102; 61 Cu, 1 Pb, bal Zn.
Annealed. 54,000 TS; 40 El.
Hard· 80,000 TS; 6 El.
For screw machine products; good machinability.

SCOVILL LEADED ROD 360
M-102; 61.5 Cu, 3 Pb, bal Zn.
Soft: 48,000 TS; 18,000 YS; 55 El
Hard: 90,000 TS; 88,000 YS; 6 El.
For screw machine parts.

SCOVILL LOW BRASS, ALLOY 240.
M-102, 79-81 Cu, 0.05 max Pb, bal Zn
Annealed: 43,000 TS; 50 El; 159 Brin.
Hard: 73,000 TS; 8 El; 156 Brin.
For drawn and formed parts; corrosion resistant

SCOVILL LOW LEADED BRASS (64%) ALLOY 330.
M-102, 67 Cu, 0.6 Pb, bal Zn.
Annealed: 47,000 TS; 57 El
Hard: 75,000 TS; 8 El.
For pipe, pump lines, trap tubes, tubes, good machinability.

SCOVILL LOW LEADED BRASS (67%) ALLOY 335
M-102; 65 Cu, 0.5 Pb, bal Zn
Annealed· 49,000 TS, 57 El.
Hard· 74,000 TS, 8 El.
For butts, hinges; good cold working

SCOVILL MATRIX BRASS 340.
M-102; 64.5 Cu, 1 Pb, bal Zn.
Annealed· 49,000 TS; 54 El.
Hard: 74,000 TS; 7 El.
For gears, rivets, screws; good cold working.

SCOVILL MUNTZ 280.
M-102; 0.35 max Pb, 0.10 max Fe, 60 min Cu, bal Zn.
Soft: 45,000 TS; 20,000 YS; 60 El.
Hard· 100,000 TS; 98,000 YS; 2 El.
For condenser tubes for pure fresh water; corrosion resistant

SCOVILL NAVAL BRASS 464.
M-102, 59-61 Cu, 0.5-1.0 Sn, 0.06 max Fe, 0.20 max Pb, bal Zn.
Soft. 54,000-65,000 TS; 25,000-27,000 YS; 40-25 El.
Hard: 105,000 TS; 99,000 YS; 7 El
For boat shafting, turn buckles, welding rod; "Scovill No. 16 Alloy", resists salt water corrosion

SCOVILL RED BRASS, 85%, ALLOY 230.
M-102; 85 Cu, bal Zn
Annealed: 41,000 TS; 48 El.
Hard: 79,000 TS; 6 El.
For screw shells, compacts, costume jewelry; resists season cracking and dezincification.

SCOVILL TIN BRASS (5%) 419.
M-102; 90.5 Cu, 5 Sn, bal Zn.
Annealed: 49,000 TS; 74 El.
For costume jewelry; spring properties; "Optical Metal."

SCREEN PLATES.
U.S.; 58 Cu, 41 Zn, 0.75 Sn, 0.25 Pb.
For screen plates; high strength

SCREW BRONZE
U.S.; 5 Zn, 1 Sn, 0.5 Pb, bal Cu.
For screws, bolts, nuts, hardware; free-cutting.

SCREW METAL
U.S., 60 Cu, 1.5 Pb, bal Zn.
For screws, bolts, studs; free-cutting.

SCREW NUT BRONZE
U.S.; 86 Cu, 11 Sn, bal Zn.
For screws, nuts, bolts; high strength.

SCRIBE-IT
M-1149; 0.95 C, 1.2 Mn, 0.25 Si, 0.5 Cr, 0.2 V, 0.5 W, bal Fe
Oil hardening tool steel; AISI O1.

SC SPECIAL.
M-115; 0.50 C, 0.3 Mn, 3 Cr, 14 W, 0.5 V, 0.3 Si, bal Fe.
For hot work and extrusion dies; oil hardening, hot work steel.

SD-NICKEL
M-529, 99.9 Ni
For anodes Improves plating.

S D T-T C O.
M-1119; 0.7 C, 18 W, 5 Co, 4 Cr, 1.3 V, bal Fe
For tools, dies, cutters, high speed steel.

SEACO HIGH SPEED.
M-374, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutting tools; high speed steel.

SEALALLOY
Bi alloy.
For sealing metal to glass.

SEALMET 1
M-1, 28 Cr, bal Fe plus Ni.
Cold drawn 88,000 TS, 69,000 YS, 23 El; 162 Brin
For glass-to-metal seals, controlled expansion

SEALMET 4.
M-1, 42 Ni, 6 Cr, bal Fe
Cold drawn 80,000 TS; 40,000 YS; 31 El, 127 Brin
For glass-to-metal seals; controlled expansion

SEALMET HC-1
M-1, 28 Cr, bal Fe.
For glass to metal seals, coef. expansion of glass

SEALMET HC4
M-1, 42 Ni, bal Fe.
Annealed 80,000 TS, 30,000 YS; 30 El; 125 Brin
Hard. 140,000 TS, 228 Brin.
For instruments, glass-to-metal seals; controlled expansion.

SEALVAC A.
M-38; M-1630; 17 Co, 29 Ni, bal Fe.
For glass to metal seals, sealing leads in electric light bulbs and radio rubes
Controlled expansion.

SEALVAR
M-1623; 29 Ni, 17 Co, bal Fe.
For glass to metal sealing, hermetic seals with the harder glasses and ceramics in electronic industries.
Controlled expansion.

SEAMLESS TUBING ALLOY.
U.S.; 60-61.5 Cu, 38.5-40 Zn.
For tubing; high strength

SEARCHER.
M-1411; 0.45 C, 2 W, 1 Cr, 0.4 Mn, 1 Si, bal Fe.
For punches, crimpers, upsetters; oil hardened, shock resistant.

SEARCHER A.1.
M-1411; 0.63 C, 1.6 W, 0.4 Cr, 1.1 Si, bal Fe.
For punches, crimpers; oil hardened.

SEARING BEARING.
Eng., 86 Cu, 14 Sn.
For bearings; bronze.

SEARS HARD FACING.
M-374; C, 11-13.5 Mn, bal Fe.
Welded: 500-600 Brin.
For hard facing electrodes for build-up work; austenitic, work hardens.

SEA STEEL.
M-59, 0.2 C, 18 Cr, 8 Ni, bal Fe.
For marine fittings, hardware, pulleys; stainless, austenitic.

SEA WATER ALLOY-1.
U.S.; 17 Ni, 5 Mn, 0.7 C, bal Fe.
For marine construction; stainless and corrosion resistant

SEA WATER ALLOY-2.
U.S., 12 Cr, 24 Ni, 0.6 Mn, 0.5 C, bal Fe.
For marine construction; stainless and corrosion resistant

SEA WATER BRONZE.
England, 33 Ni, 16 Sn, 5.5 Zn, 1 Bi, bal Cu
For marine parts, hardware; resists sea water corrosion

SECAERO
M-969, 1.0 C, 0.65 Mn, 5.0 Cr, 0.3 V, 1.1 Mo, bal Fe
Air hardening tool steel, cold work type, AISI A2.

SECOBALT
M-969, 0.75 C, 5 Cr, 11 Co, 1.5 V, 18 W, 0.8 Mo, bal Fe.
For cutters, tools, high speed steel

SECODIE.
M-969, 1.35 C. 0.6 Cr, 0.35 V, 1.5 Mo, 1.2 Si, bal Fe
For dies, non-deforming.

SECO II
Sweden; TiC, WC.
For tools, dies; sintered carbides.

SECOLEO.
M-969; 0.75 C, 0.45 Mn, 0.2 Si, 1.1 Cr, 1.65 Ni, bal Fe
Oil hardening tool and die steel

SECOLOY.
M-969; 2.5 C, 33 Cr, 44 Co, 17 W, 2 Fe.
For tool bits, cutters, cast

SECON 430
M-1524; Mo, bal Pd.
Wire 215,000 TS
For resistors, potentiometers, high electrical resistance

SECON 436D
M-1524; W, Mo, bal Pt.
Wire 300,000 TS.
For resistors, potentiometers; high electrical resistance.

SECON 445.
M-1524; Mo, bal Pd.
Wire: 250,000 TS
For resistors, potentiometers; high electrical resistance.

SECON 449.
M-1524; Rh, bal Pt.
Wire: 240,000 TS.
For resistors, potentiometers; high electrical resistance.

SECON 486.
M-1524; Mo, bal Pd.
Wire: 250,000 TS.
For resistors, potentiometers; high electrical resistance.

SECOVAN.
M-969; 0.7 C, 4.5 Cr, 2.25 V, 18 W, 0.65 Mo, bal Fe.
For tools, cutters; high speed steel.

SECO XXX.
M-969; 0.5 C, 0.9 Mn, bal Fe
For chisels, hammers; tough.

SECRETAN.
Eng., 95-91 Cu, 9-5 Al, 1.5 Mg, 0.5 P.
For strong corrosion resistant parts; corrosion resistant.

SECURIT LDS.
M-1318, 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, dies, crimpers, form tools; oil hardened, non-deforming.

SEFCO NO. 2.
M-970, 3.2 C, 2.5 Si, 1.5 Ni, bal Fe
Cast: 66,000 TS; 230 Brin.
For gears, machinery parts; cast iron

SEGMENT STEEL.
M-357; 0.85 C, 0.75 Cr, bal Fe.
For tools, dies, oil hardening.

SEIBEL WSM.
M-1369; Al alloy.
For light alloy parts.

SEIFERT
Eng., 73 Sn, 21 Zn, 5 Pb, 0.5 P, 0.5 Sb
For ornaments, bearings, anti-friction

SFL 1
M-121, 0.08 C, 15 Cr, 26 Co, 4.5 Mo, 4.4 Al, 2.3 Ti, 0.015 B, 1.0 max Fe, bal Ni.
For gas turbines, high temperature parts, jet engine components.
Cast alloy, high heat and corrosion resistant.

SEL 15
M-121, 0.07 C, 11 Cr, 14.5 Co, 6.5 Mo, 1.5 W, 5.4 Al, 2.5 Ti, 0.5 max Fe, 0.4 Cb + Ta, 0.015 B, bal Ni
For gas turbine components, high temperature parts.
Cast alloy, high heat and corrosion resistant.

SELECT B
M-73, 1.0 C, 5.25 Cr, 0.3 V, 1.1 Mo, bal Fe.
For blanking and forming dies, punches, plastic dies; wear resistant, air hardening

SELECT B-FM.
M-73; 1.0 C, 5.25 Cr, 0.3 V, 1.1 Mo, 0.15 S, bal Fe.
For blanking and forming dies, air hardening, non-deforming, self-lubricating AISI A2.

SELECT B FM
M-1702, 1.0 C, 0.7 Mn, 0.3 Si, 5.25 Cr, 0.25 V, 1.1 Mo, bal Fe.
Air hardening tool steel, medium alloy, for cold work tools; AISI A2.
Type A2 air hardening tool steels.

SELECT M
M-73; 0.90 C, 3.5 Cr, 0.6 Mo, bal Fe.
For hot work tools and dies; hot work steel.

SELENIUM COPPER-948.
M-8; 99.5 Cu, 0.5 Se.
Soft: 32,000 TS; 10,000 YS; 45 El.
Hard: 45,000 TS; 40,000 YS; 15 El.
For electrical conductors; hot work qualities.

SELF-HARDENING.
M-35, M-345; 1.6 C, 3.75 Cr, 9.5 W, bal Fe.
For tap dies, cutters; high speed steel.

SELF-HARDENING.
M-38; 1.9 C, 4 Cr, 4.1 Mo, bal Fe.
For tools, dies; air hardening.

SELFLUBE BRONZE.
M-989; 90 Cu, 10 Sn.
Cast: 14,000 TS;
For bearings; sintered.

SELFLUBE IRON.
M-939; 95 Fe, 5 Cu.
For bearings; sintered.

SELFLUBE IRON.
M-989; 90 Fe, 10 Cu.
Sintered: 40,000 TS.
For bearings; sintered.

SELVA METAL.
Eng; Zn, bal Cu.
For hardware; a high tension brass.

SEMALLOY NO. 2388.
M-1729; 83 Mg, 5 Zn, 12 Al.
Melting range: 770-1050°F.
Note: SEMALLOY alloys, available in various forms, are used essentially in brazing operations, but also for fusable links for safety devices, special castings and other special applications.

SEMALLOY NO. 2420.
M-1729; 45 Ag, 15 Cu, 16 Zn, 24 Cd.
Melting range: 1162-1170°F.

SEMALLOY NO. 2430.
M-1729; 50 Ag, 15.5 Cu, 16.5 Zn, 18 Cd.
Melting range: 1160-1175°F.

SEMALLOY NO. 2440.
M-1729; 50 Ag, 15 Cu, 25 Zn, 10 Cd.
Melting range 1160-1185°F.

SEMALLOY NO. 2450.
M-1729, 45 Ag, 18 Cu, 21 Zn, 16 Cd.
Melting range: 1141-1190°F.

SEMALLOY NO. 2460.
M-1729; 56 Ag, 22 Cu, 17 Zn, 5 Sn.
Melting range: 1145-1205°F.

SEMALLOY NO 2465
M-1729, 81 Ag, 19 Ge.
Melting range: 1206-1206°F.

SEMALLOY NO 2470.
M-1729; 61 Ag, 24 Cu, 15 In.
Melting range; 1166-1265°F.

SEMALLOY NO 2480.
M-1729; 82.7 Cu, 10 Ag, 7.3 Pd.
Melting range; 1190-1265°F.

SEMALLOY NO. 2485
M-1729; 50 Ag, 15.5 Cu, 16 Cd, 3 Ni
Melting range; 1170-1270°F.

SEMALLOY NO. 2490.
M-1729; 70 Ag, 30 In.
Melting range; 537-1279°F.

SEMALLOY NO. 2500.
M-1729; 35 Ag, 26 Cu, 21 Zn, 18 Cd.
Melting range; 1125-1295°F.

SEMALLOY NO. 2503.
M-1729; 45 Ag, 30 Cu, 12 Zn, 13 Mn.
Melting range; 1298-1298°F.; eutectic alloy.

SEMALLOY NO. 2507.
M-1729; 80 Cu, 15 Ag, 5 P.
Melting range; 1190-1300°F.

SEMALLOY NO. 2510.
M-1729; 80 Cu, 15 Ag, 5 Pd.
Melting range; 1185-1300°F.

SEMALLOY NO. 2515.
M-1729; 60 Ag, 20 Cu, 7 Zn, 10 Cd, 3 Sn.
Melting range; 1270-1300°F.

SEMALLOY NO. 2520.
M-1729; 30 Ag, 29 Cu, 21 Zn, 20 Cd.
Melting range; 1125-1300°F.

SEMALLOY NO. 2530.
M-1729; 60 Ag, 27 Cu, 13 In.
Melting range; 1175-1300°F.

SEMALLOY NO. 2535.
M-1729; 66.7 Ag, 22.3 Cu, 11 Zn.
Melting range; 1280-1320°F.

SEMALLOY NO. 2550.
M-1729, 60 Ag, 25 Cu, 15 Zn.
Melting range, 1260-1325°F.

SEMALLOY NO. 2560.
M-1729; 60 Ag, 30 Cu, 10 Sn.
Melting range; 1115-1325°F

SEMALLOY NO. 2565
M-1729; 65 Ag, 20 Cu, 15 Sn.
Melting range; 1280-1325°F.

SEMALLOY NO. 2570.
M-1729; 87 Cu, 7 P, 6 Ag.
Melting range; 1190-1325°F

SEMALLOY NO 2573
M-1729, 60.5 Ag, 22.5 Cu, 7 Zn, 10 Cd.
Melting range; 1285-1335°F

SEMALLOY NO 2580.
M-1729, 50 Ag, 28 Cu, 22 Zn
Melting range, 1250-1340°F.

SEMALLOY NO 2590.
M-1729, 40 Ag, 30.5 Cu, 29.5 Zn.
Melting range, 1080-1340°F

SEMALLOY NO. 2600
M-1729, 75 Ag, 25 Zn
Melting range, 1300-1345°F.

SEMALLOY NO 2610
M-1729; 57.3 Ag, 32.7 Cu, 7 Sn, 3 Mn.
Melting range, 1120-1345°F

SEMALLOY NO 2617
M-1729, 55 Ag, 31.5 Cu, 11.7 Zn, 1.8 Ni
Melting range, 1300-1355°F.

SEMALLOY NO 2620
M-1729, 60 Ag, 30 Cu, 10 Zn.
Melting range, 1120-1370°F

SEMALLOY NO. 2630.
M-1729; 45 Ag, 30 Cu, 25 Zn.
Melting range, 1250-1370°F

SEMALLOY NO. 2633.
M-1729; 61 Ag, 24 Cu, 15 Zn
Melting range, 1260-1375°F.

SEMALLOY NO. 2637
M-1729, 98 Ag, 2 Li.
Melting range; 1382-1382°F, eutectic alloy.

SEMALLOY NO. 2640.
M-1729; 34 Cu, 31.5 Ag, 15.5 Zn, 19 Cd.
Melting range, 1165-1390°F.

SEMALLOY NO. 2650
M-1729; 70 Ag, 20 Cu, 10 Zn.
Melting range; 1335-1390°F.

SEMALLOY NO. 2653.
M-1729; 66.7 Ag, 27.7 Cu, 5.6 Zn.
Melting range; 1350-1390°F.

SEMALLOY NO. 2655.
M-1729; 66.7 Ag, 28.25 Cu, 5.05 Zn.
Melting range; 1360-1395°F.

SEMALLOY NO. 2657.
M-1729; 72.15 Ag, 22.8 Cu, 5.05 Zn.
Melting range; 1345-1400°F.

SEMALLOY NO. 2660.
M-1729; 68 Ag, 27 Cu, 5 Zn.
Melting range; 1370-1400°F.

SEMALLOY NO. 2663.
M-1729; 68 Ag, 26.6 Cu, 0.4 Zn, 5 Sn.
Melting range; 1370-1400°F.

SEMALLOY NO. 2665.
M-1729; 40 Ag, 35 Cu, 25 Zn.
Melting range; 1340-1405°F.

SEMALLOY NO. 2667.
M-1729; 48 Cu, 32 Zn, 20 Ag.
Melting range; 1370-1410°F.

SEMALLOY NO. 2670.
M-1729; 38 Cu, 32 Zn, 30 Ag.
Melting range; 1370-1410°F.

SEMALLOY NO. 2675.
M-1729; 72 Ag, 28 Cu, 0.2 Li.
Melting range; 1410-1410°F.; eutectic alloy plus Lithium.

SEMALLOY NO. 2680.
M-1729; 93 Cu, 7 P.
Melting range; 1317-1418°F.

SEMALLOY NO. 2685.
M-1729; 75 Ag, 20 Cu, 5 Zn.
Melting range, 1350-1425°F.

SEMALLOY NO. 2690.
M-1729, 50 Ag, 34 Cu, 16 Zn.
Melting range, 1275-1427°F.

SEMALLOY NO. 2695.
M-1729, 40.15 Cu, 32.85 Zn, 27 Ag.
Melting range, 1350-1430°F.

SEMALLOY NO. 2700.
M-1729; 40 Ag, 30 Cu, 28 Zn, 2 Ni.
Melting range, 1220-1435°F.

SEMALLOY NO. 2710.
M-1729; 72 Ag, 28 Cu
Melting range, 1435-1435°F.; eutectic alloy.

SEMALLOY NO. 2720.
M-1729; 63 Ag, 27 Cu, 10 In.
Melting range; 1220-1436°F.

SEMALLOY NO. 2725.
M-1729; 40 Ag, 36 Cu, 24 Zn.
Melting range; 1330-1445°F

SEMALLOY NO. 2740.
M-1729; 91 Cu, 7 P, 2 Ag.
Melting range; 1185-1450°F.

SEMALLOY NO. 2753.
M-1729; 75 Ag, 22 Cu, 3 Zn.
Melting range; 1365-1450°F.

SEMALLOY NO. 2757.
M-1729; 92.75 Cu, 7.25 P.
Melting range; 1310-1460°F.

SEMALLOY NO. 2758.
M-1729; 71.15 Ag, 28.1 Cu, 0.75 Ni.
Melting range; 1436-1463°F.

SEMALLOY NO. 2760.
M-1729; 50 Cu, 40 Ag, 10 Mn,
Melting range; 1472-1472°F.; eutectic alloy.

SEMALLOY NO. 2765.
M-1729; 80 Cu, 15 Ag, 5 P.
Melting range; 1190-1475°F.

SEMALLOY NO. 2770.
M-1729; 63 Ag, 28.5 Cu, 6 Sn, 2.5 Ni.
Melting range; 1275-1475°F.

SEMALLOY NO. 2772.
M-1729; 75 Ag, 24.5 Cu, 0.5 Ni.
Melting range; 1435-1475°F.

SEMALLOY NO. 2774.
M-1729; 88.75 Cu, 6,25 P, 5 Ag.
Melting range; 1190-1480°F.

SEMALLOY NO. 2775.
M-1729; 89 Cu, 5 Ag, 6 P.
Melting range; 1190-1485°F.

SEMALLOY NO. 2776.
M-1729, 92.8 Cu, 7.2 P.
Melting range; 1305-1485°F.

SEMALLOY NO. 2778.
M-1729; 80 Ag, 16 Cu, 4 Zn.
Melting range; 1360-1490°F.

SEMALLOY NO. 2780.
M-1729; 68.4 Ag, 26.6 Cu, 5 Pd.
Melting range; 1485-1490°F.

SEMALLOY NO. 2805.
M-1729; 80 Cu, 15 Ag, 5 P.
Melting range: 1185-1500°F.

SEMALLOY NO. 2810.
M-1729, 45 Cu, 35 Zn, 20 Ag
Melting range: 1430-1500°F

SEMALLOY NO. 2813
M-1729; 47.75 Cu, 32.8 Zn, 19.45 Ag.
Melting range: 1440-1500°F.

SEMALLOY NO. 2817.
M-1729; 47 Cu, 35 Zn, 18 Ag.
Melting range 1440-1500°F

SEMALLOY NO. 2820.
M-1729; 50 Au, 29.5 Ag, 20.5 Cu.
Melting range: 1460-1510°F.

SEMALLOY NO. 2840.
M-1729; 49 Au, 27.5 Ag, 23.5 Cu.
Melting range: 1460-1515°F.

SEMALLOY NO. 2850
M-1729, 53 Au, 23.5 Ag, 23.5 Cu.
Melting range: 1480-1520°F.

SEMALLOY NO. 2860.
M-1729; 77 Ag, 21 Cu, 2 Ni.
Melting range. 1435-1525°F.

SEMALLOY NO. 2865
M-1729; 60 Ag, 20 Zn, 15 Cu, 5 Ni.
Melting range: 1230-1545°F.

SEMALLOY NO. 2870.
M-1729; 58.3 Au, 24 Ag, 17.7 Cu.
Melting range. 1500-1550°F.

SEMALLOY NO. 2880
M-1729; 60 Au, 20 Ag, 20 Cu
Melting range: 1535-1553°F.

SEMALLOY NO. 2890.
M-1729; 65 Ag, 28 Cu, 5 Mn, 2 Ni.
Melting range: 1385-1560°F.

SEMALLOY NO. 2895.
M-1729; 58.5 Ag, 31.5 Cu, 10 Pd.
Melting range. 1515-1566°F.

SEMALLOY NO. 2900.
M-1729; 53 Cu, 38 Zn, 9 Ag.
Melting range: 1510-1566°F.

SEMALLOY NO. 2920.
M-1729; 54 Ag, 40 Cu, 5 Zn, 1 Ni.
Melting range: 1325-1575°F.

SEMALLOY NO. 2922.
M-1729; 52.5 Cu, 25 Ag, 22.5 Zn.
Melting range: 1500-1575°F.

SEMALLOY NO. 2924.
M-1729; 40 Ag, 30 Cu, 25 Zn, 5 Ni.
Melting range: 1220-1580°F.

SEMALLOY NO. 2926.
M-1729; 50 Cu, 40 Zn, 10 Ag.
Melting range: 1495-1590°F.

SEMALLOY NO. 2928.
M-1729; 52.5 Cu, 47.5 Zn.
Melting range: 1570-1595°F.

SEMALLOY NO. 2940.
M-1729; 90 Ag, 10 Cu.
Melting range: 1434-1598°F.

SEMALLOY NO. 2945.
M-1729; 52 Cu, 38 Zn, 10 Ag.
Melting range: 1510-1600°F.

SEMALLOY NO. 2950.
M-1729; 58 Cu, 37 Zn, 5 Ag.
Melting range: 1575-1600°F.

SEMALLOY NO. 2952.
M-1729; 56 Cu, 37 Zn, 7 Ag.
Melting range: 1575-1600°F.

SEMALLOY NO. 2954.
M-1729; 51.5 Cu, 45 Zn, 3.5 Sn.
Melting range: 1585-1610°F.

SEMALLOY NO. 2956
M-1729; 89 Ni, 11 P.
Melting range: 1610-1610°F.

SEMALLOY NO. 2958.
M-1729; 57.5 Cu, 25 Ag, 17.5 Zn.
Melting range: 1255-1625°F.

SEMALLOY NO. 2960.
M-1729; 62.5 Ag, 32.5 Cu, 5 Ni.
Melting range: 1435-1625°F.

SEMALLOY NO. 2965.
M-1729; 56 Cu, 40 Zn, 4 Sn.
Melting range: 1590-1630°F.

SEMALLOY NO. 2968.
M-1729; 77 Ni, 13 Cu, 10 P.
Melting range: 1630-1630°F.

SEMALLOY NO. 2970.
M-1729; 80 Au, 20 Cu
Melting range: 1632-1632°F; eutectic alloy.

SEMALLOY NO. 2987.
M-1729; 92.5 Ag, 7.3 Cu. 0.2 Li.
Melting range: 1435-1634°F.

SEMALLOY NO. 2990.
M-1729; 92.5 Ag, 7.5 Cu.
Melting range: 1490-1634°F.

SEMALLOY NO. 2993.
M-1729; 79.5 Au, 20.5 Cu.
Melting range: 1635-1635°F; eutectic alloy.

SEMALLOY NO. 2997.
M-1729; 76.85 Ni, 13 Cr, 10 P, 0.15 Mn.
Melting range: 1615-1640°F.

SEMALLOY NO. 3000.
M-1729; 75 Au, 20 Cu, 5 Ag.
Melting range: 1625-1645°F.

SEMALLOY NO. 3010.
M-1729; 52 Ag, 28 Cu, 20 Pd.
Melting range: 1614-1648°F.

SEMALLOY NO. 3020.
M-1729; 95 Cu, 5 P.
Melting range: 1317-1653°F.

SEMALLOY NO. 3025.
M-1729; 57 Cu, 42 Zn, 1 Sn.
Melting range: 1630-1650°F.

SEMALLOY NO. 3030.
M-1729; 65 Ag, 20 Cu, 15 Pd.
Melting range: 1562-1652°F.

SEMALLOY NO 3040.
M-1729; 60 Au, 37 Cu, 3 In.
Melting range: 1580-1652°F.

SEMALLOY NO. 3043.
M-1729; 60 Cu, 40 Zn.
Melting range: 1650-1660°F.

SEMALLOY NO. 3050.
M-1729; 60 Cu, 40 Ag.
Melting range: 1434-1670°F.

SEMALLOY NO 3060.
M-1729, 81.5 Au, 15.5 Cu, 3 Ni.
Melting range. 1652-1670°F.

SEMALLOY NO. 3063
M-1729; 42 Ni, 34.5 Fe, 7.5 Co, 5 Cu
Melting range: 1600-1675°F.

SEMALLOY NO 3067
M-1729, 66.7 Au, 33.3 Cu
Melting range: 1655-1685°F.

SEMALLOY NO. 3070
M-1729, 58.3 Au, 39.6 Cu, 2.1 Ag.
Melting range. 1660-1690°F.

SEMALLOY NO 3071.
M-1729, 99.5 Ag, 0.5 Li.
Melting range: 1679-1698°F

SEMALLOY NO. 3073
M-1729, 47 Cu, 42 Zn, 10.5 Ni, 0.5 Ag
Melting range: 1685-1710°F.

SEMALLOY NO. 3074
M-1729; 48 Cu, 42 Zn, 10 Ni
Melting range: 1690-1715°F.

SEMALLOY NO 3077.
M-1729, 71.5 Ti, 28.5 Ni.
Melting range. 1728-1728°F.

SEMALLOY NO. 3080
M-1729, 99 Ag, 1 As.
Melting range. 1670-1742°F.

SEMALLOY NO 3090.
M-1729; 54 Ag, 25 Pd, 21 Cu
Melting range 1654-1742°F.

SEMALLOY NO 3110
M-1729; 70 Cu, 30 Ag
Melting range: 1434-1742°F.

SEMALLOY NO 3120
M-1729; 82 Au, 18 Ni.
Melting range: 1742-1742°F.

SEMALLOY NO. 3123.
M-1729; 47 Cu, 43 Zn, 10 Ni.
Melting range: 1660-1750°F.

SEMALLOY NO. 3127.
M-1729; 85 Ag, 15 Sn.
Melting range 1745-1760°F.

SEMALLOY NO. 3130.
M-1729; 100% Ag.
Melting point: 1761°F.

SEMALLOY NO. 3140.
M-1729; 96 Ag, 4 Mn,
Melting range: 1761-1761°F

SEMALLOY NO. 3150.
M-1729; 62 W, 35 Ag, 3 Ni.
Melting range: 1764-1764°F.

SEMALLOY NO. 3160.
M-1729; 55.5 Cu, 41.7 Au, 2.8 Ag.
Melting range: 1695-1765°F.

SEMALLOY NO. 3170.
M-1729; 85 Ag, 15 Mn.
Melting range: 1760-1780°F.

SEMALLOY NO. 3180.
M-1729; 50 Au, 50 Ag.
Melting range: 1742-1787°F.

SEMALLOY NO. 3190.
M-1729; 85 Cu, 8 Sn, 7 Ag.
Melting range: 1225-1805°F.

SEMALLOY NO. 3200.
M-1729; 94 Au, 6 Cu.
Melting range: 1769-1814°F.

SEMALLOY NO. 3201.
M-1729; 91.75 Fe, 4.5 Si, 3 B, 0.75 Ti.
Melting range: 1795-1820°F.

SEMALLOY NO. 3202.
M-1729; 91.25 Ni, 4.5 Si, 2.9 B, 1.35 Fe.
Melting range: 1795-1820°F.

SEMALLOY NO. 3203.
M-1729; 83.35 Ni, 6 Cr, 3 B, 2.5 Fe, 0.15 Mn.
Melting range: 1750-1825°F.

SEMALLOY NO. 3204.
M-1729; 82 Ni, 7 Cr, 4.5 Si, 2.9 B, 3.6 Fe.
Melting range. 1795-1825°F.

SEMALLOY NO. 3205.
M-1729; 80 Cu, 20 Ag.
Melting range: 1440-1830°F.

SEMALLOY NO. 3206
M-1729, 82.5 Ni, 7 Cu, 3 B, 4.5 Si, 3 Fe.
Melting range: 1780-1830°F.

SEMALLOY NO. 3207.
M-1729; 35 Au, 65 Ag.
Melting range: 1796-1832°F.

SEMALLOY NO. 3208.
M-1729; 43 Au, 57 Cu.
Melting range: 1796-1832°F.

SEMALLOY NO. 3209
M-1729, 72.5 Ni, 16 Cr, 3.5 B, 3 Fe, 5 Si.
Melting range: 1825-1840°F.

SEMALLOY NO. 3210.
M-1729; 95 Ag, 5 Pd.
Melting range: 1778-1850°F.

SEMALLOY NO. 3220.
M-1729; 60 Cu, 40 Au.
Melting range: 1805-1850°F.

SEMALLOY NO. 3225.
M-1729; 40 Au, 60 Cu.
Melting range: 1814-1850°F.

SEMALLOY NO. 3230.
M-1729; 77 Cu, 20 Au, 3 In.
Melting range: 1778-1859°F.

SEMALLOY NO. 3240.
M-1729; 62.5 Cu, 37.5 Au.
Melting range: 1814-1859°F.

SEMALLOY NO. 3243.
M-1729; 63 Cu, 37 Au.
Melting range: 1815-1860°F.

SEMALLOY NO. 3247.
M-1729; 60 Mn, 40 Ni.
Melting range: 1864-1864; eutectic alloy.

SEMALLOY NO. 3250.
M-1729; 95.8 Cu, 3.1 Si, 1.1 Mn.
Melting range: 1742-1866°F.

SEMALLOY NO. 3260.
M-1729; 65 Cu, 35 Au.
Melting range: 1832-1868°F.

SEMALLOY NO. 3263.
M-1729; 67 Mn, 16 Co, 16 Ni, 1 B.
Melting range: 1840-1870°F.

SEMALLOY NO. 3265.
M-1729; 73.2 Ni, 13.5 Cr, 4.5 Si, 4.5 Fe, 3.5 B.
Melting range: 1760-1875°F.

SEMALLOY NO. 3267.
M-1729; 91.8 Ni, 4.5 Si, 3.5 B, 2.2 Mn,
Melting range: 1800-1875°F.

SEMALLOY NO. 3270.
M-1729, 62 Cu, 35 Au, 3 Ni.
Melting range: 1814-1877°F.

SEMALLOY NO. 3290.
M-1729; 97 Cu, 3 Si.
Melting range: 1778-1877°F

SEMALLOY NO. 3293.
M-1729; 89.35 Ni, 6.15 P, 4.5 Si.
Melting range: 1616-1880°F.

SEMALLOY NO. 3297.
M-1729; 80 Cu, 20 Au.
Melting range: 1850-1880°F.

SEMALLOY NO. 3310.
M-1729, 99 Au, 1 Ga.
Melting range. 1877-1886°F.

SEMALLOY NO. 3315.
M-1729, 74.85 Ni, 17 Mn, 8 Si, 0.15 C.
Melting range: 1850-1890°F

SEMALLOY NO. 3320.
M-1729, 70 Cu, 30 Au.
Melting range. 1859-1895°F

SEMALLOY NO. 3322.
M-1729, 70.55 Ni, 16.5 Cr, 4.5 Si, 4 Fe, 3.85 B, 0.6 C
Melting range. 1780-1900°F.

SEMALLOY NO. 3324.
M-1729; 73.2 Ni, 13.5 Cr, 4.5 Fe, 4.5 Si, 3.5 B, 0.8 C
Melting range: 1790-1900°F.

SEMALLOY NO. 3327.
M-1729; 91 Ni, 4.5 Si, 1.5 Fe, 3 B.
Melting range. 1800-1900°F.

SEMALLOY NO. 3330.
M-1729; 99.5 Au, 0.5 Sb
Melting range 1742-1904°F

SEMALLOY NO 3335.
M-1729; 97 Cu, 3 As
Melting range: 1724-1922°F

SEMALLOY NO. 3340
M-1729, 70 Mn, 30 Ni.
Melting range: 1886-1922°F.

SEMALLOY NO 3343.
M-1729; 97 Cu, 3 Ge.
Melting range. 1894-1922°F.

SEMALLOY NO. 3360.
M-1729, 94.6 Ni, 3.5 Si, 1.9 B.
Melting range: 1905-1930°F.

SEMALLOY NO. 3370.
M-1729; 81.35 Ni, 15 Cr, 3.5 B, 0.15 C.
Melting range: 1930-1930°F.

SEMALLOY NO. 3380.
M-1729; 95 Cu, 5 Ag.
Melting range: 1832-1940°F.

SEMALLOY NO. 3400.
M-1729; 97 Cu, 3 Ga.
Melting range: 1922-1949°F.

SEMALLOY NO. 3410.
M-1729; 72 Au, 22 Ni, 6 Cr.
Melting range: 1785-1950°F.

SEMALLOY NO. 3415.
M-1729; 93.8 Ni, 3.5 Si, 1.5 Fe, 1.2 B.
Melting range: 1800-1950°F.

SEMALLOY NO. 3420.
M-1729; 90 Ag, 10 Pd.
Melting range: 1835-1950°F.

SEMALLOY NO. 3430.
M-1729; 71 Pt, 29 Sn.
Melting range: 1958-1958°F.

SEMALLOY NO. 3440.
M-1729; 65 Au, 35 Ni.
Melting range: 1769-1967°F.

SEMALLOY NO. 3445.
M-1729; 73.85 Ni, 13.5 Cr, 4.5 Fe, 4.5 Si, 3.5 B, 0.15 C.
Melting range: 1780-1970°F.

SEMALLOY NO. 3450.
M-1729; 99.7 Cu, 0.3 Si.
Melting range: 1981-1981°F.

SEMALLOY NO. 3460.
M-1729; 100 Cu.
Melting point: 1083°C; 1981°F.

SEMALLOY NO. 3470.
M-1729; 82 Cu, 18 Pd.
Melting range: 1967-1994°F.

SEMALLOY NO. 3480
M-1729; 81.45 Ni, 15 Cr, 3.5 B, 0.15 Mn
Melting range: 1900-1990°F.

SEMALLOY NO. 3490.
M-1729; 35 Cu, 30 Pd, 20 Ni, 15 Mn
Melting range: 1994-1994°F.

SEMALLOY NO. 3500.
M-1729; 63 Ni, 16 W, 11.5 Cr, 3.75 Fe, 3.25 Si, 2.5 B.
Melting range: 1790-2020°F.

SEMALLOY NO. 3505
M-1729; 55 Cu, 20 Pd, 15 Ni, 10 Mn.
Melting range: 2020-2020°F.

SEMALLOY NO. 3510.
M-1729; 75 Ag, 20 Pd, 5 Mn.
Melting range: 1960-2050°F.

SEMALLOY NO. 3520.
M-1729; 70.85 Ni, 19 Cr, 10 Si, 0.15 C.
Melting range: 1975-2075°F.

SEMALLOY NO. 3530.
M-1729; 71 Ni, 19 Cu, 10 Si
Melting range: 1975-2075°F.

SEMALLOY NO. 3540.
M-1729; 88.7 Cu, 10 Ni, 1.3 Fe.
Melting range: 2012-2102°F.

SEMALLOY NO. 3550.
M-1729; 82.55 Ni, 10 Cr, 2.5 Si, 2.5 Fe. 2 B, 0.45 C.
Melting range: 1780-2120°F.

SEMALLOY NO. 3560.
M-1729; 73 Ag, 27 Pt.
Melting range: 1823-2120°F.

SEMALLOY NO. 3570.
M-1729; 80 Ag, 20 Pd.
Melting range: 1958-2120°F.

SEMALLOY NO. 3580.
M-1729; 75 Cu, 25 Ni.
Melting range: 2102-2201°F.

SEMALLOY NO. 3590.
M-1729; 65 Pd, 35 Co.
Melting range: 2228-2228°F.

SEMALLOY NO. 3600.
M-1729, 64 Ag, 33 Pd, 3 Mn.
Melting range: 2100-2250°F.

SEMALLOY NO. 3610.
M-1729; 60 Pd, 40 Ni.
Melting range: 2260-2260°F.

SEMALLOY NO. 3620.
M-1729; 69.4 Cu, 30 Ni, 0.6 Fe.
Melting range: 2138-2264°F.

SEMALLOY NO. 3630
M-1729; 60 Cu, 40 Pd.
Melting range: 2192-2282°F.

SEMALLOY NO 3640
M-1729; 54 Pd, 36 Ni, 10 Cr.
Melting range. 2250-2300°F.

SEMALLOY NO 3650.
M-1729; 55 Cu, 45 Ni
Melting range. 2246-2372°F

SEMALLOY NO 3660
M-1729, 70 Ni, 30 Pd.
Melting range 2354-2408°F.

SEMALLOY NO. 3670.
M-1729, 53.5 Ni, 46.5 Mo
Melting range. 2408-2408°F; eutectic alloy.

SEMALLOY NO 3680.
M-1729, 63 Co, 37 Mo
Melting range: 2426-2426°F.

SEMALLOY NO 3690
M-1729; 67 Ni, 28.5 Cu, 2.5 Fe, 2 Mg
Melting range 2370-2460°F.

SEMALLOY NO 3700
M-1729, 67 Ni, 29.25 Cu, 3 Al, 0.75 Sn.
Melting range 2400-2460°F.

SEMALLOY NO. 3710.
M-1729, 72.85 Ni, 17 Cr, 10 Fe, 0.15 C.
Melting range: 2540-2600°F.

SEMALLOY NO. 3720
M-1729, 94 Ni, 4.75 Al, 1 Sn, 0.25 C.
Melting range: 2615-2635°F.

SEMALLOY NO 3730
M-1729, 64 Fe, 36 Ni.
Melting range: 2633-2633°F.

SEMALLOY NO 3740
M-1729; 100 Ni. (Nickel).
Melting point: 1453°C; 2647°F.

SEMALLOY NO. 3750
M-1729; 99.1 Fe, 0.45 Mn, 0.25 Si, 0.2 C.
Melting range: 2760-2760°F.

SEMALLOY NO. 3760.
M-1729; 100 Pd. (Palladium).
Melting point: 1552°C; 2826°F.

SEMALLOY NO. 3765.
M-1729; 100 Ti. (Titanium).
Melting point: 1660°C; 3020°F.

SEMALLOY NO. 3770.
M-1729, 75 Pt, 20 Pd, 5 Au.
Melting range: 2993-3083°F.

SEMALLOY NO. 3780.
M-1729; 100 Pt. (Platinum).
Melting point: 1769°C; 3216°F.

SEMALLOY NO. 3800.
M-1729; 100 Zr. (Zirconium).
Melting point: 1852°C; 3366°F.

SEMALLOY NO. 3810.
M-1729; 80 Mo, 20 Ru.
Melting range: 3452-3452°F.

SEMALLOY NO. 3820.
M-1729; 60 Pt, 40 Rh.
Melting range: 3515-3542°F.

SEMALLOY NO. 3830.
M-1729; 100 Rh. (Rhodium)
Melting point: 1966°C; 3574°F.

SEMALLOY NO 3840.
M-1729; 60 Pt, 40 Ir.
Melting range: 3542-3614°F.

SEMALLOY NO. 3850.
M-1729; 90 Mo, 10 Si.
Melting range: 3848-3902°F

SEMALLOY NO 3860.
M-1729; 100 Ir. (Iridium).
Melting point: 2450°C; 4442°F.

SEMALLOY NO. 3870.
M-1729; 100 Nb (Niobium or Columbium).
Melting point: 2468°C, 4474°F.

SEMALLOY NO 3880.
M-1729, Tungsten carbide
Melting point 2480°C; 4496°F.

SEMALLOY NO. 3890
M-1729, 100 Ru. (Ruthenium).
Melting point: 2500°C; 4532°F.

SEMALLOY NO 3900.
M-1729; 100 Ta (Tantalum)
Melting point: 2996°C, 5425°F.

SEMALLOY NO 3910
M-1729, 100 Re (Rhenium).
Melting point: 3180°C; 5756°F

SEMALLOY NO A963.
M-1729; Au, Ag.
Melting range: 1886-1904°F.

SEMALLOY NO A966.
M-1729, 100 Au
Melting point. 1945°F.

SEMALLOY NO. A971.
M-1729, Au, Pt.
Melting range: 1875-2156°F.

SEMALLOY NO. A972.
M-1729; 92 Au, 8 Pd.
Melting range 2174-2264°F

SEMALLOY NO. A973.
M-1729; 87 Au, 13 Pd
Melting range: 2300-2381°F.

SEMALLOY NO. A974.
M-1729; 75 Au, 25 Pt.
Melting range: 2210-2570°F.

SEMALLOY NO A975.
M-1729; 75 Au, 25 Pd.
Melting range: 2516-2570°F.

SEMALLOY NO. A976.
M-1729; 65 Au, 35 Pd.
Melting range: 2601-2624°F.

SEMALLOY NO. A977.
M-1729; Au, Pt.
Melting range: 2570-3002°F.

SEMALLOY NO. A978.
M-1729; Au, Pt.
Melting range: 2876-3110°F.

SEMDEX.
M-64; 0.6 C, 0.8 Mn, 0.3 Cr, bal Fe.
Annealed.
For trimmers, hot.

SEMI-ALLOYS NO. 100.
M-1729; 43 Bi, 22 Pb, 8 Sn, 5 Cd, 18 In, 4 Hg.
Liquidus 110°F; Solidus 100°F.
Note: Semi-Alloys No. 100 through No. 2400 are low melting alloys used for fusible elements in automatic sprinklers, solders, encapsulating electronic equipment, anchoring small assemblies, patterns, models, low melting castings, fusible cores, dental work.

SEMI-ALLOYS NO. 102.
M-1729; 45 Bi, 23 Pb, 11 Sn, 5 Cd, 16 In.
Liquidus 126°F; Solidus 117°F.

SEMI-ALLOYS NO. 103.
M-1729; 49 Bi, 18 Pb, 11 Sn, 1 Cd, 21 In.
Liquidus 133°F; Solidus 129°F.

SEMI-ALLOYS NO. 105.
M-1729; 48 Bi, 25 Pb, 13 Sn, 9 Cd, 5 In.
Liquidus 149°F, Solidus 134°F.

SEMI-ALLOYS NO. 106.
M-1729, 48 Bi, 26 Pb, 13 Sn, 9 Cd, 4 In.
Liquidus 149°F, Solidus 142°F.

SEMI-ALLOYS NO 107
M-1729, 43 Bi, 23 Pb, 12 Sn, 9 Cd, 13 Hg
Liquidus 151°F; Solidus 131°F.

SEMI-ALLOYS NO 108
M-1729; 49 Bi, 18 Pb, 15 Sn, 18 In.
Liquidus 156°F; Solidus 136°F

SEMI-ALLOYS NO 110
M-1729; 51 Bi, 28 Pb, 12 Sn, 9 Cd.
Liquidus 163°F, Solidus 158°F.

SEMI-ALLOYS NO 111.
M-1729, 50 Bi, 25 Pb, 12.5 Sn, 12.5 Cd
Liquidus 165°F; Solidus 158°F.

SEMI-ALLOYS NO. 112
M-1729; 50 Bi, 24.95 Pb, 12.5 Sn, 12.5 Cd, 0.05 Ag
Liquidus 165°F; Solidus 158°F.

SEMI-ALLOYS NO. 113
M-1729; 48 Bi, 20 Sn, 19 Pb, 13 Cd.
Liquidus 168°F; Solidus 158°F.

SEMI-ALLOYS NO 114
M-1729; 50 Bi, 35 Pb, 9 Sn, 6 Cd.
Liquidus 173°F; Solidus 158°F.

SEMI-ALLOYS NO 116
M-1729, 50 Bi, 39 Pb, 3 Sn, 8 Cd.
Liquidus 180°F; Solidus 141°F.

SEMI-ALLOYS NO 117
M-1729; 50 Bi, 39 Pb, 1 Sn, 8 Cd, 2 In.
Liquidus 185°F; Solidus 178°F.

SEMI-ALLOYS NO. 118.
M-1729; 43 Bi, 38 Pb, 10 Sn, 9 Cd.
Liquidus 190°F; Solidus 160°F.

SEMI-ALLOYS NO. 119.
M-1729, 50 Bi, 39 Pb, 2 Sn, 8 Cd, 1 In.
Liquidus 192°F; Solidus 176°F.

SEMI-ALLOYS NO. 120.
M-1729; 51 Bi, 31 Pb, 15 Sn, 1 Cd, 2 In.
Liquidus 192°F; Solidus 176°F.

SEMI-ALLOYS NO. 121.
M-1729; 51 Bi, 40 Pb, 8 Cd, 1 In.
Liquidus 192°F; Solidus 188°F.

SEMI-ALLOYS NO. 122.
M-1729; 52 Bi, 40 Pb, 8 Cd.
Liquidus 197°F; Solidus 197°F.

SEMI-ALLOYS NO. 123.
M-1729; 52 Bi, 32 Pb, 15 Sn, 1 Cd.
Liquidus 198°F; Solidus 181°F.

SEMI-ALLOYS NO. 124.
M-1729; 51.5 Bi, 31.5 Pb, 15 Sn, 2 In.
Liquidus 200°F; Solidus 190°F.

SEMI-ALLOYS NO. 125.
M-1729; 50 Bi, 39 Pb, 4 Sn, 7 Cd.
Liquidus 200°F; Solidus 165°F.

SEMI-ALLOYS NO. 126.
M-1729, 52 Bi, 32 Pb, 15 Sn, 1 Cd.
Liquidus 201°F; Solidus 195°F.

SEMI-ALLOYS NO. 129
M-1729; 50 Bi, 31 Pb, 19 Sn.
Liquidus 210°F; Solidus 200°F.

SEMI-ALLOYS NO. 130.
M-1729; 41 Bi, 28 Pb, 22 Sn, 9 Cd.
Liquidus 215°F; Solidus 158°F.

SEMI-ALLOYS NO 131.
M-1729; 50 Bi, 25 Pb, 25 Sn.
Liquidus 216°F; Solidus 203°F.

SEMI-ALLOYS NO 132.
M-1729, 54 Bi, 26 Sn, 20 Cd.
Liquidus 217°F, Solidus 216°F.

SEMI-ALLOYS NO. 134.
M-1729, 56 Bi, 22 Pb, 22 Sn
Liquidus 219°F, Solidus 203°F.

SEMI-ALLOYS NO 136
M-1729; 52 Bi, 38 Pb, 10 Sn
Liquidus 221°F, Solidus 208°F.

SEMI-ALLOYS NO. 137
M-1729; 35 Bi, 35 Pb, 20 Sn, 10 Cd.
Liquidus 221°F, Solidus 158°F.

SEMI-ALLOYS NO. 138.
M-1729; 45 Bi, 35 Pb, 20 Sn.
Liquidus 225°F, Solidus 205°F

SEMI-ALLOYS NO 138A.
M-1729; 55 Bi, 39 Pb, 6 Sn
Liquids 226°F; Solidus 215°F.

SEMI-ALLOYS NO 139.
M-1729, 46 Bi, 34 Pb, 20 Sn
Liquidus 227°F, Solidus 203°F

SEMI-ALLOYS NO 140.
M-1729; 52 Bi, 41 Pb, 7 Sn.
Liquidus 234°F, Solidus 208°F.

SEMI-ALLOYS NO. 141
M-1729; 54 Bi, 44 Pb, 1 Sn, 1 Cd.
Liquidus 235°F; Solidus 219°F.

SEMI-ALLOYS NO. 142
M-1729; 40 Bi, 33 Pb, 14 Sn, 13 Cd.
Liquidus 235°F, Solidus 162°F

SEMI-ALLOYS NO. 143.
M-1729, 50 Bi, 30 Pb, 20 Sn.
Liquidus 239°F; Solidus 203°F.

SEMI-ALLOYS NO. 144.
M-1729, 70 Pb, 25 Bi, 5 Sn.
Liquidus 240°F, Solidus 212°F.

SEMI-ALLOYS NO. 146.
M-1729; 53 Bi, 42 Pb, 5 Sn.
Liquidus 243°F; Solidus 217°F.

SEMI-ALLOYS NO. 147.
M-1729; 38 Bi, 26 Pb, 32 Sn, 3 Cd, 1 Sb.
Liquidus 244°F; Solidus 167°F.

SEMI-ALLOYS NO. 148.
M-1729; 54 Bi, 43 Pb, 3 Sn.
Liquidus 246°F; Solidus 226°F.

SEMI-ALLOYS NO. 149.
M-1729, 55 Bi, 44 Pb, 1 Sn.
Liquidus 248°F, Solidus 242°F.

SEMI-ALLOYS NO. 150.
M-1729; 55 Bi, 44 Pb, 1 In.
Liquidus 250°F; Solidus 248°F.

SEMI-ALLOYS NO. 151.
M-1729; 57 Bi, 41 Pb, 2 Cd.
Liquidus 250°F; Solidus 197°F.

SEMI-ALLOYS NO 152.
M-1729, 31 Bi, 46 Pb, 18 Sn, 5 Cd.
Liquidus 253°F; Solidus 158°F.

SEMI-ALLOYS NO 154.
M-1729, 58 Bi, 42 Pb.
Liquidus 259°F, Solidus 255°F

SEMI-ALLOYS NO. 155.
M-1729; 50 Sn, 50 In.
Liquidus 260°F, Solidus 240°F

SEMI-ALLOYS NO. 157.
M-1729, 38 Pb, 37 Bi, 25 Sn.
Liquidus 260°F, Solidus 200°F

SEMI-ALLOYS NO 158
M-1729, 52 Bi, 5 Pb, 37 Sn, 6 In.
Liquidus 264°F; Solidus 203°F.

SEMI-ALLOYS NO 159
M-1729, 95 In, 5 Ga.
Liquidus 266°F, Solidus 256°F

SEMI-ALLOYS NO 160
M-1729, 57 Bi, 2 Pb, 41 Sn
Liquidus 271°F, Solidus 262°F.

SEMI-ALLOYS NO 161
M-1729, 32 Bi, 34 Pb, 34 Sn
Liquidus 271°F, Solidus 205°F

SEMI-ALLOYS NO. 162
M-1729, 38 Bi, 31 Pb, 31 Sn
Liquidus 275°F, Solidus 205°F

SEMI-ALLOYS NO 163
M-1729, 57 Bi, 1 Pb, 42 Sn
Liquidus 275°F; Solidus 275°F.

SEMI-ALLOYS NO 164
M-1729, 55 Bi, 5 Pb, 40 Sn
Liquidus 277°F, Solidus 250°F.

SEMI-ALLOYS NO 165
M-1729, 36 Bi, 32 Pb, 31 Sn, 1 Ag.
Liquidus 277°F, Solidus 203°F.

SEMI-ALLOYS NO. 166
M-1729, 36 Bi, 32 Pb, 32 Sn
Liquidus 279°F; Solidus 203°F.

SEMI-ALLOYS NO 167.
M-1729; 28.5 Bi, 43 Pb, 28.5 Sn.
Liquidus 279°F; Solidus 205°F.

SEMI-ALLOYS NO 169
M-1729, 5 Bi, 32 Pb, 45 Sn, 18 Cd.
Liquidus 282°F, Solidus 270°F.

SEMI-ALLOYS NO. 170.
M-1729; 31 Bi, 38 Pb, 31 Sn.
Liquidus 282°F, Solidus 205°F.

SEMI-ALLOYS NO 171.
M-1729, 33 Bi, 34 Pb, 31 Sn.
Liquidus 289°F; Solidus 205°F.

SEMI-ALLOYS NO. 172.
M-1729; 60 Bi, 40 Cd.
Liquidus 291°F, Solidus 291°F.

SEMI-ALLOYS NO. 173.
M-1729; 58 Sn, 42 In.
Liquidus 292°F; Solidus 242°F.

SEMI-ALLOYS NO. 174.
M-1729; 21 Bi, 42 Pb, 37 Sn.
Liquidus 306°F; Solidus 248°F.

SEMI-ALLOYS NO. 175.
M-1729; 80 In, 15 Pb, 5 Ag.
Liquidus 315°F; Solidus 315°F.

SEMI-ALLOYS NO. 177.
M-1729, 45 Bi, 33 Pb, 22 Cd.
Liquidus 316°F; Solidus 197°F.

SEMI-ALLOYS NO 178.
M-1729; 45 Bi, 55 Pb.
Liquidus 320°F; Solidus 253°F.

SEMI-ALLOYS NO. 179
M-1729, 50 Sn, 25 Pb, 25 Cd.
Liquidus 320°F, Solidus 293°F

SEMI-ALLOYS NO 180.
M-1729, 70 Sn, 18 Pb, 12 In.
Liquidus 324°F, Solidus 324°F.

SEMI-ALLOYS NO 181.
M-1729; 16 Bi, 36 Pb, 48 Sn.
Liquidus 324°F; Solidus 284°F.

SEMI-ALLOYS NO 182.
M-1729; 14 Bi, 43 Pb, 43 Sn.
Liquidus 325°F, Solidus 291°F.

SEMI-ALLOYS NO. 183.
M-1729, 50 Sn, 40 Pb, 10 Bi.
Liquidus 330°F, Solidus 248°F.

SEMI-ALLOYS NO. 184
M-1729; 22 Bi, 51 Pb, 27 Sn.
Liquidus 338°F; Solidus 268°F.

SEMI-ALLOYS NO 185
M-1729, 40 Bi, 60 Sn.
Liquidus 338°F, Solidus 281°F.

SEMI-ALLOYS NO 186.
M-1729, 20 Bi, 50 Pb, 30 Sn
Liquidus 343°F, Solidus 266°F.

SEMI-ALLOYS NO. 187.
M-1729, 13 Bi, 47 Pb, 40 Sn.
Liquidus 349°F, Solidus 294°F.

SEMI-ALLOYS NO 188.
M-1729; 61.5 Sn, 35.5 Pb, 3 Ag
Liquidus 355°F, Solidus 355°F.

SEMI-ALLOYS NO 189
M-1729; 25 Bi, 15 Pb, 60 Sn
Liquidus 356°F, Solidus 205°F.

SEMI-ALLOYS NO. 1001
M-1729; 52 In, 48 Sn.
M.P. 243°F; 117°C

SEMI-ALLOYS NO 1010.
M-1729; 45 Bi, 19 In, 23 Pb, 8 Sn, 5 Cd
M.P 117°F; 47°C; eutectic alloy.

SEMI-ALLOYS NO. 1040
M-1729, 49 Bi, 21 In, 18 Pb, 12 Sn.
M.P. 136°F, 58°C; eutectic alloy.

SEMI-ALLOYS NO. 1050.
M-1729; 49 Bi, 21 In, 18 Pb, 1 Cd
M.P. 136°F; 58°C; eutectic alloy.

SEMI-ALLOYS NO. 1060.
M-1729; 51 In, 33 Bi, 16 Sn.
M.P. 142°F; 61°C; eutectic alloy.

SEMI-ALLOYS NO. 1075.
M-1729; 62 In, 30 Bi, 8 Cd.
M.P. 144°F; 62°C; eutectic alloy.

SEMI-ALLOYS NO. 1090.
M-1729; 50 Bi, 27 Pb, 13 Sn, 10 Cd.
M.P. 158°F; 70°C; eutectic alloy.

SEMI-ALLOYS NO. 1100.
M-1729; 52 Bi, 26 Pb, 22 In.
M.P. 158°F; 70°C; eutectic alloy.

SEMI-ALLOYS NO. 1125.
M-1729; 66 In, 43 Bi.
M.P. 162°F; 72°C; eutectic alloy.

SEMI-ALLOYS NO. 1150.
M-1729; 57 Bi, 17 Sn, 26 In.
M.P. 174°F; 79°C; eutectic alloy.

SEMI-ALLOYS NO. 1220.
M-1729, 52 Bi, 40 Pb, 8 Cd.
M.P. 197°F; 92°C; eutectic alloy

SEMI-ALLOYS NO. 1245
M-1729; 44 In, 42 Sn, 14 Cd.
M P 200°F; 93°C, eutectic alloy.

SEMI-ALLOYS NO 1270.
M-1729; 52.5 Bi, 32 Pb, 15.5 Sn.
M P. 203°F, 95°C, eutectic alloy

SEMI-ALLOYS NO 1280
M-1729; 52 Bi, 32 Pb, 16 Sn.
M.P. 204°F, 96°C, eutectic alloy.

SEMI-ALLOYS NO 1330
M-1729; 54 Bi, 26 Sn, 20 Cd.
M P 217°F, 103°C, eutectic alloy.

SEMI ALLOYS NO 1400.
M-1729; 68 Bi, 32 In
M.P 228°F; 109°C, eutectic alloy.

SEMI-ALLOYS NO 1510A
M-1729; 75 In, 25 Cd
M.P 253°F, 123°C, eutectic alloy

SEMI-ALLOYS NO 1530
M-1729, 55 Bi, 45 Pb
M P 255°F, 124°C; eutectic alloy.

SEMI-ALLOYS NO. 1555
M-1729, 46 Sn, 37 Te, 17 Cd
M P 262°F, 128°C, eutectic alloy.

SEMI-ALLOYS NO 1580.
M-1729, 56 Bi, 40 Sn, 4 Zn.
M P 266°F, 130°C; eutectic alloy

SEMI-ALLOYS NO 1630
M-1729, 57 Bi, 1 Pb, 42 Sn
M P. 275°F; 135°C, eutectic alloy

SEMI-ALLOYS NO. 1680
M-1729, 58 Bi, 42 Sn.
M.P 281°F, 138°C; eutectic alloy.

SEMI-ALLOYS NO 1690.
M-1729; 51 Sn, 31 Pb, 18 Cd
M.P 288°F, 143°C, eutectic alloy.

SEMI-ALLOYS NO 1710.
M-1729, 60 Bi, 40 Cd.
M P 291°F, 144°C, eutectic alloy.

SEMI-ALLOYS NO. 1730.
M-1729; 51.2 Sn, 30.6 Pb, 18.2 Cd.
M P 293°F; 144°C, eutectic alloy.

SEMI-ALLOYS NO. 1746
M-1729, 50 Sn, 32 Pb, 18 Cd.
M.P. 295°F; 146°C, eutectic alloy.

SEMI-ALLOYS NO. 1760.
M-1729; 100% In. (Indium).
M.P. 313°F, 156°C.

SEMI-ALLOYS NO. 1873.
M-1729; 68 Sn, 32 Cd.
M.P. 349°F; 177°C; eutectic alloy.

SEMI-ALLOYS NO. 1910.
M-1729; 62 Sn, 38 Pb.
M.P. 361°F; 183°C; eutectic alloy.

SEMI-ALLOYS NO. 1933.
M-1729; 91 Sn, 9 Zn.
M.P. 390°F; 199°C; eutectic alloy.

SEMI-ALLOYS NO. 2030.
M-1729; 100% Sn. (Tin).
M.P. 449°; 232°C.

SEMI-ALLOYS NO. 2100.
M-1729; 83 Pb, 17 Cd.
M.P. 478°F; 248°C; eutectic alloy.

SEMI ALLOYS NO. 2269.
M-1729; 100% Pb (Lead).
M.P. 621.3°F; 327.4°C.

SEMI-ALLOYS NO. 2270.
M-1729; 96.5 Sn, 3.5 Ag.
M.P. 430°F; 221°C; eutectic alloy.

SEMI-ALLOYS NO. 2284
M-1729; 100% Cd. (Cadmium).
M.P. 609.6°F; 320.9°C.

SEMI-ALLOYS NO. 2400.
M-1729; 100% Bi. (Bismuth).
M.P. 520.3°F; 271.3°C.

SEMI HIGH.
M-357; 1.1 C, 0.3 Cr, 1.1 W, 0.2 V, bal Fe.
For tools; semi-high speed.

SEMINOLE
M1; 0.4-0.5 C, 1.4 Cr, 0.25 V, 0.25 Mn, 0.30 Si, bal Fe.
Annealed: 110,000 TS; 22 El; 42 RA; 207 Brin
Oil treated: 261,700 TS; 5 El; 38 RA; 555 Brin.
For tools, chisels, rivet sets, shear blades, pneumatic tools; tough and shock resistant.

SEMINOLE HARD.
M-1; 0.52 C, 1.3 Cr, 2 W, 0.25 V, 0.9 Si, bal Fe.
For tools, hot work dies; shock resistant, hot work steel.

SEMINOLE MEDIUM.
M-1, 0.42 C, 1.3 Cr, 2 W, 0.25 Mo, 0.25 Si, bal Fe.
For hot work tools and dies; hot work steel.

SEMINOLE STEEL.
M-1; 2 W, 1.3 Cr, 0.2 V, 0.4 C, bal Fe.
Annealed: 79,000 TS; 33 El; 56 RA; 153 Brin
Heat treated: 300,000 TS; 250,000 YS, 6 El; 12 RA; 527 Brin.
For axle, tools, chisels, punches, swages, dies; shock resisting tool steel.

SEMI-PLASTIC BRONZE.
Eng ; 79-75 Cu, 13.5-16.5 Pb, 7-9 Sn.
20,000 TS; 10 El.
For machine bearings; leaded bronze.

SEMI-STEEL.
Eng.; 3.0-3.5 total C, 0.5-0.81 combined C, 1.4-1.8 Si, bal Fe
For frames, housings, cast gears; cast iron.

SEMPERAL.
M-971; 4 Cu, 1 Zn, 0.3 Mg, 0.6 Mn, 0.7 Fe, bal Al.
Soft: 36,000 TS, 22 El; 60 Brin.
Rolled: 71,000 TS; 2 El; 170 Brin.
For light alloy parts; heat treatable.

SENDUST.
M-198; 9.6 Si, 5.4 Al, 85 Co.
For cores in electromagnetic apparatus.
Brittle, cast alloy.

SENDUST.
Japan; 9.6 Si, 5.4 Al, 85 Co.
For cores of electromagnetic apparatus; brittle.

SENECA.
M-972; 0.7 C, bal Fe.
For wire.

SENECA HOT DIE.
M-435; 0.28 C, 9.5 W, 3.2 Cr, 0.4 V, bal Fe.
Heat treat: 243,000 TS; 215,000 YS; 12 El; 37 RA; 50 Rock C.
For punches, hot dies, swaging dies; hotwork.

SERAING PISTON.
England; 89 Cu, 9 Zn, 2 Sn.
Cast: 35,000 TS, 16 El.
For piston rings; corrosion resistant.

SERMALLOY A$_1$.
M-1644, M-1722; Fe, Co, Ni, Al.
Permanent magnet material.
Coercive force H$_c$ (oersted) 2000 ± 100.
Energy product BH max (MG.Oe) 5.5 ± 0.5.
Remanence Br (gauss) 7400 ± 200
Saturation field, H$_s$ (oersted) (approx) 6000.

SERMALLOY A$_2$.
M-1644, M-1722, Al-Ni-Co.
Permanent magnet material
Coercive force H$_c$ (oersted) 500.
Energy product BH max (MG.Oe) 5.
Remanence Br (gauss) 14,200 ± 200.
Saturation field H$_s$ (oersted, approx.) 1800

SERMALLOY A$_2$ GD.
M-1644, M-1722; Al-Ni-Co.
Permanent magnet material.
Coercive force H$_c$ (oersted) 600.
Energy product BH max (MG.Oe) 5.5 ± 0.5
Remanence Br (gauss) 14,300.
Saturation field H$_s$ (oersted, approx.) 2000

SERMALLOY A1.
M-1669; 38 Co, 7.5 Al, 14 Ni, 3 Cu, 8 Ti, bal Fe.
Cast. 7400 Remanent induction, 2100 coercive force, 9482 magnetic saturation, 874°C. Curie temperature
For magnetic and electrical equipment
Permanent magnet. Magnetically anisotropic.

SERMALLOY A2.
M-1669; 24 Co, 7.5 Al, 12 Ni, 2 Cu, 0.2 Si, bal Fe.
Br: 14,300, H$_c$ 500; BH max 5,000,000.
For magnetometry
High residual induction, Alnico type alloy. Permanent magnet

SERMALLOY A2GD.
M-1669; 24 Co, 7.5 Al, 12 Ni, 2 Cu, 0.2 Si, bal Fe.
Br. 14,400 Hc 610, BH max 6,600,000
For magnetometry.
Columnar Alnico type permanent magnet.

SERMALLOY A$_2$GDH.
M-1669; 24 Co, 7.5 Al, 12 Ni, 2 Cu, 0.2 Si, bal Fe.
Remanence 15,000 gauss, 280 Hc.
For hysteresis drives.
Alnico type permanent magnet.

SEVA
M-1560, M-286; 70 Cu, 0.04 As, bal Zn.
Annealed: 40,300-47,000 TS; 18,000-24,000 YS; 60-75 El; 54-73 Brin.
For condensers, and coolers, evaporators, juice heaters, vacuum pan tubes for the sugar industry.
Malleable and ductile brass; corrosion resistant.

SEVENTY-THIRTY.
Eng ; 70 Cu, 30 Ni.
For turbine blades, condenser tubes; corrosion resistant.

SEYCAST.
M-103; 99 Ni.

SEYMOUR NO. 5.
M-103; 5 Ni, 34 Zn, 61 Cu.
Hard: 135,000 TS; 2 El.
Soft: 50,000 TS.
For screw machine parts; elec. cond. 12% (wire form).

SEYMOUR NO. 5A1.
M-103; 5 Ni, 27 Zn, bal Cu.
Hard: 100,000 TS; 3 El; 185 Brin.
For hardware, springs; nickel silver, corrosion resistant.

SEYMOUR NO. 10A1.
M-103; 10 Ni, 23 Zn, 67 Cu.
Hard: 109,000 TS; 1.5 El; 188 Brin.
Soft: 52,000 TS; 40 El; 70 Brin.
For hardware; elec. cond. 9% (sheet form); "10% Nickel Silver."

SEYMOUR 10A7.
M-103; 10 Ni, 18.5 Zn, 71.5 Cu.
Soft: 54,000 TS; 67 Brin.
½ H-temper: 70,000 TS; 144 Brin.
H-temper: 80,000 TS; 165 Brin.
For holloware, flatware, zipper parts; nickel silver, good formability.

SEYMOUR NO 10X1.
M-103; 10 Ni, 28 Zn, 1 Pb, bal Cu.
Hard· 75,000 TS, 5 El; 176 Brin.
Soft: 54,000 TS; 30 El, 75 Brin
For hardware, screw machine products; nickel silver, free-cutting, corrosion resistant

SEYMOUR NO. 10X2.
M-103; 12 Ni, 25 Zn, 2 Pb, bal Cu.
Hard· 85,000 TS; 5 El; 172 Brin
For marine hardware, screw machine products; nickel silver, free-cutting, corrosion resistant.

SEYMOUR NO 12A1.
M-103, 12 Ni, 23 Zn, bal Cu
Hard: 106,000 TS; 2 El; 210 Brin.
For marine hardware, fasteners; nickel silver, corrosion resistant.

SEYMOUR 12A4.
M-103; 56.5 Cu, 12 Ni, 31.5 Zn
¼ H 65,000 TS, 108 Brin
Hard: 90,000 TS; 185 Brin.
Spring· 109,000 TS; 222 Brin
For springs, clips; nickel silver, corrosion resistant.

SEYMOUR NO. 12X1.
M-103, 12 Ni, 1 Pb, 25 Zn, bal Cu.
Hard. 90,000 TS; 5 El; 172 Brin.
Soft. 56,000 TS; 35 El; 75 Brin.
For screw machine products, marine hardware; corrosion resistant, free-cutting.

SEYMOUR NO. 12X2.
M-103; 12 Ni, 26 Zn, 2 Pb, bal Cu.
Hard· 95,000 TS; 3 El; 195 Brin.
Soft: 57,000 TS; 45 El; 76 Brin.
For marine hardware, keys, fasteners; nickel silver, free-cutting, corrosion resistant.

SEYMOUR NO. 15A.
M-103; 15 Ni, 21 Zn, 64 Cu.
Hard: 93,000 TS; 5 El; 190 Brin.
Soft: 58,000 TS; 40 El, 75 Brin.
For hardware; corrosion resistant

SEYMOUR NO. 15 Al.
M-103; 15 Ni, 65 Cu, bal Zn.
Hard: 97,000 TS; 195 Brin.
For hardware, marine parts; nickel silver, corrosion resistant.

SEYMOUR NO. 15B.
M-103; 15 Ni, 27 Zn, 58 Cu.
Hard: 100,000 TS; 2 El; 204 Brin.
Soft: 55,000 TS; 36 El; 77 Brin.
For hardware; corrosion resistant.

SEYMOUR NO. 15X1.
M-103; 15 Ni, 1 Pb, 23 Zn, bal Cu.
Hard: 85,000 TS; 10 El; 150 Brin.
Soft: 58,000 TS; 33 El; 80 Brin.
For marine hardware, screw machine products; corrosion resistant, free-cutting.

SEYMOUR NO. 15X2.
M-103; 15 Ni, 23 Zn, 2 Pb, bal Cu.
Hard: 92,000 TS; 4 El; 185 Brin.
Soft· 58,000 TS; 45 El; 75 Brin.
For hardware, screw machine products; nickel silver, free-cutting, corrosion resistant.

SEYMOUR 18 Al.
M-103; 18 Ni, 17 Zn, 65 Cu.
Hard· 80,000-120,000 TS; 12-3 El; 185-210 Brin.
Soft. 50,000-55,000 TS; 45-40 El; 75-77 Brin.
For springs, bellows, hardware, welding rod; nickel silver, good formability.

SEYMOUR NO. 18A3.
M-103; 18 Ni, 17 Zn, 65 Cu.
Hard. 100,000 TS; 3 El; 190 Brin
Soft: 54,000 TS, 40 El, 78 Brin.
For hardware; corrosion resistant

SEYMOUR NO. 18A4.
M-103, 18 Ni, 27 Zn, bal Cu.
Hard. 115,000 TS; 2 El, 210 Brin.
Soft: 65,000 TS; 45 El; 83 Brin.
For springs, marine hardware; nickel silver, corrosion resistant.

SEYMOUR NO 18A7
M-103; 18 Ni, 7 Zn, 75 Cu.
Hard: 85,000 TS, 4 El; 180 Brin.
Soft 50,000 TS; 32 El, 65 Brin.
For hardware; corrosion resistant.

SEYMOUR NO 18X1.
M-103, 18 Ni, 1 Pb, 19 Zn, 62 Cu.
Hard. 85,000 TS, 13 El; 150 Brin.
For screw machine products; "18% Leaded Nickel Silver"; free cutting.

SEYMOUR NO 25.
M-103; 25 Ni, 19 Zn, 56 Cu.
Hard 110,000 TS, 4 El; 204 Brin.
Soft: 72,000 TS; 30 El; 110 Brin.
For hardware; corrosion resistant.

SEYMOUR 265
M-103; 65 Cu, 35 Zn.
For hardware, plumbing fixtures, yellow brass.

SEYMOUR 270.
M-103, 70 Cu, 30 Zn.
Hard: 76,000 TS; 62,000 YS; 10 El; 159 Brin.
Soft· 47,000 TS; 17,000 YS; 65 El; 62 Brin.
For tanks, cartridge cases, vessels; cartridge brass.

SEYMOUR 280.
M-103; 80 Cu, 20 Zn.
Hard: 91,000 TS; 55,000 YS; 10 El; 190 Brin.
Soft: 46,000 TS; 15,000 YS; 50 El; 57 Brin.
For hardware, fasteners; low brass.

SEYMOUR 285.
M-103; 85 Cu, 15 Zn.
Hard: 84,000 TS; 55,000 YS; 2 El; 170 Brin.
Soft: 43,000 TS; 15,000 YS; 42 El; 56 Brin.
For diaphragms, fasteners; red brass.

SEYMOUR NO. 287.
M-103, 13 Zn, bal Cu.
Hard: 65,000 TS; 137 Brin.
For jewelry, trim; "Nu-Gild."

SEYMOUR 290.
M-103; 90 Cu, 10 Zn.
Hard: 72,000 TS; 47,000 YS; 6 El; 145 Brin.
Soft: 39,000 TS; 12,000 YS; 40 El; 54 Brin.
For hardware, fasteners; commercial brass.

SEYMOUR 430.
M-103; 5 Sn, 5 Pb, 0.25 P, bal Cu.
For bushings, gears, keys, bearings; leaded P-bronze.

SEYMOUR NO. 444.
M-103; 88 Cu, 4 Sn, 4 Pb, 4 Zn.
Hard: 60,000 TS; 20 El.
Soft: 48,000 TS;
For bearings, studs, shafts, gears, bolts; free-cutting, Grade B2 phosphor bronze.

SEYMOUR NO. 494.
M-103; 94 Cu, 5 Sn, 1 Pb.
Hard: 61,500 TS; 20 El.
Soft: 50,000 TS; 40 El.
For bolts, screws, bearings, gears, shafts; grade B1 phosphor bronze.

SEYMOUR NO. 780
M-103; 20 Ni, 80 Cu.
Hard: 85,000 TS; 2 El; 165 Brin.
Soft: 50,000 TS; 30 El; 72 Brin
For condenser tubes; corrosion resistant.

SEYMOUR NO. 785.
M-103; 15 Ni, 85 Cu.
Hard: 70,000 TS; 3 El; 160 Brin.
Soft: 45,000 TS; 30 El; 70 Brin
For condenser tubes; corrosion resistant.

SEYMOUR NO. 895
M-103; 89.5 Cu, 10.5 Sn, 0.10 min P
For welding rod to build up bearings; Grade C arc welding.

SEYMOUR NO. 910.
M-103; 10 Sn, 0.2 P, bal Cu
Soft: 65,000 TS; 65 El; 75 Brin
Spring: 122,000 TS; 5 El; 240 Brin.
For springs, diaphragms, fasteners, cams, bellows, shafts; Gr. D. P-bronze.

SEYMOUR NO. 928.
M-103; 8 Sn, 0.25 P, bal Cu.
Hard: 112,000 TS; 38 El; 240 Brin.
Soft: 60,000 TS; 55 El; 75 Brin.
For springs, bellows, diaphragms, hardware, bolts; Grade C, P-bronze, tough.

SEYMOUR NO. 950.
M-103; 5 Sn, 0.25 P, bal Cu
Hard: 100,000 TS; 1.5 El; 210 Brin.
Soft: 50,000 TS, 50 El; 75 Brin.
For springs, diaphragms, bolts, fasteners, hardware; Grade A, P-bronze, tough.

SEYMOUR 971.
M-103; 3 Sn, 0.25 P, bal Cu
½ H-temper: 60,000 TS, 125 Brin.
H-temper: 72,000 TS; 150 Brin.
Spring temper: 87,000 TS; 176 Brin
For springs, clips, diaphragms, contacts; Phosphor Bronze Grade E.

SEYMOUR 1008.
M-103; 8 Ni, 61.5 Cu, bal Zn.
Soft: 60,000 TS; 40 El.
Hard: 110,000 TS; 7 El.
Spring: 130,000 TS; 2 El.
For cutlery, hardware, trim, appliances, hospital equipment; nickel silver, corrosion resistant.

SEYMOUR 1009.
M-103; 61.5 Cu, 8 Ni, 2 Pb, bal Zn.
For keys, hardware, cutlery, trim; leaded nickel silver.

SEYMOUR 1011.
M-103; 65 Cu, 10 Ni, bal Zn.
Soft: 60,000 TS; 40 El.
Hard: 110,000 TS; 7 El.
Spring: 130,000 TS; 2 El.
For cutlery, hardware, trim, appliances, hospital equipment; nickel silver Gr.A, corrosion resistant

SEYMOUR 1017.
M-103; 71.5 Cu, 10 Ni, bal Zn.
Soft: 55,000 TS.
Hard: 102,000 TS.
Spring: 120,000 TS.
For cutlery, hardware, trim, appliances, hospital equipment; nickel silver, corrosion resistant.

SEYMOUR 1091.
M-103; 61.5 Cu, 10 Ni, 1 Pb, bal Zn.
Rolled: 90,000 TS
For hardware, cutlery, trim, hospital equipment; leaded nickel silver.

SEYMOUR 1092.
M-103; 61.5 Cu, 10 Ni, 2 Pb, bal Zn.
For keys, hardware, cutlery, leaded nickel silver.

SEYMOUR 1095.
M-103; 61.5 Cu, 10 Ni, 0.5 Pb, bal Zn
For hardware, trim, cutlery, hospital equipment; leaded nickel silver.

SEYMOUR 1211.
M-103; 65 Cu, 12 Ni, bal Zn.
Soft: 60,000 TS, 45 El.
Hard. 115,000 TS, 7 El.
Spring: 136,000 TS; 2 El
For cutlery, hardware, trim, appliances, hospital equipment; nickel silver, corrosion resistant

SEYMOUR 1214
M-103; 56.5 Cu, 12 Ni, bal Zn
Soft 60,000 TS; 47 El.
Hard 103,000 TS, 7 El
Spring 117,000 TS, 2 El.
For cutlery, hardware, trim, appliances, hospital equipment, nickel silver, corrosion resistant.

SEYMOUR 1291
M-103, 61.5 Cu, 12 Ni, 1 Pb, bal Zn.
For hardware, trim, cutlery; leaded nickel silver

SEYMOUR 1292
M 103; 61.5 Cu, 12 Ni, 2 Pb, bal Zn.
For keys, hardware, cutlery, trim; leaded nickel silver.

SEYMOUR 1295.
M-103; 61.5 Cu, 12 Ni, 0.5 Pb, bal Zn.
For hardware, cutlery, hospital equipment, leaded nickel silver.

SEYMOUR 1511.
M-103; 65 Cu, 15 Ni, bal Zn.
Soft: 60,000 TS; 47 El.
Hard: 103,000 TS; 7 El.
Spring: 117,000 TS, 2 El
For cutlery, hardware, trim, appliances, hospital equipment; nickel silver, corrosion resistant.

SEYMOUR 1591
M-103; 61.5 Cu, 15 Ni, 1 Pb, bal Zn.
For hardware, cutlery, hospital equipment; leaded nickel silver.

SEYMOUR 1811.
M-103; 65 Cu, 18 Ni, bal Zn.
Soft: 60,000 TS, 47 El.
Hard: 103,000 TS; 7 El.
Spring: 117,000 TS; 2 El.
For cutlery, hardware, trim, appliances, hospital equipment; nickel silver, corrosion resistant.

SEYMOUR 1814.
M-103; 55 Cu, 18 Ni, bal Zn.
Soft: 70,000 TS; 45 El.
Hard: 123,000 TS; 6 El.
Spring: 145,000 TS; 2 El.
For cutlery, hardware, trim, appliances, hospital equipment; nickel silver, corrosion resistant.

SEYMOUR 1815.
M-103; 65 Cu, 18 Ni, 0.15 Ag, bal Zn.
Soft: 60,000 TS; 47 El.
Hard: 103,000 TS; 7 El.
Spring: 117,000 TS; 2 El.
For cutlery, hardware, trim, appliances, hospital equipment; nickel silver, corrosion resistant.

SEYMOUR 1817.
M-103; 72 Cu, 18 Ni, bal Zn.
For cutlery, hardware, trim, appliances, hospital equipment; nickel silver.

SEYMOUR 1891.
M-103; 61.5 Cu, 18 Ni, 1 Pb, bal Zn.
For hardware, cutlery, hospital equipment; leaded nickel silver.

SEYMOUR 1895.
M-103; 61.5 Cu, 18 Ni, 0.5 Pb, bal Zn.
For hardware, cutlery, hospital equipment; leaded nickel silver.

SEYMOUR 1897
M-103; 65 Cu, 18 Ni, 0.15 Ag, 1 Pb, bal Zn
For hardware, cutlery, hospital equipment; leaded nickel silver.

SEYMOUR 2265.
M-103, 66 Cu, bal Zn.
½ H-temper: 60,000 TS
Hard temper 73,000 TS.
Spring: 90,500 TS.
For electrical components, hardware, watch parts, jewelry; high brass.

SEYMOUR 2270.
M-103; 70 Cu, bal Zn
½ H-temper. 62,000 TS, 121 Brin.
Hard temper 76,000 TS; 159 Brin.
Spring: 95,400 TS, 190 Brin.
For electrical components, hardware, jewelry, watches, lamps, cartridge brass.

SEYMOUR 2280
M-103; 80 Cu, bal Zn
½ H-temper 60,000 TS; 117 Brin.
Hard temper: 72,500 TS, 150 Brin.
Spring 89,000 TS; 185 Brin
For electrical components, hardware, jewelry, watches, lamps; low brass

SEYMOUR 2285
M-103; 85 Cu, bal Zn.
½ H-temper: 56,000 TS, 114 Brin
Hard temper: 67,500 TS; 139 Brin.
Spring: 82,000 TS, 165 Brin
For electrical components, hardware, jewelry, watches, lamps; rich low brass.

SEYMOUR 2287.
M-103; 87 Cu, bal Zn.
½ H-temper 54,000 TS, 116 Brin.
Hard temper: 65,000 TS; 137 Brin.
Spring 75,000 TS, 156 Brin.
For electrical components, hardware, jewelry, watches, lamps; Nugild.

SEYMOUR 2290.
M-103; 90 Cu, bal Zn
½ H-temper: 52,000 TS; 104 Brin.
Hard temper: 61,500 TS; 125 Brin.
Spring: 73,000 TS; 153 Brin.
For electrical components, hardware, jewelry, watches, lamps; commercial bronze.

SEYMOUR 2295.
M-103; 95 Cu, bal Zn.
½ H-temper: 47,000 TS; 83 Brin.
Hard temper: 54,500 TS; 110 Brin.
Spring: 64,000 TS; 130 Brin.
For electrical parts, hardware, jewelry, watches, lamps; gilding bronze.

SEYMOUR 2401.
M-103; 90 Cu, 0.5 Sn, 9.5 Zn.
Soft: 38,000 TS; 12,000 YS; 45 El.
For weather stripping; brass, corrosion resistant.

SEYMOUR 2402.
M-103; 90 Cu, 2 Sn, 8 Zn.
Soft: 40,000 TS; 42 El.
For hardware, costume jewelry; corrosion resistant.

SEYMOUR 2405.
M-103; 90.5 Cu, 5 Sn, 4.5 Zn.
For hardware, costume jewelry; corrosion resistant.

SEYMOUR 2451.
M-103; 95 Cu, 1 Sn, 4 Zn.
For hardware, weather stripping; corrosion resistant.

SEYMOUR 2875.
M-103; 87.5 Cu, 2.25 Sn, 10.25 Zn.
Soft: 45,000 TS, 57 El.
Hard: 102,000 TS; 7 El.
For hardware, costume jewelry; corrosion resistant.

SEYMOUR 2876.
M-103, 87 Cu, bal Zn.
¼H-temper 54,000 TS, 116 Brin.
Hard temper: 65,000 TS; 138 Brin.
Spring: 75,000 TS, 160 Brin.
For electrical components, hardware, watches, jewelry; high brass.

SEYMOUR 2877.
M-103; 86.5 Cu, 0.5 Sn, 13 Zn
For hardware, chains, fasteners, costume jewelry; jeweler's bronze, corrosion resistant.

SEYMOUR 2963.
M-103; 63.5 Cu, 0.75 Pb, bal Zn
¼H-temper: 60,000 TS, 50,000 YS; 23 El; 117 Brin.
Hard 73,000 TS; 60,000 YS; 8 El; 150 Brin
Spring 90,500 TS; 185 Brin
For hardware, hinges, watch backs, fasteners; low leaded brass.

SEYMOUR 2964
M-103; 64 Cu, 2 Pb, bal Zn
¼H-temper 60,000 TS, 117 Brin.
Hard: 73,000 TS; 150 Brin
Spring: 90,500 TS, 185 Brin
For clock parts, gears, wheels, channel plates, high leaded brass, corrosion resistant.

SEYMOUR 2965.
M-103, 62 Cu, 2.5 Pb, bal Zn.
¼H-temper: 60,000 TS; 117 Brin
Hard: 73,000 TS, 150 Brin
Spring 90,500 TS, 185 Brin.
For clock parts, gears, wheels, channel plates; extra high leaded brass, free-cutting

SEYMOUR 5770
M-103; 70 Cu, 30 Ni.
For process equipment; cupro-nickel, corrosion resistant.

SEYMOUR 5778.
M-103; 22 Ni, bal Cu.
For process equipment; cupro-nickel, corrosion resistant

SEYMOUR 5780.
M-103, 80 Cu, 20 Ni.
For process equipment; cupro-nickel, corrosion resistant

SEYMOUR 5788.
M-103; 10 Ni, bal Cu.
For process equipment; cupro-nickel, corrosion resistant.

SEYMOUR 5794.
M-103; 3.5 Ni, bal Cu.
For process equipment; cupro-nickel, corrosion resistant.

SEYMOUR 5798.
M-103; 2.0 Ni, bal Cu.
For process equipment; cupro-nickel, corrosion resistant.

SEYMOUR 8120.
M-103; 0.05 Ag, bal Cu.
For engraving plates; engraver's copper.

SEYMOUR 8121.
M-103; 99.9 Cu min, 0.04 oxygen.
¼H-temper: 38,000 TS; 30,000 YS; 25 El; 64 Brin.
½H-temper: 42,000 TS; 36,000 YS; 14 El; 75 Brin.
Hard: 50,000 TS; 45,000 YS; 6 El; 83 Brin.
For gutters, radio parts, terminals, ball floats; tough pitch copper.

SEYMOUR 8122.
M-103; 99.92 min Cu
¼H-temper: 38,000 TS; 30,000 YS; 35 El, 64 Brin.
Hard: 50,000 TS; 45,000 YS; 12 El, 83 Brin
For bus bars and bus conductors, wave guides; OFHC copper.

SEYMOUR NO. 9225.
M-103; 91.7 Cu, 8.25 Sn, 0.25 P.
For welding rod for bronze, brass and steel; Grade C arc welding

SEYMOUR 9230.
M-103; 8 Sn, 0.30 P, bal Cu
For springs, fuse clips, diaphragms, P-bronze.

SEYMOUR 9231.
M-103; 6 Sn, 0.30 P, bal Cu.
For instruments; special Fourdrinier wire, P-bronze.

SEYMOUR 9370.
M-103; 3 Sn, 0.23 P, bal Cu.
For springs, diaphragms, electrical contacts; Fourdrinier wire, P-bronze.

SEYMOUR 9430.
M-103; 5 Sn, 5 Pb, 0.15 P, bal Cu
For bearings, bushings, liners; bearing bronze

SEYMOUR 9444.
M-103, 4 Sn, 4 Pb, 4 Zn, 0.07 P, bal Cu.
For bearings, bushings; leaded bronze.

SEYMOUR 9494.
M-103; 5 Sn, 1 Pb, 0 07 P, bal Cu.
For bearings, liners, sleeves; leaded P-bronze.

SEYMOUR NO. 9522.
M-103;95 Cu, 5 Sn, 0.22 min P.
For welding rod for general purpose; Grade A arc welding

SEYMOUR 9910.
M-103; 10 Sn, 0.10 P, bal Cu.
For springs, discs, diaphragms, bellows; P-bronze

SEYMOUR 9928.
M-103; 8 Sn, 0.10 P, bal Cu.
For springs, thermostats, diaphragms, microphones, P-bronze.

SEYMOUR 9950.
M-103; 5 Sn, 0.15 P, bal Cu.
½H-temper: 55,000-70,000 TS.
Hard temper: 72,000-87,000 TS.
For springs, switches, diaphragms, clutch discs, chemical hardware; P-bronze, 16% electrical conductivity.

SEYMOUR 9971.
M-103; 3 Sn, 0.10 P, bal Cu.
½H-temper: 55,000-65,000 TS.
Hard: 67,000-77,000 TS.
For low duty springs, diaphragms, electrical contacts; P-bronze, 22% electrical conductivity.

SEYMOUR 9985.
M-103; 1 35 Sn, 0.07 P, bal Cu.
For low duty springs, diaphragms, electrical contacts; P-bronze.

SEYMOURCO.
M-103; 34 Zn, 5 Ni, bal Cu.
For costume jewelry, nickel silver.

SEYMOURITE
M-103; 64 Cu, 18 Ni, 18 Zn.
For ornaments, electrical equipment; high corrosion resistant.

SEYMOUR NICKEL SILVER GRADE A.
M-103, 23 Zn, 19 Ni, bal Cu
100,000 TS.
For costume jewelry; corrosion resistant.

SFS
M 1114, 0 9 C, 0 1-0 2 V, bal Fe
For tools, punches, drills; water hardened.

S-G 9
M-500; 0 26 C, 0 75 Mn, bal Fe
Normalized· 70,000 TS, 36,000 YS; 22 El; 30 RA.
For general usage; case hardened

S-G 13.
M-500 0.25 C, 0 50 Mn, bal Fe
Normalized 60,000 TS, 30,000 YS; 24 El; 35 RA
For general usage, case-hardened

S-G 17.
M-500, 0 28 C, 0.6 Mn, bal Fe.
Normalized 65,000 TS; 35,000 YS, 20 El; 30 RA.
For general usage, case hardened

S-G 30
M-1266, 6-8 Cu, 1.5-2 5 Si, 1 0-1 5 Zn, 0 2 Ti, bal Al
Cast
For general light alloy castings, modified Alcoa 212 alloy

S-G 80-10-10
M-1266, 9.25-10 5 Sn, 9-11 Pb, 0.75 max Zn, bal Cu
Cast 25,000-35,000 TS, 15,000-22,000 YS, 6-12 El, 50-60 Brin
For bearings, acid resistant castings, corrosion resistant

S-G 81-3-6-10.
M-1266, 2 5-3.5 Sn, 5-7 Pb, 9-11 Zn, bal Cu.
Cast 28,000-36,000 TS, 13,000-16,000 YS, 15-28 El; 50-60 Brin
For plumbing goods, pressure valves, fittings; free-cutting

S-G 83-4-6-7
M-1266; 3.5-4.2 Sn, 5.7-6 7 Pb, 6-8 Zn, bal Cu.
Cast· 30,000-35,000 TS, 12,000-16,000 YS; 15-25 El; 50-60 Brin.
For plumbing goods, valves, gas and water fittings; red brass, free-cutting

S-G 83-7-7-3
M-1266, 6 5-7.5 Sn, 6.5-8 0 Pb, 2.5-4.0 Zn, bal Cu
Cast: 28,000-35,000 TS, 15,000-20,000 YS; 10-15 El; 55-65 Brin.
For bearings, bushings; free-cutting.

S-G 85-5-5-5.
M-1266, 4-6 Sn, 4-6 Pb, 4-6 Zn, bal Cu.
Cast: 30,000-40,000 TS; 15,000-25,000 YS; 15-33 El; 55-65 Brin
For gears, valve bodies, plumbing; free-cutting bronze.

S-G 90.
M-1266; 3.7-4.7 Cu, 2.7-3.7 Si, 1 Fe, 0.5 Zn, 0.4 Ni, bal Al.
Cast.
For general light alloy castings; modified Alcoa 108 alloy.

SG-100 NICKEL.
M-1573; 99.93 Ni + Co, 0.08 Co, 0.006 Cu, 0.04 Fe, 0.0025 S, 0.007 C.
Annealed Strip: 50,000 TS; 8000 YS; 45 El; 25 Rock 30 T.
For cathode sleeves and shields, heat exchanger fins, getter flags, passive cathodes, magneto-strictive transducers.
High purity nickel from powder metallurgy.

S.G. IRON.
England; 3.2 C, 2.2 Si, 0.7 Mn, 0.5 Mg, bal Fe.
65,000-120,000 TS; 20-2 El; 200-250 Brin.
For gears, shafts, machinery castings; ductile cast iron.

S.G. IRON.
M-494; 3.3 C, 2.5 Si, 1.5 Ni, 0.05 Mg, bal Fe
Cast: 160-300 Brin.
For high strength and tough castings; nodular cast iron.

S G NI-RESIST D2C(Modified).
M-68; 2.2-2.6 C, 1.9-2.6 Si, 3.7-4.4 Mn, 21-24 Ni, 0.2 max Cr, 0.1 max P, bal Fe.
For pumps, valves, compressors, turbo-expanders
Austenitic iron for subzero services.
High notch toughness.

S.G.NI-RESIST D2M.
M-68, 2.2-2.6 C, 1.9-2.6 Si, 3.7-4.4 Mn, 21-24 Ni, 0.06-0.12 Mg, 0.2 max Cr, 0.1 max P, bal Ni.
For pumps, valves, compressors, turbo expanders, low temperature equipment
Excellent cryogen toughness and ductility.

SGS-TANTALUM.
M-1624, 100 Ta + Yttrium
300% stronger than ordinary Ta at 1650°C
For electronic and electrical components, vacuum furnaces, aerospace and nuclear systems.
Fine controlled grain. No oxygen embrittlement caused by grain coarsening to 2300°C.

S-G TYPE 12.
M-1266; 6.0-8.5 Cu, 1.0-3.0 Si, 0.4 Mn, 0.8-1.5 Fe, 0.05 Mg, 0.2-2.2 Zn, 0.4 Ni, 0.2 Ti, bal Al.
Sand cast: 19,000 TS
For low strength light weight castings

S-G TYPE 13
M-1266, 0.6 Cu, 9.5-13.0 Si, 2.2 Fe, 0.1 Mg, 0.3 Mn, 0.5 Ni, bal Al.
Die cast. 37,000 TS; 18,000 YS; 1.8 El.
For meter cases, switch boxes, low stressed castings; thin wall castings.

S-G TYPE 43
M-1266; 0.1-0.6 Cu, 4.5-6.0 Si, 0.2 Mn, 0.8-2.0 Fe, 0.3 Zn, 0.3 Ni, 0.2 Ti, bal Al.
Die Cast: 30,000 TS; 14,000 YS, 5.0 El, 40 Brin.
For marine castings, manifolds, cooking utensils, corrosion resistant.

S-G TYPE 81.
M-1266; 6.0-8.5 Cu, 1.0-3.5 Si, 0.4 Mn, 2-3 Fe, 1.8-2.0 Zn, 0.2 Ti, 0.4 Ni, bal Al.
Die cast: 33,000 TS; 25,000 YS; 1 El; 80 Brin.
For instrument housings, cases; high fluidity.

S-G TYPE 85
M-1266; 3.0-4.5 Cu, 4.5-9.5 Si, 0.4 Mn, 1.3-2.3 Fe, 0.6-1.0 Zn, 0.4 Ni, 0.2 Cr, bal Al.
Die cast: 38,000 TS; 22,000 YS; 2.5 El; 85 Brin.
For general die castings; high strength.

S-G TYPE 108.
M-1266; 2.5-4.7 Cu, 2.5-4.5 Si, 0.4 Mn, 1.1 Fe, 0.3-1.0 Mg, 0.2 Ti, 0.4 Ni, bal Al.
Sand cast: 21,000 TS; 14,000 YS; 2.5 El; 60 Brin.
For utility sand castings; good castability and machineability.

S-G TYPE 122.
M-1266; 9.2-10.8 Cu, 1.0-1.7 Si, 0.2 Mn, 1.5 Fe, 0.2 Mg, 0.5 Zn, 0.3 Ni, 0.2 Ti, bal Al.
Heat treated: 41,000-48,000 TS; 36,000-40,000 YS; 0.5 El; 115-140 Brin.
For pistons, valve guides, bearings; age hardenable, wear resistant.

S-G TYPE 132.
M-1266; 0.5-2.0 Cu, 11-13 Si, 0.6 Mn, 1.2 Fe, 1.2 Mg, 0.2 Zn, 0.5-3.0 Ni, 0.2 Ti, bal Al.
Heat treated: 36,000-47,000 TS; 28,000-43,000 YS; 0.5 El, 105-125 Brin.
For automotive engine pistons and sleeves; low expansion alloy.

S-G TYPE 138.
M-1266, 9-11 Cu, 3.5-4.5 Si, 1.2 Fe, 0.3 Mn, 0.2 Mg, 0.5 Zn, bal Al.
Permanent mold: 30,000 TS; 24,000 YS; 15 El; 90 Brin.
For pistons, cylinder heads; similar to Alcoa 138.

S-G TYPE 142.
M-1266; 3.5-4.5 Cu, 0.7 Si, 0.2 Mn, 0.9 Fe, 1.6 Mg, 0.5 Zn, 2.0 Ni, 0.2 Ti, bal Al.
Heat treated: 27,000-47,000 TS; 18,000-42,000 YS; 0.5-1.0 El; 70-110 Brin.
For pistons, cylinder heads; age-hardenable, strength at elevated temp

S-G TYPE 195.
M-1266, 3-5 Cu, 1.2-2.5 Si, 1.0 Fe, 0.5 Mn, 0.4 Zn, 0.2 Ti, bal Al.
Heat treated: 32,000-40,000 TS; 16,000-34,000 YS; 8.5-1.5 El, 60-95 Brin.
For crank cases, aircraft components; age hardenable

S-G TYPE 212
M-1266; 6.0-8.5 Cu, 1-3 Si, 0.4 Mn, 0.8-1.5 Fe, 0.2-2.2 Zn, bal Al.
Sand cast 19,000-24,000 TS; 11,000-14,000 YS; 2.5-1.0 El; 50-65 Brin
For general utility castings; similar to Alcoa 212.

S-G TYPE 214.
M-1266; 0.1 Cu, 0.4 Si, 0.5 Fe, 3.25-4.5 Mg, 0.25 Zn, 0.2 Ti, bal Al.
Sand cast: 25,000 TS; 12,000 YS; 9 El, 50 Brin.
For light weight castings; similar to Alcoa 214.

S-G TYPE 218.
M-1266; 0.2 Cu, 0.3 Si, 0.3 Mn, 1.8 Fe, 7.5-8.5 Mg, 0.1 Zn, bal Al.
Die cast: 42,000 TS; 23,000 YS; 7.0 El; 75 Brin.
For airplane wheel flanges and brake shoes; similar to Alcoa 218.

S-G TYPE 220
M-1266; 0.2 Cu, 0.2 Si, 9.5-10.6 Mg, 0.1 Zn, bal Al.
Heat treated. 46,000 TS; 25,000 YS; 14 El; 75 Brin.
For railway and bus equipment; similar to Alcoa 220, age hardenable.

S-G TYPE 355.
M-1266; 1.0-1.8 Cu, 4.5-5.5 Si, 0.5 Mg, 0.2 Ti, 0.2 Mn, bal Al.
Heat treated: 38,000-43,000 TS; 25,000-36,000 YS; 4-0.5 El; 80-90 Brin.
For aircraft engine castings, cylinder heads; similar to Alcoa 355; age hardenable

S-G TYPE 356.
M-1266; 0.3 Cu, 6.5-7.5 Si, 0.4 Mn, 0.5 Fe, 0.3 Mg, bal Al.
Heat treated: 32,000-40,000 TS; 24,000-30,000 YS; 5-2 El; 70-90 Brin.
For leakproof castings; similar to Alcoa 356; age hardenable.

S-G TYPE A108.
M-1266; 4-5 Cu, 5-6 Si, 1 Fe, 0.3 Mn, 0.2 Ti, 0.5 Zn, bal Al.
Permanent mold: 28,000 TS; 16,000 YS; 2 El; 65 Brin.
For utility castings; intricate shapes.

S-G TYPE AXS-679.
M-1266; 3-4 Cu, 4.5-9.5 Si, 1.3 Fe, 0.6 Zn, 0.5 Ni, 0.2 Cr, bal Al.
Die cast.
For general die castings; corrosion resistant.

S-G TYPE B195.
M-1266; 4.5 Cu, 2-3 Si, 0.05-4.0 Mn, 1.2 Fe, 0.5 Zn, 0.2 Ni, 0.2 Ti, bal Al.
Heat treated: 37,000-42,000 TS; 19,000-28,000 YS; 9-6 El; 75-90 Brin
For aircraft castings; age hardenable.

S-G TYPE C113.
M-1266, 6.0-8.5 Cu, 1.0-6.0 Si, 0.4 Mn, 1.5 Fe, 1.0-2.5 Zn, 0.2 Ti, 0.2 Ni, bal Al
Permanent mold: 30,000 TS; 24,000 YS; 1 El; 70 Brin
For utility castings; similar to Alcoa C113.

S-G TYPE SG 300.
M-1266; Al alloy.
Cast: 32,000 min TS; 5 min El
For light alloy castings.

S-G VALVE BRONZE.
M-1266; 5.5-6.5 Sn, 1-2 Pb, 3-5 Zn, bal Cu.
Cast: 34,000 max TS; 22 El.
For valve bodies; composion M alloy, free-cutting

S-G YELLOW BRASS.
M-1266; 0.5-1.2 Sn, 3-5 Pb, 0.5 max Fe, 78-81 Cu, bal Zn.
Cast: 28,000-35,000 TS, 10,000-15,000 YS; 25-35 El, 25-35 Brin.
For plumbing fixtures, ferrules, battery terminals; free-cutting brass.

SHAKUDO (SHAKDO).
Japan; 96-94 Cu, 3.7-4.2 Au, 1.6-0.1 Ag, traces of Pb, Fe, As
For ornamental parts; corrosion resistant.

SHARALLOY.
M-1071; 0.08-0.12 C, 0.15 Cr, 0.35 Ni, 0.08 Mo, bal Fe.
Long.: 62,850 TS; 51,100 YS, 30.8 El; 137 Brin.
Trans.. 64,000 TS, 50,800 YS; 31.2 El, 145 Brin.
For general structures.

SHARON 18-8.
M-600, M-1071; 0.13-0.20 C, 18 Cr, 8 Ni, bal Fe
Annealed: 90,000 TS; 30,000 YS; 50 El; 65 RA.
Cold rolled: 175,000 TS; 150,000 YS, 10 El; 45 RA.
For stainless parts, stainless, austenitic, resists scaling to 1550°F.

SHARON-SHARP KN-44.
M-1071; 1.0 C, 12 Cr, bal Fe.
For knives, cutlery, air hardening, stainless.

SHARON STAINLESS 18-8.
M-1071; 0.07 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 85,000 TS; 30,000 YS; 45 El; 65 RA; 150 Brin.
For chemical plant equipment; austenitic, stainless, Type 304.

SHAWINIGAN "20."
M-443; 29 Ni, 19 Cr, 3 Mo, 4 Cu, 1 Si, 0.07 max C, bal Fe.
Annealed: 65,000-75,000 TS; 26,000-32,000 YS; 50-35 El; 60-40 RA; 120-150 Brin.
For sulfuric acid equipment; corrosion resistant to H_2SO_4.

SHAWINIGAN CA.
M-443, 0.20 max C, 12-14 Cr, 1.0 max Ni, bal Fe.
Annealed: 100,000 TS, 85,000 YS; 20 El; 35 RA; 200 Brin.
For valve seats; wear resisting, corrosion resisting

SHAWINIGAN CF-Se
M-443, 0.10 C, 18-20 Cr, 8-10 Ni, 0.25 Se, bal Fe.
Annealed 80,000 TS; 40,000 YS; 45 El; 60 RA; 180 Brin.
For stainless parts, free-cutting, austenitic, stainless.

SHAWINIGAN HC.
M-443, 0.2-0.3 C, 26-30 Cr, 3 max Ni, bal Fe.
Cast: 112,000 TS, 75,000 YS; 25 El, 25 RA; 225 Brin.
For furnace parts; heat resisting to S atmosphere

SHAWINIGAN HH.
M-443, 0.25-0.35 C, 24-26 Cr, 11-13 Ni, bal Fe
Cast: 85,000 TS, 40,000 YS, 25 El; 45 RA, 180 Brin
For furnace parts, heat resisting

SHAWINIGAN HL
M-443, 0.25-0.35 C, 20-22 Ni, 26-30 Cr, bal Fe.
Cast 75,000 TS, 45,000 YS; 10 El, 180 Brin.
For furnace parts, heat resisting

SHAWINIGAN HT
M-443, 0.20-0.35 C, 35-40 Ni, 15-18 Cr, bal Fe
Cast 70,000 TS, 35,000 YS; 12 El, 15 RA.
For furnace parts, heat resisting to 2100°F.

SHAWINIGAN KA-2-Mo
M-443, 0.10 max C, 18-20 Cr, 8.0-10.0 Ni, 2.5-3.5 Mo, 0.5 Si, 0.4 Mn, bal Fe
Annealed 85,000 TS, 45,000 YS, 46 El, 60 RA; 180 Brin
For apparatus in the sulfite industry and chemical plants with strong acids; corrosion resistant

SHAWINIGAN SSS.
M-443, C, 35 Ni, 15 Cr, bal Fe.
For heat and corrosion resistant castings and equipment; heat and corrosion resistant

SHAWINIGAN X.
M-443, 0.2 C, 22 Cr, 14 Ni, W, bal Fe.
For jet engine parts, heat resistant.

SHEARCUT.
M-1431, M-1433, 0.55 C, 0.8 Mn, 0.25 Cr, 2 Si, 0.4 Mo, 0.3 V, bal Fe
For shear blades, punches, jaws, chisels, Type S5, oil hardened

SHEARTOUGH.
M-1724; 0.45 C, 0.25 Si, 0.3 Mn, 2.25 Ni, 1.15 Cr, 0.2 V, bal Fe.
Oil hardening alloy tool steel, for shear blades, guillotine blades, shafts

SHEATHING BRONZE.
England; 32.5 Ni, 16 Sn, 5.5 Zn, 1.5 Bi, bal Cu.
For sheathing, marine construction; resists water corrosion

SHEEPBRIDGE STOKES MARK III.
M-494; 0.3 C, 1.5 Ni, 0.9 Cr, bal Fe.
For centrifugal castings, tough.

SHEETWELD.
M-118; 0.2 C, bal Fe.
For welding electrodes; for light sheet metal

SHEFFALLOY.
M-973; Pb-Sn.
For collapsible tubes.

SHEFFIELD.
M-261; 0.82-0.85 C, 0.3 Mn, 0.5-0.7 Cr, 0.18-0.22 Mo, bal Fe.
For coining and cutlery dies; water hardening.

SHEFFIELD NO. 10.
M-207; 0.3 C, Ni, Mo, Cr, bal Fe.
Heat treated: 154,000 TS; 139,000 YS; 16 El; 55 RA; 300 Brin.
For gears, cams, arbors, shafts, axles, mandrels; preheat treated, tough.

SHEFFIELD NO. 11.
M-207, 0.4 C, bal Fe.
Annealed: 90,000 TS; 50,000 YS; 175 Brin.
For mandrels, springs, tongs, rivets, shackles; forging quality.

SHEFFIELD NO. 12.
M-207; C, alloy, bal Fe.
For gears, picks, lathe centers, shovel teeth, shock and fatigue resistant.

SHEFFIELD NO. 20.
M-207, C, alloy, bal Fe.
Heat treated. 154,000 TS; 139,000 YS, 16 El, 55 RA; 300 Brin
For shafting, pump rods, oil hardened.

SHEFFIELD-AR.
M-1428, 0 43 C, 1.5-2 0 Mn, 0.35 Si, bal Fe.
Hot Rolled: 225 Brin
For structural members, gears, shafts, countershafts
Abrasion resistant, water harden.

SHEFFIELD HARD ALLOY.
Eng., 46 Cu, 31 Sn, 20 Zn
For ornamental parts; corrosion resistant

SHEFFIELD HIGH STRENGTH-A.
M-1428, 0 09 C, 0 4 Cu, 0.7 Ni, 0 6 Cr, 0 12 Mo, bal Fe
Rolled 66,000 TS, 46,000 YS, 21 El
For structural members, auto and railroad cars, good formability

SHEFFIELD Hi Strength-B
M-1428, M-10; 0 22 max C, 1 25 max Mn, 0 20 min Cu, 0.02 min V, bal Fe
Rolled 67,000-70,000 TS, 50,000-46,000 YS, 18-24 El.
For structures, bus bodies, mine cars, derricks, booms
High-strength, low-alloy steel. Good weldability.

SHEFFIELD NICKEL SILVER
Eng.; 63-55 Cu, 17-37 Zn, 19-11 Ni, 0 3 Pb.
Used as base for plated tableware, nickel silver

SHEFFIELD P.B.
M-207, C, alloy, bal Fe.
For press brake dies, oil hardening

SHEFFIELD PLATE
M-207; C, alloy, bal Fe.
Heat treated: 150,000 TS; 140,000 YS; 14 El; 55 RA, 365 Brin
For chute liners, conveyors, baffle plates; work hardened, fatigue resistant.

SHEFFIELD PRESS BRAKE.
M-207; 0 53 C, 0.95 Mn, 0 31 Si, 1 0 Cr, 0 5 Ni, 0 24 V, 0.25 Mo, bal Fe.
Oil hardening steel for miscellaneous tools

SHEFFIELD SSS-100.
M-1428, M-10; 0.12-0 20 C, 0.4-0.7 Mn, 0 0015-0.005 B, 1.4-2.0 Cr, 0.2-0.4 Cu, 0.4-0 6 Mo, 0.04 0.10 Ti, bal Fe.
Plate: 115,000-135,000 TS; 100,000 YS; 18 min El; 50 min RA.
For pressure vessels, bridges, mine cars, power shovels, cranes, trucks, trailers.
Shock and wear resistant constructional steel. Quenched and tempered.

SHEFFIELD SSS-100A.
M-1428, M-10; 0.13-0.20 C, 0.4-0.7 Mn, 0.20-0.35 Si, 0.0015-0.005 B, 0.85-1.2 Cr, 0.2-0.4 Cu, 0.15-0.25 Mo, 0.04-0.10 Ti, bal Fe.
Plate: 115,000-135,000 TS; 100,000 YS; 18 El; min; 50 RA min
For pressure vessels, bridges, mine cars, power shovels, cranes, trucks, trailers.
Shock and wear resistant constructional steel.

SHEFFIELD SSS-100AR.
M-1428, M-10, 0.20 C, 0 4-0.7 Mn, 0.005 B, 1.4-2 0 Cr, 0.2-0.4 Cu, 0 4-0.6 Mo, 0.04-0.10 Ti, bal Fe.
Ht Tr. 161,000 TS; 146,000 YS, 16 El; 45 RA.
For bridges, booms, dipper sticks, penstocks, chutes, wear plates, truck bodies, floor plates.
Quenched and tempered at mill Tough. Wear and abrasion resistant.

SHEFFIELD SSS-100A-AR.
M-1428, M-10; 0 13-0 20 C, 0.6 Mn, 0.25 Si, 0 005 B, 0.85-1 2 Cr, 0 2-0.4 Cu, 0.15-0 25 Mo, 0.04-0.10 Ti, bal Fe
Ht Tr · 162,000 TS; 148,000 YS, 15 El, 43 RA.
For bridges, booms, dipper sticks, penstocks, chutes, wear plates, truck bodies, floor plates.
Quenched and tempered at mill. Tough. Wear and abrasion resistant.

SHEFFIELD SSS-100B
M-1428, M-10, 0 13-0 20 C, 0 4-0 7 Mn, 0 20-0.35 Si, 1 15-1 65 Cr, 0.25-0.40 Mo, 0.04-0.10 Ti, 0 20-0 40 Cu, 0 0015-0 005 B, bal Fe
Plate. 105,000-135,000 TS, 90,000-100,000 YS; 16-18 El.
For pressure vessels, bridges, mine cars, power shovels, cranes, trailers
Shock and wear resistant constructional steel.

SHEFFIELD SX4
M-1522, Ag- Sn
Cast· 7800 TS, 48 El
For soft silver solder for sanitary and domestic purposes, M P 221-224°C, corrosion resistant

SHEFFIELD SX5.
M-1522, Ag, Cd, Zn
Cast 29,200 TS, 8 El
For silver solder where strength at high temperature is important, M P 270-285°C, corrosion resistant.

SHEFFIELD SX25
M-1552, Ag, Cu, Pb.
Cast. 5600 TS; 45 El.
For soft solder; M P 302-305°C; general purpose solder

SHEF-LO-TEMP
M-10, M-1428; 0 20 C, 0.7-1.35 Mn, 0 15-0.30 Si, bal Fe.
Heat treated. 70,000 TS, 50,000 YS, 21 El.
For structural members, pressure vessels, derricks, booms, bridges,
Tough, shock resistant.

SHEF-SUPER-LO-TEMP
M-10, M-1428, 0.20 C, 1 2-1.45 Mn, 0 2-0.5 Si, bal Fe
Heat treated 80,000 TS; 60,000 YS; 21 El.
For mine and railroad cars, pressure vessels, derricks, bridges
Wear resistant, shock resistant.

SHEF-TEN STEEL.
M-1428; 0.25 max C, 1.4 Mn, 0.2 min Cu, 0.4 max Ni, bal Fe.
Rolled: 70,000 TS; 40,000 YS; 20 El.
For mine and railroad cars, shovels, structures; good formability.

SHELLDIE.
M-55; 0.36 C, 0.6 Mn, 0.9 Si, 5 Cr, 1.85 Mo, 3.0 V, bal Fe.
Ht. Tr.: As required from 37 to 46 Rc.
For forging die inserts, punches, mandrels, heading dies.
Resists heat checking. AISI H-11.

SHELLEX.
M-55; 0.32 C, 1 Si, 0.5 Mn, 3.3 Cr, 2.4 Mo, 0.4 V, bal Fe.
For forging dies, inserts, punches, extrusion tools; oil hardened, tough, resists heat check.

SHEMTSCHUSHNY.
Eng; 1.3-4.45 Fe, 11.1-13.8 Mn, 86.8-84.2 Cu, 0.6-0.5 Si
For electrical resistances; resistance alloy.

SHIBU-ICHI.
Japan; 67.3 Cu, 32.1 Ag, 0.5 Fe, trace Au.
For ornaments; corrosion resistant.

SHIBU-ICHI.
Japan; 51.1 Cu, 48.9 Ag, 0.12 Au.
For ornaments, jewelry; corrosion resistant.

SHIELD-ARC 85.
M-578; 0.12 C, 0.60 Mn, 0.03 P, 0.04 S, 0.40 Si, 0.50 Mo, bal Fe.
Steel arc welding electrode
AWS Class E7010-A1.

SHIELD-ARC 85P.
M-578; C, bal Fe.
Steel arc welding electrode.
AWS Class E7010-G.

SHIELD-ARC HYP.
M-578; C, bal Fe.
Steel arc welding electrode.

SHIELD-O-MATIC.
M-844; 0.15 C, bal Fe
For electrodes for welding; coated-arc

SHIGA WHITE GOLD
Japan: 90-60 Au, 5-20 Ni, 5-20 Cr.
For ornaments, jewelry, corrosion resistant.

SHIP BRAND ORANGE LABEL.
M-446; 0.07 C, 18-21 Cr, 8-11 Ni, bal Fe.
Rolled: 120,000 TS.
Heat treated: 190,000-290,000 TS
For springs; corrosion resistant

SHIP BRAND RED LABEL
M-446; 0.35 C, 13.5 Cr, bal Fe.
Rolled: 100,000 TS.
For springs; corrosion resistant.

SHIP NAIL ALLOY.
Eng.; 50 Sn, 33 Pb, 17 Sb
For bearings; anti-friction.

SHIP NAIL BRASS.
Eng; 64 Cu, 25 Zn, 8.5 Pb, 2.5 Sn.
For ship nails, hardware; free-cutting

SH-KH 15.
Russia; 0.95-1.10 C, 1.3-1.6 Cr, 0.2 Mn, 0.2 max Ni, bal Fe.
For ball bearings, races, pivots; water hardened.

SHOCK PROOF.
M-883; 3 C, 1.5 Si, bal Fe.
Cast: 53,000 TS.
For castings, gears; malleable iron.

SHOCK RESISTING.
M-261; C, alloy, bal Fe.
For tools, dies, shock resistant.

SHOCK RESISTING.
M-389; 0.6 C, 0.9 Mn, bal Fe.
For punches, shears; tough.

SHOCK-RITE.
M-1684; 0.65 C, 0.85 Mn, 2.0 Si, 0.25 Cr, 0.25 Mo, 0.2 V, bal Fe.
Oil or water hardening, shock resisting type tool steel; for shear blades, pneumatic tools. AISI S5.

SHOCK STEEL.
M-69; 0.54 C, 0.95 Mn, 2 Si, 0.5 Mo, bal Fe.
For punches, rivet sets, headers; shock and impact resistant.

SHOE DIE.
M-1; 0.55 C, 0.65 Cr, 0.35 Mo, bal Fe.
Oil hardened.
For dies for cutting leather; shock resistant.

SHOE NAIL BRASS.
U.S.; 63 Cu, 37 Zn.
For hardware, shoe nails; yellow brass.

SHOE TIP METAL
Eng; 88 Cu, 12 Zn
For shoe tips; red brass

SHOW CASE METAL.
Eng.; 58-59.5 Cu, 24-22.5 Zn, 18-8 Ni.
For show cases, architectural parts, corrosion resistant.

SHUNT STEEL.
M-1419, 70 Fe, 30 Ni.
For compensating shunts for electrical equipment; temperature sensitive, magnetic.

SHURBOND 2
M-1468, 91 Cu, 7 P, 2 Ag
Melt range. 1190-1425°F
For brazing copper and copper alloys

SHURBOND 4.
M-1468, 10 Ag, 52 Cu, 38 Zn.
For silver solder, M.P. 1450-1565°F.

SHURBOND 5 BRAZE.
M-1468, 89 Cu, 6 P, 5 Ag
Melt range: 1185-1485°F
For brazing copper base alloys where poor fit-ups exist.

SHURBOND 5 SOLDER
M-1468, 5 Ag, 16.5 Zn, 78.5 Cd
M. range: 500-725°F.
Solder for copper, brass and steel.

SHURBOND 5X.
M-1468, 5 Ag, 95 Cd.
Melt Range: 620-725°F
Solder for copper, brass and steel.

SHURBOND 6
M-1468; 88 Cu, 6 P, 6 Ag
Melt range: 1185-1480°F
For brazing ferrous and non-ferrous alloys; ductile joints.

SHURBOND 6F.
M-1468; 86.75 Cu, 7.25 P, 6 Ag.
Melt range: 1190-1300°F
Very fluid; for brazing copper base alloys with tight fits

SHURBOND 13
M-1468; 30 Ag, 38 Cu, 32 Zn
For silver solder; M.P. 1370-1410°F.

SHURBOND 14.
M-1468; 40 Ag, 36 Cu, 24 Zn.
For silver solder; M.P. 1330-1445°F.

SHURBOND 15.
M-1468; 80 Cu, 5 P, 15 Ag.
Melt range: 1185-1460°F.
For brazing copper base alloys having wide gaps.
AWS-BCuP-5.

SHURBOND 20.
M-1468; 20 Ag, 45 Cu, 30 Zn, 5 Cd.
For silver solder; M.P. 1140-1500°F.

SHURBOND 28.
M-1468; 50 Ag, 28 Cu, 22 Zn.
For silver solder: M.P. 1250-1340°F.

SHURBOND 31.
M-1468; 34 Cu, 31.5 Ag, 19 Cd, 15.5 Zn.
Melt range: 1165-1390°F.
For torch and induction brazing ferrous and non-ferrous alloys.

SHURBOND 33.
M-1468; 60 Ag, 25 Cu, 15 Zn
For silver solder; M.P. 1260-1325°F.

SHURBOND 35.
M-1468; 35 Ag, 26 Cu, 21 Zn, 18 Cd.
For silver solder; M.P. 1125-1295°F; Type BAg2.

SHURBOND 45.
M-1468; 45 Ag, 15 Cu, 16 Zn, 24 Cd.
For silver solder; M.P. 1125-1145°F; Type BAg1.

SHURBOND 50.
M-1468, 50 Ag, 15.5 Cu, 16.5 Zn, 18 Cd.
For silver solder; M.P. 1160-1175°F, Type BAg1a.

SHURBOND 54.
M-1468; 54 Ag, 40 Cu, 5 Zn, 1 Ni.
For silver solder, M.P. 1325-1575°F.

SHURBOND 56.
M-1468, 56 Ag, 22 Cu, 17 Zn, 5 Sn.
For silver solder, M.P. 1145-1205°F

SHURBOND 60
M-1468; 60 Ag, 30 Cu, 10 Sn.
For silver solder, M.P. 1115-1325°F

SHURBOND 65.
M-1468; 65 Ag, 20 Cu, 15 Zn.
For silver solder, M P 1235-1310°F.

SHURBOND 70.
M-1468, 70 Ag, 20 Cu, 10 Zn
For silver solder; M.P. 1275-1360°F.

SHURBOND 72.
M-1468, 72 Ag, 28 Cu.
For silver solder; M.P. 1435-1435°F.

SHURBOND 75.
M-1468; 75 Ag, 22 Cu, 3 Zn.
For silver solder, M.P 1365-1450°F.

SHURBOND 79.
M-1468; 25 Ag, 52.5 Cu, 22.5 Zn.
For silver solder; M.P. 1500-1575°F.

SHURBOND 85.
M-1468; 85 Ag, 15 Mn.
Melt range: 1760-1778°F.
AMS 4766; ASTM B-260-52T BAg-Mn.

SHURBOND 120.
M-1468; 20 Ag, 45 Cu, 35 Zn.
For silver solder; M.P. 1430-1500°F.

SHURBOND 145.
M-1468; 45 Ag, 30 Cu, 25 Zn.
For silver solder; M.P. 1250-1370°F; Type BAg5.

SHURBOND 240.
M-1468; 40 Ag, 30 Cu, 28 Zn, 2 Ni.
For silver solder; M.P. 1240-1435°F; Type BAg4.

SHURBOND 250.
M-1468; 50 Ag, 34 Cu, 16 Zn.
For silver solder; M.P. 1270-1425°F; Type BAg6.

SHURBOND 254.
M-1468; 40 Ag, 30 Cu, 25 Zn, 5 Ni.
For silver solder; M.P. 1240-1560°F.

SHURBOND 350.
M-1468; 50 Ag, 15.5 Cu, 15.5 Zn, 3 Ni.
For silver solder; M.P. 1170-1270°F.

SHURBOND 0.
M-1468; 92.8 Cu, 7.2 P.
Melt range: 1300-1450°F.
Economical, highly fluid, self-brazing on copper.

SHURBOND 02.
M-1468; 2 Ag, 91 Cu, 7 P.
Melt range: 1185-1270°F.
For brazing copper, brass and steel.

SHURBOND 06.
M-1468; 6 Ag, 86.5 Cu, 7.5 P.
Melt range: 1185-1350°F.
For brazing ferrous and non-ferrous alloys.
AWS BCuP-4.

SIBLEY ALLOY.
Eng.; 67 Al, 33 Zn.
For strong light alloy parts; non-hardenable.

SIBLEY CASTING ALLOY
Eng.; 80 Al, 20 Zn.
For strong light alloy castings, non-hardenable.

SICRIMPHY 1
M-771, C, alloy, bal Fe
For valves.

SICRIMPHY 2.
C-771, C, alloy, bal Fe.
For valves.

SICRIMPHY 3.
M-104; C, 2.5 Si, 10 Cr, 0.7 Mo, bal Fe.
For corrosion resistant parts; corrosion resistant

SICROMAL 8.
M-625; 6.3-6.8 Cr, 0.6-0.9 Al, 0.12 max C, 0.6-0.9 Si, bal Fe
Air annealed 64,000-85,500 TS; 35,000 YS; 20 El; 125-165 Brin.
For superheaters, recuperators, annealing ovens, pots, bolts; resists heat to 800°C.

SICROMAL NO 8.
M-383; 0.12 max C, 0.8 Si, 4-5 Cr, 0.5 Al, bal Fe.
At 20°C: 67,000 TS; 43,000 YS; 20 El; 75 RA; 140 Brin
At 800°C: 10,000 TS; 6000 YS; 38 El; 93 RA.
For superheater and recuperator tubes, annealing furnaces; resists oxidation and S fumes.

SICROMAL NO. 9.
M-383, 0.12 max C, 1.2 Si, 1 Al, 13 Cr, 0.005 S max, bal Fe.
At 20°C. 78,400 TS; 40,000 YS, 15 El; 68 RA; 160 Brin.
At 800°C: 11,400 TS; 7200 YS; 50 El, 90 RA.
For superheater and recuperator tubes, pipes, fittings; resists oxidation and S gases.

SICROMAL 9.
M-625; 12.5-13.5 Cr, 1.0-1.3 Si, 0.8-1.1 Al, 0.12 max C, 1 max Mn, bal Fe.
Air annealed 71,900-92,500 TS; 43,000 YS; 15 El; 140-180 Brin.
For annealing ovens, pyrometer tubes, superheaters; resists heat to 900°C.

SICROMAL NO. 10.
M-383; 0.12 max C, 1 Si, 1 Al, 18 Cr, 0.005 S max, bal Fe.
At 20°C: 85,200 TS; 50,400 YS; 10 El; 63 RA.
At 800°C: 14,500 TS; 7200 YS; 53 El; 98 RA.
For pyrometer tubes, anchor bolts, furnace parts; resists oxidizing, reducing and S gases.

SICROMAL 10.
M-625; 17.5-18.5 Cr, 0.8-1.1 Si, 0.8-1.1 Al, 0.12 max C, 1 max Mn, bal Fe.
Air annealed: 71,000-92,500 TS; 43,000 YS; 12 El; 140-180 Brin.
For superheaters, annealing ovens, pots, bolts; resists heat to 1000°C.

SICROMAL NO. 12.
M-383; 0.12 max C, 1.5 Si, 1.5 Al, 24 Cr, bal Fe.
Annealed: 71,000-92,500 TS; 43,000 YS; 12 El; 185 Brin.
For pyrometer tubes, tuyere pipes, annealing boxes; resists oxidizing, reducing and S gases.

SICROMAL 12.
M-625; 23-25 Cr, 1.3-1.6 Al, 1 max Mn, 0.12 max C, 1.3-1.6 Si, bal Fe.
Air annealed: 71,000-92,500 TS; 43,000 YS; 10 El, 140-180 Brin.
For superheaters, pots, bolts, annealing ovens, resists heat to 1200°C.

SICROMAL 12H.
M-625; 0.15 C, 23 Cr, 1 Si, 2.5 Al, bal Fe.
Annealed: 92,000 TS; 57,000 YS, 10 El.
For resistances, heating elements; heat resistant to 1200°C.

SICROMAL 17/17 KMS.
M-625; 0.1 C, 0.3-0.5 Si, 2 max Mn, 17-18 Cr, 1.8-2.2 Cu, 17-18 Ni, 1.8-2.2 Mo, Ti = 7 × C, bal Fe.
Water quenched: 78,200-106,700 TS, 35,500 YS; 40 El; 155-210 Brin.
For sulfuric acid equipment; corrosion and acid resistant.

SICROMAL 17/17KNS.
M-625; 0.7 max C, 17.5 Cr, 2 Mo, 17.5 Ni, 2 Cu, Ti = 7 × C, bal Fe.
For valves and pump parts, furnace equipment; corrosion and heat resistant.

SICROMAL 18/8.
M-625; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS, 55 El, 75 RA; 150 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El, 250 Brin.
For chemical plant equipment, tanks, mixers, filters, Type 302; stainless, austenitic

SICROMAL 18-8 MS
M-625; 0.12 max C, 17.5-18.5 Cr, 10-11 Ni, 1.8-2.2 Mo, Ti = 4 × C, 2 max Mn, bal Fe
Water quenched. 78,000-107,000 TS; 38,000 YS, 40 El; 155-210 Brin
For chemical and textile industries, austenitic, stainless.

SICROMAL 18-8 S.
M-625; 0.12 max C, 17.5-18.5 Cr, 9-10 Ni, 2 max Mn, Ti = 4 × C, bal Fe.
Water quenched: 78,000-107,000 TS; 38,000 YS; 40 El, 155-210 Brin.
For chemical industries; austenitic, stainless.

SICROMAL 18/12 MS.
M-625; 0.10 max C, 2 max Mn, 16 Cr, 13 Ni, 2.0-2.5 Mo, 1 Ta/Nb, bal Fe
Water quenched: 78,200-106,700 TS, 38,400 YS; 40 El; 150-210 Brin.
For stainless parts, oil refinery equipment; stainless, austenitic.

SICROMAL 18/12 S.
M-625; 0.10 max C, 2 max Mn, 18 Cr, 10 Ni, 1 Ta/Nb, bal Fe.
Water quenched: 78,200-106,700 TS; 38,400 YS; 40 El; 150-210 Brin.
For stainless parts, oil refinery equipment; stainless, austenitic.

SICROMAL 19 MS.
M-625; 0.10 max C, 16.5-17.5 Cr, 1.6-1.9 Mo, 1 max Mn, Ti = 7 × C, bal Fe.
Air annealed: 71,000-92,500 TS; 43,000 YS; 20 El; 140-180 Brin.
For chemical and textile industries, stainless, resists HNO_3.

SICROMAL 20-10.
M-625; 0.1-0.2 C, 19-20 Cr, 9-10 Ni, 1.8-2.3 Si, 2 max Mn, bal Fe
Water quenched. 85,000-107,000 TS, 43,000 YS; 40 El; 165-210 Brin
For furnace parts, crucibles, autoclaves; austenitic, resists heat to 1050°C.

SICROMAL 23-20.
M-625, 0.1-0.2 C, 23-25 Cr, 20-22 Ni, 1.8-2.3 Si, 2 max Mn, bal.
Water quenched: 85,000-107,000 TS, 43,000 YS, 40 El; 165-210 Brin
For recuperators, crucibles, autoclaves, austenitic, resists heat to 1200°C.

SICROMAL 85.
M-625, 0.15 C, 6.5 Cr, 2.0 Si, bal Fe.
Rolled. 78,000-107,000 TS, 56,900 YS, 18 El
For steam boilers, superheater tubes, recuperators; heat resistant to 850°C

SICROMAL 130
M-625; Cr, Si, Al, bal Fe
Annealed: 107,000 TS; 57,000 YS, 10 El
For resistance wire, resists heat to 1250°C.

SICROMAL C 7A
M-625, Cr, Si, Al, bal Fe
Annealed 78,000 TS; 57,000 YS; 10 El
For resistance wire, resists heat to 1100°C.

SICROMAL CS 65 S.
M-625, 0.15 max C, 1.3-1.7 Si, 1 max Mn, 2.0-2.5 Cr, 0.4-0.5 Mo, bal Fe
Normalized 64,000-85,500 TS, 35,500 YS, 18 El; 125 Brin
For oil refining equipment, steam boilers

SICROMAL CV 18 W
M-625; 0.1 C, 1.2-1.4 Si, 1 max Mn, 1.5-2.0 Cr, 0.2-0.3 Mo, 0.2-0.3 V, bal Fe
Normalized: 64,000-85,500 TS; 42,700 YS; 20 El; 125-165 Brin
For steam boilers.

SICROMAL D
M-625, 0.15 max C, 0.3-0.5 Si, 1 max Mn, 4.5-5.5 Cr, 0.45-0.55 Mo, bal Fe
Annealed 64,000-85,300 TS; 42.600 YS; 20 El, 125-165 Brin.
For ammonia synthesis equipment; corrosion resistant

SICROMAL D7
M-625; 0.2 C, 7 Cr, Mo, bal Fe.
Rolled: 64,000 TS; 35,600 YS, 20 El.
For petroleum cracking equipment; heat resistant to 700°C.

SICROMAL D9.
M-625, 0.15 C, 9 Cr, 0.5 Mo, bal Fe.
Rolled: 64,000 TS; 35,600 YS; 20 El.
For hydrogenating and ammonia synthesis equipment; heat resistant to 750°C.

SICROMAL D12.
M-625; 0.12 max C, 12-13 Cr, 0.4 Si, bal Fe.
Rolled: 71,000-92,500 TS; 42,700 YS, 20 El
For chemical plant equipment; corrosion resistant

SICROMAL D16.
M-625; 0.12 C, 18 Cr, 0.4 Si, bal Fe.
Rolled: 64,000-85,000 TS; 42,700 YS; 20 El.
For nitric acid and soap making equipment, corrosion resistant.

SICROMAL D 16 S.
M-625; 0.10 max C, 17-18 Cr, 1 max Mn, Ti = 7 × C, bal Fe.
Air annealed: 64,000-85,500 TS; 43,000 YS; 20 El; 125-165 Brin
For chemical industries; stainless, resists HNO_3.

SICROMAL D 45 V
M-625, 0.12 max C, 0.4-0.8 Si, 1 max Mn, 1.4-1.8 Cr, 0.25-0.35 V, bal Fe.
Normalized: 64,000-85,300 TS; 42,670 YS; 18 El; 125-165 Brin.
For ammonia synthesis apparatus.

SICROMAL TS 57
M-625, 0.1 max C, 0.7-1.1 Si, 1 max Mn, Ti = 5 × C, bal Fe.
Normalized 48,300-68,300 TS, 28,500 YS; 20 El, 95-135 Brin.
For construction steel.

SICROMAL TSL.
M-625; 0.1 C, 0.7 Ti, bal Fe.
Rolled 48,000-60,000 TS; 21,400 YS, 22 El
For steam boilers and equipment in soap industries, resists caustic embrittlement

SICROMO 1.
M-376; 0.15 max C, 1.0-1.4 Si, 0.75-1.25 Cr, 0.45-0.65 Mo, bal Fe.
Annealed 60,000 TS; 25,000 YS; 30 El; 50 RA; 163 Brin
For high temperature tubing; resists heat to 1150°F

SICROMO 2
M-376; 0.15 max C, 0.5 Mo, 1.0-1.5 Si, 1.75-2.25 Cr, bal Fe
Annealed 60,000 TS; 25,000 YS, 30 El; 163 Brin.
For refinery tubing, resists heat to 1200°F.

SICROMO 2½
M-376; 0.15 max C, 0.50 max Mn, 0.5-1.0 Si, 2.25-2.75 Cr, 0.4-0.6 Mo, bal Fe
At 85°F: 74,400 TS; 40,650 YS, 38.5 El; 72.6 RA
At 1400°F 12,900 TS, 7,500 YS, 75.0 El, 96.0 RA
For refinery tubes, still tubes, condenser tubes; resists oxidation and corrosion to oils.

SICROMO 3.
M-376; 0.15 max C, 0.5 Mo, 1.0-1.5 Si, 2.75-3.25 Cr, bal Fe.
Annealed: 60,000 TS; 25,000 YS; 30 El, 50 RA, 160 Brin
For high temperature tubing, cracking stills; resists heat to 1200°F

SICROMO 5.
M-376, 0.15 max C, 0.5 Mo, 1.0-2.0 Si, 4-6 Cr, bal Fe.
Annealed: 60,000 TS; 25,000 YS; 30 El; 163 Brin.
For tubing, resists heat to 1300°F.

SICROMO 5M.
M-376; 0.15 max C, 0.5 max Mn, 0.5-1.0 Si, 4-6 Cr, 0.9-1.1 Mo, bal Fe.
For gasoline and petroleum refineries; corrosion resistant.

SICROMO 5MS.
M-376, 0.15 max C, 0.5 max Mn, 1-1.5 Si, 4-6 Cr, 0.9-1.1 Mo; bal Fe.
Rolled: 60,000 TS; 25,000 YS, 30 El; 163 Brin.
For high temperature tubing; high surface stability.

SICROMO 5S.
M-376; 0.15 max C, 1-2 Si, 4-6 Cr, 0.45-0.65 Mo, bal Fe.
Annealed: 60,000 TS; 25,000 YS; 30 El; 50 RA; 163 Brin.
For high temperature tubing in oil refineries; heat resistant to 1500°F.

SICROMO 7.
M 376; 0.15 max C, 0.5-1.0 Si, 6-8 Cr, 0.45-0.65 Mo, bal Fe.
Annealed: 60,000 TS; 25,000 YS; 30 El; 50 RA; 179 Brin.
For high temperature tubing in oil refineries; corrosion resistant.

SICROMO 7M.
M-376; 0.15 max C, 0.5 max Mn, 0.5-1.0 Si, 6-8 Cr, 0.9-1.1 Mo, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant

SICROMO 9.
M-376; 0.15 max C, 0.5 max Mn, 0.5-1.0 Si, 8-10 Cr, 0.4-0.6 Mo, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

SICROMO 9M.
M-376, 0.15 max C, 0.5-1.0 Si, 7-9 Cr, 0.9-1.1 Mo, bal Fe
Annealed: 60,000 TS, 25,000 YS; 30 El; 50 RA; 179 Brin
For high temperature tubing in oil refineries; corrosion resistant.

SIDERAPHITE
Eng., 62 Fe, 23 Ni, 5 Cu, 5 Al, 4 W
For acid resisting vessels and apparatus; stainless and corrosion resistant.

SIEMENS-HALSKE
M-198; 90-95 Ni, 5-10 Ta
For heat and corrosion resistant parts; stainless and corrosion resisting

SIEMENS-HALSKE
M-198, 70 Ni, 30 Ta.
For spark plug electrodes, stainless and corrosion resisting

SIEMENS-HALSKE
M-198, 48 Zn, 5 Sb, 47 Cd
For solder, stainless and corrosion resisting.

SIFALUMIN NO 14
M-243; 99 Al
Welded: 12,000 TS
For welding rod for Al

SIFALUMIN NO 15.
M-243, 5 Si, bal Al.
Welded: 14,000 TS.
For welding rod for Duralumin

SIFALUMIN NO. 16
M-243, 10-12 Si, bal Al.
Welded 20,000 TS
For welding rod for Al.

SIFALUMIN NO. 27.
M-243, 5 Mg, 1 Mn, bal Al.
Welded 34,000 TS.
For welding rod for Al alloys; MG5 Alloy.

SIFALUMIN NO 28.
M-243, 7 Mg, 1 Mn, bal Al.
Welded: 46,000 TS
For welding rod for Al alloys; MG7 Alloy.

SIFALUMIN NO 29.
M-243; 5 Cu, bal Al.
Welded: 22,900 TS.
For welding rod for Al.

SIFALUMIN NO. 36.
M-243; Al alloy.
For Al brazing rod; low temperature brazing.

SIFBRASS NO. 6.
M-243; 45-50 Zn, bal Cu.
For brazing alloy for cast iron and copper; M.P. 850°C.

SIFBRONZE.
M-243; 60-70 Cu, 20-30 Zn, traces of Sn, Fe, Mn.
64,000 TS; 22 El; 156 Brin.
For welding rods; for welding cast iron or malleable iron.

SIFBRONZE NO. 1.
M-243; Sn, bal Cu.
Welded: 60,000 TS; 32,000 YS; 28 El; 35 RA; 117 Brin.
For welding rod; all purpose.

SIFBRONZE NO. 2.
M-243; 9 Ni, Sn, bal Cu.
Welded: 72,000 TS; 35,000 YS; 26 El; 33 RA; 126 Brin.
For welding rod; wear resistant

SIFBRONZE NO. 3.
M-243; 15 Ni, bal Cu.
Welded: 66,000 TS; 36,000 YS; 24 El; 30 RA, 124 Brin.
For welding rod; corrosion resistant.

SIFBRONZE NO. 4.
M-243; Sn, bal Cu.
Welded: 60,000 TS; 32,000 YS; 28 El; 35 RA, 117 Brin.
For welding rod for Al-bronze; flux coated.

SIFBRONZE NO. 5.
M-243; Sn, bal Cu.
For welding rod; bronze.

SIFBRONZE NO. 10.
M-243; Mn, Zn, bal Cu.
Welded: 60,000 TS; 32 El; 30 RA; 128 Brin.
For welding rod; resists sea water corrosion

SIFCOLOY.
M-889; 3.1 T.C., 1.14 Si, 0.62 Cu, 0.76 Mo, bal Fe
Cast 58,000 TS; 250 Brin.
For nozzle castings, lock gate valves; erosion resistant.

SIFCUPRON NO. 17
M-243; 10-15 P, bal Cu.
For brazing alloy for Cu and brass; M.P. 750°C

S.I.F. NO. 23
M-243; 6 Al, 1 Zn, bal Mg.
Welded· 36,000-40,000 TS; 16,000-20,000 YS; 12-10 El; 65-70 Brin.
For Mg welding rod.

S.I.F. NO. 24.
M-243; 1.5 Mn, bal Mg.
Welded: 20,000-28,000 TS; 14,000-18,000 YS; 3-2 El; 40-50 Brin.
For Mg welding rod.

SIFONIL NO. 10.
M-243.
For welding rod.

SIFONITE NO. 18.
M-243; C, alloy, bal Fe.
Welded: 610 Brin.
For hard surfacing electrode; wear and heat resistant.

SIFSILCOPPER NO. 7.
M-243; Ag, bal Cu.
For welding rod for copper; easy flowing.

SIFSTEEL AMS NO. 13.
M-243; 0.10 C, bal Fe.
Welded: 46,000 TS; 32,000 YS; 13 El; 20 RA.
For welding rod for steel; M.P. 1450°C.

SIFSTEEL CCMS NO 11.
M-243; 0.08 C, bal Fe.
Welded: 46,000 TS; 32,000 YS; 13 El; 20 RA.
For welding rod for steel; Cu coated.

SIFSTEEL NO. 19.
M-243; C, Si, Mn, bal Fe.
Welded: 68,000 TS; 50,000 YS; 12.7 El; 23.4 RA.
For welding rod; high strength.

SIFSTEEL NO. 22.
M-243; C, 1.5 Mn, bal Fe.
For welding rod; tough.

SIFSTEEL NO 26
M-243; C, 3 5 Ni, bal Fe.
For welding rod; tough.

SIFSTEEL NO. 34.
M-243; 80 Ni, 20 Cr
For resurfacing valves, joining heating elements, heat resistant.

SIFSTEEL STAINLESS NO 21.
M-243, 0.25-0 50 C, 2-3 5 Si, 0.6-1.25 Mn, 24-28 Ni, 15 5-19 Cr, bal Fe.
For welding rod for stainless steel; stainless

SIFSTEEL STAINLESS NO 26.
M-243, C, 18 Cr, 8 Ni, bal Fe
Welded· 10,000 TS, 34,000 YS; 56 El; 60 RA.
For welding rod for stainless steels; stainless

SIFSTEEL W.R NO. 12.
M-243, C, Si, Cr, Mn, bal Fe
Welded: 250 Brin
For hard facing electrodes, wear resistant

SIGAL.
Germ.; 87 Al, 13 Si.

SIGERON.
M-506, 3 2 C, 2.2 Si, 1.5 Ni, bal Fe.
Cast.
Castings; nickel cast iron

SIGMALUMIN
M-622, 0 8 Si, 3 8 Cu, 0 7 Mn, bal Al.
Soft· 25,000-29,000 TS; 11,400-15,900 YS; 20-15 El
For light alloy parts, age-hardenable.

SIL-5.
M-1013, 5 Ag, 37 Zn, 58 Cu.
For silver solder, M P. 1575-1600°F

SIL-5C.
M-1013; 5 Ag, 95 Cd.
For silver solder, M P. 626-740°F.

SIL-6T.
M-1013; 60 Ag, 30 Cu, 10 Sn.
For silver solder, M.P. 1095-1325°F

SIL-7T.
M-1013, 7 Ag, 85 Cu, 8 Sn.
For silver solder; M P. 1225-1805°F.

SIL 9.
M-1013; 9 Ag, 53 Cu, 38 Zn.
For silver brazing, M P. 1510-1575°F.

SIL 20.
M-1013; 20 Ag, 45 Cu, 35 Zn.
For silver brazing; M.P. 1430-1500°F.

SIL 20C.
M-1013; 20 Ag, 45 Cu, 30 Zn, 5 Cd.
For silver brazing; M P. 1140-1500°F.

SIL-25.
M-1013; 25 Ag, 52.5 Cu, 22.5 Zn.
For silver solder; M.P. 1500-1575°F.

SIL 30.
M-1013; 30 Ag, 38 Cu, 32 Zn.
For silver brazing; M.P. 1370-1410°F.

SIL-40.
M-1013; 40 Ag, 30.5 Cr, 29.5 Zn.
For silver solder; M.P. 1080-1340°F.

SIL-40N.
M-1013; 40 Ag, bal Cu.
For silver solder; M.P. 1220-1435°F; AWS-BAg 4.

SIL 45.
M-1013; 45 Ag, bal Cu.
For silver solder; M.P. 1250-1370°F; AWS-BAg 5.

SIL-50.
M-1013; 50 Ag, bal Cu
For silver solder; M.P. 1275-1425°F; AWS-BAg 6.

SIL-54N.
M-1013; 54 Ag, bal Cu.
For silver solder; M.P. 1225-1275°F.

SIL-56T.
M-1013; 56 Ag, bal Cu.
For silver solder; M.P. 1145-1205°F, AWS-BAg 7.

SIL-60.
M-1013; 60 Ag, 25 Cu, 15 Zn
For silver solder; M.P. 1260-1325°F.

SIL-65
M-1013; 65 Ag, bal Cu.
For silver solder; M.P. 1280-1325°F; AWS-BAg 9.

SIL-70
M-1013; 70 Ag, bal Cu.
For silver solder; M.P. 1335-1390°F, AWS-BAg 10.

SIL-72
M-1013; 72 Ag, bal Cu
For silver solder, M.P. 1435°F, AWS-BAg 8.

SIL-80
M-1013, 80 Ag, 16 Cu, 4 Zn.
For silver solder; M.P. 1360-1490°F.

SIL-85M.
M-1013, 85 Ag, bal Cu
For silver solder; M.P. 1745-1760°F; AWS-BAg Mn

SILAFOND BETA.
M-1176; 11.5-13.0 Si, 0.3 Mg, 0.5 Mn, bal Al.
Cast 34,000-46,000 TS, 28,000-40,000 YS; 4-1 El; 80-110 Brin.
For light alloy parts, corrosion resistant.

SILAFONT 1.
M-1354, M-1420, 11.0-13.5 Si, 0.3-0.5 Mn, bal Al.
Sand cast: 25,000-32,000 TS, 11,400-12,000 YS; 4-8 El; 50-60 Brin.
Permanent mold: 28,000-37,000 TS; 12,000-16,000 YS; 3-7 El, 60-70 Brin.
For chemical industry, ship and auto construction; high corrosion resistance.

SILAFONT-1.
M-249, M-1605, M-1634; 12-13 Si, 0.3-0.6 Mn, bal Al.
Sand cast: 27,000 TS, 10,000 YS; 6 El; 55 Brin.
Chill cast: 33,000 TS; 14,000 YS; 5 El; 60 Brin.
For chemical industry, ship and auto construction; heat treatable.

SILAFONT-2.
M-249, M-1605, M-1634; 12-13 Si, 0.2-0.4 Mg, 0.3-0.6 Mn, bal Al.
Sand cast: 40,000 TS, 34,000 YS; 2.5 El; 95 Brin.
Chill cast: 43,000 TS; 38,000 YS; 2 El; 100 Brin.
For chemical industry; ship and auto construction; heat treatable.

SILAFONT 3.
M-1361, M-1354, M-1420; 8.5-10.5 Si, 0.2-0.4 Mg, 0.5 max Mn, bal Al.
Sand cast: 45,000-54,000 TS; 31,000-37,000 YS; 3-7 El; 90-100 Brin.
Permanent mold: 48,000-58,000 TS; 35,000-40,000 YS; 4-8 El; 95-110 Brin.
For chemical industry, ship and auto construction; high corrosion resistance.

SILAFONT-3.
M-249, M-1605, M-1634; 9-10 Si, 0.2-0.4 Mg, 0.3-0.6 Mn, bal Al.
Sand cast: 38,000 TS; 30,000 YS; 7 El; 80 Brin.
Chill cast: 39,000 TS; 33,000 YS; 6 El; 85 Brin.
For chemical industry, ship and auto construction; heat treatable.

SILAFONT-4.
M-249, M-1605; 12-13 Si, 0.5-1.0 Cu, 0.3 Mn, bal Al.
Sand cast: 31,000 TS; 13,000 YS; 2-5 El; 55 Brin.
Permanent mold. 35,000 TS; 14,000 YS; 2-4 El; 65 Brin.
For instrument housings, cases, intricate castings; corrosion resistant, good castability.

SILAFONT-5.
M-1605; 9.0-9.8 Si, 0.2-0.35 Mg, 0.45-0.55 Co, bal Al
As Cast: 26,000-33,000 TS; 14,000 YS; 3-6 El; 50-60 Brin.
Heat Treated: 42,000 TS; 37,000 YS; 2-5 El; 70-95 Brin.
For general sand and die castings, housings, instrument cases
Impact and shock resistant.
Heat treatable

SILAFONT-6.
M-1605, 8.5-11.0 Si, 0.2-0.35 Mg, bal Al.
Die cast: 40,000 TS; 26,000 YS; 1 El; 80 Brin.
For general die castings, instruments cases, housings.
Good strength and corrosion resistant.

SILAFONT-7.
M-1605; 12.8-13.4 Si, 0.9-1.2 Mg, 1.0-1.4 Cu, 0.9-1.2 Ni, bal Al.
Heat Treated: 44,000 TS, 37,000 YS; 0.5 El; 135 Brin
For engine pistons
Sand and die casting alloy, good hot crack resistance. Heat treatable.

SILAFONT CUPRO.
M-1176; 0.8 Cu, 12.0-13.3 Si, 0.3 Mn, bal Al
Cast: 31,000-37,000 TS; 17,000-20,000 YS; 3.0-1.5 El, 60-80 Brin
For light alloy parts, corrosion resistant.

SILAFONT Mn.
M-1176; 9 Si, 0.35 Mg, 0.5 Mn, bal Al
Cast: 35,000-43,000 TS; 28,000-37,000 YS, 5.5-3.5 El; 80-95 Brin
For light alloy parts, corrosion resistant.

SILAFONT NORMAL.
M-1176; 12.75-13.25 Si, bal Al
Cast: 31,000-34,000 TS; 14,000-17,000 YS; 3.0-1.5 El; 60-80 Brin.
For light alloy parts; corrosion resistant.

SIL-AID.
M-1013; 35 Ag, 26 Cu, 21 Zn, 18 Cd.
Cast: 60,000 TS.
For silver brazing all metals; M.P. 1125-1300°F.

SILAL.
M-494; 2.5 C, 1.0 max Al, 0.96 Mn, 5 Si, 0.16 P, 0.05 Cr, bal Fe.
Cast: 20,000 TS; 160 Brin.
For stove and furnace parts, fire bars; cast iron, scale resistant.

SILAL 53.
M-890; 2-4 Mg, 0.4 max Mn, 0.3 max Cr, bal Al.
Soft: 28,000 TS; 13,000 YS; 30 El; 47 Brin.
Hard: 40,000 ES; 35,000 YS; 10 El; 73 Brin.
For aircraft tanks and fittings, fuel lines, marine parts; resists sea water corrosion.

SILAL V.
M-890; 97.2 Al, 1.2 Mg, 0.8 Mn, 0.5 Si, 0.3 Ti.
For light alloy parts; rolling and extrusion.

SILANCA.
Eng.; 92.5-94.5 Ag, 0-2.5 Zn, 4-4.5 Sb, 1-3 Cd.
For silverware; corrosion resistant

SILBEREISEN NO. 1.
M-383, M-403; 1.0-1.5 Si, 0.9-1.5 Mn, 0.07-0.09 P, 0.02-0.04 S, 2.8 C, bal Fe
36,000-50,000 TS.
For steamship and locomotive cylinders, turbine housings, pump bodies, high pressure valves; high strength machine and centrifugal castings.

SILBEREISEN NO. 2.
M-383, M-403; 1.7-2.5 Si, 0.4-0.7 Mn, 0.07-0.09 P, 0.02-0.04 S, 2.8 C, bal Fe.
36,000-50,000 TS.
For steam ship and locomotive cylinders, turbine housings, pump bodies, high pressure valves; malleable iron and chilled iron castings

SILBEREISEN NO 3.
M-383, M-403; 1.0-1.3 Si, 0.4-0.7 Mn, 0.3-0.8 P, 0.02-0.04 S, 2.8 C, bal Fe
36,000-50,000 TS.
For steam ship and locomotive cylinders, turbine housings, pump bodies, high pressure valves; heavy castings, hard iron (chilled) castings

SILBEREISEN NO 4
M-383, M-403; 1.3-1.7 Si, 0.4-0.7 Mn, 0.3-0.8 P, 0.02-0.04 S, 2.8 C, bal Fe.
36,000-50,000 TS
For steamship and locomotive cylinders, turbine housings, pump bodies, high pressure valves; ordinary machinery castings

SILBEREISEN NO. 5
M-383, M-403, 1.7-2.5 Si, 0.4-0.7 Mn, 0.3-0.8 P, 0.02-0.04 S, 2.8 C, bal Fe.
36,000-50,000 TS.
For steamship and locomotive cylinders, turbine housings, pump bodies, high pressure valves, thin sections, common machinery castings

SILBEREISEN NO. 6
M-383, M-403, 1.7-2.5 Si, 0.4-0.7 Mn, 2.8 max C, 1.2 Ni, 0.5-1.0 Cr, bal Fe.
For cast iron cylinders, pump bodies, acid resisting castings; cast iron.

SILBEREISEN NO 7.
M-383, M-403; 1.7-2.5 Si, 0.4-0.7 Mn, 2.8 max C, 1-2 Ni, 0.5-1.0 Cr, bal Fe
For cast iron cylinders, pump bodies, acid resisting castings; cast iron.

SILBERKREUZ 1.
M-1344, 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe
For lathe and planer tools, reamers, drills, hobs; high speed steel.

SILBERKREUZ 2.
M-1344; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

SILBERKREUZ SPEZIAL.
M-1344; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, drills, taps, reamers; high speed steel.

SILBERPUNKT.
M-1331; 0.74 C, 4.1 Cr, 1.1 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

SILBLOCK 25.
M-394; 25 Si, bal Fe.
For blocking open hearth and electric furnace steel; controls carbon content.

SILBLOCK 50
M-394, 50 Si, bal Fe
For blocking open hearth and electric furnace steel; controls carbon content

SIL-BOND
M-1013; 35 Ag, 26 Cu, 21 Zn, 18 Cd.
For Silver solder; M P. 1125-1295°F.

SIL-BOND 31.
M-1013, 31.5 Ag, 34 Cu, 15.5 Zn, 19 Cd
For silver brazing; M P. 1165-1390°F, fillet type.

SIL-BOND 45
M-1013, 45 Ag, 15 Cu, 16 Zn, 24 Cd.
Cast: 70,000 TS
For silver brazing; M P 1125-1145°F; general purpose.

SIL-BOND 50
M-1013; 50 Ag, 15.5 Cu, 16.5 Zn, 18 Cd.
Cast 65,000 TS
For silver brazing; M.P 1160-1175°F, general purpose

SIL-BOND 50N
M-1013, 50 Ag, 15.5 Cu, 15.5 Zn, 16 Cd, 3 Ni
For silver brazing for carbide tipped tools, M P 1195-1270°F resists chloride corrosion

SILBRASS.
4.5 Si, 10-12 Zn, bal Cu
For corrosion resistant parts; corrosion resistant.

SILCAZ ALLOY 3
M-48, 35-40 Si, 9-11 Ca, 6-8 Al, 3-5 Zr, 9-11 Ti, 0.55-0.75 B, bal Fe.
For addition agent in steel making, alloying agent

SILCHROME.
M-1, 9.5 Cr, 4 Si, 0.5 C, bal Fe
For heat and corrosion resisting parts, heat resistant

SILCHROME
M-1, 64 Fe, 21 Ni, 6.2 Cr, 6.1 Si, 0.8 Mn, 0.14 C
For heat and corrosion resisting parts; heat and corrosion resistant.

SILCHROM I.
M-459, 0.4 C, 3.5 Si, 9.5 Cr, bal Fe.
For valves, valve seats; heat resistant.

SILCHROM II
M-459; 0.4 C, 4 Si, 3 Cr, bal Fe.
For valves, heat resistant.

SILCHROM V.
M-459, 0.45 C, Si, Cr, bal Fe.
For bolts, gears, fasteners, oil hardened.

SILCHROM IX.
M-459, 0.45 C, 3.2 Si, 8.5 Cr, bal Fe.
For valves, heat and corrosion resistant.

SILCHROME 10
M-1; 0.37 C, 19 Cr, 8 Ni, 3 Si, 1 Mn, 0.1 N, 0.3 Mo, 0.3 Cu, bal Fe.
For exhaust valves
Austenitic, stainless, heat resistant

SILCHROM 20.
M-459; 0.8 C, 2 Si, 20 Cr, 1.5 Ni, bal Fe.
For valves; heat and corrosion resistant.

SILCHROM 25.
M-459; 0.45 C, 1.2 Si, 1.1 Mn, 23 Cr, 2.8 Mo, 5 Ni, bal Fe.
For valves; heat and corrosion resistant.

SILCHROME WIRE.
M-1; 18 Cr, 3 Si, 3 W, 0.3 C, bal Fe.
For heat and corrosion resisting wire; heat and corrosion resistant.

SIL-CO.
M-1013; 70 Ag, 20 Cu, 10 Zn.
For silver solder; M.P. 1235-1360°F

SIL-CON.
M-1013; 50 Ag, 34 Cu, 16 Zn.
For Silver solder; M.P 1260-1410°F.

SILCORO 60.
M-1493; 60 Au, 20 Cu, 20 Ag.
For brazing
M.P 835-845°C

SILCORO 75.
M-1493; 75 Au, 20 Cu, 5 Ag.
For brazing brasses.
M.P. 1625-1643°F; Corrosion resistant

SILCOZ ALLOY.
M-48; 35-40 Si, 9-11 Ca, 6-8 Al, 3-5 Zr, 9-11 Ti, 0 55-0.75 B
For boron additions to steel; increase hardenability.

SILCROME
M-76, 0 48 C, 8 5 Cr, 3 5 Si, bal Fe.
For poppet valves for automobile and aircraft engines, burglar proof safes, heat resisting; max operating temperature 1800°F.

SILCROME-1.
M-1, 0 4-0.5 C, 3-3.5 Si, 8-9 Cr, bal Fe.
240-550 Brin.
For supercharger wheels for jet engines, engine valves, heat and corrosion resistant

SILCROME NO 9
M-568, 0 5 C, 14 Ni, 14 Cr, 3 Si, 2 5 W, 0 5 Mo, bal Fe.
For valve seats, heat and corrosion resistant

SILCROME 12.
M-1, 0.12 max C, 11 5-13 0 Cr bal Fe
Annealed. 65,000 TS; 35,000 YS, 30 El, 60 RA, 156 Brin.
Heat treated. 130,000 TS, 95,000 YS; 15 El, 35 RA, 280 Brin
For applications requiring moderate corrosion resistance and high physical properties; corrosion resistant, scaling temperature at 1100°F.

SILCROME 12-2.
M-1; 0.12 max C, 12-15 Cr, 2 Ni, bal Fe
For corrosion resistant parts, table ware; corrosion resistant.

SILCROME 12-EZ.
M-1; 0 12 max C, 12-15 Cr, bal Fe.
For stainless parts, easy machining, stainless.

SILCROME 17.
M-1; 0.12 max C, 16.5-17 5 Cr, bal Fe.
Annealed: 75,000 TS; 43,000 YS; 28 El; 55 RA; 170 Brin.
For heat and corrosion resisting parts; stainless, heat and corrosion resisting.

SILCROME 21.
M-1, C, 18-23 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

SILCROME 25-12.
M-1; 0.20 C, 25 Cr, 12 Ni, bal Fe.
Annealed: 95,000 TS; 48,000 YS; 42 El; 50 RA; 167 Brin.
For corrosion and heat resistant parts; heat and corrosion resistant.

SILCROME 25-20.
M-1; C, 25 Cr, 20 Ni, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

SILCROME 28.
M-1; C, 23-28 Cr, bal Fe
For heat and corrosion resistant parts, heat and corrosion resistant.

SILCROME 46 M.
M-1; 0 25 max C, 4-6 Cr, 0.50 Mo, bal Fe.
Annealed· 68,000 TS; 29,000 YS; 32 El; 70 RA; 142 Brin.
Heat treated: 117,000 TS; 101,000 YS; 18 El; 64 RA, 262 Brin.
For machinery parts; scaling temperature 1000°F; Iz-67-72.

SILCROME H-17.
M-1, 1 0 C, 17 Cr, bal Fe.
Annealed· 120,000 TS, 60,000 YS; 10 El; 15 RA; 240 Brin.
Heat treated. 175,000 TS; 140,000 YS; 7 El; 10 RA; 350 Brin.
For heat and corrosion resistant parts, hard, heat and corrosion resistant;

SILCROME H-17-EZ.
M-1, C, 17 Cr, bal Fe.
For heat and corrosion resistant parts; corrosion and heat resistant

SILCROME KA-2.
M-76, M-1, 0 09-0 20 C, 18 Cr, 8 Ni, bal Fe.
Annealed 90,000 TS, 30,000 YS; 55 El; 65 RA, 150 Brin
Hard drawn 200,000 TS, 150,000 YS; 25 El; 45 RA; 315 Brin
For heat and corrosion resistant parts; heat and corrosion resistant, scaling temp. 1550°F.

SILCROME KA-2B
M-1; 0 13-0 20 C, Si, 16-23 Cr, 7-11 Ni, bal Fe
For heat and corrosion resistant parts; stainless, heat and corrosion resistant.

SILCROME KA2-EZ.
M-1, 0 08-0 20 C, 18 Cr, 8 Ni, bal Fe
For heat and corrosion resistant parts, free machining, heat and corrosion resistant.

SILCROME KA2M.
M-1; C, 18 Cr, 8 Ni, 3 Mo, bal Fe
For corrosion resistant parts; corrosion resistant

SILCROME KA2S.
M-1; 0 08 max C, 18 Cr, 8 Ni, bal Fe.
For corrosion resistant parts; corrosion resistant.

SILCROME KA2T.
M-1; C, Ti, 18 Cr, 8 Ni, bal Fe
For corrosion resistant parts; corrosion resistant.

SILCROME KM-1.
M-1, 0 20 max C, 14 Cr, 1 75 Ni, bal Fe.
For corrosion resistant parts; corrosion resistant.

SILCROME L-12.
M-1; 0.30 C, 12 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

SILCROME M-17.
M-1; 0.60 C, 17 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

SILCROME RA.
M-1; 0.12 C, 16 Cr, 1.0 Si, 1.0 Cu, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 35 El; 65 RA; 160 Brin.
Heat treated: 110,000 TS; 65,000 YS; 25 El; 55 RA; 241 Brin.
For corrosion resisting parts; corrosion resistant; scaling temperature 1500°F.

SILCROME TPA.
M-1; 0.4-0.5 C, 0.3-0.8 Si, 13-15 Ni, 13-15 Ni, 2-3 W, bal Fe.
170-210 Brin.
For airplane valves; heat resistant.

SILCROME X.
M-1; 0.8 C, 2 Si, 20 Cr, bal Fe.
For truck, airplane and auto engine valves; heat resistant.

SILCROME X9.
M-1; 0.7 C, 3 Si, 10 W, bal Fe.
For valves, valve seats; heat resistant.

SILCROME X10.
M-1; 0.30-0.45 C, 18 Cr, 8 Ni, 0.5-1.5 Mn, 2.5-3.5 Si, bal Fe.
For exhaust valves; heavy duty.

SILCROME X142.
M-1; 0.4-0.5 C, 0.3-0.8 Si, 13-15 Ni, 13-15 Cr, 2-3 W, bal Fe.
170-210 Brin.
For airplane valves; heat resistant.

SILCROME XB.
M-1; 0.75-0.85 C, 1.5-2.5 Si, 19-23 Cr, 1-2 Ni, bal Fe.
270-530 Brin.
For valves and valve seats; heat resistant.

SILCROME XCR.
M-1; 0.40-0.50 C, 1.0 Si, 1 0 Mn, 23-24 Cr, 4.5-5.0 Ni, 2.5-3.0 Mo, bal Fe.
300-370 Brin.
For valves and valve seats; heat resistant.

SILCRY.
M-771; C, alloy, bal Fe.
For valves.

SILECTRON.
M-1; 3 Si, bal Fe.
Rolled: 50,000 TS; 44,000 YS; 17 El.
For distribution power transformers, cores.
Grain oriented, high permeability, low core loss as high induction.

SIL-EEN.
M-1013; 40 Ag, 36 Cu, 24 Zn.
For silver solder; M.P. 1330-1445°F.

SILESIA D610PW.
M-1323; 0.30 C, 2.5 Cr, 0.2 Mo, 0.55 Mn, bal Fe.
For gears, dies, forging dies; oil hardened, tough.

SILESIA E60.
M-1323; 0.15 C, 0.65 Cr, 0.50 Mn, 0.25 Si, bal Fe.
For gears, bolts, machine tool parts; case hardened.

SILESIA EK20.
M-1323; 0.20 C, 0.25 Si, 1.25 Cr, 1.15 Mn, bal Fe.
For gears, bolts, camshafts, cams; case hardening steel.

SILESIA F6.
M-1323; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs; oil hardened, tough.

SILESIA R2.
M-1323; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers' tools, textile needles, reamers, drills; Type W1; water hardened.

SILESIA R3.
M-1323; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 18 El; 38 RA; 210 Brin.
For springs, drills, reamers, broaches; Type W1; water hardened.

SILESIA R4.
M-1323; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, drills, reamers, broaches; Type W1; water hardened.

SILESIA R5.
M-1323; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, taps, drills, cutters, reamers; Type W1; water hardened.

SILESIA R6.
M-1323; 0 70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For rails, punches, springs, girders; Type W1; water hardened.

SILESIA RWA.
M-1323; 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe.
For forging and die casting dies; oil hardened.

SILESIA RWA EXTRA.
M-1323; 0.40 C, 0.25 Si, Cr, Mn, Mo, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

SILESIA RWA SPEZIAL.
M-1323; 0.30 C, 1.1 Cr, 0 18 V, 3.75 W, 1.0 Si, bal Fe
For header and forging dies, punches; oil hardened, tough.

SILESIA SC.
M-1323; 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For springs, chisels, punches; oil hardened, tough.

SILESIA SCN.
M-1323, 0.45 C, Ni, Cr, bal Fe.
For gears, bolts, shafts, axles; oil hardened, shock resistant

SILESIA TCN SPEZIAL.
M-1323; 0.50 C, 1 05 Cr, 3 25 Ni, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, shock resistant.

SILESIA TCS.
M-1323; 0.61 C, 1.18 Cr, 0.10 V, 0.75 Mn, 0.85 Si, bal Fe.
For forging dies, punches, upsetters; oil hardened, tough.

SILESIA TCV.
M-1323; 1.15 C, 0.65 Cr, 10 V, bal Fe.
For bearings, cold work tools; oil hardened, wear resistant.

SILESIA TFE.
M-1323; 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For bearings, sleeves, liners; water hardened, wear resistant.

SILESIA TFE24.
M-1323; 1.42 C, W, V, bal Fe.
For engravers tools, form cutters; water hardened.

SILESIA TKL1.
M-1323; 1.0 C, 1.55 Cr, 0.35 Mn, bal Fe.
For bearings, liners, sleeves; oil or water hardened, wear resistant.

SILESIA TKL2.
M-1323; 1.05 C, 1.0 Cr, 0.30 Mn, bal Fe.
For bearings, liners, sleeves; water hardened, wear resistant.

SILESIA TKL3.
M-1323; 1.1 C, 0.4 Cr, 0.3 Mn, 0.2 Si, bal Fe.
For bearings, liners, cutters; water hardened, wear resistant.

SILESIA TSPE.
M-1323; 1.2 C, 0.1 V, 1.0 W, 0.28 Mn, bal Fe.
For blanking and heading dies; oil hardened, wear resistant.

SILESIA TV3.
M-1323; 1.0 C, 0.1 V, 0.25 Mn, 0.2 Si, bal Fe.
For bearings, heading dies; Type W2; water hardened.

SILESIA TWA.
M-1323; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams and liners, punches; oil hardened, hot work steel.

SILESIA TWA24.
M-1323; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, 0.30 Mn, bal Fe.
For extrusion rams, forging dies, punches; oil hardened, hot work steel.

SILESIA TWA SPEZIAL.
M-1323; 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion rams and punches, shears; hot work steel, oil hardened.

SILESIA TZ.
M-1323; 1.4 C, 0.30 Cr, 0.10 V, 0.30 Mn, bal Fe.
For engravers tools, blanking and forming dies; oil hardened, wear resistant.

SILESIA V201.
M-1323; 0.55 C, 0.7 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For forging and heading dies, punches; oil hardened, tough.

SILESIA V201 SPEZIAL.
M-1323; 0.56 C, 0.9 Cr, 0.2 Mo, 0.1 V, 2.0 Ni, bal Fe
For forging and die casting dies; oil hardened, tough.

SILESIA W35.
M-1323; 0.35 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 54 RA; 185 Brin.
For gears, shafts, axles, bolts; water hardened.

SILESIA W45
M-1323; 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 98,000 TS; 58,000 YS; 24 El; 45 RA; 212 Brin.
For axles, gears, bolts, shafts, tie rods; water hardened.

SILESIA W60.
M-1323; 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 320 Brin.
For wheels, die blocks, girders, rails, bushings; water hardened.

SILESIA W75.
M-1323; 0.75 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 180,000 TS; 135,000 YS; 12 El; 36 RA; 370 Brin.
For springs, rails, girders, clutch discs; Type W1; water hardened.

SILESIA W90.
M-1323; 0.90 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 180,000 TS; 120,000 YS; 10 El; 30 RA; 380 Brin.
For springs, taps, reamers, drills, broaches; Type W1; water hardened.

SILESIA WG.
M-1323; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
For punches, upsetters, bolts; water hardened.

SILESIA Z3.
M-1323; 0.35 C, 0.90 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For header and forging dies, punches; oil hardened, tough.

SILESIA Z4 SPEZIAL.
M-1323; 0.45 C, W, Cr, V, bal Fe.
For header and forging dies, die casting dies; oil hardened, tough.

SILESIA Z5.
M-1323; 0.55 C, 0.90 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For header and forging dies, punches; oil hardened, tough.

SILESIA Z6.
M-1323; 0.38 C, Si, Cr, V, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

SILESIA Z7.
M-1323; 0.45 C, Si, Cr, V, bal Fe.
For springs, gears, bolts, crankshafts; oil hardened, shock resistant.

SIL-EX.
M-1013; 50 Ag, 15.5 Cu, 16.5 Zn, 18 Cd.
For silver brazing; M.P. 1160-1175°F.

SILFERAL
M-302; Si, bal Al.
Chill cast: 25,000-29,000 TS; 3-2 El; 65 Brin.
For cylinder heads, motorcycle cylinders; non-hardenable.

SIL-FIL.
M-1013; 50 Ag, 15.5 Cu, 15.5 Zn, 16 Cd, 3 Ni.
For silver solder; M.P. 1170-1270°F.

SIL-FOS.
M-63, 15 Ag, 80 Cu, 5 P.
M P 1185°F, Flow P. 1300°F.
For brazing copper and copper base alloys, where joints are wide.
AWS BCuP-5.

SIL-FOS-5.
M-63, 5 Ag, 89 Cu, 6 P.
M.P. 1185°F; Flow P. 1300°F.
For brazing copper and copper alloys.
AWS BCuP-3.

SILFRAM.
M-202; 2 C, 2 Si, 2 W, 10 Ni, 31 Cr, bal Fe.
Weld: 360 Brin.
For welding of rod, hard facing for agricultural equipment; corrosion, abrasion and wear resistant.

SIL-GON.
M-1013; Ag-Cu.
For silver solder; M.P. 1275-1425°F.

SILICAL.
Swed.; 11-14 Si, bal Al.
For exhaust valves; austenitic.

SILICO I.
M-72; 0.45 C, Cr, Si, bal Fe.
For gears, shafts, crankshafts, fasteners; water hardened.

SILICO II.
M-72; 0.45 C, Cr, Si, bal Fe.
For gears, bolts, shafts, fasteners; water hardened.

SILICO ALLOY (S5).
M-35; 0.58 C, 0.85 Mn, 1.95 Si, 0.45 Mo, 0.3 Cr, bal Fe.
Annealed: 108,000 TS; 64,000 YS; 27 El; 212 Brin.

For shear blades, pneumatic tools, mandrels, bending dies, pipe cutters, chisels, punches.
Oil or water harden Type S5 tool steel.
Shock resistant. Tough.

SILICO-CHROMIUM STEEL.
U.S.; 9-12 Cr, 5 Si, 1.2 C, bal Fe.
For valves, heat resistant parts; heat resistant.

SILICO-MANGANESE BRASS.
U.S.; 40 Zn, 1-2 Mn, 0.2-0.3 Fe, 0.05-1.0 Si, bal Cu.
For marine parts, architectural applications; corrosion resistant.

SILICO MANGANESE SPRING WIRE.
M-38; 0.5 C, 0.7 Mn, 2 Si, bal Fe.
For coil and flat springs, automatic springs; high fatigue resistance

SILICO-MANGANESE STEEL.
U.S.; 0.45-15 Mn, 0.4-1.9 Si, bal Fe.
For springs.

SILICON COPPER E-1232.
M-1191; 2.75-3.25 Si, bal Cu.
Forged: 50,000-55,000 TS; 30,000-35,000 YS; 30-25 El; 95-120 Brin.
For electrical applications; forgings, high cond.

SILICON CORE IRON "B-FM."
M-32; 0.05 max C, 0.40 max Mn, 2.25-2.75 Si, 0.08-0.15 P, bal Fe.
Hc from 10,000 gauss 0.65.
Br from 10,000 gauss 5600-7600.
Saturation at H-200, 20,600.
For solenoid switches, armatures, pole pieces, relays.
Free machining, high permeability.

SILICON-FERROCHROME.
U S.; 55-45 Cr, 30-50 Fe, 1-17 Si, 2.5-7 C
For steel making; Cr-addition agent

SILICO NICKEL.
M-897; 96 Cu, 2.5 Si, 1.5 Mn.
For cathodes and filaments in electronic tubes; heat resistant.

SILICON-MANGANESE.
M-48; 68 Mn, 20 Si, 11 Fe, 0 7 C
For steel making; Mn addition.

SILICON MONEL METAL 2 5%
M-68; 64-71 Ni, 28-30 Cu, 1-2 Fe, 2.5-3.0 Si, 0.5-0.75 Mn, 0.15-0 25 C.
Cast· 85,000 TS; 50,000 YS; 15 El; 250 Brin
For valves, power plant equipment; combines some hardness with moderate ductility.

SILICON-NICKEL.
M-48; 80-40 Ni, 16-18 Si, 2 5-30 Fe.
For steel making; Ni addition

SILICON NICKEL A.
M-61; 95 Ni, 2 5 Si, 2.5 Mn
Annealed.
For electrical resistances.

SILICON NICKEL B.
M-61; 97 Ni, 3 Si.
For filaments; Mn free.

SILICON RED BRASS-6942.
M-8; 82 Cu, 17 Zn, 1.0 Si.
Soft: 55,000 TS; 20,000 YS; 60 El.
Hard: 90,000 TS; 50,000 YS, 8 El.
For resistance welding.

SILICON STEEL-M15.
M-604, M-1, M-10; 4 Si, bal Fe.
Rolled: 61,000-79,000 TS; 60,000-66,000 YS; 4-8 El; Rock B 75.
For motors, generators, transformers, laminations.
High magnetic permeability.
Transformer M58 Grade.

SILICON STRUCTURAL STEEL.
M-24; 0.25 C, 0.5 Si, bal Fe.
Rolled: 45,000 TS.
For bridges, towers, structures; not weldable.

SILICON TIN BRONZE 5072.
M-8; 97.5 Cu, 1.75 Sn, 0.75 Si.
Forged: 45,000 TS; 14,000 YS; 40 El.
For electrical apparatus; corrosion resistant, forgeable.

SILICO-SPIEGEL.
M-48; 15-20 Mn, 8-15 Si, 0.15 P, C, bal Fe.
For steel making; Si addition.

SILIMAZ
M-72; 0.6 C, 15.5 Si, 2.6 Mn, bal Fe.
Cast: 15,000 TS; C 50 Rock.
For pumps, valves, drains, agitators, fittings, castings.
Acid resistant. Brittle as cast. Sensitive to thermal shock.

SILKORRIT-1
M-1323; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
Cold drawn: 180,000 TS; 130,000 YS; 10 El; 250 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302, stainless, austenitic.

SILKORRIT-2.
M-1323, 0.07 max C, 18 Cr, 9.5 Ni, bal Fe
Annealed: 85,000 TS; 35,000 YS; 60 El; 75 RA; 150 Brin
Cold drawn 180,000 TS, 125,000 YS; 10 El, 330 Brin
For chemical plant equipment, welded structures; Type 304, stainless, austenitic.

SILKORRIT-2T
M-1323, 0.1 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed· 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin
Cold drawn: 180,000 TS; 130,000 YS; 10 El, 250 Brin.
For chemical plant equipment, tanks, mixers, agitators, Type 302, stainless, austenitic.

SILKORRIT-2U
M-1323, 0.12 max C, 18 Cr, 9 5 Ni, Ti = 4 × C, bal Fe.
Annealed 85,000 TS; 35,000 YS, 55 El; 65 RA; 150 Brin.
Cold drawn· 95,000 TS, 60,000 YS, 40 El; 60 RA, 185 Brin.
For welded chemical plant equipment, tanks, mixers; Type 321; stainless, austenitic

SILKORRIT-4.
M-1323; 0 07 max C, 18 Cr, 2 Mo, 10 5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn· 150,000 TS, 135,000 YS; 6 El; 300 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

SILKORRIT-4T.
M-1323; 0.10 max C, 18 Cr, 2.2 Mo, 9.5 Ni, bal Fe.
Annealed· 85,000 TS; 35,000 YS; 50 El; 65 RA, 160 Brin
Cold drawn· 150,000 TS; 135,000 YS; 6 El, 300 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

SILKORRIT-4U.
M-1323; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Ti = 4 × C, bal Fe.

Annealed: 85,000 TS; 35,000 YS; 45 El; 60 RA; 160 Brin.
For welded acid resistant chemical plant equipment; Type 316 Ti; stainless, austenitic.

SILLMAN BRONZE.
England; 9.7 Al, 3.9 Fe, bal Cu.
For jewelry, bullet shells; corrosion resistant, Al-bronze.

SIL-LO.
M-1013; 15 Ag, 80 Cu, 5 P.
For silver brazing nonferrous metals; M.P 1185-1300°F.

SIL-LON
M-1013; 30.5 Cu, 29.5 Zn, 40 Ag.
For silver brazing all metals; Cd free; M.P. 1250-1350°F.

SIL-LOY
M-1013; 65 Ag, 20 Cu, 15 Zn.
For silver brazing; Cd free; M.P. 1265-1325°F.

SILMA
M-1133; 85 Ag, 15 Mn, 0.5 max others
For silver solder brazing, M P. 1790°F; S.S. 27000, for high temperature service.

SILMA.
M-1178, 85 Ag, 15 Mn.
For solder; high temperature service, M.P. 1790°F.

SIL-MAG NO. 1.
M 398; 42-47 Si, 7.5-10 0 Mg, bal Fe.
For cast iron inoculant; for ductile iron.

SIL-MAG NO 2
M-398, 60-65 Si, 16-20 Mg, bal Fe.
For cast iron inoculant, for ductile iron.

SIL-MAG-M NO 1.
M-398, 42-47 Si, 7 5-10 0 Mg, 1 Misch metal, bal Fe
For cast iron inoculant, for ductile iron

SIL-MAG-M NO 2.
M-398, 60-65 Si, 16-20 Mg, 1 Misch metal, bal Fe
For cast iron inoculant, for ductile iron.

SILMAL
French, 1 Mg, 1 75 Si, bal Al
Rolled. 38,000-43,000 TS, 25-30 El.
For light alloy parts; same as "Silumin"

SILMALAR.
M-982, 0 5 Mg, 0.5 Si, bal Al.
Rolled: 43,000 TS.
For conductors, conductivity 53.5 I ACS

SILMALEC
M-338; 0.5 Mg, 0.5 Si, bal Al.
For light alloy parts; age-hardening alloy

SIL-MAN.
M-34, M-115, 0 55 C, 2.1 Si, 0.85 Mn, 0 25 Cr, 0.3 V, bal Fe.
205,000 TS, 175,000 YS; 8 El; 16 RA; 400 Brin.
For shock tools, punches, chisels, shear blades; shock resisting tool steel; silico-manganese steel

SILMANAL.
M-38, M-1076; 86.75 Ag, 8.8 Mn, 4.45 Al.
Bar: 110,000 TS; 230 Brin.
590 Br, 6300 Hc, 292 Bo.
For electrical and magnetic equipment.
High coercive force. Permanent magnet.

SILMELEC.
French; 97.8 Al, 0.6 Mg, 0.6 Mn, 1.0 Si.
For electric conductor wires; high electrical conductivity.

SILMET.
M-135; Ni-Cu-Zn alloys.
For deep stamping in electroplate trade; deep stamping and spinning.

SILMO
M-376; 0.15 max C, 1.15-1.65 Si, 0.45-0.65 Mo, bal Fe.
Annealed: 60,000 TS; 30,000 YS; 30 El, 50 RA; 163 Brin.
For high temperature tubing; heat resistant to 1000°F.

SILNIC BRONZE (Copper Alloy No. 647).
M-33; 1.6-2 2 Ni, 0.45-0.75 Si, bal Cu.
Aged· 90,000 TS; 80,000 YS; 12 El.
For fasteners, bolts, structural components.
High strength, corrosion resistant.

SIL-NIK
M-1013, 40 Ag, 30 Cu, 28 Zn, 2 Sn.
For silver solder; M.P. 1240-1435°F.

SIL-O-ACID NO. 7.
M-481, Co, Si, Mg, bal Cu.
Cast· 52,000 TS; 21 El; 20 RA; 78 Brin.
For acid proof parts; resist acetic, carbolic, sulfuric and tartaric acids.

SIL-OID.
M-1013, 31 5 Ag, 34 Cu, 15 5 Zn, 19 Cd.
For silver brazing all metals; M.P. 1165-1390°F.

SIL-TEX.
M-1013, 60 Ag, 25 Cu, 15 Zn
For silver brazing all metals, Cd free, M.P. 1230-1330°F.

SIL-TIN
M-1013, 56 Ag, 22 Cu, 17 Zn, 5 Sn
For silver solder, M P. 1145-1205°F.

SIL-TITE
M-1013, 45 Ag, 30 Cu, 25 Zn.
For silver brazing all metals, Cd free, M.P. 1240-1370°F

SIL-TRODE
M-13, Si, bal Cu
For welding electrodes, for repairing silicon bronze parts

SIL-TRON.
M-1013, 80 Ag, 16 Cu, 4 Zn.
For silver brazing, Cd free; M P. 1375-1480°F

SILUMIN.
M-116; 12-13.5 Si, bal Al.
Hard 36,000 TS; 2 El
For cylinders, wrought

SILUMIN
M-299, M-297; 11-14 Si, bal Al.
Annealed. 21,000 TS; 8500 YS, 20 El; 50 Brin
For automotive castings, instruments, housings, corrosion resistant, easy to cast.

SILUMIN
M-315; 11-14 Si, bal Al
Sand cast 30,000 TS, 13,000 YS; 8 El; 60 Brin.
For automotive castings, good castability, corrosion resistant.

SILUMIN-BETA.
M-299, M-297; 12 Si, 0 3 Mg, 0 5 Mn, bal Al.
Sand cast: 25,000 TS, 14,000 YS; 2-4 El; 60 Brin.
For automotive castings; high fluidity, corrosion resistant

SILUMIN-GAMMA
M-297, M-299, 12 Si, 0.5 Mn, 0.3 Mg, bal Al.
Cast: 28,000 TS; 16,000 YS; 3 El; 60 Brin.
For automotive castings; good castability, corrosion resistant.

SIL-UTEC.
M-1013; 72 Ag, 28 Cu.
For silver solder; M.P. 1435°F.

SILVALOY.
M-897; 3 Si, 97 Ni.
Annealed: 75,000 TS; 55,000 YS; 25 El.
For cathodes and filaments in electronic tubes; heat resistant.

SILVALOY.
M-1432; C, alloy, bal Fe.
Heat treated: 155,000 TS; 132,000 YS; 17 El; 57 RA; 280 Brin.
For shafting, pump rods; preheat treated steel.

SILVALOY 5.
M-686; 5 Ag, 88.5 Cu, 6.5 P.
For brazing for joining copper; M.P. 1185-1280°F.

SILVALOY 6.
M-686; 6 Ag, 88 Cu, 6 P.
For brazing alloy.
M.P. 1190-1300°F.

SILVALOY 15.
M-686; 15 Ag, 5 P, 80 Cu.
For silver brazing for Cu alloys; M.P. 1185-1280°F.

SILVALOY 20.
M-686; 20 Ag, 45 Cu, 30 Zn, 5 Cd.
For silver brazing; M.P. 1130-1500°F.

SILVALOY 35.
M-686; 35 Ag, 26 Cu, 21 Zn, 18 Cd.
For silver brazing; M.P. 1125-1295°F.

SILVALOY 45.
M-686; 45 Ag, 15 Cu, 16 Zn, 24 Cd.
For silver brazing; M.P. 1145-1190°F.

SILVALOY 50.
M-686; 50 Ag, 15.5 Cu, 16.5 Zn. 18 Cd.
For silver brazing; M.P. 1160-1175°F.

SILVALOY 54.
M-686; 54 Ag, 40 Cu, 5 Zn, 1 Ni.
For brazing.
M.P. 1325-1575°F.

SILVALOY 60.
M-686; 60 Ag, 30 Cu, 10 Sn.
For atmosphere furnace brazing.
M.P. 600-725°C.

SILVALOY 105.
M-686; 45 Ag, 30 Cu, 12 Zn, 13 Mn.
For brazing; good strength to 700°F.

SILVALOY 250.
M-686; 40 Ag, 30 Cu, 28 Zn, 2 Ni.
For silver brazing for stainless steel; M.P. 1222-1416°F.

SILVALOY 254.
M-686; 40 Ag, 30 Cu, 25 Zn, 5 Ni.
For brazing steels; hardening and brazing in one operation.

SILVALOY 301.
M-686; 72 Ag, 28 Cu.
For silver brazing; M.P. 1435°F.

SILVALOY 355.
M-686; 56 Ag, 22 Cu, 17 Zn, 5 Sn.
For brazing.
M.P. 1145-1205°F.

SILVALOY 371.
M-686; 5 Ag, 95 Cd.
Uses: Brazing alloy.
M.P. 640-740°F.

SILVALOY 503.
M-686; 50 Ag, 15.5 Cu, 15.5 Zn, 16 Cd, 3 Ni.
For silver brazing of carbide tipped tools; M.P. 1195-1270°F.

SILVALOY 850.
M-686; 85 Ag, 15 Mn.
For silver brazing; M.P. 1760-1778°F.

SILVALOY A-4.
M-686; 10 Ag, 52 Cu, 38 Zn.
For silver brazing; M.P. 1510-1600°F.

SILVALOY A-11.
M-686; 20 Ag, 45 Cu, 35 Zn.
For silver brazing; M.P. 1430-1500°F.

SILVALOY A-13.
M-686; 30 Ag, 38 Cu, 32 Zn.
For silver brazing; M.P. 1370-1410°F.

SILVALOY A-14
M-686; 40 Ag, 36 Cu, 24 Zn.
For silver brazing; M.P. 1330-1445°F.

SILVALOY A-18.
M-686; 45 Ag, 30 Cu, 25 Zn.
For silver brazing; M.P. 1250-1370°F.

SILVALOY A-25.
M-686; 50 Ag, 34 Cu, 16 Zn.
For silver brazing; M.P. 1272-1425°F.

SILVALOY A-28.
M-686; 50 Ag, 28 Cu, 22 Zn.
For silver brazing; M.P. 1250-1340°F.

SILVALOY A-33.
M-686; 60 Ag, 25 Cu, 15 Zn.
For silver brazing; M.P. 1260-1325°F.

SILVALOY A-49.
M-686, 80 Ag, 16 Cu, 4 Zn.
For silver brazing; M.P 1360-1490°F.

SILVALOY A-79;
M-686; 25 Ag, 52.5 Cu, 22 5 Zn.
For brazing alloy; M P. 1500-1575°F.

SILVALOY AE-100.
M-686, 92.5 Ag, 7.3 Cu, 0.2 Li.
For atmosphere furnace brazing.

SILVALOY AE-102.
M-686; 72 Ag, 27.8 Cu, 0.2 Li
For brazing.
M.P. 1410°F. Eutectic alloy.

SILVALOY AT-600.
M-686; 98 Ag, 2 Li
For brazing.
M P. 1290-1400°F.

SILVALOY AT-601.
M-686; 97 Ag, 3 Li.
For brazing.
M P. 1115-1235°F.

SILVALOY B-70.
M-686; 7 Ag, 85 Cu, 8 Sn.
For brazing.
M.P. 1225-1805°F.

SILVALOY EASY.
M-686; 65 Ag, 20 Cu, 15 Zn.
For silver solder; M.P. 1280-1325°F.

SILVALOY HARD.
M-686; 75 Ag, 22 Cu, 3 Zn.
For silver solder; M.P. 1365-1450°F.

SILVALOY I-401.
M-686; 5 Ag, 16.6 Zn, 78.4 Cd.
For brazing.
M.P. 480-600°F.

SILVALOY K-427.
M-686; 75 Ag, 25 Zn.
For brazing.
M.P. 1300-1345°F.

SILVALOY MEDIUM.
M-686; 70 Ag, 20 Cu, 10 Zn.
For silver solder; M.P. 1330-1390°F.

SILVALOY S-475.
M-686; 95 Ag, 5 Al.
For brazing.
M.P. 1550-1600°F.

SILVALOY T50.
M-686; 62.5 Ag, 32.5 Cu, 5 Ni.
For silver brazing for precipitation hardening steels; M P. 1435-1625°F; good wetting.

SILVALOY T-51.
M-686; 75 Ag, 24.5 Cu, 0.5 Ni.
For brazing alloy.
M.P. 1435-1475°F.

SILVALOY T52.
M-686; 77 Ag, 21 Cu, 2 Ni.
For silver brazing for precipitation hardening steels; M.P. 1435-1525°F; good wetting.

SILVALOY T-53.
M-686; 71.5 Ag, 28 Cu, 5 Ni.
For brazing
M.P. 1435-1450°F.

SILVALOY VTG 60.
M-686; 60 Ag, 30 Cu, 10 Sn.
For brazing filler metals for electronic applications.
M P. 600-725°C.

SILVALOY VTG 301.
M-686; 72 Ag, 28 Cu
For brazing filler metal for electronic applications.
M.P. 780°C

SILVALOY VTG 303.
M-686, 50 Ag, 50 Cu.
Annealed wire· 60,800 TS; 13 El.
For brazing filler metals for electronic applications
M P 780-855°C.

SILVALOY VTG-AQ602
M-686; 61.5 Ag, 24 Cu, 14.5 In.
Annealed wire: 58,700 TS; 37.5 El.
For brazing filler metals for electronic applications.
M.P. 630-705°C

SILVANITE.
M-35; 1.25 C, 4 Cr, 8 W, bal Fe.
For wood working knives; high speed steel.

SILVAZ.
M-48; 0 6 B, 37 Si, 6 Al, 10 Ti, 6 Zr, 10 V, bal Fe.
For deoxidizer; for steel making.

SILVAZ 3.
M-48; 0 5 B, 35-40 Si, 6 Al, 10 Ti, 6 Zr, 10 V, bal Fe.
For hardening constituent in steel; adding B to steel.

SILVEL.
67.5 Cu, 16 Zn, 6.5 Ni, 2.2 Fe.
Hard drawn· 130,000 TS; 2 El.
For table ware, plumbing fixtures, electric contact springs; German Silver.

SILVEL.
73 Cu, 12 Mn, 12 Sn, 1.8 Fe, 0.5 Pb, 0.3 Al.
Annealed: 73,000 TS; 32 El.
For table ware, plumbing fixtures, electric contact springs; German Silver.

SILVER ALLOYED COPPER 110.
M-8; 1 Ag, 0.1 Mn, bal Cu.
For welding rod; oxy-acetylene for copper.

SILVER-BEARING COPPER.
M-1657; 25 oz./ton Ag, bal Cu.
Hard: 50,000 TS; 40,000 YS; 6 El; B 50 Rock.
Soft: 34,000 TS; 10,000 YS; 45 El; F 45 Rock.
For electrical and electronic components.
Electrical conductivity 100.5.
Superior elevated temperature properties.

SILVER BEARING COPPER 111.
M-8; 99.9 Cu, bal Ag.
Hard: 48,000 TS; 40,000 YS; 6 El; 83 Brin.
Soft: 33,000 TS, 10,000 YS; 45 El; 42 Brin.
For electrical apparatus; high conductivity.

SILVER BEARING COPPER-112.
M-8; 99.9 Cu, 10-15 oz Ag/ton.
Soft: 33,000 TS; 10,000 YS; 35 El.
Hard: 46,000 TS; 40,000 YS; 5 El.
For electrical apparatus; for high softening temp.

SILVER BEARING COPPER, COPPER NO. 113.
M-8, M-33; 99.7 + Cu, 8 oz. Ag per ton.
Sheet,-annealed or cold rolled.
For core and fin stock for radiators, assemblies for tin dipping.
Higher softening temperature than pure copper.
ASTM B152.

SILVER BEARING COPPER-114.
M-8; 99.9 Cu, 0 034-0 051 Ag.
Hard: 48,000 TS; 40,000 YS; 6 El; B 50 Rock.
Soft· 33,000 TS; 10,000 YS; 45 El; F 45 Rock.
For electrical and electronic components.
Elect. cond 100.

SILVER BEARING COPPER, COPPER NO. 116.
M-8, M-33, 99 7 + Cu, 25 oz. Ag per ton.
Sheet,-annealed or cold rolled.
For core and fin stock for radiators, commutator segments, tin dipped assemblies.
Higher softening temperature than pure copper.
ASTM B152.

SILVERBOND
M-69; stainless clad steel.
For structural applications; stainless.

SILVER BRONZE.
England; 13-23 Zn, 16-18 Ni, 0-2 Al, 0-2 Pb, 0.3 Si, bal Cu
For bearings, bushings, hardware; corrosion resistant.

SILVER CHISEL.
M-661; C, alloy, bal Fe.
For welding electrode for chisels, tough, shock resistant.

SILVER, COINAGE U S.A.
U.S.; 90 Ag, 10 Cu.
For coins, corrosion resistant.

SILVERCOTE BERYLLIUM COPPER
M-1244; 2 Be, 0 5 max Co, bal Cu.
Heat treated: 200,000 TS; 450 Brin.
For springs, lead wires, pins; age hardenable, low creep and corrosion resistance.

SILVERCOTE BERYLLIUM COPPER NO. 10.
M-1244; 0.5 Be, 2.5 Co, bal Cu.
Cold drawn: 120,000-130,000 TS.
For lead wires, connectors; age hardenable, high fatigue resistance.

SILVER FOIL-1.
U.S.; 90 Sn, 10 Zn.
For foil for wrapping purposes.

SILVER FOIL-2.
U.S.; 98 Sn, 2 Cu.
For foil for wrapping purposes.

SILVER FOIL-3.
U.S.; 91 Sn, 8.3 Zn, 0.4 Pb.
For foil for wrapping purposes.

SILVER FOX 6.
M-1724; 0.1 C, 14 Cr, bal Fe.
Annealed: 78,400 TS; 31 El; 70 RA.
For stainless parts; not hardenable.

SILVER FOX 10.
M-1724, 0.10 C, 12-13 Cr, bal Fe.
Air hardened: 166,000-85,000 TS; 142,000-66,000 YS; 13-32 El; 37-67 RA.
For turnbuckles, rivets, split pins, shrouding for turbine blading; stainless iron.

SILVER FOX 11.
M-1724; 0.15 C, 12-13 Cr, bal Fe.
Heat treated: 107,000 TS; 30 El; 50 RA.
For taper pins, hinge pins, surgical instruments, scissors; stainless, martensitic.

SILVER FOX 12.
M-1724; 0.20 C, 12-13 Cr, bal Fe.
Heat treated: 107,000 TS; 30 El; 50 RA.
For valve parts, precision instruments; stainless martensitic.

SILVER FOX 13.
M-1724; 0.30 C, 12-14 Cr, bal Fe.
Heat treated: 112,000 TS; 28 El; 50 RA.
For table cutlery, special tools, exhaust valves; heat resistant; high strength at elevated temperature.

SILVER FOX 14.
M-1724; 0.40 C, 14.0 Cr, bal Fe.
Air hardened. 89,500-235,000 TS; 35-10 El, 70-20 RA, 183-477 Brin.
For dies and molds for plastic materials; corrosion resistant; Izod 20-100.

SILVER FOX 15
M-1724; 0.70 C, 14 Cr, bal Fe
For stainless parts, cutlery; stainless, hardenable.

SILVER FOX 17.
M-1724; 0.12 max C, 16-18 Cr, bal Fe.
Annealed: 78,000-101,000 TS; 28 El; 60 RA.
For nitric acid manufacture apparatus; non-hardenable; resists corrosion

SILVER FOX 18.
M-1724; 0.20 max C, 18 Cr, 2 Ni, bal Fe.
Tempered: 123,000-145,000 TS; 22 El; 40 RA.
For precision instruments, valves pump rods, stainless, martensitic.

SILVER FOX 24.
M-1724; C, 12 Cr, 12 Ni, alloys, bal Fe
Annealed: 90,000-135,000 TS; 26,000-45,000 YS; 80-60 El; 80-60 RA.
For centrifugal separators, dryers; resists sulphuric acid corrosion; stainless.

SILVER FOX 321.
M-1724; 0.08 max C, 17-19 Cr, 9-11 Ni, Ti, bal Fe.
Annealed· 85,000 TS, 30,000 YS, 55 El, B80 Rock.
For welded structures, tanks, chemical plant equipment, digesters, evaporators.
Stabilized, non-magnetic Type 321 stainless, austenitic.

SILVER FOX 610.
M-1724; 0.10 C, 13 Cr, bal Fe.
Tempered: [illegible],600 TS; 30 El; 50 RA.
For stainless parts; stainless, free-cutting.

SILVER FOX 611.
M-1724; 0.15 C, 13 Cr, bal Fe.
Tempered: 107,500 TS; 30 El; 50 AR.
For stainless parts; free-cutting, stainless.

SILVER FOX 612.
M-1724; 0.20 C, 13 Cr, bal Fe.
Tempered: 107,500 TS; 30 El; 50 RA.
For stainless parts; free-cutting, stainless.

SILVER FOX 613.
M-1724; 0.30 C, 13 Cr, bal Fe.
Tempered: 112,000 TS; 28 El; 50 RA.
For stainless parts; free-cutting, stainless, hardenable.

SILVERIN "BLANCADUR."
M-303; 67-70 Ni, 1-3 Mn and Fe, bal Cu.
Annealed: 74,000 TS; 40 El
Heat treated: 146,000 TS; 20 El.
For chemical apparatus, dye vats, plating rolls, table ware; similar to "Monel"; corrosion resistant.

SILVERINE.
M-452; 80-71 Cu, 16-17 Ni, 1-8 Zn, 1-2.8 Sn, 1-2 Co, 1-1.5 Fe.
For ornamental and sanitary fittings; corrosion resistant.

SILVERITE.
Eng.; Cu, Ni.
For corrosion resistant parts; nickel silver.

SILVER LABEL.
M-343; 0.90 C, 0.5 Cr, 1.1 Mn, 0.5 W, bal Fe.
For hobs, taps, reamers, dies; non-deforming.

SILVER LABEL.
M-341, 0.6 C, 0.8 Mn, 0.45 Mo, 0.2 V, 1.85 Si, bal Fe.
For punching and shearing dies, oil or water hardening AISI S5 tool steel

SILVER LEAF
U.S., 8.25 Zn, 91 Sn, 0.35 Pb.
For foil for wrapping purposes

SILVER-MAGNESIUM-NICKEL
M-63, 99.5 Ag, 0.3 Mg, 0.2 Ni, bal Fe
Heat treated 70,000 TS, 57,000 YS; 5-11 El; 70-130 Brin.
For electrical contacts, cables, connectors, high electrical and thermal conductivity, air hardened

SILVER MAG NICKEL.
M-237; 0.28 max Mg, 0.18 max Ni, 99.4 min Ag.
Annealed 32,000-38,000 TS; 12-27 El, 75 Knoop
Hardened 68,000-74,000 TS; 2-6 El; 169 Knoop
For springs, switches
Vacuum melted, corrosion resistant
Hardened by oxidation

SILVER METAL-1
Eng., 67 Zn, 33 Ag
For ornaments.

SILVER METAL-2
Eng.; 53.3 Cu, 8.3 Zn, 31.6 Ni, 0.8 Fe, 1.2 Sn, 3.6 Pb, 0.3 Mn.
For corrosion resistant parts; corrosion resistant.

SILVER SOLDER AK NO 5.
M-926; 35 Ag, 42 Cu, 11 Zn, 12 Cd.
For brazing; M.P. 1190-1180°F, easy flow.

SILVER SOLDER KA
M-926; 53.5 Ag, 31.5 Cu, 15 Zn.
For brazing; M.P. 1280-1320°F, medium flow.

SILVER SOLDER KC NO. 4.
M-926; 54 Ag, 41.1 Cu, 3.9 Zn, 1 Ni.
For brazing; M.P. 1290-1400°F, hard flow.

SILVER SOLDER KL NO. 1.
M-926; 52 Ag, 16 Cu, 15.5 Zn, 16.5 Cd.
For brazing; M.P. 1150-1160°F, easy flow.

SILVER SOLDER MK NO. 3.
M-926; 75 Ag, 24 Zn, 1 Cd.
For brazing; M.P. 1380-1430°F, medium flow.

SILVER SOLDERS.
U.S.; 32 Ag, 23 Cu, 17 Zn, 18 Cd.
For solders, silver solders; corrosion resistant.

SILVER SOLDER SC NO. 1.
M-926; 63.3 Ag, 25.6 Cu, 11.1 Zn.
For brazing; M.P. 1280-1340°F, easy flow.

SILVER SOLDER SC NO. 4.
M-926; 63.8 Ag, 29.7 Cu, 5.71 Zn, 0.75 Ni.
For brazing; M.P. 1260-1430°F, medium flow.

SILVER STEEL.
M-510; 1.20 C, 0.40 Mn, 0.40 Cr, bal Fe.
Water hardening carbon tool steel.

SILVER STEEL.
M-1062; 1 0 C, bal Fe.
For saws; water hardened.

SILVER STRIPE HIGH SPEED.
M-1067; 0.7 C, 4 Cr, 18 W, 1.0 V, bal Fe.
For tools, cutters, boring and chasing tools; high speed steel.

SILVERTEM.
M-64, 0 35 C, 4 75 Cr, 1.25 W, 1.5 Mo, 1.0 Si, 0.2 Ag, bal Fe
For hot work dies; prehardened die steel.

SILVIUM
M-1384; Sb, bal Pb.
For grids for batteries; corrosion resistant

SILVORE.
Eng , 61 9 Cu, 19 5 Zn, 18 4 Ni, 0 3 Fe.
For show cases and architectural trim, corrosion resistant.

SILVUNG 240.
M-1246, W, Ag
For contacts for interrupters, tungsten impregnated with Ag.

SILVUNG D
M-1246, W, Ag For contacts for voltage regulators; tungsten impregnated with Ag.

SILVUNG P.
M-1246, W, Ag
For facing contacts, tungsten impregnated with Ag

SIL-X
M-1059; ferro silicon
For steel deoxidizer; compounded with an oxidizing agent

SIMAGAL 200
M-324, 0 6-1 4 Mg, 0 6-1 6 Si, 0.6-1.0 Mn, 0.3 max Cr, bal Al.
Annealed. 21,000 TS; 8000 YS, 24 El
For window frames, fan blades, gutters, boats; good weldability and formability.

SIMANAL
M-398, 20 Si, 20 Mn, 20 Al, bal Fe.
For steel making, deoxidizer

SIMBRAX.
M-338, 85-97 Cu, 1 5 Fe, 1-3 5 Si, 2-7 Zn.
Soft· 45,000 TS; 20,000 YS; 50 El; 40 Brin
Hard: 120,000 TS; 2 El; 250 Brin.
For pressure gauges; corrosion resistant.

SIMETEORA.
Eng ; 0.76 C, 0.17 Mn, 2.87 Cr, 16 86 W, bal Fe.
For tools, cutters, drills; high speed steel.

SIMGAL.
M-338; 0.5 Mg, 0.5 Si, 0.6 Fe, bal Al.
Rolled: 27,000 TS; 22,000 YS; 12 El.
For architectural trim, light structures; not hardenable.

SIMILARGENT.
Eng.; Cu, Ni.
For white metal parts; nickel silver.

SIMILOR.
Eng.; 89-80 Cu, 9-20 Zn, 0-7 Sn.
For hardware, pipe fittings; corrosion resistant.

SIMO.
M-1115; 0.3-0.4 C, 2.0-3.0 Si, 9-11 Cr, 0.8-1.3 Mo, bal Fe.
Rolled: 141,000 TS; 114,000 YS; 15 El.
For high temperature valves; corrosion and heat resistant.

SIMOCH.
M-115; 0 46-0.50 C, 0.8-1.0 Si, 3.0-3.5 Cr, 1.4 Mo, 0.3 V, bal Fe.
For shear knives and blades, punches, rivet sets; air hardened, shock resistant.

SIMONDS.
M-373; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For dies; non-deforming

SIMONDS.
M-373; 71 Ni, 2.8 Cr, 3.67 Si, bal Fe.
For radiant tubes, furnace muffles, conveyor belts, high temperature equipment.
Corrosion and oxidation resistant.
Heat resistant.

SIMONDS 17% COBALT MAGNET STEEL.
M-373; 17 Co, bal Fe.
For permanent magnets.

SIMONDS 30% NICKEL STEEL.
M-373, 0.1 C, 30 Ni, bal Fe.
For temperature compensator, controlled expansion

SIMONDS 35% COBALT MAGNET STEEL.
M-373, 35 Co, bal Fe.
For permanent magnets.

SIMONDS 38-7FM
M-373, 38 Ni, bal Fe.
For bourdon tubes, control devices, tuning forks
Constant modulus, controlled expansion.

SIMONDS 40% COBALT MAGNET STEEL.
M-373; 40 Co, bal Fe.
For permanent magnets.

SIMONDS 42-43
M-373, 42 Ni, bal Fe
For glass to metal seals, sealing leads in electric light bulbs and radio tubes
Controlled expansion.

SIMONDS NO. 47.
M-373, 0.5 C, 1.4 Cr, 0.25 V, 2 W, 0.25 Mo, 0.8 Si, bal Fe
For chisels, shock resistant.

SIMONDS 48-50.
M-373, 48 Ni, bal Fe.
For sealing leads in electric light bulbs and radio tubes, glass-to-metal seals
Controlled expansion.

SIMONDS 73
M-373; 3 5 Cr, bal Fe
Hardened. 300,000-400,000 UTS, 62-66 Rock C.
For permanent magnets.

SIMONDS 74.
M-373; 6 Cr, bal Fe.
Hardened 300,000-400,000 UTS; 62-66 Rock C.
For permanent magnets.

SIMONDS 81
M-373; 0 75-0.80 C, 17 0-18.5 Co, 2.5-3.75 Cr, 5.0-8 0 W, bal Fe.
Hardened: 300,000-400,000 TS; 62-64 Rock C.
For magnetic and electrical equipment.
Permanent magnets, high permeability.

SIMONDS 81C.
M-373; 0.7 C, 3 Cu, 4 Cr, 0.7 Mn, 20 Co, bal Fe.
Annealed: Rock C 25-35.
Hardened: 300,000 TS; Rock C 60-65.
For permanent magnets in hysteresis motors, speedometers, meters, gages.
Quench-hardened alloy. Non-directional magnetic properties.

SIMONDS 83.
M-373; 3 Co, bal Fe.
Hardened: 300,000-400,000 UTS; 62-66 Rock C.
For permanent magnets.

SIMONDS 139.
M-373; 39 Ni, bal Fe.
For hypodermic syringes, precision machinery components, bimetallics.
Controlled expansion.

SIMONDS 142.
M-373; 42 Ni, bal Fe.
For bimetals.
Controlled expansion.

SIMONDS 149.
M-373; 49 Ni, bal Fe.
For bimetals.
Controlled expansion.

SIMONDS 168.
M-373; 0.85 C, 12.0 Cr, 0.8 V, 0.7 Mo, bal Fe.
Air or oil hardening tool and die steel, chromium type; AISI D2.

SIMONDS NO. 864.
M-373; 0.90 C, 1.6 Mn, bal Fe.
For punches, trimmers, crimpers, blanking dies; Type O1; oil hardened, non-deforming.

SIMONDS NO. 3400.
M-373; 33 Co, bal Fe.
For permanent magnets; high permeability.

SIMONDS 3500.
M-373; 37 Co, bal Fe.
Hardened: 300,000-400,000 UTS; 62-64 Rock C.
For permanent magnets.

SIMONDS NO. 12150.
M-373; 1.5 C, 12 Cr, 0.15 V, 0.8 Mo, bal Fe.
For punches, dies; abrasion and corrosion resistant.

SIMONDS 12225.
M-373; 2.20 C, 12.0 Cr, 1.0 V, bal Fe.
Hardened: C 64-67 Rock.
For blanking and forming dies, burnishing tools and rolls, plug gauges, slitting cutters, drawing dies.
Type D3 oil hardening cold work steel, deep hardening, abrasion resistant.

SIMONDS AIRTRUE 51.
M-373; 1 C, 5 Cr, 0.25 V, 1 Mo, bal Fe.
For gages, knives, blanking and forming dies; Type A2; air hardened, non-deforming.

SIMONDS ALNICO NO. 5.
M-373; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe.
For cast permanent magnets; high coercive force.

SIMONDS BLUE LABEL.
M-373; 0.8-1.25 C, bal Fe.
For edge holding tools; water hardened.

SIMONDS BLUE STREAK.
M-373; 0.10 C, 22 Ni, 12 Al, 3 Co, bal Fe.
For magnets; permanent.

SIMONDS CCM.
M-373; 1.5 C, 13 Cr, 0.8 Mo, 0.3 V, bal Fe.
For tools, dies, cold work dies; air hardening, nondeforming.

SIMONDS CR-32.
M-373; 71 Ni, 4.3 Cr, 3.67 Si, bal Fe.
For radiant tubes, furnace muffles, conveyor belts, high temperature equipment.
Corrosion and oxidation resistant.
Heat resistant.

SIMONDS CHROMIUM MAGNET STEEL.
M-373; 3.5 Cr, 1 C, bal Fe.
For magnets; permanent.

SIMONDS CHROMIUM MAGNET STEEL.
M-373; 6 Co, 1 C, bal Fe.
For magnets; permanent.

SIMONDS CHROMIUM-MOLYBDENUM MAGNET STEEL.
M-373; 4 Cr, Mo, bal Fe.
For magnets; permanent.

SIMONDS DIAMOND "S."
M-373; 0.1-1.4 C, bal Fe.
For cutting tools, drills, taps; water hardening.

SIMONDS D.N.V.
M-373; 0.35 C, 4 Cr, 0.35 V, 0.4 Mo, 9.5 W, bal Fe.
For bolt and rivet dies, forging mandrels, piercing punches; Type H21; hot work steel.

SIMONDS FRONTIER.
M-373; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutting tools, reamers; high speed steel.

SIMONDS FRONTIER SPECIAL
M-373; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For heavy duty high speed tools; high speed steel.

SIMONDS GREEN STREAK.
M-373, 12 Al, 25 Ni, 0.4 Si, bal Fe.
For permanent magnets.

SIMONDS H-12.
M-373; 0.35 C, 5 Cr, 0.4 V, 1.5 W, 1.5 Mo, bal Fe.
For punches, extrusion dies, upsetters; Type H12; hot work steel.

SIMONDS H-13.
M-373; 0.35 C, 5 Cr, 1 V, 1.5 Mo, bal Fe.
For hot work tools; hot work steel; Type H13.

SIMONDS HACKSAW.
M-373; C, W, bal Fe.
For hack saws.

SIMONDS HIGH SPEED.
M-373; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For speed cutters, drills; high speed steel.

SIMONDS MOLVA.
M-373; 0.8 C, 4.0 Cr, 1.75 V, 8.5 Mo, bal Fe.
For cutting tools, drills, reamers; high speed steel.

SIMONDS MOLVA-T.
M-373; 0.8 C, 4 Cr, 5.75 W, 4.5 Mo, 1.6 V, bal Fe.
For drills, reamers, cutters, taps, broaches; high speed steel.

SIMONDS NON-SHRINKING.
M-373; 0.9 C, 1.2 Mn, 0.5 Cr, bal Fe.
For dies, punches, shears; non-deforming.

SIMONDS O.H.D. NO. 106.
M-373; 1.2 C, 0.6 Cr, 0.25 V, 1.65 W, bal Fe.
For punches, dies, crimpers; oil hardened, tough.

SIMONDS RED LABEL.
M-373; 0.8-1.2 C, 0.3 Mn, 0.25 Si, bal Fe.
For taps, drills, reamers, hobs, punches; Type W1; water hardened.

SIMONDS RED LABEL SPECIAL.
M-373; 0.60-1.4 C, 0.25 Mn, 0.25 Si, bal Fe.
For hot or cold work dies, shear blades, punches; water hardened.

SIMONDS RED STREAK.
M-373; 0.75 C, 4 Cr, 1 V, 18 W, bal Fe.
For drills, reamers, cutting tools; high speed steel.

SIMONDS RED STREAK AIR HARDENING.
M-373; 1.0 C, 5 Cr, 0.25 V, 1.0 Mo, bal Fe.
For dies, gages, knives, forming and drawing dies; nondeforming, air hardened.

SIMONDS RED STREAK OIL HARDENING.
M-373; 0.9 C, 0.3 Mo, 1.5 Cr, bal Fe.
For dies, gages, knives, tools; oil hardened, shock resistant.

SIMONDS S.T.M.
M-373; 0.8 C, 3.75 Cr, 1.1 V, 1.6 W, 8.6 Mo, bal Fe.
For cutting tools, drills, reamers; high speed steel.

SIMONDS SUPER COBALT.
M-373; 0.8 C, 4 Cr, 8 Co, 2 V, 18 W, 0.7 Mo, bal Fe.
For lathe and planer tools, reamers, hobs, milling cutters; Type T5; high speed steel.

SIMONDS SUPER INVAR Type A.
M-373, 31 Ni, 4.5 Co, bal Fe.
For bimetals.
Controlled expansion.

SIMONDS "T.A.S."
M-373; C, W, Cr, bal Fe. For shear blades, heavy duty cutters, dies; oil hardening.

SIMONDS TEENAX 46.
M-373; 0.9 C, 0.5 Cr, 1.25 Mn, 0.15 V, 0.5 W, bal Fe
For taps, punches, shear blades, chisels, upsetters; Type O1; oil hardened, non-deforming.

SIMONDS TUNCO.
M-373; 0.7 C, 4 Cr, 5 Co, 1 V, 18 W, bal Fe.
For drills, reamers, cutting tools; high speed steel.

SIMONDS TUNGSTEN MAGNET STEEL.
M-373; 1 C, 3 W, bal Fe.
For permanent magnets

SIMPLEX
M-48; 0.01 max C, 5-7 Si, 63-66 Cr, bal Fe.
For making stainless steel; alloy additive.

SIMPLEX "CH"
M-38; 0.20 C, 1.25 Ni, 0.6 Cr, bal Fe.
Heat treated: 90,000 TS; 80,000 YS, 16 El; 45 RA; 260 Brin.
For gears, pinions, shafts; carburizing steel.

SIMPLEX FORGING
M-38; 1.25 Ni, 0.60 Cr, 0.4 C, bal Fe.
Heat treated: 130,000 TS; 110,000 YS; 17 El; 45 RA; 290 Brin
For gears, high strength machine parts; forging steel.

SIN-CHU.
Japan; 66.5 Cu, 33.4 Zn, 0.1 Fe
For hardware; brass.

SINIMAX.
M-1; 42 Ni, 3 Si, 55 Fe.
For electrical equipment, auto transformers, tape recording heads; magnetically soft.

SINTAG 852
M-63; 85 Ag, 15 CdO.
For electric contacts.
Sintered, corrosion resistant.

SINTAG 903.
M-63; 90 Ag, 10 CdO.
For electric contacts.
Sintered, corrosion resistant.

SINTALOY B-901.
M-1427; 90 Cu, 10 Sn.
Sintered bronze.
As sintered: 30,000 TS; 2 El.
General purpose structural parts.

SINTALOY BB-901.
M-1427; 88 Cu, 10 Sn, 1.75 C.
Sintered bronze
As sintered: 15,000 TS; 1 El.
General purpose structural parts. SAE 901.

SINTALOY CI-100 DENSITY 5.1-6.1.
M-1427; 99 Fe, 1 C.
Sintered steel, low density.
Sintered: 16,000-24,000 TS; 0.2 El; 10-50 Rb.
Low cost, quality structural parts.

SINTALOY CI-100 DENSITY 6.1-6.5.
M-1427; 99 Fe, 1 C.
Sintered steel, medium density.
As sintered: 19,000-30,000 TS; 0.3 El; 20-50 Rb.
Low cost, quality structural parts.
ASTM B310 Type 1 Class A.

SINTALOY CI-100-HT.
M-1427; 99 Fe, 1 C.
Sintered steel, heat treated.
HT: 30,000-40,000 TS; 10-35 Rc.
Improved strength and hardness.

SINTALOY CI-100-ST.
M-1427; 99 Fe, 1 C.
Sintered steel, steam treated.
As treated: 19,000-30,000 TS; 50-90 Rb.
Improved hardness, wear and corrosion resistance.

SINTALOY CX-140.
M-1427; 1.75 Ni, 0.5 Mo, 1.5 Cu, 0.6 C, bal Fe.
Sintered: 60,000 TS; 2-4 El; 60-80 Rb.
High strength, low alloy steel characteristics.

SINTALOY CX-140-HT
M-1427; 1.75 Ni, 0.5 Mo, 1.5 Cu, 0.6 C, bal Fe.
Sintered and heat treated: 100,000 TS; 30-40 Rc.
Good strength, hardness, wear resistance.

SINTALOY EC-100.
M-1427, 100 Cu
Sintered copper.
As sintered: 17,000-34,000 TS; 6-20 El
Excellent electrical conductivity.

SINTALOY F-1003.
M-1427; 96 Fe, 3 Ni, 1 C.
Sintered: 60,000 min TS; 2-6 El; 60-90 Rb.
Good strength alloy.

SINTALOY F-1003-HT.
M-1427; 96 Fe, 3 Ni, 1 C
Sintered and heat treated: 100,000-150,000 TS; 1-4 El, 20-45 Rc.
High strength alloy, good wear resistance.

SINTALOY HDM.
M-1427; 100 Fe.
Sintered iron.
As sintered: 25,000-40,000 TS; 2-15 El.
For magnetic applications.

SINTALOY HDS.
M-1427; 99 Fe, 1 C.
Sintered steel, high density.
As sintered: 45,000-70,000 TS; 2-12 El; 30-70 Rb.
Similar characteristics to annealed steel.

SINTALOY HDS-HT.
M-1427; 99 Fe, 1 C.
Sintered steel, heat treated, high density.
HT: 60,000-120,000 TS; 0.2 El; 20-50 Rc.
Hardened steel for wear parts.

SINTALOY L-1004.
M-1427; 95 Fe, 4 Cu, 1 C.
Sintered: 25,000-45,000 TS; 0.5 El; 20-60 Rb.
Moderate strength structural parts.

SINTALOY L-1007.
M-1427; 92 Fe, 7 Cu, 1 C.
Sintered: 30,000-50,000 TS; 0.5 El; 25-70 Rb.
Moderate strength structural parts.
ASTM B222.

SINTALOY LI-1010.
M-1427; 74 Fe, 25 Cu, 1 C.
Sintered: 55,000 TS; 0.5 El; 85-95 Rb.
Infiltrated alloy; good mechanical properties.
ASTM B303.

SINTALOY LI-1010 HT.
M-1427; 74 Fe, 25 Cu, 1 C.
Sintered and heat treated: 90,000 TS; 30-40 Rc.
Good strength, hardness and wear.

SINTALOY N-6418.
M-1427; 64 Cu, 18 Zn, 18 Ni.
Sintered nickel silver.
As sintered: 19,000-36,000 TS; 5-18 El.
White alloy with excellent corrosion resistance and good wear.

SINTALOY SS-316L.
M-1427; 16 Cr, 12 Ni, 2 Mo, bal Fe.
Sintered: 35,000-45,000 TS; 4-6 El, 55-70 Rb.
Austenitic stainless; good corrosion resistant properties.

SINTALOY SS-410L.
M-1427; 12.5 Cr, bal Fe.
Sintered: 34,000-49,000 TS; 5-8 El; 50-75 Rb.
Corrosion resistant; heat treatable

SONTALOY SS-410L-HT.
M-1427; 12.5 Cr, C, bal Fe.
Sintered and heat treated: 100,000-140,000 TS; 1 El; 25-37 Rc.
High strength stainless steel.

SINTALOY Z-703.
M-1427; 70 Cu, 30 Zn.
Sintered: 23,000-30,000 TS; 5-10 El.
For hardware, machine tool parts; powder metallurgy.

SINTALOY Z-703P.
M-1427; 70 Cu, 29.7 Zn, 0.3 P.
Sintered: 28,000-36,000 TS; 20-30 El.
For hardware, structural and machine parts; powder metallurgy

SINTALOY Z-802
M-1427; 80 Cu, 20 Zn.
Sintered: 29,000-36,000 TS; 10-18 El.
For hardware, machine tool parts; yellow brass, powder metallurgy.

SINTALOY Z-802 Pb.
M-1427; 78.5 Cu, 20 Zn, 1.5 Pb.
Sintered: 27,000-34,000 TS; 10-18 El.
For hardware, machine tool parts; leaded yellow brass.

SINTALOY Z-802 Pb-P.
M-1427; 78.5 Cu, 19.7 Zn, 1.5 Pb, 0.3 P.
Sintered: 29,000-36,000 TS; 18-32 El.
For hardware, machine tool parts; powder metallurgy.

SINTALOY Z-851.
M-1427; 85 Cu, 15 Zn.
Sintered: 29,000-35,000 TS; 8-15 El.
For hardware, machine tool parts; red brass, powder metallurgy.

SINTALOY Z-901.
M-1427; 90 Cu, 10 Zn.
Sintered: 20,000-28,000 TS; 8-15 El.
For hardware, structural parts; high electrical conductivity.

SINTALOY Z-901P.
M-1427; 90 Cu, 9.5 Zn, 0.5 P.
Sintered: 25,000-30,000 TS; 18-25 El.
For hardware, structural parts; powder metallurgy.

SINTALOY Z-901 Pb.
M-1427; 88.5 Cu, 10 Zn, 1.5 Pb.
Sintered: 18,000-27,000 TS; 8-15 El;
For hardware, structural parts; free-cutting, powder metallurgy.

SINTEEL M.
M-1020; steel impregnated with Cu.
Sintered: 100,000 TS
Heat treated: 170,000 YS.
For machinery parts, sintered.

SINTEEL R.
M-1020, steel impregnated with Cu.
For machinery parts; sintered.

SINTEEL S.
M-1020, steel impregnated with Cu.
For machinery parts; sintered.

SINTERBRONZE.
M-1246; Sn, bal Cu
Sintered.
For bearings, sintered.

SINTERLOY A.
M-799, 0.15 C, bal Fe
For gears, cams, washers; sintered alloy.

SINTERLOY B.
M-799; 0.40 C, bal Fe.
For gears, cams, washers; sintered alloy

SINTERLOY C.
M-799, 0.80 C, bal Fe.
For gears, cams; sintered alloy

SINTHERM
M-1246; TiC, Zr, B.
For evaporation boats.

SINTOX.
M-1379; Al_2O_3.
For cutting tools; sintered

SINTREX D.
M-1710, 99.0 min Fe, other non-volatile 0.12 max.
Electrolytic iron powder
100 mesh standard, annealed powder for sintering to soft magnetic iron parts.

SINTREX E.
M-1710; 99.0 min Fe, other non-volatile 0.12 max.
Electrolytic iron powder.
100 mesh sponge, annealed powder, for sintering to soft magnetic iron parts.

SINTREX F
M-1710; 99.0 min Fe, other non-volatile 0.12 max.
Electrolytic iron powder.
200 mesh annealed powder for sintering into soft magnetic iron parts.

SIOUX H-HARDENED RINGS.
M-512; 0.76 C, 0.54 Mn, 1.38 Si, 3.8 Cr, 5.53 Mo, bal Fe.
Hardened: 200,000-225,000 TS; 11-9 El; 35-28 RA.
For valve rings, valve seat inserts; Rockwell C-47.

SIOUX SUPER CAST RINGS.
M-512; 0.45-0.55 Mo, 1.1-1.2 Si, 1.6 C, 0.6-0.7 Mn, 1.0-2.0 Ni, 0.55-0.65 Cr, bal Fe
At 75°F: 75,000 TS; 46,000 YS; 35 El; 1.8 RA.
At 1000°F: 43,000 TS; 33,000 YS; 14 El; 13.3 RA.
For valve seat inserts, valve seat rings; heat and scale resistant.

S.I.P. NO. 25.
M-243; 67 Ni, 28 Cu.
Welded: 66,000 TS.
For Monel welding rod; corrosion resistant

SIRIUS 3.
M-1303; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS, 45,000 YS, 50 El; 65 RA, 180 Brin.
At 1200°F 57,000 TS; 22,000 YS; 32 El; 45 RA.
For furnace parts and equipment, heat treating boxes, Type 310; austenitic, heat resistant.

SIRIUS-5 CAST
M-1546; 0.30 C, 16.0 Cr, 12.0 Ni, 3.6 Si, 1.2 Mn, bal Fe
For furnace parts, heat treating boxes, superheaters, carburizing boxes, salt pots.
Austenitic, stainless, Useful to 1050-1100°C in slightly sulphur atmosphere

SIRIUS-7.
M-1303; 0.2 max C, 22-24 Cr, 12-15 Ni, 2 max Mn, 1 max Si, bal Fe
Annealed· 85,000 95,000 TS; 40,000-50,000 YS; 45-55 El, 150-185 Brin
For heat treating boxes, oil refinery and chemical plant equipment, Type 309, austenitic, heat resistant.

SIRIUS-10 CAST.
M-1546, 0.25 C, 18.0 Cr, 9.5 Ni, 1.3 Si, bal Fe
For furnace parts, superheaters, heat treating boxes
Austenitic, stainless Resists sulphur atmosphere.

SIRIUS 30
M-1546; 0.19 C, 19.0 Cr, 7.0 Ni, 4.0 W, 1.5 Si, 1.5 Mn, bal Fe
Heat treated 107,000 TS, 43,000 YS, 30 El.
For turbine blades and discs, catalyzer equipment jet engine parts
Austenitic stainless steel. Heat resistant to 1000°C

SIRIUS 40
M-1546, 0.32 C, 14.0 Cr, 14.0 Ni, 2.5 W, 1.5 Si, bal Fe.
Annealed 114,000 TS, 64,000 YS, 40 El.
For valves, exhaust valves for automobile and aircraft engines
Austenitic, stainless, heat resistant

SIRIUS HT
M 1303, 0.25 C, 16 Ni, 17 Cr, 3 W, 2 Ti, bal Fe
For gas turbine components, heat and creep resistant.

SIRIUS SUPER-HT.
M-1546; 0.20 C, 16 Cr, 14 Ni, 10 Co, 2.5 W, 2.0 Ti, 1.0 Si, bal Fe.
Heat treated. 100,000 TS, 72,000 YS; 20 El
For gas turbine component parts
Austenitic, stainless Resists oxidation up to 950°C.

SIRONZE.
M-61; 96 Cu, 3 Si, 0.1 Fe.
Annealed. 70,000 TS; 17 El, 26 Brin
Drawn 110,000 TS; 83,000 YS; 15 El, 22 RA; 189 Brin.
For bolts, nuts, screws; corrosion resistant.

SISCO.
M-375; 0.9 C, bal Fe.
For tools, drills; water hardened.

SISCO C.N.V.
M-375; 0.5 C, 1.5 Mo, 0.8 Cr, 0.2 V, bal Fe.
For tools, gears, shafts; tough, shock resistant.

SISCO C.V.R.
M-375; 0.4 C, 1.5 Cr, 0.2 V, bal Fe.
For tools, punches, tough.

SISCO C.V.S.
M-375, 0.5 C, 1 Cr, 0.2 V, bal Fe.
For tools, shafts, gears; oil hardened, tough.

SISCO EXTRA NO. 2.
M-375; 1.0-1.1 C, bal Fe
For tools, dies, fixtures; formerly "Acorn Extra No. 2."

SISCO OIL HARDENING CHISEL
M-375; 0.6 C, 2 Si, 1 Mn, bal Fe.
For chisels; tough.

SISCO STANDARD NO. 3
M-375, 1.1-1.2 C, bal Fe
For tools, dies, cutters; formerly "Acorn Standard No 3."

SISCO V.A.S
M-375, 0.9 C, 0.2 V, bal Fe
For tools, drills, taps, water hardened

SISERSKITE
Russia, 57 Os, 8 Ru, 34 Rh + Ir, Pt, Pd, Au, Cu.
For fountain pen points, natural osmiridium mined in U.S.S.R

SITKIN NO 100
M-1727, 4.5-5.7 Sn, 2.75-4.0 Pb, 1.0-9.5 Zn, bal Cu.
For bearings, pump impellers, free cutting

SITKIN NO 101
M-1727, 4.5-5.75 Sn, 2-3 Pb, 9.5-16 Zn, bal Cu.
For bushings, bearings, pump impellers, free-cutting.

SITKIN NO 110
M-1727, 4.5-5.5 Sn, 4.25-7.0 Pb, 2.0-7.0 Zn, bal Cu
For pump impellers, bushings, bearings, free-cutting, red brass

SITKIN NO 115
M-1727, 4.0-5.5 Sn, 4.25 7.0 Pb, 4.0-10.0 Zn, bal Cu.
Cast 33,000-46,000 TS, 17,000 24,000 YS; 15-35 El, 12-32 RA, 55-65 Brin
For hardware, plumbing; red brass, free-cutting

SITKIN NO. 120
M-1727, 3.0-4.5 Sn, 6-10 Pb, 5-10 Zn, bal Cu
Cast· 30,000-38,000 TS, 12,000-17,000 YS; 15-27 El, 12-25 RA, 50-60 Brin
For hardware, plumbing, red brass, free-cutting

SITKIN NO 123.
M-1727, 2-4 Sn, 5-8 Pb, 6-18 Zn, bal Cu
Cast. 29,000-39,000 TS; 13,000-17,000 YS, 18-30 El; 15-27 RA, 50-60 Brin.
For hardware, plumbing, plumbers brass, free-cutting

SITKIN NO 125
M-1727, 2-4 Sn, 5-8 Pb, 6-18 Zn, bal Cu
Cast. 30,000-40,000 TS; 12,000-16,000 YS; 20-35 El; 15-30 RA, 50-60 Brin
For hardware, plumbing; plumbers brass, free-cutting

SITKIN NO 130
M-1727, 1-3 Sn, 4-10 Pb, 8-20 Zn, bal Cu.
For hardware, plumbing, free-cutting

SITKIN NO 131
M-1727, 1-2 Sn, 1-2 Pb, 2-8 Zn, bal Cu.
For hardware, plumbing; free-cutting.

SITKIN NO 132.
M-1727; 1-3 Sn, 1-3 Pb, 86-88 Cu, bal Zn.
For hardware, plumbing; free-cutting.

SITKIN NO. 193.
M-1727; 21-23 Sn, 0.50 max others, bal Cu.
For bearings.

SITKIN NO. 194.
M-1727; 18-20 Sn, bal Cu.
For bearings.

SITKIN NO. 195.
M-1727; 16-18 Sn, bal Cu.
For bearings.

SITKIN NO. 196.
M-1727; 14-16 Sn, bal Cu.
For bearings.

SITKIN NO. 197.
M-1727; 13-15 Sn, 1.5 max Zn, 0.2 Pb, bal Cu.
For bearings.

SITKIN NO. 198.
M-1727; 12.5-14.5 Sn, 2.5-4.5 Zn, 1 max Pb, bal Cu.
For bearings.

SITKIN NO. 199.
M-1727; 12-14 Sn, bal Cu.
For bearings.

SITKIN NO. 200.
M-1727; 10.75-12.25 Sn, 0.75-1.25 Pb, 0.1 max Zn, bal Cu.
For bearings; free-cutting.

SITKIN NO. 201.
M-1727; 10.75-12.0 Sn, 0.8-1.2 Pb, 1-4 Zn, bal Cu
For bearings.

SITKIN NO. 205.
M-1727; 9.75-12.0 Sn, bal Cu.
For bearings.

SITKIN NO. 206.
M-1727; 9-11 Sn, 1.0-2.5 Pb, bal Cu
For bearings.

SITKIN NO. 210.
M-1727; 9.0-10.7 Sn, 1-7 Zn, 0.2 max Pb, bal Cu.
For bearings.

SITKIN NO. 215.
M-1727; 9.0-10.7 Sn, 1-7 Zn, 0.8-1.2 Pb, bal Cu.
For bearings.

SITKIN NO 220.
M-1727; 9.0-10.7 Sn, 1.2-2.7 Pb, 1-5 Zn, bal Cu
For bearings

SITKIN NO. 221.
M-1727; 9.0-10.7 Sn, 2.7-4.2 Pb, 1-5 Zn, bal Cu
For bearings.

SITKIN NO. 225.
M-1727, 7.5-9.7 Sn, 1-7 Zn, 0.2-0.4 Pb, bal Cu.
For bearings.

SITKIN NO. 230.
M-1727; 7.5-9.0 Sn, 0.80-1.2 Pb, 1-7 Zn, bal Cu.
Cast: 33,000-43,000 TS; 16,000-24,000 YS; 18-30 El, 15-30 RA; 60-75 Brin.
For bearings; Gun Metal.

SITKIN NO. 235.
M-1727; 7.5-9.0 Sn, 1.2-2.7 Pb, 1-6 Zn, bal Cu.
For bearings.

SITKIN NO. 240.
M-1727; 7.5-9.0 Sn, 2.7-4.2 Pb, 1-6 Zn, bal Cu.
For bearings.

SITKIN NO. 241.
M-1727; 7.5-9.0 Sn, 4.2-6.2 Pb, 1-6 Zn, bal Cu.
For bearings.

SITKIN NO. 242.
M-1727; 6-8 Sn, 0.5 max Zn, bal Cu.
For bearings.

SITKIN NO. 245.
M-1727; 5.7-7.5 Sn, 1-2 Pb, 1-7 Zn, bal Cu.
Cast: 34,000-42,000 TS; 16,000-21,000 YS; 20-35 El; 16-30 RA; 60-70 Brin.
For valves, pump parts; free-cutting.

SITKIN NO. 250.
M-1727; 5.7-7.5 Sn, 2.0-3.2 Pb, 2-6 Zn, bal Cu.
For bearings.

SITKIN NO. 251.
M-1727, 5.7-7.5 Sn, 3.2-5.2 Pb, 1-6 Zn, bal Cu.
For bearings

SITKIN NO. 253.
M-1727; 4.5-5 7 Sn, 1-2 Pb, 1-9 Zn, bal Cu.
For bearings.

SITKIN NO. 255.
M-1727, 4 0-5 7 Sn, 2 0-2.7 Pb, 1-4 Zn, bal Cu.
For bearings.

SITKIN NO. 256
M-1727, 3 0-4.5 Sn, 1.7-3 0 Pb, 1-9 Zn, bal Cu.
For bearings.

SITKIN NO 257
M-1727, 3-4 Sn, 0 5-1 0 Pb, 85-90 Cu, bal Zn.
For bearings.

SITKIN NO 295
M-1727; 15-17 Sn, 4-6 Pb, 0 25-1 0 Zn, bal Cu.
For bearings

SITKIN NO 296
M-1727, 12-14 Sn, 14-16 Pb, 0.5 max Zn, 0.5-1.0 Ni, bal Cu
For bearings

SITKIN NO. 296 5.
M-1727, 10 5-12 5 Sn, 7-10 Pb, bal Cu.
For bearings

SITKIN NO 297.
M-1727, 9 5-11 5 Sn, 4 2-6 0 Pb, 0 75-1 5 others, bal Cu
For bearings

SITKIN NO 298.
M-1727, 9-11 Sn, 4 2-6.2 Pb, 1-5 Zn, bal Cu.
For bearings

SITKIN NO. 299
M-1727, 9-11 Sn, 9-11 Pb, 0.15-0.75 Zn, bal Cu.
For bearings

SITKIN NO 300
M-1727; 9 0-10.7 Sn, 8 5-11.7 Pb, 0.25 max Sb, bal Cu
For bearings.

SITKIN NO 305.
M-1727, 9.0-10 7 Sn, 8 5-21 7 Pb, 0 75-1.5 others, bal Cu
Cast. 27,000-37,000 TS, 15,000-22,000 YS, 6 12 El; 5-11 RA; 55-70 Brin.
For bearings; bearing bronze.

SITKIN NO. 310.
M-1727; 7 5-9.0 Sn, 7.2-8 7 Pb, 0.75-1.5 others, bal Cu.
For bearings.

SITKIN NO. 311.
M-1727, 7.5-9.0 Sn, 7.2-8 7 Pb, bal Cu.
For bearings.

SITKIN NO. 312.
M-1727; 7.5-9.0 Sn, 8.7-11.0 Pb, 0.75-1.5 others, 3.0 max Zn, bal Cu.
For bearings.

SITKIN NO. 313.
M-1727; 7.5-9.0 Sn, 12-16 Pb, 0.25-0.50 Ni, bal Cu.
For bearings.

SITKIN NO. 314.
M-1727; 7.5-9.0 Sn, 12-16 Pb, 0.25-0.75 others, bal Cu.
For bearings.

SITKIN NO. 315.
M-1727; 5.5-7.5 Sn, 6.0-10.5 Pb, 4 max Zn, 0.75-1.5 others, bal Cu.
Cast: 30,000-38,000 TS; 17,000-21,000 YS; 12-20 El; 10-22 RA; 55-65 Brin.
For bearings, bushings; bearing bronze.

SITKIN NO. 319.
M-1727; 5.7-7.5 Sn, 12-16 Pb, 0.75-2.0 others, bal Cu.
Cast: 25,000-30,000 TS; 14,000-20,000 YS; 10-18 El; 8-15 RA; 50-60 Brin.
For bearings, bushings; bearing bronze.

SITKIN NO. 320.
M-1727; 5.7-7.5 Sn, 16.7-29.7 Pb, 3.0 max Zn, bal Cu.
For bearings

SITKIN NO 321
M-1727; 5.7-7.5 Sn, 16-29 Pb, 0.75-1.5 others, bal Cu
For bearings.

SITKIN NO. 322
M 1727; 4.0-5.7 Sn, 21-26 Pb, 1.5 max others, bal Cu
Cast. 23,000-30,000 TS, 11,000-15,000 YS; 7-16 El; 5-12 RA; 42-55 Brin.
For bearings, bushings, bearing bronze.

SITKIN NO 323
M-1727, 4-6 Sn, 21.7-26.0 Pb, 0.5 max Zn, bal Cu.
For bearings

SITKIN NO 324
M-1727; 4.0-5.7 Sn, 26-32 Pb, 0.75-1.5 impurities, bal Cu
For bearings

SITKIN NO. 325.
M-1727; 4.5-5.7 Sn, 11.7-21.7 Pb, 3 max Zn, bal Cu
For bearings

SITKIN NO 326.
M-1727, 3.5-5.5 Sn, 8-10 Pb, 4 max Zn, bal Cu
For bearings.

SITKIN NO 400.
M-1727, 0.5-1.7 Sn, 2-4 Pb, 70-74 Cu, bal Zn
Cast: 35,000-40,000 TS, 12,000-14,000 YS; 25-40 El, 20-40 RA; 40-55 Brin
For plumbing, hardware, leaded yellow brass, free-cutting.

SITKIN NO 403
M-1727; 66-70 Cu, 0.5-1.7 Sn, 2-4 Pb, bal Zn
Cast: 30,000-38,000 TS, 11,000-15,000 YS, 20-35 El; 15-30 RA; 40-60 Brin
For plumbing, hardware, yellow brass, free-cutting.

SITKIN NO. 405.
M-1727; 66 max Cu, 0.5-1.7 Sn, 2-4 Pb, bal Zn
For hardware, screw machine products; free-cutting, yellow brass.

SITKIN NO. 405.1.
M-1727, 65 max Cu, 0.5-1.5 Sn, 0.5 max Pb, bal Zn.
For hardware, screw machine products; yellow brass

SITKIN NO. 405.2.
M-1727; 65 max Cu, 0.5-1.5 Sn, 0.5-1.0 Pb, bal Zn.
For hardware, screw machine products, free-cutting, yellow brass.

SITKIN NO. 406.
M-1727; 66 max Cu, 0.5-1.0 Sn, 1.0-1.5 Pb, bal Zn.
For hardware, screw machine products, free-cutting,

SITKIN NO. 407.
M-1727; 66-72 Cu, 0.5 max Sn, 0.5 max Pb, bal Zn.
For hardware, screw machine products; yellow brass.

SITKIN NO. 407.5.
M-1727; 90-95 Cu, 0.20 max Sn, 0.50 max Pb, bal Zn.
For clips, fasteners, springs; good corrosion resistance.

SITKIN NO 408
M-1727; 83-86 Cu, 0.20 max Sn, 0.50 max Pb, bal Zn.
For clips, fuse parts, hardware; good corrosion resistance.

SITKIN NO. 409.
M-1727; 61 max Cu, 1.5-2.0 Pb, bal Zn.
For screw machine products, hardware, free-cutting, yellow brass

SITKIN NO. 410.
M-1727, 5 max Sn, 10 max Pb, 9-14 Ni, bal Cu + Zn.
Cast: 30,000-40,000 TS; 15,000-20,000 YS, 10-25 El; 7-20 RA, 50-60 Brin
Nickel silver, leaded.

SITKIN NO 411.
M-1727; 5 max Sn, 10 max Pb, 14-18 Ni, bal Cu + Zn
Cast: 35,000-45,000 TS, 17,000-24,000 YS; 15-30 El; 15-30 RA, 65-80 Brin.
For bearings, nickel silver, leaded.

SITKIN NO 412
M-1727, 5 max Sn, 10 max Pb, 18-22 Ni, bal Cu + Zn
Cast: 40,000-60,000 TS; 17,000-30,000 YS; 15-25 El; 11-22 RA; 76-120 Brin.
For bearings, nickel silver, leaded.

SITKIN NO 413
M-1727, 5 max Sn, 10 max Pb, 22-27 Ni, bal Cu + Zn.
For bearings, nickel silver, leaded.

SITKIN NO 414
M-1727; 5 max Sn, 10 max Pb, 27-33 Ni, bal Cu + Zn.
For bearings; nickel silver, leaded.

SITKIN NO 415.
M-1727, 1 max Sn, 0.1 max Pb, 8-13 Al, bal Cu + Zn.
Cast 70,000-87,000 TS; 25,000-30,000 YS, 22-38 El; 20-36 RA; 110-140 Brin
For hardware, propellers, gears; Al. Bronze

SITKIN NO 420
M-1727; Zn, Mn, bal Cu
Cast 60,000-65,000 TS
For hardware, propellers, gears; Mn Bronze

SITKIN NO. 421
M 1727, 56-69 Cu, 0.75-2.0 Fe, 0.3 max Pb, 0.5 max Ni, bal Zn.
Cast: 65,000-68,000 TS, 28,000-40,000 YS; 20-35 El; 20-40 RA; 115 Brin.
For propellers, gears, hardware; Bronze.

SITKIN NO. 422.
M-1727, Zn, Mn, bal Cu.
Cast: 80,000-90,000 TS.
For hardware, gears, propellers; Mn. Bronze.

SITKIN NO. 423.
M-1727; Zn, Mn, bal Cu.
Cast: 90,000-100,000 TS.

SITKIN NO. 424.
M-1727; 60-68 Cu, 2-4 Fe, 1 max Ni, 0.1 max Pb, bal Zn.
Cast: 100,000-120,000 TS; 65,000-90,000 YS; 12-18 El; 5-18 RA; 190-235 Brin.
For hardware, gears, propellers; Mn. Bronze.

SITKIN NO. 500.
M-1727; 90 min Cu, 2 max Sn, 2.0-5.5 Si, 2.5 max Fe, 1.5 max Mn.
For bolts, gears, fasteners; Si. Bronze.

SIVAN.
M-38; 0.6 C, 1.2 Si, 0.2 V, bal Fe.
For tools; water hardening.

SIVAR 48.
M-459; 0.03 C, 29 Ni, 18 Co, bal Fe.
For sealing glass to metal; controlled expansion

SIVYER 5% Cr.
M 288: 0.25 max C, 4.5-6.5 Cr, 0.45-0.65 Mo, bal Fe.
Normalized: 100,000-110,000 TS; 75,000-90,000 YS; 22-18 El; 229-241 Brin.
For oil refinery and chemical plant equipment; Type 502; corrosion resistant

SIVYER 20.
M-288; 0.07 max C, 29 Ni, 20 Cr, 2-3 Mo, 4 Cu, bal Fe.
Cast: 65,000-75,000 TS; 28,000-38,000 YS; 50-35 El; 50-40 RA; 120-150 Brin
For chemical plant equipment, valves, mixers, tanks; resists mixed acids, austenitic.

SIVYER NO. 60.
M-288, 18 Cr, 8 Ni, 0.50 Mn, 0.10 C, bal Fe.
Cast. 70,000-80,000 TS; 30,000-40,000 YS; 50-60 El; 50-70 RA, 135-150 Brin
For stainless parts; corrosion resisting.

SIVYER NO. 62
M-288; 23-25 Cr, 11-13 Ni, 1.0 Si, 0.5 Mn, 0.18 C, bal Fe.
Cast: 75,000-85,000 TS, 30,000-40,000 YS; 35-45 El, 35-45 RA.
For furnace parts, heat and corrosion resisting parts; heat and corrosion resisting.

SIVYER NO. 64.
M-288; 0.25 C, 0.50 Mn, 1.0 Si, 30 Cr, 9.5 Ni, bal Fe.
For corrosion and heat resistant parts, corrosion and heat resistant

SIVYER NO. 66.
M-288, 12-14 Cr, 0.5 Mn, 1.0 Si, 0.10 C, bal Fe
Cast: 75,000-170,000 TS, 45,000-130,000 YS; 8-25 El; 15-50 RA, 175-350 Brin
For furnace parts, corrosion resisting parts, corrosion resisting.

SIVYER NO. 67.
M-288; 16-18 Cr, 0.25 C, 0.50 Mn, 1.0 Si, bal Fe
Cast: 85,000-105,000 TS; 55,000-70,000 YS; 10-20 El; 15-35 RA; 160-190 Brin.
For furnace parts, corrosion resisting parts; corrosion resisting.

SIVYER NO 70.
M-288; 15-17 Cr, 35-37 Ni, 1.0 Si, 0.45 C, bal Fe, 0.50 Mn.
Cast: 60,000-70,000 TS; 1-7 El; 1-8 RA; 200-225 Brin
For furnace parts, heat and corrosion resisting parts; corrosion and heat resisting.

SIVYER CHROME ELECTRIC STEEL.
M-288; 0.22 C, 5.0 Cr, 0.75 Mn, 0.40 Si, bal Fe.
Annealed: 95,000 TS; 55,000 YS; 18 El; 25 RA; 200 Brin.
Heat treated: 100,000-200,000 TS; 70,000-165,000 YS; 19-3 El; 35-4 RA; 200-550 Brin.
For miscellaneous castings; corrosion resistant.

SIVYER CHROME NICKEL ELECTRIC STEEL.
M-288; 0.40 C, 0.9 Cr, 3 Ni, bal Fe.
Annealed: 100,000 TS; 65,000 YS; 20 El; 35 RA; 200 Brin.
Heat treated: 115,000-210,000 TS; 85,000-173,000 YS; 18-6 El; 43-10 RA; 200-600 Brin.
For gears, shafts; oil hardening.

SIVYER "DYNAMO"
M-288; 0.12 C, 0.10 Mn, 0.20 Si, bal Fe.
Normalized. 55,000 TS; 35,000 YS; 30 El, 60 RA; 120 Brin.
For electrical parts; high magnetic permeability.

SIVYER HIGH CARBON STEEL.
M-288; 0.7 C, bal Fe
Annealed. 80,000 TS; 40,000 YS, 20 El; 30 RA; 175 Brin
Heat treated: 85,000-150,000 TS; 55,000-90,000 YS; 20-3 El; 35-4 RA; 175-400 Brin.
For tools, springs, water hardening.

SIVYER HIGH SILICON.
M-288; 0.09-0.12 C, 0.15 Mn, 1.75 Si, bal Fe.
For electrical equipment, high permeability.

SIVYER MANGANESE-CARBON ELECTRIC STEEL
M-288; 0.32 C, 1.45 Mn, 0.40 Si, bal Fe.
Annealed: 95,000 TS, 55,000 YS, 22 El; 40 RA; 200 Brin
Heat treated 95,000 TS; 65,000 YS; 22-2.5 El; 50-3.5 RA, 200-450 Brin
For gears, shafts, oil hardening

SIVYER NITRO
M-288, 0.30 C, 0.75 Mn, 0.40 Si, 1.5 Cr, 0.6 V, bal Fe.
For gears, pinions, shafts, cams; nitriding steel.

SIVYER "NULOY"
M-288; 0.28 C, 1.25 Mn, 0.40 Si, bal Fe
For castings, gears, water hardenable

SIVYER "POLE"
M-288, 0.18 C, 0.55 Mn, 0.25 Si, bal Fe.
For case hardened parts, carburizing steel

SIVYER VANADIUM ELECTRIC STEEL
M-288; 0.45 C, 0.20 V, 0.75 Mn, 0.40 Si, bal Fe.
Annealed. 85,000 TS, 50,000 YS; 22 El; 40 RA; 180 Brin
For shafts, gears, pinions, water hardening.

SIWI
M-40, C, alloy, bal Fe
For dies; hot die steel

SIXIX.
M-435, 0.8 C, 4 Cr, 6.5 W, 5 Mo, 2 V, bal Fe
For cutters, tools, high speed steel.

S & J SPECIAL.
M-38, 1.25 C, bal Fe.
For drill rod, tools, taps, reamers; water hardening.

SK-1
M-459, 1.2 C, 0.6 Cr, bal Fe.
For bearing balls and ball races; water hardened.

SK-3
M-459, 0.05 C, 1.0 Cr, bal Fe.
For bearing balls and ball races, case hardened.

SK 42
M-883, 0.27 C, 1.2 Mn, bal Fe.
Plate: 60,000 TS, 42,000 YS; 19 El.
For mine and railroad cars, booms, derricks, bridges, pressure vessels
Good fabricability and weldability

SK A45.
M-883; 0.22 C, 1.25 Mn, 0.10 Si, 0.02 min V, bal Fe.
Rolled: 65,000 TS; 45,000 YS; 19 El.
For railroad and mine cars, booms, bridges, derricks, pressure vessels.
Good fabricability and weldability.

SK A50.
M-883; 0.26 C, 1.3 Mn, 0.10 Si, 0.02 min V, bal Fe.
Rolled: 70,000 TS; 50,000 YS; 18 El.
For railroad and mine cars, auto and bus bodies, bridges, derricks, pressure vessels.
Good fabricability and weldability.

SK H8.
M-Japan; 0.65 C, 16.0 W, 4.3 Cr, 0.76 V, 2.64 Co, bal Fe.
Hardened: C 64-66 Rock.
For tools and cutters, lathe and planer tools, drills.
High-speed steel, high red-hardness.

SKEFKO NO 1.
M-224, 0.95-1.05 C, 1.4-1.65 Cr, 0.25-0.35 Mn, bal Fe.
Heat treated: 90,000-160,000 TS; 60,000-140,000 YS; 20-6 El, 45-12 RA; 190-450 Brin.
For ball bearings, water hardening

SKEFKO NO. 2
M-224; 1.01-1.1 C, 0.4-0.6 Cr, 0.30-0.40 Mo, bal Fe.
For ball bearings, water hardening.

SKEFKO NO. 3
M-224, 0.95-1.05 C, 1.0-1.25 Cr, 0.30-0.40 Mo, bal Fe
For ball bearings; water hardening

SKF NO 2
M-267, 0.87-0.97 C, 1.4-1.7 Mn, 1.4-1.7 Cr, bal Fe.
For trimming and stamping dies, oil hardened

S.K.F NO. 3 TUBING
M-267, 1.0 C, 1 Cr, bal Fe
For bearing races, bushings, water hardened

SKF NO 6.
M-267, 0.9 C, 1.1 Cr, 0.6 Mn, bal Fe.
For ball bearings, rollers, spindles, water hardened

S.K.F NO 7.
M-267; 1.1 C, 0.6 Cr, bal Fe
For balls, rollers, spindles, water hardened

S.K.F. NO 9
M-267; 1.1 C, 0.9 Cr, bal Fe.
For balls, rollers, spindles, water hardened.

S.K.F NO. 13
M-267; 1.1 C, 1.0 Cr, bal Fe
For balls, rollers, spindles, water hardened.

S.K.F. NO 48 STEEL
M-267, high C, high Cr, Mo, bal Fe.
For cold trimming, drawing, punching and blanking dies, gauges, air hardening steel.

SKF NO 85.
M-267; C, alloy, bal Fe.
For chisels; water hardened.

S.K.F 100.
M-267; 0.7-1.0 C, bal Fe.
For stamping, cold heading and trimming dies, general tools; water hardened

S.K.F. NO. 711.
M-267; 0.5 C, 2.5 W, 1.2 Cr, 0.7 Si, 2 V, bal Fe.
For tools, shear blades, dies, cutters, chisels; good wear resistance.

S.K.F. DRILL
M-267; C, bal Fe.

S.K.F. STEEL NO. 1.
M-267; 1.0 C, 1.05 Mn, 0.45 Si, 1.05 Cr, bal Fe.
For ball bearings, races and balls; wear resistant.

S.K.F. STEEL NO. 3.
M-267; 1.0 C, 1.50 Cr, bal Fe.
For ball bearings, races and balls; wear resistant.

S.K.F. STEEL NO. 22.
M-267; 1.0 C, 0.35 Mo, 1.1 Cr, bal Fe.
For trimming and stamping dies, drills; wear resistant.

S.K.F. STEEL NO. 36.
M-267; 2.25 C, 11.5-12.5 Cr, 0.15 V, 1.2 Mn, 0.20 Si, bal Fe.
For cold trimming, drawing, punching, blanking dies, gages; formerly known as "VH-63 Steel."

SKF STEEL NO. 46.
M-267, C, Cr, W, V, bal Fe.
For tools, cutters, dies; non-deforming

SKHLF STEEL
Russia; 0.2 C, 0.3 Si, 0.5 Mn, 0.55 Cr, 0.45 Ni, 0.68 Cu, bal Fe.
For welded structures; good weldability.

S.I B.
M-802; 0.45 C, bal Fe.
For castings.

S-LESS STEEL (BREARLY).
Eng; 13 Cr, 0.3 C, bal Fe.
For corrosion resisting parts; corrosion resistant.

SLICKER SOLDER.
U.S., 66 Sn, 34 Pb.
Commercial lead solder; M.P. 356°F.

SLIDE VALVE BRONZE.
England, 2.5 Sn, 9 Zn, bal Cu.
For slide valves, high strength

SLOCRODE
M-494, 3.2 C, 0.75-1.25 Ni, 0.5-0.75 Cr, bal Fe.
Oil treated 36,000-40,000 TS; 200-500 Brin.
For castings for high duty purposes; cast iron.

S.L.V. STEEL.
M-56, M-521; 0.45 C, 8 Cr, 3.5 Si, bal Fe.
Oil treated: 145,600-156,800 TS; 100,000-112,000 YS; 20-15 El, 43-53 RA, 255-285 Brin
For valves for automobile and aircraft engines; heat and corrosion resistant, Firth-Brown J-181.

S-M.
M-32; 0.6 C, 0.8 Mn, 1.9 Si, bal Fe.
For punches, chisels, shock resistant

SM-0005
M-1186, 99.9 Cu.
Annealed 30,000 TS; 6000 YS; 45 El, 70 RA; 50 Brin
For electrical equipment; high conductivity

SM-0010.
M-1186; 99.9 Cu
Cold drawn. 61,000 TS; 57,000 YS; 3 El; 50 RA; 70 Brin.
For electrical equipment; high conductivity.

SM-0020.
M-1186; 99.9 Cu.
Wire. 61,000 TS; 57,000 YS; 3 El; 50 RA; 70 Brin.
Hard drawn: 37,000 TS; 29,000 YS; 10 El; 40 RA.
For electrical equipment, fire refined

SM-0021.
M-1186, 99.8 Cu.
Annealed: 30,000 TS; 6000 YS; 45 El; 70 RA; 50 Brin.
Rolled: 39,000 TS; 33,000 YS; 20 El; 60 RA; 75 Brin.

S.M. 40.
M-106; Same as FRONTIER BRONZE.

S.M. 40 etc. see also Jessop Steels.

SM100.
M-38; 1.0 C, bal Fe.
For drills, punches; drill rod, water hardening.

SM116.
M-137; 5.5-6.5 Mg, 11-13 Si, 1-2 Ni, bal Al.
44,000 TS; 36,000 YS; 10 El; 125 Brin.
For light alloy parts, die castings; hardenable, high temperature applications.

SM 200.
M-1536; 0.15 C, 9 Cr, 12.5 W, 10 Co, 1 Cb, 5 Al, 2 Ti, 0.05 Zr, 0.015 B, 0.25 Fe, bal Ni.
At R.T.: 135,000 TS; 120,000 YS; 7 El.
At 1900°F: 60,000 TS; 50,000 YS; 5 El.
For cast gas-turbine blades, jet engine components.
Precipitation hardening. Good oxidation resistance, useful strength to 1900°F.

SM 211.
M-1536; 0.15 C, 9.0 Cr, 10.0 Co, 2.5 Mo, 5.5 W, 2.7 Cb, 2.0 Ti, 5.0 Al, 0.015 B, 0.05 Zr, bal Ni.
For high temperature applications, fasteners, jet engine and gas turbine components.
High rupture strength, heat and corrosion resistant.

SM 302
M-1536; 0.78-0.93 C, 20-23 Cr, 9-11 W, 8-10 Ta, 0.10-0.30 Zr, 1.5 max Fe, 0.010 max B, bal Co.
Cast: 140,000 TS; 100,000 YS; 2 El.
At 1800°F: 40,000 TS; 32,000 YS, 15 El.
For aircraft gas turbine guide vanes and buckets.
High oxidation resistance to 2000°F.

SM 322.
M-1536; 0.9-1.1 C, 20-23 Cr, 8-10 W, 4-5 Ta, 2.0-2.5 Zr, 0.65-0.85 Ti, 1.5 max Fe, bal Co.
Cast: 121,000 TS; 91,000 YS; 3.2 El; 4.0 RA.
At 1400°F: 86,000 TS; 51,000 YS; 6.3 El, 9.3 RA.
For turbine blades and vanes.
High heat and oxidation resistant.
Vacuum melted and vacuum cast superalloy.

SM-0710.
M-1186; 1 Sn, bal Cu.
Annealed: 37,000 TS; 9000 YS, 45 El; 60 RA; 55 Brin.
Hard: 46,000 TS; 38,000 YS; 15 El, 40 RA; 95 Brin.
For sheets, wire, rod; phosphor bronze.

SM-0720.
M-1186; 2 Sn, bal Cu.
Annealed: 40,000 TS; 12,000 YS; 50 El; 60 RA; 60 Brin.
Hard: 51,000 TS; 44,000 YS; 15 El; 40 RA; 110 Brin.
For sheets; phosphor bronze.

SM-1063.
M-1186; 63 Cu, bal Zn.
Annealed: 47,000 TS, 14,000 YS; 60 El; 60 RA, 65 Brin.
Hardened: 60,000 TS; 45,000 YS; 25 El; 40 RA; 115 Brin.
For sheets, wire tubes; yellow brass

SM-1067.
M-1186; 67 Cu, 23 Zn.
Drawn: 60,000 TS; 45,000 YS, 20 El; 45 RA.
For tubing; yellow brass.

SM-1072.
M-1186; 72 Cu, bal Zn.
Annealed: 45,000 TS; 14,000 YS; 65 El; 70 RA; 60 Brin.
For sheets, cartridge cases; cartridge brass.

SM-1076.
M-1186; 76 Cu, bal Zn.
Annealed: 43,000 TS; 11,000 YS; 50 El; 65 RA; 60 Brin.
For wire; ductive brass.

SM-1080.
M-1186; 80 Cu, bal Zn.
Annealed: 40,000 TS; 11,000 YS; 55 El; 75 RA; 55 Brin.
Rolled: 50,000 TS; 35,000 YS; 25 El; 65 RA; 110 Brin.
For sheets; low brass.

SM-1085.
M-1186; 85 Cu, bal Zn.
Annealed: 37,000 TS; 11,000 YS; 55 El; 75 RA; 55 Brin.
Rolled: 51,000 TS; 40,000 YS; 20 El; 65 RA; 110 Brin.
For wire, tube, rod; red brass.

SM-1092
M-1186; 92 Cu, bal Zn.
Annealed: 34,000 TS; 11,000 YS; 50 El; 75 RA; 55 Brin.
Rolled: 45,000 TS; 33,000 YS; 20 El; 65 RA; 100 Brin.
For sheets; commercial bronze.

SM-1258
M-1186; 1 Pb, 58 Cu, bal Zn.
Forged 64,000 TS; 17,000 YS; 20 El; 20 RA; 110 Brin.
For architectural applications, trim, hardware; leaded brass, free-cutting.

SM-1361
M-1186, 1.5 Pb, 61 Cu, bal Zn.
Annealed: 50,000 TS, 17,000 YS; 40 El; 40 RA; 80 Brin.
Cold drawn: 55,000 TS; 35,000 YS; 25 El, 30 RA; 100 Brin.
For hardware, bolts, nuts, screws, fasteners; leaded brass, free-cutting.

SM-1459.
M-1186; 2 Pb, 59 Cu, bal Zn
Annealed: 53,000 TS; 17,000 YS; 30 El; 25 RA; 90 Brin
Cold drawn: 68,000 TS; 57,000 YS; 8 El; 15 RA; 140 Brin.
For hardware, bolts, nuts, screws, fasteners; leaded brass, free-cutting.

SM-1658
M-1186; 3 Pb, 59 Cu, bal Zn.
Cold drawn: 61,000 TS; 31,000 YS; 20 El; 15 RA; 110 Brin.
For screw machine products, fasteners; free-cutting, leaded brass

SM-2060.
M-1186, 60 Cu, 0.5 Al, 0.5 Pb, 1 Sn, 2 Mn, 0.8 Fe, bal Zn
Cold drawn: 68,000 TS; 43,000 YS; 20 El; 25 RA; 130 Brin.
For vessels, tanks, containers; brass.

SM-2265.
M-712: 2.2 Al, 2 Pb, 65 Cu, bal Zn.
Cast: 64,000 TS; 43,000 YS; 25 El; 30 RA; 120 Brin.
For welding rod; Al-brass.

SM-2266.
M-1186; 66 Cu, 4.5 Al, 2 Fe, 3.5 Mn, bal Zn.
Forged: 100,000 TS; 57,000 YS; 15 El; 20 RA; 180 Brin.
For rods, forgings; aluminum brass.

SM-2276.
M-1186; 76 Cu, 2 Al, bal Zn.
Hard: 61,000 TS; 40 El.
For tubes; Admiralty Brass.

SM-2359.
M-1186; 59 Cu, 2 Mn, bal Zn.
Drawn: 64,000 TS; 43,000 YS; 30 El; 35 RA; 120 Brin.
For wire, rod; manganese brass.

SM-2770.
M-1186; 70 Cu, 1 Sn, bal Zn.
Drawn: 57,000 TS; 30 El.
For tubes, condenser tubes; Admiralty Brass.

SM-3010.
M-1186; 82 Cu, 10 Al, 4 Ni, 4 Fe.
Forged: 92,000 TS; 50,000 YS; 15 El; 160 Brin.
For rod, shapes, propellers; aluminum bronze.

SM-3080.
M-1186; 85 Cu, 8 Al, 1 Ni, 2 Fe, 3 Mn, 1 Sn.
Forged: 71,000 TS; 28,000 YS; 35 El; 40 RA; 120 Brin.
For wire, rod, shapes; aluminum bronze.

SM-3090.
M-1186; 91 Cu, 9 Al.
Rolled: 71,000 TS; 28,000 YS; 30 El; 35 RA; 100 Brin.
For sheets, rod; aluminum bronze.

SM-3099.
M-1186, 81.5 Cu, 10 Al, 1.5 Ni, 3 Fe, 3 Mn, 1 Sn.
Forged: 92,000 TS; 57,000 YS; 15 El; 20 RA; 160 Brin.
For rods, shapes; aluminum bronze.

SM-3617.
M-1186; 98 Cu, 1.7 Si, 0.3 Mn
Annealed: 38,000 TS; 11,000 YS; 35 El.
Drawn: 50,000 TS; 28,000 YS; 15 El.
For wire, rod, silicon bronze.

SM-3630.
M-1186; 96 Cu, 3 Si, 1 Mn.
Annealed: 57,000 TS; 17,000 YS, 50 El; 50 RA; 85 Brin.
Hard 71,000 TS; 43,000 YS; 20 El; 30 RA; 150 Brin.
For sheets, rod; silicon bronze

SM-3730.
M-1186; 3 Sn, bal Cu
Annealed: 43,000 TS, 14,000 YS; 55 El; 60 RA; 70 Brin
Rolled: 54,000 TS; 46,000 YS; 30 El; 40 RA; 115 Brin
For sheets; phosphor bronze.

SM-3750.
M-1186; 5 Sn, bal Cu.
Annealed: 47,000 TS; 17,000 YS; 65 El; 65 RA; 70 Brin.
Rolled: 63,000 TS; 54,000 YS; 25 El; 50 RA; 130 Brin.
For sheets; phosphor bronze.

SM-3770.
M-1186; 7 Sn, bal Cu.
Rolled: 100,000 TS; 90,000 YS; 8 El; 35 RA; 200 Brin.
Drawn: 135,000 TS.
For sheets, wire; phosphor bronze.

SM-3790.
M-1186; 9 Sn, bal Cu.
Hard: 75,000 TS; 57,000 YS; 35 El; 50 RA; 170 Brin.

SM-3840.
M-1186; 4 Sn, 4 Pb, 4 Zn, bal Cu.
Rolled: 57,000 TS; 48,000 YS; 20 El; 35 RA; 125 Brin.
For sheets; free-cutting.

SM-4220.
M-1186; 80 Cu, 20 Ni.
Drawn: 60,000 TS; 43,000 YS; 5 El; 30 RA; 120 Brin.
For tubes, condenser tubes; Cupro-Nickel.

SM-4230.
M-1186; 70 Cu, 30 Ni.
Drawn: 80,000 TS; 64,000 YS; 5 El; 30 RA; 155 Brin.
For tubes, condenser tubes; Cupro-Nickel.

SM-4312.
M-1186; 64 Cu, 12 Ni, bal Zn.
Annealed: 57,000 TS; 21,000 YS; 35 El; 60 RA; 80 Brin.
Hard: 80,000 TS; 64,000 YS; 8 El; 40 RA; 150 Brin.
For sheets, tubes, wire, shapes; nickel silver.

SM-4318.
M-1186; 60 Cu, 18 Ni, bal Zn.
Annealed: 60,000 TS; 26,000 YS; 30 El; 50 RA; 90 Brin.
Hard: 83,000 TS; 67,000 YS; 8 El; 35 RA; 150 Brin.
For sheets, tubes, wires, shapes; nickel silver

SM-5023.
M-1186; 99.7 Al.
Drawn. 27,000 TS.
For wire, ASTM 9975 A.

SM-5025
M-1186; 99.5 Al.
Drawn: 25,000 TS.
For wire; ASTM 996A.

SM-5027
M-1186, 99.3 Al
Rolled. 18,000 TS, 16,000 YS, 4 El; 45 Brin.
For sheets, ASTM 9930 A.

SM-5078.
M-1186; 1.2 Mn, bal Al.
Annealed: 14,000 TS; 6000 YS; 30 El; 35 Brin.
Hard: 26,000 TS; 23,000 YS; 5 El; 60 Brin.
For sheets, tube, shapes, ASTM M-1 A, 3 S alloy.

SM-5083.
M-1186; 0.6 Mg, bal Al.
Annealed: 14,000 TS; 6000 YS; 30 El, 35 Brin
Hard: 26,000 TS; 23,000 YS; 5 El; 60 Brin.
For sheets, tubes, shapes; ASTM-GS-10 A; 63 S alloy.

SM-6307.
M-1186; 0.8 Mg, 0.6 Mn, 4.2 Cu, 0.5 Si, bal Al.
Age-hardened. 57,000 TS; 35,000 YS; 14 El; 120 Brin.
For sheets, tube, rod, shapes; ASTM-CM-41 A; 17 S alloy; age-hardenable

SM-6315.
M-1186; 1.5 Mg, 0.6 Mn, 4.5 Cu, bal Al.
Age-hardened: 63,000 TS; 40,000 YS; 12 El; 130 Brin.
For sheets, tube, rod, shapes; ASTM-CG-42 A; 24 S alloy; age-hardenable.

SM-6508.
M-1186; 0.8 Mg, 0.7 Mn, 1 Ni, bal Al.
Age-hardened: 43,000 TS; 35,000 YS; 10 El; 100 Brin.

SM-6525.
M-1186; 2.5 Mg, 0.25 Cr, bal Al.
Annealed: 26,000 TS; 11,000 YS; 18 El; 50 Brin.
Hard: 35,000 TS; 33,000 YS; 4 El; 90 Brin.
For sheets, tube, shapes; ASTM-GR-20 A; 52 S alloy.

SM-6536.
M-1186; 3.5 Mg, 0.5 Mn, bal Al.
Annealed: 32,000 TS; 11,000 YS; 18 El; 60 Brin.
Hard: 43,000 TS; 35,000 YS; 6 El; 100 Brin.
For sheets, wire, shapes; ASTM-GZ-42 A; A 214 alloy.

SM-6821.
M-1186; 1.5 Mg, 0.6 Mn, 4.5 Cu, bal Al.
Heat treated: 57,000 TS; 37,000 YS; 12 El; 130 Brin.
For sheets, aircraft structures; age-hardenable.

SM-6958.
M-1186; 2.5 Mg, 0.1 Mn, 1.6 Cu, 5.75 Zn, 0.2 Cr, 0.05 Ti, bal Al.
Age-hardened: 78,000 TS; 68,000 YS; 6 El; 155 Brin.
ASTM-ZG-62 A; 75 S alloy, age-hardenable.

S-M ALLOY.
M-244; 5 Si, bal Al.
Al welding rod for welding and soldering of Al; corrosion resistant.

SMC-155.
M-38; 0.5 C, 1.1 Si, 0.5 Mo, bal Fe.
For tools; shock resistant.

SMENA NO. 1.
M-515; 20.6 W, 31.4 Cr, 33.5 Ni, 4.2 C, 1.6 Mn + Si, 8.7 Fe.
For cutting tools, drills, reamers, hobs; high speed steel.

SMENA NO. 2.
M-515; Co-Cr-W.
To replace Stellite for resurfacing; hard alloy, wear and corrosion resistant.

SM FERROCHROME (HIGH CARBON).
M-48, 60-65 Cr, 4-6 Si, 4-6 Mn, 4-6 C, bal Fe.
For Cr additions to steel or iron; Si and Mn protects the Cr.

SMITH NO. 10.
M-579, M-605, 37.5 Cr, 7.5 Al, bal Fe.
200-235 Brin.
For electrical resistors for heating furnaces, heating elements; heat resistant; El. Res. 1000 ohms; C.M.F. max operating temperature 2400°F.

SMITH SW-15.
M-579; C, bal Fe.
For welding electrodes; mild steel.

SMITH SW-17.
M-579; C, bal Fe.
For welding electrode; for mild steel.

SMITHWAY.
M-605; C, alloy, bal Fe.
For welding electrodes.

SMITTER LENIAN.
Eng.; 72 Cu, 13 Ni, 9.8 Zn, 2.3 Sn, 2 Fe, 1 Bi.
For corrosion resistant parts; corrosion resistant.

S.M.L. ALLOY (MONEL).
Eng.; 68 Ni, 28 Cu, 2.5 Fe, 2.5 Mn.
For parts requiring high corrosion resistance and strength at elevated temperatures; corrosion resistant.

SMOOTH-CUT.
M-35; 0.7 C, 1.1 Cr, 2 Mn, S, bal Fe.
Annealed: 180 Brin.
Ht. Tr.: 293,000 TS; 265,000 YS; 1 El; C 55 Rock.
For blanking and forming dies, cutters, shear blades, punches, coining dies.
Type A6 oil or air hardening, non-deforming.

S.M.S. ALLOY 1.
M-1093; Cu-W.
Bars: 135,000 TS; 130 Brin.
For resistance welding electrode; 35% conductivity, for stainless steel and brass.

S.M.S. ALLOY 10.
M-1093; Cu-W.
Bars: 160,000 TS; 205 Brin.
For resistance welding electrode; 28% conductivity, for inserts and facings.

S.M.S. ALLOY 20.
M-1093; Cu-W.
Bars: 170,000 TS; 228 Brin.
For resistance welding electrode; 27% conductivity, for heavy projection welds

S.M S. ALLOY 100W.
M-1093; Cu-W.
Bars: 200,000 TS, Rockwell A76.
For resistance welding electrode; 30% conductivity, for Red Brass.

S.M.S. ALLOY 101.
M-1093; Cu alloy.
Bars· 50,000-60,000 TS, 15,000-20,000 YS; 25-20 El; 100-116 Brin
For resistance welding electrode; 80% conductivity, for coated metals.

S M.S. ALLOY 103.
M-1093; Cu alloy.
Bars: 55,000-65,000 TS; 25,000-35,000 YS; 15 El; 116-137 Brin
For resistance welding electrode, 75% conductivity, for carbon steel and brass.

S M S ALLOY 116.
M-1093; Cu alloy.
Cast· 65,000-75,000 TS; 12,000-16,000 YS; 10-2 El; 116-165 Brin
For resistance welding electrode.

S.M S ALLOY W-2
M-1093, Cu alloy.
Cast. 90,000 TS; 68,000 YS, 1 El; 330 Brin.
Rolled 140,000 TS; 85,000 YS; 2 El; 330 Brin.
For resistance welding electrode.

S.M S. ALLOY W5
M-1093; 0 4 Be, 2 6 Co, bal Cu.
Cast: 90,000 TS; 55,000 YS; 10-15 El.
Rolled: 125,000 TS, 65,000 YS; 8-15 El.
For springs, bellows, diaphragms; age-hardenable, corrosion resistant

S.M STEEL.
M-32; 2 Si, 0.8 Mn, 0 5-0.6 C, bal Fe.
For machinery parts, gears, shafts, water hardening

S M.Z. ALLOY.
M-48; 60-65 Si, 5-7 Mn, 5-7 Zr, bal Fe.
For graphitizing alloy for cast iron; ladle addition.

SO 7.1002 (304 + Si).
M-106, 3 8-4.5 Cu, 1.0-1.5 Si, bal Al.
Sand cast: 40,000-45,000 TS; 27,000-29,000 YS; 4-6 El; 90-100 Brin; 3.5 Izod.
Sand or chill cast aluminum alloy, hardenable, good strength and less hot short

SOBU.
M-233; 0.7 C, 18 W, 9 Co, 1 Mo, 4 Cr, 2 V, bal Fe.
For lathe and planer tools, reamers, hobs, drills, broaches; high speed steel, oil hardened.

S.O.B.V. ALLOY.
M-233; 4.5 Cr, 10 Co, 19 W, 1.2 V, 0.75 C, 0.75 Mo, 0.25 Si, 0.3 Mn, bal Fe.
Hardened: 350,000 TS.
For cutting tools for machining hard metals; super high speed steel.

S.O.D. DIE STEEL.
M-140; 0.9 C, 1.65 Mn, bal Fe.
Heat treated: 570-650 Brin.
For hobs, cutters, blanking and forming dies; oil hardened, nondeforming.

SODERFORS NO 05.
M-387; 0.06 C, 0.10 Si, 0.20 Mn, bal Fe.
For case hardened gears, cams, camshafts, plastic molds.
Case hardening steel, wear resistant.

SODERFORS NO. 1
M-387; 0.6 C, 0.3 Mn, bal Fe.
For tools, punches; water hardening

SODERFORS NO. 2.
M-387; 0.7 C, 0.2 Si, 0.3 Mn, bal Fe.
For tools, punches, dies; water hardening.

SODERFORS NO 3.
M-387; 0.8 C, 0.2 Si, 0.3 Mn, bal Fe.
For tools, springs; water hardening.

SODERFORS NO. 3½.
M-387; 0.9 C, 0.2 Si, 0.3 Mn, bal Fe.
For tools, springs, drills; water hardening

SODERFORS NO. 4.
M-387; 1.0 C, 0.2 Si, 0.3 Mn, bal Fe.
For tools, drills, taps; water hardening

SODERFORS NO 5.
M-387, 1.1 C, 0.2 Si, 0.3 Mn, bal Fe
For tools, drills, taps; water hardening

SODERFORS NO 6
M-387, 1.2 C, 0.2 Si, 0.3 Mn, bal Fe
For tools, cutters, drills, water hardening

SODERFORS NO 7.
M-387, 1.3 C, 0.2 Si, 0.3 Mn, bal Fe.
For tools, cutters, water hardening

SODERFORS NO 8
M-387; 1.45 C, 0.2 Si, 0.3 Mn, bal Fe
For tools, cutters; water hardening

SODERFORS NO. 9.
M-387; 0.6-1.45 C, 0.2 Si, 0.3 Mn, 0.45 Cr, bal Fe
For tools, punches; water hardening.

SODERFORS NO 9 A.
M-387; 0.6-1.45 C, 0.20 Si, 0.3 Mn, 0.25 Cr, bal Fe
For tools, punches; water hardening.

SODERFORS NO 9 B.
M-387; 0.6-1.45 C, 0.2 Si, 0.3 Mn, 0.15 Cr, bal Fe.
For tools, springs, dies; water hardening.

SODERFORS NO. 10.
M-387; 0.6-1.45 C, 0.2 Si, 0.3 Mn, 1.0 Cr, bal Fe.
For tools, drills, springs; water hardening.

SODERFORS NO. 11.
M-387; 0.6-1.45 C, 0.2 Si, 0.3 Mn, 1.5 Cr, bal Fe.
For tools, drills, springs; water hardening.

SODERFORS 11 A.
M-387; 1.0 C, 2 Cr, bal Fe.
For tools, dies; water hardening.

SODERFORS NO. 12.
M-387; 0.8 C, 0.2 Si, 0.3 Mn, 0.45 Cr, 0.10 V, bal Fe.
For tools, drills, taps; water hardening

SODERFORS NO. 12/0.8.
M-387; 0.75-0.85 C, 0.05-0.15 V, bal Fe.
Annealed: 88,000 TS; 52,000 YS; 20 El; 190 Brin.
For cutters, shears, slitters, gripper and forming dies, coining and embossing dies.
Type W2 water hardening steel, wear resistant.

SODERFORS 12/1.0.
M-387; 1.0 C, 0.2 Si, 0.3 Mn, 0.1 V, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 40 RA; 220 Brin.
For heading and forming dies, punches; Type W2; water hardened.

SODERFORS NO. 13.
M-387; 0.95 C, 0.2 Si, 0.3 Mn, 0.45 Cr, 0.10 V, bal Fe.
For tools, drills, cutters; water hardening.

SODERFORS NO 14.
M-387; 1.05 C, 0.2 Si, 0.3 Mn, 0.45 Cr, 0.10 V, bal Fe.
For tools, drills, cutters; water hardening.

SODERFORS NO. 15.
M-387; 0.90-1.05 C, 1.35-1.65 Si, 0.6-0.9 Mn, 0.9-1.15 Cr, bal Fe.
For bearings, liners, cutters, bushings, cold heading tools.
Oil hardening, wear and shock resistant.

SODERFORS NO. 16.
M-387; 0.95 C, 0.2 Si, 1.25 Mn, 0.5 Cr, 0.5 W, 0.1 V, bal Fe
For tools, dies, cutters; non-shrinking AISI O1

SODERFORS NO. 17.
M-387, 1.15 C, 0.2 Si, 0.3 Mn, 0.1 V, 0.5 W, bal Fe
For drills, taps, hobs, broaches; water hardened.

SODERFORS NO. 17A.
M-387, 1.1 C, 0.25 Cr, 0.13 V, 1.1 W, bal Fe.
Annealed: 100,000 TS; 60,000 YS; 15 El; 210 Brin.
For punches, slitters, bearings, textile needles, broaches, reamers
Type F1 tool steel. Water or oil hardening. Abrasion resistant

SODERFORS No. 18
M-387; 0.45 C, 0.25 Si, 1.4 Cr, 2.2 W, 0.2 V, 0.2-0.3 Mo, bal Fe.
For chisels, punches, shock resisting.

SODERFORS NO. 19
M-387, 1.15 C, 0.10 Si, 0.5 Cr, 1.5 W, bal Fe.
For tools, cutters; keen cutting edge.

SODERFORS NO 20.
M-387; 1.3 C, 1.8 Cr, 4 W, 0.20 V, bal Fe
For tools, dies; oil hardening

SODERFORS NO 21.
M-387, 1.3 C, 0.5 Cr, 5 W, bal Fe.
For tools, dies, cutters; oil hardening.

SODERFORS NO. 22.
M-387; 0.5 C, 3 Cr, 9 W, 0.3 V, bal Fe.
For die casting dies, extrusion mandrels and liners; hot work steel, oil hardened

SODERFORS NO. 23.
M-387; 0.45 C, 3 Cr, 14 W, bal Fe.
For tools, dies; hot work steel.

SODERFORS NO 24.
M-387; 0.45 C, 3.0 Cr, 0.3 V, 9.0 W, bal Fe.
For hot punches, extrusion dies, hot piercers and grippers.
Hot work tool steel, oil hardening, tough and shock resistant.

SODERFORS NO. 25.
M-387; 0.70 C, 4 Cr, 18 W, 1 V, 0.4 Co, bal Fe.
For drills, reamers, broaches, hobs, lathe cutters; high speed steel, oil hardened.

SODERFORS NO. 26.
M-387; 0.80 C, 5.5 Cr, 18 W, 1.5 V, 1.5 Mo, 2 Co, bal Fe.
For tools, cutters; high speed steel. AISI T2.

SODERFORS NO. 27.
M-387; 0.80 C, 5.5 Cr, 18 W, 1.5 V, 1.5 Mo, 5.5 Co, bal Fe.
For tools, cutters; high speed steel. AISI T4.

SODERFORS NO. 28.
M-387; 0.75 C, 5.5 Cr, 18 W, 1.5 V, 1.0 Mo, 10 Co, bal Fe.
For tools, cutters; high speed steel. AISI T5.

SODERFORS NO. 29.
M-387; 0.77-0.87 C, 3.5-4.5 Cr, 4.5-5.5 Mo, 1.7-2.1 V, 6.0-7.0 W, bal Fe.
Hardened: 64-67 Rock C.
For lathe and planer tools, form cutters, reamers, broaches, drills, hobs
Type M2 high-speed steel, high red-hardness.

SODERFORS NO. 29A.
M-387; 0.82-0.90 C, 3.5-4.5 Cr, 2.8-3.6 Mo, 1.9-2.3 V, 6.0-7.0 W, bal Fe.
Hardened: 64-66 Rock C.
For lathe and planer tools, hobs, reamers, drills, taps.
High-speed steel, high red-hardness.

SODERFORS NO. 29B.
M-387; 1.45 C, 4 Cr, 5 Mo, 5 V, 6.5 W, bal Fe.
For textile needles, reamers, broaches, chasers, hobs.
High speed steel, high red-hardness.

SODERFORS NO. 30.
M-387; 1.1 C, 9.5 Co, 4.3 Cr, 5 Mo, 2.6 V, 6.5 W, bal Fe.
Hardened: 64-68 Rock C.
For broaches, reamers, twist drills, lathe and milling cutters, boring tools.
Type M36 high-speed steel, high red hardness.

SODERFORS NO. 31.
M-387; 1 C, 3 Cr, bal Fe.
For dies, tools; oil hardening.

SODERFORS NO. 32.
M-387; 0.65 C, 6 W, bal Fe.
For hot work tools; hot work steel.

SODERFORS NO. 41.
M-387; 0.5-1.3 C, 0.2 Si, 0.55 Mn, bal Fe.
For tools, dies, punches; water hardening.

SODERFORS NO. 42.
M-387; 0.45-0.70 C, 0.7 Si, 0.9 Mn, bal Fe.
For tools, dies, punches; water hardening.

SODERFORS NO. 43.
M-387; 0.60 C, 1.9 Si, 0.9 Mn, bal Fe.
For tools, springs; oil hardening.

SODERFORS NO. 46.
M-387; 0.5 C, 1.1 Cr, 0.15 V, bal Fe.
For gears, shafts; oil hardened, tough.

SODERFORS NO. 61.
M-387; 2.2 C, 13 Cr, 1 W-Mo-Ni-Co, bal Fe.
For tools, dies; non-deforming.

SODERFORS NO. 62.
M-387; 2.2 C, 12.5 Cr, bal Fe.
For dies; non-deforming. AISI D3.

SODERFORS 63.
M-387; 1.5 C, 12 Cr, 0.8 Mo, 0.2 V, bal Fe.
For shears, punches, blanking and forming dies; air hardened, non-deforming.

SODERFORS NO. 65.
M-387; 0.95-1.05 C, 5.0-5.5 Cr, 1.0-1.2 Mo, 0.15-0.25 V, bal Fe.
Annealed: 103,000 TS; 51,000 YS; 26 El; C 18 Rock.
Ht. Tr.: 255,000 TS; 200,000 YS; 3 El; C 57 Rock.
For blanking and trimming dies, cutters, gauges, punches, burnishing tools, shear blades, broaches.
Type A2 air hardening steel, nondeforming.

SODERFORS NO. 67.
M-387; 0.35-0.42 C, 0.8-1.2 Si, 5.0-5.5 Cr, 1.2-1.6 Mo, 0.85-1.15 V, bal Fe.
Annealed: 98,000 TS; 74,000 YS; 28 El; 216 Brin.
Ht. Tr.: 290,000 TS; 228,000 YS; 3 El; C 55 Rock.
For forging and heading dies, compression tools, die casting and extrusion dies.
Type H13 hot work steel. High hot hardness. Shock resistant.

SODERFORS NO. 81.
M-387; 0.13 C, 0.7 Cr, 3 Ni, bal Fe.
For gears, shafts; case hardening.

SODERFORS NO. 82.
M-387, 0.3 C, 0.6 Cr, 2 Ni, bal Fe.
For shafts, gears, pinions; tough.

SODERFORS NO. 83.
M-387; 0.3 C, 0.8 Cr, 3 Ni, bal Fe.
For gears, pinions, shafts, tough.

SODERFORS 84.
M-387; 0.6 C, 1.8 Ni, 0.7 Cr, 0.7 Mo, bal Fe.
For drop forging dies; oil hardened, tough.

SODERFORS NO. 85.
M-387; 0.5 C, 0.8 Cr, 3.25 Ni, 0.2 Mo, bal Fe.
For gears, dies, tools; tough.

SODERFORS NO. 214.
M-387; 1.05 C, 0.2 V, 0.2 Si, 0.3 Mn, bal Fe.
Annealed: 90,000 TS; 55,000 YS, 18 El; 200 Brin.
For shears, slitters, lathe and planer tools, drills, hobs.
Water hardening, wear resistant.

SODERFORS NO. 215.
M-387, 1.0 C, 1.3 Si, 0.8 Mn, 1.0 Cr, bal Fe.
For bearings, liners, bushings, cutters, punches, cold heading and drawing dies
Oil hardening, abrasion resistant.

SODERFORS NO. 323
M-387, 0.30 C, 0.30 Si, 4.8 Co, 1.5 Cr, 0.5 Mo, 0.10 V, 5.3 W, bal Fe.
For hot work tools, punches, hot shears.
Oil hardening, shock resistant.

SODERFORS NO. 364.
M-387, 1.45-1.65 C, 11-13 Cr, 0.7-0.9 Mo, 0.7-1.0 V, bal Fe.
Ht. Tr.: 278,000 TS, 214,000 YS, 1 El; C 57 Rock.
For blanking and drawing dies, broaches, hobs, shear blades, punches, gauges.
Type D2 air-hardening steel. Nondeforming, shock resistant.

SODERFORS NO. 423.
M-387; 1.15 C, 4.0 Cr, 5.0 Mo, 3.0 V, 6.0 W, bal Fe.
Hardened: 64-68 Rock C.
For drills, reamers, broaches, form cutters, lathe and planer tools, hobs, form cutters.
Type M3 high-speed steel, High red hardness.

SODERFORS NO. 424.
M-387; 1.1 C, 5.3 Co, 4.3 Cr, 5.0 Mo, 2.6 V, 6.5 W, bal Fe.
Hardened: 64-68 Rock C.
For broaches, reamers, taps, chasers, drills, lathes and planer tools.
Type M35 high-speed steel, high red-hardness.

SODERFORS NO. 431.
M-387; 0.8 C, 4.0 Cr, 9.0 Mo, 1.2 V, 1.5 W, bal Fe.
Hardened: 64-66 Rock C.
For lathe and planer tools, form cutters, drills, hobs, reamers, gauges.
Type M1 high-speed steel, oil hardening. High red-hardness.

SODERFORS NO. 433.
M-387; 1.0 C, 4 Cr, 9 Mo, 2 V, 1.8 W, bal Fe.
Hardened: 64-67 Rock C.
For drills, end mills, thread rolling dies, chasers, punches, taps.
Type M-7 high-speed steel. High red-hardness.

SODERFORS NO. 434.
M-387; 1.2 C, 5 Co, 4 Cr, 9 Mo, 3 V, 1.8 W, bal Fe.
For reamers, broaches, drills, form cutters, chasers.
High-speed steel, good red-hardness.

SODERFORS NO. 481.
M-387; 0.8 C, 4 5 Cr, 8 Mo, 2 V, 9 W, bal Fe.
For chasers, taps, drills, reamers, broaches, lathe and planer tools.
High-speed steel, good red-hardness.

SODERFORS NO. 502.
M-387; 0.1 C, 14 Cr, bal Fe.
Annealed: 90,000 TS; 50,000 YS; 40 El; 50 RA; 160 Brin.
For cutlery, surgical instruments, chemical plant equipment; Type 410; corrosion resistant.

SODERFORS NO. 504.
M-387; 0.08 max C, 17.5 Cr, 12.0 Ni, 2.75 Mo, bal Fe
Annealed· 80,000 TS; 30,000 YS; 60 El; B 80 Rock.
For chemical plant equipment, evaporators, acid tanks, digesters.
Corrosion resistant, austenitic, nonhardenable.

SODERFORS NO 506.
M-387; 0.10 max C, 27 Cr, 5.3 Ni, 1 6 Mo, bal Fe.
For heat treating boxes, furnaces parts, retorts, gas burners, combustion chambers.
Corrosion and heat resistant

SODERFORS NO. 508
M-387, 0.10 max C, 27 Cr, 5 3 Ni, 1 6 Mo, bal Fe.
For heat treating boxes, furnace parts, retorts, gas burners, combustion chambers.
Corrosion and heat resistant.

SODERFORS NO. 509.
M-387; 0.12 C, 12 Cr, 0.6 Ni, 0.5 Mo, bal Fe.
Annealed· 80,000 TS; 42,000 YS, 30 El, 160 Brin.
For chemical plant and oil refinery equipment, tableware, knives
Heat and corrosion resistant.

SODERFORS NO. 510.
M-387, 0.15 C, 14 Cr, 0.3 Ni, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For cutlery, pump parts, valves; Type 410; corrosion resistant.

SODERFORS NO. 511.
M-387; 0.2 C, 14 Cr, 0.3 Ni, bal Fe.
For pump-shafts, cutlery, valves; corrosion resistant.

SODERFORS NO. 512.
M-387; 0.35 C, 14 Cr, 0.3 Ni, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
Heat treated: 250,000 TS; 215,000 YS; 8 El; 25 RA; 512 Brin.
For cutlery, knives, surgical instruments, gears, shafts; Type 420; corrosion resistant.

SODERFORS NO. 514.
M-387; 0.53-0.58 C, 13.5-14.0 Cr, 0.3 Ni, bal Fe.
Annealed: 100,000 TS; 50,000 YS; B 90 Rock.
For surgical instruments, cutlery, knives, gears, shafts.
Corrosion and heat resistant.

SODERFORS NO. 516.
M-387; 0.20 C, 14 Cr, 0.3 Ni, 0.3 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; B 92 Rock.
For cutlery, surgical instruments, gauges, needle valves, bearings.
Corrosion and heat resistant.

SODERFORS NO. 517.
M-387; 1.0 C, 14 Cr, 0.2 Mo, 0.6 Co, 0.1 V, bal Fe.
For bearings; corrosion resistant.

SODERFORS NO. 522.
M-387; 0.08 max C, 17.5 Cr, 0.5 Mn, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For household utensils, sinks, oil refinery equipment; stainless, ferritic; Type 430.

SODERFORS NO. 523.
M-387; 0.10 max C, 17 Cr, 0.35 Ni, 1.75 Mo, bal Fe.
Annealed· 90,000 TS; 50,000 YS; 20 El; 165 Brin.
For oil burners, hardware, marine fittings, food handling equipment.
Corrosion and heat resistant.

SODERFORS NO. 525.
M-387, 0 15-0.25 C, 16-18 Cr, 1.25-2.5 Ni, bal Fe.
Annealed: 125,000 TS; 90,000 YS; 20 El; 260 Brin.
For pump shafts, marine hardware, valve trim, aircraft components.
Type 431 corrosion and heat resistant.

SODERFORS NO. 526.
M-387, 0.15 C, 17.5 Cr, 1 8 Mo, bal Fe.
Annealed. 85,000 TS, 48,000 YS; 25 El; 160 Brin.
For oil burner parts, hardware, marine fixtures, food handling equipment,
Corrosion and heat resistant.

SODERFORS NO. 527.
M-387; 0.15 C, 17 Cr, 1.5 Ni, 0.5 Mo, 0.2 Si, bal Fe.
For cutlery, tableware; corrosion resistant, free cutting.

SODERFORS NO. 532.
M-750; 0 2 C, 25 Cr, bal Fe.
For stainless parts, corrosion resistant.

SODERFORS NO. 541.
M-387; 0.41 C, 3 Si, 9 Cr, 0.3 Mo, bal Fe.
For valves; heat corrosion resistant.

SODERFORS NO. 552
M-387; 0 03 max C, 17-20 Cr, 9-12 Ni, bal Fe.
Annealed 80,000 TS; 30,000 YS; 60 El; B 74 Rock.
For architectural molding and trim, processing equipment, welded tanks, evaporators.
Type 304L stainless steel, austenitic.

SODERFORS NO. 553.
M-387; 0.05 C, 18 Cr, 9 Ni, bal Fe.
For chemical and textile plant equipment; Type 304; austenitic, stainless.

SODERFORS NO. 554.
M-387, 0.08 max C, 18 Cr, 9 Ni, bal Fe.
For stainless parts; austenitic, stainless.

SODERFORS NO. 555.
M-387; 0.13 C, 18 Cr, 9 Ni, bal Fe.
Annealed: 90,000 TS; 35,000 YS; 50 El; 16 RA; 140 Brin.
For chemical and plastic plant equipment; Type 302; stainless, austenitic.

SODERFORS NO. 556.
M-387; 0.10 max C, 18 Cr, 9 Ni, 0.2 S, bal Fe.
Rolled: 80,000-100,000 TS; 40,000-60,000 YS; 150-200 Brin.
For screw machine products, fasteners, machinery parts; Type 303; austenitic, free-cutting, stainless.

SODERFORS NO. 558.
M-387; 0.08 max C, 17-19 Cr, 9-13 Ni, Ti = 5 × C, bal Fe.
Annealed: 85,000 TS; 30,000 YS; 58 El; B 82 Rock.
For welded structures, chemical plant equipment, tanks, evaporators.
Type 321 stainless steel, austenitic, stabilized, welding grade.

SODERFORS NO. 558 Cb.
M-387; 0.08 max C, 17-19 Cr, 9-13 Ni, 1.2 max Cb, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; B 80 Rock.
For welded structures, chemical plant equipment, digesters.
Type 347 stainless steel, austenitic, stabilized, welding grade.

SODERFORS NO. 558 Nb.
M-387; 0.08 max C, 17-19 Cr, 9-13 Ni, 1.2 max Cb, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 55 El; B 82 Rock.
For welded structures, chemical plant equipment, digesters.
Type 347 stainless steel, austenitic stabilized, welding grade.

SODERFORS NO. 558 Ti.
M-387; 0.06 C, 18 Cr, 11 Ni, 0.4 Ti, bal Fe.
Annealed: 85,000 TS; 30,000 YS; 55 El; B 80 Rock.
For welded structures and tanks, chemical plant equipment, jet aircraft components, exhaust systems.
Type 321 stainless steel, austenitic, stabilized.

SODERFORS NO. 559.
M-387; 0.12 max C, 14 Cr, 13 Ni, bal Fe.
For valves; corrosion and heat resistant.

SODERFORS NO. 562.
M-387; 0.05 max C, 18 Cr, 10 Ni, 1.5 Mo, bal Fe.
For chemical plant equipment; acid resistant, austenitic.

SODERFORS NO. 562 EL.
M-387; 0.03 max C, 17-18 Cr, 12-14 Ni, 2.3-3.8 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; B 82 Rock.
For chemical plant equipment, acid tanks, agitators, valve trim.
Type 316L stainless steel, austenitic, acid resistant.

SODERFORS NO. 562 N.
M-387; 0.06 max C, 17.5 Cr, 10.5-11.5 Ni, 2.25 Mo, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El; B 80 Rock.
For chemical plant equipment, agitators, digesters, evaporators.
Austenitic, stainless, Type 316.

SODERFORS NO. 563.
M-387; 0.08 max C, 18 Cr, 10 Ni, 1.5 Mo, bal Fe
For chemical plant equipment; acid resistant, austenitic.

SODERFORS NO. 564.
M-387; 0.05 max C, 18 Cr, 12 Ni, 2.7 Mo, 1.2 Mn, bal Fe.
For chemical plant equipment; stainless, austenitic.

SODERFORS NO. 565.
M-387; 0.08 max C, 1.2 Mn, 18 Cr, 12 Ni, 2.7 Mo, bal Fe.
For stainless parts; austenitic, stainless.

SODERFORS NO. 566.
M-387; 0.10 max C, 27 Cr, 5 Ni, 1.6 Mo, bal Fe.
For chemical plant equipment, sulphuric acid tanks; Type 329; stainless steel.

SODERFORS NO. 571.
M-387; 0.45 C, 14 Cr, 14 Ni, 0.3 Mo, 2.2 W, bal Fe.
For engine valves; austenitic, stainless.

SODERFORS NO. 576.
M-387; 0.15 max C, 1.2 Si, 23 Cr, 21 Ni, bal Fe.
For furnace parts, heat treating boxes; heat resistant to 1100°C.

SODERFORS NO. 584.
M-387; 0.12 max C, 7.5-10.0 Mn, 17-19 Cr, 4-6 Ni, 0.25 max N, bal Fe.
Annealed: 100,000 TS; 50,000 YS; 60 El; B 90 Rock.
For dairy and chemical plant equipment springs, refrigerators trays, cabinets, architectural trim.
Type 202 stainless steel, austenitic.

SODERFORS ANVIL.
M-387; 0.8 C, 0.9 Mn, bal Fe.
For tools, water hardened.

SODERFORS ARROW.
M-336; High C, 1.2 Mn, 0.5 W, 0.5 Cr, 0.1 V, bal Fe
For tools, dies, thread and block gages, master tools, taps; non-shrinking; non-warping.

SODERFORS CROWN "W."
M-336; 0.9 C, 0.3 Mn, 1.8 Cr, 4.0 W, 0.2 V, bal Fe.
For tools, for turning chilled iron rolls and all hard metals; non-warping.

SODERFORS DOUBLE CRANE.
M-387, 0.9-1.2 C, bal Fe.
For tools, drills, stone tools; water hardened.

SODERFORS DRILL.
M-387; 1.0-1.2 C, bal Fe
For drills, tools, hollow and solid drills; water hardened

SODING ADK.
M-1309; 2.1 C, 12.0 Cr, 0.7 W, bal Fe.
For blanking and forming dies, punches, gauges; oil hardening, non-deforming.

SODING ADK SPEZIAL
M-1309, 2.1 C, 12.0 Cr, bal Fe.
For blanking and forming dies, gauges, punches; air hardened, non-deforming.

SODING ADP.
M-1309, 1.65 C, 11.5 Cr, 0.5 W, bal Fe.
For blanking and forming dies, gauges, punches, air hardening, non-deforming

SODING ADP SPEZIAL
M-1309; 1.7 C, 12.0 Cr, 0.6 Mo, 0.5 W, bal Fe.
For punches, crimping and forming dies, blanking and trimming dies, punches.
Air hardening, nondeforming Cold work tool steel.
DIN X-165 CrMoV12; Werkstoff Nr.1.2601.

SODING ADT.
M-1309, 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies, gauges, punches; oil or air hardened, non-deforming

SODING CNF.
M-1309; 0.15 C, Ni, Cr, bal Fe.
For gears, bolts, machine tool parts; case hardened, tough.

SODING CNL.
M-1309; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

SODING CNL EXTRA.
M-1309; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment; Type 321; stainless, austenitic.

SODING CNL SPEZIAL.
M-1309; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, vessels;
Type 304; stainless, austenitic.

SODING CNM.
M-1309; 0.15 C, Ni, Cr, bal Fe.
For chemical plant equipment; stainless.

SODING CNP.
M-1309; 0.07 max C, 17.5 Cr, 17.5 Ni, 2 Mo, 2 Cu, Ti = 4 × C, bal Fe.
For chemical plant equipment, welded structures; corrosion resistant.

SODING CNU EXTRA.
M-1309; 0.12 max C, 18 Cr, 2 Mo, 10.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; 60 RA; 160 Brin
For welded acid resistant chemical plant equipment; Type 316 Ti; stainless, austenitic.

SODING CNU SPEZIAL.
M-1309, 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe
Annealed· 85,000 TS, 35,000 YS; 55 El, 65 RA; 160 Brin
For acid resistant chemical plant equipment;
Type 316; stainless, austenitic.

SODING CORROCHROM 13 T.
M-1309; 0.20 C, 1.0 Si, 1.0 Mn, 13.0 Cr, 1.15 Mo, bal Fe.
Air hardening corrosion resistant steel for plastic molds,—heat and abrasion resistant
DIN X20CrMo13, Werkstoff Nr. 1.4120.

SODING CRWC
M-1309, 0.30 C, 10.0 W, 2.5 Cr, 2.5 Co, 0.3 V, bal Fe.
For extrusion dies, mandrels, die casting dies, hot shears, gripper dies.
Hot work tool steel, oil hardening.

SODING CS1
M-1309; 0.62 C, 1.0 Si, 1.0 Mn, 0.6 Cr, bal Fe.
Oil hardening cold work tool steel; for shear knives, cold punches, machine knives.
DIN 62SiMnCr4; Werkstoff Nr. 1.2101.

SODING CSJ
M-1309; 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For punches, crimpers, upsetters, oil hardened, shock resistant.

SODING EXTRA HART.
M-1309; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, drills, crimpers; Type W1; water hardened.

SODING EXTRA MH.
M-1309; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 57,000 YS; 18 El; 40 RA; 210 Brin.
For springs, drills, cutters, taps, reamers, hobs; Type W1; water hardened.

SODING EXTRA SPEZIAL 35.
M-1309; 1.15 C, 0.10 V, bal Fe.
For cold working tools, drills, lathe and planer tools, hobs, headers, forming and drawing dies.
Water hardening, wear resistant.
DIN 100V1; Werkstoff Nr. 1.2833.

SODING EXTRA WEICH.
M-1309; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, rails, punches, hammers, axes, tools; Type W1; water hardened.

SODING EXTRA ZAH.
M-1309 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For drills, taps, springs, reamers; Type W1; water hardened.

SODING EXTRA ZH.
M-1309; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA 200 Brin.
For springs, drills, taps, reamers, broaches;
Type W1; water hardened.

SODING GCNS
M-1309; 0.15 C, 1.5 Si, 18 Cr, 8.5 Ni, bal Fe.
Annealed· 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers
Type 302; stainless, austenitic

SODING GCNV.
M-1309; 0.15 C, 18 Cr, 2 Mo, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment;
Type 316; stainless, austenitic.

SODING GCr6.
M-1309, 0.3 C, 2.2 Si, 6 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

SODING GCr17Si.
M-1309 0.5 C, 1.5 Si, 17 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

SODING GCr23.
M-1309; 0.6 C, 1.5 Si, 22 Cr, bal Fe.
For oil refinery equipment, creep and heat resistant.

SODING GCr27Ni.
M-1309, 0.4 C, 26 Cr, 14 Ni, bal Fe.
Cast: 75,000 TS; 47,000 YS, 17 El, 25 RA; 200 Brin.
For heat treating boxes, furnace parts, grids, conveyors, Type HH; heat and corrosion resistant.

SODING GCr28.
M-1309, 0.4 C, 27 Cr, 4 Ni, bal Fe
Cast: 90,000 TS; 65,000 YS; 2 El; 212 Brin.
Aged: 97,000 TS, 65,000 YS, 18 El, 210 Brin.
For cylinder liners, bushings, valve seats and bodies; heat resistant.

SODING GCr28Ni.
M-1309; 0.4 C, 27 Cr, 4 Ni, bal Fe.
Cast· 90,000 TS; 65,000 YS, 2 El 212 Brin.
Aged: 97,000 TS; 65,000 YS; 18 El; 210 Brin.
For cylinder liners, bushings, valves; heat resistant.

SODING GCr30.
M-1309, 1.2 C, 29 Cr, bal Fe.
For wear parts, rollers, crushers, grates; heat and abrasion resistant.

SODING GCr30Si.
M-1309; 1.3 C, 29 Cr, 1.5 Si, bal Fe.
For wear parts, rollers, grates, crushers; heat and abrasion resistant.

SODING GCr30W.
M-1309 0.6 C, 1.5 Si, 29 Cr, bal Fe.
For grates, valve seats, cylinder liners; heat and abrasion resistant.

SODING GMN.
M-1309; 0.55 C, 0.18 Mo, 1.65 Ni, 0.1 V, 0.7 Cr, bal Fe.
For gears, bolts, crankshafts, hot work tools, oil hardened, shock resistant.

SODING GMN EXTRA.
M-1309; 0.55 C, 1.1 Cr, 0.4 Mo, 1.8 Ni, 0.18 V, 1.0 W, bal Fe.
For bolts, crankshafts, gears, hot and cold working tools.
Oil hardening, shock resistant

SODING GNRSN.
M-1309; 0.25 C, 17 Cr, 1.8 max Ni, bal Fe.
Annealed: 125,000 TS; 90,000 YS; 20 El, 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431; corrosion and heat resistant.

SODING GONC.
M-1309 0.4 C, 25 Cr, 19 Ni, bal Fe.
Cast: 75,000 TS; 50,000 YS; 17 El; 170 Brin.
For furnace parts, retorts, stack dampers; Type HK

SODING GONF.
M-1309; 0.5 C, 25 Cr, 30 Ni, bal Fe.
For retorts, furnace parts, rabble arms; heat resistant.

SODING H.
M-1309; 0.45 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA 212 Brin.
For gears, bolts, machine tool parts; water hardened

SODING HBC/Ni.
M-1309; 0.12 C, 1.5 Si, 1.0 Mn, 29.5 Cr, bal Fe.
For parts such as furnace parts, steam boiler, equipment, heat treat boxes, that operate at temperatures up to 1150°C.
DIN X10CrSi29; Werkstoff Nr. 1.4772.

SODING HID1
M-1309; 0.55 C, 1.05 Cr, 0.9 Si, 0.18 V, 1.85 W, bal Fe.
For chisels, air hammers, punches, shears; cold work steel, oil hardened, shock resistant.

SODING HID2.
M-1309; 0.45 C, 0.9 Si, 1.7 Cr, 0.2 V, 1.85 W, bal Fe.
For chisels, punches, pneumatic tools, crimpers; shock resistant, oil hardened, cold work steel.

SODING HID3.
M-1309 0.35 C, 0.9 Si, 1 Cr, 0.18 V, 1.85 W, bal Fe.
For chisels, punches, pneumatic tools, crimpers; shock resistant, oil hardened.

SODING HID-4.
M-1309; 0.45 C, 1.0 Si, 1.1 Cr, 0.2 V, 2.0 W, bal Fe.
Cold work tool steel, for chisels, pneumatic tools, rivet hammers.
DIN 45WCrV7; Werkstoff 1.2542.

SODING HPM.
M-1309; 0.45 C, 1.5 Cr, 1.0 V, 1.5 Si, bal Fe.
For springs, gears, crankshafts; punches, pneumatic tools, hot work tools.
Water hardening, shock resistant.

SODING KLR.
M-1309; 1.0 C, 1.1 Cr, 0.07 Mn, 0.25 Si, bal Fe.
For bearings, liners, bushings, cutters; water hardened, wear resistant.

SODING LKW.
M-1309; 0.90 C, 0.80 Cr, bal Fe.
For cold working tools, embossing tools, cams, hand tools, woodworking tools.
DIN 90 Cr3; Werkstoff Nr. 1.2056.

SODING LMD.
M-1309; 1.2 C, 0.1 V, 0.2 Cr, 1.0 W, bal Fe.
For cutters, bearings water hardened, wear resistant.

SODING LME.
M-1309; 1.0 C, 1.0 Cr, 1.2 W, 1.0 Mn, bal Fe.
For cutters, bearings, sleeves, bushings, punches.
Water hardening, wear resistant.

SODING MSW.
M-1309; 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, 0.9 Si, bal Fe.
For forging and header dies, punches, upsetters; oil hardening, hot work toolsteel; tough.

SODING MW.
M-1309; 0.45 C, 13.0 Cr, 13.0 Ni, 1.2 W, 1.2 V, bal Fe.
Austenitic type hot work tool steel for extrusion dies and tube presses handling heavy metals.
Hot work steel X50NiCrWV1313.

SODING NR17T
M-1309, 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For welded oil refinery equipment; corrosion resistant.

SODING NR18T.
M-1309, 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe.
Annealed: 85,000 TS, 52,000 YS; 23 El, 53 RA; 160 Brin
For welded acid resistant equipment; corrosion resistant.

SODING NRSA.
M-1309, 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS, 25 El; 50 RA 150 Brin
For screw machine products; free-cutting; Type 430 F; stainless.

SODING NRSB 1320.
M-1309; 0.20 C, 0.4 Si, 0.3 Mn, 13 Cr, bal Fe.
Air hardening steel for pressure chambers for light metal die casting; heat, abrasion and corrosion resistant
DIN-X20Cr13, Werkstoff Nr. 1.2082.

SODING NRSB 1340.
M-1309, 0.40 C, 0.40 Si, 0.3 Mn, 13.0 Cr, bal Fe.
Air or oil hardenable; for heavy duty plastic molds; good resistance to abrasion and corrosion
DIN X40Cr13; Werkstoff Nr. 1.2083.

SODING NRSE.
M-1309; 0.90 C, Cr, Mo, bal Fe.
For valves, cutlery; oil hardened.

SODING NRSF.
M-1309; 0.08 C, 17 Cr, 0.4 Si, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, oil burners, sinks; Type 430; stainless.

SODING NRSG.
M-1309; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For cutlery, valves, surgical instruments; Type 420; stainless.

SODING NRSM.

M-1309; 0.4 C, 13 Cr, 0.4 Si, bal Fe.

Annealed: 100,000 TS; 55,000 YS; 22 El; 52 RA 200 Brin.

For cutlery, valves, surgical and dental instruments; Type 420; stainless, hardenable.

SODING NRSN.

M-1309; 0.22 C, 0.4 Si, 17 Cr, 1.5 Ni, bal Fe.

Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.

For pumps, marine hardware, valves; Type 431; stainless

SODING NRST.

M-1309; 0.20 C, 13 Cr, 1.15 Mo, bal Fe.

Annealed: 100,000 TS; 55,000 YS; 22 El; 52 RA; 200 Brin.

For chemical plant equipment, valves, cutlery; Type 420 Mo; stainless.

SODING NRSW.

M-1309; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.

Annealed: 75,000 TS; 40,000 YS; 35 El 70 RA; 155 Brin.

For turbine blades, valves, cutlery; Type 410; stainless.

SODING OA708.

M-1309; 0.12 C, 0.80 Si, 0.30 Mn, 0.80 Al, 6.5 Cr, bal Fe.

For parts of furnaces, steam plants, heat treating equipment, that operate at temperatures up to 800°C.

DIN X10 CrA17; Werkstoff Nr. 1.4713.

SODING OA1310.

M-1309; 0.12 C, 1.2 Si, 0.30 Mn, 1.0 Al, 13 Cr, bal Fe.

For parts in glass, porcelain and enameling industry that operate at temperatures up to 950°C.

DIN X10CrAl 13; Werkstoff Nr. 1 4724.

SODING OA1810.

M-1309, 0.12 C, 1.0 Si, 0.30 Mn, 1.0 Al, 18 Cr, bal Fe.

For parts for furnaces, petroleum industry, heat treating, power plants, operating at temperatures up to 1050°C.

DIN X10CrAl 18 Werkstoff Nr 1 4742.

SODING OA2415.

M-1309; 0.12 C, 1.4 Si, 0.30 Mn, 1.5 Al, 24.0 Cr, bal Fe.

For parts for furnaces, heat treat equipment, petroleum cracking, glass making, that operate at temperatures up to 1200°C.

DIN X10CrAl 24; Werkstoff Nr. 1.4762.

SODING ON16 36.

M-1309; 0.15 C, 1.8 Si, 1.2 Mn, 16.0 Cr, 35.5 Ni, bal Fe.

For carburizing boxes, annealing boxes, petroleum processing equipment, heat exchanger tubes that operate at temperatures up to 1100°C; resistant to carburizing gases.

DIN 12NiCrSi 36 16; Werkstoff Nr. 1.4864.

SODING ON20 12.

M-1309; 0.20 C, 2.0 Si, 1.2 Mn, 20.0 Cr, 12 Ni, bal Fe.

For parts, operating at temperatures up to 1050°C in petroleum plants, glass plants, enameling plants, heat treating equipment, corrosion resistant.

DIN X 15 CrNiSi2012; Werkstoff Nr. 1.4828.

SODING ON25 4.

M-1309; 0.20 C, 1.2 Si, 1.2 Mn, 25 Cr, 4 Ni, bal Fe.

For muffles, retorts, hot plates and other parts that operate at temperatures up to 1100°C.

DIN X20CrNiSi25 4; Werkstoff Nr. 1.4821.

SODING ON25 20.

M-1309; 0.20 C, 2.0 Si, 1.2 Mn, 25.0 Cr, 20 Ni, bal Fe.

For parts for furnaces, heat treating equipment, jet engines, petroleum plants, glass factories that operate at temperatures up to 1200°C; corrosion resistant.

DIN X15CrNiSi 25 20; Werkstoff Nr. 1.4841.

SODING ON 189.

M-1309; 0.15 C, 0.30 Si, 1.2 Mn, 18 Cr, 10 Ni, 0.7 Ti, bal Fe.

For parts operating at temperatures up to 800°C as hot plates, brackets for heat exchangers, furnace parts; corrosion resistant.

DIN X12 CrNiTi189; Werkstoff Nr. 1.4878.

SODING ONC.

M-1309; 0.15 C, 2 Si, 24 Cr, 19 Ni, bal Fe.

Annealed: 100,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin.

For furnace parts, pumps, valves, jet parts; Type 310 stainless, austenitic.

SODING ONIA.

M-1309; 0.20 C, 2.0 Si, 20.0 Cr, 12.0 Ni, 1.2 Mn, bal Fe.

Annealed: 80,000 TS; 35,000 YS; 55 El; 150 Brin.

Cold Drawn: 180,000 TS; 150,000 YS; 10 El; 250 Brin.

For chemical plant and oil refinery equipment; AISI Type 302; stainless, austenitic.

SODING PERMANENT.

M-1309; 0.75 C, 4.5 Cr, 18.5 W, 1.2 V, bal Fe.

Hardenable to C 62-65 Rock.

For roughing and finishing cuts of all kinds, lathe tools, milling cutters, taps, drills, reamers.

High speed steel B18

SODING PERMANENT 35.

M-1309 0.8 C, 4.5 Cr, 18.5 W, 0.8 Mo, 1.7 V, 5.0 Co, bal Fe.

Hardenable to C 63-66 Rock.

For heavy and roughing cuts on lathes, planers, and slotters on cast iron, steel and cast steel including stainless grades.

High speed steel E18Co5.

SODING PERMANENT 70.

M-1309, 1.4 C, 4.5 Cr, 12.5 W, 1.0 Mo, 4.0 V, 5 0 Co, bal Fe.

Hardenable to C 63-66 Rock

For form tools for automatics, lathe tools, relieving tools; medium and finishing cuts at high speed.

High speed steel EVA Co.

SODING PERMANENT 120.

M-1309; 1.35 C, 4 5 Cr, 9.0 W, 3.7 Mo, 3.75 V, 10.5 Co, bal Fe.

Hardenable to C 63-68 Rock.

For lathe tools, form tools for automatics, relieving tools and form cutters for planing and slotting operations.

High speed steel EW9Co10.

SODING PK35.

M-1309; 0 50 C, 1.0 Cr, 3.0 Ni, 0.5 Mn, bal Fe.

For gears, bolts, crankshafts, axles; oil hardened.

SODING PRIMA WEICH.

M-1309; 0.35 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.

Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 180 Brin.

For crankshafts, gears, shafts, fasteners; water hardened.

SODING PRIMA ZAH.

M-1309; 0.45 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.

Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.

For axles, gears, bolts, tie-rods, bushings; water hardened.

SODING PRIMA ZH.
M-1309; 0.60 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El; 40-54 RA; 320-230 Brin.
For wheels, die blocks, girders; water hardened.

SODING RADIKAL Mo5.
M-1309; 0.85 C, 4.5 Cr, 6.7 W, 5.3 Mo, 2.0 V, bal Fe.
Hardenable to C 62-66 Rock.
For milling cutters, twist drills, reamers, form cutters and lathe tools; for heavy and rough cuts; good toughness.
High speed steel D Mo5; AISI M2.

SODING RADIKAL Mo9.
M-1309; 0.85 C, 4.2 Cr, 2.0 W, 9.2 Mo, 1.3 V, bal Fe.
Hardenable to C 62-66 Rock.
For twist drills, taps, reamers, milling cutters and tools for wood working machines.
High speed steel BMo9; AISI M1.

SODING RADIKAL Mo55.
M-1309; 0.85 C, 4.5 Cr, 6.7 W, 5.3 Mo, 2.0 V, 5.5 Co, bal Fe.
Hardenable to C 62-66 Rock.
For lathe, planer and slotter tools, milling cutters, twist drills; for difficult machining and drilling operations.
High speed steel E Mo5Co5.

SODING RADIKAL Mo60.
M-1309; 1.25 C, 4.5 Cr, 6.7 W, 5.3 Mo, 3.4 V, bal Fe.
Hardenable to C 62-66 Rock.
For form tools on medium-sized lathes and automatics, milling cutters, twist drills, chasers, broaches, reamers.
High speed steel E Mo5V3.

SODING RADIKAL Mo92.
M-1309; 1.1 C, 4.2 Cr, 2.0 W, 9.2 Mo, 2.1 V, bal Fe.
Hardenable to C 62-66 Rock.
For twist drills, reamers, lathe tools, milling cutters; and tools for wood-working machines.
High speed steel B Mo9V.

SODING SCHM.
M-1309; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, shafts, bolts, axles; oil hardened, tough.

SODING SHCM EXTRA.
M-1309; 0.45 C, 1.4 Cr, 0.70 Mo, 0 30 V, 0.7 Mn, bal Fe.
For foreign and upsetting dies; oil hardened, tough.

SODING SPECIAL DIAMANT.
M-1309; 1.0 C, 3 5 W, 0.3 V, bal Fe.
For blanking and forming dies, cutters, reamers, broaches.
Water or oil hardening, wear resistant.

SODING SPECIAL MH.
M-1309; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, drills, reamers; Type W1; water hardened.

SODING SPEZIAL WEICH.
M-1309; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For springs, punches, girders, rails, die blocks; Type W1; water hardened.

SODING SPEZIAL ZAH.
M-1309; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, taps, drills, reamers, tools; Type W1; water hardened.

SODING SPEZIAL ZH.
M-1309; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, drills, reamers, broaches; Type W1; water hardened.

SODING SPG.
M-1309; 1.30 C, 1.20 Si, 1.2 Cr, 0.7 Mn, bal Fe.
For bearings, cutters, liners, sleeves; water or oil hardening, wear resistant.

SODING SPH2.
M-1309; 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For extrusion dies, rams, liners, punches hot work steel, oil hardened.

SODING SPH3.
M-1309, 0.30 C, 0.6 V, 2.35 Cr, 4 25 W, bal Fe.
For extrusion dies, rams, liners, punches; hot work steel, oil hardened.

SODING SPH 7.
M-1309, 0.32 C, 2.9 Cr, 2.8 Mo, 0.5 V, bal Fe.
Oil or salt bath hardenable to C 40-51 Rock.
For extrusion ram heads for light and heavy metals, hot upsetting tools, pressure die casting dies for brass, light metals and zinc.
Hot work tool steel X32CrMoV33.

SODING SPH 8.
M-1309; 0.30 C, 2.8 Cr, 2.8 Mo, 2.6 Co, 0.5 V, bal Fe
Oil hardenable to C 40-50 Rock.
For tools for metal extrusion and tube presses, extrusion dies for heavy metals, pressure die casting dies.
Hot work steel.

SODING SPHX.
M-1309; 0 30 C, 0.35 V, 2.65 Cr, 8.5 W, bal Fe
For extrusion dies, rams, liners, punches; hot work steel, oil hardened

SODING SPM.
M-1309, 0 45 C, 0 5 W, 1.5 Cr, 0.8 V, 0.6 Si, 0.5 Mo, 0.4 Mn, bal Fe.
Oil hardening hot work tool steel; for press dies, pressing punches, shear knives.
DIN 45 CrVMoW58, Werkstoff Nr 1.2603.

SODING STA.
M-1309, 1.45 C, 1.4 Cr, 0 60 Mn, bal Fe.
For bearings, cutters, engravers tools; oil or water hardened.

SODING UNB.
M-1309; 1.1 C, 0 9 Cr, 1 1 Mn, bal Fe.
For cold working tools, threading tools for hand operation, light punching dies.
DIN 105 MnCr4; Werkstoff Nr 1.2127.

SODING UNIVERSAL.
M-1309; 0 90 C, 2.0 Mn, 0.10 V, bal Fe.
For cold working tools, punches.
DIN 90 MnV8; Werkstoff Nr. 1.2842.

SODING W15.
M-1309; 0.38 C, 1.5 Cr, 0.1 V, 1.5 Si, 0.4 Mn, bal Fe.
Cold work tool steel; for compressed air tools, blacksmith's chisels, trimming tools.
DIN 38 SiCrV6; Werkstoff Nr. 1.2248.

SODING W35.
M-1309; 0.4 C, 5.5 Cr, 1.4 Mo, 0.3 V, bal Fe.
Air or oil hardenable to C 40-54 Rock.
For impact and pressure forging dies, pressure die casting dies, extrusion dies, piercing and punching dies.
Hot work tool steel X38CrMoV51; AISI H11.

SODING W36.
M-1309; 0.37 C, 4.8 Cr, 1.5 Mo, 1.4 W, 0.9 Si, 0.6 Mn, 0.2 V, bal Fe.
Oil or air hardenable to C 40-54 Rock.
For pressure die casting dies for light metal, tin, zinc and lead alloys when long life is important. For forging die inserts.
Hot work steel X37CrMoW51 AISI H12.

SODING W37.
M-1309; 0.40 C, 5.0 Cr, 1.5 Mo, 1.0 V, bal Fe.
Air or oil hardenable to C 40-54 Rock.
For pressure die casting dies for light metals, tin, zinc and lead alloys; also for forging die inserts, piercing mandrels and extrusion mandrels.
Hot work tool steel X40CrMoV51; AISI H13.

SODING WM
M-1309; 0.45 C, 0.80 Mn, bal Fe.
Water hardening steel for small, lightly loaded dies.
DIN C45W3; Werkstoff Nr. 1.1730.

SODING ZWAT.
M-1309; 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies, punches; oil or air hardened, non-deforming.

SODIUM-LEAD ALLOY.
M-596; 98 Pb, 2 Na.
For non-ferrous alloy deoxidizer.

SODIUM-ZINC ALLOY.
M-596; 98 Zn, 2 Na.
For nonferrous alloy deoxidizer; brittle.

SOFT
M-388, 0.5 C, bal Fe.
For tools, shafts, gears; water hardened.

SOFTITE.
M-206, galvanized steel
For structural components.

SOFTWELD
M-578, C, bal Fe.
Arc welding electrode
AWS Class En· CI.

SOHO SELF-HARDENING
M-340; 0.9 C, 4 Cr, 0.2 V, bal Fe
For tools, dies, oil hardened.

SOLABRAZE C-6601.
M-1670, 43 Zr, 12 Ni, 2 Be, bal Ti.
For brazing titanium to itself or to ceramic parts in vacuum or oxygen-free inert gas.
Melting point 1470-1500°F. Braze at 1650°F

SOLABRAZE C-6602.
M-1670, 45 Zr, 8 Ni, 2 Be, bal Ti
For brazing titanium to itself or to ceramic parts in high vacuum or oxygen-free inert gas
Melting range 1650°F. Braze at 1700°F.

SOLABRAZE C-6603
M-1670, 47 Zr, 5 Be, bal Ti.
For brazing titanium to itself or to ceramic parts in high vacuum or oxygen-free inert gas.
Melting range 1640-1660°F. Braze at 1725°F.

SOLABRAZE C-6604
M-1670, 47 Zr, 5 Be, 5 Al, bal Ti.
For brazing titanium to itself or to ceramic parts in high vacuum or oxygen-free inert gas.
Melting range 1700°F. Braze at 1750°F.

SOLAR
M-96; 1.2 C, 1.6 Cr, 1.45 W, 0.15 V, bal Fe.
For tools, dies.

SOLAR.
M-1322; 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For cutters, reamers, forming dies; water or oil hardened.

SOLAR ECLIPSE.
M-891; C, alloy, bal Fe.
For cold hobbing dies; oil hardened.

SOLBISKYS ALLOY.
Germ.; 1.4 Zn, 0.5-1.0 Ni, 0-3 Cd, 0.3 Sn, bal Al.
For light alloy parts; non-hardenable.

SOLDALOY NO. 1.
M-265; Cu alloy.
65,000 TS; 20 El; 93-137 Brin.
For soldering iron tips; 85% electrical conductivity

SOLDALOY 2.
M-265; Cu alloy. For soldering iron tip; high thermal conductivity 40%.

SOLDALOY NO 8.
M-265; Cu alloy
90,000 TS; 10 El; 165, 210, 137 Brin.
For soldering iron tips; 50% electrical conductivity.

SOLDERAL.
M-427; 5 Si, bal Al.
For Al solder, castings; non-corroding.

SOLDER HC
M-870; Pb-Sn.
20,000 TS.
For solder for Al

SOLDER NO. 1.
Eng., 30-40 Sn, 2-3 Sb, bal Pb.
6890 TS, 117 El; 12 Brin.
For commercial lead solders M.P. 401°F.

SOLDER NO. 2.
Eng.; 50 Sn, 50 Pb.
6400 TS; 96 El; 11 Brin
For commercial lead solders; M.P. 446°F.

SOLDERZIT
M-1137; Pb, Sn
For soft soldering, powdered soft solder and flux combination.

SOLDIER A26.
M-1415, 0.3 C, 9 W, 3.25 Cr, 0.2 V, bal Fe
For rivet dies, extrusion and press dies, mandrels; hot work steel, oil hardened.

SOLDIER A26N.
M-1415, 0.25 C, 8.5 W, 3 Cr, 0.25 V, 2.5 Ni, bal Fe
For rivet dies, extrusion and press dies, mandrels; hot work steel, oil hardened.

SOLDIER CHROME H.33
M-1415 0.95 C, 4 Cr, bal Fe.
For hot shears, upsetters, punches; hot work steel for nonferrous metals.

SOLDIER M 314
M-1415; 0.35 C, 1 Cr, 3 Ni, 0.3 Mo, 0.5 Mn, bal Fe.
For die casting dies, stamping die blocks; hot work steel, oil hardened

SOLDIER P.23
M-1415; 0.4 C, 1 Si, 5 Cr, 4 W, 0.4 Mo, bal Fe.
For hot dies, punches, mandrels, gripper dies; hot work steel, air or oil hardened.

SOLDIER SCT C.16 B
M-1415, 0.5 C, 1.5 Cr, 2 W, 0.2 V, 1 Si, bal Fe.
For shear blades, swaging dies; hot work steel, shock resistant.

SOLEIL-1.
M-1043; 0.38-0.43 C, 13 Cr, bal Fe.
For valves, cutlery, surgical and dental instruments; Type 420; corrosion resistant.

SOLEIL 1.2.
M-1302; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS; 40,000 YS; 32 El; 68 RA; 170 Brin.
Heat treated: 256,000 TS; 190,000 YS; 6 El; 10 RA; 540 Brin.
For cutlery, valve trim, turbine blades; Type 420; stainless, hardenable.

SOLEIL-2.
M-1043; 0.19-0.25 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For turbine blades, valves, cutlery, surgical instruments; Type 420; corrosion resistant.

SOLEIL NO. 2.
M-1043; 0.32 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For valves, cutlery, surgical instruments; corrosion resistant.

SOLEIL 2B.
M-1043, M-1546; 0.20 C, 13 Cr, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 30 El; B 90 Rock.
Ht. Tr.: 225,000 TS; 160,000 YS; 8-16 El.
For cutlery, turbine blades, valves, pumps, furnace parts, pistons.
Type 420 stainless steel. Hardenable. Corrosion and heat resistant.

SOLEIL 3.
M-1302, M-1043; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Heat treated: 120,000-135,000 TS; 110,000-117,000 YS; 16-15 El; 63-58 RA; 220-240 Brin.
For cutlery, valves, turbine blades; Type 410; corrosion resistant.

SOLEIL-4.
M-1043; 0.14 C, 13 Cr, 1 Mo, bal Fe.
For turbine blades, valves, cutlery, surgical instruments; corrosion resistant.

SOLEIL 4S.
M-1546; 0.05 C, 13 Cr, 0.2 Al, bal Fe.
Annealed: 68,000 TS; 38,000 YS; 30 El.
For oil refinery equipment, cracking stills, tubes for the petroleum industry.
Ferritic stainless steel. Non-hardenable.

SOLEIL 16.
M-1546; 0.06 C, 16.5 Cr, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 30 El; 140 Brin.
For food and chemical industries, nitric acid equipment, cooking utensils.
Ferritic stainless steel. Resists nitric acid, non-hardenable.

SOLEIL 17.
M-1546; 0.20 C, 17 Cr, bal Fe.
Annealed: 80,000 TS; 45,000 YS; 30 El; 130 Brin.
For chemical plant and oil refinery equipment, fixtures, pump parts.
Ferritic stainless steel, non-hardenable.

SOLEIL 18.
M-1302, M-1043; 0.12 max C, 14-18 Cr, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 30 El; 55 RA; 150 Brin.
Cold drawn: 130,000 TS; 120,000 YS; 2 El; 185 Brin.
For oil refinery equipment, bolts, kitchen sinks; Type 430; stainless, ferritic.

SOLEIL-30.
M-1043; 0.10 C, 21 Cr, 1.5 Ni, bal Fe.
For furnace parts and equipment; heat resistant.

SOLEIL O.
M-1546; 0.44 C, 14 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; B 92 Rock.
For cutlery, turbine blades, diesel engine pistons, surgical instruments.
Martensitic stainless steel. Hardenable. Corrosion and heat resistant.

SOLEIL T1.
M-1546; 0.20 C, 0.4 Cb, 11 Cr, 0.75 Mo, 0.5 V, 0.3 Ni, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; B 92 Rock.
Heat treated: 240,000 TS; 205,000 YS; 9 El; C 50 Rock.
For surgical instruments, hardware, knives, gears, shafts.
Corrosion resistant, hardenable.

SOLEIL T2.
M-1546; 0.20 C, 11 Cr, 1 Mo, 0.8 Ni, 0.35 V, 0.6 W, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened: 240,000 TS; 205,000 YS; 9 El; C 50 Rock.
For valves, bearings, cutlery, surgical instruments.
Corrosion resistant, hardenable.

SOLID DRILL.
M-783; 1.05 C, 0.35 Mn, bal Fe.
For granite drills; water hardened.

SO-LUMINUM.
55 Sn, 33 Zn, 11 Al, 1 Cu.
For aluminum solder.

SOLUSAL
M-388, M-427; Cu, Si, bal Al.
34,000 TS; 16 El.
For airplane, automobile and marine parts to resist corrosion; light alloy.

SONA-METALL.
M-893, 0.2-0 7 Si, 3-4 Cu, 0 7 Sn, 0 5 Mg, 1 0 Fe, 0 2 Ni, bal Al.
36,000-50,000 TS; 4-7 El; 60-90 Brin
For light alloy parts, age-hardenable.

SONDERLEGIERUNG.
M-116; 1 Mn, 0.2 Si, 0.5 Fe, bal Al.
Annealed: 19,000 TS; 14,000 YS; 30 El.
For deep drawing parts; corrosion resistant.

SONDERMESSING.
Germany; Cu, alloy, bal Zn.
For nuts, bolts, hardware; special alloy high tensile brass.

SONDERSTAHL DAUER D-X.
M-1310; 2.1 C, 11.5 Cr, 0 35 Si, 0.30 Mn, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

SONDERSTAHL MIME EXTRA ZH.
M-1310; 1.05 C, 0.25 Si, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For blanking and forming dies; oil hardened, tough.

SONDERSTAHL TCK.
M-1310; 1.0 C, 1.1 Cr, 0.07 Mn, 0.25 Si, bal Fe.
For bearings, liners, sleeves, cutters; water hardened, wear resistant.

SOREL'S ALLOY-1.
Eng.; 80 Zn, 10 Cu, 10 Fe.
For bearings.

SOREL'S ALLOY-2.
Eng.; 98 Zn, 1 Cu, 1 Fe.
For bearings.

SORMITE.
M-515; 30 Cr, 4.5 Si, 1.1 Mn, 3.2 C, 5.3 Ni, bal Fe.
To replace certain Stellite alloys, hard facing; hard alloy, wear and corrosion resistant.

SORMITE.
Russia; 1.75 C, 15.5 Cr, 2 Ni, 2 Si, bal Fe.
For blanking and forming dies, gages, punches; air hardened, non-deforming.

SOS6-6.
Russia; C, alloy, bal Fe.
Bearings for high speeds and pressures: anti-friction.

SP 35X.
M-959; 35 Sn, bal Pb.
Block solder; melt range: 358-460°F.

SP 40X.
M-959; 40 Sn, bal Pb.
Block solder; melt range: 358-448°F.

SPANAL 320.
M-324; 2.5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, 0 5-2.5 Pb, Sn, Cd, Bi, bal Al.
Annealed· 27,000 TS; 11,000 YS; 22 El, 47 Brin.
Heat treated: 72,000 TS; 57,000 YS; 130 Brin.
For screw machine products, aircraft parts; free-cutting, age-hardenable.

SPANG CHALFANT 1.
M-735; 0 15 C, 2 Cr, 0.5 Mn, 0 5 Mo, bal Fe.
Rolled: 66,500 TS; 40,500 YS; 40 El; 131 Brin.
For gears, shafts, rolls, case hardened

SPANG CHALFANT 2.
M-735; 0.1-0 2 C, 0 5 Mn, bal Fe.
Rolled: 62,400 TS; 36 El; 126 Brin.
For gears, shafts, rolls; case hardened.

SPANG CHALFANT 3.
M-735, 0 1 0 2 C, 0 45-0 65 Mo, bal Fe.
Rolled. 64,000 TS, 32,500 YS, 37 El, 126 Brin
For gears, shafts, rolls; case hardened.

SPANVAL 320
Eng.; C, alloy, bal Fe.
For engineering structures, strong.

SPARKALOY.
M-61, 1 Si, 4 Mn, bal Fe.
For spark plugs, wear resistant

SPARKONITE 1
M-265; 95 Cu, 5 $BaCO_3$
Sintered material for EDM electrodes (electrical discharge machining).

SPARKONITE 2A
M-265; 97 2 Cu, 2 8 ZrO_2.
Sintered material for EDM electrodes.

SPARKONITE 3.
M-265, Special graphite base composition.
For EDM electrodes

SPARKONITE 7.
M-265; 70 W, 30 Cu.
Sintered material for EDM electrodes.

SPARKONITE 10.
M-265; 68 W, 32 Cu.
Sintered and infiltrated material for electrodes for EDM (electrical discharge machining).

SPARK PLUG METAL.
M-68; 94 Ni, 2-6 Mn, traces Fe + Cu.
74,000 TS; 24,000 YS; 51 El; 60 RA.
For spark plug wire; P.L. 20,000; "D" Nickel.

SPARTA.
M-114; 1 05 C, 5 Cr, 0.9-1 25 Mo, 0.25 V, bal Fe.
For cutting tools, dies, punches; air hardened.

SPARTA 80.
M-114; 0.8 C, 0.65 Mn, 5.25 Cr, 1.1 Mo, 0.25 V, bal Fe.
For blanking and forming dies, punches; air hardening.

SPARTA CV.
M-114; 2.35 C, 5.25 Cr, 4 V, 1 Mo, 1 W, bal Fe.
Hardened: 65-67 Rock C.
For blanking and forming dies, lamination and coining dies, cold shear blades, plug gauges.
Type A7 cold work die steel. Abrasion resistant.

SPARTAN-5.
M-435; 0.5 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutting tools, shear blades; high speed steel, hot work tools.

SPARTAN-7.
M-435; 0.7 C, 0.25 Mn, 18 W, 4 Cr, 1.2 V, bal Fe.
For hot shear blades, drills, seamers, tips, broaches; high speed steel.

SPECIAL.
M-341, 0 7 C, 4 Cr, 1 V, 1.5 W, 9.5 Mo, bal Fe.
For cutting tools, drills; high speed steel.

SPECIAL.
M-344; C, W, bal Fe.
For dies, high duty shafts; hot dies; oil hardened.

SPECIAL.
M-388; 0.8 C, 0.2 V, 0.8 Cr, bal Fe.
For tools, cutters; oil hardened.

SPECIAL
M-389; 0.7 C, 18 W, 4 Cr, 2 V, bal Fe.
For tools, cutters, high speed steel.

SPECIAL 8 T
M-115; 0.80 C, 0 12 V, bal Fe.
Annealed. 70,000 TS; 45,000 YS; 25 El; 57 RA; 170 Brin
Heat treated. 258,000 TS; 240,000 YS; 5 RA; 465 Brin
For tools for general purposes; water hardening.

SPECIAL 10 T
M-115, 1 0 C, 0 12 V, bal Fe
Annealed· 70,000 TS; 45,000 YS; 25 El; 57 RA; 170 Brin.
Heat treated: 258,000 TS; 240,000 YS; 5 RA; 465 Brin.
For tools, drills, taps, water hardening.

SPECIAL NO 18
M-336, M-341; 0.45 C, 1 4 Cr, 2.2 W, 0.2 V, 0.3 Mo, bal Fe
180 Brin
For pneumatic tools, shear blades, chisels, rivet sets; shock tool steel

SPECIAL NO 18S.
M-336, 0.45 C, 1 4 Cr, 2.2 W, 0 3 Mo, 1.0 Si, 0.2 V, bal Fe.
For shear blades, rivet busters, chisels; shock resistant.

SPECIAL NO 19.
M-336; C, W, Mn, Cr, bal Fe.
200 Brin
For taps, thread dies; oil hardened

SPECIAL NO. 20
M-336; C, Cr, W, Mn, V, bal Fe.
240 Brin.
For finishing tools; oil hardened.

SPECIAL ALLOY.
M-389; 0.7 C, 1 Mn, 0 4 Cr, bal Fe.
For tools, dies; water hardened.

SPECIAL ALLOY (DISSTON).
M-357, 0.45 C, 0.8 Cr, bal Fe
For tools, punches, dies; water hardened.

SPECIAL ALLOYS.
M-373; C, alloy, bal Fe.
For tools.

SPECIAL ALUMINUM.
U.S.; 10.5-10.7 Al, 3.1-4.25 Fe, 3.6 Ni, 0-1.6 Mn, bal Cu.
200-300 Brin.
For worm wheels, gears, trolley shoes; heat treatable.

SPECIAL BB.
M-261; 0.28 C, 3.20 Cr, 0.30 V, 9.50 W, bal Fe.
Hardened: 243,000 TS; 215,000 YP; 12 El; 37 RA; 50 Rock C.
For die casting dies for brass and aluminum bronze, extrusion dies and liners, hot forging dies.
Oil or air hardening; AISI Type H21.

SPECIAL CARBON.
M-73; 1.0 C, 0.25 Mn, 0.10 max Cr, bal Fe.
For drills, tools, taps; water hardened.

SPECIAL CARBON.
M-97; 0.65-1.4 C, 0.3 Mn, 0.25 Si, bal Fe.
For cold work dies; water hardening.

SPECIAL CARBON SSC.
M-40, 0.95 C, 0.35 Ni, V, bal Fe.
For tools, punches; water hardened.

SPECIAL CARBON WITH V.
M-73; 1.0 C, 0.2 Mn, 0.2 V, 0.10 max Cr, bal Fe.
For drills, tools; water hardening.

SPECIAL CHROME VANADIUM.
M-365; 0.6 C, 0.9-1 0 Cr, 0.2 V, bal Fe.
For tools, punches; oil hardened.

SPECIAL COLD PRESSING VANADIUM STEEL.
M-112; 1.1 C, 0.2 Si, 0.3 Mn, 0.2 V, bal Fe.
For cold heading dies, swaging dies; water hardened, shock resistant.

SPECIAL CONQUEROR
M-1406; 0.85-1.1 C, bal Fe.
Heat treated: 190,000 TS, 145,000 YS; 10 El; 30 RA; 400 Brin.
For rock drills, punches, taps, shear blades; water hardened; Type W1.

SPECIAL D
M-344; C, W, bal Fe.
For tools; oil hardened.

SPECIAL DOUBLE CROWN
M-530, 0.15 max C, 0.6 Mn, 0 2 Si, 0.03 max S + P, bal Fe.
Rolled: 50,000-63,000 TS; 30,000-36,000 YS, 25 El
For locomotive fire box parts; good weldability

SPECIAL DRACO.
M-114; 0.7 C, 1 4 Cr, 0.2 V, bal Fe
For tools, dies, drills; water hardened.

SPECIAL DYNAMO
M-806; 0.04 C, 3.2 Si, bal Fe.
Annealed: 75,000 TS, 55,000 YS; 12 El.
For induction and power and radio transformers; low loss.

SPECIAL G.
M-782; 0.7-1.2 C, bal Fe.
For tools; water hardened.

SPECIAL HS-55.
M-24; 0.50 C, 4 Cr, 1 V, 18 W, bal Fe.
Air Hardened, C 60-62 Rock.
Oil Hardened: C 60-64 Rock.
For extrusion and forging dies, swaging and pressing dies, punches, hammer tools.
Type H26 Hot work steel, high red-hardness and toughness.

SPECIAL HDS.
M-486; 0.28 C, 3.2 Cr, 0.3 V, 9.5 W, 0.3 Mo, bal Fe.
For die casting dies, hot swaging dies; hot die steel.

SPECIAL "H.M." OIL HARDENING STEEL.
M-69; 0.90 C, 1.7 Mn, 0.20 V, bal Fe.
For cutting tools, drawing and blanking dies, punches, form cutters; max hardness and superior cutting qualities.

SPECIAL HOT DIE.
M-1112; 9.5 W, 2.5 Cr, 0.10-0.15 V, bal Fe.
For cutting tools, dies; hot die steels.

SPECIAL HS55.
M-24; C, W, Cr, V, bal Fe.
For tools, dies; oil hardened.

SPECIAL K.
M-27, M-1405, M-1618; 1.9 C, 13.5 Cr, 0.65 Si, 0.3 Mn, bal Fe.
For punches, dies, swaging and forming tools; air or oil hardened; non-deforming.

SPECIAL K.
M-363; 2 2 C, 12 Cr, 0 6 Si, 0 3 Mn, bal Fe.
For punch and die work tools, cutting dies, plug gages; non-deforming.

SPECIAL K5
M-118; 2 C, 5 Cr, bal Fe.
For tools, dies, forming and blanking dies; air hardened, non-deforming.

SPECIAL K5.
M-1618; 1.0 C, 0 7 Mn, 0.3 Si, 5.3 Cr, 0 15 V, 1.0 Mo, bal Fe
Annealed· 103,000 TS; 51,000 YS; 26 El, C 18 Rock.
Ht. Tr · 253,000 TS, 200,000 YS, 3 El, C 53 Rock
For blanking and trimming dies, shear blades, broaches, cutters, punches
Type A2 air hardening tool steel, nondeforming.

SPECIAL KCO
M-27, M-1618, 1 27 C, 12 Cr, 0 35 V, 3 Co, bal Fe
Ht Tr . 180,000-200,000 TS, 1 El
For broaches, burnishing tools, slitter cutters, shears, chasers, reamers, hobs, milling cutters
Type D5 tool steel, air hardening, non-deforming

SPECIAL KMV
M-27, M-1618, 1 55 C, 11.5 Cr, 0.3 Ni, 0 95 V, 0 8 Mo, bal Fe.
Ht Tr 278,000 TS, 214,000 YS, 1 El; C 56 Rock.
For blanking and drawing dies, punches, gages, mandrels, broaches, thread rolling dies, hobs.
Type D2 air hardening, nondeforming. High abrasion resistance.

SPECIAL KN
M-1182; 1 5 C, 12 Cr, 1 Mo, bal Fe
For blanking and forming dies, punches, Type D2, air hardened, non-deforming.

SPECIAL KR
M-1182, 2.25 C, 12 Cr, bal Fe.
For lamination and blanking dies, punches; Type D3, oil hardened, non-deforming

SPECIAL KRM
M-27, M-1618; 2.15 C, 12 Cr, 0.2 V, 0.8 Mo, bal Fe
Heat treated· C 63-67 Rock.
For thread rolling dies, extrusion dies, gauges, knurlers, shear blades.
Type D4 tool steel. Heat and abrasion resistant. Oil hardening

SPECIAL LOHYS.
M-1591; 0.75 Si, 99 25 Fe
Initial permeability 400.
Max. permeability 5350.
Coercive force 0.85.
For electrical equipment, magnetic instruments.
Soft magnetic material.

SPECIALLOY.
M-1704; 0.51 C, 0.93 Mn, 0.98 Cr, 0.52 Ni, 0.22 V, 0.25 Mo, bal Fe.
Low alloy medium carbon oil hardening tool steel.

SPECIALLOY 1026.
M-1236; 10 Fe, 90 Cu.
For brass alloying; addition agent.

SPECIALLOY 1029.
M-1236; 99.9 min Cu.
For iron and steel alloying; addition agent.

SPECIALLOY 1214.
M-1236; 4 Si, 1.1 Mn, bal Cu.
For brass alloying; addition agent; Everdur.

SPECIALLOY 1224.
M-1236; 5 Cr, 95 Cu.
For brass alloying; addition agent.

SPECIALLOY 1414.
M-1236, 15 Si, bal Cu.
For brass alloying; addition agent.

SPECIALLOY 1725.
M-1236, 30 Mn, 70 Cu.
For brass alloying; addition agent.

SPECIALLOY 1728.
M-1236, 30 Ni, 70 Cu.
For brass alloying; addition agent

SPECIALLOY 1950
M-1236; 5 Ni, 5 Sn, 2 Zn, 88 Cu.
For brass alloying; addition agent; Ni-Vee.

SPECIALLOY 2029.
M-1236, 70 Ni, 30 Cu
For iron alloying; addition agent.

SPECIALLOY 2829.
M-1236; 50 Ni, 50 Cu.
For brass alloying, addition agent

SPECIALLOY 2929
M-1236, 65 Ni, 32 Cu.
For iron and steel alloying; addition agent.

SPECIALLOY 2929A
M-1236, 60 min Ni, 30 min Cu
For iron and steel alloying; addition agent.

SPECIALLOY 3028
M-1236; 45 Ni, 15 Cr, bal Fe
For iron and steel alloying; addition agent

SPECIALLOY 3028A.
M-1236; 70 Ni, 15 Cr, bal Fe.
For iron and steel alloying, addition agent.

SPECIALLOY 3928.
M-1236; 60 Ni, 24 Cu, 8 Cr, bal Fe
For cast iron alloying; addition agent.

SPECIAL MANGANESE NICKEL.
M-872; 0.4 C, 12-14 Mn + Ni, bal Fe.
For welding electrode, hard facing; shielded arc.

SPECIAL M-O HIGH SPEED.
M-97; 0.79-0.86 C, 6.0-6.75 W, 4 Cr, 5 Mo, 2 V, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

SPECIAL MOTOR.
M-806; 0.04 C, 2.5 Si, bal Fe.
Annealed: 67,000 TS; 50,000 YS; 15 El.
For rotating equipment, motors.

SPECIAL MS.
M-459, M-1496; 0.28 C, 0.5 Si, 0.3 Mn, 1.2 Cr, 1.4 Mo, 0.25 V, 2.3 W, 2.3 Co, bal Fe.
For die casting dies, extrusion press components. Thermal shock resistance.

SPECIAL OIL HARDENING.
M-69; 0.90 C, 1.7 Mn, 0.2 Cr, bal Fe.
Annealed: 190 Brin.
For spindles, hobs, press tools, punches, crimpers; non-deforming, oil hardened.

SPECIAL OIL HARDENING.
M-389; 0.9 C, 1.2 Mn, bal Fe.
For tools, dies; non-deforming.

SPECIAL OIL HARDENING.
M-275; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies, punches; non-deforming.

SPECIAL OILWAY.
M-345; 0.90 C, 1.6 Mn, bal Fe.
For tools, dies, punches, cutters; Type O2; oil hardened.

SPECIAL PISTON STEEL.
M-57; 1.05 C, 0.25 Mn, bal Fe.
For pistons; water hardened.

SPECIAL POWER TRANSFORMER NO. 65.
M-806, 0.03 C, 4 Si, bal Fe.
Annealed: 73,000 TS; 62,000 YS; 8 El.
For power and radio transformers; high permeability.

SPECIAL PUNCH.
M-73; 1 C, 2 W, bal Fe
For punches; tough.

SPECIAL PUNCH & CHISEL STEEL.
M-81; 0.5 C, 0.25 Mn, 2.15 W, 1.5 Cr, 0.25 V, bal Fe.
For punches, chisels, pneumatic tools; tough, shock resistant.

SPECIAL R 2
M-261, M-486, 0.2 C, 13 Cr, bal Fe.
Hardened: 210,000-140,000 TS; 195,000-120,000 YS; 10-15 El; 461-300 Brin.
For plastic molding dies; corrosion resistant.

SPECIAL SEHR HART.
M-27; 1.4 C, 0.65 Cr, 4.75 W, 0.25 V, bal Fe.
For tools, dies, cutters; oil hardening.

SPECIAL SEHR HART A.
M-27, 1.4 C, 3.25 W, 0.65 Cr, 0.25 V, bal Fe.
For tools, dies, cutters; oil hardening.

SPECIAL SHELL TURNING.
Eng; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For high speed cutting; high speed steel.

SPECIAL SIFBRONZE 22% NICKEL.
M-243; 22 Ni, bal Cu
Welded: 70,000 TS; 54,000 YS; 4 El; 216 Brin.
For welding rod for stainless steel and cast iron; wear resistant.

SPECIAL TOOL
M-38, 0.7-1.2 C, bal Fe.
For cutters, drills, broaches, dies; water hardened.

SPECIAL V.
M-140; 0.6-1.2 C, 0.20 V, 0.25 Mn, 0.25 Si, bal Fe.
For drills, reamers, punches, taps, knives, razors; Type W1; water hardened.

SPECIAL VANADIUM.
M-339; C, bal Fe.
For dies, cold punches, impact tools, shear blades; tough and shock resistant.

SPECIAL VANADIUM.
M-35; C, alloy, bal Fe.
For tools, dies; oil hardening.

SPECIAL VANADIUM.
M-275; 0.8-1.6 C, 0.2 V, bal Fe.
For tools, dies; water hardened.

SPECIAL VANADIUM.
M-365; 0.8-1.1 C, 0.10-0.20 V, bal Fe.
For tools; water hardened.

SPECIAL VERY HARD.
M-363; 1.1 C, 2.8 W, bal Fe.
For fast finishing tools; oil or water hardened.

SPECIAL W 2.
M-459; 0.3 C, 2.2-2.5 Cr, 0.3-0.5 V, 2 W, bal Fe.
For tools, dies; for extrusions.

SPECIAL W5.
M-459; 0.3 C, 2.4 Cr, 0.55 V, 4.5 W, bal Fe.
For tools, dies, extrusion press mandrels, hot punching dies.
Hot work steel, tough.

SPECIAL W10D1.
M-35; 0.7-1.2 C, 0.15 Cr, 0.25 Mn, bal Fe.
For forming dies, reamers, roll thread dies; water hardened.

SPECIAL WIRE DRAWING DIE.
M-35; 2 C, 1.8 Mn, 1.85 Cr, 10.5 W, 0.5 Mo, bal Fe.
For drawing dies; for wire.

SPECIAL XX.
M-57; 1.05 C, 0.25 Mn, bal Fe.
For tools, drills, taps; water hardened.

SPECIFICATION 55-ALLOY STEEL.
M-38; 0.68 C, 0.6 Mn, 0.3 Si, 0.65 Ni, 0.70 Cr, 0.20 Mo, bal Fe.
Oil hardenable to 62 Rc.
For chain saw links, cutters, drive links, power saw blades.

SPECULUM.
68.25 Cu, 31.75 Sn.
For reflectors, mirrors; Cu_4Sn.

SPECULUM METAL.
U.S.; 68-66 Cu, 32-34 Sn.
Rolled: 4,000-6,000 TS; 0 El.
For telescope reflectors, mirrors; resists tarnish; approximately Cu_4Sn.

SPEDEX.
M-135; 8-20 Ni, 2 Pb, 25 Zn, bal Cu.
For keys, electroplaters, sundries, gas and electric meters, carburetors, screws, nickel silver, free machining.

SPEED ALLOY.
M-173, 0.35 C, 1.04 Cr, 0.002 B, 1.15 Mn, bal Fe.
Rolled: 105,000 TS; 65,000 YS; 20 El; 207 Brin.
For cams gears, racks, yokes, platens, die casting dies. Oil hardening

SPEED-ALLOY 66.
M-849; Flux cored weld wire.
Typical deposit analysis: 0.08 C, 1.30 Mn, 0.40 Si. (using Co_2 shielded gas).
Welded: 77,000 TS, 65,000 YS; 21 El.
For welding mild steel. AWS E70T-G.

SPEED ALLOY 71.
M-849; Flux cored weld wire.
Typical deposit analysis; 0.08 C, 1.10 Mn, 0.50 Si. (using CO_2 shielding gas).
Welded: 87,000 TS; 75,000 YS; 25 El.
For welding mild steel. AWS E70T-1.

SPEED-ALLOY 73.
M-849; Flux cored weld wire.
Typical deposit analysis: 0.10 C, 1.85 Mn, 0.95 Si.
Welded: 120,000 TS; 112,000 YS; 18 El.
For welding low alloy, high strength steel.
AWS E70T-3.

SPEED-ALLOY 74.
M-849; Flux cored weld wire.
Typical deposit analysis: 0.09 C, 1.0 Mn, 0.30 Si.
Welded: 88,000 TS; 70,000 YS; 22 El.
For welding mild steel. AWS E70T-4.

SPEED-ALLOY 75.
M-849; Flux cored weld wire.
Typical deposit analysis: 0.08 C, 1.2 Mn, 0.55 Si. (using CO_2 shielding gas).
Welded: 76,450 TS; 64,100 YS; 32 El.
For welding mild steel. AWS E70T-5.

SPEED-ALLOY 75-A1.
M-849; Flux cored low alloy weld wire.
Typical deposit analysis: 0.08 C, 0.85 Mn, 0.40 Si, 0.55 Mo.
Welded. 78,000 TS; 66,000 YS; 21 El.
For welding carbon 0.5 Mo steels.
AWS E70T-G.

SPEED ALLOY 85.
M-849; Flux cored low alloy weld wire.
Typical deposit analysis: 0.08 C, 1.0 Mn, 0 40 Si, 1 60 Ni, 0.20 Mo.
Welded. 85,700 TS; 70,200 YS; 26 El.
For welding low alloy steels with a tensile strength of about 80,000 psi.
AWS E80T.

SPEED-ALLOY 85-B2L.
M-849; Flux cored low alloy weld wire.
Typical deposit analysis: 0.03 C, 0.90 Mn, 0.45 Si, 1 35 Cr, 0 50 Mo
Welded: 85,000 TS; 72,000 YS, 17 El.
For welding Cr-Mo pipe and plate.

SPEED-ALLOY 85-C1.
M-849; Flux cored low alloy weld wire.
Typical deposit analysis: 0.08 C, 1.1 Mn, 0 50 Si, 2 60 Ni.
Welded. 104,500 TS, 85,000 YS; 21 El.
For welding 2½% nickel steels, good low temperature impact properties.
AWS E80T.

SPEED-ALLOY 85-C2.
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.06 C, 0.85 Mn, 0 40 Si, 3 50 Ni.
Welded· 82,000 TS; 70,000 YS; 28 El.
For welding 3½% nickel steels, good low temperature properties. AWS E80T.

SPEED-ALLOY 85-C3
M-849; Flux cored alloy weld wire
Typical deposit analysis. 0.05 C, 0.90 Mn, 0 55 Si, 0.90 Ni, 0.55 Mo.
Welded 86,000 TS; 72,000 YS; 25 El.
For welding low alloy, high strength steels in the 80,000 psi tensile strength range.
AWS E80T.

SPEED-ALLOY 91.
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.08 C, 1.35 Mn, 0.40 Si, 1.70 Ni, 0 20 Mo.
Welded: 98,000 TS; 89,250 YS; 20 El
For welding low alloy, high strength steels in the 90,000 psi tensile strength range.

SPEED-ALLOY 91-B3.
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.09 C, 0.75 Mn, 0.50 Si, 2.25 Cr, 1.0 Mo.
Welded: 130,000 TS; 120,000 YS; 12 El.
For welding Cr-Mo steel for high temperature operation.

SPEED-ALLOY 91-B3L.
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.035 C, 0.95 Mn, 0.45 Si, 2.20 Cr, 1.0 Mo.
Welded: 95,000 TS; 82,000 YS; 16 El.
For welding Cr-Mo steel for high tempereature operation.

SPEED-ALLOY 95.
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.07 C, 1.30 Mn, 0.40 Si, 1.80 Ni, 0.25 Mo.
Welded: 94,000 TS; 81,000 YS; 21 El.
For welding low alloy, high strength steels in the 90,000 psi tensile strength range.
AWS E90T.

SPEED-ALLOY 95-D1.
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.07 C, 1.65 Mn, 0.40 Si, 0.45 Mo.
Welded: 105,000 TS; 97,000 YS; 22 El.
For welding Mn-Mo steels in the 90,000-100,000 psi tensile strength range. AWS E90T.

SPEED-ALLOY 105.
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.07 C, 1.45 Mn, 0.40 Si, 2.10 Ni, 0.35 Mo.
Welded: 108,500; 96,000 YS; 22 El.
For welding low alloy, high strength steels in the 100,000 psi tensile strength range.
AWS E100T.

SPEED-ALLOY 105-D2.
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.08 C, 1.90 Mn, 0.50 Si, 0.40 Mo.
Welded: 107,500 TS; 86,750 YS; 25 El.
For welding Mn-Mo steels for 100,000 min tensile strength. AWS E110T.

SPEED-ALLOY 111
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.07 C, 1.40 Mn, 0.40 Si, 2.30 Ni, 0.35 Mo
Welded: 117,000 TS, 105,000 YS; 21 El
For welding low alloy, high strength steels in the 110,000 psi tensile strength range.
AWS E110T.

SPEED-ALLOY 115.
M-849, Flux cored alloy weld wire,
Typical deposit analysis; 0.08 C, 1.60 Mn, 0.40 Si, 2.30 Ni, 0.40 Mo.
Welded: 118,000 TS, 108,000 YS, 21 El.
For welding low alloy, high strength steels in the 110,000 psi tensile strength range.
AWS E110T.

SPEED-ALLOY 121-H.
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.18 C, 1.40 Mn, 0.40 Si, 0.45 Cr, 1.25 Ni, 0.30 Mo.
Welded: 135,000 TS; 92,000 YS; 9 El.
Designed for repair and reclamation of AISI 4130 castings; a heat treatable deposit.

SPEED-ALLOY 125.
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.085 C, 1.60 Mn, 0.40 Si, 0.40 Cr, 2.20 Ni, 0.45 Mo.
Welded: 130,000 TS; 120,000 YS; 19 El.
For welding low alloy, high strength steels, in the 120,000-130,000 psi tensile strength range.
AWS E110T.

SPEED-ALLOY 5025.
M-849; Flux cored alloy weld wire.
Typical deposit analysis: 0.05 C, 1.0 Mn, 0.55 Si, 5.10 Cr, 0.35 Ni, 0.55 Mo.
Welded and stress relieved at 1350°F: 98,000 TS; 86,000 YS; 22 El.
For welding 5% Cr-1% Mo plate and pipe.

SPEEDALOY.
M-987; 2.0 C, 32 Cr, 18 W, 48 Co.
Cast alloy for cutters, tools.

SPEEDALOY.
M-908; 2.0 C, 32 Cr, 18 W, 48 Co.
For dies, cutters, tool bits; cast alloy.

SPEEDALOY.
M-1067; 2.0 C, 32 Cr, 18 W, 48 Co, 2 Fe.
For tools, cutters, dies; cast alloy.

SPEED CASE.
M-173, M-1024; 0.20 C, 1.25 Mn, 0.25 Si, 0.02 P, bal Fe.
Rolled: 70,000 TS; 45,000 YS; 30 El; 54 RA.
For carburized gears, cams, shafts, camshafts, jigs, figures.
Free-machining, case-hardening.

SPEEDCASE X-1515.
M-894; 0.15 C, Mn, bal Fe.
For screw machine parts; free machining.

SPEED CASE X-1525.
M-495, 0.20 C, bal Fe.
Hot rolled: 70,000 TS; 52,000 YS, 37.5 El; 60 RA; 137 Brin.
Cold rolled: 85,000 TS; 80,000 YS; 26 El; 48 RA; 156 Brin.
For case hardened parts, gears, shafts, pinions; carburizing steel.

SPEEDICUT 14.
M-56, 0.60 C, 3.5 Cr, 0.65 V, 14 W, bal Fe.
For lathe and planer tools, hobs, drills, reamers; high speed steel.

SPEEDICUT LEDA.
M-56, 0.75 C, 4 Cr, 7 Mo, 1.4 V, 18 W, 5.2 Co, bal Fe.
Hardened: 600-700 Brin.
For high speed tools, cutters; super high speed steel for severe service; "Firth Brown K-203," "Browns Atlas AEI."

SPEEDICUT MAXIMUM.
M-56; 0.73 C, 22 W, 4.8 Cr, 1.5 V, bal Fe.
Hardened: 600-700 Brin.
For high speed tools, cutters, for severe service; "Firth Brown K-202."

SPEEDICUT MAXIMUM-18.
M-56; 0.75 C, 4.25 Cr, 1.4 V, 18 W, bal Fe.
For high speed tools, cutters; high speed steel "Firth Brown K-201"; "Browns Atlas Extra."

SPEEDICUT SIXLEDA.
M-56; 0.7 C, 15 Co, 20 W, 5.5 Cr, 0.7 Mo, bal Fe.
For lathe and planer tools, form cutters, turning tools, high speed steel, oil hardened.

SPEEDICUT SUPERLEDA.
M-56; 0.78 C, 4.8 Cr, 1 Mo, 2 V, 18.8 W, 9.3 Co, bal Fe.
For cutting tools, reamers; high speed steel.

SPEED STAR see **CARPENTER MEL-TROL SPEED STAR.**

SPEED TREAT.
M-1024; 0.45 C, 1.25 Mn, bal Fe.
Hot rolled: 90,000 TS, 60,000 YS; 23 El; 40 RA.
Cold finished. 105,000-100,000 TS; 80,000-85,000 YS; 18-19 El; 30-37 RA.
For gears, shafts, pinions, lead screws; "X1545 analysis."

SPEED TREAT X-1535.
M-495; 0.30-0.40 C, 0.25 S, bal Fe.
For screw machine parts; free machining.

SPEED TREAT X-1545.
M-894; 0.40-0.50 C, bal Fe.
For screw machine parts; free machining.

SPEED TREAT X-1545.
M-495; 0.40-0.50 C, 0.25 S, bal Fe.
For screw machine parts; free machining.

SPELTER WIRE.
Eng.; 64 Cu, 36 Zn, 0.4 Pb, 0.2 Fe.
For brazing.

SPERRY ALLOY 37.
M-701; 4.3 Si, 1.8 Mg, 3.5 Zn, 0.1 Cu, 0.2 Cr, 0.3 Fe, 0.4 Mn, bal Al.
For die castings, gimbal rings; high yield strength.

SPEZIAL NO. 5.
M-459; C, W, Cr, bal Fe.
For steel trimming and weld steel.

SPEZIAL BRONZE.
M-1386; Sn, bal Cu.
For hardware; corrosion resistant.

SPEZIAL EINSATZSTAHL ES2.
M-1352; 0.15 C, 0.10-0.40 Si, 0.25-0.80 Mn, bal Fe.
Annealed: 70,000 TS; 55,000 YS; 25 El; 60 RA; 145 Brin.
For gears, bolts, camshafts, cams, rivets, case hardened.

SPEZIAL W.
M-459; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams and dies, punches; oil hardened, tough.

SPEZIAL WSF.
M-459; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For extrusion rams and liners, punches; oil hardened, tough.

SPHERULITE.
M-1257; 3.0 C, 2.5 Si, bal Fe.
For housings, gears, shafts; cast iron.

SPHINX.
M-1120; 0.8 C, 2 Mn, 0.2 V, bal Fe.
For punches, dies, low temperature appliances; oil hardened.

SPHYNX.
M-1120; 0 8 C, 2.0 Mn, 0.2 V, 0 5 W, bal Fe.
For punches, crimpers, headers, cutters; oil hardened, non-deforming.

SPIAUTER.
Eng.; 90 Zn, 8 Sb, 2 Cu
For bearings, hard zinc.

SPIN 803PH.
M-1709; 0.05 C, 16 Cr, 4 Ni, 3 Cu, bal Fe.
Age Hardened: C 44 Rock; 190,000 TS.
Centrifugally-cast, high strength stainless steel; for bushings, bearing rings, small pressure vessels.

SPINNING SILVER.
Eng.; 67 Cu, 17 Zn, 16 Ni.
For spoons, forks, knives; spun and drawn.

SPOOLALLOY.
M-1263; C, alloy, bal Fe.
For heliarc welding wire; steel welding.

SPOON METAL.
Cu, Ni.
For spoons; nickel silver.

SPRABABBITT A.
M-853; 7.5 Sb, 3.5 Cu, bal Sn.
For wire for metal spraying; Babbitt.

SPRABRASS Y.
M-853; 34 Zn, bal Cu.
For wire for metal spraying; brass.

SPRABRONZE C.
M-853; 10 Sn, bal Cu.
For wire for metal spraying; bronze.

SPRABRONZE M.
M-853; 40 Zn, 58 Cu, 2 Sn, Fe, Mn.
For wire for metal spraying; bronze.

SPRABRONZE P.
M-853; 5 Sn, 0.25 P, bal Cu.
For wire for metal spraying; P-bronze.

SPRABRONZE T.
M-853; 39 Zn, 1 Sn, bal Cu.
For wire for metal spraying; Tobin bronze.

SPRAIRON A.
M-853; Fe.
For metal spraying; iron wire.

SPRASTEEL 10.
M-853; 0.10 C, bal Fe
For metal spraying; steel wire.

SPRASTEEL 25.
M-853; 0.25 C, bal Fe.
For metal spraying; steel wire.

SPRASTEEL 40.
M-853; 0.40 C, bal Fe.
For metal spraying; steel wire.

SPRASTEEL 80.
M-853; 0 80 C, bal Fe.
For metal spraying; steel wire.

SPRASTEEL 120.
M-853; 1.2 C, bal Fe
For metal spraying; steel wire

SPREEMETALL
M-621; 43 Zn, 1.5 Mn, 0 5 Pb, bal Cu.
Cold rolled: 86,000 TS; 50,000 YS; 5 El; 140 Brin
For sheets, bars, forgings; resists sea water corrosion.

SPRING BRASS.
M-33; 66-72 Cu, bal Zn.
Rolled: 95,000-120,000 TS, 70,000-80,000 YS, 4-2 El.
For springs, withstands drastic treatment

SPRING GOLD.
50 Cu, 25 Au, 25 Ag.
For jewelry, dental applications; corrosion resistant.

SPRING OREIDE
M-102, 92 Cu, 8 Sn.
Soft 55,000 TS; 25,000 YS; 75 El.
Hard· 120,000 TS; 117,000 YS, 1 El.
For spring contacts, switches, diaphragms; "Scovill No. 151 Alloy."

SPRING SILVER.
M-1066, M-237; 99 4 min Ag, 0 28 max Mg, 0.18 max Ni
Air Hardened 58,000 min TS; 5-15 El, 63-67 Rock (30T).
For spring contacts, switches, relays.
Air hardens by internal oxidation; 70% elect. cond. Good spring properties.

SPRING SILVER.
54 6 Cu, 27.3 Zn, 18 Ni
For corrosion resistant springs; corrosion resistant.

SPRING STEEL.
0.9-1 1 C, 0.4-0.8 Mn, bal Fe.
For springs; oil hardening.

SPRING WIRE BRASS.
U.S.; 70-74 Cu, 30-26 Zn.
100,000 TS.
For springs.

SPS 245.
M-435; 0.40 C, 0.75 Mn, 0.60 Cr, 0.15 Mo, bal Fe.
Annealed: 100,000 TS; 68,000 YS; 30 El; 58 RA; 187 Brin.
For shafts, gears, bolts, studs; Izod-45.

S.P.S SPECIAL.
M-96; 0.8 C, 2 W, 0.9 Cr, bal Fe.
For tools, cutters; water hardened.

SR STEEL IIA-1121.
M-1161; C, Cr, Ni, bal Fe.
Cast: 112,000 TS; 44,000 YS; 23 El; 16 RA; 200 Brin.
Rolled: 95,000 TS; 75,000 YS; 50 El; 65 RA.
For pumps, valves, propellers, heat exchangers; stainless, austenitic.

SR STEEL IIA-1123.
M-1161; C, Cr, Ni, bal Fe.
For chemical plant equipment; stainless, austenitic.

SR STEEL IIA-1132.
M-1161; 0.12 max C, 13-15 Ni, 11-13 Cr, 6-7 Mo, 5.5-6.5 Cu, bal Fe.
Annealed: 95,000 TS; 75,000 YS; 50 El; 65 RA; 180 Brin.
At 1500°F: 32,500 TS.
For chemical plant and food processing equipment; stainless, austenitic.

SR STEEL UST.
M-1161; 0.1 C, 20 Ni, 20 Cr, 10 max Cu + Mo, bal Fe
At 1600°F: 33,800 TS; 10 El, 17 RA
For chemical plant equipment; austenitic, stainless.

SS 1-6
M-459; 1.4-0.7 C, bal Fe.
For jaws, tools, springs; water hardening.

SS 1 EXTRA EXTRA.
M-459; 1.05 C, bal Fe.
For cutting tools; high hardness.

SS2.
M-459, 0.7-1.3 C, bal Fe
For cutting tools, drills, taps; Type W1, water hardened.

SS 2 EXTRA EXTRA.
M-459, 1.0 C, bal Fe
For scrapers, hard tools, drawing dies; water hardening

SS3
M-459; 1.1 C. 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed 110,000 TS, 58,000 YS, 19 El; 40 RA; 210 Brin
For springs, drills, reamers, broaches; Type W1; water hardened.

SS 3 EXTRA EXTRA.
M-459, 1.0 C, bal Fe
For medium hard tools, milling machine tools, water hardening.

SS4
M-459; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 185,000 TS; 120,000 YS; 10 El; 30 RA; 390 Brin.
For springs, taps, reamers, hobs, cutters; Type W1; water hardened

SS 4 EXTRA EXTRA.
M-459; 1.0 C, bal Fe.
For punches, edge engraving tools; tough.

SS5
M-459; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 140,000 YS; 10 El; 30 RA; 395 Brin.
For springs, taps, reamers, cutters, drills; Type W1; water hardened.

SS 5 EXTRA EXTRA.
M-459; 1.0 C, bal Fe.
For hand hammer, center punches; tough.

SS6.
M-459; 0.7-1.3 C, bal Fe.
For cutting tools, drills, taps; Type W1, water hardening.

SS 6 EXTRA EXTRA.
M-459; 1.0 C, 1.5 Si, bal Fe.
For hot chisels, soft tools, riveting set; shock resistant.

"SS15" QUALITY.
M-179; Cu, 15 Ni, bal Fe.
Extruded: 84,000 TS; 54,000 YS; 18 El; 10 RA; 150 Brin.
Drawn: 90,000 TS; 58,000 YS; 15 El; 10 RA; 145 Brin
For stampings, hardware; silver bronze.

SS 931.
M-494, 3.0 C, 2.2 Si, 1.3 Cr, bal Fe.
Cast: 260-310 Brin.
For valve seats, heat resistant castings; cast iron.

SSB.
4.5-5.5 Cu, bal Al.
For light alloy parts; super duralumin type.

SSB.
M-459; C, bal Fe.
For spindles, axles; water hardened.

SS EXTRA COLD HEADING.
M-908; 1.0-1.1 C, bal Fe.
For cold heading dies.

SSF.
M-459, C, Mn, bal Fe.
For axles, mandrels; oil hardening.

S/S FR. VIII.
M-1260, 80 Sn, 11.5 Sb, 5.5 Cu, 3 Pb.
Cast: 17,800 TS; 35 Brin.
For steam turbine and generator bearings; M P 355-675° F; wear resistant

S. SIRIUS.
French; 0.25 C, 16 Ni, 17 Cr, 3 W, 12 Co, 2 Ti, bal Fe
For valves; heat and corrosion resistant.

SSM
M-459; C, Mn, bal Fe
For axles, mandrels; water hardened.

S S TOOL.
M-38; 1.0 C, 1.2 Cr, 0.3 Mo, bal Fe.
For rolls, tools, blanking dies; oil hardening.

ST-10 SOLDER.
M-815, 87.5 Pb, 10 Sn, 1.5 Ag, 0.5 Bi, 0.5 Sb.
Cast 5335 TS, 11.5 El
For solder; liquid at 554°F

ST-15.
M-1073, 82.75 Pb, 15 Sn, 1.25 Ag, 0.5 Bi, 0.55 Sb.
For soft solder; M.P. 278-532°F.

ST-15 SOLDER.
M-815; 82.75 Pb, 15 Sn, 1.25 Ag, 0.5 Bi, 0.5 Sb
Cast: 6180 TS; 11.5 El.
For solder, liquid at 532°F.

ST-20 SOLDER.
M-815; 77.75 Pb, 20 Sn, 1.25 Ag, 0.5 Bi, 0.5 Sb.
Cast: 6840 TS; 14 El.
For solder; liquid at 518°F.

ST-20A SOLDER.
M-815; 76.75 Pb, 20 Sn, 1.25 Ag, 1.5 Bi, 0.5 Sb.
Cast: 6720 TS; 13 El.
For solder; liquid at 514°F.

ST-20B SOLDER.
M-815; 73.25 Pb, 20 Sn, 1.25 Ag, 5 Bi, 0.5 Sb.
Cast: 6810 TS; 27 El.
For solder; liquid at 486°F.

ST-20B.
M-1073; 73.25 Pb, 20 Sn, 1.25 Ag, 5.0 Bi, 0.5 Sb.
For soft solder; M.P. 258-486°F.

ST-30.
M-1073; 67.75 Pb, 30 Sn, 1.25 Sb, 0.5 Bi, 0.5 Sb.
For soft solder; M.P. 248-478°F.

ST-30 SOLDER.
M-815; 67.75 Pb, 30 Sn, 1.25 Ag, 0 5 Bi, 0.5 Sb.
Cast: 7625 TS; 15 El.
For solder; liquid at 478°F.

ST. 37.161.
Swiss; 0.15 C, 0.06 S, 0.06 P, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For bridge construction; good weldability.

ST. 40.21.
Germany; 0.18 C, bal Fe.
For welded sluice gates; excellent weldability.

ST-48.
M-895; 0.4 C, bal Fe
For gears, shafts; water hardened.

ST-51.
M-516; 0.48-0.55 C, 1.35-1.65 Mn, 0.08-0.13 S, bal Fe.
Cold drawn, stress relieved: 140,000 TS min; 125,000 YS min: 285 Brin.
For machine parts, shafts.
Free machining, eliminates heat treatment.

ST-52.
German; 0 12-0.15 C, 0.5-1.1 Si, 0.75-1.6 Mn, 0.25-1.0 Cu, 0-0.6 Cr, 0-0.25 Mo, bal Fe.
89,600 TS; 65,000 YS; 24 El.
For structural parts; excellent for welding.

ST. 52.
German; 0.2 C, 0.15 Si, 0.5 Mn, 0.5 Cu, bal Fe.
For railway cars, bus and truck bodies; high strength structural steel.

ST. 60.
Swiss; 0.1 C, bal Fe.
Annealed: 64,000 TS; 41,000 YS; 28 El; 65 RA; 130 Brin.
For welded structures, good weldability.

STA 8.
M-494; 3.2 C, 1.6-2.8 Si, 0.2 P, bal Fe.
Cast: 210-260 Brin.
For thin section castings; cast iron.

STABIL.
M-36; M-96; 0.8 C, 2.0 Mn, V, bal Fe.
Annealed: 107,000 TS; 215 Brin
For blanking dies, threading tools, milling cutters, gages.
Oil hardening, shock resistant. Type 02 tool steel.

STABIL.
M-1322; 0.90 C, 1 9 Mn, 0.1 V, bal Fe.
For punches, cutters, forming dies; oil hardened, non-deforming.

STABIL SPECIAL.
M-96; 0.85 C, 1.7 Mn, 0.3 Cr, 0.2 V, bal Fe.
For tools, dies; non-deforming.

STABIL SPEZIAL.
M-1322; 1.05 C, 1.0 Cr, 1.15 W, 0.9 Mn, bal Fe.
For cutters, bearings, forming dies; oil or water hardened.

STABLE-ARC.
M-578; C, bal Fe.
Steel arc welding electrode.
AWS Class E 4510.

STABRITE.
M-550; Ni alloy.
For castings; corrosion resistant.

STACKPOLE FW-41.
M-1069; Ag-W.
For electric contacts; sintered.

STACKPOLE SILVER-GRAPHITE.
M-1069; Ag-graphite.
For electric contacts, relays, circuit breakers; sintered.

STAFLO 761.
M-63; 20% Ni & 80% Lithobraze 925 (Lithobraze 925 is 92.5 Ag, 7.3 Cu, 0.2 Li).
Duplex brazing alloy for brazing honeycomb panels of stainless, helps control fillets.

STAG.
M-210; 1.1 C, bal Fe.
For tools, drills, taps; water hardened.

STAG 14 AIR HARDENING.
M-210; 0.67 C, 15 W, 3 5 Cr, 0.37 V, bal Fe.
For wood working tools, end mills, drills; high speed steel.

STAG ALLENITE
M-210; W C + Co.
For tipped cutting tools, fast cutting on cast iron, sintered carbide.

STAG ATHYWELD 60/1/13.
M-210; WC
Rockwell C 52.
For hard facing brick making machines, mixer knives.
Wear and abrasion resistant.

STAG EXTRA SPECIAL.
M-210, 0 8 C, 19 W, 6 Co, 5 Cr, 1 5 V, 0.5 Mo, bal Fe
For lathe and planer cutters, hobs, reamers, taps; high speed steel, oil hardened

STAG MAJOR.
M-210, 0 8 C, 21 W, 11 Co, 5 Cr, 1.5 V, 0.5 Mo, bal Fe
For drills, reamers, hobs, lathe and planer cutters; high speed steel, oil hardened.

STAG Mo.
M-210; 0 8 C, 6.5 W, 4 Mo, 4 Cr, 1 5 V, bal Fe.
For tools, cutters, reamers, broaches, taps; high speed steel.

STAG Mo562.
M-210; 0.85 C, 4.75 Cr, 5.0 Mo, 6.0 W, 2.0 V, bal Fe.
For drills, taps, reamers, form tools; high speed steel

STAG SPECIAL.
M-210; 0.7 C, 19 W, 4 Cr, 1 V, bal Fe.
For planing and shaping tools, drills, reamers, hobs; high speed steel, oil hardened.

STAHLSCHMIDT C1V
M-1294; 0.50 C, 1.0 Cr, 0.09 V, bal Fe.
For springs, gears, machine tool parts, bolts; oil hardened, shock resistant.

STAHLSCHMIDT C2V.
M-1294; 0.58 C, 1.0 Cr, 0.09 V, bal Fe.
For springs, gears, crankshafts; oil hardened, shock resistant.

STAHLSCHMIDT CE6.
M-1294; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
For gears, fasteners, machine tool parts; case hardened, shock resistant.

STAHLSCHMIDT CE8.
M-1294; 0.16 C, 0.95 Cr, 1.15 Mn, bal Fe.
For gears, cams, camshafts; case hardened, tough.

STAHLSCHMIDT CE10.
M-1294; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, cams, camshafts; case hardened, tough.

STAHLSCHMIDT CNL.
M-1294; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

STAHLSCHMIDT E16.
M-1294; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS, 25 El, 60 RA; 145 Brin.
For gears, bolts, machine tool parts; case hardening steel.

STAHLSCHMIDT E25.
M-1294; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed: 75,000 TS; 42,000 YS; 22 El; 58 RA; 140 Brin.
For gears, shafts, fasteners, bolts, screws; water hardened.

STAHLSCHMIDT EXTRA.
M-1294; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

STAHLSCHMIDT G500
M-1294; 1.0 C, 0.20 Si, 0.25 Mn, 0.10 V, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El, 42 RA; 200 Brin.
For drills, taps, reamers, springs; Type W2; water hardened.

STAHLSCHMIDT HS23.
M-1294; 0.95 C, W, Mo, bal Fe.
For cutters, dies; oil hardened, tough

STAHLSCHMIDT HS55.
M-1294, 0.85 C, W, Mo, Cr, V, bal Fe.
For cutters, dies; oil hardened, tough.

STAHLSCHMIDT HWG
M-1294; 0.56 C, Ni, Cr, Mo, V, bal Fe.
For upsetters, extrusion dies; oil hardened, tough.

STAHLSCHMIDT HWGW.
M-1294, 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe
For forging dies, upsetters, shears, oil hardened, tough

STAHLSCHMIDT MS5.
M-1294; 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
For gears, punches, machine tool parts; oil hardened, tough

STAHLSCHMIDT MV7.
M-1294, 0.42 C, 1.75 Mn, 0.25 Si, 0.1 V, bal Fe
For punches, gears, bolts, shafts; oil hardened, tough.

STAHLSCHMIDT NE15.
M-1294; 0.15 C, 1.55 Cr, 1.55 Ni, bal Fe.
For die casting dies, gears, cams; case hardened, tough.

STAHLSCHMIDT NE25
M-1294, 0.13 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, machine tool parts; case hardened, shock resistant.

STAHLSCHMIDT NE35.
M-1294; 0.13 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, camshafts, cams; case hardened, shock resistant.

STAHLSCHMIDT NE45.
M-1294; 0.13 C, 1.1 Cr, 4.5 Ni, 0.5 Mn, bal Fe.
For gears, bolts, camshafts, cams; case hardened, shock resistant.

STAHLSCHMIDT NV15.
M-1294; 0.28-0.35 C, 0.5 Cr, 1.5 Ni, 0.6 Mn, bal Fe.
For bolts, gears, machine tool parts; oil hardened, shock resistant.

STAHLSCHMIDT NV25.
M-1294; 0.28-0.35 C, 0.6 Mn, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, shock resistant.

STAHLSCHMIDT NV35.
M-1294; 0.22-0.30 C, 0.6 Mn, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, shock resistant.

STAHLSCHMIDT NV45.
M-1294; 0.35 C, 4.5 Ni, 1.3 Cr, 0.6 Mn, bal Fe.
For gears, dies, crankshafts, bolts; oil hardened, shock resistant.

STAHLSCHMIDT PD EXTRA.
M-1294; 0.38 C, Si, Cr, V, bal Fe.
For gears, bolts, springs, crankshafts, oil hardened, shock resistant.

STAHLSCHMIDT RCM
M-1294, 0.45 C, 1.4 Cr, 0.70 Mo, 0.30 V, 0.7 Mn, bal Fe.
For forging dies, punges, gears, crankshafts; oil hardened, tough.

STAHLSCHMIDT SC15.
M-1294, 0.67 C, 1.3 Si, 0.50 Cr, 0.5 Mn, bal Fe.
For shears, rivet sets, upsetters; oil hardened, tough.

STAHLSCHMIDT SCE.
M-1294; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
For gears, bolts, oil refinery equipment, case hardened, creep resistant.

STAHLSCHMIDT SCS
M-1294; 1.05 C, 1.15 Cr, bal Fe.
For liners, sleeves, cutters, bearings; water or oil hardened, wear resistant

STAHLSCHMIDT SE1
M-1294; 0.20 C, 1.25 Mn, 1.25 Cr, bal Fe
For gears, bolts, crankshafts, cams, case hardened, tough.

STAHLSCHMIDT SGK.
M-1294, 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For blanking and forming dies; water or oil hardened.

STAHLSCHMIDT SGS2.
M-1294, 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For blanking and forming dies, cutters, reamers; Type W1; water hardened.

STAHLSCHMIDT SGS3.
M-1294; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 18 El; 40 RA; 210 Brin
For springs, drills, reamers, taps, broaches; Type W1; water hardened.

STAHLSCHMIDT SGS4.
M-1294; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin
For springs, tools, drills, taps, reamers; Type W1; water hardened.

STAHLSCHMIDT SGS5.
M-1294; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 185,000-125,000 TS; 140,000-85,000 YS, 14-24 El; 37-52 RA; 400-230 Brin.
For springs, drills, reamers, taps, cutters; Type W1; water hardened.

STAHLSCHMIDT SGS6.
M-1294; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 174,000-122,000 TS, 128,000-82,000 YS; 12-22 El; 37-52 RA; 352-240 Brin.
For wheels, die blocks, rails, springs; Type W1; water hardened.

STAHLSCHMIDT SNR.
M-1294; 1.65 C, 11.5 Cr, 0.10 V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

STAHLSCHMIDT SNS EXTRA.
M-1294; 2.1 C, 11.5 Cr, 0.30 Mn, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

STAHLSCHMIDT SNS SPEZIAL.
M-1294; 2.1 C, 11.5 Cr, 0.70 W, bal Fe.
For blanking and forming dies; oil hardened, non-deforming.

STAHLSCHMIDT SP EXTRA.
M-1294; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe
For punches, shears, upsetters; oil hardened, tough.

STAHLSCHMIDT SPEZIAL ZAH.
M-1294; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps, high speed steel.

STAHLSCHMIDT SSF.
M-1294; 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated. 160,000 115,000 TS, 113,000-77,000 YS, 12-23 El, 40-54 RA, 320-230 Brin.
For wheels, die blocks, rails, girders, springs; water hardened

STAHLSCHMIDT SS II.
M-1294; 0.90 C, 1.9 Mn, 0.10 V, bal Fe
For blanking and forming dies, cutters, punches; oil hardened, non-deforming.

STAHLSCHMIDT STANDARD.
M-1294, 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, reamers, drills, hobs; high speed steel.

STAHLSCHMIDT STANDARD SPEZIAL.
M-1294; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe
For lathe and planer tools, drills, reamers; high speed steel.

STAHLSCHMIDT STS3.
M-1294; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 200,000-140,000 TS, 125,000-90,000 YS; 10-20 El; 30-45 RA, 400-275 Brin.
For springs, reamers, drills, taps; Type W1; water hardened.

STAHLSCHMIDT STS4.
M-1294; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 185,000-130,000 TS, 120,000-80,000 YS; 10-20 El; 30-45 RA; 390-270 Brin.
For springs, hobs, cutters, reamers, taps, Type W1; water hardened.

STAHLSCHMIDT STS5.
M-1294; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 180,000-130,000 TS; 118,000-80,000 YS; 12-24 El; 32-47 RA; 370-260 Brin.
For springs, taps, reamers, drills; Type W1; water hardened.

STAHLSCHMIDT STS6.
M-1294; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 174,000-122,000 TS; 128,000-82,000 YS; 12-22 El; 37-52 RA; 352-240 Brin.
For wheels, die blocks, rails, springs; Type W1; water hardened.

STAHLSCHMIDT SUPERIOR.
M-1294, 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

STAHLSCHMIDT SZP 40.
M-1294; 0.30 C, 2.35 C, 0.6 V, 4.25 W, bal Fe.
For shear blades, pneumatic tools, punches; oil hardened, hot work steel

STAHLSCHMIDT SZP 80
M-1294; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion dies, rams and liners; oil hardened, hot work steel.

STAHLSCHMIDT SZP 120
M-1294; 0.30 C, 2.0 Co, 0.25 V, 8.5 W, 2.4 Cr, bal Fe
For extrusion dies, rams and liners, punches, shear blades; oil hardened, hot work steel.

STAHLSCHMIDT UE8.
M 1294, 0.15 C, Cr, Mo, bal Fe
For gears, bolts, camshafts, cams, case hardened, tough

STAHLSCHMIDT UE10.
M-1294; 0.20 C, Cr, Mo, bal Fe.
For gears, bolts, camshafts, cams; case hardened, tough.

STAHLSCHMIDT UV12
M-1294, 0.25 C, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe
For gears, bolts, camshafts; oil hardened, tough

STAHLSCHMIDT UV13
M-1294, 0.33 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough

STAHLSCHMIDT UV14.
M-1294, 0.42 C, 1.0 Cr, 0.2 Mo, bal Fe
For gears, bolts, crankshafts, dies, oil hardened, tough

STAHLSCHMIDT UV24.
M-1294, 0.50 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, crankshafts, fasteners, oil hardened, shock resistant

STAHLSCHMIDT V35
M-1294, 0.35 C, 0.55 Mn, 0.25 Si, bal Fe.
Hot rolled 85,000 TS, 54,000 YS; 30 El; 53 RA; 183 Brin.
For gears, bolts, crankshafts, axles, screws, water hardened.

STAHLSCHMIDT V45
M-1294; 0.45 C, 0.55 Mn, 0.25 Si, bal Fe.
Hot rolled: 98,000 TS, 59,000 YS, 24 El; 45 RA; 212 Brin.
For axles, gears, bolts, crankshafts; water hardened.

STAHLSCHMIDT V60.
M-1294, 0.61 C, 0.25 Si, 0.55 Mn, bal Fe.
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El; 40-54 RA, 320-230 Brin
For girders, rails, springs, die blocks; water hardened.

STAINALOY.
M-1102; Cu alloy.
For resistance and spot welding electrodes.

STAINEX NO. 1.
M-35; 0.35 C, 13.5 Cr, 0.35 Si, bal Fe.
Annealed.
For stainless parts; heat and corrosion resistant.

STAINEX NO. 2.
M-35; 0.65 C, 17 Cr, 0.35 Si, bal Fe.
Annealed.
For stainless parts; heat and corrosion resistant.

STAINEX NO. 3.
M-35; 0.10 C, 13 Cr, 0.40 Si, bal Fe.
Annealed.
For stainless parts; heat and corrosion resistant.

STAINLEND 8N12.
M-677; 0.03 C, 6 Mn, 0.5 Si, 16.5 Cr, 72.3 Ni, 0.2 Mo, 1.7 CbTa, 1.8 Fe.
For welding electrodes; Inconel, class ENiCrFe-3.

STAINLEND 14/75
M-677, 0.04 C, 3 Mn, 0.6 Si, 15 Cr, 69 Ni, 1.3 Mo, 1.6 Cb, 8.9 Fe.
For welding electrodes; Inconel, class ENiCrFe-2.

STAINLEND 15/35 see STAINLEND 330.

STAINLEND 19/9 see STAINLEND 347

STAINLEND 25/12 see STAINLEND 309 Cb

STAINLEND 308.
M-677, 19 Cr, 9 Ni, 0.07 C, bal Fe
For welding rods, corrosion resistant

STAINLEND 308L.
M-677; 0.035 C, 1.8 Mn, 0.4 Si, 20 Cr, 9.8 Ni, bal Fe
For welding electrodes; stainless steel type 308L

STAINLEND 308HC
M-677, 0.14 C, 1.7 Mn, 0.4 Si, 20 Cr, 9.7 Ni, bal Fe
For welding electrodes, specially coated for welding austenitic CrNi stainless steel.

STAINLEND 309
M-677, 25 Cr, 12 Ni, 0.10 C, bal Fe
For welding rods, corrosion and heat resistant

STAINLEND 309 Cb
M-677; 0.08 C, 1.9 Mn, 0.5 Si, 23 Cr, 13 Ni, 0.8 CbTa, bal Fe
For welding electrodes; Cb-stabilized stainless steel for root pass welding in Type 347 clad steel

STAINLEND 309 Mo
M-677, 0.07 C, 1.8 Mn, 0.4 Si, 23 Cr, 12.8 Ni, 2.5 Mo, bal Fe
For welding electrodes, Mo-bearing stainless steel for root pass welding of 316, 316L, 319 clad steel

STAINLEND 310
M 677, C, 25 Cr, 20 Ni, bal Fe
For welding electrodes, E-310-16; stainless

STAINLEND 310 Cb
M-677, 0.1 C, 2 Mn, 0.5 Si, 26 Cr, 21 Ni, 0.8 CbTa, bal Fe
For welding electrodes; Cb-stabilized for root pass welds in type 347 clad plate.

STAINLEND 310 HC
M-677; 0.22 C (also 0.3 C and 0.4 C) 1.8 Mn, 0.4 Si, 26.5 Cr, 21 Ni, bal Fe.
For welding electrodes, welding ACI types CK-20, HK, HL, HN castings, supplied in three carbon ranges.

STAINLEND 310 Mo.
M-677; 0.1 C, 1.8 Mn, 0.4 Si, 25.5 Cr, 21.5 Ni, 2.3 Mo, bal Fe.
For welding electrodes, Mo-bearing stainless steel.

STAINLEND 312.
M-677; 0.12 C, 1.8 Mn, 0.5 Si, 29 Cr, 9.2 Ni, bal Fe.
For welding electrodes, for joining dissimilar metals.

STAINLEND 316.
M-677; 0.12 C, 1.8 Mn, 0.5 Si, 19 Cr, 9.2 Ni, bal Fe.
For welding electrodes; for joining dissimilar metals.

STAINLEND 316L.
M-677; 0.035 C, 1.8 Mn, 0.4 Si, 19.5 Cr, 12.5 Ni, 2.2 Mo, bal Fe.
For welding electrodes; stainless steel type 316L.

STAINLEND 317.
M-677; 0.035 C, 1.8 Mn, 0.4 Si, 19.5 Cr, 12.5 Ni, 2.2 Mo, bal Fe.
For welding electrodes; stainless steel type 316L.

STAINLEND 318.
M-677; 0.035 C, 1.8 Mn, 0.4 Si, 19.5 Cr, 12.5 Ni, 2.2 Mo, bal Fe.
For welding electrodes; stainless steel type 316 L.

STAINLEND 330.
M-677, 0.035 C, 1.8 Mn, 0.4 Si, 19.5 Cr, 12.5 Ni, 2.2 Mo, bal Fe.
For welding electrodes; stainless steel type 316 L.

STAINLEND 347.
M-677; 0.035 C, 1.8 Mn, 0.4 Si, 19.5 Cr, 12.5 Ni, 2.2 Mo, bal Fe
For welding electrodes; stainless steel type 316 L.

STAINLEND 349.
M-677, 0.09 C, 1.8 Mn, 0.5 Si, 19.5 Cr, 9 Ni, 0.5 Mo, 0.9 Cb, 1.4 W, bal Fe.
For welding electrodes; superalloy electrode, stainless steel type 349.

STAINLEND 410
M-677, 0.08 C, 0.9 Mn, 0.4 Si, 12.7 Cr, 0.2 Ni, 0.4 Mo, bal Fe
For welding electrodes, martensitic stainless steel, type 410.

STAINLEND 430
M-677, 0.08 C, 0.8 Mn, 0.4 Si, 16.5 Cr, 0.4 Ni, bal Fe
For welding electrodes; ferritic stainless steel, type 430.

STAINLEND HCN see STAINLEND 310.

STAINLEND KMo see STAINLEND 316.

STAINLEND KMoCb see STAINLEND 318.

STAINLESS NO 20
M-46, 0.07 max C, 0.75 Mn, 1.0 Si, 20 Cr, 29 Ni, 2 Mo, 3 Cu, bal Fe
Rolled. 85,000 TS; 35,000 YS; 35-50 El; 50-70 RA; 150-180 Brin
For wrought stainless parts; corrosion resistant to H_2SO_4

STAINLESS INVAR
Japan; 5 Co, 31.5 Ni, 63.5 Fe
For stainless and corrosion resistant parts and equipment, stainless, corrosion resistant.

STAINLESS INVAR.
U.S., 36.5 Fe, 9.5 Cr, 54 Co.
For instruments, low expansion.

STAINLESS IRON.
M-248; 0.12 max C, 12-23 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

STAINLESS IRON (AMERICAN STAINLESS STEEL).
M-293; 0.12 max C, 8-60 Cr, bal Fe.
For hardware, tools, chemical equipment; stainless.

STAINLESS IRON C-1
M-293; 0.12 max C, 15 max Cr, bal Fe.
70,000-190,000 TS; 35-16 El; 140-387 Brin.
For stampings, automobile trim moldings, machine parts, cheap cutlery; corrosion resistant.

STAINLESS IRON C-2.
M-293; 0.12 max C, 15-18 Cr, bal Fe.
90,000-75,000 TS; 28 El; 170 Brin.
For exterior trim for buildings and automobiles, cold rivets, nitric acid equipment, stampings; corrosion resistant.

STAINLESS IRON C-3.
M-293; 0.35 max C, 18-23 Cr, bal Fe.
100,000 TS; 22 El; 196 Brin.
For screw machine products, wire paper mill products, chemical apparatus; corrosion resistant.

STAINLESS IRON C-4.
M-293; 0.35 max C, 23-30 Cr, bal Fe.
95,000 TS; 18 El; 187 Brin.
For furnace parts, valve parts, conveyor chain bolts and nuts, heat resisting parts; corrosion and heat resistant.

STAINLESS IRON "N."
M-73; 0.10 C, 16.5 Cr, bal Fe.
66,000-149,000 TS; 44,000-121,000 YS; 25-11 El; 65-32 RA, 165-315 Brin.
For stainless iron parts; stainless iron; Iz-20-80.

STAINLESS IRON TYPE F.I.
M-56, M-521; 0.1 C, 11-13 Cr, 1.0 max Si, 1.0 max Mn, bal Fe.
Heat treated: 68,000-83,000 TS; 40,000-56,000 YS; 40-30 El; 60-50 RA; 150-180 Brin.
For turbine blades, shrouding strip, aircraft fittings; Type 403 and 410; corrosion resistant.

STAINLESS IRON TYPE FI 17.
M-521; 0.10 C, 0.2 Si, 0 2 Mn, 17 Cr, bal Fe.
Annealed: 75,000 TS; 48,000 YS; 32 El; 50 RA, 160 Brin.
For corrosion resistant parts; brittle welds, corrosion resistant.

STAINLESS M.S. NO. 2.
M-32; 0.3 C, 13 Cr, bal Fe
For plastic mold dies; oil or air hardened.

STAINLESS S-20.
M-1262; 0.07 max C, 29 Ni, 20 Cr, 3-4 Mo, 4 Cu, bal Fe.
Cast: 65,000-75,000 TS; 28,000-38,000 YS; 50-35 El; 50-45 RA; 120-160 Brin.
For chemical plant equipment, valves, agitators, tanks; resists mixed acids, austenitic.

STAINLESS STEEL
M-61; 0.07 max C, 16-23 Cr, 7-11 Ni, bal Fe.
For stainless parts; stainless.

STAINLESS STEEL A.
M-293; 0.12 min C, 8-16 Cr, bal Fe.
Hardened: 260,000 TS, 10 El; 512 Brin.
For cutlery, springs, balls, bearing races, surgical instruments, hypodermic needles; stainless and corrosion resistant.

STAINLESS STEEL A.S.S.
M-293; 8-60 Cr, 0.40 Mn, > 0.12 C, bal Fe.
Rolled: 80,000-250,000 TS; 24,000-150,000 YS; 10-15 El; 30-35 RA; 150-250 Brin.
For cutlery, surgical instruments, valve seats, pump shafts; corrosion and abrasion resisting.

STAINLESS STEEL B.
M-293; 0.12 min C, 16-18 Cr, bal Fe.
Hardened: 601 Brin.
For cutlery, bearing races, surgical instruments; stainless and corrosion resistant.

STAINLESS STEEL TYPE FAL.
M-521; 0.10 C, 0.4 Si, 0.6 Mn, 12 Cr, 4.5 Al, bal Fe.
Heat treated: 88,000 TS; 62,000 YS; 25 El.
For resistances, rheostats; maximum service temperature 700°C.

STAINLESS STEEL TYPE FG.
M-56, M-521; 0.25 C, 12-14 Cr, 0.4 Si, 0.3 Mn, bal Fe.
Heat treated: 90,000-112,000 TS; 56,000-78,500 YS; 30-20 El; 60-50 RA; 220-240 Brin.
For turbine blades, high pressure steam valves; Type 420; corrosion resistant.

STAINLESS STEEL TYPE FH.
M-56, M-521; 0.3 C, 12-14 Cr, bal Fe.
Heat treated: 230,000 TS; 450-550 Brin.
For cutlery, surgical instruments, knives, edge tools, rolls, springs, ball bearings and races; magnetic, stainless; Firth Brown I-162, Firth F.H. Stainless.

STAINLESS STEEL TYPE FHM.
M-521; 0.8 C, 0.2 Si, 0.2 Mn, 17 Cr, 0.5 Mo, bal Fe.
Annealed: 120,000 TS; 98,000 YS; 260 Brin.
For ball bearings; corrosion resistant.

STAINLESS STEEL TYPE F.T.V.
M-521, 0.04 C, 0.4 Si, 0.8 Mn, 20 Cr, bal Fe.
Annealed: 72,000 TS; 49,300 YS; 30 El; 160 Brin.
For sealing to soft glass, corrosion resistant.

STAIN-ROD NO 308.
M-1096; 0 07 max C, 9 Ni, 19 Cr, bal Fe.
Welded: 85,000-95,000 TS; 40-50 El.
For stainless steel welding rod; austenitic, stainless.

STAINTEC 10670.
M-717;
Nickel base alloy powder for overlays on steel and nickel alloys.

STAINTIN 157PA.
M-717;
For soldering stainless steel.
M P. 425°F.

STAINTRODE A
M-717;
Electrode for AC-DC welding of 300 series stainless.
Tensile strength 90,000 psi

STAINTRODE A-MO.
M-717,
Electrode for AC-DC welding of 303, 315, 316 and 329 stainless steels
Tensile strength 80,000 psi.

STAINTRODE A-MO-L.
M-717;
Electrode for AC-DC welding of 316, 316L and 318 stainless steels.
Tensile strength 90,000 psi.

STAINTRODE B-MO.
M-717;
Electrode for AC-DC welding of several 300 series stainless steels.
Tensile strength 90,000 psi.

STAINTRODE D.
M-717;
Electrode for AC-DC welding of type 310 stainless.
Tensile strength 95,000 psi.

STAINWELD 308-15.
M-578; 0.08 C, 18.0 Cr, 9.0 Ni, 2.5 Mn, 0 90 Si, 0.04 P, 0 03 S, bal Fe.
Stainless steel arc welding electrode.
AWS Class E308-15.

STAINWELD 308-16.
M-578; 0.08 C, 18.0 Cr, 9.0 Ni, 2.5 Mn, 0.90 Si, 0.04 P, 0.03 S, bal Fe.
Stainless steel arc welding electrode.
AWS Class E308-16.

STAINWELD 308L-16.
M-578; 0.08 C, 18.0 Cr, 9.0 Ni, 2.5 Mn, 0.90 Si, 0.04 P, 0.03 S, bal Fe.
Stainless steel welding electrode.
AWS Class E308L-16.

STAINWELD 310-15.
M-578; 0.20 C, 25.0 Cr, 20.0 Ni, 2.5 Mn, 0.75 Si, bal Fe.
Stainless steel arc welding electrode.
AWS Class E310-15.

STAINWELD 310-16.
M-578; 0.20 C, 25.0 Cr, 20.0 Ni, 2.5 Mn, 0.75 Si, bal Fe.
Stainless steel arc welding electrode.
AWS Class E310-16.

STAINWELD 316L-16.
M-578; 0.04 C, 17.0 Cr, 11.0 Ni, 2.0 Mo, 2.5 Mn, 0.90 Si, bal Fe.
Stainless steel arc welding electrodes.
AWS Class E316L-16.

STAINWELD 347-15.
M-578; 0.08 C, 18.0 Cr, 9.0 Ni, 2.5 Mn, 0.90 Si, bal Fe.
Stainless steel arc welding electrode.
AWS Class E347-15.

STAINWELD 347-16.
M-578; 0.08 C, 18.0 Cr, 9.0 Ni, 2.5 Mn, 0.90 Si, bal Fe.
Stainless steel arc welding rod.
AWS Class E347-16.

STALINITE.
Russian; C, 9.5 Cr, 11.5 Mn, bal Fe.
For machine parts, dredging, oil drilling, agricultural and kindred equipment; sintered alloy.

STALINIT NO 2.
Russ ; Ti-Cr-Fe.
For cutting tools; hard sintered alloy

STALLOY.
Eng.; C, 3-4 Si, bal Fe
For telephone and loud speaker diaphragms, electrical machinery, instruments; max permeability 8,000.

STAMINAL
M-73; 0.55 C, 0.4 Cr, 2.7 Ni, 0.9 Mn, 0.15 V, 0.45 Mo, 1.0 Si, bal Fe.
For chisels, cold cutters, die blocks, punches; oil or air hardened, tough.

STANDARD.
M-336; 0.9 C, 0.3 Mn, bal Fe.
For general tools, drills, stone tools, dies; water hardened.

STANDARD.
M-275, M-35; 0.7-1.2 C, bal Fe.
For general tools, dies, punches; water hardened.

STANDARD NO. 4 BABBITT.
M-428, M-88; Pb, Sb, Sn.
At 70°F: 14.3 Brin.
At 212°F: 6.4 Brin.
For bearings for line shafts; Babbitt, heavy loads.

STANDARD ADMIRALTY BRONZE.
M-126; 88 Cu, 10 Sn, 2 Zn.
For bronze castings, gears, worm wheels, trolley wheels; tough, wear resistant.

STANDARD ALLOY CR-1.
M-105; 0.08 max C, 1.5 Mn, 2 Si, 18-21 Cr, 8-11 Ni, bal Fe.
Cast: 70,000 TS; 28,000 YS; 55 El; 150 Brin.
For chemical and food processing equipment, furnace parts; ACI-CF8; corrosion and heat resistant.

STANDARD ALLOY CR-2.
M-105; 0.08 max C, 1.5 Mn, 1.5 max Si, 18-21 Cr, 9-12 Ni, 2-3 Mo, bal Fe.
Cast: 75,000 TS; 30,000 YS; 50 El; 160 Brin.
For chemical plant equipment; ACI-CF8M; corrosion resistant.

STANDARD ALLOY CR-3.
M-105; 0.20 max C, 1.5 max Mn, 2.0 max Si, 18-21 Cr, 8-11 Ni, bal Fe.
Cast: 75,000 TS; 30,000 YS; 50 El; 160 Brin.
For chemical and food processing equipment; ACI-CF20; corrosion resistant.

STANDARD ALLOY "H.R.-1."
M-105; 20 Ni, 20 Cr, 0.4 C, 1.5 Si, 0.7 Mn, bal Fe.
For furnace parts; heat and corrosion resistant.

STANDARD ALLOY "H.R.-2."
M-105; 25 Ni, 20 Cr, 1.5 Si, 0.4 C, 0.7 Mn, bal Fe.
For furnace parts; heat and corrosion resistant.

STANDARD ALLOY "H.R.-3."
M-105; 36 Ni, 15 Cr, 0.4 C, 0.7 Mn, 1.5 Si, bal Fe.
Cast: 62,000 TS; 35,000 YS; 10 El; 11 RA; 190 Brin.
For lead pots, carburizing boxes, trays; heat resistant.

STANDARD ALLOY "H.R.-4."
M-105, 62 Ni, 14 Cr, 0.4 C, 0.7 Mn, 1.5 Si, bal Fe.
Cast: 65,000 TS; 35,000 YS; 5 El; 5 RA; 180 Brin.
For carburizing boxes, retorts; heat resistant.

STANDARD ALLOY "H.R.-5."
M-105, 20 Ni, 25 Cr, 0.4 C, 0.7 Mn, 1.7 Si, bal Fe.
73,000 TS; 46,000 YS; 17 El.
For furnace parts; heat resistant.

STANDARD ALLOY CO. H R-5 M.
M-105; 50 Fe, 25 Cr, 20 Ni, 2.5-4.0 Mo, 0.40 Mn, 0.3 C
Cast: 62,000 TS; 51,000 YS; 18 El; 13 RA; 190-210 Brin
For furnace parts; heat and corrosion resistant

STANDARD ALLOY "H.R.-6."
M-105, 13 Ni, 25 Cr, 0.4 C, 0.7 Mn, 1.7 Si, bal Fe.
Cast: 85,000 TS; 50,000 YS, 15 El; 15 RA; 170 Brin.
For furnace rails, stack dampers; heat resistant.

STANDARD ALLOY "H.R.-7"
M-105, 8 Ni, 18 Cr, 0.3 C, 1.0 Mn, 1.0 Si, bal Fe.
Cast: 97,000 TS; 45,000 YS; 25 El; 20 RA;
For stainless castings, stainless.

STANDARD ALLOY "H.R-8"
M-105, 28-30 Cr, Mn, 3 Ni, 0.4 Cr, 1.8 Si, bal Fe.
Cast: 50,000 TS; 40,000 YS, 1 El; 0 RA; 196 Brin.
For acid resisting equipment, grate bars; acid and corrosion resistant.

STANDARD ALLOY HR-9.
M-105; C, 18 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

STANDARD ALLOY HR-10.
M-105; 0.21-0.35 C, 24-30 Cr, 7-11 Ni, Si, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

STANDARD ALLOY HR-11.
M-105; 0.21-0.35 C, 16-23 Cr, 12-15 Ni, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

STANDARD ALLOY K.A. 4.
M-105; 17-20 Cr, 8-10 Ni, 0.25 C, 2-4 Mo, bal Fe.
Annealed: 105,000 TS; 49,000 YS; 55 El; 62 RA.
For pipe fittings, pump casings, impellers, shafts; austenitic; will not respond to heat treatment.

STANDARD ALLOY, SPECIAL.
M-105; 20 Cr, 25 Ni, 0.40 C, bal Fe.
62,100 TS; 3 El; 177 Brin.
For furnace parts; heat and corrosion resistant.

STANDARD ALNICO.
M-271; 11-13 Al, 19-23 Ni, 4.5-5.5 Co, bal Fe.
For magnets; Alnico I.

STANDARD AR-1.
M-105; 0.2 C, 9 Ni, 19 Cr, 3 Si, bal Fe.
Cast.
For castings, valves and fittings for handling H_2SO_4; acid resisting.

STANDARD BEARING.
58 Pb, 26 Sn, 15 Sb, 1 Cu.
For bearings; anti-friction.

STANDARD BEARING.
M-24; 1 C, 0 35 Mn, 1.5 Cr, bal Fe.
For bearings, rollers, master gauges; water hardening.

STANDARD CADMIUM.
U.S.; 92.5 Ag, 5.75 Cu, 1.75 Cd.
For solder, brazing; silver solder.

STANDARD CARBON.
M-73; 0.9-1.3 C, 0.2 Si, 0 25 Mn, bal Fe.
For tools, drills, taps; water hardening.

STANDARD CARBON.
M-97; 0 65-1.0 C, 0.3 Mn, 0.15-0.30 Si, bal Fe
For cold work dies; water hardening

STANDARD CARBON WITH V.
M-73; 0.9-1.3 C, 0.2 V, bal Fe.
For drills, tools; water hardening.

STANDARD DIEHARD.
M-56; 1 5 C, 0.3 Si, 0.3 Mn, 12 Cr, 0.9 Mo, 1.15 V, bal Fe.
For dies; nondeforming.

STANDARD (DISSTON).
M-357; 0.7-1.2 C, bal Fe.
For tools, drills, taps; water hardened.

STANDARD DRACO.
M-114; 0.7-1.2 C, 0.2 V, bal Fe
For tools, dies, punches; water hardened.

STANDARD DRACO DV.
M-114; 1.0 C, 0.5 V, bal Fe.
For drills, taps, reamers, broaches; Type W3, oil or water hardened.

STANDARD G
M-782; 0.7-1.4 C, bal Fe.
For chisels, tools; water hardened.

STANDARD GLYCO.
M-240; Sn, Sb, bal Pb.
For bearings; Babbitt.

STANDARD GOLD.
90 Au, 10 Cu.
For money, jewelry; corrosion resistant.

STANDARD GOLD (GREAT BRITAIN).
Eng.; 92 Au, 8 Cu.
For coinage; corrosion resistant.

STANDARD (HALCOMB)
M-260, M-38; 0.7-1.2 C, bal Fe.
For tools, chisels, rivet sets, hammers, sledges, shear blades; water hardening.

STANDARD H.R. ALLOYS.
M-105; 16-25 Cr, 20-60 Ni, C, bal Fe.
For furnace parts; heat resisting.

STANDARD MISCO.
M-84; 46 Fe, 35 Ni, 15 Cr, 0.50 Mn, 0.60 C.
Cast: 75,000 TS; 70,000 YS; 3 El; 6 RA; 180 Brin.
Rolled: 100,000 TS; 81,000 YS; 42 El; 52 RA; 190 Brin.
For heat treating boxes, furnace parts, valves, stills; heat resisting; wear and corrosion resisting.

STANDARD NICKEL BRONZE.
M-126, 88 Cu, 5 Sn, 2 Zn, 5 Ni.
For valves, corrosion resistant parts; corrosion resistant.

STANDARD PHOSPHOR BRONZE.
U.S.; 80 Cu, 10 Sn, 10 Pb, up to 0.25 P.
Cast· 28,000 TS; 6-9 El; 55-65 Brin.
For high speed bearings; heavy duty.

STANDARD SILVER.
92.5 Ag, 7.5 Cu.
For coinage; corrosion resistant.

STANDARD SILVER STERLING
90 Ag, 10 Cu.
For cutlery, ornaments, utensils.

STANDARD TOOL
M-38; 0.07-1.2 C, bal Fe.
For general tools; see Black Diamond.

STANDFEST SPEZIAL
M-1307; 0.90 C, 0 25 Si, 1.9 Mn, 0.10 V, bal Fe.
For forming and blanking dies, punches; oil hardened, non-deforming.

STANELEC.
M-691, 0 25 Si, bal Fe.
For motors, armatures; high permeability.

STANFIRE
M-896, 3.2 C, 1.5 Ni, 0.8 Cr, bal Fe
For fire box grates, heat resisting cast iron.

STANLEY, GRADE A
M-574, 0 12 max C, 12-15 Cr, bal Fe
For corrosion resistant parts; corrosion resistant.

STANLEY, GRADE B
M-574; 0.12 max C, 15-18 Cr, bal Fe
For corrosion resistant parts, corrosion resistant

STANLEY, GRADE C.
M-574, 0.13-0 35 C, 18-23 Cr, bal Fe.
For corrosion resistant parts, corrosion resistant

STANLEY, GRADE D
M-574, 0 13-0 20 C, 17-19 Cr, 7-9 Ni, bal Fe
For stainless, heat and corrosion resistant parts, stainless, heat and corrosion resistant.

STANNIOL.
96 Sn, 2.4 Pb, 1 Cu, 0.3 Ni, 0.1 Fe.
For bearings, wrapping foil.

STANNIOL
98 9 Sn, 0 7 Pb, 0.33 Cu.
For bearings, wrapping foil.

STANNUM METAL
M-77; 90 Sn, 6 Sb, 4 Cu, Cast.
For machine bearings, high tin Babbitt.

STANTUFONT.
M-1176; 0.5-1.0 Cu, 12.4-13.0 Si, 0.7-1.0 Mg, 2.0-2.4 Ni, bal Al.
Heat treated. 40,000-50,000 TS; 38,000-43,000 YS; 0.5-0.3 El; 120-130 Brin.
For light alloy parts; age-hardened.

STAR.
M-657; 78 Cu, 6 Sn, 10 Zn, 6 Pb.
For castings; free-cutting.

STAR BLUE CHIP.
M-57; 0.7 C, 14 W, 4 Cr, 2 V, bal Fe.
For cutters, drills, reamers, hobs, lathe and planer tools; high speed steel.

STAR-BORON.
M-32; 0.5-0.6 C, 4-4.5 Cr, 1.5-2 W, 1.5-2 V, 8-9 Mo, 7.75-8.5 Co, 0.4-0.6 B, bal Fe.
For tools, cutters; high speed steel.

STAR ETD.
M-27; 0.5 C, 1.5 Cr, 2.25 W, 0.25 V, bal Fe.
For hot work tools and dies; hot work steel.

STAR J METAL see HAYNES STELLITE STAR J.

STARKAD.
M-111; 1.3 C, 0.25 Cr, 5.5 W, bal Fe.
For drawing dies; oil hardening.

STARLI.
M-1260; 85 Sn, 10 Sb, 5 Cu.
Cast: 19,900 TS; 28 Brin.
For engine bearings; M.P. 440-630°F, shock resistant.

STAR-MAX.
M-32, 0.78 C, 3.75 Cr, 1.15 V, 1.5 W, 8.5 Mo, bal Fe
For cutting tools, broaches, reamers, taps; high speed steel.

STAR-MO.
M-57, 0 8 C, 6.5 W, 5 Mo, 4 Cr, 2 V, bal Fe.
For cutting tools; high speed steel.

STAR-Mo F.M.
M-57, 0.83 C, 6.4 W, 5 Mo, 4 Cr, 2 V, 0.12 S, bal Fe
For broaches, blanking dies, hobs, thread chasers; high speed steel, free-cutting.

STAR-MO F.M.
M-57; 0.83 C, 6.4 W, 5 0 Mo, 4 0 Cr, 2.0 V, 0.12 S, bal Fe
For reamers, broaches, chasers, lathe and form tools, milling cutters, high speed steel, free-machining.

STAR-Mo MOD
M-57, 0.65 C, 4.25 Cr, 6 Mo, 6 W, 2 V, bal Fe
For reamers, drills, lathe and planer tools, high speed steel

STARO
M-1294; 0 40 C, 0.40 Si, 0 30 Mn, 13 Cr, bal Fe.
Annealed: 100,000 TS, 55,000 YS, 20 El, 50 RA; 210 Brin.
For valves, cutlery, surgical and dental instruments, Type 420; stainless.

STARRETT NO. 496.
M-1143, M-1225, 0.90 C, 1.2 Mn, 0.5 Cr, 0.5 W, 0 2 V, bal Fe
For punches, crimpers, upsetters, headers; oil hardened, non-deforming.

STARRETT NO 497
M-1225, M-1143, 0 95-1.05 C, 0 6 Mn, 0.4 Si, 5.0-5 5 Cr, 1 0 Mo, 0 25 V, bal Fe.
For thread roller dies, master hubs, forming dies; air hardening, nondeforming.

STARRETT NO. 498.
M-1225;
Free machining low carbon steel (0.18C) as precision ground flat stock.

STAR-ZENITH see CARPENTER MEL-TROL STAR-ZENITH.

STAR ZENITH LOW CARBON.
M-32; 0.5 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutting tools, drills, punches; high speed steel.

STATO 3.
M-111a; 0.15 C, 1.2 Cr, 0.25 Mo, bal Fe.
For gears, shafts, machinery parts; case hardened.

STATO 5.
M-111; 0.25 C, 0.65 Mn, 1.05 Cr, 0.2 Mo, bal Fe.
For gears, shafts, bolts; tough.

STATO 8.
M-111; 0.4 C, 0 65 Mn, 1.1 Cr, 0.25 Mo, bal Fe.
For gears, shafts, bolts; tough.

STATO 23.
M-111; 0.15 C, 0 8 Mn, 1 Cr, 0 35 Mo, bal Fe.
For gears, shafts; case hardened.

STATOS EXTRA.
M-1314; 0.9 C, 1.9 Mn, 0 1 V, bal Fe.
For punches, dies, form tools, upsetters, crimpers; oil hardened, non-deforming.

STATOS SPEZIAL.
M-1314; 2.1 C, 11.5 Cr, bal Fe
For blanking and drawing dies, punches; oil or air hardened, non-deforming.

STATOS SPEZIAL GW.
M-1314; 1 65 C, 11.5 Cr, 0 1 V, bal Fe.
For blanking and forming dies; air hardened, non-deforming.

STATOS SPEZIAL W
M-1314; 2 1 C, 11.5 Cr, 0 7 W, bal Fe.
For blanking and forming dies, punches; oil or air hardened, non-deforming.

STATOS SUPERIOR
M-1314; 1 05 C, 1 Cr, 1 15 W, bal Fe.
For cold working tools, headers, punches, bearings; water hardened, wear resistant.

STATOS V.
M-1314, 1.45 C, 1.4 Cr, bal Fe.
For punches, drawing dies, bearings, liners, water hardened

STATUARY BRONZE
95-88 Cu, 1 4-10 Sn, 9.5 Zn, 0-6 Pb, trace P.
For statuary, castings

STATUARY BRONZE, AUGSBURG "A"
89 43 Cu, 8 17 Sn, 1 07 Pb, 0 34 P, 0.19 Ni.
For statuary; corrosion resistant.

STATUARY BRONZE, AUGSBURG "B"
94 74 Cu, 1 64 Sn, 0 54 Zn, 6.24 Pb, 0.71 Ni.
For statuary; corrosion resistant.

STATUARY BRONZE, BACCHUS POTSDAM.
89.34 Cu, 7 5 Sn, 1 63 Zn, 1 21 Pb, 0 18 P
For statuary; corrosion resistant.

STATUARY BRONZE, BAVARIA MUNICH.
91 55 Cu, 1.77 Sn, 5 5 Zn, 1 3 Pb
For statuary, good castability

STATUARY BRONZE, COLUMN VENDOME.
89.2 Cu, 10.2 Sn, 0 5 Zn, 0.1 Pb.
For statuary; good castability.

STATUARY BRONZE MELANCHTON, WITTENBERG.
89.55 Cu, 2 99 Sn, 7 45 Zn
For statuary, good castability.

STATUARY BRONZE, MUNICH.
92 88 Cu, 4.18 Sn, 0 44 Zn, 2.31 Pb, 0.15 P
For statuary; good castability

STAUFFER 90Ta-10W.
M-1528; 90 Ta, 10 W.
Annealed. 80,000 TS, 67,000 YS, 25 El; 50 RA.
Cold drawn 160,000 TS, 1 El.
For rocket engine parts, nozzles, flame barriers; useful in temperature range of −200°F to + 5200°F.

STAUFFER SCb-291.
M-1528, 10 Ta, 10 W, bal Cb.
For high temperature applications; heat resistant.

STAUFFER SM 291.
M-1528; 10 Ta, 10 W, bal Cb.
At 2200°F: 37,100 TS; 34,200 YS.
At 3000°F: 11,800 TS; 10,500 YS.
For space vehicles, nuclear reactors.
High temperature strength.

STAUFFER STa 880.
M-1528; 12.5 W, bal Ta.
At R.T.: 102,000 TS; 85,000 YS, 23 El (Annealed).
At 5300°F: 930 TS; 880 YS.
For nozzles, space equipment, rocket components, chemical equipment.
Develops optimum strength above 4000°F. Melted by electron beam.

STAUFFER STa 900.
M-1528; 9-11 W, bal Ta.
Annealed: 80,000 TS; 67,000 YS; 25 El.
Cold rolled 90%: 160,000 TS; 1 El.
At 4900°F: 1320 TS; 1285 YS.
For missile nozzles, electronic components, chemical equipment.
Resists HC1 and H_2SO_4 Corrosion.

STAVANGER N250.
M-1304; 0.25 C, 23-30 Cr, bal Fe.
Annealed: 85,000 TS; 55,000 YS; 25 El; B 83 Rock
For annealing boxes, oil burners, glass molds, furnace parts and fittings, exhaust manifolds.
Type 446 stainless steel, heat and corrosion resistant.

STAVANGER N330.
M-1304; 0.35 max C, 23-27 Cr, bal Fe.
Annealed: 90,000 TS; 60,000 YS; 20 El; 45 RA; 180 Brin.
For furnace parts, heat treating boxes; Type 446; heat resistant.

STAVANGER S1CHMO.
M-1304; 0 12 C, 13 Cr, 1.1 Mo, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 25 El; B 92 Rock
For springs, shafts, table flatware, oil refinery and chemical plant equipment.
Corrosion resistant.

STAVANGER S1CH-Ni.
M-1304; 0 15 max C, 13 Cr, 2 Ni, bal Fe.
For oil refinery equipment, valves; corrosion resistant.

STAVANGER S1C Spec.
M-1304; 0.08 C, 14 Cr, bal Fe.
Annealed: 75,000 TS; 36,000 YS, 30 El; B 80 Rock
For flat springs, knives, tableware, chemical plant equipment.
Type 410 stainless steel, heat and corrosion resistant.

STAVANGER S23/20.
M-1304; 0.20 C, 2 Si, 25 Cr, 20 Ni, bal Fe.
Annealed: 100,000 TS; 50,000 YS; 45 El; B 90 Rock.
For furnace parts, annealing boxes, heat treating fixtures.
Type 314 stainless steel, austenitic, heat and corrosion resistant.

STAVANGER S128M SPECIAL.
M-1304; 0.06 max C, 18 Cr, 9 Ni, 1.5 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El, 65 RA; 160 Brin.
For acid resistant chemical plant equipment; Type 316; stainless.

STAVANGER S178.
M-1304; 0.08-0.20 C, 2 max Mn, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 125,000 TS; 95,000 YS; 22 El; 55 RA; 277 Brin.
For oil refinery and chemical plant equipment; Type 302; stainless, austenitic.

STAVANGER S178 IISP.
M-1304; 0.08 C, 19 Cr, 11 Ni, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El; B 80 Rock.
For chemical plant equipment, digesters, evaporators, tanks.
Type 304 stainless steel, austenitic.

STAVANGER S178 SUPRA.
M-1304; 0.03 C, 18-20 Cr, 9-12 Ni, bal Fe.
Annealed: 77,000 TS; 30,000 YS; 60 El; B 75 Rock.
For chemical plant equipment, evaporators, digesters, tanks.
Type 304L stainless steel, austenitic

STAVANGER S268M.
M-1304; 0.20 C, 23-28 Cr, 2.5-5.0 Ni, 1-2 Mo, bal Fe.
Normalized: 103,000 TS; 78,000 YS; 18 El, 45 RA; 235 Brin.
Annealed: 95,000 TS, 41,000 YS; 29 El; 60 RA; 225 Brin.
For valves, pumps, furnace parts: Type 327; heat resistant.

STAVANGER S278.
M-1304; 0 12 C, 17-19 Cr, 8-10 Ni, bal Fe
Annealed: 90,000 TS; 40,000 YS; 50 El; B 58 Rock.
For chemical plant equipment, vessels, tanks, mixers, agitators
Type 302 stainless steel, austenitic.

STAVANGER SC-140.
M-1304; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS, 40,000 YS; 32 El; 68 RA; 170 Brin.
For cutlery, valve trim, turbine blades; Type 420; stainless, hardenable.

STAVANGER SC140L
M-1304; 0 20 C, 14 Cr, bal Fe.
Ht. Tr.: 225,000 TS; 200,000 YS, 12 El, C 48 Rock
For cutlery, surgical instruments, scissors, knives, gears, shafts.
Type 420 stainless steel, hardenable. Heat and corrosion resistant

STAVANGER SC140MO.
M-1304; 0.14 C, 14 5 Cr, 1 Mo, bal Fe.
Annealed: 80,000 TS, 35,000 YS; 25 El; B 92 Rock.
For springs, shafts, table flatware, oil refinery and chemical plant equipment
Corrosion, resistant, hardenable.

STAVANGER SCN192.
M-1304, 0 25 max C, 17 Cr, 2 Ni, bal Fe.
For oil refinery equipment; Type 341; corrosion and heat resistant.

STAVANGER SIC.
M-1304; 0.08 max C, 11.5-13 Cr, 0 1-0.3 Al, bal Fe
Annealed: 71,000 TS; 42,600 YS; 22 El; 70 RA; 150 Brin.
Heat treated 175,000 TS, 145,000 YS; 21 El; 64 RA; 352 Brin.
For oil refinery and chemical plant equipment; Type 405; corrosion resistant.

STAVANGER SIC16.
M-1304; 0.12 max C, 14-18 Cr, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 30 El; 55 RA; 150 Brin.
Cold drawn: 130,000 TS; 120,000 YS; 2 El; 185 Brin.
For oil refinery equipment, bolts, kitchen sinks; Type 430; stainless, ferritic.

STAVANGER SIC18.
M-1304; 0.12 max C, 14-18 Cr, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 30 El; 55 RA; 150 Brin.
Cold drawn: 130,000 TS; 120,000 YS; 2 El; 185 Brin.
For oil refinery equipment, bolts, kitchen sinks; Type 430; stainless, ferritic.

STAVANGER SICH.
M-1304; 0.15 max C, 11.5-13.5 Cr, 1 max Mn, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For valve parts, turbine blades, cutlery, knives; Type 410; corrosion resistant

STAVANGER SN12-12
M-1304; 0.08-0.16 C, 12 Cr, 12 Ni, bal Fe.
For valves; corrosion and heat resistant.

STAVANGER SN128IIISP.
M-1304; 0.06 C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 80,000 TS, 30,000 YS; 60 El; B 78 Rock.
For chemical plant equipment, vessels, tanks, digesters, agitators.
Type 316 stainless steel, austenitic.

STAVANGER SN128M
M-1304, 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Annealed· 85,000-95,000 TS; 35,000-45,000 YS, 60-50 El, 75-60 RA, 150-190 Brin.
For acid resistant chemical plant equipment; Type 316, stainless, austenitic.

STAVANGER SN128MIIISP
M-1304; 0 08 C, 17 Cr, 12 Ni, 2 Mo, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El; B 78 Rock.
For chemical plant equipment, tanks, digesters, agitators, mixers.
Type 316 stainless steel. Austenitic.

STAVANGER SN128, SPEC.
M-1304; 0.10 max C, 16-18 Cr, 10-14 Ni, 1 7-2 7 Mo, Cb = 10 × C, bal Fe
Annealed· 85,000-95,000 TS, 35,000-45,000 YS; 60-50 El; 75-60 RA, 150-190 Brin.
For acid resistant chemical plant equipment; Type 316 Cb; stainless, austenitic.

STAVANGER SN129
M-1304, 0.08 max C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 60 El; 135 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 330 Brin
For chemical plant equipment, welded structures; Type 304, stainless, austenitic.

STAVANGER SNW.
M-1304; 0 25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS, 45,000 YS; 50 El; 65 RA; 185 Brin.
At 1200°F: 57,000 TS; 22,000 YS; 32 El; 45 RA.
For furnace parts and equipment, heat treating boxes; Type 310; austenitic, heat resistant

STAVANGER SS286M.
M-1304; 0.10 max C, 26 Cr, 5 Ni, 1.5 Mo, bal Fe.
For furnace parts and equipment; Type 329; heat resistant.

STAVANGER SS286M.
M-1304; 0.12 C, 25-30 Cr, 3.5-6.0 Ni, 1-2 Mo, bal Fe.
Annealed: 105,000 TS; 80,000 YS; 25 El; 230 Brin.
For valves, valve fittings, pump parts, furnace equipment. Precipitation hardening.
Type 329 stainless steel, austenitic, corrosion and heat resistant.

STAYBLADE MAX.
M-521; 0.12 C, 18.5 Cr, 8.5 Ni, 0.8 Ti, 1.4 Al, bal Fe.
For turbine blades, boiler drums; austenitic; resists heat to 900°C.

STAYBLADE STEEL.
M-521; 0.22 C, 1 Si, 0.6 Mn, 20 Cr, 8.5 Ni, 1.2 Ti, bal Fe.
Heat treated: 95,000 TS; 58,000 YS; 30 El; 50 RA; 200 Brin.
For heat and corrosion resistant parts; heat and corrosion resistant.

STAYBOLT.
M-724; 0.05 C, 2 SiO_2, 0.15 Si, bal Fe.
For staybolts; wrought iron

STAYBRITE 17/7.
M-521; 0.10 C, 0.6 Si, 1.3 Mn, 17.5 Cr, 7.5 Ni, bal Fe.
Soft Sheet: 108,000 TS; 38,000 YP; 55 El.
Hard Sheet· 180,000 TS; 146,000 YP; 10 El.
For springs, aircraft structural parts, diaphragms, household utensils, trim.
Type 301 stainless steel, nonmagnetic, austenitic.

STAYBRITE 254.
M-521; 0.07 C, 0.4 Si, 0 8 Mn, 18 Cr, 18 Ni, 0 6 Ti, 3.7 Mo, 2 4 Cu, bal Fe.
Annealed: 84,000 TS; 38,000 YS; 47 El; 66 RA; 160 Brin.
For stainless parts; austenitic, stainless, stabilized.

STAYBRITE 317(L).
M-521; 0.03 C, 0.2-1.0 Si, 0.5-2 0 Mn, 18 0-19 5 Cr, 14-16 Ni, 3.0-4.0 Mo, bal Fe.
Ann: 72,000 min TS; 28,000 min YS; 40 min El.
Weldable without subsequent heat treatment.
Excellent corrosion resistant and resistance to pitting corrosion; for parts in textile, paper pulp and food industries. AISI 317L

STAYBRITE D.D.Q.
M-56, M-521; 0 10 C, 12 Cr, 12 Ni, 0.3 Si, 0.8 Mn, bal Fe.
Annealed: 78,000-90,000 TS; 32,000-37,000 YS; 60-40 El, 60-40 RA; 130-150 Brin.
For domestic table and hollowware, decorative trim; austenitic, stainless.

STAYBRITE EMS.
M-521; 0.12 C, 0 8 Si, 1.6 Mn, 0.25 S, 18 Cr, 10 Ni, 0 28 Mo, 0 6 Ti, bal Fe.
Annealed. 82,000 TS; 36,000 YS; 53 El; 54 RA; 175 Brin.
For stainless parts, free-cutting, austenitic, stainless.

STAYBRITE FCB.
M-521; 0 12 C, 0 6 Si, 0.4 Mn, 18 Cr, 10 Ni, 1.2 Cb, bal Fe.
Annealed: 84,000 TS, 37,000 YS; 58 El; 65 RA, 175 Brin
For stainless parts; austenitic, stainless.

STAYBRITE FCB (T).
M-521; 0.13 C, 0.6 Si, 1 2 Mn, 18 Cr, 12 Ni, 1.3 Cb, bal Fe.
Heat treated: 85,000 TS; 38,000 YS; 58 El; 65 RA; 175 Brin.
For stainless parts; stainless, austenitic.

STAYBRITE F.D P.
M-521; 0.10 max C, 0.2-1.0 Si, 0.5-2.0 Mn, 17-19 Cr, 8.5-10.5 Ni, Ti = 5 × C min, bal Fe.
Ann: 78,000 min TS; 30,000 min YS; 40 min El; 180 VDH.
Weldable stainless; for welded assemblies; for operation at elevated temperatures.
BS: En.58B, S129, S520, S521; AISI 321.

STAYBRITE F.D.P. (L).
M-521; 0.05 C, 0.8 Si, 0.8 Mn, 18 Cr, 11 Ni, Ti = 5 × C min, bal Fe.
Annealed: 90,000 TS; 40,000 YP; 50 El; 50 RA; 160 Brin.
For welded equipment in chemical, plastic and textile plants, tanks.
Type 321 stainless, austenitic, welding grade. Stabilized.

STAYBRITE FG.
M-521; 0.2 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, filters; stainless, austenitic; Type 302.

STAYBRITE FH.
M-521; 0.22 C, 12-14 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; B 92 Rock.
Ht. Tr.: 250,000 TS; 215,000 YS; 8 El; C 50 Rock.
For cutlery, surgical instruments, scissors, knives, gears, shafts.
Type 420 stainless steel, hardenable. Heat and corrosion resistant.

STAYBRITE FJ.
M-521; 0.10 C, 11.5-13 5 Cr, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 30 El; B 80 Rock
For flat springs, knives, tableware, chemical plant equipment.
Type 410 stainless steel, heat and corrosion resistant.

STAYBRITE F.M.B.
M-56, M-521; 0.07 C, 18 Cr, 8 Ni, 3 Mo, bal Fe
Annealed: 90,000-112,000 TS; 36,000-42,500 YS; 60-40 El; 60-40 RA; 160-190 Brin.
For chemical apparatus to resist acetic and other acids at elevated temperatures; rust and acid resisting; non-magnetic; Firth Brown I-166.

STAYBRITE F.M.B.3 T
M-521; 0.06 C, 18-20 Cr, 10-14 Ni, 3-4 Mo, bal Fe.
Annealed: 85,000 TS; 45,000 YS; 60 El; B 80 Rock.
For chemical plant equipment, paper and pulp mill components, digesters, evaporators, mixers.
Type 317 stainless steel, austenitic, acid resistant.

STAYBRITE F M.B.(L).
M-521; 0.03 C, 0.4 Si, 1 5 Mn, 17.5 Cr, 12 0 Ni, 2 8 Mo, bal Fe.
Annealed: 88,000 TS; 35,000 YP; 50 El; 50 RA; 160 Brin.
For chemical, textile, plastic and pharmaceutical plant equipment.
Type 316L stainless steel, austenitic, nonmagnetic.

STAYBRITE FMB(Ti).
M-521; 0.07 C, 0.3 Si, 0.3 Mn, 18 Cr, 8 Ni, 3.25 Mo, 0.3 Ti, bal Fe.
Annealed: 85,000 TS; 38,000 YS; 50 El; 50 RA; 170 Brin.
For chemical plant equipment, evaporators, austenitic, stainless.

STAYBRITE FMB(V4A).
M-1420; C, Cr, Ni, bal Fe.
Annealed: 58,000-78,000 TS; 29,000-35,000 YS; 18-12 El; 170-200 Brin.
For chemical plant equipment, dye plant equipment; stainless, austenitic.

STAYBRITE FML.
M-521; 0.07 C, 0.6 Si, 0.8 Mn, 18 Cr, 9.5 Ni, 1.25 Mo, bal Fe.
Annealed: 85,000 TS; 38,000 YS; 50 El; 50 RA; 170 Brin.
For stainless parts; austenitic, stainless.

STAYBRITE F.M.S.
M-521; 0.06 C, 0.90 Si, 0.55 Mn, 19.5 Cr, 8.7 Ni, 2.8 Mo, 0.8 Nb, bal Fe.
Austenitic stainless steel spun castings, weldable.
Cast: 90,000 TS; 45,000 YS (0.2%); 35 El.
For cast parts (requiring welding) for use in food and chemical industries.

STAYBRITE F M.X.
M-521; 0.05 C, 0.6 Si, 0.95 Mn, 23.0 Cr, 9.4 Ni, 3.4 Mo, bal Fe.
Austenitic stainless steel spun castings.
Cast: 98,000 TS; 56,000 YS (0 2%); 30 El.
For cast parts used in food and chemical industries.

STAYBRITE FSL.
M-521; 0.05 C, 0.5 Si, 0.4 Mn, 19 Cr, 10 Ni, bal Fe.
Annealed: 84,000 TS; 35,000 YS; 60 El; 65 RA; 160 Brin.
For stainless parts; austenitic, stainless.

STAYBRITE F.S.L (L).
M-521; 0.03 C, 0.6 Si, 1.0 Mn, 18.5 Cr, 11 0 Ni, bal Fe
Annealed: 85,000 TS; 36,000 YS; 60 El; 65 RA; 160 Brin
For chemical, textile and pharmaceutical processing equipment, tanks, agitators, vessels, filters.
Type 304L stainless, austenitic, nonmagnetic

STAYBRITE FSM (2).
M-521, 0.1 C, 18 Cr, 5 Ni, 8 Mn, bal Fe.
Rolled: 112,000 TS, 56,000 YS; 50 El, 200 Brin.
For domestic utensils and equipment; stainless.

STAYBRITE F.S.T.
M-56, M-521; 0 2 max C, 18 Cr, 8 Ni, 0.8 Mn, 0 6 Si, bal Fe.
Annealed: 83,000-101,000 TS; 34,000-41,000 YS; 60-40 El, 60-40 RA, 160-180 Brin
For vats, tanks, ship fittings, trim, reflectors, Type 302, austenitic, stainless.

STAYBRITE F S.T (FC).
M-521; 0 10 max C, 0 2-1.0 Si, 1.0-2 0 Mn, 0 15-0 30 S, 17-19 Cr, 8.5-10.5 Ni, 0 2-0 5 Mo, bal Fe
Ann· 78,000 min TS, 30,000 min YS, 40 min El; 175 VDH
Free machining austenitic stainless for machined parts as studs, cap screws, shafts
EN 58 AM; AISI 303.

STAYBRITE F.S T (L).
M-521, 0.06 C, 0 6 Si, 1 5 Mn, 18.5 Cr, 10 Ni, bal Fe
Annealed· 90,000 TS; 36,000 YP; 60 El; 65 RA, 160 Brinell.
For architectural trim, kitchen equipment, chemical and textile processing equipment
Type 304 stainless steel, nonmagnetic, austenitic.

STAYBRITE STEFL.
M-56; 18 Cr, 8-9 Ni, C, bal Fe.
100,000 TS; 35,000 YS, 50 El, 40 RA; 153 Brin.
For stainless steel parts; corrosion resisting

STEAM BRONZE-1
U.S ; 85 Cu, 5 Zn, 5 Pb, 5 Sn.
26,000 TS; 16 El; 20 RA.
For valves and fittings, automotive parts, castings

STEAM BRONZE-2
U.S.; 88 Cu, 2 Zn, 2 Pb, 8 Sn.
32,000 TS; 22 El; 25 RA.
For valves, fittings, automobile parts; free-cutting.

STEAM METAL.
M-126; 88 Cu, 6 Sn, 3 Pb, 3 Zn.
For injectors, valves, steam specialties; free-cutting

STEAM METAL, AJAX.
M-123; 87 Cu, 6 Sn, 5 Zn, 2 Pb.
37,000-42,000 TS; 16,000-17,000 YS; 51-27 El.
For valves.

STEAM VALVE BRONZE.
Sn, Zn, Pb, bal Cu.
For steam valves; pressure tight castings.

STEB METAL.
M-496, Ag, Cu.
For enameling and electrical contacts; silver rolled into copper

STEDMETAL.
M-518; 3.2 C, 2.5 Si, 1.5 Ni, 0.7 Mn, bal Fe.
For crushers, grinders, pulverizers; Ni-cast iron.

STEEL 1KH14ND.
Russia; 0.05 C, 13.5 Cr, 1.5 Ni, 1.37 Cu, bal Fe.
For stainless parts; stainless, austenitic.

STEEL 1KH18N9T
Russia; C, Ni, Cr, Ti, bal Fe.
For stainless parts; stainless.

STEEL 15 Cr 3. ①
Germany; 0.12-0.18 C, 0.5 Mn, 0.20 Si, 0.5-0.8 Cr, bal Fe.
Heat treated: 85,000-120,000 TS.
For gears, shafts, machine tool parts; case hardening steel, water hardened.

STEEL 15 Cr Ni 6 ②
Germany, 0.12-0.17 C, 0.5 Mn, 0.20 Si, 1.4-1.7 Ni, 1.4-1.7 Cr, bal Fe.
Heat treated: 140,000-185,000 TS
For gears, cams, shafts, camshafts; case-hardening steel, oil hardened.

STEEL 16 Mn Cr 5. ③
Germany; 0.14-0.19 C, 1.0-1.3 Mn, 0.25 Si, 0.8-1.1 Cr, bal Fe
Heat treated. 115,000-155,000 TS
For gears, shafts, machine tool parts, case hardening steel, oil hardened.

STEEL 18 Cr Ni 8. ④
Germany, 0.15-0.20 C, 0.5 Mn, 0.20 Si, 1.8-2.1 Ni, 1.8-2.1 Cr, bal Fe.
Heat treated: 170,000-205,000 TS.
For gears, shafts, cams, pinions, camshafts; case hardening steel, oil hardened.

STEEL 20 Mn Cr 5. ⑤
Germany; 0.17-0.22 C, 1.1-1.4 Mn, 0.20 Si, 1.0-1.3 Cr, bal Fe.
Heat treated: 127,000-170,000 TS.
For gears, pinions, cams, shafts, camshafts; case hardening steel, oil hardened.

STEEL 20-XGP.
Russia; C, alloy, bal Fe.
Rolled: 144,000 TS; 114,000 YS.
For machine tool parts; case hardened.

STEEL 20-XHM.
Russia, C, alloy, bal Fe.
For machine tool parts; case hardened.

STEEL 25 Cr Mo 4. ⑥
Germany; 0.22-0.29 C, 0.7 Mn, 0.25 Si, 0.9-1.2 Cr, 0.15-0.25 Mo, bal Fe.
Heat treated: 115,000-135,000 TS.
For construction parts and equipment; oil hardened, shock resistant.

STEEL 30 Cr Mo V 9. ⑦
Germany; 0.26-0.34 C, 0.6 Mn, 0.25 Si, 2.3-2.7 Cr, 0.15-0.25 Mo, 0.1-0.2 V, bal Fe.
Heat treated: 180,000-207,000 TS.
For construction equipment, gears, crankshafts, axles; oil hardened, shock resistant.

STEEL 30 Cr Ni Mo 8. ⑧
Germany; 0.26-0.34 C, 1.8-2.1 Ni, 1.8-2.1 Cr, 0.25-0.35 Mo, bal Fe.
Heat treated: 177,000-207,000 TS.
For gears, shafts, crankshafts, axles; oil hardened, shock resistant.

STEEL 30 Mn 5. ⑨
Germany; 0.27-0.34 C, 1.2-1.5 Mn, 0.15-0.35 Si, bal Fe.
Heat treated: 115,000-135,000 TS.
For gears, shafts, machine tools, axles; oil hardened.

STEEL 34 Cr 4. ⑩
Germany; 0.30-0.37 C, 0.5-0.8 Mn, 0.15-0.35 Si, 0.9-1.2 Cr, bal Fe.
Heat treated: 127,000-150,000 TS.
For construction parts and equipment; oil hardened.

STEEL 34 Cr Mo 4. ⑪
Germany; 0.30-0.37 C, 0.7 Mn, 0.25 Si, 0.9-1.2 Cr, 0.15-0.25 Mo, bal Fe.
Heat treated: 127,000-135,000 TS.
For construction parts and equipment; oil hardened, shock resistant.

STEEL 34 Cr Ni Mo 6. ⑫
Germany; 0.30-0.38 C, 1.4-1.7 Ni, 1.4-1.7 Cr, 0.15-0.25 Mo, bal Fe.
Heat treated: 157,000-185,000 TS.
For gears, shafts, crankshafts, axles; oil hardening, shock resistant.

STEEL 36 Cr Ni Mo 4.
Germany; 0.32-0.40 C, 0.9-1.2 Ni, 0.9-1.2 Cr, 0.15-0.25 Mo, bal Fe.
Heat treated: 142,000-170,000 TS.
For construction parts, gears, crankshafts; oil hardened, shock resistant

STEEL 37 Mn Si 5.
Germany; 0.33-0.61 C, 1.1-1.4 Mn, 1.1-1.4 Si, bal Fe.
Heat treated: 127,000-150,000 TS.
For construction parts, machine tools; oil hardened

STEEL 40 Mn 4.
Germany; 0.36-0.44 C, 0.8-1.1 Mn, 0.25-0.50 Si, bal Fe
Heat treated: 115,000-135,000 TS.
For gears, shafts, machine tools, axles; oil hardening.

STEEL 41 Cr 4.
Germany, 0.38-0.44 C, 0.5-0.8 Mn, 0.15-0.35 Si, 0.9-1.2 Cr, bal Fe.
Heat treated: 127,000-150,000 TS.
For construction parts and equipment; oil hardened.

STEEL 42 Cr Mo 4.
Germany, 0.38-0.45 C, 0.7 Mn, 0.25 Si, 0.9-1.2 Cr, 0.15-0.25 Mo, bal Fe
Heat treated: 142,000-170,000 TS.
For construction parts and equipment; oil hardened, shock resistant.

STEEL 42 Mn V 7
Germany, 0.38-0.45 C, 1.6-1.9 Mn, 0.15-0.35 Si, 0.07-0.12 V, bal Fe.
Heat treated: 142,000-170,000 TS
For construction parts and equipment; oil hardened.

STEEL 50 Cr Mo 4.
Germany; 0.46-0.54 C, 0.7 Mn, 0.25 Si, 0.9-1.2 Cr, 0.15-0.25 Mo, bal Fe.
Heat treated: 157,000-185,000 TS.
For construction parts and equipment; oil hardened, shock resistant.

STEEL 50 KHFA.
Russia; C, bal Fe.
For springs; water hardened.

STEEL 55C2.
Russia; C, alloy, bal Fe.
For machine tool parts.

STEEL-COTE NITRA-ALLOY.
M-1243.
For solder; for soft spot protection during heat treatment.

STEEL-COTE NO. G.
M-1243.
For solder; general duty.

STEEL-COTE NO. L.
M-1243.
For solder; for lead or Terne Plate.

STEEL-COTE NO. T.
M-1243.
For solder; for tin plate.

STEEL-COTE NO. W.
M-1243.
For solder; for weld coating.

STEEL-COTE NO. Z.
M-1243.
For solder; for zinc or galvanized parts.

STEEL EC30.
Germany; 0.10-0.60 C, 0.3-0.5 Cr, 0.4-0.6 Mn, 0.35 max Si, bal Fe.
Heat treated: 78,000-100,000 TS.
For gears, pinions, shafts, cams; case hardening, water hardened.

STEEL EC60.
Germany; 0.12-0.18 C, 0.6-0.9 Cr, 0.5 Mn, 0.35 max Si, bal Fe.
Heat treated: 100,000-127,000 TS.
For gears, pinions, shafts, cams; case hardening, water hardened.

STEEL ECMo 80.
Germany; 0.13-0.17 C, 1.0-1.3 Cr, 0.2-0.3 Mo, 0.8-1.1 Mn, bal Fe.
Heat treated: 120,000-155,000 TS.
For gears, shafts, pinions, cams; case hardening, oil hardened.

STEEL ECMo 100.
Germany; 0.18-0.23 C, 0.9-1.2 Mn, 1.1-1.4 Cr, 0.3 Mo, bal Fe.
Heat treated: 155,000-205,000 TS.
For gears, pinions, shafts, cams; case hardening, oil hardened.

STEEL ECN25.
Germany; 0.10-0.17 C, 2.25-2.75 Ni, 0.55-0.95 Cr, bal Fe.
Heat treated: 115,000-155,000 TS.
For gears, pinions, shafts, cams; case hardening, shock resistant.

STEEL ECN35.
Germany; 0.10-0.17 C, 3.25-3.75 Ni, 0.55-0.95 Cr, bal Fe.
Heat treated: 127,000-170,000 TS.
For gears, pinions, shafts, cams, crankshafts; case hardening, shock resistant.

STEEL ECN45.
Germany; 0.10-0.17 C, 4.25-4.75 Ni, 0.90-1.35 Cr, bal Fe.
Heat treated: 170,000-200,000 TS.
For gears, pinions, shafts, cams, camshafts; case hardening, shock resistant.

STEEL EI-257.
Russia; 0.14 C, 13 Cr, 12 Ni, 2.5 W, 0.68 Mo, bal Fe.
For steam tubes, boilers.

STEEL EN15.
Germany; 0.10-0.17 C, 1.25-1.75 Ni, 0.2 max Cr, bal Fe.
Heat treated: 85,000-115,000 TS.
For gears, pinions, shafts, cams; case hardening, shock resistant, water hardened.

STEELMET 100.
M-265; 1 Mn, 1 Ni, bal Fe.
Sintered: 50,000-55,000 TS; 30,000-35,000 YS; 30-20 El; 100-110 Brin.
For machine tool parts; prealloyed metal powders.

STEELMET 101.
M-265; 9 Ni, 1 Mn, bal Fe.
Sintered: 78,000-82,000 TS; 68,000-70,000 YS; 12-8 El; 176-185 Brin.
For machine tool parts; prealloyed metal powders.

STEELMET 302.
M-265; 0.20 C, 18 Cr, 8 Ni, bal Fe.
Sintered: 75,000-90,000 TS; 35,000-37,000 YS; 30-15 El; 150-185 Brin.
For stainless components; stainless, austenitic.

STEELMET 600.
M-265; 2 Cu, 25 Ni, bal Fe.
Sintered: 70,000 TS; 55,000 YS; 16 El; 155 Brin.
Heat treated: 90,000 TS; 88,000 YS; 3 El; 216 Brin.
For machine tool parts; prealloyed alloy powders.

STEEL-OILITE.
M-211; Fe.
Sintered: 65,000 TS.
For gears, cams, brackets, lever arms; sintered.

STEEL OILITE A.
M-211; 97.75 min Fe; 0.25 max C.
Sintered: 30,000 TS; 7.0 min density. 27,000 shear; 24,000 fatigue.
ASTM B310-67 Type IV C1.A.
PMPMA F-0000-S.

STEEL OILITE AH.
M-211; 1.0-3.0 Cu, 94.0 min Fe, 0.6-1.0 C.
Sintered, heat treated: 120,000 TS; 7.0 min density. 100,000 shear; 28,000 fatigue.

STEFANITE A2
M-1188; carbite.
For cutting tools; for high speed finishing.

STEFANITE A3.
M-1188; carbide.
For cutting tools; for medium speed cutting.

STEFANITE A4.
M-1188, carbide
For cutting tools; medium speed machining.

STEFANITE A6.
M-1188; carbide
For cutting tools; for roughing and finishing.

STEFANITE A9.
M-1188; carbide.
For cutting tools; for low speed rough turning.

STEFANITE F6.
M-1188; carbide.
For cutting tools; for cutting cast iron.

STEIERISCHE NO. 779.
M-1114; 0.7 C, 18 W, 9 Co, 1 Mo, 4 Cr, 2 V, bal Fe.
For lathe and planer tools, milling cutters, hobs, taps; Type T4; high speed steel.

STELCO CB45-60.
M-1124; 0.20 C, 1.2 Mn, 0.005 min Cb, bal Fe.
Rolled: CB45: 60,000 TS; 45,000 YS; 25 El.
CB50: 65,000 TS; 50,000 YS; 22 El.
CB55: 70,000 TS; 55,000 YS; 20 El.
CB60: 75,000 TS; 60,000 YS; 18 El.
For mine and railroad cars, pressure vessels, derricks, booms, bridges.
Good fabricability and weldability.

STELCO COLUMBIUM.
M-1124; 0.20 C, 1.2 Mn, 0.005 min Cb, bal Fe.
Rolled: 60,000-75,000 TS; 45,000-60,000 YS; 18-25 El.
For bridges, pressure vessels, booms, mine cars, railroad and bus bodies.
High strength low alloy steel, good formability and weldability.

STELCOLOY 50.
M-1124; 0.15 max C, 1.35 max Mn, 0.15-0.30 Si, 0.20-0.50 Cu, 0.20-0.50 Ni, bal Fe.
A low alloy high-strength steel with emphasis on resistance to brittle fracture as well as atmosphere corrosion.
Rolled: 70,000 TS; 50,000 YS; 22 El.
For welded, riveted or bolted construction, especially welded bridges and buildings.

STELCOLOY 70.
M-1124; 0.22 max C, 1.5 max Mn, 0.15-0.30 Si, 0.20-0.50 Cu, 0.25-0.50 Ni, 0.05 max Cb, 0.02-0.10 V, bal Fe.
A low alloy, high strength steel especially designed for the transportation industry.
Rolled: 90,000 TS; 70,000 YS; 14 El (8").

STELCO VANADIUM 441.
M-1124; 0.20 C, 1.2 Mn, 0.02 min V, bal Fe.
Rolled: 65,000 TS; 50,000 YS; 22 El.
For bridges, booms, pressure vessels, mine and railroad cars.
High strength low alloy steel, tough, good weldability and formability.

STELLAR.
M-1704, 0.34 C, 0.80 Mn, 0.50 Si, 0.90 Cr, 0.35 Mo, 0.33 Cu.
Low alloy, oil hardening tool steel.

STELLITE 1
M-1580; 2.4 C, 33 Cr, 13 W, bal Co.
Cast: 95,000 TS; C 56 Rock.
For hard facing applications.
Heat, corrosion and wear resistant.

STELLITE 3.
M-1580; 2.4 C, 30 Cr, 13 W, bal Co.
Cast: 90,000 TS; 51-58 Rc.
For pump sleeves, rotary seal rings, wear pads, bearing sleeves.
High abrasion and corrosion resistant

STELLITE 4
M-1580; 31 Cr, 14 W, 1 C, bal Co.
Cast: 130,000 TS; 45-49 Rc
High temperature strength and wear resistant castings.

STELLITE ALLOY NO. 4.
M-167; C, Cr, W, bal Co.
Cast: 39,100 TS; 39,000 YS; 1 El; 1 RA; 450 Brin.
For tools, cutters; wear and corrosion resistant.

STELLITE 6.
M-1580; 26 Cr, 5 W, 1 C, bal Co.
Cast: 116,000 TS; 1 El; 400 Brin.
For weld deposits on steam and chemical valves, shear blades, tong bits.
Corrosion and heat resistant.

STELLITE 7.
M-1580; 26 Cr, 6 W, 0.4 C, bal Co.
Cast: 120,000 TS; 30-35 Rock C.
For gas turbine blades, brass casting dies, extrusion dies.
Resistant to thermal shock.
Excellent corrosion resistance and high temperature strength.

STELLITE 8.
M-1580; 0.2 C, 30 Cr, 6 Mo, 63.0 Co.
Cast: 120,000 TS; 30-35 Rock C.
For gas turbine blades, brass casting dies, extrusion dies.
Cast alloy. High temperature strength and excellent corrosion resistance.

STELLITE 12.
M-1580; 1.8 C, 9 W, 29 Cr, bal Co.
Cast: 108,000 TS; 510 Brin.
For hard facing electrodes.
Good high temperature strength.
Heat and wear resistant.

STELLITE 20.
M-1580; 33 Cr, 18 W, 2.5 C, bal Co.
Cast: 80,000 TS; 55-59 Rock C.
High abrasion and corrosion resistance.

STELLITE ALLOY NO. 40.
M-167; 65 Co, 27 Cr, 4.5 W, 1.2 C, bal Fe.
For hard facing rod, welding; abrasion and corrosion resistant.

STELLITE 100.
M-1580; 34 Cr, 19 W, 2 C, bal Co.
Cast: 56,000 TS; 61-66 Rc.
For tool bits, milling cutters, blades.

STELLITE NO. 6059
see HAYNES STELLITE ALLOY NO. 27.

STELLITE HS-30-422
see HAYNES STELLITE ALLOY NO. 30.

STELLITE SF1.
M-1580; 45 Co, 19 Cr, 13 W, 1.0 C, 13 Ni, 3 Si, 2.5 B.
As cast: 54-58 Rock C.
For hard facing; wear and abrasion resistant.

STELLITE SF6
M-1580; 50 Co, 19 Cr, 8 W, 1.0 C, 13 Ni, 2.5 Si, 1.5 B.
Cast: 43-46 Rock C.
For hard facing; wear and abrasion resistant; machinable.

STELLITE SF12.
M-1580; 52 Co, 19 Cr, 9 W, 1.0 C, 13 Ni, 2.5 Si, 1.5 B
Cast: 48-50 Rock C.
For hard facing, wear and abrasion resistant; machinable with difficulty.

STELLITE SF20.
M-1580; 42 Co, 19 Cr, 15 W, 1.5 C, 13 Ni, 3 Si, 3 B.
Cast: 60-62 Rock C.
For hard facing, wear and abrasion resistant; not machinable.

STELLITE X40.
M-1580; 25 Cr, 7 W, 0.3 C, 10 Ni, bal Co.
Cast: 96,000 TS; 30-35 Rock C.
Corrosion resistant, high temperature strength and resistance to thermal shock.

STELLIT TTS NO. 1.
Russ.; Co-W-Cr.
For cutting tools; hard sintered alloy

STELLIT TTS NO. 2.
Russ.; Co-W-Cr.
For cutting tools; hard sintered alloy.

STELLRAM.
M-1385; WC.
For cutting tools; sintered carbide.

STEMALLOY.
M-264; Sn, alloy, bal Cu.
For valve stem and seats, globe valves; valve bronze, corrosion and wear resistant

STENTOR.
M-501, M-912; 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For heading and forging dies, die casting dies; oil hardened, tough.

STENTOR see also CARPENTER STENTOR.

STEPHENSON-1.
Eng.; 84 Cu, 8.3 Zn, 2.9 Pb, 0.4 Fe.
30,000 TS; 17 El; 19 RA.
For piston rings; P.L. 16,000.

STEPHENSON-2.
Eng.; 31 Sn, 31 Fe, 19 Cu, 19 Zn.
For castings.

STEPHENSON LOCOMOTIVE BEARING.
Eng.; 79.5 Cu, 7.5 Sn, 5 Zn, 8 Pb.
For bearings for locomotives; heavy duty.

STEPHENSON PISTON RINGS.
Eng.; 84 Cu, 8.3 Zn, 2.9 Sn, 4.3 Pb, 0.4 Fe.
For piston rings; tough.

STERCON-1000.
M-57; 0.07 C, 19 Cr, 14 Ni, 4.3 Mo, 3 Ti, 1.3 Al, 1.0 Fe, bal Ni.
For high temperature applications; corrosion and heat resistant.

STERLIN.
69 Cu, 18 Ni, 13 Zn, 0.8 Pb.
For base for plated tableware; corrosion resistant.

STERLINE.
68-68.5 Cu, 13.3-12.8 Zn, 18 Ni, 0.75-0.80 Fe, 0-0.8 Pb.
For tableware, architectural trim; corrosion resistant.

STERLING.
Eng.; 62 Sn, 15 Zn, 11 Al, 8.3 Pb, 2.5 Cu, 1.2 Sb.
For solder.

STERLING.
M-904; 0.1 C, 18 Cr, 8 Ni, bal Fe.
Cast: 75,000 TS; 30,000 YS; 25 El; 40 RA; 150 Brin.
For chemical plant equipment; Type 302; stainless, austenitic.

STERLING 7Q5.
M-106; see SAE 300 (7Q5).

STERLING 18-8S.
M-57; 0.08 max C, 18-20 Cr, 8-10 Ni, bal Fe.
For stainless and heat resistant parts; stainless, malleable.

STERLING 40E.
M-106; Same as FRONTIER BRONZE.

STERLING 300.
M-106; 9.5-11.0 Mg, bal Al.
Sand cast: 40,000-47,000 TS; 21,300-23,500 YS; 8-12 El; 70-80 Brin; 10 Izod.
Sand or chill cast aluminum; good proof stress, resistance to shock and corrosion.
Gen.Eng.BS 1490:LM10-W, 11-W, 11-WP.

STERLING 304 + Si see SO 7.1002 (304 + Si).

STERLING 305/3051.
M-106; 2-4 Cu, 4-6 Si, 0.3-0.7 Mn, bal Fe.
Sand cast: 20,000-21,400 TS; 9,000-13,000 YS; 1.5-2 El; 70-80 Brin; 0.8 Izod.
General purpose sand or chill cast aluminum.
Gen.Eng.BS 1490: LM 22-W.

STERLING 356.
M-106; 0.2-0.45 Mg, 6.5-7.5 Si, bal Al.
Sand cast: 17,900-20,200 TS; 10,000-11,200 YS; 2-3 El; 50-60 Brin, 1.1 Izod.
Heat treated: 33,600-36,000 TS; 29,200-31,400 YS; 0-1 El; 80-90 Brin; 1.4 Izod.
Good general purpose heat treatable sand or chill cast aluminum alloy; corrosion resistant and pressure tight.
Gen.Eng.BS. 1490 LM 25-M, 25-P, 25-W, 25-WP.

STERLING A.356.
M-106; 0.2-0.45 Mg, 6.5-7.5 Si, bal Al. (lower residuals than Sterling 356).
Chill cast bar: 40,000 TS; 29,000 YS; 5 El; 80-90 Brin; 2.0 Izod.
Premium quality aluminum casting, sand or gravity die
(AIRCRAFT)D.T.D.Draft M184 (England).

STERLING "M" DRILL STEEL.
M-57; 1.25 C, 0.3 Mn, 0.25 Cr, bal Fe.
For drills, taps; water hardened.

STERLING METAL.
66 Cu, 33-27 Zn, 0.7 Fe, 0-2 Pb, Sn.
For hardware, fittings; free-cutting.

STERLING SILVER.
M-63; 92.5 Ag, 7.5 Cu.
Sand cast: 30,000 TS, 18,000 YS; 41 El, 55 RA.
Chill cast: 24,000 TS; 19,000 YS; 7 El; 16 RA.
For silverware, coins, jewelry; corrosion resistant.

STERLING SILVER SOLDER.
80 Ag, 18 Zn, 2.5 Cu
For silver solder; corrosion resistant.

STERLING STAINLESS 410.
M-57; 0.15 max C, 1 max Mn, 11.5-13.5 Cr, bal Fe.
Hardened: 190,000 TS; 145,000 YS; 15 El; 55 RA; 390 Brin.
For valve parts, pump rods, pistons, shafts, bolts, corrosion resistant, hardenable; Type 410.

STERLING STAINLESS 416
M-57; 0.15 max C, 1.25 max Mn, 12-14 Cr, 0.07 min S, P or Se, 0.6 max Mo or Zr, bal Fe.
Hardened: 110,000 TS, 85,000 YS; 18 El; 55 RA; 230 Brin.
For screw machine products; corrosion resistant, hardenable, free-cutting; Type 416.

STERLING STAINLESS 420.
M-57; 0.15 min C, 1 max Mn, 12-14 Cr, bal Fe
Hardened: 230,000 TS; 195,000 YS; 8 El; 25 RA; 500 Brin.
For cutlery, needles, optical mirrors; corrosion resistant, hardenable; Type 420.

STERLING STAINLESS 430
M-57; 0.12 max C, 1 max Mn, 14-18 Cr, bal Fe.
Cold drawn: 85,000 TS; 70,000 YS; 20 El; 65 RA; 185 Brin.
For corrosion and heat resistant parts; non hardenable, corrosion resistant, Type 430

STERLING STAINLESS 440-A.
M-57; 0.60-0.75 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Hardened: 260,000 TS, 240,000 YS; 5 El; 20 RA; 510 Brin.
For valve parts, knives, ball bearings; corrosion resistant, hardenable; Type 440-A.

STERLING STAINLESS 440-B.
M-57; 0.75-0.95 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Hardened: 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin.
For valve parts, knives, ball bearings; corrosion resistant, hardenable; Type 440-B.

STERLING STAINLESS 440-BMo.
M-57; 0.85 C, 0.4 Mn, 17 Cr, 0.2 V, 2.5 Mo, bal Fe.
Hardened: 280,000 TS; 270,000 YS; 3 El; 15 RA; 590 Brin.
For oil refineries, valve parts; corrosion resistant, hardenable.

STERLING STAINLESS 440-BV.
M-57; 0.75-0.95 C, 0.3-0.5 Mn, 16-18 Cr, 0.4-0.6 Mo, 0.15-0.25 V, bal Fe.
Hardened: 280,000 TS; 270,000 YS; 3 El; 15 RA; 590 Brin.
For cutlery, knives; corrosion resistant, hardenable.

STERLING STAINLESS 440-CM.
M-57; 0.95-1.20 C, 1 max Mn, 16-18 Cr, 0.75 max Mo, bal Fe.
Hardened: 285,000 TS; 275,000 YS; 2 El; 10 RA; 580 Brin.
For bushings, ball races, valve parts, cutlery; corrosion resistant, hardenable; Type 440-C.

STERLING STAINLESS 440-CX.
M-57; 0.95-1.20 C, 1 max Mn, 16-18 Cr, 0.75 max Mo, bal Fe.
Hardened· 285,000 TS; 275,000 YS; 2 El; 10 RA; 610 Brin
For ball bearings, cutlery; corrosion resistant, hardenable; Type 440-C.

STERLING STAINLESS A.
M-57; 0 35 C, 0 35 Mn, 12-15 Cr, bal Fe.
Oil treated: 240,000-150,000 TS; 200,000-125,000 YS, 4 12 El; 8-40 RA; 500-300 Brin.
Annealed· 100,000 TS; 65,000 YS, 27 El; 60 RA; 185 Brin
For cutlery, sharp edged or pointed parts, scissors, surgical and dental instruments; stain resisting, tough and hard; max. operating temperature 1650°F.

STERLING STAINLESS B
M-57, 16 Cr, 0 35 Mn, 0 65 C, bal Fe.
Oil treated. 270,000-130,000 TS, 245,000-100,000 YS, 2-12 El; 3-30 RA, 545-285 Brin
Annealed 95,000 TS; 54,000 YS, 27 El 45 RA; 185 Brin.
For cutlery, surgical and dental instruments, ball bearings, valve seats, max operating temperature 1650°F; requires heat treatment for stainless properties.

STERLING STAINLESS BHH.
M-57; 1 05 C, 17 5 Cr, bal Fe
For ball races, valve parts, bearing surfaces, machine parts; heat and corrosion resistant; hard grade.

STERLING STAINLESS M.
M-57, 0 12 max. C, 15-18 Cr, bal Fe
Annealed· 100,000 TS, 70,000 YS; 25 El; 65 RA; 200 Brin.
For heat resisting parts, corrosion resisting parts, stain resisting without heat treatment; 17-40.

STERLING STAINLESS MG.
M-57, 0 35 max. C, 0 50 Mn, 18-23 Cr, bal Fe.
For shafts, pump rods, furnace parts, glass molds; high temperature resistance, corrosion resistant.

STERLING STAINLESS Ni-"T."
M-57; 0 15 max C, 11-13 Cr, 1 2-2 5 Ni, bal Fe.
For gun barrels, pistons, bolts, pump rods; corrosion resistant, hardenable

STERLING STAINLESS T.
M-57; 12 5 Cr, 0 35 Ni, 0.35 Mn, 0.12 C, bal Fe.
Oil treated: 185,000-120,000 YS; 160,000-100,000 YS; 17-22 El; 60-70 RA, 395-240 Brin.
Normalized: 145,000 TS; 125,000 YS, 20 El; 63 RA; 241 Brin
For pump rods, machinery parts, turbine blades, shafts, pistons, gun barrels; resists stain without heat treatment, max. operating temperature 1650°F.

STERLING "V."
M-57; 0.9 C, 0.35 Mn, 0.15 Cr, 0.15 V, bal Fe.
For punches, springs, shear blades, taps; water hardened.

STERLING XX.
M-57; 0.95 C, 0.30 Mn, 0.05 Cr, bal Fe.
For tools, dies; water hardened.

STERLITE.
M-201; 53 Cu, 25 Ni, 20 Zn, Mn.
53,650 TS; 27,250 YS; 33 El; 35 RA; 99 Brin.
For ship fittings, laundry and dairy machinery, surgical instruments; tough and corrosion resisting.

STERMET GR. 1
M-1008; 65-70 Ni, 17-20 Cr, bal Fe.
For heat resistant castings, heat treating and carburizing pots; for "heat shock."

STERMET GR. 2.
M-1008; 58-62 Ni, 10-14 Cr, bal Fe.
Cast: 60,000-75,000 TS; 30,000-40,000 YS, 2-5 El; 2-6 RA; 185 Brin.
For castings, rolls, plates, enameling fixtures; for "heat shock"; heat resistant.

STERMET GR. 3.
M-1008, 35-40 Ni, 16-20 Cr, bal Fe.
For castings, rolls, rails, furnace parts, heat resistant.

STERMET GR. 4.
M-1008, 33-37 Ni, 13 17 Cr, bal Fe.
Cast. 60,000-75,000 TS, 35,000-50,000 YS; 4-6 El; 4-7 RA; 185 Brin.
For furnace parts, conveyors, belts, burner parts; heat resistant, castings

STERMET GR 5
M-1008; 8-10 Ni, 28-30 Cr, bal Fe
For stoker parts, dampers, skid rails, castings; heat resistant.

STERMET GR 6.
M-1008, 10-14 Ni, 24-26 Cr, bal Fe.
Cast: 80,000-100,000 TS; 40,000-55,000 YS; 10-18 El, 10-20 RA, 175 Brin
For heat resistant castings; for severe S atmospheres and abrasive conditions

STERMET GR 7
M-1008, 18-22 Ni, 23-27 Cr, bal Fe.
For castings, furnace parts, heat and corrosion resistant.

STERMET GR. 8
M-1008, 8-12 Ni, 26-30 Cr, bal Fe.
For furnace parts, skid rails, castings; heat resistant.

STERMET GR 9
M-1008; 0-3 Ni, 27-30 Cr, bal Fe.
Cast 40,000-55,000 TS; 35,000-45,000 YS; 1 0 El; 1.5 RA, 180 Brin.
For castings, salt pots; heat resistant.

STERMET GR 10.
M-1008, 8-10 Ni, 18-20 Cr, bal Fe.
Cast. 80,000-95,000 TS; 30,000-45,000 YS; 40-60 El; 50-60 RA; 180 Brin
For food and dairy equipment, heat and corrosion resistant

STEREOTYPE METAL
60 Sn, 35 Pb, 5 Sb
For type metal.

STEREOTYPE METAL.
82 Pb, 14.8 Sb, 3 2 Sn.
12,000 TS, 4 El; 22 Brin.
For type metal; m p. 468°F.

STEREOTYPE METAL.
82 Pb, 6 Sn, 12 Sb.
For type.

STEREOTYPE METAL.
76 Pb, 4 Sn, 20 Sb.
For type.

STEREOTYPE METAL.
70 Pb, 7 Sn, 23 Sb.
For type.

STEREOTYPE METAL.
67 Pb, 17 Sn, 16 Sb.
For type.

STERRO METAL.
Eng.; 60-55 Cu, 38-42 Zn, 1.8-4.7 Fe.
Forged: 78,200 TS; 27,800 YS; 39 El.
Cast: 60,500 TS.
For hydraulic cylinders subjected to high pressures; pressure-tight castings.

STERVAC 1000.
M-57; 0.08 C, 19.5 Cr, 4.3 Mo, 13.5 Co, 1.3 Al, 3.1 Ti, 1.25 Fe, bal Ni.
At 70°F: 188,000 TS; 115,000 YS; 28 El; 25 RA.
At 1400°F: 117,000 TS; 99,000 YS; 28 El; 41 RA.
For turbo blades and rotor discs, high temperature bolts; heat resistant to 1500°F.

STERVAC 2000.
M-57; 0.15 C, 19 Cr, 9.75 Mo, 10 Co, 1.1 Al, 2.5 Ti, 1.25 Fe, 0.06 Zr, 0.005 Be, bal Ni.
At 70°F: 170,000 TS; 98,000 YS; 20 El; 22 RA.
At 1400°F: 120,000 TS; 92,000 YS; 20 El.
For jet engine and gas turbine buckets; heat resistant to 1500°F.

STERVAC 3000.
M-57; 0.08 C, 14 Cr, 33 Ni, 4 Mo, 0.25 Al, 0.25 Zr, 2 Ti, 6.5 W, bal Fe.
At 1200°F: 134,000 TS; 121,000 YS; 14 El; 20 RA.
For jet engine components; high heat resistance to 1350°F.

STERVAC 4000.
M-57; 0.09 C, 19 Cr, 52.5 Ni, 9.75 Mo, 11 Co, 1.65 Al, 3.15 Ti, 0.005 B, bal Fe.
At 1400°F: 120,000 TS; 110,000 YS; 8 El; 12 RA.
For jet engine components; useful up to 1650°F.

STERVAC 5000.
M-57; 0.15 max C, 3 Al, 3 Ti, 4 Mo, 18 Cr, 17 Co, 3 Fe, bal Ni.
At 70°F: 197,000 TS; 18 El, 22 RA.
At 1200°F: 175,000 TS; 8 El; 16 RA.
At 1800°F: 4,600 TS; 22 El; 41 RA.
For gas turbine components, bolts, valves; useful up to 1600°F, age-hardenable.

STEWART ALLOY NO. 3.
M-514; 12.5 Si, bal Al.
Cast: 36,000 TS; 16,000 YS; 2.0 El; 80 Brin.
For intricate castings; casting alloy.

STEWART ALLOY NO. 10.
M-514; 3.5-4.5 Cu, 4.5-5.5 Si, bal Al.
Cast: 37,000 TS; 18,000 YS; 2.5 El; 78 Brin.
For castings; die cast.

STEWART ALLOY NO. 10R.
M-514; 3-4 Cu, 8.5-9.5 Si, bal Al.
Cast: 44,000 TS; 21,000 YS; 2 El; 80 Brin.
For castings; die cast.

STEWART ALLOY NO. 13X.
M-514; 0.15 max Cu, 10-12 Si, bal Al.
Die cast: 38,000 TS; 20,000 YS; 4 El; 2.5 RA; 79 Brin.
For die castings; high fluidity.

STEWART ALLOY NO. 16.
M-514; 0.25 max Cu, 1 max Si, 4.5-5.5 Ni, bal Al.
Die cast: 32,000 TS; 16,000 YS; 3.5 El; 3.0 RA; 70 Brin.
For die castings; high fluidity.

STEWART ALLOY NO. 18.
M-514; 1.3 Ni, 7.5-8.5 Mg, bal Al.
Die cast: 37,000 TS; 21,000 YS; 4.5 El; 9 RA; 80 Brin.
For die castings; high corrosion resistant.

STEWART ALLOY NO. 35.
M-514; 5 Si, bal Al.
Cast: 29,000 TS; 14,000 YS; 3.5 El; 55 Brin.
For light castings; casting alloy.

STEWART MAGNESIUM R.
M-514; 8.3-9.7 Al, 0.13 min Mn, 0.5 max Si, 0.4-1.0 Zn, bal Mg.
Cast: 33,000 TS; 3 El; 60 Brin.
For castings; die cast.

STEWART Zn NO. 2.
M-514; 2.5-3.5 Cu, 3.7-4.2 Al, 0.04 Mg, bal Zn.
Cast: 47,900 TS; 5 El; 83 Brin.
For castings; die cast.

STEWART Zn NO. 3.
M-514; 0.10 max Cu, 3.75-4.25 Al, 0.04 Mg, bal Zn.
Cast: 40,300 TS; 4.7 El; 74 Brin.
For castings; die cast.

STEWART Zn NO. 5.
M-514; 0.75-1.2 Cu, 3.7-4.2 Al, 0.04 Mg, bal Zn.
Cast: 45,400 TS, 3 El; 79 Brin.
For castings; die cast.

STIRLING CAST.
66.2 Cu, 33.11 Zn, 0.02 Pb, 0.66 Fe.
For hardware; high strength.

STITCHING WIRE.
74.5 Ni, 18 Cr, 7.5 Mn.
For electrical resistances; resistance alloy.

STM see SIMONDS STM.

STM.
M-1419; 0.15 max C, 11.5-14.0 Cr, 0.2-0.6 Mo, 0.6 max Ni, bal Fe.
Annealed: 80,000 TS; 38,000 YS; 25 El; B 92 Rock.
Cold Drawn: 100,000 TS; 80,000 YS; 15 El; B 96 Rock.
For springs, shafts, table flatware, oil refinery equipment. Corrosion resistant.

STOLLBERG BRASS.
England; 32.8 Zn, 0.4 Sn, 2 Pb, bal Cu.
For forgings, hardware, fittings, good workability, free-cutting.

STONE BRONZE.
M-452; 58 Cu, 39 Zn, 1.5 Fe, 0.8 Al, 0.5 Mn, Sn.
For marine propellers, nuts, bolts; corrosion resistant.

STONES "608" SUPERHEAT BRONZE.
M-452; 7 Ni, bal Cu.
For parts exposed to superheated steam bucket wheels, pistons, locomotive slide valve, cocks; resists corrosion and erosion.

STONES ENGLISH GEAR BRONZE.
M-452; 89 Cu, 11 Sn, trace P.
Cast: 39,000-42,000 TS; 21,000-24,000 YS; 10-6 El; 9-7 RA; 80 Brin.
For gears, bearings; used for severe service; C.E.L. 16,000.

STONES GEAR BRONZE.
M-126; 11 Sn, 0.25 Pb, 0.25 P, bal Cu.
For gears, worm wheels; tough, wear resistant.

STONES Z-METAL.
M-452; Sn, Ni, bal Cu.
For fire box stays; heat resistant.

STONEWELL BABBITT.
M-565; Pb, Sb, Sn.
Cast: 10,650 TS; 7,550 YS.
For bearings for heavy loads and pressures, machinery bearings; Babbitt metal.

STOODITE.
M-202; 4 C, 1.5 Si, 31 Cr, 4 Mn, bal Fe.
Weld: 600 Brin.
For hard facing rod for farm tools, crushers; abrasion resisting.

STOODY 1.
M-202; 2.5 C, 26 Cr, 10.5 W, 60 Co, 1 Fe.
Welded: 50,000 TS.
For hard facing electrode; abrasion, wear and heat resistant.

STOODY 6.
M-202; 1.2 C, 1 Si, 28 Cr, 5 W, 70 Co, 1 Fe.
Welded: 125,000 TS; 2 El; 400 Brin.
For hard facing electrodes; impact and corrosion resistant.

STOODY 100.
M-202; 36 (Cr, Mo, Mn, C, Si), bal Fe.
Cast: 520-580 Brin
For crushers, tool joints, hard facing electrode.

STOODY 101.
M-202; 2 C, 28 Cr, 8 Ni, 1.5 W, 0.6 Mn. 1 Si, bal Fe
Cast: 350-400 Brin.
For electrode for submerged arc; hard facing.

STOODY 102
M-202, 0.3 C, 5 Cr, 1.5 W, 1.5 Mn, 0.75 Mn, 1 Si, bal Fe
Cast· 520-550 Brin
For electrode for submerged arc; hard facing

STOODY 103.
M-202; 4 C, 30.5 Cr, 3.5 Mn, 1.2 Si, bal Fe.
560 Brin.
For welding electrodes; hard facing.

STOODY 104
M-202; 3.2 (Mn, Mo, Si, C), bal Fe.
Cast: 270-320 Brin
For tractor rollers, idlers, trunnions; hard facing electrode.

STOODY 105.
M-202; 0.25 C, 3 Cr, 1.5 Ni, 0.5 Mo, 0.3 V, 1.25 Mn, 0.5 Si, bal Fe.
Cast: 500-520 Brin.
For electrode for submerged arc; hard facing.

STOODY 105.
M 202, 8 (Cr, Mo, V, Mn, Si, C), bal Fe.
Forged: 200,000 TS; 14 El, 14 RA; 470 Brin.
For hard facing electrodes, rollers and idlers for tractors and shovels; abrasion and impact resistant.

STOODY 106.
M-202; 13 (Ni, Mo, Si, Mn, C), bal Fe.
Cast: 140,000 TS; 400 Brin.
For hard facing electrode for steel mill roll necks, cable drums; abrasion and impact resistant.

STOODY 107.
M-202; 6.5 (Cr, Mn, Mo, Si, C), bal Fe.
Cast: 360-410 Brin.
For hard facing electrode.

STOODY 120.
M-202; 2.5 C, 15 Cr, 2 Mn, 1 Si, 0.25 Zr, bal Fe.
Cast: 540 Brin.
For electrode for open or submerged arc; hard facing.

STOODY 121.
M-202; 2.5 C, 15 Cr, 2 Mn, 1 Si, 0.25 Zr, bal Fe.
Cast: 560 Brin.
For electrode for submerged arc; hard facing.

STOODY 122.
M-202; 0.75 C, 8 Cr, 2.5 Mn, 1 Si, 0.05 Zr, bal Fe.
Cast: 530 Brin.
For electrode for submerged arc; hard facing.

STOODY 130
M-202; 60 WC in 40 steel matrix.
For electrode for open arc; hard facing.

STOODY 1027.
M-202; 1.5 C, 4.5 Cr, 1.2 Mn, 1 Si, bal Fe.
For hard facing electrodes; impact resistant.

STOODY MANGANESE.
M-202; 0.7 C, 14 Mn, 5 Ni, bal Fe.
Cast: 82,000 TS; 60,000 YS; 15 El; 12 RA.
For welding electrodes for Mn steel; austenitic, wear resistant.

STOODY MANGANESE NICKEL.
M-202; 20 (Mn, Ni, Si, C), bal Fe.
For hard facing electrode; for manganese steel parts

STOODY SELF-HARDENING.
M-202; 1 C, 0.1 Mo, 2 Mn, 6 Cr, 1.2 Si, bal Fe.
Weld· 550 Brin
For welding rod, hard surfacing; hard-facing, tough; non-machinable.

STOODY SELF-HARDENING 21.
M-202; 3 C, 14 Cr, 2.5 Mn, 1.2 Si, bal Fe.
For welding electrodes, hard facing rod; severe abrasion resistance.

STOVALL.
72 Au, 16.5 Cu, 2 Pt, 13.5 Ni.
For dental alloy, corrosion resistant.

STRAINFREE ELASTUF PENN.
M-307; 0.35-0.45 C, 1.25 Mn, bal Fe.
Cold drawn· 120,000-135,000 TS; 110,000-120,000 YS, 10-20 El; 30-45 RA; 269-300 Brin.
For gears, worms, shafts, spindles; oil hardening.

STRAIN TEMPERED 1045.
M-516, 0.43-0.50 C, 0.6-0.9 Mn, bal Fe.
Cold drawn, stress relieved.
125,000 TS min; 100,000 YS min.
For machine parts, shafts. Eliminates heat treatment.

STRAIN TEMPERED 1050.
M-516, 0.48-0.55 C, 0.6-0.9 Mn, bal Fe.
125,000 TS min, 100,000 YS min.
Cold drawn, stress relieved.
For machine parts, shafts.
Eliminates heat treatment

STRAIN TEMPERED 1141.
M-516; 0.37-0.45 C, 1.35-1.65 Mn, 0.08-0.13 S, bal Fe
Cold drawn, stress relieved.
125,000 TS min, 100,000 YS min.
For machine parts, shafts.
Free machining, eleminates heat treating.

STRAIN TEMPERED 1144.
M-516; 0.40-0.48 C, 1.35-1.65 Mn, 0.24-0.33 S, bal Fe.
Cold drawn, stress relieved.
125,000 TS min, 100,000 YS min.
For machine parts, shafts.
Free machining, eleminates heat treating.

STRAIN TEMPERED 1151.
M-516; 0.48-0.55 C, 0.70-1.0 Mn, 0.08-0.13 S, bal Fe.
Cold drawn, stress relieved.
125,000 TS min, 100,000 YS min.
For machine parts, shafts.
Free machining, eliminates heat treating.

STRAIN TEMPERED 4140.
M-516; 0.38-0.43 C, 0.75-1.0 Mn, 0 20-0.35 Si, 0.80-1.1 Cr, 0.15-0.25 Mo, bal Fe.
Cold drawn, stress relieved
125,000 TS min; 105,000 YS min.
For machine parts, shafts.
Eliminates heat treatment.

STRAIN TEMPERED 41L45.
M-516; 0.43-0.48 C, 0.75-1.0 Mn, 0.20-0.35 Si, 0.8-1.1 Cr, 0.15-0.25 Mo, 0.15-0.35 Pb, bal Fe.
Cold drawn, stress relieved.
150,000 TS min; 130,000 YS min; 10 El; 35 RA; 302 Brin.
For machine parts, shafts.
Eliminates heat treatment.

S-TREATED.
M-64; 0 6 C, 0.3 Cr, bal Fe.
Prehardened: 201-235 Brin.
For die blocks; hot work, hammer press, short runs.

S-TREATED 14A60.
M-64; 0.60 C, 0 8 Mn, 0 25 Si, 0.25 Cr, bal Fe.
Water hardening tool steel; AISI W4.

STRENES B.
M-898; C, Cr, Ni, Mo, bal Fe.
For dies, bushings.

STRENES C.
M-898; 3 C, 2.2 Si, 0 9 Mn, 0.4 Mo, 0 4 Cr, bal Fe
Cast: 50,000 TS; 190 Brin.
Heat treated: 75,000 TS; 550 Brin.
For pump impellers, fixtures, bushings; alloy cast iron.

STRENES D.
M-898; C, Cr, Ni, Mo, bal Fe
For dies, bushings; heat resistant.

STRENES E.
M-898; 3 C, 1.5 Si, 14 Ni, 3 Cr, 6 Cu, bal Fe.

STRENICOR.
M-238; 3.5-5.0 Ni, 0.7-2.0 Si, 0.3-1.0 Fe, bal Cu
Cast: 90,000 TS; 70,000 YS; 1 El, 8 RA.
Forged: 107,000 TS; 83,000 YS, 5 El; 7 RA.
For transformer terminal eye-bolts; corrosion resistant, no season cracking.

STRENLITE.
M-1124; 0.28 max C, 1.1-1.6 Mn, 0.31 max Si, 0.20 min Cu, bal Fe
A high strength steel for construction of riveted or bolted bridges and buildings and for other structural purposes
Rolled: 70,000 TS; 50,000 YS; 18 El.

STRESCON TM 0195.
M-279; 97 Cu, 1.5 Fe, 0.8 Co, 0 6 Sn, 0 1 P.
Ann: 50,000-65,000 TS; 22,000-45,000 YS, 22-35 El.
Cold rolled: 60,000-100,000 TS; 35,000-87,000 YS; 3-24 El.
For electrical terminals, connectors, contact springs; high strength, high conductivity, corrosion resistant.

STRESSITE BRASS.
M-211; 70 Cu, 30 Zn.
For machinery parts; molded and sintered.

STRESSITE BRONZE.
M-211; Sn, bal Cu.
For machinery parts; molded and sintered.

STRESSITE COPPER.
M-211; Cu.
For electric equipment; high conductivity.

STRESSITE IRON.
M-211; Fe.
For gears, retainers, ball bearings; sintered.

STRESSPROOF.
M-669, 0 40-0.48 C, 1.35-1.65 Mn, 0.04 max P, 0.24-0.33 S, 0.15-0.30 Si, 0.25 max Cu, bal Fe.
Cold finished: 132,300 min TS; 100,000 min YS; 12 El; 83% machinability.
For studs, bolts shafts; free machining.

STRESSPROOF.
M-1124; 0 40-0.48 C, 1 35-1.65 Mn, 0 04 max P, 0.24-0.33 S, 0.15-0.30 Si, 0.25 max Cu, bal Fe
Cold finished: 132,000 min TS; 100,000 min YS; 12 El; 83% machinability.
For bolts, shafts, studs; free machining.

STRIKING DIE.
M-38; 0.95 C, 0.4 Cr, 0 25 V, bal Fe.
For tools, cold forging dies; water or oil hardening.

STRIKING DIE.
M-275, 0 90 C, 0 30 Mn, 0.25 Si, bal Fe.
For hobs, punches, stamping dies, blanking and coining dies. Water hardening tool steel, AISI W1.

STROH
M-899, 0.4 C, bal Fe
For steel castings, gears; wear and shock resistant.

STROLOY 5C.
M-17; 0 18 C, 0 9 Mn, 0.3 Si, 0 9 Cr, 0.2 Mo, 0 003 B, bal Fe.
Tube· 100,000 min YS; 110,000-140,000 TS, 15 Elong.
For critical structural and mechanical applications.
Available as quenched and tempered tubes.
High strength tubing. Can be welded to 100% joint efficiency

STRONGER-THAN-STEEL.
M-603; 89 Cu, 10 Al, 1 Fe
Cast 80,000 TS; 140 Brin
Heat treated 100,000 TS; 160 Brin.
For die castings; resists corrosion.

STRUCTURAL SILICON (SIL-TEN).
M-604; 0 40 max C, 0.60 min Mn, 0.04 max P, 0.05 max S, 0 20 min Si, bal Fe.
Rolled 80,000-95,000 TS; 45,000 YS, 30 El.
For structural parts, add 0.20 min Cu for corrosion resistance

STRUCTURAL SILICON STEEL.
M-377; 0 4 max C, 0 04 max P, 0.05 max S, 0 2 min Si, bal Fe
Hot rolled 80,000-95,000 TS, 45,000 YS; 30 El.
For derricks and bridge work; high elastic plates and shapes.

STUDAL.
French, 97 7 Al, 1 0 Mg, 1 3 Mn
For light alloy parts.

STUFFING BOX ALLOY.
Eng.; 61.5 Cu, 15 5 Ni, 11 Zn, 10 Pb, 2 Sn.
For stuffing boxes; corrosion resistant.

STYLUS METAL.
5 Sn, 20 Cu, 12 Sb, 63 Pb.

STYLUS METAL.
85 Pb, 5 Sn, 10 Sb.
For bearings; Babbitt.

STYRIA 2.
M-1291; C, bal Fe.
For gears, bolts, machine tool parts; water hardened.

STYRIA 3.
M-1291; C, bal Fe.
For gears, bolts, machine tool parts; water hardened.

STYRIA 4.
M-1291; C, bal Fe.
For gears, bolts, machine tool parts; water hardened.

STYRIA 5.
M-1291; 0.90 C, 0.4 Si, 0.8 Mn, bal Fe.
Heat treated: 130,000-185,000 TS; 80,000-120,000 YS; 20-10 El; 47-30 RA; 269-375 Brin.
For springs, tools, cutters, taps, drills; Type W1; water hardened.

STYRIA 6.
M-1291; 0.75 C, 0.5 Si, 0.8 Mn, bal Fe.
Heat treated: 122,000-175,000 TS; 82,000-130,000 YS, 20-12 El; 50-36 RA; 240-355 Brin.
For springs, punches, crimpers; Type W1; water hardened

STYRIA 779.
M-1291; 0.6 C, 18 W, 4 Cr, 1.3 V, 18 Co, bal Fe.
For cutting tools, lathe and planer tools, machine tool parts
High speed steel, high heat resistant, high red hardness.

STYRIA 1818.
M-1291, C, bal Fe.
For machine tool parts.

STYRIA 2028
M-1291, C, bal Fe.
For machine tool parts.

STYRIA A-1
M-1291, 1.4 C, 0.3 Cr, 0.1 V, bal Fe
For engraving tools, cutters, water hardened, keen edge

STYRIA A-2
M-1291; 1.3 C, 0.35 Mn, 0.25 Si, bal Fe
For engraving tools, reamers, taps, Type W1; water hardened

STYRIA A-3
M-1291, 1.15 C, 0.25 Si, 0.35 Mn, bal Fe.
Annealed. 105,000 TS, 55,000 YS; 20 El; 40 RA; 205 Brin.
For drills, taps, reamers, broaches, hobs; Type W1, water hardened

STYRIA ACM
M-1291; 0.32 C, 1.1 Cr, 1.1 Al, 0.18 Mo, bal Fe
For oil refinery equipment, creep resistant

STYRIA ACM-N
M-1291, M-1114, 0.32 C, 1.10 Cr, 0.18 Mo, 1.10 Al, bal Fe
Annealed 100,000 TS, 72,000 YS; 20 El; 55 RA
For oil refinery equipment, gears, fasteners, cams, camshafts.
Nitriding steel, abrasion resistant.

STYRIA B100
M-1291, 0.2 C, 1 Mn, 1.2 Cr + Mo, bal Fe.
For case hardened machinery parts, fasteners, cams, camshafts, gears. Oil hardening.

STYRIA BCM
M-1291, 0.06 C, 4 Cr, 0.5 Mo, bal Fe.
For plastic molds.
Case hardening.

STYRIA BHM.
M-1291; 0.28 C, 4.5 Ni, 1.5 Mo, Cr, V, bal Fe.
For gears, bolts, shafts, axles.
Oil hardening, shock resistant.

STYRIA BN3.
M-1291; 0.19 C, 0.7 Cr, 0.2 Mo, 3.4 Ni, bal Fe.
For gears, bolts, crankshafts, cams, camshafts, fasteners.
Case hardening, tough, shock resistant.

STYRIA BN4 SPECIAL.
M-1291; 0.2 C, 1.2 Cr, 4.4 Ni, 0.4 W + V, bal Fe.
For case hardened machinery parts, fasteners, cams, camshafts, gears.
Air or oil hardening.

STYRIA BSP.
M-1291; 0.08 C, bal Fe.
Core: 60,000 TS, 40,000 YS; 125 Brin.
For fasteners, containers, cans, deep drawn parts.
Water hardening, carburized steel.

STYRIA CE.
M-1291; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
For gears, shafts, fasteners, bolts; case hardened, water hardened.

STYRIA CM EXTRA.
M-1291, C, bal Fe.
For gears, shafts, fasteners, machine tool parts; case hardened, water hardened.

STYRIA CM EXTRA K
M-1291; C, alloy, bal Fe.
For machine tool parts; oil hardened.

STYRIA CMG
M-1291, 0.4 C, 1.3 Mn, 2.0 Cr, Mo, bal Fe.
For machine tool parts, gears, crankshafts, countershafts, dies
Oil hardening, shock resistant.

STYRIA CMH.
M-1291, 0.42 C, 1.05 Cr, 0.20 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough

STYRIA CMHH.
M-1291; 0.42 C, Cr, Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough

STYRIA CMM.
M-1291; 0.33 C, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough

STYRIA CMS
M-1291; 0.30 C, 2.5 Cr, 0.2 Mo, 0.55 Mn, 0.15 V, bal Fe
For gears, bolts, crankshafts, oil hardened, tough.

STYRIA CM SPEZIAL
M-1291, 0.31 C, 0.55 Mn, 2.5 Cr, 0.2 Mo, 0.15 V, bal Fe.
For gears, bolts, machine tool parts, oil hardened, tough.

STYRIA CMW.
M-1291, 0.25 C, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

STYRIA CMZ.
M-1291; 0.50 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, crankshafts, studs; oil hardened, tough.

STYRIA CMZH.
M-1291; 0.50 C, 1.0 Cr, 0.2 Mo, 0.1 V, bal Fe.
For gears, bolts, springs, crankshafts, oil hardened, tough

STYRIA CR35.
M-1291; 0.33 C, 0.65 Mn, 1.0 Cr, 0.25 Si, bal Fe.
For gears, bolts, machine tool parts; water hardened.

STYRIA CR35H.
M-1291; 0.41 C, 0.25 Si, 0.65 Mn, 1.0 Cr, bal Fe.
For gears, bolts, machine tool parts; water hardened.

STYRIA CRD.
M-1291; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies; air hardened, non-deforming.

STYRIA CRD SPEZIAL.
M-1291; 1.65 C, Cr, Mo, V, bal Fe.
For blanking and forming dies; air hardened, non-deforming.

STYRIA CRLS.
M-1291; C, alloy, bal Fe.
For machine tool parts; oil hardened.

STYRIA CRS 815.
M-1291; 0.5 C, 8 Cr, 1.4 W, 1.6 Mo + V, bal Fe.
For heavy duty shears, knives, punches, cutlery, oil refinery equipment.
Air or oil hardening, corrosion resistant.

STYRIA CRS 815W.
M-1291; 0.5 C, 8 Cr, 1.4 W, 1.6 Mo + V, bal Fe.
For heavy duty shears, knives, oil refinery equipment.
Air or oil hardening, corrosion resistant.

STYRIA Cr-V-SILBERSTAHL.
M-1291; 1.2 C, 0.8 Cr + V, bal Fe.
For fast cutting tools, drills, reamers, form tools.
Water hardening, wear resistant.

STYRIA CSF.
M-1291; 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For springs, punches, upsetters; tough, shock resistant.

STYRIA CV3.
M-1291; C, alloy, bal Fe.
For machine tool parts; tough, oil hardened.

STYRIA CV3M.
M-1291; 0.4 C, 0.6 Cr, 0.7 Si + W, bal Fe.
for dies and molds.
Water hardening, tough.

STYRIA CV5.
M-1291; 0.50 C, 1.05 Cr, 0.1 V, 0.95 Mn, bal Fe.
For springs, gears, bolts, crankshafts; oil hardened, shock resistant.

STYRIA CVF.
M-1114, M-1291; 0.50 C, 1.5 Cr, 0.25 V, bal Fe.
Hardened: 200,000-235,000 TS, 170,000 min YS; 6 El; 35 RA.
For gears, countershafts, crankshafts, hammers.
Similar to SAE 6150, shock resistant.

STYRIA CVZ.
M-1291; 0.50 C, 1.05 Cr, 0.1 V, 0.95 Mn, bal Fe.
For springs, gears, bolts, crankshafts; oil hardened, shock resistant.

STYRIA DGM.
M-1291; 0.27 C, 2 Cr, 2 6 Ni, 1 W, 2.6 Mo, bal Fe.
For die casting dies.
Hot work steel, shock resistant.

STYRIA DPK.
M-1291; 0 45 C, 1.4 Cr, 1.3 Si, V, bal Fe.
For gears, springs, bolts, crankshafts, studs.
Oil hardening, shock resistant.

STYRIA DPKH.
M-1291; 0.61 C, 0.85 Si, 0.75 Mn, 1.18 Cr, 0.1 V, bal Fe.
For springs; oil hardened, shock resistant.

STYRIA E30.
M-1291; 0.13 C, Cr, bal Fe.
For gears, machine tool parts; case hardening steel.

STYRIA E60.
M-1291; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
For gears, fasteners, machine tool parts; case hardening steel.

STYRIA E80.
M-1291; 0.15 C, Cr, Mo, bal Fe.
For gears, machine tool parts; case hardening steel.

STYRIA E100.
M-1291; 0.20 C, Cr, Mo, bal Fe.
For gears, machine tool parts; case hardening steel.

STYRIA ECR.
M-1291, M-1114; 0.90 C, 0.30 Mn, 0.80 Cr, bal Fe.
For bearings, bushings, cutters; water hardened, wear resistant.

STYRIA ECR1.
M-1291; 1.0 C, 1.1 Cr, 0.07 Mn, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant.

STYRIA ECR2.
M-1291; 0.85 C, 1.75 Cr, 0 35 Mn, bal Fe.
For bearings, bushings, liners, water hardened, wear resistant.

STYRIA ECR EXTRA.
M-1291; 1.4 C, 0 8 Cr, bal Fe.
For bearings, bushings, liners, files, needles.
Water hardening, wear resistant.

STYRIA EE.
M-1291, M-1114; 0.13 C, 1.1 Cr, 4.5 Ni, 0 5 Mn, bal Fe.
For gears, bolts, crankshafts; case hardened, shock resistant.

STYRIA EHH.
M-1291; C, alloy, bal Fe.
For machine tool parts.

STYRIA EM12.
M-1291; 1 2 C, 12.5 Mn, bal Fe.
For earth moving equipment, dippers, crushers, rollers; wear and abrasion resistant.

STYRIA EMH
M-1291; 1.0 C, 0 25 max Si, 0.2 max Mn, bal Fe.
For drills, taps, cutters, springs; Type W1; water hardened.

STYRIA EN1W.
M-1291; 0 13 C, 1.5 Ni, 0.2 Cr, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel, tough

STYRIA EN3M.
M-1291; 0.22 C, 3 Ni, bal Fe.
Annealed: 85,000 TS, 52,000 YS; 27 El; 65 RA
For gears, bearings, fasteners, cams, camshafts.
Case hardening, tough, shock resistant

STYRIA EN3W
M-1291; 0 12 C, 3 Ni, bal Fe.
Ht. Tr.: 120,000 TS; 72,000 YS; 17 El; 250 Brin.
For machinery parts, gears, fasteners, cams, camshafts.
Case hardening, tough, shock resistant.

STYRIA EN5M.
M-1291; C, alloy, bal Fe
For machine tool parts; oil hardened.

STYRIA EN5W.
M-1291; C, alloy, bal Fe.
For machine tool parts; oil hardened.

STYRIA EN36.
M-1114, M-1291; 36 Ni, bal Fe.
Annealed: 70,000 TS; 24,000 YP; 36 El; 143 Brin.
Cold Drawn. 90,000 TS; 70,000 YP; 20 El; 185 Brin.

For variable condensers, thermostatic and temperature control devices, bimetals.
Similar to Invar. Low coefficient of expansion.

STYRIA ENC2.
M-1291; 0.18 C, 2.0 Cr, 2.0 Ni, bal Fe.
For gears, bolts, machine tool parts; case hardening steel, tough.

STYRIA ENC10.
M-1291; C, alloy, bal Fe.
For machine tool parts; oil hardened.

STYRIA ENC15.
M-1291; 0.15 C, 1.55 Cr, 1.55 Ni, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel.

STYRIA ESPA.
M-1291; 0.7 C, 1.7 Si, 0.7 Mn, bal Fe
For springs; oil hardened, tough.

STYRIA ESPAS.
M-1291; 0.55 C, 1 Mn, 1 Si, bal Fe.
For springs, shafts, axles, punches.
Oil hardening, shock resistant.

STYRIA ESS.
M-1291; 0.80 C, 0.10-0.40 Si, 0.5-0.7 Mn, bal Fe.
Heat treated: 188,000 TS; 143,000 YS; 12 El; 35 RA; 390 Brin.
For springs, tools, drills, taps, reamers; Type W1; water hardened.

STYRIA EWP.
M-1291; C, alloy, bal Fe.
For machine tool parts; oil hardened.

STYRIA EWP398.
M-1291; 0 3 C, 8 5 W, 2.5 Cr, 1.8 Ni, V, bal Fe.
For machine tool parts, hot work tools and dies.
Hot work steel, oil hardened.

STYRIA EWP 970
M-1291; 0 3 C, 2 Co, 2.8 Cr, 0 25 V, 10 W, bal Fe.
For extrusion press rams and liners, dies.
Hot work steel, oil hardening.

STYRIA EWPX.
M-1291; 0 32 C, 9 W, 3 Cr + V, bal Fe.
For extrusion dies and rams, mandrels, die casting dies, forging dies.
Hot work steel, shock resistant.

STYRIA EWS.
M-1291; 1 25 C, 0.8 W, bal Fe.
For bearings, piercers, tools, cutters.
Water hardening, wear resistant.

STYRIA EWS1.
M-1291; 1.2 C, 0.20 Cr, 0.1 V, 1.0 W, bal Fe.
For cutters, forming and blanking dies; water hardened, wear resistant.

STYRIA EWS SPEZIAL.
M-1291; 1.35 C, W, Cr, V, bal Fe.
For cutters, forming and blanking dies; water hardened, wear resistant.

STYRIA EXTRA EXTRA.
M-1291; 1.5 C, 0.50 Cr, 0.1 V, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant.

STYRIA EXTRA HH.
M-1291, M-1114; 1.3 C, bal Fe.
For cutters, chasers, chisels, engravers tools.
Oil or water hardening, wear resistant.

STYRIA EXTRA MH.
M-1291; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 55,000 YS; 20 El; 40 RA; 210 Brin.
For drills, taps, cutters, springs; Type W1;

STYRIA EXTRA ZH.
M-1291; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, springs, cutters; Type W1; water hardened.

STYRIA EXTRA ZH SPEZIAL.
M-1291; 1.0 C, 0.20 Si, 0.25 Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, tools, cutters, taps, drills; Type W1; water hardened.

STYRIA EXTRA ZW.
M-1291; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 174,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For rails, axes, hammers, punches, crimpers; Type W1; water hardened.

STYRIA EZH.
M-1291, M-1114; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, tools, drills, taps, reamers; Type W1; water hardened.

STYRIA EZH SPEZIAL.
M-1291, M-1114; 1.0 C, 0.1 V, 0.25 Mn, bal Fe.
For cutters, drills, reamers, taps, hobs; Type W2, water hardened.

STYRIA EZW.
M-1291, 0 70 C, 0.25 max Si, 0 25 max Mn, bal Fe.
Heat treated. 174,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For rails, axes, hammers, punches, crimpers; Type W1; water hardened.

STYRIA FLP
M-1291; 0 58 C, 1.5 Cr, 4 Ni, 0.8 W, 0.4 Mo, bal Fe.
For machine tool parts, shafts, cold work dies, punches.
Oil hardening, shock resisting

STYRIA G2.
M-1291; 0.95 C, 0.6 Mn, bal Fe.
Rolled: 136,000 TS; 68,000 YS; 9 El; 268 Brin.
Hardened. 216,000 TS; 152,000 YP; 11 El; 600 Brin.
For machine tool parts, cutting tools, springs, drills.
Water hardening, wear resistant.

STYRIA G3.
M-1291; 0 8 C, 0.4 Mn, bal Fe.
Annealed: 120,000 TS, 68,000 YS; 15 El; 223 Brin.
Hardened: 185,000 TS; 135,000 YS; 13 El; 620 Brin.
For springs, drills, cutters, bearings, lock washers.
Water hardening, wear resistant

STYRIA G3F.
M-1291; 1.4 C, bal Fe
For files, textile needles.
Salt bath or water hardening.

STYRIA G4.
M-1291; 0.75 C, 0.25 Si, 0.55 Mn, bal Fe.
For rails, punches, hammers, axes, springs; water hardened.

STYRIA G4F.
M-1114, M-1291; 0.7 C, 0.6 Mn, 0.2 Si, bal Fe.
Hardened: 170,000-215,000 TS; 150,000 min YS; 5 El; 35 RA;
For springs, hammers, punches, cutters, drills, saws.

STYRIA G5.
M-1291; 0.61 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 325 Brin.
For punches, axes, crimpers, machine tool parts; water hardened.

STYRIA G5F.
M-1291; 1.3 C, bal Fe.
For files, textile needles.
Salt or water hardening, wear resistant.

STYRIA G6.
M-1291, M-1114; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For gears, bolts, shafts, machine tool parts; water hardened.

STYRIA G6S.
M-1291; 0.50 C, bal Fe.
For agricultural equipment, gears, shafts.
Water harden.

STYRIA G7.
M-1291, M-1114; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 98,000 TS, 59,000 YS; 24 El; 45 RA; 212 Brin.
For gears, bolts, shafts, machine tool parts; water hardened.

STYRIA G7S.
M-1291, M-1114; 0.35 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 85,000 TS, 54,000 YS; 30 El; 53 RA; 185 Brin.
For gears, bolts, shafts, machine tool parts; water hardened.

STYRIA G7W.
M-1291, M-1114; 0.22 C, 0.15 Si, 0.35 Mn, 0.06 S and P, bal Fe.
Annealed: 75,000 TS; 42,000 YS; 22 El; 58 RA; 145 Brin.
For gears, shafts, machine tool parts; case hardening steel.

STYRIA G8
M-1291, M-1114; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe
Hot rolled: 70,000 TS; 45,000 YS, 22 El, 58 RA; 145 Brin.
For gears, shafts, machine tool parts; case hardening steel.

STYRIA G10.
M-1291, M-1114; 0.07 C, 0.09 Si, 0.25 Mn, 0.06-0.08 P, 0.06 S, bal Fe.
For plastic molds and dies, good hobbability, carburized.

STYRIA GBK.
M-1291; 1.0 C, 1.5 Cr, bal Fe.
Annealed: 95,000 TS; 62,000 YS; 27 El; B 89 Rock
Ht. Tr.: 165,000 TS; 145,000 YS; 5 El; 360 Brin
For bearings, bushings, sleeves, liners, machinery parts.
Water hardening, wear resistant.

STYRIA GWR.
M-1291; 1.5 C, Cr, Si, bal Fe.
For bearings, bushings, sleeves, liners; water hardened, wear resistant.

STYRIA HW7.
M-1291; 0.10 C, 0.80 Si, 6.5 Cr, 0.8 Al, bal Fe.
Annealed: 100,000 TS; 56,000 YS; 20 El; 140 Brin.
For oil refinery and chemical plant equipment, fittings, valve trim.
Max. heat resistance to 800°C, Type 502.

STYRIA HW18.
M-1291; 0.10 C, 1.0 S, 18 Cr, 1 Al, bal Fe.
Annealed: 112,000 TS; 67,000 YS; 12 El; 165 Brin.
For oil refinery equipment, furnace parts, hardware.
Heat resistant to 1050°C max.

STYRIA HWD.
M-1291; 0.20 C, 0.40 Si, 21 Cr, 1.5 Mo, bal Fe.
Annealed: 112,000 TS; 78,000 YS; 15 El; 140 Brin.
For nitric acid storage tanks, combustion chambers, heat treating equipment.
Heat resistant to 1050°C, Type 442, Non-hardenable.

STYRIA HWDA.
M-1291; 0.10 C, 1.5 Si, 24 Cr, 1.5 Al, bal Fe.
Annealed: 112,000 TS; 78,000 YS; 10 El; 170 Brin.
For furnace equipment, oil refinery equipment, heat treating boxes
Heat and oxidation resistant to 1200°C.

STYRIA HWDN
M-1291; 0.20 C, 1.0 Si, 25 Cr, 4 Ni, bal Fe.
Annealed: 134,000 TS; 89,000 YS; 25 El; 175 Brin.
Cold Worked. 175,000 TS; 155,000 YS; 2 El; 250 Brin.
For oil burners, heat treating equipment, pyrometer tubes, baffle plates, valves
Heat and oxidation resistance to 1100°C. Type 446.

STYRIA KCN
M-1291, 0.35 C, 0.6 Mn, 1.3 Cr, 4.5 Ni, bal Fe
For gears, bolts, crankshafts, machine tool parts; oil hardened, shock resistant.

STYRIA KCR.
M-1291; 1.05 C, 0.20 Si, 0.30 Mn, 0.40 Cr, bal Fe.
For bearings, cutters, bushings, liners, water hardened, wear resistant.

STYRIA KLR
M-1291, 1.45 C, 1.4 Cr, 0.60 Mn, bal Fe
For bearings, bushings, tools, dies, oil or water hardened, wear resistant

STYRIA KLS.
M-1291, M-1114, 1.0 C, 1.55 Cr, 0.35 Mn, bal Fe.
For bearings, cutters, bushings, oil or water hardened, wear resistant.

STYRIA KS45.
M-1291, 0.87 C, 0.7 Ni, 0.7 W, bal Fe
For cold heading dies.
Water hardening.

STYRIA KWS.
M-1291, M-1114, 1.0 C, 1.6 Cr, 0.3 Mo, 0.07 Mn, bal Fe
For bearings, bushings, cutters.
Water or oil hardening, wear resistant.

STYRIA KWSD.
M-1291; 1.6 Cr, 0.9 C, 0.3 Mo, bal Fe.
For textile needles, bearings
Oil or water hardening.

STYRIA LBS.
M-1291, M-1114; 0.40 C, 1.5 Cr, 4.0 Ni, 1.3 W, bal Fe.
For bolts, machine tool parts, header dies, punches.
Cold working tool steel, shock resisting, tough.

STYRIA LH.
M-1291, M-1114, 0.35 C, 0.35 Si, 0.6 Mn, 1.3 Cr, 4.5 Ni, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, shock resistant.

STYRIA LHP
M-1291, M-1114; 0.35 C, 1.35 Cr, 0.4 Mo, 4.5 Ni, bal Fe.
For gears, bolts, crankshafts, dies; oil hardened, shock resistant.

STYRIA M1H.
M-1291, M-1114; 0.53 C, 0.9 Si, 0.9 Mn, bal Fe.
For machine tool parts, shafts; water hardened.

STYRIA M3MO.
M-1291; C, bal Fe.
For machine tool parts.

STYRIA M-80.
M-1114, M-1291; 0.15 C, 1.0 Mn, 1.2 Cr, 0.25 Mo, bal Fe.
Annealed: 78,000 TS; 54,000 YS; 26 El; 60 RA; 155 Brin.
Heat treated: 115,000-160,000 TS; 85,000 min YS; 10 El, 40 RA; 239-331 Brin.
For gears, cams, camshafts, bearings, fasteners.
Case hardening, tough, shock resistant.

STYRIA M-90.
M-1114, M-1291; 0.20 C, 1.25 Mn, 1.20 Cr, bal Fe.
Annealed: 92,000 TS; 64,000 YS; 23 El; 55 RA; 183 Brin.
Heat treated: 143,000-185,000 TS; 100,000 min YS; 8 El; 35 RA; 300-385 Brin.
For gears, bearings, cams, camshafts, fasteners
Case hardening, tough, shock resistant.

STYRIA MAN
M-1114, M-1291; 0.30 C, 1.4 Mn, bal Fe.
Annealed: 93,000 TS; 55,000 YS, 22 El; 55 RA.
For gears, bolts, fasteners, axles, shafts, screws, jacks.
Similar to SAE 1136, water hardening.

STYRIA MCV.
M-1291; 0.27 C, Mn, Cr, V, bal Fe
For gears, bolts, fasteners, shafts; oil hardened, tough.

STYRIA MN2.
M-1291; C, alloy, bal Fe.
For machine tool parts; oil hardened.

STYRIA MNC.
M-1291; C, alloy, bal Fe
For machine tool parts; oil hardened

STYRIA MNS.
M-1291, 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
For gears, bolts, crankshafts, oil hardened.

STYRIA MNV
M-1291; 0.42 C, 1.75 Mn, 0.25 Si, bal Fe
For springs, gears, machine tool parts, punches, oil hardened, tough.

STYRIA MP.
M-1291, M-1114; 0.50 C, 1.0 Cr, 3.25 Ni, Mo, bal Fe
For cold working tools, upsetters, forging dies, gears, bolts; oil hardened, shock resistant.

STYRIA MSH
M-1291, M-1114; 0.65 C, 1.7 Si, 0.70 Mn, bal Fe.
Heat treated: 340,000 TS; 283,000 YS, 5 El; 20 RA; 600 Brin.
For springs, pneumatic tools, punches; oil hardened, tough

STYRIA MSS.
M-1291; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe
For gears, bolts, punches, fasteners, oil or water hardened.

STYRIA MSW.
M-1291; 0.50 C, 1.7 Si, 0.65 Mn, bal Fe.
For springs, punches; oil hardened, tough.

STYRIAN BLUE LABEL
M-651, 0.9 C, 0.2 V, bal Fe
For cutting tools, water hardened.

STYRIA NCZ
M-1114, M-1291; 0.40 C, 1.0 Cr, 2.0 Ni, 0.25 Mo, bal Fe.
Annealed: 104,000 TS; 83,000 YS; 20 El; 55 RA.
For gears, crankshafts, bolts, studs, fasteners.
Similar to AISI 4340, oil hardening, shock resistant, tough.

STYRIA NH2H
M-1291, 0.35 C, 0.35 max Si, 0.5 max Mn, 0.5 Cr, 1.5 Ni, bal Fe.
For gears, bolts, shafts, machine tool parts; oil hardened, tough.

STYRIA NH2W.
M-1291; 0.28 C, 0.5 Cr, 1.5 Ni, bal Fe.
For gears, bolts, shafts, machine tool parts; oil hardened, tough.

STYRIA NH3.
M-1291; 0.22-0.30 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, machine tool parts; oil hardened, shock resistant.

STYRIA NHH.
M-1291, 0.35 C, 0.5 Cr, 1.5 Ni, bal Fe.
For gears, bolts, crankshafts, punches, dies; oil hardened, shock resistant.

STYRIA NHM.
M-1291; 0.18 C, 0.5 Cr, 1.5 Ni, bal Fe.
For gears, cams, camshafts, fasteners; case hardened, shock resistant.

STYRIA NHP
M-1291; 0.55 C, 0.7 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For forging and heading dies, punches; oil hardened, tough.

STYRIA NHP SPECIAL
M-1291, 0.56 C, 1 Cr, 1.7 Ni, 0.5 Mo, 0.1 V, bal Fe.
For forging and heading dies, punches, cold work tools.
Oil hardening, tough, shock resisting

STYRIA NW1.
M-1291; C, Ni, Cr, bal Fe
For machine tool parts, oil hardened, tough

STYRIA NW2
M-1291, 0.13 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, cams, camshafts, fasteners, case hardened, tough

STYRIA NW3
M-1291; 0.13 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, cams, camshafts, case hardened, tough.

STYRIA O5K.
M-1291, 0.56 C, 0.30 Si, 0.55 Mn, bal Fe
Heat treated: 160,000-115,000 TS; 113,000-77,000 YS; 12-23 El; 40-54 RA; 320-230 Brin.
For wheels, die blocks, girders, rails, axles, water hardened.

STYRIA O6K.
M-1291; 0.71 C, 0.22 Si, 0.27 Mn, bal Fe
Heat treated. 174,000-122,000 TS; 128,000-82,000 YS, 12-22 El; 37-52 RA; 350-240 Brin
For springs, rails, clutch discs, die blocks, water hardened; Type W1

STYRIA O7K
M-1291; 0.45 C, 0.38 Si, 0.68 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS, 24 El, 45 RA; 212 Brin.
Cold drawn 103,000 TS; 90,000 YS; 14 El; 40 RA; 220 Brin.
For axles, gears, bolts, shafts; water hardened.

STYRIA OM EXTRA.
M-1291; 0.42 C, 1.6 Cr, 1.0 V, bal Fe.
For springs, bolts, gears, crankshafts; oil hardened, shock resistant.

STYRIA OMS.
M-1291; 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
For punches, rivet sets, shears, upsetters; oil hardened, tough.

STYRIA P2.
M-1291, M-1114; 1.3 C, 0.20 Si, 0.20 Mn, bal Fe.
For blanking and forming dies, punches; Type W1; water hardened.

STYRIA P3.
M-1291, M-1114; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For springs, taps, reamers, broaches, drills; Type W1; water hardened.

STYRIA P4.
M-1291, M-1114; 1.0 C, 0.25 Si, 0.20 Mn, bal Fe.
Heat treated: 185,000-130,000 TS; 120,000-80,000 YS; 10-20 El; 30-46 RA; 375-270 Brin.
For springs, taps, cutters, drills, reamers; Type W1; water hardened.

STYRIA P5.
M-1291, M-1114; 0.85 C, 0.20 Si, 0.20 Mn, bal Fe.
Heat treated: 190,000-130,000 TS; 144,000-88,000 YS; 12-21 El; 35-50 RA; 390-255 Brin.
For springs, taps, cutters, drills, tools, hammers; Type W1; water hardened.

STYRIA P5M.
M-1291, M-1114; 0.86 C, 0 20 Si, 0.20 Mn, bal Fe.
Heat treated: 190,000-130,000 TS; 144,000-88,000 YS; 12-21 El; 35-50 RA; 390-255 Brin
For springs, taps, cutters, drills, reamers; Type W1; water hardened.

STYRIA P6.
M-1291, M-1114; 0.70 C, 0.20 Si, 0 20 Mn, bal Fe.
Heat treated: 174,000-122,000 TS; 128,000-82,000 YS; 12-22 El; 37-52 RA; 355-240 Brin.
For springs, rails, clutch discs, die blocks. Type W1; water hardened.

STYRIA P973.
M-1291, M-1114; 0.85 C, 0.6 Ni, bal Fe.
For machine tool parts, cold heading dies, punches
Water hardening, wear resistant.

STYRIA PECO.
M-1291, M-1114; 0.67 C, 1.3 Si, 0.50 Mn, 0.5 Cr, bal Fe.
For springs, pneumatic tools, punches, oil hardened, tough.

STYRIA PFM.
M-1114, M-1291; 0.75 C, 1 Cr, 1.8 Ni, bal Fe.
For machine tool parts, dies, punches, springs, cold working tools.
Oil hardening, tough, shock resisting.

STYRIA PK.
M-1114, M-1291; 0.65 C, 1 Ni, bal Fe.
For cutting knives, machine tool parts.
Oil hardening, shock resistant.

STYRIA PS2.
M-1291, M-1114; 1.3 C, 0.20 max Si, 0.20 max Mn, bal Fe.
For blanking and forming dies, reamers; Type W1; water hardened.

STYRIA PS3.
M-1291, M-1114; 1.15 C, 0.20 Cr, 0.20 Mn, bal Fe.
For reamers, cutters, bearings; water hardened, wear resistant.

STYRIA PS4.
M-1291, M-1114; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 185,000-130,000 TS; 118,000-80,000 YS; 10-21 El; 30-47 RA; 375-270 Brin.
For springs, drills, taps, reamers, cutters; Type W1; water hardened.

STYRIA RA.
M-1291, M-1114; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

STYRIA RA1.
M-1291, M-1114; 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

STYRIA RA1 EXTRA.
M-1291, M-1114; 0 07 max C, 17.5 Cr, 17.5 Ni, 2 Mo, 2 Cu, Ti = 7 × C, bal Fe
For valves, pumps, acid resistant equipment; corrosion resistant.

STYRIA RA1 SPEZIAL.
M-1291, M-1114; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 50 El; 65 RA; 160 Brin.
For welded chemical plant equipment; Type 347; stainless, austenitic.

STYRIA RA1T.
M-1291; 0 10 max C, 18 Cr, 11 Ni, 2.5 Mo, Ti, bal Fe.
Annealed. 123,000 TS, 60,000 YS; 40 El; 140 Brin.
For chemical, textile and die industry equipment, paper and pulp mill equipment.
Stainless, austenitic, Type 317.

STYRIA RA3.
M-1291; 0 06 max C, 18 Cr, 13 Ni, 3 Mo, bal Fe
Annealed· 123,000 TS, 49,000 YS; 45 El; 140 Brin.
For chemical, textile and die industries, paper and pulp mill equipment
Type 317, stainless, austenitic, acid resistant.

STYRIA RA3 EXTRA
M-1291; 0 10 max C, 18 Cr, 13 Ni, 3 Mo, Cb, bal Fe.
Annealed. 123,000 TS; 60,000 YS; 4 El; 140 Brin.
For welded structures, tanks, agitators, reaction vessels, chemical plant equipment.
Stainless, austenitic, acid resistant.

STYRIA RA22.
M-1291; 0.10 max C, 18 Cr, 10 Ni, 2 Mo, 2 Si, bal Fe
Annealed· 134,000 TS, 67,000 YS, 35 El; 140 Brin.
For chemical and pharmaceutical plant equipment, tanks, agitators.
Stainless, austenitic, acid resistant.

STYRIA RAF.
M-1291; 0.15 C, 2 0 Si, 25 Cr, 20 Ni, bal Fe.
Annealed: 134,000 TS; 67,000 YS, 40 El; 145 Brin.
For furnace parts, radiant tubes, annealing boxes, heat treating fixtures.
Heat and oxidation resistant to 1200°C. Type 314

STYRIA RAFK.
M-1291; 0.15 C, 2.0 Si, 20 Cr, 12 Ni, bal Fe.
For furnace parts, heat exchangers, chemical plant and oil refinery equipment.
Heat and oxidation resistant to 1050°F.

STYRIA RAS (NB).
M-1291, M-1114; 0.12 max C, 9.5 Ni, 18 Cr, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
For welded chemical plant equipment, mixers, tanks; Type 347; stainless, austenitic.

STYRIA RAT.
M-1291; 0.10 max C, 18 Cr, 10 Ni, Ti, bal Fe.
Annealed: 123,000 TS; 60,000 YS; 40 El; 140 Brin.
For engine exhaust systems, welded structures, jet aircraft components, oil refinery equipment.
Stainless, austenitic, Type 321. Max. operating temperature of 1650°F.

STYRIA RAW.
M-1291, M-1114; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 304; stainless, austenitic.

STYRIA RAZ.
M-1291; 0.12 C, 18 Cr, 9 Ni, 0.3 Mo, 0.20 S, bal Fe.
Annealed: 123,000 TS, 56,000 YS; 50 El, 130 Brin.
Cold Drawn: 224,000 TS; 145,000 YS; 280 Brin.
For screw machine products, fasteners, hardware gears, shafts.
Stainless, austenitic, Type 303, free machining.

STYRIA RCP.
M-1291, M-1114; 0.45 C, W, Cr, V, bal Fe.
For forging and heading dies; oil hardened, tough.

STYRIA RK15
M-1291, M-1114; 0.90 C, 18 W, 0.10 V, 1.1 Mo, bal Fe.
For hot work tools and dies; oil hardened, wear resistant.

STYRIA RKH
M-1291, 1.0 C, 16 Cr, 0.8 Mo, 2 Co, bal Fe.
Annealed. 113,000-128,000 TS; 220-260 Brin.
Hardened: 60-62 Rock C.
For dental and surgical instruments, cutlery, ball bearings, valves.
Type 440C stainless, hardenable, wear resistant.

STYRIA RKW
M-1291; 0.40 C, 14 Cr, 0.50 Mo, bal Fe.
Annealed: 71,000-92,000 TS; 43,000 YS; 20 El; 160 Brin
Ht. Tr.: 85,000-107,000 TS, 64,000 YS; 18 El; 170-210 Brin.
For gas turbine blades and components, valves, jet engine parts, slides.
Heat and corrosion resistant.

STYRIA RP1K
M-1291, M-1114, 0.45 C, 1.4 Cr, 0.70 Mo, 0.30 V, bal Fe
For forging and heading dies, upsetters, oil hardened, tough

STYRIA RS1.
M-1291, M-1114, 0.4 C, 13 Cr, 0.4 Si, bal Fe.
Annealed: 100,000 TS; 55,000 YS, 20 El; 50 RA; 200 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; stainless.

STYRIA RS2
M-1291, M-1114; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed. 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For valves, cutlery, surgical and dental instruments; Type 420, stainless.

STYRIA RS2M.
M-1291; 0.20 C, 14 Cr, 1.2 Mo, bal Fe.
Annealed: 85,000 TS; 50,000 YS; 22 El; 165 Brin.
Ht. Tr.: 128,000 TS; 78,000 YS; 14-16 El; 210-250 Brin.
For valves, turbine and jet engine components, pump parts.

STYRIA RS2W.
M-1291; 0.20 C, 14 Cr, bal Fe.
Annealed: 78,000-93,000 TS; 50,000 YS; 22 El; 175 Brin.
Ht. Tr.: 128,000 TS; 78,000 YS; 14-16 El; 210-250 Brin.
Type 420 corrosion resistant, hardenable.

STYRIA RS3.
M-1291, M-1114; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El; 55 RA; 195 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; stainless.

STYRIA RS3N.
M-1291, M-1114; 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431; stainless.

STYRIA RS3S.
M-1291, M-1114; 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe.
Annealed: 125,000 TS; 95,000 YS, 20 El; 55 RA; 260 Brin
For welded oil refinery equipment; heat and corrosion resistant.

STYRIA RS3T.
M-1291, M-1114; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe
Annealed. 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For welded oil refinery equipment; corrosion and heat resistant

STYRIA RS20N
M-1291; 0.12 max C, 20 Cr, 1 Ni, bal Fe.
Annealed: 70,000-92,000 TS; 42,000 YS; 20 El; 160 Brin.
For chemical and oil refining plant equipment, agitators, roasters.
Heat and corrosion resistant.

STYRIA RSK.
M-1291; 0.10 max C, 17 Cr, bal Fe
Annealed: 64,000-85,000 TS; 43,000 YS; 20 El; 160 Brin.
Cold Rolled: 120,000 TS, 95,000 YS; 10 El; 185 Brin
For automotive trim, builders hardware, oil burners and heaters, septic tanks
Type 430 corrosion resistant.

STYRIA RSMO.
M-1291; 0.10 max C, 20 Cr, 2.2 Mo, Ti, bal Fe.
Annealed: 70,000-92,000 TS; 43,000 YS; 20 El; 160 Brin.
For chemical plant and oil refining equipment, welded structures.
Corrosion and heat resistant.

STYRIA RSN.
M-1291; 0.20 C, 18 Cr, 2 Ni, bal Fe.
Annealed: 106,000-120,000 TS; 85,000-YS; 18 El; 220 Brin.
Ht. Tr.: 113,000-195,000 TS; 80,000 YS; 14 El; 275 Brin.
For pump shafts, marine hardware, surgical trusses, valve trim.
Type 431 corrosion resistant, hardenable.

STYRIA RSV.
M-1291, M-1114; C, alloy, bal Fe.

STYRIA RSW.
M-1291, M-1114; 0.12 max C, 13 Cr, 0.4 Si, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, valves, cutlery; Type 410; stainless.

STYRIA RSZ.
M-1291; 0.14 C, 17 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 78,000-100,000 TS; 50,000 YS; 21 El; 170 Brin.
Ht. Tr.: 120,000 TS; 64,000 YS, 12 El; 235 Brin.
For chemical plant equipment, oil burners and heaters, soot blowers, screw machine products, fasteners.
Type 430F stainless, free-cutting

STYRIA S434
M-1291, M-1114; 1 0 C, 0.1 V, 0.30 Mn, bal Fe.
For blanking and forming dies;
Type W2; water hardened.

STYRIA SCV
M-1291, M-1114, 1.15 C, 0.65 Cr, 0.1 V, 0.30 Mn, bal Fe.
For bearings, cutters, forming dies, water or oil hardened.

STYRIA SIMPLEX.
M-1291; 0 58 C, 1 7 Cr, 3 3 Ni + V, bal Fe.
For die casting dies.
Oil hardening, shock resistant

STYRIA SKL.
M-1291, M-1114; 1 0 C, 1 55 Cr, 0 35 Mn, bal Fe.
For bearings, liners, sleeves, forming and blanking dies; oil hardened, abrasion resistant

STYRIA SP5H.
M-1291, M-1114; 0 67 C, 0 38 Si, 0.70 Mn, bal Fe.
Heat treated. 175,000 TS, 130,000 YS; 12 El; 38 RA; 350 Brin.
For wheels, die blocks, springs; water hardened.

STYRIA SP5W
M-1291, M-1114; 0.60 C, 0.38 Si, 0 65 Mn, bal Fe.
Heat treated: 160,000 TS; 115,000 YS, 12 El; 40 RA; 330 Brin
For clutch discs, girders, rails, springs; water hardened

STYRIA SP6H.
M-1291, M-1114, 0 53 C, 0 38 Si, 0 55 Mn, bal Fe.
Annealed. 100,000 TS; 55,000 YS; 15 El; 22 RA; 160 Brin.
For axles, gears, bolts, tie rods, crankpins, water hardened.

STYRIA SP6W.
M-1291, M-1114, 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS, 24 El, 45 RA, 212 Brin
For axles, gears, bolts, crankshafts; water hardened.

STYRIA SPAH.
M-1291, M-1114; 0.15 C, 0 25 Si, 0 37 Mn, bal Fe.
Annealed: 70,000 TS; 55,000 YS; 25 El; 60 RA; 145 Brin.
For gears, bolts, camshafts, cams; case hardened.

STYRIA SPAW.
M-1291, M-1114; 0.15 C, 0.25 Si, 0 37 Mn, bal Fe.
Annealed: 70,000 TS; 55,000 YS; 25 El, 60 RA; 145 Brin.
For gears, bolts, camshafts, fasteners; case hardened.

STYRIA SPEZIAL CN.
M-1291, M-1114; 0.19 C, 1.25 Cr, 0.20 Mo, 3.75 Ni, bal Fe.
For camshafts, cams, gears, bolts, case hardened, shock resistant.

STYRIA SPG EXTRA.
M-1114, M-1291; 0 40 C, 5.3 Cr, 1.5 Mo, 0 45 V, bal Fe.
For bolts, crankshafts, dies, molds, rams, punches.
Oil hardening, shock resistant.

STYRIA SPG EXTRA V.
M-1291; 0.35 C, 5 Cr, 1.3 Mo, 1 V, bal Fe.
For punches, mandrels, die casting dies, extrusion rams and liners.
Hot work steel, oil hardening, shock resistant.

STYRIA SPG SPECIAL W
M-1291, 0 35 C, 5 Cr, 1.5 W, 1.5 Mo, 0 5 V, bal Fe.
For hot piercers, punches, extrusion rams and liners.
Hot work steel, shock resistant.

STYRIA SPMK
M-1114, M-1291; 0 50 C, 1 2 Mn, 0.15 S, bal Fe.
For machine tool parts, gears, shafts, axles, housing.
Oil hardening, shock resistant, free-cutting.

STYRIA SPMW
M-1291, M-1114; 0 40 C, 0 38 Si, 0 95 Mn, bal Fe.
Hot rolled 91,000 TS; 58,000 YS; 27 El; 50 RA; 200 Brin.
For bolts, gears, axles, shafts; water hardened.

STYRIA SS25K.
M-1114, M-1291, 0 95 C, 2.8 W, 4.3 Cr, 2 8 Mo, 2 4 V, bal Fe
For lathe and planer tools, reamers, broaches.
High-speed steel, High red-hardness.

STYRIA SS39K
M-1291, M-1114; 0.86 C, 4.1 Cr, 0.85 Mo, 2 5 V, 12 W, bal Fe
For lathe and planer tools, drills, reamers, taps; high speed steel

STYRIA SS39KN
M-1291, M-1114, 0 86 C, 4 1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps, high speed steel.

STYRIA SS50KN
M-1114, M-1291; 1.35 C, 12 4 W, 4 Cr, 4.5 V, bal Fe
For blanking and forming tools, engraver's tools.
High speed steel, abrasion resistant, high-red hardness.

STYRIA SS 652.
M-1114, M-1291; 0 85 C, 6 W, 5 Mo, 2 V, 4 Cr, bal Fe.
For lathe and planer tools, reamers, broaches, drills.
High-speed steel, high red-hardness.

STYRIA SS 653 SPECIAL.
M-1291, 1.2 C, 6 W, 5 Mo, 3 V, 4 Cr, bal Fe.
For lathe and planer tools, form cutters, chasers, reamers, broaches.
High-speed steel, high red hardness.

STYRIA SS921.
M-1291; 0 83 C, 2 W, 9 Mo, 1 V, 4 Cr, bal Fe.
For lathe and planer tools, form cutters, chasers, drills, reamers.
High speed steel, high red-hardness.

STYRIA SS1200 ULTRA
M-1291; 1.2 C, 7 5 W, 4 Cr, 5.8 Mo, 3 V, 12 5 Co, bal Fe
For lathe and planer tools, drills, reamers, broaches, form cutters.
High speed steel, high red-hardness.

STYRIA SSF.
M-1114, M-1291; 0.90 C, 1.3 Cr, 1.2 Si, bal Fe.
For bearings, punches, upsetters.
Oil or water hardening, shock resistant.

STYRIA S-SPECIAL.
M-1291; 1.2 C, 1.3 W, 0.2 V + Cr, bal Fe.
For cold working tools, bearings.
Water hardening, abrasion resistant.

STYRIA SW1.
M-1291, M-1114; 1.05 C, 0.90 Mn, 1.0 Cr, 1.15 W, bal Fe.
For cold work tools, heading dies; oil hardened, tough.

STYRIA SWS.
M-1291, M-1114; C, bal Fe.
For machine tool parts; water hardened.

STYRIA SX3 TANNEN.
M-1291, M-1114, 0.55 C, 0.10-0.40 Si, 0.30-0.50 Mn, bal Fe
Annealed: 100,000 TS; 55,000 YS; 15 El, 22 RA; 180 Brin
For machine tool parts, gears, bolts; water hardened.

STYRIA TENIT-KL.
M-1291; 0.6 C, 2.2 W, 1 Cr, bal Fe.
For cold work tools, mandrels, punches.
Cold work steel, tough

STYRIA US-SILBERSTAHL.
M-1291; 1.15 C, bal Fe.
For cutters, drills, chasers, broaches
Water hardening, abrasion resistant.

STYRIA V66
M-1114, M-1291; 0.45 C, 13 Cr, 13 Ni, 2.2 W, bal Fe.
Ht. Tr 114,000-142,000 TS; 57,000 YS, 25 El; 35 RA,
For valves. Austenitic, corrosion and heat resistant.

STYRIA V101
M-1114, M-1291; 0.45 C, 19 Cr, 9.5 Ni, 1.2 W, bal Fe.
Heat Treated: 114,000-142,000 TS, 57,000 YS; 25 El, 35 RA
For furnace parts, roasters, agitators
Heat and oxidation resistant

STYRIA VCN.
M-1291, M-1114, 0.22-0.30 C, 0.7 Cr, 3.5 Ni, bal Fe
For gears, bolts, machine tool parts; oil hardened, shock resistant.

STYRIA VCN15
M-1291, M-1114, 0.34 C, 1.55 Cr, 1.55 Ni, 0.55 Mn, bal Fe
For forging and upsetting dies; oil hardened, tough.

STYRIA VCV2.
M-1291, M-1114, 0.30 C, Cr, Ni, Mo, bal Fe
For gears, bolts, machine tool parts, oil hardened, shock resistant.

STYRIA VK20N.
M-1114, M-1291; 0.80 C, 2.0 Si, 21.0 Cr, 1.5 Ni, bal Fe.
Heat treated: 128,000-150,000 TS; 100,000 YS; 6 El.
For furnace parts, combustion chambers, oil refinery equipment, bearings, liners.
Hardenable, corrosion resistant.

STYRIA VKS.
M-1291, M-1114; 0.45 C, 9 Cr, 0.45 Mn, 3.0 Si, bal Fe
For oil refinery equipment; corrosion and creep resistant.

STYRIA VKSN.
M-1291, M-1114; 0.80 C, 2.0 Si, 20 Cr, 1.4 Ni, bal Fe.
Heat treated. 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin.
For cutlery, valves, ball bearings, furnace wear plates; corrosion resistant, hardenable

STYRIA VMS.
M-1291, M-1114; 0.36 C, 1.25 Si, 1.25 Mn, bal Fe.
For punches, upsetters, riveters; oil hardened.

STYRIA VNC2.
M-1114, M-1291; 0.30 C, 2.0 Cr, 2.0 Ni, 0.3 Mo, bal Fe.
Annealed: 114,000 TS; 85,000 YS; 18 El; 50 RA.
For gears, pinions, crankshafts, bolts, fasteners.
Oil hardening, shock resistant

STYRIA VNC10.
M-1291, M-1114; 0.36 C, 1.0 Cr, 0.2 Mo, 1.0 Ni, bal Fe
For gears, bolts, crankshafts; oil hardened, tough.

STYRIA VNC15
M-1114, M-1291; 0.34 C, 1.5 Cr, 1.5 Ni, 0.2 Mo, bal Fe.
Annealed: 108,000 TS; 80,000 YS; 20 El; 55 RA.
For gears, pinions, shafts, axles, crankshafts, fasteners.
Oil hardening, shock resistant.

STYRIA WB.
M-1291, M-1114; 0.40 C, 13 Cr, 0.3 Ni, 0.3 Mo, 0.3 Mn, bal Fe.
Annealed: 100,000 TS; 55,000 YS, 23 El; 200 Brin.
For cutlery valves, surgical and dental instruments.
AISI Type 420, corrosion resistant.

STYRIA WCM
M-1291, M-1114; 0.13 C, 0.85 Cr, 0.45 Mo, bal Fe
For camshafts, cams, bolts, gears; case hardened.

STYRIA WCMD.
M-1291, M-1114, 0.24 C, 1.25 Cr, 0.45 Mo, 0.55 Mn, bal Fe
For gears, bolts, crankshafts, axles; oil hardened, tough.

STYRIA WCMDW
M-1114, M-1291, 0.18 C, 1.0 Cr, 0.45 Mo, bal Fe
For gears, bolts, fasteners, cams, camshafts
Carburizing, water or oil hardening.

STYRIA WCMV
M-1291, M-1114, 0.24 C, 1.55 Cr, 0.55 Mo, 0.20 V, bal Fe
For gears, bolts, crankshafts, axles; oil hardened, tough.

STYRIA WCMW
M-1291, M-1114; 0.24 C, 1.15 Cr, 0.25 Mo, bal Fe.
For gears, bolts, machine tool parts, oil hardened, tough.

STYRIA WD30.
M-1291, M-1114; 0.15 C, 0.30 Mo, 0.65 Mn, bal Fe.
For machine tool parts, bolts; case hardened.

STYRIA WK5.
M-1291, M-1114; 0.30 C, 3.2 Cr + V, 4.5 W, bal Fe.
For extrusion rams and liners, hot work tools; oil hardened.

STYRIA WK5K
M-1291, M-1114, 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For upsetter and header dies, punches; oil hardened, hot work steel.

STYRIA WKM.
M-1114, M-1291, 0.42 C, 1.7 Cr, 0.5 W, 1.5 Mo, 0.4 V, bal Fe.
For punches, shears, dies, machine tools, cold working tools
Oil hardening, shock resistant.

STYRIA WKM 33.
M-1291; 0.30 C, 3 Cr, 2.8 Mo, 0.5 V, bal Fe.
For die casting dies, molds.
Hot work steel, shock resistant

STYRIA WPN EXTRA.
M-1291; 0.45 C, 13.5 Cr, 13 Ni, 1.3 W, 1.2 V, bal Fe.
For valves, furnace parts.
Heat and corrosion resistant.

STYRIA WPS.
M-1291, M-1114; 0.20 C, 13 Cr, 0.30 Mn, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For turbine blades, valves, cutlery, corrosion resistant.

STYRIA W-SILBERSTAHL.
M-1291; 1.25 C, 1.1 W, bal Fe.
For fast cutting tools, drills, lathe and planer tools.
Oil hardening, wear resistant.

ST. Z1.
Swiss; 0.13 C, 0.05 S, 0.05 P, bal Fe.
Rolled: 52,000-64,000 TS; 34,000 YS; 25 El.
For bridge construction; good weldability.

SU-16.
M-1622; 11 W, 3 Mo, 2 Hf, 0.08 C, bal Cb.
At 78°F: 112,000 TS; 90,000 YS; 25 El; 43 RA.
At 1112°F: 90,500 TS; 64,500 YS; 15 El; 45 RA.
For jet engine and missile components.
High heat resistant. Good rupture strength.

SUB 66.
M-618; C, 5.5 W, 4 Mo, 4 Cr, 1.5 V, bal Fe.
For tools, cutters; high speed steel.

SUBSTITUTE.
90 Cu, 6.5 Sn, 3 Zn, 0.5 Pb.

SUDAL.
M-380; Pb, Sn.
For Al solders.

SUDALON "A."
M-380; Pb, Sn.
For Al solders.

SUDALON "B."
M-380; Pb, Sn.
For Al solders.

SUDALON "C."
M-380; Pb, Sn.
For Al solders.

SUEDOIS-S1.
M-1546; 1.0 C, 0.4 Mn, 0.2 Si, bal Fe.
Hardened: 216,000 TS; 152,000 YP; 11 El; 600 Brin.
For precision tools, drills, cutters, chisels, punches, taps, springs, bumper bars, bearings.
Water hardening, wear resistant.

SUEDOIS-S2.
M-1546; 0.80 C, 0.7 Mn, 0.2 Si, bal Fe.
Hardened: 183,000 TS; 135,000 YP; 13 El; C 40 Rock.
For precision tools, drills, cutters, chisels, taps, punches.
Water hardening, wear resistant.

SUHLER-WHITE COPPER.
40 Cu, 32 Ni, 25 Zn, 2.6 Pb.
For ornamental parts; corrosion resistant.

SUJ2-N.
M-1589, 1.2 C, 1.0 Cr, 0.6 Mn, 0.4 Si, bal Fe.
Ht. Tr.: 225,000 TS; 210,000 YS; 444 Brin.
For ball bearings, balls and races, liners, bushings.
Water hardening. Similar to 52100 Steel.

SULGERS ANTIFRICTION.
England; 83.6 Zn, 9.9 Sn, 4 Cu, 1.2 Pb.
For bearings; will not resist heat or live steam.

SULZER-2 Cr 120Mo8Co.
M-1660; 0.2 C, 1 Mn, 2 Co, 12.3 Cr, 0.8 Mo, 0.3 V, bal Fe.
Annealed: 93,000 TS; 38,000 YS; 26 El; B 93 Rock.
Heat Treated: 245,000 TS; 205,000 YS; 10 El; C 50 Rock.
For surgical instruments, hardware, knives, scissors.
Corrosion resistant, hardenable.

SUMET BRONZE SM-8.
M-1065, M-143; 24-27 Pb, 3-8 Sn, bal Cu.
Sand cast: 20,900 TS; 11,000 YS; 16 El; 32-37 Brin.
For moderately severe service at medium or high speed bearings; C.E.L. 8300.

SUMET BRONZE SM-10.
M-1065; 22-25 Pb, 5-7 Sn, bal Cu.
Sand cast: 22,600 TS; 15 El; 38-41 Brin.
For bearings for severe service subject to shock and impact; heavy duty.

SUMET BRONZE SM-12.
M-1065; 20-23 Pb, 7-9 Sn, bal Cu.
Sand cast: 23,000 TS; 14 El; 41-45 Brin.
For bearings for slow speed service under heavy load and impact; heavy duty.

SUMET BRONZE SM-14.
M-1065; 12-15 Pb, 9-11 Sn, bal Cu
Sand cast: 27,350 TS; 12 El; 56-60 Brin.
For bearings for severe service subjected to heavy shock, heavy duty.

SUMET BRONZE SM-16.
M-1065, 18-21 Pb, 9-11 Sn, 0.3-0.7 Ni, bal Cu.
Sand cast: 24,600 TS; 17,000 YS; 7 El; 47-52 Brin.
For bearings for heavy duty and slow speed service, heavy duty.

SUMET BRONZE SM-18.
M-1065; 15.5-18.5 Pb, 10-12 Sn, 1-2 Ni, bal Cu.
Sand cast 26,000 TS; 7 El; 58-62 Brin.
For bearings for extremely severe service, heavy duty.

SUMET BRONZE SM22.
M-71; 10 Pb, Sn, bal Cu
For bearings, heavy duty.

SUMITEN 60
M-1296, 0.15 C, 0.32 Si, 1.30 Mn, 0.009 P, 0.010 S, 0.30 Ni, 0.07 V, bal Fe
50 mm thick plate. 93,600 TS; 76,300 YS; 27 El
High strength low alloy steel for structural purposes.

SUMITEN 70R.
M-1296, 0.15 C, 0.32 Si, 1.36 Mn, 0.025 P, 0.018 S, 0.05 Cu, 0.02 Cr, 0.09 V, bal Fe.
20 mm thick plate: 105,000 TS; 87,800 YS; 32 El.
High strength low alloy steel for structural purposes.

SUMITEN 80.
M-1296; 0.13 C, 0.26 Si, 0.79 Mn, 0.007 P, 0.013 S, 0.31 Cu, 0.91 Ni, 0.56 Cr, 0.49 Mo, 0.05 V, 0.0024 B, bal Fe.
45 mm plate thickness 119,000 TS; 109,000 YS; 23 El.
High strength low alloy steel for structural purposes.

SUMITEN 80S.
M-1296; 0.14 C, 0.31 Si, 0.58 Mn, 0.013 P, 0.015 S, 0.27 Cu, 0.97 Cr, 0.44 Mo, 0.05 V, 0.0031 B, bal Fe.
32 mm thick plate: 121,500 TS; 112,500 YS; 20 El.
High strength low alloy steel for structural purposes

SUMITEN 100.
M-1296; 0.14 C, 0.29 Si, 0.97 Mn, 0.012 P, 0.015 S, 0.25 Cu, 0.83 Ni, 0.72 Cr, 0.58 Mo, 0.09 V, bal Fe.
26 mm thick plate: 156,000 TS; 154,000 YS; 20 El.
High strength low alloy steel for structural purposes.

SUMITOMO CR1.
M-1296; 0.15 max C, 0.1-0.8 Si, 0.25-0.65 Ni, 0.6-1.0 Cr, 0.3-0.6 Cu, bal Fe.
Tube: 67,000 TS; 45,000 YS; 54 El.
For low temperature boilers, air preheaters, furnace parts.
High-strength low-alloy steel, good resistance to H_2SO_4.

SUMITOMO CR2.
M-1296; 0.15 max C, 0.1-0.8 Si, 0.25-0.65 Ni, 0.6-1.0 Cr, 0.3-0.6 Cu, bal Fe.
Sheet: 76,000 TS; 49,000 YS; 34 El.
For low temperature boilers, air preheaters furnace parts.
High strength, good resistance to H_2SO_4.

SUMITOMO ESD.
M-1296; 2 Cu, 0.5 Mn, 1.5 Mg, 7.5 Zn, bal Al.
For aircraft parts; age-hardenable.

SUN BRONZE.
England; 40-60 Co, 10 Al, 30-50 Cu.
For high temperature fittings, heat resistant.

SUN BRONZE-1 .
Eng ; 95 Cu, 5 Al.
For pump rods, bushings, propeller blade bolts; corrosion resistant.

SUN BRONZE-2.
U.S., 60-40 Co, 30-50 Cu, 10 Al.
For high temperature fittings; heat resistant.

SUNDEEL.
80 Au, 10 W, 7 Ni.
Used as dental alloy, corrosion resistant.

SUNRAY GOLD.
M-422; Ni, bal Cu.
For imitation gold, jewelry; corrosion resistant.

SUNSHINE METAL.
2.9 C, 2 Si, bal Fe.
For rubber tire molds; semi-steel cast iron.

SUPARD CHROME.
M-508; 0.4 C, 11.5-14 Cr, 1 max Ni, 0.5 max Mo, bal Fe.
Heat treated: 240,000 TS; 175,000 YS; 5 El; 7 RA; 450 Brin
For pump liners, plunger sleeves, bushings; resists H_2SO_4.

SUPER.
M-783; 1.1 C, 3.75 Cr, 0.3 Mn, 3.25 V, 17.5 W, 0.8 Mo, bal Fe.
For lathe and planer tools; high speed steel.

SUPER A.
M-1243.
For solder; tins without special cleaning.

SUPER ALLOY.
M-328; 0.55-0.65 C, 1.0-1.5 Ni, 0.45-0.75 Cr, bal Fe.
Heat treated: 225,000 TS; 220,000 YS; 6 El; 20 RA; 470 Brin.
For plow and harrow discs; tough.

SUPER-ALLOY.
M-335; 0.5 C, 0.75 Si, 1.15 Cr, 2.5 W, 0.2 V, bal Fe.
Oil hardening; for tools, dies.
AISI S1 Shock resisting tool steel.

SUPERALUMAG T.35.
M-770; 3 Zn, 1.5 Mg, 0.2 Cr, 0.4 Mn, bal Al.
Annealed: 26,000 TS; 10,000 YS; 20 El; 38 Brin.
Hardened: 50,000 TS; 35,000 YS; 16 El; 70 Brin.
For engine parts; corrosion resistant.

SUPERALUMAG T.45.
M-770; 6 Zn, 2 Mg, 0.3 Cr, 0.5 Mn, bal Al.
Annealed· 29,000 TS; 10,000 YS; 20 El; 50 Brin.
Hardened: 69,000 TS; 50,000 YS; 12 El; 150 Brin.
For aircraft parts; hardenable.

SUPERALUMAG T.60.
M-770; 8 Zn, 2 Mg, 1.5 Cu, 0.3 Cr, 0.5 Mn, bal Fe.
Annealed: 45,000 TS; 10,000 YS; 16 El; 55 Brin.
Hardened: 86,000 TS; 72,000 YS; 8 El; 180 Brin.
For aircraft structures; hardenable.

SUPER A MEEHANITE.
M-82; 3 C, 0.5 Cu, bal Fe.
50,000 TS.
For gears, piston rings, engines; cast iron.

SUPER ANTINIT B.
M-27; 64 Ni, 28 Mo, bal Fe.
Annealed: 64,000 TS; 51,200 YS; 210 Brin.
For chemical plant equipment; resists HCl.

SUPER ANTINIT C.
M-27; 60 Ni, 17 Mo, 16 Cr, bal Fe.
Annealed: 113,800 TS; 49,800 YS
For boilers, tanks, chemical plant equipment; corrosion and heat resistant.

SUPER-ASCOLOY.
M-1; < 0.2 C, 17-20 Cr, 7-10 Ni, bal Fe.
Annealed· 90,000 TS; 45,000 YS, 61 El; 75 RA; 170 Brin.
Hot rolled: 110,900 TS; 81,970 YS; 43 El; 66 RA; 223 Brin.
At 900°C: 13,590 TS, 36 El; 57 RA.
Used for all applications where exceptional resistance to most forms of corrosion must be coupled with high tensile properties, austenitic alloy; max operating temperature 1700°F.

SUPER AVIONAL.
M-249, M-624; 4.5 Cu, 0.8 Si, 1 Mg, 1.2 Mn, bal Al.
Aged. 68,000 TS; 48,000 YS; 15 El, 130 Brin
For aircraft parts, structural members; age-hardenable.

SUPERB.
M-73, 0.7 C, 0.9 Cr, 0.2 V, bal Fe.
For tools, dies, chasers; water or oil hardened.

SUPERBASIQUE.
M-700; C, Cr, Ni, bal Fe.
For corrosion resistant parts; stainless, austenitic.

SUPERBRONZE.
Eng.; 57-69 Cu, 21-38 Zn, 3-3.2 Mn, 1.3-2 Fe, 1.2-5 Al.
For marine parts, propeller blades; corrosion resisting.

SUPER BRONZOCHROM 10186.
M-717;
Bronze-nickel alloy powder for steel, nickel alloys, copper alloys.

SUPERCASE.
M-406; 0.08-0.15 C, bal Fe.
Hot rolled: 60,000 TS; 33 El; 60 RA; 110 Brin.
Heat treated: 81,000 TS; 24 El; 69 RA; 217 Brin.
For camshafts, gears, bolts, transmission shafts, worms, sprockets; case hardening steel; free machining.

SUPER CAST ALLOY NO. 6.
M-1018; Al, Cu, bal Zn.
For dies castings.

SUPER CESCO.
M-356; 0.55 C, 1.0 Mn, 1.3 Mo, 0.35 V, 2.0 Si, bal Fe.
For tools; shock resistant.

SUPER CESCO DIAMOND.
M-356; 0.50-0.65 C, 2.0 Si, 1.0 Mn, 1.25 Mo, 0.3 V, bal Fe.
Heat treated: 236,400-338,000 TS; 231,000-279,200 YS; 10.5-4 El; 31-7.7 RA; 612 Brin.
For chisels, concrete busters, drills, caulking and beading tools; superseded by "Cesco Diamond Special."

SUPERCHITONAL.
M-624; aluminum clad Superavional.
For aircraft structures.

SUPER CHNC.
M-50, M-1414; 0.15 C, 0.40 Mn, 4.20 Ni, 1.2 Cr, 0.25 Mo, bal Fe.
Oil Harden: 193,000-204,000 TS; 14-16 El; 50-55 RA; 40-55 IZOD.
For aircraft engine gears, supercharger gears, heavy duty worms, cams, camshafts.
Tough, shock resistant. Case hardening.

SUPER CHROME.
M-1705; 1.4 C, 0.3 Mn, 0.6 Si, 13.0 Cr, 0.5 Ni, 0.6 Mo, 3.3 Co, bal Fe.
High carbon, high chromium tool and die steel; air or oil hardening. AISI D5.

SUPER CHROME VANADIUM
M-618; 0.95-1.05 C, 0.9-1.0 Cr, 0.15-0.25 V, bal Fe.
For cutlery dies, drawing and stamping dies; deep hardening, tough.

SUPER COAT
M-1540; Coated sheet steel.
Coated with 0.03-0.06 μ chromium and 0.014-0.2 μ CrO_3.
For beverage cans, crown caps, pails, dry cells, motor oil cans Resists staining and corrosion.

SUPER COBALT see SIMONDS SUPER COBALT.

SUPER DBL.
M-1; 0.8 C, 5.5 W, 4.2 Mo, 7.7 Co, 4 Cr, 1.7 V, bal Fe.
For lathe and boring tools, form tools, cutters for heavy duty cutting; wear resistant high speed steel; AISI M36.

SUPER-DE LAVAUD
M-203, 3.0 C, 2.5 Si, bal Fe.
For gears, shafts, housings; cast iron.

SUPER-DE LAVAUD METAL
M-203; 3.5-3.75 T C, 0.3-5 Mn, 1.5-1.85 Si, bal Fe.
Cast: 32,000 TS; 0.5 El.
For pipes; centrifugal cast iron.

SUPERDIE.
M-35; 2.20 C, 12 Cr, 0.8 W, 1.0 Si, bal Fe.
Annealed: 269 Brin.
For blanking, trimming dies, burnishing tools, extrusion and drawing dies; resistant to abrasive wear. AISI D2 tool steel.

SUPERDRAW.
M-210; 1.3 C, 0.3 Mn, 2.25 W, bal Fe.
For cold drawing dies; water hardened.

SUPER DREADNOUGHT.
M-260, M-38; 0.7 C, 4 Cr, 2 V, 14 W, bal Fe.
For high speed cutting tools, roughing cuts on hard material; high speed steel

SUPER-DUCT F-3.
M-440; 0.4 C, 1.5 Ni, 0.8 Cr, 0.2 Mo, bal Fe.
For machinery parts; high strength and tough.

SUPER DURALUMIN.
M-338; 4.3 Cu, 0.5 Mg, 0.78 Si, 0.49 Mn, bal Al.
59,000-75,500 TS; 25-13 El.
For airplane and dirigible parts; age-hardenable.

SUPER E.
M-1243.
For solder; noncorrosive.

SUPER ECLAIR.
M-1043; 0.62 C, 14 W, bal Fe.
For hot work tools; oil hardened.

SUPERELSO.
M-1488; 0.18 max C, 0.90 Mn, 0.30 Si, 1.3 Cr, 0.2 Cu, 0.25 Mo, 1.5 Ni, V, bal Fe.
Plate: 114,000-135,000 TS; 97,000 YS; 15 min El.
For mine cars, chutes, bus and trailer bodies, derricks, structures, booms.
Low-alloy high strength structural steel, shock resistant.

SUPERELSO 52.
M-1488; 0.20 max C, 0.40 Ni, 0.30 Mo, 0.40 Cr, 1.20 Mn, bal Fe.
Heat treated. 86,000-103,000 TS; 68,000 min YS;
For mine cars, derricks, truck and bus bodies, chutes
Low-alloy high-strength structural steel; Suitable for case-hardening

SUPERELSO 60.
M-1488, 0.20 max C, 1.2 Mn, 0.40 Mo, bal Fe
Heat treated· 100,000 min TS; 85,000 min YS.
For mine cars, chutes, derricks, truck and bus bodies, booms.
Low-alloy high-strength structural steel. shock resistant

SUPERELSO 70.
M-1488; 0.18 max C, 1.1 Mn, 1.0 Cr, 0.4 Mo, 2.5 Ni, bal Fe.
Heat treated: 114,000-136,000 TS; 100,000 min YS.
For mine cars, derricks, booms, structures, bridges.
Low-alloy high-strength structural steel, shock resistant.

SUPERFINE IX.
M-900, C, alloy, bal Fe.
Cast· 32,000 TS, 190 Brin.
For cast iron castings; Tr. S. 2500

SUPERFINE MM.
M-900, C, alloy, bal Fe
Cast 44,000 TS, 180 Brin
For cast iron castings; Tr. S. 7000.

SUPERFINE MOLD.
M-900, C, alloy, bal Fe.
Cast 26,000 TS; 160 Brin.
For glass *mold castings; cast iron.*

SUPERFINE MX.
M-900; C, alloy, bal Fe.
Cast· 62,500 TS; 220 Brin.
For cast iron castings; Tr. S. 8620.

SUPERFINE XXX.
M-900; C, alloy, bal Fe.
Cast: 43,000 TS; 200 Brin.
For cast iron castings; Tr. S 8380.

SUPER HALLAMITE.
M-1202; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For hacksaw blades, saws, cutting tools; high speed steel, oil hardened

SUPER HARDTEM.
M-64; 0.43 C, 2.6 Ni, 1.35 Cr, 0.55 Mo, 0.18 V, bal Fe.
Annealed: 250 Brin.
Heat treated: 470 Brin.
For die blocks; oil hardened, shock resistant.

SUPER-HIGH SPEED.
U.S.; 0.75-0.90 C, 17-22 W, 4.5-6 Cr, 1-2.5 V, 0.75-1.5 Mo, 8-15 Co, bal Fe.
For high speed tools; high speed steel; has great red hardness.

SUPER HI-PHY KIRKSITE.
M-794; 4 Al; 3 Cu, 0.01 Mg, 0.007 Be, bal Zn. (max .005 Pb, .002 Sn, .002 Cd, .05 Fe)
Sand cast: 40,000 TS, 3.0 El; 34 impact; 109 Brin.

SUPER-HOLFOS W.W.
M-169; 88.3 Cu, 11.5 Sn, 0.2 P.
Cent cast. 45,000 TS; 27,000 YS; 8 El; 100 Brin.
Good wear and abrasion resistance.
For worm and helical gears, drive shafts, splined couplings.
BS 1400 PB2-C; BS 421; SAE 65.

SUPER HYDRA.
M-1411; 0.75 C, 18 W, 4.5 Cr, 1.2 V, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel.

SUPER HY-TUF
M-38; 0.32-0.43 C, 1.3 Mn, 2.3 Si, 1.4 Cr, 0.2 V, 0.35 Mo, bal Fe
Heat treated 294,000 TS; 241,000 YS; 10 El; 35 RA; 540 Brin.
For aircraft structures, landing gears, cylinders, oil hardened, high toughness.

SUPER HY-TUF HIGH CARBON
M-38; 0.47 C, 1.3 Mn, 2.4 Si, 1.1 Cr, 0.25 V, 0.4 Mo, bal Fe
Heat treated 325,000 TS; 24 El
For gears, shafts, machine tool parts; tough, shock resistant.

SUPER IMPACTO.
M-1636, M-435; 0.12 C, 0.5 Mn, 1.5 Cr, 3.25 Ni, bal Fe
Heat treated. 175,000 TS; 135,000 YS; 16 El; 59 RA, 341 Brin, 48 Izod.
For heavy duty gears, bearings, clutch dogs, broach holders, plastic molds, transmission shafts.
Tough and fatigue resistant.

SUPERIMPHY
M-104; 80 Ni, 20 Cr
For electrical resistances, heating elements; heat and corrosion resistant.

SUPER INCOMPARABLE.
M-1409, 0.8 C, 19-20 W, 4.6 Cr, 1.6 V, 5.5 Co, Mo, bal Fe.
For continuous cutting tools for cast iron; high speed steel

SUPER-INVAR.
M-118, 31 Ni, 5 Co, bal Fe.
For instruments; zero expansion.

SUPER INVINCIBLE 5% COBALT.
M-1406; 0.75 C, 18 W, 4 Cr, 1.5 V, 5 Co, bal Fe.
For tools, cutters, reamers, hobs, chasers; high speed steel.

SUPER INVINCIBLE ADVANCE.
M-1406; 0.75 C, 19 W, 4.25 Cr, 1.75 V, 10 Co, bal Fe.
For lathe and turning tools, drills, broaches; high speed steel.

SUPER INVINCIBLE TB.
M-1406; 0.75 C, 14 W, 4 Cr, 2 V, 5 Co, bal Fe.
For shear blades, tools, cutters, punches; high speed steel.

SUPERIOR.
U.S.; 19.5 Cr, 0.5 Fe, 2.0 Mn, bal Ni.
For resistance; resistance alloy.

SUPERIOR.
M-248; C, 76-84 Ni, 16-23 Cr.
For heat and corrosion resistant parts; heat and corrosion resistant.

SUPERIOR
M-901; 0.2 C, 18 Cr, 8 Ni, bal Fe.
For stainless steel parts; stainless.

SUPERIOR 1.
M-140; 2.05-2.2 C, 11.5-13.5 Cr, 0.55-0.65 V, bal Fe.
For tools, cutters. blanking dies, shear knives, ceramic tools; non-deforming.

SUPERIOR NO. 1.
M-1170; 3.00-3.25 T.C., 1.9-2.1 Si, 0.75-1.25 Ni, 0.3-0.6 Cr, 0.6-0.8 Mo, bal Fe.
Cast. 50,000-60,000 TS; 235-269 Brin.
For diesel pistons, cast iron.

SUPERIOR 2.
M-140; 1.45-1.6 C, 11-12 Cr, 0.15-0.25 V, 0.70-0.80 Mo, bal Fe.
For tools, cutters, coining and forming and blanking dies, oil hardening.

SUPERIOR NO 2.
M-1170, 3.00-3.25 T.C., 2.00-2.25 Si, 0.75 Ni, 0.3-0.5 Mo, 0.6-0.8 Mn, bal Fe.
Cast 40,000 TS; 196-235 Brin.
For machine tools; Tr. S. 3000; Tr D 0.30; cast iron

SUPERIOR 3
M 140, 1.5 C, 12 Cr, 0.87 V, 1.0 Mo, bal Fe.
For shear blades, blanking and forming dies; cold worked steel.

SUPERIOR NO. 3.
M-1170, 3.00-3.25 T.C., 2.00-2.25 Si, 0.7-0.9 Mn, 0.75-1.00 Cu, bal Fe
Cast. 38,000 TS, 187-217 Brin.
For machine tools; Tr. S 2900; Tr. D. 0.30.

SUPERIOR NO 4
M-1170; 3.0-3.3 T.C, 2.0-2.2 Si, 0.6-0.8 Mn, 0.3 Cr, bal Fe.
Cast· 35,000 TS, 187-217 Brin.
For elevator sheaves; Tr. S 2800, Tr. D 0.28

SUPERIOR 5.
M-140, 1.35 C, 0.30 Mn, 1.0 Si, 6.25 Cr, 6.0 V, 1.0 Mo, bal Fe
For cold steel extrusion dies, cold heading dies, form punches.
Tough and wear resistant. Oil or salt bath hardening.

SUPERIOR NO 5.
M-1170; 3.00-3.25 T.C., 2.1-2.4 Si, 0.6-0.8 Mn, 0.3-0.4 Mo, bal Fe.
Cast: 38,000 TS; 211-248 Brin.
For automotive manifold; cast iron.

SUPERIOR NO. 6.
M-1170; 3.0-3.3 T.C., 2.0-2.2 Si, 0.65-0.80 Mn, 0.3 Cr, 0.3 Mo, bal Fe.
Cast: 40,000 TS, 207-241 Brin.
For pressure castings; Tr. S. 3000; Tr. D. 0.30.

SUPERIOR NO. 7.
M-1170; 3.00-3.25 T.C., 2.0-2.2 Si, 0.6-0.9 Mn, 1.25-1.75 Ni, 0.4-0.6 Cr, 0.4-0.6 Mo, bal Fe.
Cast: 50,000-60,000 TS; 207-255 Brin.
For lathe beds, dies; suitable for flame hardening.

SUPERIOR NO. 8.
M-1170; 3.00-3.25 T.C., 1.8-2.0 Si, 0.7-0.9 Mn, 1 Ni, 0.25-0.35 Cr, 0.3-0.4 Mo, bal Fe.
Cast: 40,000-55,000 TS; 207-217 Brin.
For diesel heads; resists heat shock and wear.

SUPERIOR A NICKEL CHROME.
M-248; 80 Ni, 20 Cr.
For electrical resistances; non-magnetic.

SUPERIOR ARK.
M-261; 0.7 C, 19 W, 4 Cr, 2 V, bal Fe.
For high speed cutting tools; high speed steel.

SUPERIOR CHROME.
M-275; C, Cr, bal Fe.
For tools, dies; oil hardened.

SUPERIOR COPPER STEEL.
M-967; C, alloy, Cu, bal Fe.
For replacing solid copper; Cu plated corrosion resistant steel.

SUPERIOR OIL.
M-694; 0.92 C, 1.15 Mn, 0.5 Cr, 0.5 W, 0.2 V, bal Fe.
For tools, dies, cutters; nondeforming, oil hardening.

SUPERIOR OIL HARDENING.
M-261; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For press tools, dies, gauges, punches; oil hardened, nondeforming.

SUPERIOR SHAFTING.
M-435; 0.35 C, 1.5 Mn, 0.25 Si, 2 Cr, 0.1 max S, bal Fe.
For shafting; free cutting.

SUPERIOR TOOL.
M-38; C, 0.48 Cr, bal Fe.
For die casting dies; water hardened.

SUPERIOR TOOL STEEL.
M-81; 0.9 C, 0.4 Mn, 3 Si, bal Fe.
For chisels, trimming dies, punches, general tools; water hardening.

SUPERIOR X-3012.
M-945; 0.1 Zr, 2 W, bal Ni.
For vacuum tube cathodes; excellent electron emission characteristics.

SUPER JACKSBERG.
M-477; C, alloy, bal Fe.
For high speed tools and cutters; high speed steel.

SUPER KANTHAL.
M-1150; Mo-disilicide.
For heating elements; high oxidation resistance to 3000°F.

SUPER KINITE.
M-345; 1.5 C, 12.7 Cr, 0.85 Mo, 0.65 V, 0.16 Ni, 3.5 Co, bal Fe.
For tools, dies, cutting tools; air hardening; abrasion resistant.

SUPERKORE BB.
M-604; 0.25 max C, 0.55 Mn, 1.8 Ni, 0.25 Mo, 0.005 min B, bal Fe.
Heat treated: 190,000 TS; 155,000 YS; 13 El; 50 RA; 370 Brin.
For gears, pinions, shafts; case hardening steel.

SUPER-KUT.
M-1067; 0.7 C, 4 Cr, 18 W, 0.5 Mo, 5 Cr, 1 V, bal Fe.
For tools, cutters, broaches, chasers; high speed steel.

SUPERLA.
M-336; 1.3 C, V, bal Fe.
For lathe and planer tools, reamers, taps, drills; Type W2; water hardened.

SUPER LA-LED.
M-669; 0.13 max C, 0.85-1.35 Mn, 0.15-0.35 Pb, 0.5 S, bal Fe.
Cold Drawn: 70,000 TS; 60,000 YS; 12 El; 150 Brin.
For screw machine products, bolts, fasteners, shafts. Free-machining.

SUPER LEDA.
M-56; 0.7 C, Cr, W, V, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

SUPER LION.
M-1415; 0.75 C, 19 W, 4.5 Cr. 1.25 V, 10 Co, 0.75 Mo, bal Fe.
For lathe and planer tools, drills, reamers; high speed steel.

SUPER LION EXTRA.
M-1415; 0.75 C, 20 W, 4 Cr, 1 V, 10 Co, 0.75 Mo, bal Fe.
For lathe and planer tools, hobs, drills, reamers; high speed steel.

SUPER LION SPECIAL.
M-1415; 0.80 C, 19 W, 4.5 Cr, 1.25 V, 15 Co, 0.75 Mo, bal Fe.
For lathe and planer tools, drills, reamers; high speed steel

SUPER LMW.
M-1; 0.7 C, 4 Cr, 2 V, 8 Mo, 8 Co, bal Fe.
For tools, cutters, milling, lathe and planer tools; high speed steel.

SUPER LMW SPECIAL.
M-1; 0.90 C, 3.75 Cr, 2.0 V, 1.65 W, 8.7 Mo, 8.25 Co, bal Fe.
High speed steel for cutting tools, molybdenum-cobalt type; AISI M34.

SUPER LMX EXTRA.
M-1; 0.90 C, 3.75 Cr, 1.15 V, 1.65 W, 9.5 Mo, 8.25 Co, bal Fe.
High speed steel for cutting tools, molybdenum-cobalt type; AISI M33.

SUPER LO
M-1243.
For solder; M.P. 220-302°F.

SUPERLOY.
M-136, 3.2 C, 1.4 Si, 0.8 Mn, bal Fe.
For rolls; cast iron.

SUPERLOY.
M-507; 30 Cr, 8 Mo, 8 Co, 0.05 B, 5 W, 0.2 C, bal Fe.
Welded: 200,000 TS, 1000 Brin.
For hard facing electrodes; wear resistant, bond composition.

SUPER-LOY.
M-1085; 0.2 C, bal Fe.
For screws, filter cloth.

SUPERLOY.
M-1102; Cu alloy.
For resistance and spot welding electrodes.

SUPERLOY 30.
M-246; 0.25-0.35 C, 1.2-1.3 Mn, 0.75 max Si, bal Fe.
Annealed: 60,000 TS; 30,000 YS; 24 El; 35 RA; 150 Brin.
For castings, gears, shafts; water hardening.

SUPERLOY 42.
M-246; 0.25-0.35 C, 1.1-1.5 Mn, 0.75 max Si, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 17 El; 25 RA; 175 Brin.
For castings, gears, shafts; water hardening.

SUPERLOY 53.
M-246; 0.30-0.40 C, 0.7-0.9 Mn, 0.3-0.5 Si, 0.6-0.7 Cr, 1.25-1.75 Ni, 0.25-0.35 Mo, bal Fe.
Annealed: 85,000 TS; 50,000 YS; 20 El; 30 RA; 190 Brin.
For castings, gears, shafts, crankshafts; tough, shock resistant.

SUPERLOY 64.
M-246; 0.35-0.45 C, 1.35-1.65 Mn, 0.3-5 Si, 0.7-0.9 Cr, 1.25-1.75 Ni, 0.3-0.4 Mo, bal Fe.
Annealed: 120,000 TS; 90,000 YS; 10 El; 15 RA; 260 Brin.
For castings, gears, shafts, crankshafts; tough, shock resistant.

SUPERLOY 530.
M-246; C, alloy, bal Fe.
For machine tool parts; high strength and shock resistant.

SUPERMAGALUMA.
M-622; 5.4 Mg, 0.15 Mn, bal Al.
Soft: 36,000-42,500 TS; 14,500-21,000 YS; 25-20 El.
Hard. 50,000-65,000 TS; 42,500-58,000 YS, 6-4 El.
For light alloy parts, heat treatable, corrosion resistant.

SUPERMAL.
M-170, 1.7 T.C., 0.3 Mn, 1.2 Si, bal Fe.
Heat treated: 75,000 TS; 55,000 YS; 8 El; 187 Brin.
For chains, buckets, conveyor equipment; pearlitic, wear resistant; malleable iron.

SUPER-M-ALLOY.
United States, 79 Ni, bal Mo, Fe, Mn.
For permanent magnet; high permeability.

SUPERMALLOY.
M-670; 15.7 Fe, 5 Mo, 0.3 Mn, bal Ni.
For transformers, communication and radar equipment, magnetically soft. (Fabricated parts only)

SUPERMALOY
M-205, M-1, 79 Ni, 5 Mo, 15.7 Fe, 0.3 Mn.
For communication transformers, magnets; high permeability.

SUPER MANGANESE BRONZE.
M-129, 69 Cu, 20 Zn, 6.5 Al, 2.5 Fe, 2 Mn.
Cast: 110,000 TS, 200 Brin.
For propeller blades, marine parts; corrosion resistant.

SUPERMENDUR.
M-118, M-22, M-38; 49 Fe, 49 Co, 2 V
For amplifiers, pulse and power transformers; high permeability. Soft magnet.

SUPER MENDUR.
M-670, 49 Fe, 49 Co, 2 V.
Soft magnetic material, high permeability. (fabricated parts only)

SUPERMETAL.
M-635; coated low carbon steel.
For oven linings; corrosion and heat resistant.

SUPER Mo-CHIP HIGH SPEED.
M-57; 0.7 C, 4 Cr, 8 Co, 1.5 V, 8 Mo, bal Fe.
For tools, cutters, reamers; high speed steel.

SUPER MOTUNG.
M-114; 0.8 C, 3.75 Cr, 5 Co, 1.25 V, 1.5 W, 8.5 Mo, bal Fe.
For cutting tools, form tools, taps, broaches; high speed steel.

SUPER MOTUNG 33.
M-114; 0.88 C, 9.5 Mo, 1.75 W, 4.0 Cr, 1.25 V, 8.25 Co, bal Fe.
Hardened: 64-67 Rock C.
For cutters, drills, taps, end mills, lathe tools, milling cutters, chasers. Good red-hardness and wear resistance.
AISI-M33 High-speed steel.

SUPER MOTUNG 34.
M-114; 0.90 C, 8.5 Mo, 1.75 W, 4.0 Cr, 2.0 V, 8.25 Co, bal Fe.
Hardened: 64-67 Rock C.
For cutters, drills, taps, chasers, lathe tools, milling cutters, form tools.
Good cutting properties and red-hardness.
AISI-M34 High speed steel.

SUPERMU 10.
M-1089; 50 Ni, 50 Fe.
Annealed: 58,000 TS; 19,000 YS; 27 El. (magnetic anneal).
For electric motor laminations, cores for audio and instrument transformers, magnetic shields.
High permeability. Soft magnet.

SUPERMUMETAL.
M-108; 14 Fe, 5 Cu, 4 Mo, bal Ni.
For electrical and magnetic equipment.
Vacuum melted. High magnetic permeability and low electrical losses.

SUPER-MUMETAL 50.
M-108; 77 Ni, bal Fe
Rolled: 132,000 TS; 290 Brin.
Annealed: 78,000 TS; 61,000 YS; 110 Brin.
For electronic and electrical equipment, motors; soft magnet, high permeability.

SUPER NERVA.
M-807, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, cutters; high speed steel.

SUPER NICKEL-701.
M-8; 70 Cu, 30 Ni.
Hard: 70,000 TS, 60,000 YS; 10 El.
For condenser tubes, corrosion resisting.

SUPERNICKIMPHY.
M-104; 0.02 C, 0.10 Mn, 0.02 Cu, bal Ni.
For radio tube cathodes; heat and corrosion resistant.

SUPER NILVAR.
M-44; 31 Ni, 7 Co, bal Fe.
For instruments; zero expansion

SUPER OILITE.
M-211, 18-22 Cu, bal Fe.
Sintered. 22,000 TS; 5.8-6.2 density.
Oilite bearing material.
ASTM B439-67 Grade 4; SAE 863.

SUPER OILITE 2-1.
M-211; 1.75-3.0 Cu, 0.5-1.0 C, bal Fe.
Sintered: 50,000 TS; 6.1-6.4 Density; 15,000 fatigue strength.
ASTM B426-65, Type 11 Gr 1 Class C; SAE 864B.

SUPER OILITE 5-1.
M-211; 4.0-6.0 Cu, 0.5-1.0 C, bal Fe.
Sintered: 50,000 TS, 6.1-6.4 density; 15,000 fatigue strength.
ASTM B426-65 Type 11 Gr 2; Class C; SAE 865B.

SUPER OILITE 9.
M-211; 7.0-11.0 Cu, 86.5 min Fe, 0.3 max C.
Sintered: 29,500-34,000 TS; 5.8-6.2 density; 17,000 Shear; 13,000 fatigue.
ASTM B439-67 Gr 3; SAE 862.

SUPER OILITE 9-1.
M-211; 6.5-7.5 Cu, 89.0 min Fe, 0.6-1.0 C.
Sintered: 40,000-50,000 TS; 5.8-6.2 density.
ASTM B426-65 Gr 3 Cl.C; SAE 866 A;
PMPMA FC-0710-N.

SUPER OILITE 16.
M-211; 18-22 Cu, 0.6-1.0 C, bal Fe.
Sintered: 40,000 TS; 5.8-6.2 density;
Oilite bearing material, self lubricating bearings.

SUPER PANTHER.
M-1; 0.8 C, 19 W, 4 Cr, 2 V, 8 Co, 0.7 Mo, bal Fe.
For lathe and planer tools, reamers, broaches, form cutters; high speed steel; Type T5.

SUPER PERMALLOY "C."
M-269; 78 Ni, 13 Fe, 4 Mo, 5 Cu.
For telecommunications, magnetic amplifiers, wide band transformers, current transformers, computers.
High initial permeability with low losses.

SUPER PURITY.
M-28; 99.99 min Al.
O-temper: 8500 TS.
½ H-temper: 11,000 TS.
H-temper: 14,500 TS.
Extruded: 8000 TS.
For roofing flashings, reflectors; high corrosion resistance.

SUPER PYRONEAL.
M-64; 0.42-0.47 C, 0.3-0.6 Mn, 0.5-0.7 Si, 4.1-4.5 Ni, 1.25-1.65 Cr, 0.7-0.8 Mo, 0.12-0.16 V, bal Fe.
For press and hammer dies, upsetter and insert dies.
Oil hardening. High compressive strength.
Resists softening at high working temperatures.

SUPER PYROTEM.
M-64; 0.42-0.47 C, 0.30-0.60 Mn, 0.5-0.7 Si, 4.1-4.5 Ni, 1.25-1.65 Cr, 0.7-0.8 Mo, 0.12-0.16 V, bal Fe.
For press and hammer dies, upsetter and insert dies.
Oil hardening; High compressive strength.
Resists softening at high working temperatures.

SUPER RADIOMETAL.
M-108; 50 Ni, 50 Fe.
Annealed: 58,000 TS; 19,000 YS; 27 El. (magnetic anneal).
For electrical and magnetic equipment, core material for audio and instrument transformers, magnetic shields.
Vacuum melted. Soft magnet. High magnetic permeability and low losses.

SUPER RAPID.
M-1405; 0.8 C, 4 Cr, 18 W, 1.2 V, bal Fe.
For lathe and planer tools, broaches, reamers, drills, high speed steel.

SUPER RAPID EXTRA.
M-27; 0.72 C, 4.1 Cr, 18.5 W, 1.2 V, bal Fe.
For high speed cutters, reamers, broaches, drills; high speed steel.

SUPER-RAPID EXTRA.
M-363; 0.7 C, 18 W, Cr, 1 V, bal Fe.
For punches, dies, cutting tools; high speed steel.

SUPER RAPID EXTRA.
M-1182; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe. For cutters, taps, broaches, drills; high speed steel.

SUPER RAPID EXTRA 214A.
M-27; 0.7 C, 9.5 W, 3.7 Cr, 2.8 V, 2.8 Co, bal Fe.
For tools, dies, cutters; high speed steel.

SUPER RAPID EXTRA 214N.
M-27; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, drills; high speed steel.

SUPER RAPID EXTRA 500.
M-27; 0.8 C, 4 Cr, 17.5 W, 2 V, 1 Mo, 0.5 Mn, 5 Co, bal Fe.
For high speed cutters, drills, broaches, hobs; high speed steel.

SUPER RAPID EXTRA 500N.
M-27; 0.85 C, 4 Cr, 13 W, 1 Mo, 2.5 V, 5 Co, bal Fe.
For cutting tools; high speed seteel.

SUPER RAPID EXTRA A.
M-27; 0.65 C, 8.5 W, 3.8 Cr, 1.8 V, bal Fe.
For tools, dies, cutters; high speed steel.

SUPER RAPID EXTRA HVA.
M-27; 0.9 C, 9.5 W, 3.8 Cr, 2.5 V, bal Fe.
For tools, dies, cutters; high speed steel.

SUPER RAPID EXTRA HVN.
M-27; 0.86 C, 4 Cr, 0.8 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, reamers; high speed steel.

SUPER RAPID EXTRA MO.
M-27; 0.85 C, 4.3 Cr, 6.4 W, 5.0 Mo, 2 V, bal Fe.
For lathe and planer tools, drills, reamers; high speed steel.

SUPER RAPID EXTRA N.
M-27; 0.82 C, 4 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, milling cutters, drills; high speed steel

SUPER RAPID EXTRA V.
M-27; 0.7 C, 18 W, 4 Cr, 1.7 V, Mo, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel.

SUPER RUSTFREE SR STEEL.
M-1161; Cr, Ni, Mo, bal Fe.
Cold worked: 90,000-105,000 TS; 75,000-100,000 YS; 50-4 El, 65-28 RA; 156-410 Brin.
Annealed 95,300 TS; 75,000 YS.
For pickling equipment, turbine compressors, gasoline cracking plants; corrosion resistant, "Super Rustfree Steels;" austenitic.

SUPER-SAFETY.
M-449, C, alloy, bal Fe.
For steel stamps.

SUPER SAMSON see
CARPENTER MEL-TROL SUPER SAMSON.

SUPER-SHOCK.
M-750, 0.5 C, 0.75 Si, 1.15 Cr, 2.5 W, 0.2 V, bal Fe.
For cold battering and chipping tools, caulking and beading tools; shock resistant, wear resistant.

SUPER SILICON CAST IRON NO. 9.
M-243; 3.5 C, 2.5 Si, bal Fe.
For welding rods for cast iron; cast iron.

SUPER SIRIUS.
M-1303; C, Ni, Cr, W, Co, Ti, bal Fe.
For high temperature applications; high heat, creep and oxidation resistance.

SUPER SIRIUS HT.
M-1303, C, Ni, Cr, W, Ti, bal Fe.
For gas turbine components; heat and creep resistant.

SUPER SPECIAL EXPRESS.
M-1408; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, hobs, reamers, taps; high speed steel.

SUPER SQUAREMU 79.
M-1089; Ni-Fe.
For magnetic and electrical equipment; magnetic alloy.

SUPER STAR-Mo M2-5.
M-57; 0.85 C, 6 W, 4.1 Cr, 2 V, 5 Mo, 5 Co, bal Fe.
For boring tools, broaches, hobs, milling cutters; high speed steel.

SUPER STAR ZENITH.
M-32; 0.8 C, 4 Cr, 2 V, 18 W, bal Fe.
For cutters, hobs, drills, taps, reamers; high speed steel; Type T2.

SUPERSTON 40.
M-452, M-13, M-539; 8 Al, 3 Fe, 12 Mn, 2 Ni, bal Cu.
Sand cast: 98,000 TS; 48,000 YS; 26 El; 28 RA; 185 Brin.
Centrifugal cast: 105,000 TS; 50,000 YS; 30 El; 30 RA; 190 Brin.
Heat treated: 125,000 TS; 75,000 YS; 12 El; 255 Brin.
For valves, pumps, propellers, gears, slides; corrosion and wear resistant

SUPERSTON 60
M-452, M-13, M-539; 11-14 Mn, 8.5-9.0 Al, 2-4 Fe, 1.5-4.5 Ni, 1.0 max Sn, 0.02 max Pb, bal Cu.
Sand Cast· 107,500 TS; 56,000 YS; 10 El.
Chill Cast: 127,000 TS; 83,000 YS; 5.5 El.
For marine propellers, shafts, hardware.
High strength, tough, corrosion resistant.

SUPERSTON L-189.
M-452; 8-12 Al, 4-6 Ni, 4-6 Fe, bal Cu.
Cast 90,000 TS; 45,000 YS; 15-20 El; 180 Brin.
For engine parts; Al bronze, corrosion resistant.

SUPER STRENGTH 100.
M-1428, 0 15 C, 0.50 Mn, 0.35 Si, 1.65 Cr, 0.25 Cu, 0.50 Mo, 0.002 B, 0.07 Ti, bal Fe
For mine cars, chutes, bus and trailer bodies, structures, derricks
Low-alloy high-strength structural steel. Shock resistant.

SUPER STRENGTH MALLEABLE.
M-171; 3 0 C, 1 2 Si, 0 7 Mn, bal Fe.
Cast 57,000 TS; 38,000 YS, 18 El; 120 Brin
For machinery parts; malleable cast iron.

SUPERTEMP.
M 24, 0 35 C, 0 8 Mn, 0.45 Cr, 1 W, 0.6 Mo, bal Fe
Heat treated· 140,000 TS; 120,000 YS; 18 El; 50 RA; 321 Brin.
At 1000°F: 110,000 TS, 90,000 YS, 20 El, 70 RA; 241 Brin
For bolts, studs, forgings; creep resistant, oil hardened.

SUPER TERRIFIC.
M-1113; C, 18 W, 5 Co, 4 Cr, 1.3 V, bal Fe
For tools, dies, cutters; high speed steel.

SUPERTHERM
M-47; 35 Ni, 26 Cr, 15 Co, 5 W, 1 6 Si, 0.5 C, bal Fe.
Cast: 75,000 TS; 48,000 YS, 5 El; 215 Brin.
For furnace parts, cement kilns, smelting and calcining equipment.
High heat resistance to 2300°F. Good hot ductility.

SUPER TIGER.
M-24; 0.8 C, 18.5 W, 4 5 Cr, 0.8 Mo, 1.7 V, 7.5 Co, bal Fe.
For tools, cutters, drills, high speed steel.

SUPER-TM-2.
M-376; 0.38-0.43 C, 1.85-2.25 Ni, 1.0-1.3 Cr, 0.35-0 55 Mo, bal Fe.
Heat treated: 271,000-280,000 TS; 221,000-235,000 YS; 10.5-7.0 El; 38.5-24.5 RA; 510-530 Brin.
For aircraft structural parts, landing gears, impeller shafts; oil hardened, shock resistant.

SUPERTOUGH B.20.
M-50, M-1414; 0.20 C, 1.50 Mn, bal Fe.
Oil Harden: 89,000-112,000 TS; 60,000-92,000 YS; 21-26 El; 59 RA; 94-118 Izod.
For welded structures, crankshafts, steering levers, shafts, spindles.
Oil or water hardening.

SUPERTOUGH B.25.
M-50, M-1414; 0.25 C, 1.50 Mn, bal Fe.
Oil Harden: 89,000-112,000 TS; 60,000-92,000 YS; 21-26 El; 59 RA; 94-118 Izod.
For welded structures, crankshafts, steering levers, shafting, spindles.
Oil or water hardening.

SUPERTOUGH B.35.
M-50, M-1414; 0.35 C, 1.5 Mn, bal Fe.
Oil Harden: 96,000-120,000 TS; 70,000-88,000 YS; 22-29 El; 54-68 RA; 60-92 Izod.
For axles, shafts, crankshafts, connecting rods.
Oil or water hardening.

SUPERTOUGH C.20.
M-50, M-1414; 0.18 C, 1.6 Mn, 0.60 Ni, 0.25 Mo, bal Fe.
Oil Harden: 97,000-103,000 TS; 78,000-88,000 YS; 22-30 El; 61-67 RA; 70-109 Izod.
For welded structures, axles, railway equipment, dredging and earth moving equipment.
Oil or water hardening.

SUPERTOUGH C.40
M-50, M-1414; 0.35 C, 1.60 Mn, 0.28 Mo, bal Fe.
Oil Harden· 106,000-146,000 TS; 79,000-125,000 YS; 18-28 El; 52-66 RA, 45-100 Izod.
For crankshafts, bolts, axles, shafts, studs, levers, connecting rods
Tough shock resistant. Oil hardening.

SUPERTOUGH C.40M.
M-50, M-1414, 0 35 C, 1.6 Mn, 0.45 Mo, bal Fe.
Oil Harden 116,000-153,000 TS; 90,000-135,000 YS; 19-23 El; 50-61 RA; 49-74 Izod.
For crankshafts, connecting rods, axles, levers, bolts, fasteners.
Tough, impact resistant, oil harden.

SUPERTOUGH D.
M-1414, 0.40 C, 1 35 Mn, 0.75 Ni, 0.45 Cr, 0.20 Mo, bal Fe.
Oil Harden 112,000-153,000 TS; 88,000-140,000 YS; 20-27 El; 52-64 RA; 42-85 Izod.
For bolts and studs, crankshafts, gears, boring bars, collets.
Oil hardening, shock resistant.

SUPER TRICENT.
M-24; 0.55 C, 3.6 Ni, 0.9 Cr, 0 5 Mo, 0.8 Mn, 2.1 Si, bal Fe.
Heat treated: 342,000 TS; 240,000 YS; 7 El; 555 Brin.
For aircraft structures, landing gears; tough, shock resistant.

SUPER TUFF.
M-1705; 0.5 C, 0 7 Mn, 3.25 Cr, 1.4 Mo, bal Fe.
Shock resisting tool steel; air or oil hardening. AISI S7.

SUPER UGIMAX.
M-1120; 14 Ni, 8 Al, 24-35 Co, 3 Cu, bal Fe.
13400 Bi, 800 Hc, 8 BH max.
For magnets in loudspeakers, microphones, measuring instruments.
Permanent magnet, high permeability.

SUPER VAN DREADNOUGHT.
M-38, M-362; 0.8 C, 18 W, 2 V, 4 Cr, 0.6 Mo, bal Fe.
For lathe and planer tools, reamers, hobs, drills, taps; Type T2; high speed steel.

SUPER VNCA.
M-50, M-1414; 0.30 C, 0.60 Mn, 3.0 Ni, 0.75 Cr, 0.25 Mo, bal Fe.
Oil Harden: 124,000-140,000 TS; 103,000-132,000 YS; 20-24 El; 59-66 RA; 62-100 Izod.
For shafts, spindles, crankshafts, axles, bolts, connecting rods.
Oil hardening, tough, shock resistant.

SUPERWELD NO. 55.
M-607; 0.2 C, bal Fe.
Deposited: 65,000 TS; 45,000 YS; 30 El.
For welding electrode for heavy plate welding.

SUPERWELD NO. 66.
M-607; C, bal Fe.
Deposited: 60,000-70,000 TS; 45,000-55,000 YS; 30-25 El.
For welding electrode for light and heavy gauge material.

SUPERWELD NO. 77.
M-607; C, bal Fe.
Deposited: 70,000 TS; 50,000 YS; 25-30 El.
For welding electrode for light and heavy gauge material; high speed welding.

SUPER WH MEEHANITE
M-82; 3 C, 2 Si, bal Fe.
For ball mill liners, muller tires; wear resisting cast iron.

SUPER X.
M-1243.
For solder for Nichrome and stainless steel.

SUPER X LEADED NICKEL SILVER 8%.
M-279; 8 Ni, 28 Zn, 1.5 Pb, bal Cu.
Hard: 85,000 TS; 2 El.
For key and cylinder blocks, lock parts; nickel silver, corrosion resistant.

SUPER X NICKEL SILVER 12 ALLOY NO. 176.
M-279; 12 Ni, 18 Zn, bal Cu.
Hard: 79,000 TS; 4 El.
Soft: 52,000 TS; 50 El.
For coins, emblems, hardware, jewelry; corrosion resistant, good cold workability.

SUPER X NICKEL SILVER 18 ALLOY 163.
M-279; 18 Ni, 10 Zn, bal Cu.
Hard: 79,000 TS; 4 El.
Soft: 51,000 TS; 45 El.
For deep drawn shells and vessels, vases, candlestick holders; deep drawing, corrosion resistant.

SUPER X NICKEL SILVER 18 ALLOY 164.
M-279; 18 Ni, 17 Zn, bal Cu.
Hard: 85,000 TS; 75,000 YS; 3 El.
Soft: 58,000 TS; 28,000 YS; 40 El.
For coins, jewelry, hardware; corrosion resistant, good cold workability.

SUPER X NICKEL SILVER 18 ALLOY 168.
M-279; 18 Ni, 27 Zn, bal Cu
Hard: 100,000 TS; 85,000 YS; 3 El.
Soft: 60,000 TS; 27,000 YS; 40 El.
For springs, switch blades, washers, radio tubes; corrosion resistant, good spring qualities.

SUPER X PHOSPHOR BRONZE A ALLOY NO. 106.
M-279; 5 Sn, 0.25 P, bal Cu.
Hard: 81,000 TS; 75,000 YS; 10 El.
Soft: 47,000 TS; 19,000 YS; 64 El.
For springs, contacts, diaphragms, electrical connectors; good spring properties.

SUPER X PHOSPHOR BRONZE GR. C ALLOY 113.
M-279; 8 Sn, 0.05-0.35 P, bal Cu.
Hard: 93,000 TS; 72,000 YS; 40 El.
Soft: 55,000 TS; 21,000 YS; 70 El.
For springs, contacts, diaphragms, fuse clips; fatigue and wear resistant.

SUPER-X-PHOSPHOR BRONZE GRADE D.
M-279; 90 Cu, 10 Sn, P.
Hard: 103,000 TS; 13 El.
Soft: 65,000 TS; 60 El.
For springs, diaphragms; tough.

SUPER X PHOSPHOR BRONZE GR. E ALLOY 101.
M-279; 3.5 Sn, 0.05-0.35 P, bal Cu.
Hard: 65,000 TS; 50,000 YS; 8 El.
Soft: 40,000 TS; 14,000 YS; 48 El.
For fuse clips, springs, clutch plates; corrosion and wear resistant.

SUPER-Y.
M-902; 3.3 C, 1.5 Ni, 0.5 Cr, bal Fe.
Annealed: 60,000 TS; 44,000 YS; 18 El; 143 Brin.
For castings; malleable iron.

SUPER ZORITE.
M-184; 37-40 Ni, 17-21 Cr, bal Fe.
For beams, rails, trays, furnace parts; heat resisting to 1800°F.

SUPRA.
English, 20 Si, 5 Cu, 2 Mn, 0.7 Fe, bal Al.
Cast: 21,000 TS; 0.5 El; 100-130 Brin.
For pistons; light weight.

SUPRAKOLBENMETALL.
20 Si, 5 Cu, 2 Mn, 0.7 Fe, bal Al.
For light alloy parts, pistons

SUPRALOY
M-964; C, alloy, bal Fe.
For hard surfacing electrodes; wear resistant.

SUPRALOY.
M-1128; C, B, bal Fe.
640 Brin.
For hard surfacing electrodes; for metal to metal wear.

SUPRA REKORD I.
M-1307; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, drills, reamers, taps, high speed steel.

SUPRA REKORD II.
M-1307, 0.79 C, 4.7 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

SUPRA RECORD III.
M-1307; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

SUPRA VENIVICI
M-1307; 0 86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, milling cutters, hobs; high speed steel.

SUPRA VENIVICI EXTRA.
M-1307; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel.

SUPREMUS.
M-69; 0.73 C, 18 W, 4 Cr, 1.1 V, bal Fe.
For high speed tools, cutters, planer tools, broaches, drills; high speed steel.

SUPREMUS EXTRA.
M-69; 0.85 C, 0.7 Mo, 18.5 W, 4 Cr, 2 V, bal Fe.
For cutters, drills, lathe centers, broaches, reamers; high speed steel; Type T1.

SUPREMUS T-1.
M-69; 0.73 C, 4 Cr, 18 W, 1.1 V, 0.6 max Mo, bal Fe.
For reamers, drills, lathe and planer tools; high speed steel.

SUPRIMPACTO.
M-435; 0.12 C, 5 Mn, 1.5 Cr, 3.75 Ni, bal Fe.
For plastic mold dies, carburized parts; machine cut cavities, case hardened.

SU-PYR-LOY.
M-1432; C, alloy, bal Fe.
Rolled: 153,000 TS; 120,000 YS; 241 Brin.
Heat treated: 264,000 TS; 210,000 YS; 530 Brin.
For shear blades, chisels, punches; water hardened, non-tempering.

SURA 13-CKN-30.
M-1189; 0.12 C, 0.75 Cr, 3 Ni, bal Fe.
For gears, shafts, camshafts; case hardened, shock resistant.

SURA 18-CKN-30.
M-1189; 0.18 C, 0.75 Cr, 3 Ni, bal Fe.
For gears, shafts; case hardened, shock resistant.

SURA 25-CKM-10.
M-1189; 0.25 C, 1.05 Cr, 0.2 Mo, bal Fe.
For machinery parts; water hardening.

SURA 30-CKMN-32.
M-1189, 0.30 C, 1.05 Cr, 3.25 Ni, 0.25 Mo, bal Fe.
For gears, shafts; oil hardened, shock resistant.

SURA 30-CMK-27.
M-1189, 0.30 C, 2.7 Cr, 0.5 Mo, bal Fe.
For machinery parts; oil hardened.

SURA 35-CKN-25.
M-1189; 0.35 C, 1.15 Cr, 2.6 Ni, bal Fe
For shafts, gears, pinions; oil hardened, tough.

SURA 40-CKN-12.
M-1189, 0.4 C, 0.8 Mn, 0.8 Cr, 1.25 Ni, bal Fe.
For shafts, gears, pinions; oil hardened, tough.

SURA 40-CMK-10.
M-1189, 0.40 C, 1.1 Cr, 0.25 Mo, bal Fe.
For machinery parts; oil hardened

SURA 50-CG-12.
M-1189; 0.5 C, 1.2 Mn, bal Fe
For gears, shafts, machinery parts; oil hardened, tough.

SURA 50-CK-5.
M-1189; 0.5 C, 0.5 Cr, bal Fe.
For shafts; water hardening.

SURA-A30.
M-1189; 4.2 Si, bal Fe.
For transformers; silicon steel.

SURA-AT26.
M-1189; 4.2 Si, bal Fe.
For transformers; silicon steel.

SURA-C33.
M-1189; 3 5 Si, bal Fe.
For transformers; silicon steel.

SURA-C37.
M-1189; 3.5 Si, bal Fe.
For transformers, large electrical machines; silicon steel.

SURA-C43.
M-1189; 2.5 Si, bal Fe.
For transformers, electrical machines; silicon steel.

SURA-C44.
M-1189; 2.1 Si, bal Fe.
For transformers, electrical machines; silicon steel.

SURA-CT28.
M-1189; 3.5 Si, bal Fe.
For transformers; silicon steel.

SURA-CT30.
M-1189; 3.5 Si, bal Fe.
For machines and transformers for high frequencies; silicon steel.

SURA-D57.
M-1189; 1.7 Si, bal Fe.
For D.C. motors subject to heavy loads; silicon steel.

SURA-D59.
M-1189; 1.7 Si, bal Fe.
For electrical machines and transformers; silicon steel.

SURA-D60.
M-1189; 1.0 Si, bal Fe.
For transformers, low frequency machines; silicon steel laminations.

SURA-D66.
M-1189; 1.3 Si, bal Fe.
For small electrical motors; silicon steel laminations.

SURA-D68.
M-1189; 1.0 Si, bal Fe.
For small electric motors; silicon steel laminations.

SURA-D70
M-1189; 1.0 Si, bal Fe.
For electrical machines; silicon steel.

SURA-D80.
M-1189; 0 5 Si, bal Fe.
For armatures, motors, generators; silicon steel laminations.

SURAHAMMAR 15-CMK-6.
M-1189; 0.15 C, 0.8 Cr, 0.6 Mo, bal Fe.
For machinery parts, gears; case hardened.

SUREWELD NO. 450.
M-844; C, alloy, bal Fe.
For welding electrodes; coated, wear and shock resisting

SUREWELD NO. 520.
M-844; C, 12-14 Mn, bal Fe.
600 Brin.
For Mn steel welding electrodes; hard surfacing.

SUREWELD NO. 550.
M-844; C, alloy, bal Fe.
600-675 Brin.
For hard surfacing electrodes; abrasion and wear resisting.

SUREWELD NO. 650.
M-844; C, alloy, bal Fe.
700-800 Brin. For hard-surfacing electrodes; severe abrasion resisting.

SUREWELD A.
M-844; 0.07 C, bal Fe.
Welded: 67,000 TS; 53,000 YS; 30 El.
For welding electrodes; coated.

SUREWELD B.
M-844; 0.06 C, bal Fe.
Welded: 70,000 TS; 55,000 YS; 30 El.
For welding electrodes; coated.

SUREWELD C.
M-844; C, bal Fe.
Welded: 67,000 TS; 25 El.
For welding electrodes; coated.

SUREWELD F.
M-844; 0.09 C, bal Fe.
Welded: 67,000 TS; 55,000 YS; 27 El; 35 RA.
For welding electrodes; coated.

SUREWELD H.
M-844; C, 12-15 alloy, bal Fe.
For hard facing electrodes; wear resistant.

SUREWELD H1.
M-844; C, 15 alloy, bal Fe.
Welded: 550-650 Brin.
For hard facing electrodes; impact resistance.

SUREWELD H2.
M-844; C, 18 alloy, bal Fe.
Welded: 500-575 Brin.
For hard facing electrodes; wear resistant.

SUREWELD MLY.
M-844; 0.06 C, bal Fe.
Welded: 80,000 TS; 62,000 YS; 25 El
For welding electrodes; coated.

SUREWELD N.
M-844; 0.9 C, bal Fe.
Welded: 75,000 TS; 55,000 YS; 25 El; 20 RA.
For welding electrodes; coated.

SUREWELD TD.
M-844; C, 2 alloy, bal Fe.
Welded: 600-780 Brin.
For hard facing electrodes for cutting tools and dies; wear resistant.

SURF-HARD.
M-1636; 0.40 C, 0.60 Mn, 1.6 Cr, 0.35 Mo, 1.05 Al, bal Fe.
Annealed: 87,000 TS; 54,000 YS; 20 El; 179 Brin.
For ejector pins for plastic molds, bushings, sleeves, shafts, gears.
Nitriding steel, wear and abrasion resistant, nitrided case.

SURGALOY.
M-1019; 0.20 max C, 18 Cr, 8 Ni, bal Fe.
For sutures for surgery; stainless.

SUSINI.
Japan; 1.5-4.5 Cu, 1-8 Mn, 0.5-1.5 Zn, bal Al.
For light alloy parts; non-hardenable.

SU-VENEER.
M-901; clad steel.
For corrosion resistant stampings and drawn parts; corrosion resistant.

SUWEFA 12M.
M-1307; 1.2 C, 0.4 Si, 12.5 Mn, bal Fe.
For wear plates, rails, crushers, rollers; wear and abrasion resistant, work hardens.

SUWEFA A12.
M-1307; 0.10 max C, 12.5 Cr, 12 Ni, bal Fe.
For chemical plant equipment, valves; heat and corrosion resistant.

SUWEFA A18.
M-1327; 0.15 max C, 18 Cr, 9 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 302; stainless, austenitic.

SUWEFA A18Z.
M-1327; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, tanks; Type 321; stainless, austenitic.

SUWEFA A18ZN.
M-1327; 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
For welded chemical plant equipment, tanks; vessels; Type 347; stainless, austenitic.

SUWEFA A182Z.
M-1307; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo. Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, tanks, vessels; Type 321; stainless, austenitic.

SUWEFA A182ZN.
M-1307; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Cb = 8 × C, bal Fe.
Annealed. 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
For welded chemical plant equipment, tanks, vessels; Type 347; stainless, austenitic.

SUWEFA A2182Z
M-1307; 0.07 C, 17.5 Cr, 2 Mo, 17.5 Ni, 2 Cu, Ti = 7 × C, bal Fe.
For chemical plant equipment, heat and corrosion resistant.

SUWEFA AS18.
M-1307; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn 180,000 TS, 125,000 YS; 10 El; 330 Brin.
For welded chemical plant equipment, tanks, mixers; Type 304; stainless, austenitic.

SUFEFA AS175.
M-1307; 0.07 max C, 17 Cr, 4.75 Mo, 13 Ni, bal Fe.
Annealed 90,000 TS, 40,000 YS, 55 El; 65 RA; 160 Brin
For acid resistant chemical plant equipment, tanks; Type 317; stainless, austenitic

SUWEFA AS182
M-1307; 0.07 max C, 18 Cr, 10.5 Ni, Cb = 8 × C, bal Fe
Annealed· 90,000 TS, 45,000 YS; 56 El; 65 RA; 160 Brin.
Cold drawn: 100,000 TS, 65,000 YS; 40 El, 60 RA; 205 Brin
For welded chemical plant equipment, tanks, mixers; Type 347, stainless, austenitic.

SUWEFA BEM
M-1307. 0.4 C, 0.38 Si, 0.95 Mn, bal Fe
Hot rolled· 90,000 TS; 58,000 YS; 27 El, 50 RA; 200 Brin.
For gears, shafts, bolts, fasteners; water hardened

SUWEFA BKM.
M-1307; 0.3 C, 0.25 Si, 1.35 Mn, bal Fe.
For cams, bolts, camshafts, machine tool parts, oil hardened, tough.

SUWEFA C1VV
M-1307, 0.50 C, 1.0 Cr, 0.09 V, 0.85 Mn, bal Fe.
For springs, gears, crankshafts, bolts; oil hardened, shock resistant.

SUWEFA C12.
M-1307; 2.1 C, 0.30 Mn, 11.5 Cr, bal Fe
For blanking and forming dies, punches; oil hardened, nondeforming.

SUWEFA C12CO.
M-1307; 1.65 C, 0.3 Mn, 11.5 Cr, Co, bal Fe.
For blanking and forming dies, punches; air hardened, nondeforming.

SUWEFA C12 SPEZIAL.
M-1307; 2.1 C, 0.3 Mn, 11.5 Cr, 0.7 W, bal Fe.
For blanking and forming dies, punches; oil hardened, nondeforming.

SUWEFA C45.
M-1307; 0.41 C, 1.0 Cr, 0.65 Mn, bal Fe.
For springs, gears, crankshafts, bolts, studs; oil hardened, shock resistant.

SUWEFA CG.
M-1307; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, machine; oil hardened, tough.

SUWEFA CIVV.
M-1307; 0.50 C, 1.0 Cr, 0.09 V, bal Fe
For springs, gears, bolts, studs; oil hardened, tough.

SUWEFA CME.
M-1307; 0.15 C, Cr, Mo, bal Fe.
For gears, bolts, machine tool parts; case hardened, tough.

SUWEFA CMM.
M-1307; 0.20 C, Cr, Mo, bal Fe
For gears, cams, machine tool parts; case hardened, tough.

SUWEFA CMV2.
M-1307, 0.25 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe
For gears, bolts, machine tool parts; oil hardened, tough.

SUWEFA CMV3
M-1307; 0.33 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, fasteners, machine tool parts; oil hardened, tough.

SUWEFA CMV4.
M-1307, 0.42 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

SUWEFA CMV SPEZIAL.
M 1307; 0.50 C, Cr, Mo, bal Fe
For gears, bolts, machine tool parts; oil hardened, tough

SUWEFA CN1V
M-1307, 0.28-0.35 C, 0.5 Cr, 1.5 Ni, bal Fe
For gears, bolts, machine tool parts; oil hardened, tough.

SUWEFA CN2E.
M-1307, 0.13 C, 0.7 Cr, 2.5 Ni, bal Fe
For gears, cams, camshafts, case hardened, tough

SUWEFA CN2V
M-1307, 0.28-0.35 C, 0.7 Cr, 2.5 Ni, bal Fe
For gears, bolts, crankshafts, oil hardened, tough.

SUWEFA CN3E
M-1307, 0.13 C, 0.7 Cr, 3.5 Ni, bal Fe
For gears, cams, camshafts, machine tool parts, case hardened, shock resistant

SUWEFA CN3V
M-1307, 0.22-0.30 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, shafts, studs, machine tool parts; oil hardened, shock resistant.

SUWEFA CN4E.
M-1307, 0.13 C, 1.1 Cr, 4.5 Ni, bal Fe.
For gears, bolts, cams, shafts, camshafts; case hardening steel.

SUWEFA CN4V
M-1307, 0.35 C, 1.3 Cr, 4.5 Ni, bal Fe
For gears, bolts, fasteners, crankshafts, oil hardened, shock resistant.

SUWEFA Co 300.
M-1307, 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, hobs, reamers, drills, taps; high speed steel.

SUWEFA Co 500.
M-1307; 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

SUWEFA Co 1000.
M-1307; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe
For lathe and planer tools, milling cutters, hobs; high speed steel.

SUWEFA CSV4.
M-1307; 0.38 C, 0.85 Si, 1.0 Cr, 0.1 V, bal Fe.
For springs, gears, bolts, studs, oil hardened, shock resistant

SUWEFA CSV5
M-1307; 0.45 C, 1.0 Cr, 0.1 V, bal Fe.
For springs, gears, bolts, studs; oil hardened, shock resistant

SUWEFA CSV6.
M-1307; 0.61 C, 1.18 Cr, 0.1 V, 0.75 Mn, bal Fe.
For springs, gears, bolts, studs; oil hardened, shock resistant.

SUWEFA CV.
M-1307, 0.41 C, 1.0 Cr, 0.65 Mn, bal Fe
For gears, bolts, crankshafts; oil hardened, tough.

SUWEFA CV50
M-1307, 0.41 C, 0.25 Sn, 0.65 Mn, 1.0 Cr, bal Fe.
For gears, bolts, studs, shafts, fasteners; oil hardened, shock resistant

SUWEFA DMo 10.
M-1307; 0.24 C, 1.15 Cr, 0.25 Mo, bal Fe.
For gears, bolts, fasteners, machine tool parts; oil hardened, tough

SUWEFA DMo 11.
M-1307; 0.15 C, 0.65 Mn, 0.30 Mo, bal Fe.
For gears, fasteners, machine tool parts case hardening steel

SUWEFA DMo 14
M 1307, 0.13 C, 0.85 Cr, 0.45 Mo, bal Fe
For gears, fasteners, machine tool parts; case hardening steel.

SUWEFA DMo 15
M 1307, 0.24 C, 1.25 Cr, 0.45 Mo, bal Fe.
For gears, machine tool parts, oil hardened, tough

SUWEFA DMo 20
M-1307, 0.24 C, 1.35 Cr, 0.55 Mo, 0.20 V, bal Fe.
For gears, shafts, machine tool parts; oil hardened, tough

SUWEFA E50
M-1307, 0.35 C, 0.25 Si, 0.55 Mn, bal Fe
For gears, bolts, machine tool parts; water hardened.

SUWEFA EC3.
M-1307; 0.15 C, 0.25 Si, 0.5 Mn, 0.65 Cr, bal Fe.
For gears, bolts, machine tool parts, case hardened.

SUWEFA ECM.
M-1307, 0.20 C, 0.25 Si, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, cams, camshafts, fasteners; case hardened, shock resistant.

SUWEFA EH50.
M-1307 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS, 25 El; 60 RA; 145 Brin.
For gears, fasteners, machine tool parts; case hardening steel.

SUWEFA EHC40
M-1307; 0.13 C, 0.5 Cr, bal Fe.
For gears, bolts, oil refinery equipment; case hardening steel.

SUWEFA EHC70.
M-1307; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
For gears, shafts, oil refinery equipment; case hardening steel.

SUWEFA EHC90.
M-1307; 0.16 C, 0.95 Cr, 1.15 Mn, bal Fe.
For gears, bolts, camshafts, cams; case hardening steel.

SUWEFA ELCS.
M-1307; 1.45 C, 0.6 Mn, 1.4 Cr, bal Fe.
For bearings, liners, sleeves, bushings; water hardened, wear resistant.

SUWEFA EMC5.
M-1307 0.16 C, 0.95 Cr, 1.15 Mn, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel, tough.

SUWEFA EMC5H.
M-1307; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel, tough.

SUWEFA ENC14.
M-1307; 0.13 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, cams, camshafts; case hardening steel, tough.

SUWEFA ENC18.
M-1307; 0.13 C, 1.1 Cr, 4.5 Ni, bal Fe.
For gears, bolts, machine tool parts; case hardening steel, tough.

SUWEFA EW3.
M-1307; 0.15 C, 0.5 Mn, 0.65 Cr, bal Fe.
For gears, cams, camshafts, machine tool parts; case hardening steel.

SUWEFA EW5H.
M-1307; 0.20 C, 1.15 Cr, 1.25 Mn, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel, tough.

SUWEFA EX15.
M-1307; 0.15 C, 1.55 Cr, 1.55 Ni, bal Fe.
For gears, cams, camshafts; case hardened, tough.

SUWEFA EX20.
M-1307; 0.18 C, 2 Cr, 2 Ni, bal Fe.
For gears, cams, camshafts; case hardened, tough.

SUWEFA EX25.
M-1307; 0.13 C, 0.7 Cr, 2.5 Ni, bal Fe
For gears, bolts, machine tool parts; case hardened, shock resistant.

SUWEFA EXTRA
M-1307; 1.0 C, 0.10 V, 0.25 Mn, bal Fe.
For cutters, taps, springs, drills, reamers; Type W2; water hardened.

SUWEFA EXTRA MH.
M-1307; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 56,000 YS; 20 El; 40 RA; 210 Brin.
For springs, tools, cutters, taps, drills; Type W1; water hardened.

SUFEWA EXTRA WEICH.
M-1307; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 174,000 TS 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, rails, punches, axes, hammers; Type W1; water hardened.

SUWEFA EXTRA ZAH.
M-1307; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For springs, rails, axes, punches; Type W1; water hardened.

SUWEFA EXTRA ZH.
M-1307; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA 200 Brin.
For cutters, taps, springs, drills, broaches; Type W1; water hardened.

SUWEFA F11Z.
M-1307; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, sinks; Type 430 Ti; stainless.

SUWEFA F13.
M-1307; 0.12 max C, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS 35 El; 70 RA; 155 Brin
For turbine blades, valves, cutlery; Type 410; stainless.

SUWEFA F17.
M-1307; 0.8 C, 17 Cr, bal Fe.
Annealed: 107,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin.
For cutlery, valves, ball bearings, surgical instruments; Type 440B; corrosion resistant.

SUWEFA F17A.
M-1307, 0.12 C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin
For screw machine products, oil refinery equipment; Type 430F; corrosion resistant

SUWEFA F171Z.
M-1307; 0.1 max C, 17 Cr, 1.8 Mo, Ti = 7 × C, bal Fe
Annealed: 125,000 TS, 95,000 YS, 20 El, 55 RA; 260 Brin
For welded chemical plant equipment, pump parts, corrosion resistant; Type 431 Ti.

SUWEFA FBV.
M-1307; 1.15 C, 0.65 Cr, 0.10 V, bal Fe.
For bearings, bushings, liners; water or oil hardened, wear resistant.

SUWEFA FPC4.
M-1307; 0.40 C, Cr, Mn, V, bal Fe
For gears, bolts, crankshafts, fasteners, oil hardened, shock resistant

SUWEFA GB1.
M-1307; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin
For gears, bolts, machine tool parts; case hardened.

SUWEFA GB2
M-1307, 0.22 C, 0.25 Si, 0.45 Mn, bal Fe
Annealed: 73,000 TS; 42,000 YS, 21 El; 57 RA; 145 Brin.
For machine tool parts, gears, fasteners, case hardened.

SUWEFA GB3.
M-1307; 0.35 C, 0.25 Si, 0.55 Mn, bal Fe.
Hot rolled: 85,000 TS 54,000 YS; 30 El; 53 RA; 185 Brin
For gears, bolts, machine tool parts; water hardened.

SUWEFA GB4.
M-1307; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled: 98,000 TS, 60,000 YS; 24 El; 45 RA; 212 Brin.
For gears, bolts, machine tool parts; water hardened.

SUWEFA GB5.
M-1307; 0.53 C, 0.25 Si, 0.65 Mn, bal Fe.
Normalized: 100,000 TS; 55,000 YS; 19 El; 26 RA; 200 Brin.
For gears, bolts, machine tool parts; water hardened.

SUWEFA GB5H.
M-1307; 0.56 C, 0.30 Si, 0.55 Mn, bal Fe.
Normalized: 102,000 TS; 56,000 YS; 18 El; 25 RA; 205 Brin.
For gears, bolts, machine tool parts; water hardened.

SUWEFA GB6.
M-1307; 0.61 C, 0.25 Si, 0.65 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 320 Brin.
For rails, axes, hammers, springs; water hardened.

SUWEFA GB9.
M-1307; 0.90 C, 0.37 Si, 1.0 Mn, bal Fe.
For springs, cutters; Type W1; water hardened.

SUWEFA GB11.
M-1307; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA 145 Brin.
For gears, bolts, machine tool parts; case hardened.

SUWEFA GB12
M-1307; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Cold drawn. 78,000 TS, 68,000 YS; 20 El, 55 RA; 160 Brin.
For machine tool parts; case hardened.

SUWEFA GB13
M-1307; 0.35 C, 0.25 max Si, 0.55 max Mn, bal Fe
Hot rolled 85,000 TS, 54,000 YS; 30 El; 53 RA 185 Brin.
For gears, machine tool parts; water hardened.

SUWEFA GB14
M-1307, 0.45 C, 0.25 Si, 0.65 Mn, bal Fe.
Hot rolled· 98,000 TS, 59,000 YS; 24 El; 45 RA; 212 Brin
For gears, bolts, machine tool parts; water hardened.

SUWEFA GB16
M-1307, 0.60 C, 0.38 Si, 0.65 Mn, bal Fe.
Heat treated 160,000 TS, 113,000 YS; 12 El; 40 RA 321 Brin
For machine tool parts, axes, shafts; water hardened

SUWEFA GB18
M-1307, 0.75 C, 0.38 Si, 0.70 Mn, bal Fe
Heat treated· 185,000 TS; 142,000 YS, 15 El, 40 RA, 390 Brin
For rails, springs, axes, hammers, punches, Type W1, water hardened

SUWEFA GBS40
M-1307, 0.45 C, Ni, Cr, bal Fe.
For gears, bolts, machine tool parts, oil hardened, tough

SUWEFA GBS45
M-1307; 0.45 C, Ni, Cr, W, bal Fe.
For gears, bolts, machine tool parts, oil hardened, tough

SUWEFA GBS50
M-1307, 0.50 C, 1.05 Cr, 3.25 Ni, 0.5 Mn, bal Fe
For gears, bolts, machine tool parts, oil hardened, shock resistant

SUWEFA GC2.
M-1307, 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For bearings, bushings, liners, water hardened, wear resistant

SUWEFA GCS9.
M-1307; 0.90 C, 1.2 Cr, 1.15 Si, 0.7 Mn, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant.

SUWEFA GCS12.
M-1307; 1.25 C, 1.2 Cr, 1.15 Si, 0.7 Mn, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant.

SUWEFA GCV.
M-1307, 0.38 C, 1.2 Si, Cr, V, bal Fe.
For bolts, gears, machine tool parts; oil hardened, tough.

SUWEFA GDW.
M-1307; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, shock resistant.

SUWEFA GF2.
M-1307; 1.3 C, 0.25 max Si, 0.25 max P, bal Fe.
For gears, shafts, machine tool parts, bolts; water hardened.

SUWEFA GF43.
M-1307; 0.45 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
For gears, shafts, fasteners, machine tool parts; water hardened.

SUWEFA GFD3.
M-1307; 0.46 C, 1.7 Mn, bal Fe.
For punches, crimpers, shear blades; oil hardened.

SUWEFA GFD4.
M-1307; 0.46 C, 1.7 Si, 0.65 Mn, bal Fe.
For upsetters, riveters, punches; shock resistant, oil hardened

SUWEFA GFD5.
M-1307; 0.65 C, 1.75 Si, 0.70 Mn, bal Fe.
For springs; tough, shock resistant.

SUWEFA GFD5W
M-1307; 0.55 C, 1.7 Si, 0.70 Mn, bal Fe.
For upsetters, springs, punches; tough, shock resistant.

SUWEFA GFD7
M-1307; 0.65 C, 1.15 Si, 1 Mn, bal Fe
For springs, shock resistant

SUWEFA GFD7R.
M-1307, 0.7 C, 0.7 Mn, 1.7 Si, bal Fe.
For springs, shock resistant.

SUWEFA GFD8
M-1307, 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe
For springs, shock resistant.

SUWEFA GHE SPEZIAL.
M-1307, 0.56 C, Ni, Cr, Mo, V, bal Fe.
For gears, bolts, machine tool parts; oil hardened, shock resistant.

SUWEFA GKI O
M-1307, 1.0 C, 1.55 Cr, 0.35 Mn, 0.3 Si, bal Fe.
For bearings, liners, sleeves; water hardened.

SUWEFA GR
M-1307, 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For cutters, fast finishing tools, water hardened.

SUWEFA GR3.
M-1307, 1.42 C, W, V, bal Fe.
For fast finishing cutters, form tools; water hardened.

SUWEFA GS.
M-1307, 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For gears, bolts, crankshafts, oil hardened, shock resistant.

SUWEFA GS7
M-1307; 0.80 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Heat treated: 188,000 TS; 143,000 YS; 12 El 35 RA, 390 Brin.
For springs, taps, drills, hobs, reamers; Type W1; water hardened

SUWEFA GS8
M-1307, 0.80 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Heat treated 188,000 TS; 143,000 YS, 12 El; 35 RA; 390 Brin.
For springs, cutters, drills, taps; Type W1; water hardened.

SUWEFA GSI.
M-1307; 1.15 C, 0.20 Si, 0.30 Mn, 0.65 Cr, 0.10 V, bal Fe.
For bearings, bushings, liners; oil hardened.
wear resistant.

SUWEFA GSP5.
M-1307; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
For gears, bolts, studs, fasteners; water hardened.

SUWEFA GSP6.
M-1307; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe
For springs; oil hardened, tough.

SUWEFA GSS
M-1307; 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, dies, upsetters, cutters; oil hardened, non-deforming.

SUWEFA GSS2
M-1307; 0.90 C, 1.9 Mn, 0.1 V, bal Fe
For punches, dies, upsetters, cutters, oil hardened, nondeforming.

SUWEFA GSS111.
M-1307; 1.05 C, 1.0 Cr, 1.15 W, 0.9 Mn, bal Fe
For fast finishing tools, bearings, cutters;
water hardened.

SUWEFA GVS6.
M-1307; 0.55 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Normalized. 100,000 TS; 55,000 YS; 18 El; 26 RA; 200 Brin
For gears, bolts, shafts, studs; water hardened.

SUWEFA GW7.
M-1307; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS, 128,000 YS, 12 El;
37 RA, 355 Brin.
For rails, springs, axes, hammers, punches,
water hardened.

SUWEFA GW7E.
M-1307; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 175,000 TS; 128,000 YS, 12 El;
37 RA, 355 Brin
For rails, springs, axes, hammers, punches,
water hardened.

SUWEFA GW8
M-1307, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated 190,000 TS, 145,000 YS; 10 El,
30 RA; 400 Brin
For springs, taps, cutters, drills, Type W1,
water hardened.

SUWEFA GW8E.
M-1307; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS, 145,000 YS, 10 El,
30 RA; 400 Brin
For springs, taps, cutters, drills; Type W1;
water hardened

SUWEFA GW10
M-1307; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, cutters, drills, taps, reamers; Type W1;
water hardened.

SUWEFA GW10E
M-1307; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed. 100,000 TS; 53,000 YS; 21 El; 42 RA, 200 Brin.
For springs, cutters, drills, taps, reamers,
Type W1; water hardened

SUWEFA GW10V.
M-1307; 1.0 C, 0.20 Si, 0.25 Mn, 0.1 V, bal Fe.
For springs, cutters, drills, taps, reamers; Type W2;
water hardened.

SUWEFA GW11.
M-1307; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 56,000 YS; 18 El; 40 RA; 210 Brin.
For springs, taps, cutters, broaches; Type W1;
water hardened.

SUWEFA GW11E.
M-1307; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS, 56,000 YS, 20 El, 40 RA; 205 Brin.
For springs, taps, reamers, broaches; Type W1;
water hardened.

SUWEFA GW13.
M-1307; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe
For engravers' tools, reamers, broaches, taps;
Type W1; water hardened.

SUWEFA GW23.
M-1307; 0.15 C, 0.25-0.50 Si, 0.30-0.70 Mn, bal Fe.
Annealed. 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, bolts, machine tool parts, case hardened

SUWEFA GW33
M-1307, 0.35 C, 0.25-0.50 Si, 0.30-0.70 Mn, bal Fe.
Hot rolled. 85,000 TS; 54,000 YS; 30 El; 53 RA; 185 Brin
For gears, bolts, machine tool parts, water hardened.

SUWEFA GW43.
M-1307, 0.45 C, 0.25-0.50 Si, 0.30-0.70 Mn, bal Fe
Hot rolled: 98,000 TS, 60,000 YS; 24 El; 45 RA; 215 Brin
For gears, bolts, machine tool parts; water hardened.

SUWEFA GW63
M-1307, 0.60 C, 0.25-0.50 Si, 0.30 0.70 Mn, bal Fe
Heat treated: 160,000 TS, 113,000 YS, 12 El,
40 RA, 32 Brin
For gears, rails, springs, hammers; water hardened

SUWEFA GW73
M-1307; 0.67 C, 0.25-0.50 Si, 0.30 0.70 Mn, bal Fe
Heat treated 170,000 TS, 125,000 YS, 14 El,
38 RA, 340 Brin.
For rails, springs, axes, crimpers; water hardened

SUWEFA GW93
M-1307, 0.90 C, 0.25-0.50 Si, 0.30-0.70 Mn, bal Fe
Heat treated 190,000 TS; 145,000 YS, 10 El,
30 RA, 400 Brin
For springs, tools, cutters, drills, Type W1,
water hardened

SUWEFA GZB8F
M-1307, 0.12 max C, 0.7 Si, 0.3 Mn, 6.5 Cr,
0.75 Al, bal Fe
For oil refinery equipment; creep and heat resistant.

SUWEFA GZB9F.
M-1307, 0.12 max C, 1.15 Si, 0.3 Mn, 13 Cr,
0.95 Al, bal Fe
For oil refinery equipment, creep and heat resistant

SUWEFA GZB10A
M-1307, 0.15 C, 2 Si, 19.5 Cr, 9.5 Ni, bal Fe
Annealed: 80,000 TS, 35,000 YS, 55 El, 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers,
Type 302, stainless, austenitic

SUWEFA GZB10F
M-1307; 0.12 max C, 18 Cr, 0.95 Al, bal Fe.
For oil refinery equipment; heat and creep resistant.

SUWEFA GZB11FA.
M-1307; 0.2 C, 25 Cr, 1.2 Si, 4 Ni, bal Fe.
Cast: 90,000 TS; 65,000 YS, 18 El; 210 Brin.
For cylinder liners, valve seats and bodies;
corrosion and heat resistant.

SUWEFA GZB12A.
M-1307; 0.15 C, 24 Cr, 19 Ni, bal Fe.
Annealed: 100,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin
For furnace parts, valves, pumps, turbines; Type 310; corrosion and heat resistant.

SUWEFA GZB12F.
M-1307; 0.12 max C, 1.5 Al, 24 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant.

SUWEFA GZW.
M-1307; 1.4 C, 0.1 V, 0.3 Cr, 0.3 Mn, bal Fe.
For bearings, liners, cutters; water hardened, wear resistant.

SUWEFA H10.
M-1307; 0.21 C, 3 Cr, 0.4 Mo, 0.8 V, 0.37 W, bal Fe.
For upsetters, crimpers; oil hardened

SUWEFA HE15.
M-1307, 0.15 C, 0.25 Si, 0.37 Mn, bal Fe
Annealed 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin
For gears, bolts, machine tool parts; case hardened.

SUWEFA HEC5
M-1307, 0.13 C, Cr, bal Fe
For machine tool parts

SUWEFA HEC10
M-1307, 0.15 C, 0.25 Si, 0.5 Mn, 0.65 Cr, bal Fe.
For gears, machine tool parts; case hardened.

SUWEFA HEN15
M-1307; 0.13 C, 0.2 Cr, 1.5 Ni, bal Fe.
For gears, bolts, camshafts; case hardened, shock resistant

SUWEFA HH
M-1307, 1.2 C, Mn, bal Fe.
For cutters, wear parts, oil hardened

SUWEFA HKC10.
M-1307; 0.33 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, crankshafts, fasteners, oil hardened, tough.

SUWEFA HSB2
M-1307, 0.75 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 180,000-130,000 TS; 135,000-90,000 YS, 10-20 El; 35-50 RA, 370-245 Brin
For springs, tools, cutters, rails, die blocks; Type W1, water hardened

SUWEFA HSB3
M-1307, 0.85 C, 0.5 Cr, bal Fe
For bearings, bushings, cutters, water hardened

SUWEFA HZCV.
M-1307; 0.50 C, 0.95 Mn, 1.05 Cr, 0.1 V, bal Fe
For springs, gears, bolts, shafts; oil hardened, shock resistant

SUWEFA KL3.
M-1307; 1.0 C, 1.55 Cr, 0.35 Mn, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant

SUWEFA KMC
M-1307; 0.20 C, 1.15 Cr, 1.25 Mn, bal Fe
For bearings, liners, races, bushings, case hardened, tough.

SUWEFA KZM.
M-1307; 1.4 C, 0.30 Mn, 0.1 V, bal Fe.
For engravers tools, punches, header dies; water hardened; Type W2.

SUWEFA LCN.
M-1307; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, shafts, countershafts, bolts, studs; oil hardened, shock resistant.

SUWEFA LCV.
M-1307; 0.50 C, 1.05 Cr, 0.1 V, 0.95 Mn, bal Fe.
For gears, springs, bolts, studs, shafts; oil hardened, shock resistant.

SUWEFA LCW1.
M-1307; 0.35 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For header dies, upsetters, crimpers; oil hardened, tough.

SUWEFA LCW2.
M-1307; 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For header dies, punches, crimpers, upsetters; oil hardened, tough.

SUWEFA LCW3.
M-1307; 0.55 C, 0.9 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For header dies, punches, shears. crimpers; oil hardened, tough.

SUWEFA LST.
M-1307; 0.45 C, Cr, V, Si, bal Fe.
For gears, springs, bolts, studs, shafts, oil hardened, shock resistant

SUWEFA M13.
M-1307; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; stainless.

SUWEFA M-M1.
M-1307, 0.90 C, 18 Cr, 1.15 Mo, 1.0 V, bal Fe
Heat treated: 280,000 TS; 270,000 YS; 3 El, 15 RA; 555 Brin
For cutlery, valves, ball bearings, hardenable, corrosion resistant.

SUWEFA MO1.
M-1307; 0.95 C, W, Mo, bal Fe
For dies, tools, cutters; oil hardened

SUWEFA Mo-333.
M-1307; 0.95 C, Cr, W, Mo, bal Fe
For lathe and planer tools, reamers, broaches, taps, high speed steel

SUWEFA Mo-560.
M-1307; 0.85 C, Cr, W, Mo, bal Fe.
For lathe and planer tools, drills, reamers, hobs; high speed steel

SUWEFA Mo-900
M-1307, 0.80 C, Mo, Cr, W, V, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

SUWEFA MOG.
M-1307; 0.45 C, 0.7 Mn, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe.
For forging dies, punches, shears; oil hardened, tough.

SUWEFA MVC20
M-1307; 0.30 C, Cr, V, bal Fe
For gears, bolts, crankshafts; oil hardened, tough.

SUWEFA MV EXTRA
M-1307; 0.42 C, 1.75 Mn, 0.25 Si, 0.1 V, bal Fe
For punches, upsetters, shears; oil hardened, tough.

SUWEFA NC6.
M-1307; 0.27 C, 0.6 Mn, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment; heat and creep resistant.

SUWEFA NC6H.
M-1307; 0.34 C, 1.1 Al, 1.4 Cr, 0.6 Mn, bal Fe.
For oil refinery equipment; heat and creep resistant.

SUWEFA NCMo4.
M-1307; 0.32 C, 1.1 Cr, 1.1 Al, 0.18 Mo, bal Fe.
For oil refinery equipment; heat and creep resistant.

SUWEFA NCV9 SPEZIAL.
M-1307; 0.31 C, 0.6 Mn, 2.35 Cr, 0.18 Mo, 0.13 V, bal Fe.
For oil refinery equipment; heat and creep resistant

SUWEFA NFKC.
M-1307; 1.42 C, W, V, bal Fe.
For forming and blanking dies, cutters; oil hardened, wear resistant.

SUWEFA NG.
M-1307; 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For forging and heading dies, upsetters; oil hardened, tough.

SUWEFA NG2 SUPRA.
M-1307; 0.56 C, 0.2 Mo, 1.8 Ni, 0.1 V, 0.8 Cr, bal Fe.
For forgingandheading dies, upsetters; oil hardened, tough.

SUWEFA Ni 2.
M-1307; 0.13 C, 0.2 Cr, 1 5 Ni, bal Fe.
For gears, bolts, camshafts; case hardened.

SUWEFA NiC 2.
M-1307; 0.28-0.35 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, fasteners, crankshafts; oil hardened, shock resistant.

SUWEFA NiC 3.
M-1307; 0.13 C, 2.5 Ni, 0.7 Cr, bal Fe.
For gears, bolts, crankshafts, cams, case hardened, shock resistant.

SUWEFA NiC 4.
M-1307; 0.13 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, camshafts, cams; case hardened, shock resistant.

SUWEFA NiC 4H.
M-1307; 0.22-0 30 C, 0.7 Cr, 3.5 Ni, bal Fe
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant

SUWEFA NiC 5.
M-1307; 0.13 C, 1.1 Cr, 4.5 Ni, bal Fe.
For gears, bolts, camshafts, cams, case hardened, shock resistant.

SUWEFA NiC 5H.
M-1307; 0.35 C, 1.3 Cr, 4.5 Ni, bal Fe.
For gears, bolts, machine tool parts, oil hardened, shock resistant.

SUWEFA NSI
M-1307; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, pneumatic tools, chisels; oil hardened, tough.

SUWEFA PIL80.
M-1307; 0.28 C, Ni, Cr, Mo, V, bal Fe.
For forging and heading dies; oil hardened, tough

SUWEFA PRIMA WEICH
M-1307; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000-122,000 TS; 128,000-82,000 YS; 12-22 El; 37-52 RA; 350-240 Brin.
For springs, rails, clutch discs, girders, rails; Type W1; water hardened.

SUWEFA PRIMA ZAH.
M-1307; 0.85 C, 0 25 max Si, 0.25 max Mn, bal Fe.
Heat treated· 190,000 TS; 145,000 YS; 10 El; 32 RA; 400 Brin.
For drills, taps, reamers, springs, hobs; Type W1; water hardened.

SUWEFA PRIMA ZH.
M-1307; 1.05 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 200,000 TS; 125,000 YS; 8 El; 28 RA; 400 Brin.
For springs, drills, reamers, taps, broaches; Type W1; water hardened.

SUWEFA REA.
M-1307; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks; Type 302; stainless, austenitic.

SUWEFA REA2.
M-1307; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 302; stainless, austenitic.

SUWEFA REA2-K.
M-1307; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed· 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, mixers, tanks; Type 321; stainless, austenitic.

SUWEFA REA2-KN.
M-1307, 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe.
Annealed· 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin
For welded chemical plant equipment, tanks, vessels; Type 347; stainless, austenitic.

SUWEFA REA2-KS.
M-1307; 0 07 C, 18 Cr, 9 5 Ni, bal Fe
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, vessels; Type 304, stainless, austenitic.

SUWEFA REA4-K
M-1307; 0 12 max C, 18 Cr, 2 Mo, 10 5 Ni, Ti = 4 × C, bal Fe
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 170 Brin
For welded acid resistant equipment, tanks, mixers; Type 316 Ti; stainless, austenitic

SUWEFA REA4-KN.
M-1307; 0 12 max C, 18 Cr, 10.5 Ni, 2 Mo, Cb = 8 × C, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 70 Brin.
For welded acid resistant chemical plant equipment; Type 316 Cb; stainless, austenitic

SUWEFA REA4·KS
M-1307, 0 07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El; 300 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

SUWEFA REH.
M-1307, 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 50 RA; 205 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; stainless.

SUWEFA REHD.
M-1307; 0.20 C, 13 Cr, 1.15 Mo, bal Fe.
Annealed· 100,000 TS, 55,000 YS; 22 El; 52 RA; 200 Brin.
For valves, cutlery, chemical plant equipment; Type 420 Mo; stainless.

SUWEFA REH EXTRA.
M-1307; 0.90 C, Cr, V, bal Fe.
For bearings, blanking and forming dies; oil hardened, wear resistant.

SUWEFA REM.
M-1307; 0.20 C, 13 Cr, 0.4 Si, 0.3 Mn, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For surgical and dental instruments, valves, cutlery; Type 420; stainless.

SUWEFA RES.
M-1307; 0.65 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For springs; oil hardened, tough.

SUWEFA RESO.
M-1307; 0.65 C, 1.15 Si, 1.0 Mn, bal Fe.
For springs; oil hardened, tough.

SUWEFA REW.
M-1307; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, valves, cutlery, surgical instruments; Type 410; stainless.

SUWEFA REXH.
M-1307; 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 250 Brin.
For pumps, marine hardware, valves, Type 431; heat resistant.

SUWEFA REXH EXTRA.
M-1307; 0.22 C, 0.4 Si, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
Cold drawn: 130,000 TS; 110,000 YS; 15 El; 35 RA; 270 Brin.
For pumps, marine hardware, valves; Type 431; heat resistant.

SUWEFA REXN.
M-1307; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin
For oil refinery equipment, oil burner heaters; Type 430 Ti; stainless.

SUWEFA REXW.
M-1307; 0.8 C, 18 Cr, bal Fe.
Annealed: 110,000 TS; 65,000 YS; 18 El; 35 RA; 220 Brin
Heat treated: 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin.
For bearings, cutlery, valves; stainless, hardenable

SUWEFA SBH.
M-1307; 1.25 C, 1.15 Si, 0.70 Mn, 1.2 Cr, bal Fe.
For blanking and forming dies, bearings; oil hardened, wear resistant.

SUWEFA SBN.
M-1307; 1.1 C, 0.40 Cr, 0.30 Mn, bal Fe.
For bearings, cutters, liners; water or oil hardened.

SUWEFA SCHE.
M-1307; 0.61 C, 0.85 Si, 0.75 Mn, 1.18 Cr, 0.10 V, bal Fe.
For springs, gears, bolts, crankshafts; oil hardened, shock resistant.

SUWEFA SER.
M-1307; 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For springs, punches, pneumatic tools; oil hardened, tough.

SUWEFA SIW.
M-1307; 1.2 C, 0.20 Cr, 0.10 V, 1.0 W, bal Fe.
For bearings, sleeves, liners; water hardened, wear resistant.

SUWEFA SJI.
M-1307; 0.46 C, 1.7 Si, 0.65 Mn, bal Fe.
For springs, punches, chisels; oil hardened, tough.

SUWEFA SJII.
M-1307; 0.55 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, punches, chisels, pneumatic tools; oil hardened, tough.

SUWEFA SJIII.
M-1307; 0.65 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, punches, chisels, pneumatic tools; oil hardened, tough.

SUWEFA SJCV.
M-1307; 1.15 C, 0.2 Si, 0.3 Mn, 0.65 Cr, 0.1 V, bal Fe.
For bearings, sleeves, liners; water hardened.

SUWEFA T13.
M-1307; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 50 RA; 195 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; stainless.

SUWEFA T17.
M-1307; 0.22 C, 0.4 Si, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 50 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431; stainless.

SUWEFA T131.
M-1307, 0.20 C, 0.4 Si, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 45 RA; 200 Brin.
For oil refinery equipment, valves, cutlery; Type 430 Mo; stainless.

SUWEFA T171.
M-1307; 0.35 C, 16.5 Cr, 1.15 Mo, bal Fe.
For oil refinery equipment, heat treating boxes; corrosion resistant.

SUWEFA TC4.
M-1307; 0.33 C, 0.25 Si, 0.65 Mn, 1.0 Cr, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, tough.

SUWEFA TC4 SPEZIAL.
M-1307; 0.41 C, 1.0 Cr, 0.65 Mn, bal Fe.
For gears, bolts, crankshafts, axles, oil hardened, tough.

SUWEFA TCMo4.
M-1307; 0.34 C, 1.05 Cr, 0.20 V, 0.65 Mn, bal Fe.
For gears, bolts, springs, crankshafts; oil hardened, shock resistant.

SUWEFA TCMo4H.
M-1307; 0.42 C, 1.05 Cr, 0.20 V, 0.65 Mn, bal Fe.
For gears, bolts, springs, crankshafts; oil hardened, shock resistant.

SUWEFA TCMo4W.
M-1307; 0.25 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

SUWEFA TCMo5.
M-1307; 0.50 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

SUWEFA TCV4.
M-1307; 0.50 C, 1.0 Cr, 0.09 V, bal Fe.
For springs, bolts, crankshafts; oil hardened, shock resistant.

SUWEFA TCV5.
M-1307; 0.58 C, 1.0 Cr, 0.09 V, bal Fe.
For springs, shafts, gears, crankshafts; oil hardened, shock resistant.

SUWEFA TCV9 SPEZIAL.
M-1307; 0.30 C, 2.5 Cr, 0.2 Mo, 0.15 V, bal Fe.
For gears, shafts, crankshafts, pinions, bolts; oil hardened, shock resistant.

SUWEFA TFH.
M-1307; 0.58 C, Cr, V, bal Fe.
For springs, bolts, crankshafts; oil hardened, shock resistant.

SUWEFA TM4.
M-1307; 0.40 C, 0.37 Si, 0.95 Mn, bal Fe.
Hot rolled: 92,000 TS; 58,000 YS; 27 El; 50 RA; 200 Brin.
For gears, bolts, shafts, axles, screws; water hardened.

SUWEFA TM5.
M-1307; 0.30 C, 0.25 Si, 1.35 Mn, bal Fe.
For gears, bolts, shafts, axles, crankshafts; water hardened.

SUWEFA TMCV4.
M-1307; 0.27 C, Mn, Cr, V, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

SUWEFA TMS4.
M-1307; 0.53 C, 0.80 Si, 1.05 Mn, bal Fe.
For gears, bolts, machine tool parts; water hardened.

SUWEFA TMS5.
M-1307; 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
Hot rolled: 97,000 TS; 59,000 YS; 25 El; 52 RA; 200 Brin.
For punches, chisels, pneumatic tools; oil hardened, shock resistant.

SUWEFA TMV7.
M-1307; 0.42 C, 1.75 Mn, 0.1 V, bal Fe.
For punches, chisels, pneumatic tools, gears; oil hardened, tough.

SUWEFA TNC6.
M-1307; 0.28-0.35 C, 0.5 Cr, 1.5 Ni, bal Fe
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

SUWEFA TNC14H.
M-1307; 0.22-0.30 C, 0.7 Cr, 3.5 Ni, bal Fe
For gears, bolts, crankshafts, fasteners, oil hardened, shock resistant.

SUWEFA TNC18.
M-1307; 0.35 C, 1.3 Cr, 4.5 Ni, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, shock resistant.

SUWEFA TX10
M-1307; 0.36 C, 1.0 Ni, 1.0 Cr, 0.2 Mo, bal Fe
For die casting and plastic mold dies; oil hardened, tough.

SUWEFA TX15
M-1307, 0.35 C, 1.55 Ni, 1.55 Cr, 0.2 Mo, bal Fe.
For die casting and plastic mold dies, oil hardened, tough.

SUWEFA TX20.
M-1307, 0.30 C, 2.0 Cr, 0.3 Mo, 2.0 Ni, bal Fe.
For die casting and plastic mold dies; oil hardened, tough.

SUWEFA UCN.
M-1307; 0.19 C, 1.25 Cr, 0.20 Mo, 3.75 Ni, bal Fe
For gears, bolts, camshafts, cams; oil hardened, tough.

SUWEFA UER
M-1307, 0.40 C, 13 Cr, 0.30 Mn, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 50 RA; 200 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; corrosion resistant.

SUWEFA UH50.
M-1307; 0.15 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA, 143 Brin.
For gears, bolts, cams, screws, fan blades; case hardened.

SUWEFA UH60.
M-1307; 0.15 C, 0.65 Cr, 0.25 Si, 0.50 Mn, bal Fe.
For gears, bolts, fan blades; case hardened.

SUWEFA UMC.
M-1307; 0.20 C, 1.15 Cr, 1.25 Mn, 0.25 Si, bal Fe.
For gears, bolts, camshafts, cams; case hardened.

SUWEFA UNIVERSAL.
M-1307; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
For springs, bolts, gears, machine tool parts; oil hardened, tough.

SUWEFA URV.
M-1307; 1.42 C, W, V, bal Fe.
For engravers' tools, cutters, forming dies, oil hardened, wear resistant.

SUWEFA USS.
M-1307, 0.90 C, 1.9 Mn, 0.10 V, bal Fe.
For punches, blanking and forming dies; oil hardening, non-deforming

SUWEFA V200.
M-1307, 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

SUWEFA V300.
M-1307, 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, broaches, taps, drills; high speed steel

SUWEFA V400.
M-1307, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe
For engravers' tools, form cutters, reamers, taps; high speed steel.

SUWEFA VC11.
M-1307, 1.1 C, 0.40 Cr, 0.30 Mn, bal Fe
For bearings, liners, sleeves, cutters; water or oil hardened.

SUWEFA VC12.
M-1307, 2.1 C, 11.5 Cr, 0.30 Mn, bal Fe
For blanking and forming dies; oil hardened, non-deforming

SUWEFA VCN188.
M-1307, 0.45 C, Cr, Ni, W, bal Fe.
For forging and heading dies; oil hardened, tough.

SUWEFA VCS2.
M-1307; 0.45 C, Si, Cr, bal Fe.
For machine tool parts; oil hardened, tough.

SUWEFA VCS9
M-1307, 0.45 C, Cr, Si, bal Fe.
For machine tool parts, oil hardened, tough

SUWEFA VMS
M-1307; 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
For machine tool parts; oil hardened, tough.

SUWEFA VRV.
M-1307, 1.3 C, 0.25 Si, 0.30 Mn, 0.20 max Cr, 4.75 W, bal Fe.
For cutters, engravers' tools, reamers; fast-finishing tool steel

SUWEFA W6.
M-1307, 0.60 C, 0.38 Si, 0.65 Mn, bal Fe.
Heat treated: 160,000 TS, 115,000 YS; 12 El; 40 RA; 325 Brin.
For wheels, die blocks, girders, rails, springs; water hardened

SUWEFA W18.
M-1307, 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, broaches, drills; high speed steel.

SUWEFA WCV4.
M-1307; 0.50 C, 1.0 Cr, 0.85 Mn, bal Fe.
For gears, bolts, crankshafts; oil hardened, tough.

SUWEFA WCV5.
M-1307; 0.58 C, 1.0 Cr, 0.09 V, 0.95 Mn, bal Fe.
For springs, gears, bolts, machine tool parts; oil hardened, shock resistant.

SUWEFA WCV9 SPEZIAL.
M-1307; 0.30 C, Cr, Mo, V, bal Fe.
For forging and heading dies, punches; oil hardened, tough.

SUWEFA WEL.
M-1307; 1.05 C, Cr, bal Fe.
For bearings, cutters, header dies, water hardened, wear resistant.

SUWEFA WES.
M-1307; 1.2 C, 0.10 V, 0.20 Cr, 0.28 Si, 1.0 W, bal Fe.
For header and blanking dies; oil hardened, tough.

SUWEFA WF8
M-1307, 0.67 C, 1.3 Si, 0.5 Mn, 0.50 Cr, bal Fe.
For springs, punches, chisels, upsetters, oil hardened, tough

SUWEFA WGKL
M-1307; 1.0 C, 0.30 Si, 0.35 Mn, 1.55 Cr, bal Fe.
For bearings, cutters, blanking dies; oil hardened, abrasion resistant.

SUWEFA WKL
M-1307, 1.0 C, 1.1 Cr, 0.07 Mn, 0.25 Si, bal Fe
For bearings, header dies; water hardened, wear resistant

SUWEFA WM13.
M-1307; 0.40 C, 0.40 Si, 0.30 Mn, 13 Cr, bal Fe
Annealed: 100,000 TS; 55,000 YS; 25 El, 55 RA, 200 Brin
For valves, cutlery, surgical and dental instruments; Type 420; stainless

SUWEFA WMS
M-1307, 0.30 C, 2.65 Cr, 0.33 V, 8.5 W, bal Fe
For extrusion rams and liners, punches, hot work steel, oil hardened.

SUWEFA WMS5.
M-1307; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, 0.30 Mn, bal Fe.
For extrusion rams, upsetters, punches, shears, hot work steel, oil hardened.

SUWEFA WMS SPEZIAL
M-1307, 0.30 C, 2.0 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For hot work tools, dies, punches, hot work steel, oil hardened.

SUWEFA WMV.
M-1307, 0.45 C, 1.35 Cr, 0.45 Mo, 0.8 V, 0.45 W, bal Fe.
For forging and heading dies, die casting dies; oil hardened, tough.

SUWEFA WRL.
M-1307, 0.90 C, 0.80 Cr, 0.30 Mn, 0.25 Si, bal Fe
For bearings, cutters, sleeves, liners, water hardened, wear resistant.

SUWEFA WRL HART.
M-1307; 1.05 C, 1.0 Cr, 0.30 Mn, 0.25 Si, bal Fe
For bearings, cutters, sleeves, liners; water hardened, wear resistant.

SUWEFA WS1.
M-1307; 1.20 C, W, bal Fe.
For cutters, dies; oil hardened, wear resistant.

SUWEFA W SPEZIAL 4
M-1307; 0.45 C, 0.25-0.50 Si, 0.30 Mn, bal Fe.
Hot rolled: 98,000 TS, 58,000 YS; 24 El; 45 RA; 212 Brin.
For machine tool parts, gears; water hardened.

SUWEFA W SPEZIAL H.
M-1307; 0.90 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 190,000 TS, 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, taps, cutters, reamers, drills; Type W1; water hardened.

SUWEFA W SPEZIAL MH.
M-1307; 0.75 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated. 175,000 TS; 128,000 YS, 12 El; 37 RA; 352 Brin.
For springs, rails, clutch discs, girders; Type W1; water hardened.

SUWEFA W SPEZIAL WEICH.
M-1307; 0.35 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 183 Brin.
For gears, bolts, shafts, axles; water hardened

SUWEFA W SPEZIAL ZAH.
M-1307, 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled. 98,000 TS, 59,000 YS; 24 El; 45 RA; 212 Brin
For axles, gears, bolts, tie rods, water hardened.

SUWEFA W SPEZIAL ZH
M-1307, 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated 160,000 TS; 113,000 YS, 12 El; 40 RA; 320 Brin
For wheels, die blocks, girders, springs, water hardened

SUWEFA WT13.
M-1307, 0.20 C, 0.40 Si, 0.30 Mn, 13 Cr, bal Fe.
Annealed: 73,000 TS; 40,000 YS, 22 El; 58 RA; 140 Brin
For turbine blades, valves, cutlery; Type 420, stainless

SUWEFA WZK SPEZIAL
M-1307, 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams and liners, punches, upsetters, hot work steel, oil hardened.

SUWEFA ZGW
M-1307, 1.65 C, 11.5 Cr, 0.10 V, bal Fe
For forming and blanking dies, air hardened, non-deforming

SUWEFA ZH12.
M-1307, 2.1 C, 11.5 Cr, 0.30 Mn, 0.25 Si, bal Fe.
For forming and blanking dies, punches, oil hardened, non-deforming

SUWEFA ZH120.
M-1307, 2.1 C, 11.5 Cr, 0.30 Mn, 0.35 Si, bal Fe
For blanking and forming dies, punches; oil hardened, non-deforming

SVENSKA SM-0010.
M-1186, 99.99 Cu, 0.03 oxygen
Annealed: 33,000 TS; 70,000 YS; 45 El.
½ H-temper. 40,000 TS; 36,000 YS; 15 El; 80 Brin.
For electrical terminals, tough pitch copper.

SVENSKA SM-1092.
M-1186; 8 Zn, 92 Cu.
Annealed: 36,000 TS; 10,000 YS; 45 El; 50 Brin.
H-temper. 64,000 TS, 56,000 YS; 5 El; 125 Brin.
For hardware, commercial bronze.

SVENSKA SM-1160.
M-1186; 60 Cu, 0.4 Pb, bal Zn.
Annealed 52,000 TS, 18,000 YS, 40 El, 100 Brin.
¼ H-temper: 57,000 TS; 43,000 YS; 20 El; 137 Brin.
For architectural trim, condenser tubes, hardware, Muntz Metal.

SVENSKA SM-1163.
M-1186; 63 Cu, 0.3 Pb, bal Zn.
Annealed: 51,000 TS; 18,000 YS; 50 El; 64 Brin.
H-temper: 86,000 TS; 65,000 YS; 5 El; 176 Brin.
For screw machine products; low leaded brass.

SVENSKA SM-1261.
M-1186; 61 Cu, 1 Pb, bal Zn.
Annealed: 52,000 TS; 18,000 YS; 40 El; 75 Brin.
H-temper: 70,000 TS; 45,000 YS; 20 El; 137 Brin.
For screw machine products; leaded brass.

SVENSKA SM-1263.
M-1186; 63 Cu, 1 Pb, bal Zn.
Annealed: 51,000 TS; 18,000 YS; 40 El; 69 Brin.
½ H-temper: 65,000 TS; 50,000 YS; 20 El; 132 Brin.
For screw machine products; leaded brass.

SVENSKA SM-1661.
M-1186; 61.5 Cu, 3 Pb, bal Zn.
½ H-temper: 49,000 TS; 18,000 YS; 40 El; 61 Brin.
H-temper: 68,000 TS; 52,000 YS; 20 El; 150 Brin.
For screw machine products; leaded brass.

SVENSKA SM-1956.
M-1186; 56 Cu, 0.5 Pb, 0.4 Al, bal Zn
For architectural trim; brass.

SVENSKA SM-2276.
M-1186; 76 Cu, 2 Al, 0.05 As, bal Zn.
Annealed: 65,000 TS; 42,000 YS; 40 El; 107 Brin.
For condenser tubes; aluminum brass.

SVENSKA SM-2771.
M-1186; 71 Cu, 1 Sn, 0.4 As, bal Zn.
Annealed: 65,000 TS; 42,000 YS; 35 El; 107 Brin.
For condenser tubes; evaporator and heat exchanger tubes; Inhibited Admiralty.

SVENSKA SM-4210.
M-1186, 88.4 Cu, 10 Ni, 1.2 Fe, 0.4 Mn, bal Zn.
Cold drawn: 44,000-60,000 TS; 22,000-57,000 YS; 45-15 El; 64-120 Brin.
For condenser tubes; corrosion resistant

SVERKER 1.
M-111; 2 C, 0.7 Mn, 13 Cr, 0.2 V, bal Fe.
For dies; for cold work, non-deforming

SVERKER 2.
M-111; 1.5 C, 12 Cr, 0.08 Mo, 0.2 V, bal Fe.
For dies; for cold work, non-deforming.

SVERKER 3.
M-111; 2.05 C, 0.75 Mn, 13 Cr, 1.25 W, bal Fe.
For coldwork dies; air or oil hardening; non-deforming; AISI D6.

SVERKER 21.
M-111; 1.55 C, 12 Cr, 0.8 Mo, 0.9 V, bal Fe
Hardened: 278,000 TS; 214,000 YS; 1 El; C 56 Rock.
For hobs, plastic molds, punches
Type D2 air hardening steel, wear resistant.

SVM.
M-27, M-1618; 0.55 C, 0.75 Mn, 1.85 Si, 0.25 V, 0.50 Mo, bal Fe.
Ht. Tr.: 275,000 TS; 247,000 YS; 9 El, 514 Brin
For pneumatic tools, shear blades, punches, chisels, caulking tools.
Type S5 tool steel, tough, shock resistant.

SWB 7SC5.
M-1331; 0.67 C, 1.3 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For springs; oil hardened, good resiliency.

SWB-13C2.
M-1331; 0.13 C, Cr, bal Fe.
For gears, cams, machine tool parts; case hardening.

SWB 14N6.
M-1331; 0.13 C, 0.2 Cr, 1.5 Ni, bal Fe.
For gears, pinions, shafts, cams, camshafts; case hardened, shock resistant.

SWB 15C3.
M-1331; 0.15 C, 0.65 Cr, bal Fe.
For gears, pinions, shafts, cams, camshafts; case hardened, shock resistant.

SWB 15CN6.
M-1331; 0.15 C, 1.5 Cr, 1.5 Ni, bal Fe.
For gears, pinions, camshafts, cams, shafts; case hardened, shock resistant.

SWB 15MNC32.
M-1331; 0.15 C, bal Fe.
Cold drawn: 72,000 TS; 60,000 YS; 22 El; 58 RA; 145 Brin.
For gears, cams, camshafts, fasteners; case hardening steel.

SWB 16M5
M-1331; 0.16 C, Si, 1.1 Mn, bal Fe.
For gears, cams, camshafts; case hardening.

SWB 16M8.
M-1331; 0.16 C, Si, 1.2 Mn, bal Fe.
For gears, cams, camshafts; case hardening.

SWB 16MC5.
M-1331; 0.16 C, 0.25 Si, 1.15 Mn, 0.95 Cr, bal Fe.
For gears, cams, camshafts, machine tool parts; case hardening

SWB 18CN8.
M-1331, 0.18 C, 2 Cr, 2 Ni, bal Fe.
For gears, shafts, machine tool parts; case hardening

SWB-20MC5.
M-1331; 0.2 C, 1.25 Mn, 1.15 Cr, bal Fe
For gears, shafts, machine tool parts; case hardening

SWB-22CV4
M-1331; 0.22 C, 1.1 Cr, 0.2 V, bal Fe
For gears, cams, camshafts; case hardening

SWB-22M3
M-1331, 0.22 C, 1 Mn, bal Fe.
For gears, cams, camshafts, case hardening.

SWB-24CMo5
M-1331; 0.24 C, 1.15 Cr, 0.25 Mo, bal Fe.
For gears, bolts, fasteners, shafts; water or oil hardened, tough.

SWB-24CMo54.
M-1331; 0.24 C, 1.25 Cr, 0.45 Mo, bal Fe
For gears, shafts, bolts, studs, fasteners; water or oil hardened, tough.

SWB 24CMoV55
M-1331, 0.25 C, 1.35 Cr, 0.55 Mo, 0.2 V, bal Fe.
For gears, machine tool parts, bolts, shafts; oil hardened, shock resistant.

SWB-25CMo4
M-1331, 0.25 C, 1.0 Cr, bal Fe
For gears, shafts, bolts, studs; water hardened.

SWB-27MCV5
M-1331; 0.27 C, Mn, Cr, V, bal Fe.
For gears, shafts, machine tool parts; water hardened, tough.

SWB-30M5.
M-1331; 0.30 C, 1.35 Mn, bal Fe.
For gears, shafts, machine tool parts; water or oil hardened.

SWB-30MoV9.
M-1331; 0.3 C, 2.5 Cr, 0.2 Mo, 0.15 V, bal Fe.
For gears, axles, machine tool parts, bolts; oil hardened, shock resistant.

SWB-31CMoV9.
M-1331; 0.31 C, 2.35 Cr, 0.18 Mo, 0.13 V, bal Fe.
For gears, shafts, machine tool parts, bolts; oil hardened, shock resistant.

SWB-32CAMo4.
M-1331; 0.32 C, 1.1 Al, 1.1 Cr, 0.18 Mo, bal Fe.
For oil refinery equipment, fasteners; creep resistant.

SWB-33CAN7.
M-1331; 0.33 C, 1.1 Al, 1.7 Cr, 1 Ni, bal Fe.
For oil refinery equipment, fasteners; creep resistant

SWB-34C4.
M-1331; 0.33 C, 1 Cr, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; water hardened.

SWB-34CA6.
M-1331; 0.34 C, 1.1 Al, 1 Cr, 0.65 Mn, bal Fe.
For oil refinery equipment, fasteners; creep resistant.

SWB-34CNMo6.
M-1331; 0.34 C, 0.55 Mn, 1.5 Cr, 0.2 Mo, 1.5 Ni, bal Fe.
For gears, shafts, machine tool parts, bolts; oil hardened, shock resistant.

SWB-35CMo4.
M-1331; 0.33 C, 0.65 Mn, 1 Cr, 0.2 Mo, bal Fe.
For gears, shafts, machine tool parts, bolts; oil hardened, shock resistant.

SWB-35MC72.
M-1331; 0.40 C, 1.5 Mn, Cr, bal Fe.
For gears, shafts, machine tool parts, crimpers; oil hardened, tough.

SWB-36C6
M-1331, 0.36 C, 0.45 Mn, 1.6 Cr, bal Fe.
For gears, shafts, machine tool parts; water hardened.

SWB 36CNMo4.
M-1331; 0.36 C, 0.65 Mn, 1 Cr, 0.2 Mo, 1 Ni, bal Fe.
For gears, shafts, machine tool parts, bolts; oil hardened, shock resistant.

SWB-37MS5
M-1331; 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
For machine tool parts, upsetters, oil hardened, shock resistant

SWB-37MSG
M-1331, 0.35 C, 1.25 Si, 1.25 Mn, bal Fe
For machine tool parts, upsetters; oil hardened, shock resistant

SWB-40M4
M-1331, 0.4 C, 0.95 Mn, bal Fe
Hot rolled: 95,000 TS; 60,000 YS; 25 El; 50 RA; 205 Brin.
For gears, shafts, machine tool parts, bolts; water hardened.

SWB-41C4.
M-1331; 0.41 C, 1.0 Cr, 0.65 Mn, bal Fe.
For gears, shafts, machine tool parts; water hardened.

SWB-42CMo4.
M-1331; 0.42 C, 0.65 Mn, 1 Cr, 0.2 Mo, bal Fe.
For gears, shafts, crimpers, bolts, punches; oil hardened, tough.

SWB-42CV6
M-1331; 0.42 C, Cr, V, bal Fe.
For gears, shafts, bolts, axes, fasteners; oil hardened, shock resistant.

SWB-42MV7.
M-1331; 0.42 C, 1.75 Mn, 0.1 V, bal Fe.
For punches, crimpers, upsetters; shock resistant.

SWB-46M7.
M-1331; 0.46 C, 1.75 Mn, 0.1 V, bal Fe.
For punches, crimpers, upsetters; shock resistant.

SWB-46MSG.
M-1331; 0.46 C, 1.2 Si, 1.25 Mn, bal Fe.
For punches, upsetters, riveters; oil hardened, shock resistant.

SWB-50CMo4.
M-1331; 0.5 C, 0.65 Mn, 1 Cr, 0.2 Mo, bal Fe.
For bolts, studs, machine tool parts; oil hardened, shock resistant.

SWB-50CV4.
M-1331; 0.5 C, 0.85 Mn, 1 Cr, 0.09 V, bal Fe.
For bolts, springs, shafts, crankshafts; oil hardened, shock resistant.

SWB-50CVG.
M-1331; 0.5 C, 0.85 Mn, 1 Cr, 0.09 V, bal Fe.
For bolts, fasteners, crankshafts, axles, springs; oil hardened, shock resistant.

SWB-53MS4.
M-1331; 0.53 C, 0.8 Si, 1.05 Mn, bal Fe.
For springs, bolts, shafts, tough, oil hardened.

SWB-58CV4.
M-1331, 0.58 C, 0.95 Mn, 1 Cr, 0.09 V, bal Fe.
For springs, crankshafts, axles; tough, oil hardened.

SWB-70WS7.
M-1331; 0.70 C, 1.7 Si, 0.7 Mn, bal Fe.
For dies, punches, upsetters, springs; oil hardened, shock resistant.

SWB-74NC2
M-1331; 0.75 C, Ni, Cr, bal Fe.
For punches, upsetters, crimpers; oil hardened, shock resistant.

SWB-85C7
M-1331, 0.85 C, 1.75 Cr, 0.35 Mn, bal Fe.
For bearings, liners, sleeves, water or oil hardened, wear resistant.

SWB-100C4.
M-1331, 1.0 C, 1.1 Cr, 0.07 Mn, bal Fe.
For bearings, liners, sleeves, water hardened, wear resistant

SWB-100C6
M-1331, 1.0 C, 0.35 Mn, 1.55 Cr, bal Fe.
For bearings, liners, races, sleeves; water hardened, wear resistant.

SWB-105C4.
M-1331, 1.05 C, 0.25 Si, 0.3 Mn, 1 Cr, bal Fe.
For bearings, liners, sleeves, cutters; water hardened, wear resistant

SWB-110C2.
M-1331, 1.1 C, 0.4 Cr, 0.3 Mn, bal Fe.
For bearings, liners, races, sleeves; water hardened, wear resistant.

SWB-120C5.
M-1331; 1.2 C, 0.3 Mn, 0.2 Si, bal Fe.
For cutters, drills, reamers, hobs, taps; Type W1; water hardened.

SWB-130C1.
M-1331; 1.25 C, 0.2 Si, 0.3 Mn, 1 Cr, bal Fe.
For bearings, races, taps, reamers, water hardened, wear resistant

SWB-140C3.
M-1331; 1.4 C, 0.2 Si, 0.3 Mn, 1 Cr, bal Fe.
For bearings, sleeves, liners, races; water hardened, wear resistant.

SWB-150C6.
M-1331; 1.45 C, 0.25 Si, 0.6 Mn, 1.4 Cr, bal Fe.
For bearings, sleeves, liners, races; water hardened, wear resistant.

SWB-200C8.
M-1331; 2.0 C, 13 Cr, bal Fe.
For blanking and forming dies; oil or air hardened, nondeforming.

SWB-A7.
M-1331; 0.40 C, 0.25 Si, 0.25 Mn, bal Fe.
Hot rolled: 92,000 TS; 58,000 YS; 27 El; 50 RA; 205 Brin.
For gears, bolts, shafts, studs, fasteners; water hardened.

SWB-A8.
M-1331; 0.85 C, 0.25 Si, 0.25 Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 12 El; 35 RA; 390 Brin.
For drills, hobs, springs, cutters; Type W1; water hardened.

SWB-A10.
M-1331; 1.0 C, 0.25 Si, 0.25 Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, reamers, cutters, springs; Type W1; water hardened

SWB-A10 SPEZIAL.
M-1331; 1.0 C, 0.2 Si, 0.25 Mn, 0.1 V, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, springs, reamers; Type W2, water hardened.

SWB-A11.
M-1331; 1.1 C, 0.25 Si, 0.25 Mn, bal Fe.
Annealed 105,000 TS, 55,000 YS; 20 El; 40 RA; 200 Brin.
For drills, hobs, reamers, broaches; Type W1; water hardened.

SWB-A13.
M-1331; 1.3 C, 0.25 Si, 0.25 Mn, bal Fe.
For engravers tools, taps, reamers; Type W1; water hardened.

SWB-CMo4.
M-1331; 0.33 C, 0.65 Mn, 1 Cr, 0.2 Mo, bal Fe.
For gears, shafts, crankshafts, machine tool parts, bolts; oil hardened, tough.

SWB-CNMo8.
M-1331, 0.30 C, 2 Cr, 0.3 Mo, 2 Ni, bal Fe.
For gears, bolts, machine tool parts, water or oil hardened, shock resistant

SWEAT-ON PASTE
M-963; 82.0 Cr, 18.0 B
Hardness of deposit: C 68-72 Rock.
For thin coating having extreme abrasion
For earth cutting tools, chutes, fan blades.

SWEDESTEEL "A."
M-367; 0.8 C, bal Fe
For rock drills, concrete busters; water hardened.

SWEDESTEEL "B."
M-367; 0.8 C, 0.2 Mo, bal Fe
For scarifier teeth, chisel blanks, water hardened

SWEDESTEEL "C."
M-367, 0.5 C, 1 Cr, 1.5 Ni, bal Fe
For shovel teeth; oil hardened.

SWEDESTEEL "D."
M-367; 0.5 C, 1.5 Cr, 0.2 V, bal Fe.
For digging bars.

SWEDESTEEL "E."
M-367; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For tool bits, drills, taps; high speed steel.

SWEDISH STEEL NO. 4.
M-336; 0.9-1.0 C, bal Fe.
For embossing dies, wood and machine screw cold-header dies; water hardened

SWEDISH STEEL NO. 9.
M-336; C, alloy, bal Fe.
For large cold-header dies; water hardened.

SWEDISH STEEL NO. 41.
M-336; C, high Si, high Mn, bal Fe.
For chipping chisels; retains keen cutting edge.

SWEDISH VANADIUM.
M-80; 0.7 C, 0.2 V, bal Fe.
For tools and dies, punches; water hardened.

SWED-OIL.
M-335; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, 0.2 V, bal Fe.
Oil hardening tool and die steel.

SWESCO E.
M-1026, 0.10 C, 17-20 Cr, bal Fe
Heat treated. 75,000 TS; 40,000 YS; 50 El.
For heat treatment castings; resists oxidation to 1550°F.

SWESCO E-2
M-1026, 0.20-0.30 C, 0.60-0.85 Mn, 0.35-0.50 Si, bal Fe
Annealed 72,000 TS; 42,000 YS; 29 El; 49 RA; 147 Brin
Normalized: 78,500 TS; 44,500 YS; 30 El; 48 RA; 163 Brin.
For cast gears, shafts, machinery parts; water hardened.

SWESCO E-3.
M-1026, 0.30-0.35 C, 1 Mn, 0.30 Mo, 0.8 Cu, bal Fe
Annealed: 97,000 TS; 58,500 YS, 24 El, 39 RA, 192 Brin
Heat treated: 113,000 TS, 100,000 YS; 20 El; 55 RA; 245 Brin.
For cast gears, shafts, machinery parts, water hardened, tough.

SWESCO E-4.
M-1026; 0.45-0.50 C, 1 Mn, 0.30 Mo, 1.25 Cr, 0.9 Cu, bal Fe
Cast 107,000 TS, 78,250 YS; 19 El; 41 RA; 217 Brin
For pumps, valves

SWESCO E-5
M-1026, 0.40-0.50 C, 0.70-0.90 Mn, 0.003 B, 0.3-0.5 Si, bal Fe
Normalized: 98,500 TS; 49,500 YS, 22 El; 32 RA; 179 Brin
For dies, gears, sprockets, runways; cast to shape

SWESCO F.
M-1026, 0.40 C, 23-28 Cr, 9-13 Ni, bal Fe
Cast. 70,000 TS, 45,000 YS; 15 El.
For heat and corrosion resistant castings, resists oxidation to 2100°F.

SWESCO G
M 1026, 0.10 C, 34-37 Ni, 13-17 Cr, bal Fe
Cast: 60,000 TS; 35,000 YS; 5 El
For heat resistant castings; resists oxidation to 2100°F.

SWIFTWELD.
M-578, 0.2 C, bal Fe.
Cast. 45,000-55,000 TS; 5-10 El.
For welding electrodes, for mild steel

SWITCH COPPER.
M-238, Cu.
Rolled: 36,000 TS, 15 El.
For switch blades, electrical parts, high electrical conductivity.

SYLCUM.
M-England; 7.3 Cu, 0.5 Mn, 1.4 Ni, 0.5 Fe, 9 Si, bal Al.
For pistons.
Cast, corrosion resistant.

SYLVALOY.
M-61; 97 Ni, 3 Si.
Annealed: 75,000 TS; 35 RA.
For vacuum tube filaments; magnetic.

SYLVANIA NO 4.
M-856; 42 Ni, 5.6 Cr, 0.20 Mn, 0.25 Si, 0.15 max Al, bal Fe.
Annealed. 73,000 TS; 30,000 YS; 40 El; 107 Brin.
Cold drawn: 140,000 TS; 135,000 YS, 2 El; 210 Brin.
For glass to metal seals; controlled expansion.

SYLVANIA A.
M-856; 0.5 Hf, 0.02 C, bal W
Stress Relieved· 64,200 TS at 2000°F.
For gyros, high density materials.
Very little weldability
Highest creep strength at 3200°F, brittle.
High ductile to brittle transition temp.

SYLVANIA MT-104.
M-856; 0.5 Ti, 0.08 Zr, 0.025 C, bal Mo.
Rolled: 145,000 TS, 117,000 YS, 21 El; 52 RA.
Recrystallized. 85,000 TS; 56,000 YS, 40 El, 34 RA.
Stress-Relieved: 133,000 TS; 100,000 YS; 31 El; 59 RA
For heat engines, heat exchangers, nuclear reactors, radiation shields, rocket nozzles, vector controls.
Good high temperature properties. Powder metallurgy

SYLVANIA NC73.
M-856, 90 W, 7 Ni, 3 Cu.
Sintered· 115,000 TS; 105,000 YS, 8 El; C 45 Rock.
For counterweights, radioactive shields, electric contacts, flywheels, governors, gyroscope parts.
(Name changed to WN-103)
Sintered heavy metal

SYLVANIA NF 22
M-856, 95 W, 2.5 Ni, 2.5 Fe
Sintered. 140,000 TS, 120,000 YS; 18 El; C 50 Rock
For counterweights, radioactive shields, electric contacts, flywheels, governors, gyroscope parts
(Name changed to WN-102)
Heavy metal, sintered

SYLVANIA NR-106
M-856, 8-10 Eu_2O_3 + Gd_2O_3 + Sm_2O_3, bal Ni
R T · 56,000 TS, 28,000 YS, 15 El; 230 DPH
At 1800°F 7000 TS, 5000 YS, 14 El
For nuclear reactor control structures
Neutron flux control Used up to 2000°F
Sintered powders Dispersion alloy

SYLVANIA NS55.
M-856; 0.0018 Na, 0.0049 K, 0.0003 Ca, 0.0008 Si, 0.0008 Cr, 0.0025 Fe, 0.0004 Al, 0.02 C, 0.00002 Cu, 0.0004 max Mg, bal Fe
For high temperature filaments and instruments
High purity iron.

SYLVANIA WN-102.
M-856; 95 W, 2.5 Ni, 2.5 Fe
Sintered: 125,000 TS; 100,000 YS; 11 El, C 26-31 Rock.
For counterweights, radioactive shielding, electrical contacts, flywheels, governors, gyroscopes.
Sintered heavy alloy.

SYLVANIA WN-103.
M-856; 90 W, 7 Ni, 3 Cu.
Sintered· 110,000 TS, 95,000 YS; 8 El; C 20-25 Rock
For counterweights, radioactive shielding, electrical contacts, gyros, flywheels, governors.
Sintered heavy metal.

SYLVANITE F8.
M-35, 1.25 C, 4 Cr, 8 W, 0.5 V, bal Fe.
For wood working knives, scrapers, wood working tools.
High speed steel, good red-hardness.

SYLVAN STAR.
M-57, 1.05 C, 0.10 Cr, 0.2 V, bal Fe.
Annealed· 100,000 TS; 53,000 YP; 21 El; 197 Brin.
Ht Tr.· 104,000-216,000 TS; 74,000-152,000 YP; 11-23 El; 32-50 RA; 200-600 Brin.
For cold work dies, tools, cutters, axes, chisels, punches.
Type W2 water hardening tool steel.

SYRACUSE GENUINE BABBITT.
M-565; Cu, Sb, Pb, bal Sn.
70,000 TS.
For bearings to resist shock and high temperature; Babbitt metal; shock resistant.

T-1-ALLOY
M-190; 4 Cu, 0.2 Ti, bal Al.
Heat treated: 30,000-34,000 TS; 7-9 El.
For light alloy parts; age-hardenable.

T 2 EXTRA
M-96, 0.56 C, 0.9 Mn, 0.4 Si, 0.5 Cr, bal Fe
For shafts, dies, punches; water hardening.

T5K12V.
M-Russia, 83 WC, 5 TiC, 12 Co.
For hard cutting tools, wear resistant dies.
Sintered carbide, wear resistant.

T15K6.
M-Russia; WC, TiC, Co.
For cutting tools
Sintered carbide, abrasion resistant.

T51 see HEPPENSTALL T51.

Ta-8W-2 Hf.
M-53; 8 W, 2 Hf, bal Ta.
At R T 112,000 TS; 96,000 YS.
At 24000°F 40,000 TS; 33,000 YS.
At 3500°F. 11,000 TS; 11,000 YS.
For high temperature applications.
Good high temperature strength and cryogenic ductility

Ta-10W
M-53, 10 W, bal Ta
At R.T.. 109,000 TS, 101,000 YS
At 2000°F: 61,000 TS; 55,000 YS.
At 3000°F: 19,000 TS, 16,000 YS
For high temperature applications.
Good high temperature strength and cryogenic ductility.

Ta-12.5 W.
M-53; 12.5 W, bal Ta
At R T.· 102,000 TS; 85,000 YS
At 4900°F: 1900 TS, 1400 YS
For high temperature applications.
Good high temperature strength and cryogenic ductility.

TA-135
M-634, C, alloy, bal Fe.
For gear sectors, castings.

TACK DIE
M-38, 2 C, 2 Cr, 12 W, bal Fe.
For tools, dies; oil hardened.

TACK DIE
M-357; 2.05 C, 1.05 Mn, 0.85 Si, 1.25 Cr, 9.5 W, bal Fe.
For tack dies; oil hardening.

TAIFUN.
M-614; 1.05 C, 0.90 Mn, 1.0 Cr, 1.15 W, bal Fe.
For cold work tools, heading dies; oil hardened, tough.

TAIL SHAFT BRONZE.
M-508; 87 Cu, 6 Sn, 3 Pb, 4 Zn.
For bearings, pump liners; centrifugal casting.

TALABOT A.C.T. NO. 1.
M-1119; 0.5 C, 1.5 Cr, 2.2 W, 0.2 V, bal Fe.
For hot work dies and tools; hot work steel.

TALABOT A.C.T. NO. 2.
M-1119; 0.5 C, 1.5 Cr, 2.2 W, 0.2 V, bal Fe.
For hot work dies and tools; hot work steel.

TALABOT F.C. 2.
M-1119; 2.25 C, 13 Cr, bal Fe.
For tools, dies; non-deforming.

TALABOT MNS.
M-1119; 0.5 C, 0.7 Mn, 1.9 Si, 0.2 Mo, bal Fe.
For tools, dies, punches; tough.

TALABOT SPECIAL OM.
M-1119; 0.95 C, 1.2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tools, dies, cutters; non-deforming.

TALIDE 101.
M-913; W, C, Co.
Sintered: 840 Brin.
For drawing dies, blast nozzles; Tr.S. 190,000; C.S. 810,000; sintered carbides

TALIDE C-75.
M-913; WC.
Sintered: Rockwell A85
For cutting tools; sintered carbide.

TALIDE C-80.
M-913; WC.
Sintered: Rockwell A87
For cutting tools; sintered carbide.

TALIDE C-85.
M-913; WC.
Sintered: Rockwell A88.
For cutting tools; sintered carbide

TALIDE C-88.
M-913; 9 Co, 91 Wc.
Sintered: A 91 Rock; 275,000 Tr.S ; 275,000 CS.
For extrusion and swaging dies, draw punches.
Wear and abrasion resistant.

TALIDE C-89.
M-913; 84.5 W, 5.5 C, 10 Co.
Sintered: 150,000 TS; Rockwell A90.
For draw dies, cutting tools; sintered carbide

TALIDE C-91.
M-913; 86.4 W, 5.6 C, 8 Co.
Sintered: 140,000 TS; Rockwell A91.5.
For draw dies, cutting tools; sintered carbide

TALIDE C93.
M-913; 86 W, 2.3 Ta, 5.8 C, 6 Co.
Sintered: 130,000 TS; 790 Brin.
For wear plates, guides, dies; heat resistant to 2000°F.

TALIDE C-95.
M-913; 91 W, 6 C, 3 Co.
Sintered: 810 Brin.
For precision boring and finishing cutters; Tr. S. 200,000; C.S. 775,000, sintered carbides.

TALIDE C-99.
M-913; WC.
Sintered: Rockwell A91.
For cutting tools; sintered carbide.

TALIDE C-907.
M-913; Sintered carbide tool material.
For cutting tools on finish cutting operations, and for cold work dies for processing aluminum.

TALIDE C-7525.
M-913; 66 W, 5 Ta, 25 Co, 6 C.
Sintered: 210,000 TS; 650 Brin.
For cold working tools, blanking dies; sintered carbide.

TALIDE C-8020.
M-913; 5 C, 75 W, 20 Co.
Sintered: 190,000 TS; 680 Brin.
For punching and shearing tools; sintered carbides.

TALIDE C-8515.
M-913; 79.8 W, 5.2 C, 15 Co.
Sintered: 175,000 TS; 700 Brin.
For impact tools; sintered carbides.

TALIDE CT-20.
M-913; Sintered carbide tool material.
For dies for cold extrusion of non-ferrous metals.

TALIDE CT-28.
M-913; Sintered carbide tool material
For cutting tools for flash trimming operations.

TALIDE S-88
M-913; 75 W, 14 Ti, 5.6 Ta, 6.3 C, 9 Co.
Rockwell A90.
For cutting tools, cold forming dies; sintered carbides.

TALIDE S-90.
M-913, 73 W, 8 Ti, 2 Ta, 7 C, 10 Co.
Rockwell A91.
For cutting tools; sintered carbides

TALIDE S-92.
M-913, 69.5 W, 9.6 Ti, 5.6 Ta, 7.3 C, 8 Co.
Rockwell A92.
For cutting tools, sintered carbides.

TALIDE S-94
M-913, 65.7 W, 12 Ti, 7.5 Ta, 7.8 C, 7 Co.
Sintered: 810 Brin.
For precision boring cutters, Tr S 180,000, C S. 750,000; sintered carbides.

TALIDE S-880.
M-913; Sintered carbide tool material
For cutting tools for rough cutting operations on steel.

TALIDE S-901
M-913, Sintered carbide tool material.
For cutting tools for finish cutting operations on steel

TALISMAN.
M-178; Sb, Sn, bal Pb.
For bearings; antifriction.

T-ALLOY.
M-140; 0.38 C, 3.5 Cr, 10.5 W, 0.4 V, bal Fe.
Hardened: C 48-52 Rock
For brass forging dies, hot forming dies, hot punches, spreading punches, dummy blocks.
Type H22 hot work tool steel.

T ALLOY "A"
M-140; 0.33 C, 3.5 Cr, 9.6 W, 0.5 V, bal Fe.
For tools, forming dies; hot work steel.

T-ALLOY B.
M-140; 0.5 C, 3.0 Cr, 15 W, 0.5 V, bal Fe.
For dies, punching and forming dies; hot work steels.

T-ALLOY C.
M-140; 0.25 C, 4 Cr, 15 W, 0.5 V, bal Fe.
For punching and forming dies; hot work steel.

T-ALLOY TOOL.
M-140; 0.35 C, 3.5 Cr, 0.4 V, 11 W, bal Fe.
For hot shear knives, hot forming dies; hot work steel.

TALMI GOLD-1.
Japan; 90 Cu, 8.9 Zn, 0.9 Au.
For cheap jewelry; Au welded on by rolling.

TALMI GOLD-2.
Japan; 86 Cu, 12 Zn, 1.1 Sn, 0.3 Fe.
For hardware, cheap jewelry; corrosion resist.

TALON.
M-210; 0.9 C, bal Fe.
For tools.

TAM
M-109; 12-15 Ti, 18-22 Al, 2-4 Si, 4.5 Cr.
For refining steel, grain refiner.

TAM CUPRO-TITANIUM.
M-109; 25-30 Ti, 0.2 max Fe, Si, C, bal Cu.
Used in adding Ti to Cu alloys, hardener.

TAM FOUNDRY FERRO TITANIUM.
M-109; 0.1 max C, 20-24 Si, 28-32 Ti, 0.5-1.5 Al, bal Fe.
For addition agent for alloy cast iron; inoculant.

TAM LOW CARBON FERRO TITANIUM 25% GRADE
M-109; 0.1 max C, 3-4.5 Si, 26-29 Ti, 4.5-6.5 Al, bal Fe.
For addition agent for alloy steel; inoculant

TAM LOW CARBON FERRO-TITANIUM (40% GRADE).
M-109, 38-42 Ti, 6-9 Al, 3-5 Si, < 0.1 C, bal Fe.
For source of Ti for alloy steels; Ti-additions

TAM MAGNESIUM-ZIRCONIUM K-50
M-109, 50 Zr, 50 Mg.
Addition agent to Mg alloys; for alloying.

TAM MANGANESE-TITANIUM REGULAR GRADE
M-109, 0.10 max C, 25-28 Ti, 8-10 Al, 1.5-3.5 Si, 20-25 Fe, bal Mn.
For steel deoxidizer, grain refiner.

TAM MANGANESE-TITANIUM SPECIAL GRADE.
M-109; 0.10 max C, 27-31 Ti, 8-10 Al, 2-4 Si, 2-5 Fe, bal Mn.
For steel deoxidizer; grain refiner.

TAM MED CARBON FERRO-CARBON TITANIUM.
M-109, 17-21 Ti, 3-5 C, approx 2-3 Si, approx 1.3 Al, bal Fe.
For steel metallurgical applications, for extra low C rimming steel.

TAM METALLIC TITANIUM.
M-109; > 98 Ti, < 0.2 Fe, < 0.2 Si, < 0.2 C, < 0.2 Al.
For making of special Titanium alloys; Ti-additions.

TAM MOLYBDENUM TITANIUM.
M-109; 48 Mo, 16 Ti, 2 Al, 7 Si, 27 Fe.
For ladle additions to cast iron; Mo-addition.

TAM NICKEL TITANIUM.
M-109; 62 Ni, 25 Ti, 8 Al, 1 Si, 3.5 Fe.
For ladle additions to steel; Ni-addition.

TAM ORIGINAL FERROCARBON TITANIUM.
M-109; 15-18 Ti, 6-8 C, 2.65 Si, 1.9 Al, bal Fe.
For deoxidizer in steel making.

TAM SILICO TITANIUM.
M-109; 44-47 Ti, 42-45 Si, 0.03-0.1 C, 1.5-3.0 Al, bal Fe.
For cast iron inoculant, steel deoxidizer; low M.P.

TANDEM.
78 Pb, 17 Sb, 5 Sn.
For bearings; anti-friction.

TANDEM B.M.
England; 66 Zn, 21.5 Sn, 7 Cu, 4.8 Pb, 0.4 Al.
For bearings; will not resist heat or live steam.

Ta-Ni (TANTALUM-NICKEL).
M-53; Ni plus Ta.
115,000 TS.
For electronic tube parts, chemical applications; cheaper than pure Ta.

TANK BRAND.
M-914, 0.3-0.5 C, bal Fe.
For machinery parts; water hardening.

TANNE 3M.
M-27; 0.55 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
Heat treated: 155,000 TS; 112,000 YS; 15 El; 45 RA; 310 Brin.
For crankshafts, tie rods, axles, bushings; water hardened.

TANNENBAUM.
M-1307; 0.55 C, 0.10-0.40 Si, 0.30-0.70 Mn, bal Fe
Annealed: 100,000 TS, 55,000 YS; 15 El; 22 RA; 180 Brin
For machine tool parts, bolts, gears; water hardened.

TANNENBAUM.
M-1308, 0.55 C, 0.30 Si, 0.60 Mn, bal Fe.
Heat treated: 160,000 TS; 115,000 YS; 13 El; 42 RA, 340 Brin.
For gears, shafts, tools, mandrels; water hardened.

TANTALOY.
M-53, M-329, TaC + Co.
For cutting tools; for corrosion resistant steels.

TANTALUM BRONZE.
M-99, 1.25 Mo, 0.20 Ta, 10 Al, bal Cu.
Sand cast. 68,700 TS; 44,000 YS; 8.5 El
Drawn wire: 162,200 TS, 154,000 YS, 1.7 El.
For steam fittings, valves, corrosion resistant.

TANTUNG.
M-53, M-329, 45-50 Co, 27-32 Cr, 1-3 Mn, 14-19 W, 2-7 Ta, Cb, 2-4 C, 2-5 Fe.
For cutting tools, mixer blades, hot swaging dies; wear and corrosion resistant.

TANTUNG 144.
M-329; 45-50 Co, 27-32 Cr, 2-4 C, 14-18 W, 2-7 Ta.
For cutting tools, cast, nonferrous.

TANTUNG 148.
M-53, M-329, 45-50 Co, 27-32 Cr, 14-19 W, 2-4 C, 2-7 Ta or Cb, 1-3 Mn, 2-5 Fe
Cast: 350 Brin.
Heat treated: 460 Brin.
For cutting tools, burner plates; shock, wear and corrosion resistant.

TANTUNG 162A.
M-53, M-329, 45-50 Co, 27-32 Cr, 14-19 W, 2-4 C, 2-7 Ta or Cb, 1-3 Mn, 2-5 Fe.
Cast. 490 Brin
For cutting tools, knives; high red hardness and transverse rupture strength.

TANTUNG 166A.
M-53, M-329, 45-50 Co, 27-32 Cr, 14-19 W, 2-4 C, 2-7 Ta or Cb, 1-3 Mn, 2-5 Fe.
Cast: 65,000 TS; 550 Brin.
For cutting tools, mold plungers; high red hardness and transverse rupture strength.

TANTUNG 171.
M-53, M-329; 45-50 Co, 27-32 Cr, 14-19 W, 2-4 C, 2-7 Ta or Cb, 1-3 Mn, 2-5 Fe.
Cast: 300 Brin.
For cutting tools, cast parts; corrosion and shock resistant.

TANTUNG G.
M-53, M-329; 28 Cr, 16 W, 46 Co, 2 C, 0.2 B, 2 Fe, 5 Ta.
For cutting tools, wear and corrosion resisting parts; carbides.

TANTUNG G2.
M-53, M-329; Cr-W-Co, TaC-CbC.
For cutting tools; cast.

TAP DIE.
M-35; 1.25 C, 1.0 W, 0.20 Cr, bal Fe.
Annealed: 200 Brin.
For tools, hobs, taps, reamers; brass cutting

TA QUALITY.
M-1405; 1 15 C, 0.35 Mn, 0.2 Si, bal Fe.
For punches, dies, drill jigs, cutting tools; water hardened.

TARNAC.
Cu, Mn, Ni.
For electrical instruments; v. "Manganin."

TARPON
M-1; C, alloy, bal Fe
For tools, fixtures; water hardening

TATA BB
M-997; 1.0 C, 1.5 Cr, 0.2 Mo, bal Fe.
For ball bearings, races, cold rolls, wear resistant

TATA CRDY.
M-997; 0 5 C, 1 Cr, bal Fe.
For die blocks, rifle barrels; wear resistant.

TATA CRW.
M-997; 0 4 C, 1 Si, 1 Cr, 2 W, bal Fe.
For pneumatic tools, boiler snaps; tough, shock resistant.

TATA DYH.
M-997; 1.35 C, 4 W, 1 Cr, bal Fe.
For cold working dies, plug gages, brass cutting tools; oil hardening.

TATA G-30-N
M 997; 0 14 C, 3.5 Ni, bal Fe
Normalized: 100,000 TS; 18 El.
For gears, pinions, shafts; case hardening.

TATA G-35-CRN.
M-997, 0.12 C, 3 5 Ni, 1 Cr, bal Fe
Rolled: 125,000 TS; 14 El
For gears, pinions, shafts; tough.

TATA G-45-N.
M-997, 0.12 C, 4.5 Ni, bal Fe.
Rolled 90,000 TS; 50,000 YS; 20 El
For case hardened parts, gears, shafts; tough.

TATA HC-12-CR.
M-997, 0 35 C, 14 Cr, bal Fe.
For cutlery; corrosion resistant.

TATA HCRH.
M-997, 2 0 C, 12 Cr, bal Fe
For wortle plates, blanking dies; wear resistant.

TATA HCRM.
M-997; 1 C, 12 Cr, bal Fe.
For shear blades, thread rollers, blanking dies, wear resistant.

TATA HD.
M-997; 0.35 C, 10 W, 4 Cr, bal Fe
For dies, mandrels, piercing and hot heading dies; hot work steel

TATA HMV.
M-997; 0.95 C, 1.7 Mn, 0.2 Mo, 2 V, bal Fe.
For press tools, gages, taps, dies; non-deforming.

TATA LC-12-CR.
M-997; 0.15 C, 12 Cr, bal Fe
Rolled: 78,000 TS; 25 El; 150-255 Brin.
For surgical instruments, forceps; corrosion resistant.

TATA LSB.
M-997; 0 6 C, 1 Cr, Mo, V, bal Fe.
For shear blades; tough, wear resistant.

TATA NCMA.
M-997; 0.3 C, 4 Ni, 1 Cr, 0.2 Mo, bal Fe
Hardened: 220,000 TS; 180,000 YS; 8 El; 444 Brin.
For gears, gudgeon pins, air hardening.

TATA NCMB.
M-997; 0.4 C, 1.5 Ni, 1 Cr, 0.2 Mo, bal Fe.
For piston rods, gears, crankshafts; air hardening

TATA NCRDY.
M-997; 0.5 C, 1.2 Ni, 0.8 Cr, bal Fe.
For die blocks, shock resistant.

TATA NDY.
M-997; 0.60 C, 1 5 Ni, bal Fe
Heat treated 212-269 Brin.
For die blocks, forging dies, oil hardening.

TATA NIMN
M-997, 1 0 C, 12 Mn, 4 Ni, bal Fe.
Normalized· 110,000 TS; 60,000 YS, 40 El; 60 RA; 150-277 Brin
For wearing plates, axle box liners; abrasion resistant austenitic.

TATA P-15-N
M-997, 0 12 C, 2 Ni, bal Fe
Normalized: 58,000 TS, 35,000 YS, 25 El, 60 RA.
Boiler stays, case hardened parts, tough

TATA P-35-N
M-997, 0 4 C, 3.5 Ni, bal Fe
Normalized· 110,000 TS, 85,000 YS; 20 El; 223-302 Brin
For crankshafts, gears, pistons, tough.

TATA SS
M-997, 0 15 C, 8 Ni, 18 Cr, bal Fe.
Rolled 80,000 TS, 34,000 YS; 30 El
For chemical plant equipment, stainless

TATA T C S 7
M-997, 0.65-0 75 C, bal Fe.
For hammers, spindles, pressing and stamping dies; water hardening

TATA T C S.8
M-997, 0 75-0 85 C, bal Fe
For hand chisels, shear blades, punches; water hardening

TATA T C S 9.
M-997; 0 85-0.95 C, bal Fe
For cold heading dies, mandrels, chisels, cutters, water hardening.

TATA T.C S 10
M-997; 0 95-1 05 C, bal Fe
For tapes, reamers, chisels, mint dies; water hardening

TATA T C.S 11.
M-997, 1 05-1 15 C, bal Fe.
For twist drills, reamers, punches, cutters; water hardening

TATA T C.S 12
M-997; 1 15-1 25 C, bal Fe.
For cutting tools, hack saw blades, lathe centers; water hardening

TATA T H.S.1
M-997; 0 65-0 75 C, 14 W, 4 Cr, 1 V, bal Fe.
For taps, reamers, piercing and blanking dies, shears; high speed steel.

TATA THS2.
M-997; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For drills, hobs, reamers, broaches, form cutters; high speed steel.

TATA T.H.S.3.
M-997; 0.7-0.8 C, 18 W, 4 Cr, 2 max V, bal Fe.
For form tools, broaches, drills, reamers, high speed steel

TATA THS-4
M997; 0.7 C, 18 W, 4.5 C, 1 V, 5 Co, bal Fe.
For turning tools, boring and milling cutters, high speed steel.

TATA T.H.S.5.
M-997; 0.7-0.8 C, 20 W, 4 Cr, 2 V, 10 Co, bal Fe
For cutting tools, planing and shaping tools, high speed steel.

TATA THS6.
M-997, 0.70 C, 22 W, 4 Cr, 1 V, bal Fe.
For cutters, tools; high speed steel.

TATA TS
M-997, 1.2 C, 1 W, bal Fe
For taps, drills, reamers, threading dies; water hardening, wear resistant

TATA W6F
M 997, 1.25 C, 6 W, bal Fe.
For finishing tools, cutters; fast finishing steel.

TATMO.
M-73, 0.80 C, 4 Cr, 8 Mo, 1.5 W, 1 V, bal Fe.
Hardened Rock C 64-66
For twist drills, cutters, reamers, broaches, milling cutters
Type M-1 high-speed tool steel, tough.

TATMO V
M-73, 1.0 C, 1.75 W, 3.75 Cr, 2.05 V, 8.75 Mo, bal Fe
Hardened 65-68 Rock C
For cutters, drills, reamers, lathe and planer tools, form tools, broaches
Type M-7 high speed steel Good red-hardness and edge toughness

TAURUS BRONZE MARK I.
M-476, 87.7 Cu, 12 Sn, 0.3 P
Sand cast: 24,700-40,300 TS; 15,700-24,700 YS, 25-5 El
For high quality gear bronze, Iz-25-40

TAURUS BRONZE MARK II.
M-476; 89.7 Cu, 10 Sn, 0.3 P.
Sand cast. 27,000-47,000 TS; 15,700-22,300 YS, 28-6 El.
For bearings requiring some plasticity; Iz-27-44.

TAURUS BRONZE MARK III.
M-476; 86 Cu, 14 Sn, trace P.
Sand cast: 29,000-33,200 TS; 24,700-29,000 YS; 3-1 El.
For bearings for turn tables, movable bridges, etc; Iz-13-17

TAURUS BRONZE MARK IV.
M-476; 88.25 Cu, 10.5 Sn, 0.25 P, 1.0 Ni.
Sand cast 31,300-49,000 TS; 17,800-31,300 YS, 30-8 El.
For sand castings requiring high strength, toughness and wearing qualities; Iz-40-60.

TAURUS BRONZE MARK V.
M-476; 88 Cu, 11.2 Sn, 0.3 P, 0.5 Ni.
Centrifugal: 40,300-49,000 TS; 27,000-36,000 YS; 5-15 El.
For gear bronze; Iz-24-32.

TAURUS BRONZE MARK VI.
M-476; 88 Cu, 10 Sn, 2 Zn.
Sand cast: 31,300-44,700 TS; 17,800-22,300 YS; 10-25 El.
For general bronze castings; similar to "Admiralty Metal."

TAURUS BRONZE MARK VII.
M-476; 81.7 Cu, 12 Sn, 0.3 P, 1 Ni, 5 Pb.
Sand cast 29,000-40,000 TS; 22,300-31,000 YS; 4-10 El.
For cogging and rolling mill bearings, heavy duty bearings, Iz-40-50.

TAURUS BRONZE MARK VIII.
M-476; 80.7 Cu, 10 Sn, 0.3 P, 1 Ni, 8 Pb.
Sand cast 31,300-37,800 TS, 22,300-27,000 YS; 6-12 El
For bearings, running against hard shafts; Iz-80-90.

TAURUS BRONZE MARK IX.
M-476; 76.7 Cu, 10 Sn, 0.3 P, 1 Ni, 12 Pb.
Sand cast. 31,300-37,800 TS, 20,700-27,000 YS; 8-13 El
For heavy duty plastic bronze bearings, Iz-60-80.

TAURUS BRONZE MARK X
M-476, 84 Cu, 8 Sn, 4 Pb, 4 Zn
Sand cast: 29,000-42,600 TS, 13,500-15,700 YS; 18-26 El
For dense general purpose castings, pump bodies, etc; Iz-90-120

TAURUS BRONZE MARK XI
M-476, 85 Cu, 5 Sn, 5 Pb, 5 Zn
Sand cast 29,000-40,300 TS; 13,500-15,700 YS; 20-30 El
For castings not requiring hardness, bushes and bearings, Iz-70-120

TAURUS BRONZE MARK XII
M-476, 88 Cu, 6 Sn, 6 Zn
Sand cast 36,000-42,600 TS, 15,700-17,800 YS, 30-60 El
For light, thin section, tough castings; Iz-120

TAURUS MARK XIV.
M 476, 86 Cu, 7 Sn, 5 Zn, 2 Pb
Cast 31,300-40,300 TS, 13,500-17,900 YS; 12-8 El
For general purpose castings, free-cutting

TAURUS MARK XVI
M 476, 90.75 Cu, 9 Sn, 0.5 Ni, 0.25 P.
Cast 44,800-53,800 TS, 22,400-31,400 YS; 30-21 El
For general purpose castings, corrosion resistant.

TAURUS MARK XIX
M-476, 88.5 Cu, 10.5 Sn, 0.75 Ni, 0.25 P.
Centrifugal cast 31,400-49,400 TS, 17,900-31,400 YS, 30-8 El
For centrifugal castings, wear resistant.

TAURUS MARK XX.
M-476, 80.5 Cu, 4 Ni, 2 Mn, 4 Fe, 9.5 Al.
Centrifugal cast. 89,600-105,000 TS; 35,200-56,000 YS; 16-12 El.
For highly stressed bearings and structures; fatigue resistance

TAURUS MARK XXI.
M-476; 55 Cu, 0.75 Mn, 1 Fe, 1 Al, bal Zn.
Sand cast. 67,000-78,500 TS; 25,900-31,400 YS; 28-20 El
For castings, corrosion resistant

TAURUS MARK XXII
M-476; 65 Cu, 2 Mn, 2 Fe, 5 Al, bal Zn.
Sand cast. 85,000-94,200 TS, 40,300-49,300 YS; 18-15 El.
For castings, corrosion resistant.

TAURUS MARK XXIII.
M-476; 60 Cu, 2 Mn, 2 Fe, 5.5 Al, bal Zn.
Sand cast: 107,500-112,000 TS; 58,200-67,200 YS; 15-12 El.
For castings; corrosion resistant.

TAURUS MARK XXIV.
M-476; 73 Cu, 5 Sn, 17 Ni, 5 Pb.
Centrifugal cast: 44,800-56,500 TS; 35,840-44,800 YS; 2-1 El.
For bushings, castings; good machinability.

TAURUS MARK XXV
M-476; 94.5 Cu, 1.5 Sn, 4 Ni.
Centrifugal cast: 38,200-49,300 TS; 20,300-26,800 YS; 42-25 El.
For slip rings for electrical machines; high conductivity.

TAURUS MARK XXVI.
M-476; 44 Cu, 11 Sn, 38 Ni, 7 Pb.
Centrifugal cast: 49,300-53,800 TS; 22,400-31,400 YS; 4-2 El.
For valve seats; for severe service.

TAURUS MARK XXX.
M-476; 88 Cu, 2 Sn, 10 Zn.
Sand cast: 26,900-31,300 TS; 35-30 El.
For brazing brass; high strength.

TAURUS MARK XXXI.
M-476, 59 Cu, 40 Zn, 1 Pb.
Sand cast: 40,300-44,800 TS; 15 El.
For valves, roll and ball bearing castings; free-cutting.

T.A.W.
M-53; 92.5 W, 7.5 Ta
For coil springs; heat resistant.

Ta-W (TANTALUM-TUNGSTEN).
M-53; Ta plus W.
For electronic tube parts, rectifier electrodes, chemical applications, harder and stiffer than pure Ta.

TAWILCO.
M-1442; 3 C, alloy, bal Fe.
Cast: 50,000 TS; 45,000 YS; 0 1 El; 174-500 Brin
For machinery parts, gears, housings; cast iron, heat and abrasion resistant.

TAYLOR 751.
M-1412; 3.3 C, 2.0 Si, Mn, alloy, bal Fe.
For brick mold die liners, cast iron, hard, wear resistant

TAYLOR CRA.
M-1412; 3 3 C, Mn, 1.8 Si, alloy, bal Fe
For castings for clay working industries; cast iron, hard, wear resistant.

TAYLOR Ni-Mo STEEL.
M-915; 0.2 C, 1.5 Ni, 0.2 Mo, bal Fe
For hoist and drag chains.

TAYLOR TM ALLOY.
M-915; 0.18-0.23 C, 0.4-0.7 Ni, 0.15-0.25 Mo, 0.4-0 6 Cr, bal Fe
For chains; shock resistant.

TAYLOR-WHITE.
Eng.; 8.5 W, 3 Cr, 0.75-1.0 C, bal Fe.
For tools, dies, cutters; semi high speed steel.

TAZ-8.
M-U.S.; 8 Ta, 6 Cr, 6 Al, 4 W, 4 Mo, 2.5 Cb, 0.004 B, 1.0 Zr, 0.125 C, bal Ni.
At 1900°F: 56,000 TS.
For high speed aircraft nose cones, turbine buckets.
High stress rupture strength. Cast alloy.
Highest strength at 1900°F. Hardenable.

TAZ-8A.
M-U.S.; 8 Ta, 6 Cr, 6 Al, 4 Mo, 4 W, 2.5 Cb, 1 Zr, 0.125 C, 0.004 B, bal Ni.
As Cast: 130,000 TS.
Rolled. 240,000 TS.
For low-stress components, stator vanes, turbine buckets, after-burner liners, transition ducts.
High oxidation resistance and high temperature strength.

TAZ-8B.
M-U.S.; 8 Ta, 6 Cr, 6 Al, 4 Mo, 4 W, 1.5 Cb, 1.0 Zr, 5 Co, 0 125 C, 0.004 B, bal Ni.
At R.T.: 150,000 TS; 3 El.
For turbine and jet engine buckets.
High creep and stress rupture strength.
High temperature strength. Heat and oxidation resistant.

T-C 20.
M-1022; 20 W, 80 Co.
For dies, cutlery, bearings; corrosion resistant.

T-C 25.
M-1022, 25 W, 75 Co.
For dies, cutlery, bearings; corrosion resistant.

T-C 30
M-1022, 30 W, 70 Co.
For dies, cutlery, bearings; corrosion resistant.

T-C 35.
M-1022; 35 W, 65 Co.
For dies, cutlery, bearings; corrosion resistant.

T.C FERRY.
M-121; 45 Ni, 55 Cu.
Annealed: 73,000 TS, 34,000 YS; 47 El; 77 RA; 155 Brin.
For thermocouple wires and compensating leads

TC QUALITY.
M-1405; 0.88 C, 0.35 Mn, 0 2 Si, bal Fe.
For cutting tools, punches, dies, water hardened.

TCS (TERNE COATED STAINLESS STEEL)
M-806, Base: Type 304 (18 Cr, 8 Ni) stainless steel.
Coating: 80 Pb, 20 Sn (Terne).
Soft: 80,000 TS, 30,000 YS
For roofing, gutters, flashings, architectural brackets.
Easy to form and to solder

TD NICKEL
M-522, M-53; 2 ThO_2, 98 Ni
At. R.T.: 65,000 TS, 50,000 YS; 23 El; 90 RA
At 2400°F: 11,000 TS; 10,000 YS, 0.4 El, 5 RA.
At 1200°F: 32,000 TS, 30,000 YS; 10 El, 45 RA.
For aircraft gas turbines, afterburners, high temperature applications, fasteners
Dispersion hardening alloy Good characteristics at 900-1200°F

TD NiCr.
M-522, M-53; 20 Cr, 2 ThO_2, bal Ni.
At R T.. 125,000 TS, 80,000 YS, 18 El. (in 1").
At 1500°F: 35,000 TS; 30,000 YS; 7 El (in 1").
For high temperature applications, jet engines, aerospace structural components, furnace hardware.
Dispersion hardening alloy. High oxidation and sulfidation resistance.

TE.
U.S.; 0.1 C, 0.7 Mn, 20 Cr, 30 Ni, 4 Mo, 4 W, 1.9 Ta, 0 15 N_2, bal Fe.
For jet engine parts; high heat and oxidation resistant.

TEA LEAD.
Eng.; 98 Pb, 2 Sn.
For lead foil for packing tea.

TEC.
M-63; 5 Ag, 95 Cd.
For solder for copper, brass and steel; M.P. 640-740°F.

TEC 4.
M-63; 4 Ag, 1 Cu, 16.6 Zn, bal Cd.
For brazing joints requiring higher shear strengths than lead-tin solders.
M.P. 500-625°F.

TECHALLOY 35-18.
M-1280; 18 Cr, 35 Ni, bal Fe.
For furnace parts, heat treat boxes; resists oxidation and carburization.

TECHALLOY 45-55.
M-1280; 45 Ni, 55 Cu.
For thermocouples.

TECHALLOY 62-15
M-1280; 15 Cr, 62 Ni, bal Fe.
Annealed: 100,000 TS; 35 El; 55 RA; 165 Brin.
Hard: 175,000 TS; 1 El; 1 RA, 260 Brin.
For heating elements, furnace parts, conveyor belts; heat resistant to 2100°F.

TECHALLOY 80-20
M-1280; 20 Cr, 80 Ni.
Annealed: 95,000 TS; 35 El, 55 RA; 165 Brin.
Hard: 165,000 TS; 1 El; 1 RA; 260 Brin
For heating elements, electrical resistances; elec. resistivity: 108 micro ohms/cm.
Heat resistant to 2100°F

TECHALLOY 302.
M-1280; 0.2 max C, 18 Cr, 8 Ni, bal Fe.
Annealed: 90,000 TS, 40,000 YS; 50 El; 160 Brin.
Cold drawn: 180,000 TS; 150,000 YS, 10 El, 215 Brin
For chemical plant equipment, stainless, austenitic.

TECHALLOY 304.
M-1280, 0.08 C, 18 Cr, 8 Ni, bal Fe
Annealed: 85,000 TS; 35,000 YS, 60 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS, 125,000 YS, 10 El; 330 Brin
For chemical and textile plant equipment, tanks, vessels, for welded structures, stainless, austenitic.

TECHALLOY 309.
M-1280; 0.1 C, 25 Cr, 12 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; Rockwell B83.
For refinery and chemical plant equipment, furnace parts, austenitic, corrosion and heat resistant.

TECHALLOY 310.
M-1280, 0.25 max C, 25 Cr, 20 Ni, bal Fe.
Annealed: 100,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin.
For furnace parts, heat treat boxes, furnace linings, austenitic, corrosion and heat resistant.

TECHALLOY 314
M-1280, 0.20 C, 25 Cr, 20 Ni, 2-3 Si, bal Fe.
Annealed: 100,000 TS; 50,000 YS; 45 El; 60 RA; 180 Brin.
For furnace parts, heat treat boxes, fixtures, heat resistant, austenitic.

TECHALLOY 316.
M-1280; 0.1 C, 18 Cr, 12 Ni, 2-3 Mo, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El; 80 RA; 135 Brin.
Cold drawn: 150,000 TS, 135,000 YS; 6 El; 300 Brin.
For chemical plant equipment, mixers, tanks, agitators; austenitic, acid resistant.

TECHALLOY 317.
M-1280; 0.1 C, 18 Cr, 12 Ni, 3-4 Mo, bal Fe.
Annealed: 85,000-90,000 TS; 40,000 YS; 50-45 El; 160 Brin.
For chemical plant equipment, mixers, tanks, agitators; austenitic, acid resistant.

TECHALLOY 330.
M-1280; 0.20 C, 15 Cr, 35 Ni, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 30 El; 30 RA; 185 Brin.
For furnace parts, heat treat boxes; austenitic, heat resistant

TECHALLOY 347.
M-1280; 0.08 C, 18 Cr, 10 Ni, Cb = 10 × C, bal Fe.
Annealed: 90,000 TS; 35,000 YS; 50 El; 65 RA; 110 Brin.
Cold drawn: 100,000 TS; 65,000 YS; 40 El, 60 RA; 210 Brin.
For chemical plant equipment, tanks, vessels; welded structures, austenitic, stainless.

TECHALLOY 430.
M-1280; 0.10 C, 14-18 Cr, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 30 El; 65 RA; 155 Brin.
Cold drawn: 130,000 TS; 120,000 YS, 2 El, 185 Brin
For screw machine products, pump and valve parts; corrosion resistant

TECHALLOY C-20.
M-1280; 0.07 max C, 29 Cr, 20 Ni, 2 min Cu, 1 Si, 2 Mo, bal Fe
Cast: 65,000 TS; 30,000 YS; 45 El; 50 RA; 130 Brin
Rolled: 85,000 TS, 35,000 YS; 35 El; 50 RA, 180 Brin.
For chemical plant equipment, mixers, agitators; resists mixed acids, austenitic

TECH-ALOY
M-349, 67 Ag, bal Sn, Cu, Zn.
For tooth model alloy; corrosion resistant.

TECHNALLOY A.
M-229, 1.2-1.3 C, bal Fe.
For rolls, for steel mills

TECHNALLOY AX.
M-229, C, bal Fe.
For heavy duty rolls; for blooming mills.

TECHNALLOY B
M-229, 1.8-2.0 C, bal Fe
For rolls, for steel mills.

TECHNALLOY C.
M-229, 1.5-1.8 C, bal Fe
For heavy duty rolls, for structural mills

TECHNALLOY D
M-229, 2.2-2.3 C, bal Fe.
For rolls, for steel mills.

TECHNALLOY E
M-229, 2.4-2.6 C, bal Fe.
For rolls; for steel mills

TECHNALLOY STANDARD.
M-229, 1.0 C, bal Fe.
For rolls, for steel mills

TECHNICAL IRON.
Russia; 0.025 max C, 0.03 max Mn, 0.03 max Si, bal Fe.
For magnetic circuits, deflectors, high permeability.

TECO.
M-796, WC, VC, CrC, ThC, MoC, Co, Ni.
For tools, wearing parts, cutters, a series of refractory alloys.

TECO 38.
M-1054; WC, Co.
For cutting tools; sintered.

TECO 51.
M-1054; WC, Co.
For cutting tools; sintered.

TECO 469.
M-1054; WC + Co.
For cutting tools; cemented.

TECO 610 G.
M-1054; WC, Co
For cutting tools; sintered.

TECO 946 X.
M-1054; WC, Co.
For cutting tools; sintered.

TECO A.
M-1054; WC, Co.
For cutting tools, sintered.

TECO A-1.
M-1054; WC, Co.
For cutting tools; sintered.

TECO-ATS1.
M-1054; 10 Mo, bal TiC.
For tools, bearings, seals, wear parts
Resists heat and wear, sintered carbide

TECO B.
M-1054; WC, Co
For cutting tools, sintered.

TECO C.
M-1054; WC, Co
For cutting tools; sintered.

TECO CF.
M-1054; WC, Co
For cutting tools; sintered.

TECO CHD
M-1054, WC, Co.
For cutting tools; sintered.

TECO CMD.
M-1054, WC, Co
For cutting tools, sintered

TECO GRADE 23.
M-916, WC
For cutting tools; 90.8 Ra

TECO GRADE 68
M-916, WC.
For cutting tools, 91.3 Ra.

TECO GRADE 607.
M-916; WC
For cutting tools, 91.8 Ra

TECO GRADE 610
M-916; WC
For cutting tools; 92.0 Ra

TECO GRADE 625.
M-916; WC.
For cutting tools, 91.0 Ra.

TECO GRADE 946.
M-916; WC.
For cutting tools; 90.2 Ra.

TECO GRADE 946X
M-916; WC.
For cutting tools; 91.5 Ra.

TECO GRADE 964.
M-916; WC.
For cutting tools; 91.0 Ra.

TECO GRADE K-65.
M-916, WC.
For cutting tools; 91.5 Ra.

TECO GRADE KT-13.
M-916; WC.
For cutting tools; 89.0 Ra.

TECO GRADE T-13.
M-916; WC.
For cutting tools, 88.0 Ra.

TECO KT 13.
M-1054; WC, Co.
For cutting tools; sintered.

TECO TH.
M-1054; carbide.
For cold work dies; sintered

TEFLO
M-618, high C, bal Fe.
For gages, taps, threading dies; non-deforming, oil hardened

TEENAX.
M-373; 0.9 C, 1.7 Mn, bal Fe.
For tools, non-deforming.

TEGO
M-528, 78-83 Pb, 15-18 Sb, 1.5-3.0 Sn, 1-2 Cu, 0.3-0.8 As.
For bearings; antifriction.

TELASTIC MOLY
M-862, C, Mn, 0.15-0.20 Mo, bal Fe.
Normalized. 80,000 TS, 45,000 YS; 23 El; 40 RA; 190 Brin
Heat treated 110,000 TS; 85,000 YS, 15 El, 40 RA; 245 Brin
For cast gears, heavy duty

TELCON 36/64
M-108, 36 Fe, 64 Ni
For pulse and radar transformers, relay cores, soft magnet, high permeability

TELCON 79
M-108,
For instrument transformers, magnetic screens, chokes, high permeability with low losses

TELCON BRONZE
M-108, 2 Be, 0.25 Co, bal Cu
Annealed 80,000 TS; 30,000 YS, 50 El, 100 Brin.
Heat treated 180,000 TS, 165,000 YS, 3 El; 352 Brin
For springs, bushings, diaphragms, clips, electrical contacts; hardenable, tough, corrosion resistant

TELCON Cu-Be 250
M-108, 2 Be, 0.25 Co, bal Cu.
For springs, switches, diaphragms, vibrator arms; age hardenable, high strength, corrosion resistant.

TELCON Cu-Be MOLD
M-108, 2.7 Be, bal Cu.
Heat treated: 168,000-179,000 TS; 2 El, 400-480 Brin
For injection molds, plastic molds; age-hardenable, wear and corrosion resistant

TELCON R 2799
M-108; 70 Fe, 30 Ni.
Rolled· 90,100 TS; 35,100 YS.
For magnetic shunts, speedometers, tachometers; soft magnet, Curie temperature at 60°C

TELCON R2800
M-108; 48 Ni, bal Fe
Rolled 150-185 Brin.
For electrical and electronic equipment.
Soft magnet, high magnetic permeability.

TELCONSTAN.
M-108; Cu-Ni.
For electrical resistances, shunts, motor starters; heat resistant.

TELCOSEAL.
M-108; 54 Fe, 29 Ni, 17 Co.
For sealing to borosilicate glasses in thermionic valve and cathode ray tube construction.
Coefficient of expansion same as glass.

TELCUMAN.
M-108; Cu alloy.

TELECTAL.
M-299, 1.5 Si, 0.1 Li, bal Al.
43,000-47,000 TS; 6 El; 80-100 Brin.
For light alloy parts, electrical conductors; non-hardenable.

TELEDIUM.
M-458; 0.02-0.10 Te, bal Pb.
Cold rolled· 3800-5000 TS; 8 Brin.
For chemical plant equipment, cable sheathing, batteries, water supply pipes; corrosion resistant.

TELEGRAPH BRONZE
Eng.; 80 Cu, 7.5 Pb, 7.5 Zn, 5 Sn.
For machine parts, switches; free-cutting

TELEMET.
M-1; 0.25 max C, 16-23 Cr, 2 max Mn, 1 max Si, bal Fe
Rolled: 60,000-75,000 TS; 40,000-45,000 YS, 35-30 El, 178-185 Brin.
For television picture tubes, metal-to-glass seals; heat and corrosion resistant.

TELLURIUM COPPER.
M-33, 0.5 Te, bal Cu.
Forged 33,000 TS; 8,000 YS; 3 El
Drawn: 48,000 TS; 46,000 YS; 18 El
For general use, high conductivity.

TELLURIUM COPPER 112
M-141, 0.5 Te, bal Cu.
For welding torch and soldering iron tips, high conductivity

TELLURIUM COPPER 145
M-8, 99.49 Cu, 0.50 Te, 0.01 P
Hard Rod 48,000 TS, 40,000 YS; 12 El; B 50 Rock
Soft Rod 32,000 TS, 10,000 YS, 45 El, B 45 Rock
For transformer and circuit breaker terminals, studs, bolts, current-carrying parts
Elect cond 95% Free-cutting. Not subject to hydrogen embrittlement.

TELLURIUM COPPER 1452
M-8; 0.50 Te, bal Cu
Hard 48,000 TS; 40,000 YS; 12 El; 83 Brin.
Soft 32,000 TS, 10,000 YS, 45 El, 42 Brin.
For electrical apparatus, screw machine parts, high conductivity, free-cutting

TELLURIUM LEAD.
M 88; 0.06 Te, 0.06 Cu, bal Pb
Rolled.
For pipes, chemical industry; greater corrosion resistance to H_2SO_4

TELPHY.
M-771, nickel alloy.
For motors, electrical equipment; non-magnetic.

TEMCROSS.
M-328, 0.4 C, 1 Cr, 0.2 V, bal Fe.
For gears, shafts; oil hardening

TEMP AIR 8
M-1431; 0.6 C, 3.6 Cr, 1.75 V, 8.5 Mo, bal Fe.
For drills, cutters, extrusion dies; hot work steel, oil hardened.

TEMPALOY 630.
M-8; 82 Cu, 9.5 Al, 1.0 Mn, 5 Ni, 2.5 Fe.
Hard· 105,000 TS; 60,000 YS; 12 El.
For propeller shafting; heat treatable.

TEMPALTO.
M-719, 56 Cu, 14 Ni, 30 Pb, P
For metallic packing; for high temperatures.

TEMPERA 1.
M-1288; 0.12 max C, 0.8 Si, 0.8 Al, 6.5 Cr, bal Fe.
Annealed: 70,000 TS; 30,000 YS; 28 El; 65 RA; 150 Brin.
For oil refinery equipment, corrosion and creep resistant.

TEMPERA 2.
M-1288; 0.12 max C, 1.2 Si, 1 Al, 13 Cr, bal Fe.
Annealed 75,000 TS; 40,000 YS, 35 El; 70 RA; 155 Brin.
For oil refinery equipment; corrosion and creep resistant.

TEMPERA 3.
M-1288; 0.12 max C, 1.5 Si, 1.5 Al, 24 Cr, bal Fe.
Annealed. 75,000-95,000 TS; 46,000-60,000 YS; 35-25 El, 65-46 RA, 160-200 Brin
For furnace equipment, heat treat boxes, heat resistant.

TEMPERA 4
M-1288; 0.15 C, 2 Si, 20 Cr, 9.5 Ni, bal Fe.
Annealed· 75,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin.
For chemical plant equipment; Type 302; stainless, austenitic

TEMPERA 5
M-1288, 0.15 C, 2 Si, 24 Cr, 19 Ni, bal Fe
Annealed 100,000 TS; 45,000 YS; 50 El, 65 RA; 185 Brin.
For furnace parts, heat treat boxes; Type 310, corrosion and heat resistant

TEMPERA A
M-1288, 0.12 max C, 1 Si, 1 Al, 18 Cr, bal Fe.
Annealed 90,000 TS, 55,000 YS, 20 El, 40 RA; 160 Brin
For chemical plant equipment, furnace parts; corrosion and creep resistant.

TEMPERA B
M-1288; 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe.
Annealed. 95,000 TS; 60,000 YS; 25 El; 45 RA; 180 Brin
For furnace parts, heat treat boxes, heat and creep resistant.

TEMPERATURE COMPENSATOR 32 see CARPENTER TEMPERATURE COMPENSATOR 32.

TEMPERATURE COMPENSATOR ALLOY NO. 30
England, Fe-Ni
For compensating shunts for electrical equipment; temperature-sensitive, magnetic.

TEMPERDIE.
M-1433, 0.40 C, 1 Mn, 1.5 Cr, 0.25 V, 1 Mo, bal Fe.
For hot header dies, punches, hot press dies; hot work steel, oil hardened.

TEMPERIM.
M-566; 3.2 C, Si, Mn, other alloy elements, bal Fe.
Cast. 400 Brin.
For wear resistant parts; cast iron, abrasion resistant.

TEMPERITE.
M-917, Pb, Sn, Cd.
For temperature indicating alloys; low melting series of alloys.

TEMPER TOUGH.
M-40; 0.75 C, 0.6 Mn, 1.15 Si, 0.8 Cr, 0.15 V, 0.3 Mo, bal Fe.
Oil hardening tool steel; AISI L6.

TEMPEST.
M-1411; 0.16 C, 17 Cr, 1.8 Ni, bal Fe.
For furnace parts, cutlery, valves, pumps; corrosion resistant.

TEMPLATE.
M-719; Zn alloy.
For general castings; white metal.

TEMPLESS.
M-1009; 0.9 C, alloy, bal Fe.
For punches, dies, forming and blanking dies, upsetters; no temper required.

TEMPLESS NO. 11.
M-1009; 0.30-0.37 C, 0.4 Mn, 0.7-0.9 Cr, 0.4-0.6 Mo, bal Fe.
Rolled: 130,000 TS; 16 El, 50 RA; 220 Brin.
For pneumatic tools, axes, chisels, caulking tools; shock resistant

TEMPLEX.
M-748; 0 35-0.50 C, 0.4-0.7 Mn, 0.8-1.1 Cr, 0.3-0.4 Mo, 0.2-0.3 V, bal Fe.
Heat treated: 125,000-145,000 TS; 105,000-120,000 YS; 16-14 El; 50-45 RA.
For high temperature bolting; ASTM-A193 G.B.

TEMPO.
M-1433; 0.90 C, 1.15 Mn, 0.5 Cr, 0.5 W, bal Fe
For gauges, hobs, punches, master tools; oil hardened, non-deforming.

TENAILLE NO. 2½.
M-1117; 0.8-1.0 C, bal Fe.
For tools, drills; water hardened

TENAX METAL
M-1322, 4.2-4 6 Al, 2.2-3.0 Cu, 1.2 Pb, 0.35 Fe. bal Zn.
For solder for aluminum ware; strong.

TENAX-N.
M-36, M-96; 0.45 C, 1.0 Cr, 2 W, bal Fe.
Annealed: 102,000 TS; 205 Brin.
For chisels, tools, punches, dies, hot shear blades.
Oil hardening, shock resistant.

TENAX NB.
M-96, M-1322; 0.55 C, 1 Si, 1.1 Cr, 1.9 W, 0.18 V, 0.3 Mn, bal Fe.
For punches, upsetters, riveters, dies, crimpers; oil hardened, shock resistant.

TENCO.
M-618; C, 18 W, 9 Co, 1 Mo, 4 Cr, 2 V, bal Fe.
For tools, dies, cutters; high speed steel.

TENEM.
M-646; Sn, Be, bal Cu.
For corrosion and wear resistant parts; high strength.

TENIT 1720
M-1114, M-1291; 0.3 C, 1 0 Si, 0.4 Mn, 1.1 Cr, 3 75 W, bal Fe.
Oil hardening tool steel for tools, dies, punches, and miscellaneous hot work.

TENIT 1720 SPEZIAL.
M-1114; 0.3 C, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For hot work tools and dies; hot work steel, oil hardened.

TENIT KL.
M-1114, M-1291; 0.6 C, 0.2 V, 1.0 Cr, 2.2 W, 0.9 Si, bal Fe.
Oil or water hardening hot work tool steel for dies, punches, chisels.

TENIT KL SPEZIAL.
M-1114; 0.55 C, 1 Cr, 0.18 V, 1.8 W, bal Fe.
For hot work tools and dies; hot work steel, oil hardened.

TENIT W.
M-1114; 0.45 C, 0.2 V, 2.2 W, 1.0 Cr, 0.9 Si, bal Fe.
For hot work dies, punches, chisels; oil hardened.

TENNESSEE SPECIAL.
M-377; 0.95 C, bal Fe.
For general tools, broaches; water hardened.

TENS-50.
M-1458; Si, Mg, Be, N, bal Al.
Sand cast: 46,000 TS; 36,000 YS; 5 El.
Permanent mold: 50,000 TS; 44,000 YS; 6 El.
For aircraft and missile components, gear cases; age-hardenable.

TENSIL-COR.
M-663; 0.04 C, 1.63 Mn, 0.5 Si, 0.5 Mo, bal Fe.
A CO_2 shielded, cored wire for single or multipass welding of high tensile low alloy steel.
As welded: 112,000 TS; 104,700 YS; 24 El.
Good toughness down to −75°F.
AWS E 70T-G

TENSILEND 70.
M-677, 0.06 C, 0 55 Mn, 0 35 Si, bal Fe.
Welded· 70,000-80,000 TS; 70,000 YS; 26 El; 60 RA; 180 Brin.
For welding electrodes for low alloy steel; low H_2.

TENSILEND 80.
M-677; 0 06 C, 0.8 Mn, 0.4 Si, 1 0 Ni, bal Fe.
For welding electrodes; class E8016-C3, 1% nickel steel.

TENSILEND 100.
M-677; 0.06 C, 0.55 Mn, 0 4 Si, 1 8 Ni, 0.6 Mo, 0.1 V, bal Fe.
Welded: 100,000-110,000 TS; 91,000 YS; 22 El; 58 RA; 230 Brin
For welding electrodes for low alloy steel; low H_2.

TENSILEND 120
M-677, 0 07 C, 0.9 Mn, 0.25 Si, 1.8 Ni, 0.8 Mo, 0 25 V, bal Fe
Welded: 120,000-130,000 TS; 107,000 YS; 19 El; 52 RA, 260 Brin.
For welding rods for marine applications; low H_2.

TENSILIA.
Eng ; 0 48 C, 0.51 Mn, 0 18 V, bal Fe
For tools, gears, pinions, shafts; water hardening.

TENSILITE
M-129; 67-64 Cu, 24-29 Zn, 2.5-3 8 Mn, 3.1-4.4 Al, 0-1.2 Fe.
103,100 TS, 32,500 YS; 19 El; 23 RA.
For gears, worm wheels; tough.

TENSILITE.
M-129, 68 26 Cu, 21.04 Zn, 3.20 Mn, 0.04 Si, 0.14 Pb, 4 8 Al, 2.03 Fe.
For gears, worm wheels; wear resistant.

TENSILOY BORON.
M-1438; C, alloy, bal Fe.
For machinery parts, gears, pinions, shafts; preheat treated, abrasion and shock resistant.

TENSILOY EXTRA.
M-1438; 0.50 C, 1.3 Si, 0.3 Mo, 0.5 W, bal Fe.
For gears, crimpers, punches, dies, upsetters; oil hardened, shock resistant.

TENSILOY H.C.C.
M-1438; 1.5 C, 12 Cr, 1 V, 1 Mo, bal Fe.
For blanking and forming dies, punches; Type D2; air hardened, non-deforming.

TENSILOY H.S.S.
M-1438; 0.80 C, 4 Cr, 2 V, 18 W, 0.65 Mo, bal Fe.
For reamers, taps, broaches, drills, hobs, lathe tools; Type T2; high speed steel.

TENSILOY NITRIDING DIE.
M-1438; 0.80 C, 4 Cr, 1 V, 1.5 W, 8 Mo, bal Fe.
For reamers, broaches, dies, hobs; Type M1; high speed steel.

TENSILOY NON-TEMPERING.
M-1438; 0.33 C, 0.75 Cr, 0.75 Cu, 0.75 Mo, bal Fe.
For tools, dies; water hardened, non-tempering.

TENSILOY O.H. DIE.
M-1438; 0.90 C, 1.15 Mn, 0.5 Cr, 0.5 W, bal Fe.
For punches, dies, crimpers, cutting tools; oil hardened, non-deforming.

TENSITE.
M-61; 2 Al, 98 Ni.
Annealed: 56,500 TS.
For vacuum tube filaments.

TENSITE.
M-897; 98 Ni, 2 Al.
Annealed: 57,000 TS; 18,000 YS; 45 El.
For cathodes and filaments in electronic tubes; heat resistant.

TEN STAR see CARPENTER TEN STAR.

TENUAL 50.
M-190; 6-8 Cu, 2.5 max Zn, 1.5 max Fe, 2.0 max Si, bal Al.
For crankcases, oil pans, cylinder heads.

TENUAL NO. 226.
M-190; 87 min Al, 9.25-10.75 Cu, 0.90-1.50 Fe, 0.15-0.35 Mg
Cast: 21,000-24,000 TS; 115-127 Brin.
For pistons, valve tappets, cam-shaft bearings, guides; same as SAE-34.

TENUAL I.
M-190; 5 Si, bal Al.
Cast: 19,000 TS; 8000 YS; 8 El; 40 Brin.
For instrument cases, thin wall pressure tight castings; corrosion resistant.

TENUAL T.
M-190; 0.2 Ti, 1 Mn, bal Al.
For aircraft structures, cowling; corrosion resistant.

TENUAL T TITANITE.
M-190; 0.2 Ti, 1.5 Mn, bal Al.
For light alloy parts, corrosion resistant.

TENZALOY.
M-815; 0.8 Cu, 0.4 Mg, 8 Zn, bal Al.
Aged: 32,000 TS; 22,000 YS; 3 El, 65 Brin.
For light castings, housings, machinery parts; high strength, requires no heat treatment.

TEPAZ.
M-1318; 0.12 max C, 1.15 Si, 13 Cr, 0.95 Al, bal Fe.
For oil refinery equipment; corrosion and creep resistant.

TEPAZ 1020.
M-1318; 0.15 C, 2 Si, 19.5 Cr, 9.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 65 RA; 170 Brin.
For chemical plant equipment; Type 302; stainless, austenitic.

TEPAZ 2025.
M-1318; 0.15 C, 24 Cr, 19 Ni, bal Fe.
Annealed: 100,000 TS; 45,000 YS; 50 El; 65 RA; 180 Brin.
For furnace parts, heat treat boxes; heat resistant, austenitic; Type 310.

TERMACID.
M-1245; 0.10-0.25 C, 27 Cr, 4.5 Ni, Mo, Mn, bal Fe.
For furnace parts, heat treating boxes; heat resistant to 2000°F.

TERMAFOND 245C.
M-1445; 3.75-4.25 Cu, 14-15 Si, 0.6-1.0 Mg, 3.7-4.3 Ni, 0.5-0.9 Co, bal Al.
Heat treated: 24,000-33,000 TS; 22,000-21,000 YS; 0.5-0.2 El; 115-140 Brin.
For light alloy parts; age-hardened, corrosion resistant.

TERMAFOND 245NT.
M-1445; 4.3-4.7 Cu, 14.5-15.5 Si, 0.7-1.1 Mg, 0.7 Mn, 0.2 Ti, 2.3-2.7 Ni, bal Al.
Heat treated: 21,000-28,500 TS; 20,000-27,000 YS; 0.5-2.0 El; 110-130 Brin.
For light alloy parts; age-hardened.

TERMAFOND C3.
M-1445; 2.9-3.2 Cu, 1.6 Fe, 0.7 Si, 0.6 Mg, 0.2 Ti, 0.6 Ni, bal Al.
Heat treated: 47,000-60,000 TS; 43,000-51,000 YS; 5-1 El; 115-150 Brin.
For light alloy parts; age-hardenable.

TERMAFOND C10.
M-1445; 9.3-10.7 Cu, 0.5-1.3 Fe, 0.2-0.4 Mg, bal Al.
Heat treated: 40,000-51,200 TS; 34,000-37,000 YS; 0.5-0.2 El; 125-150 Brin.
For pistons; age-hardenable.

TERMAFOND C12N.
M-1445; 11.0-12.5 Cu, 0.6-0.8 Fe, 0.1-0.2 Ti, 0.4-0.6 Ni, bal Al.
Heat treated: 40,000-65,000 TS; 24,000-27,000 YS; 1.5-1.0 El; 110-130 Brin.
For pistons; age-hardenable.

TERMAFOND C12T.
M-1445; 11.0-12.5 Cu, 0.2 Ti, 1 Fe, bal Al.
Heat treated: 38,000-42,700 TS; 22,800-25,600 YS; 1.5-1.0 El; 110-125 Brin.
For pistons; age-hardenable.

TERMAFOND C46.
M-1445; 9.5-10.5 Cu, 0.8-1.2 Si, 0.3 Mg, 0.2 Ti, 1.3-1.7 Ni, bal Fe.
Heat treated: 45,000-54,000 TS; 37,000-48,000 YS; 1.0-0.5 El; 115-140 Brin.
For engine cylinder heads, pistons; age-hardenable.

TERMAFOND S10.
M-1445; 2.0-2.5 Cu, 9.5-10.5 Si, 1.4 Mg, 0.8-1.2 Ni, bal Al.
Heat treated. 36,000-50,000 TS; 34,000-42,000 YS; 0.5-0.3 El; 95-125 Brin.
For light alloy parts; for high temperature service.

TERMAFOND S121.
M-1445; 2.25 Cu, 0.8-1.2 Fe, 11-13 Si, 1.5 Mg, 0.5 Mn, bal Al.
Heat treated: 41,000-50,000 TS; 38,000-43,000 YS; 0.5-0.3 El; 120-135 Brin
For light alloy parts; corrosion resistant.

TERMAFOND S122.
M-1445, 0.5-1.1 Cu, 13 Si, 1.2 Mg, 0.15 Ti, 2.2 Ni, bal Al.
Heat treated: 40,000-50,000 TS; 38,000-43,000 YS; 0.5-0.3 El, 120-130 Brin.
For light alloy parts; for high temperature service.

TERMAFOND Y.
M-1445; 3.8-4.2 Cu, 1.3-1.7 Mg, 1.8-2.3 Ni, bal Al.
Heat treated: 36,000-47,000 TS; 32,000-43,000 YS; 0.5-0.3 El; 95-115 Brin.
For engine cylinder heads, pistons; age-hardenable.

TERMAFOND YT.
M-1445; 4 Cu, 1.5 Mg, 2 Ni, bal Al.
For engine cylinders, pistons; age-hardenable.

TERNALLOY 5.
M-130; 1.6 Mg, 3 Zn, 0.3 Cr, 0.5 Mn, bal Al.
SC-F temper: 29,000 TS; 13,000 YS; 12 El; 50 Brin.
SC-T 51 temper: 30,000 TS; 18,000 YS; 7 El; 60 Brin.
PM-Age temper: 43,000 TS; 22,000 YS; 16 El; 70 Brin.
For castings; natural aging.

TERNALLOY 6.
M-906, M-130; 0.2-0.4 Mn, 3.4-3.9 Zn, 0.2-0.4 Cr, 0.6-2.0 Mg, bal Al.
Cast: 30,000 TS; 20,000 YS; 2 El; 70 Brin.
Aged: 35,000 TS; 23,000 YS; 4 El.
For light alloy castings; heat treatable.

TERNALLOY 7.
M-130; 0.2-0.4 Cr, 0.2 max Cu, 1.8-2.4 Mg, 0.2-0.4 Mn, 4-4.5 Zn, bal Al.
F-Temper: 30,000 TS; 19,000 YS; 5 El; 65 Brin.
T6-Temper: 44,000 TS; 40,000 YS; 1.5 El; 80 Brin.
For light alloy castings; responds to heat treatment.

TERNALLOY 8.
M-130; 0.2-0.4 Cr, 0.2 max Cu, 1.8-2.4 Mg, 0.2-0.4 Mn, 4.9 Zn, bal Al.
SC-F-Temper: 33,000 TS; 22,000 YS; 3 El; 70 Brin.
SC-T6-Temper: 57,000 TS; 55,000 YS; 100 Brin.
PM-6 Temper: 58,000 TS; 50,000 YS, 3 El; 110 Brin.
For light alloy castings; responds to heat treatment.

TERNE METAL.
M-88; 15-30 Sn, 85-70 Pb, up to 2.0 Sb.
For terne plate, roofing, gasoline and oil tanks; corrosion resistant, bearings

TERNE ROOFING.
M-806; Base: copper bearing steel
Coating: 80 Pb, 20 Sn (Terne)
Soft: 45,000 TS.
For roofing, gutters, flashings, down drains, termite shields.
Easy to form and solder.

TERRA.
M-1422; C, alloy, bal Fe.
Hardenable to 60/61 Rock C
For ball races, blanking and forming dies, cutlery dies, collets, drills, gauges, pistons rings, taps, vise jaws, Oil hardening, non-deforming

TERRIFIC
M-1113; C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, dies, cutters; high speed steel

TETON.
M-1; 1.0 C, 1.3 Cr, bal Fe.
For balls and races for bearings, compression dies, machine parts, water hardened.

TETMAJER ALUMINUM BRONZE.
England; 4-10 Al, 1-3 Si, 0.7-1.0 Fe, bal Cu
For bushings, fittings; tough, high strength.

TEX NON-SHOCK.
M-618, C, Cr, W, bal Fe.
For pneumatic tools, rivet sets, punches; oil hardened, shock resistant

T.G.S. see CARPENTER T.G.S.

T H-30.
M-383, M-625; C, bal Fe.
At 20°C : 61,000 TS; 42,500 YS; 20 El.
At 600°C.: 34,000 TS; 15,500 YS.
For boiler and superheater tubes; good strength at high temperature; corrosion resistant.

T H-31.
M-383, M-625; C, bal Fe.
At 20°C: 71,700 TS; 44,000 YS; 18 El.
At 600°C: 35,000 TS; 23,000 YS.
For boiler tubes, superheater tubes; maintains strength at high temperature.

T H 60B.
M-625, M-383; Cu-Ni.
Rolled: 79,650 TS; 52,625 YS; 20 El.
For thick walled, seamless high pressure drums; good strength at high temperatures.

T H 61B.
M-625, M-383; Cu-Ni.
Rolled: 85,340 TS; 55,470 YS; 23 El.
For thick walled, seamless high pressure drums; good strength at high temperatures

T H 62B
M-625, M-383; Cu-Ni.
Rolled: 99,560 TS, 61,160 YS; 20 El.
For thick walled, seamless high pressure drums; good strength at high temperatures.

THALASSAL.
M-984; Si, 2.5 Mn, 2.3 Mg, 0.2 Sb, bal Al.
Sand cast: 24,000-31,000 TS.
For dirigible and airplane parts, marine parts; resists sea water corrosion.

THERLO
M-44; 28.5-29.5 Ni, 16.5-17.5 Co, bal Fe.
Sheet: 89,700 TS, 50,500 YP; 200-250 Brin
For electrical resistors, glass to metal seals, grid glow tubes
Heat resistant Can be brazed or welded

THERMAL B
M-750; 0.4 C, 3-4 Cr, 14 W, 0.6 V, bal Fe
For tools, cutters, hot shear blades, hot work steel.

THERMAL BB.
M-750; 0.58 C, 3-4 Cr, 10-14 W, 0.4 V, bal Fe
For tools, cutters; high speed steel

THERMALLOY 4
M-9, C, Cr, Ni, bal Fe.
For hard facing electrode, resists high temperature and thermal shock.

THERMALLOY 20
M-47, 0.50 max C, 26-30 Cr, 4 max Ni, bal Fe.
Aged 115,000 TS, 80,000 YS; 18 El.
Cast: 75,000 TS, 60,000 YS, 2 El, 190 Brin
For furnace parts, grate bars, salt pots, ACI Type HC, heat resistant.

THERMALLOY 28
M-47, 0.2-0.4 C, 25-28 Cr, 1-3 Ni, bal Fe.
Cast: 90,000 TS, 50,000 YS, 1 El; 1 RA; 240 Brin.
Annealed: 67,000 TS; 48,000 YS; 4 El; 4 RA; 190 Brin
For salt pots, sintering bars, grate bars, dampers, Type HC, corrosion resistant to sulfur atmosphere

THERMALLOY 30
M-47, 0.2-0.4 C, 18-21 Cr, 9-11 Ni, bal Fe.
Cast: 93,000 TS, 50,000 YS; 32 El, 34 RA; 176 Brin.
Annealed 97,000 TS; 50,000 YS, 35 El, 38 RA; 173 Brin.
For conveyor belts, oil stills, furnace parts; Type HF; heat resistant to 1600°F.

THERMALLOY 38
M-47, 0.2-0.5 C, 26-29 Cr, 7-10 Ni, bal Fe.
Cast: 107,000 TS; 76,000 YS, 4 El; 3 RA; 269 Brin.

Annealed: 79,000 TS; 60,000 YS; 4 El; 2 RA; 226 Brin.
For dampers, rabble arms and blades; Type HE; heat resistant.

THERMALLOY 38E.
M-47; C, 28 Cr, 11 Ni, bal Fe.
For heat resistant castings; corrosion and heat resistant.

THERMALLOY 40.
M-47; 0.20-0.50 C, 25-28 Cr, 10-13 Ni, bal Fe.
Cast: 95,000 TS; 60,000 YS; 13 El; 15 RA; 160 Brin.
Annealed: 75,000 TS; 37,000 YS; 32 El; 32 RA; 190 Brin.
For chain and belt links, furnace parts, dampers, valves; Type HH; resists hot gases above 1650°F.

THERMALLOY 40A2.
M-47; C, 25 Cr, 15 Ni, 1 Cb, bal Fe.
For heat resistant castings; corrosion and heat resistant.

THERMALLOY 40B
M-47; C, 25 Cr, 13 Ni, bal Fe.
For heat resistant castings; corrosion and heat resistant.

THERMALLOY 43.
M-47; 0.20-0.50 C, 26-30 Cr, 14-18 Ni, bal Fe.
Cast: 80,000 TS, 45,000 YS; 12 El; 160 Brin.
Aged. 90,000 TS; 65,000 YS; 6 El; 200 Brin.
For hearth plates, lead pots, retorts; Type HI; corrosion and heat resistant.

THERMALLOY 45.
M-47; C, 20 Cr, 25 Ni, bal Fe.
For heat resistant castings; corrosion and heat resistant.

THERMALLOY 47
M-47; 0.20-0.50 C, 25-28 Cr, 19-22 Ni, bal Fe.
Cast 84,000 TS; 72,000 YS; 14 El; 15 RA; 179 Brin.
Annealed 76,000 TS; 40,000 YS; 18 El; 22 RA; 174 Brin
For pots, feed pipes, furnace parts, calcining tubes; Type HK, heat resistant to 2150°F.

THERMALLOY 47D
M-47, 0.50 C, 27 Cr, 20 Ni, bal Fe.
For heat resistant castings, corrosion and heat resistant.

THERMALLOY 48
M-47, C, 30 Cr, 20 Ni, bal Fe
For heat resistant castings; corrosion and heat resistant.

THERMALLOY 50
M-47; 0.4-0.55 C, 34-37 Ni, 15-17 Cr, 1 Mn, 2 Si, bal Fe.
Cast: 60,000-72,000 TS; 38,000-52,000 YS, 20-4 El; 21-6 RA; 156-200 Brin.
For heat treating furnaces, rollers, rails, grids, hearth plates, chain belts; heat and corrosion resistant.

THERMALLOY 50C.
M-47, C, 15 Cr, 35 Ni, 1 Cb, bal Fe.
For heat resistant castings, corrosion and heat resistant.

THERMALLOY 58.
M-47; 0.35-0.75 C, 17-19 Cr, 37-40 Ni, bal Fe.
Cast: 72,000 TS; 40,000 YS; 4 El; 3 RA; 200 Brin.
Annealed. 73,000 TS, 40,000 YS; 9 El, 9 RA; 200 Brin.
For retorts, muffles, cyanide and lead pots; Type HU; heat resistant.

THERMALLOY 58B.
M-47; 38 Ni, 18 Cr, bal Fe.
Cast.
For carburizing equipment, retorts, cyanide pots; heat resistant.

THERMALLOY 63.
M-47; 0.35-0.75 C, 34-38 Ni, 25-28 Cr, bal Fe.
Cast: 68,000 TS; 32,000 YS; 19 El; 18 RA; 170 Brin.
Annealed: 78,000 TS; 46,000 YS; 6 El; 5 RA; 175 Brin
For calcining tubes, furnace shafts, heat treating boxes; heat resistant to 2100°F.

THERMALLOY 72.
M-47; 0.4-0.6 C, 58-62 Ni, 12-14 Cr, 1.0 Mn, 2.0 Si, bal Fe.
Cast: 59,000-73,000 TS; 30,000-37,000 YS; 9-3 El; 9-4 RA; 166-198 Brin.
For retorts, muffles, heat treating boxes; heat and corrosion resistant

THERMALLOY 85.
M-47; 0.35-0.75 C, 17-19 Cr, 65-85 Ni, bal Fe.
Cast: 78,000-88,000 TS; 35,000-44,000 YS; 10-7 El; 15-8 RA; 190-220 Brin.
For retorts, muffles, burner parts, heat treating boxes; Type HX; heat resistant to 2100°F in absence of sulfur.

THERMALLOY 85E
M-47; C, 15 Cr, 65 Ni, 2 Mo, bal Fe.
For heat resistant castings; corrosion and heat resistant

THERMALLOY HC-250.
M-47, high C, 25 Cr, bal Fe
Cast and heat treated: 70,000-100,000 TS; 50,000-80,000 YS; 0.2-0.5 El, 550-750 Brin.
For castings, pumps, stokes, crusher rolls, grinding rolls, abrasion resistant, oxidation resistant to 1850°F.

THERMANIT A.
M-459, 0.10 C, 1.2 Si, 19.5 Cr, 9 Ni, 2 Mo, 1.5 Cb, bal Fe
For welding rod, stainless steel.

THERMANIT C.
M-459, 0.1 C, 2.2 Si, 1.25 Mn, 23 Cr, 16.9 Ni, bal Fe.
For welding rod; stainless steel.

THERMANIT D.
M-459, 0.15 C, 1.75 Si, 1.25 Mn, 22.5 Cr, 9.5 Ni, bal Fe.
For welding rod; stainless steel.

THERMANIT G.
M-459, 0.05 C, 0.5 Si, 18 Cr, 9 Ni, 2 Mo, bal Fe.
For welding rod; stainless steel.

THERMANIT J.
M-459, 0.05 C, 18.5 Cr, 8 Ni, bal Fe.
For welding rod, stainless steel.

THERMANIT L.
M-459, 0.2 C, 25 Cr, 3 Ni, bal Fe.
For welding rod; stainless steel.

THERMANIT P.33.
M-459, 0.12 C, 19.5 Mn, 1.5 Si, 12.5 Cr, 1.5 Ni, bal Fe.
Welded. 100,000 TS; 57,000 YS; 40 El; 45 RA.
For welding rod; austenitic.

THERMANIT X.
M-459; 0.12 C, 8 Mn, 0.8 Si, 19.5 Cr, 9 Ni, bal Fe.
Welded. 85,000 TS, 45,000 YS; 45 El; 45 RA.
For welding rod, austenitic, stainless.

THERMAX 8A.
M-459; 0.1 C, 1 Mn, 18 Cr, 10 Ni, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 50 El; 65 RA; 160 Brin.
For chemical plant equipment; stainless, austenitic.

THERMAX 8FAL.
M-459; 0.1 C, 6.5 Cr, 0.75 Al, bal Fe.
For oil refinery equipment; heat resistant.

THERMAX 10 A.
M-459; 0.1 C, 2.35 Si, 1.25 Mn, 19 Cr, 10 Ni, bal Fe.
For corrosion and heat resistant parts; corrosion and heat resistant, austenitic.

THERMAX 10A.
M-1299; 0.2 max C, 22-24 Cr, 12-15 Ni, 2 max Mn, 1 max Si, bal Fe.
Annealed: 85,000-95,000 TS; 40,000-50,000 YS; 45-55 El; 150-185 Brin.
For heat treating boxes, oil refinery and chemical plant equipment; Type 309; austenitic, heat resistant.

THERMAX 10FAL.
M-459; 0.1 C, 1 Si, 18 Cr, 8 Al, bal Fe.
For chemical and plastic plant equipment; corrosion resistant.

THERMAX 11 A.
M-459; 0.15 C, 2.3 Si, 1.25 Mn, 23.5 Cr, 19.5 Ni, bal Fe.
For corrosion and heat resistant parts; corrosion and heat resistant, austenitic.

THERMAX 11A.
M-1299; 0.25 max C, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El; 65 RA; 180 Brin.
At 1200°F: 57,000 TS; 22,000 YS; 32 El; 45 RA.
For furnace parts, heat treating boxes, valves, pumps; Type 310; austenitic, heat resistant.

THERMAX 11AS G.
M-459; 0.4 C, 1.8 Si, 26 Cr, 14 Ni, bal Fe.
For heat treat boxes, pots, furnace parts; heat resistant.

THERMAX 11F.
M-1350; 0.6 C, 1.5 Si, 22 Cr, bal Fe.
For valve and pump parts, furnace equipment; corrosion and heat resistant.

THERMAX 11 FN.
M-459; 0.2 C, 0.5 Si, 0.6 Mn, 25 Cr, 2.5-3.0 Ni, bal Fe.
For corrosion and heat resistant parts; corrosion and heat resistant.

THERMAX 12FAL.
M-459; 0.1 C, 1.5 Si, 24 Cr, 1.5 Al, bal Fe
For furnace parts, chemical plant equipment; corrosion and heat resistant

THERMAX 12 F.-Cr.
M-459; 0.15 C, 1.75 Si, 1.0 Mn, 25 Cr, 0.5 Ni, bal Fe.
For corrosion and heat resistant parts; corrosion and heat resistant.

THERMAX 12FH G
M-459; 1.3 C, 1.8 Si, 29 Cr, bal Fe
For chemical plant equipment, furnace parts; corrosion and heat resistant.

THERMAX 12FN G.
M-459; 0.4 C, 1.2 Si, 27 Cr, 4 Ni, bal Fe.
For furnace parts, heat treat boxes; corrosion and heat resistant.

THERMAX 13 Co-G.
M-459; 0.1 C, 0.18 Ti, 0.6 Cb, 26-30 Cr, 47-52 Co, bal Fe.
Cast: 135,000 TS; 48,000 YS; 10 El; 10 RA; 250 Brin.
For furnace baffles, burner tips, sintering grates, quench baskets.
Corrosion, heat and thermal shock resistant.

THERMAX 25.
M-1485; 0.25 max C, 19-21 Ni, 23-26 Cr, bal Fe.
Annealed: 78,500 TS; 20 El; 200-240 Brin.
For furnace parts, heat treating equipment, salt pots; Brit. BS 1648 F, heat and corrosion resistant.

THERMAX 30.
M-1485; 0.20-0.35 C, 28-32 Cr, bal Fe.
Annealed: 62,800 TS; 2 El; 200-240 Brin.
For furnace parts, heat treating boxes; Brit. 1648 B, scale resistant to 1100°C.

THERMAX 37.
M-1485; 0.50 max C, 34-37 Ni, 15-18 Cr, bal Fe.
Annealed: 67,200 TS; 5-10 El; 150-180 Brin.
For furnace parts, heat treating boxes; heat resistant castings.

THERMAX 45.
M-1485; 0.30 max C, 2.5 max Si, 1.5 max Mn, 20 Cr, 45 Ni, bal Fe.
Cast: 70,000 TS; 6 El; 170-200 Br.
For furnace parts such as heat resisting trays and rollers; good resistance to scaling and thermal shock.

THERMAX 60.
M-1485; 0.35 max C, 15-20 Cr, 60-65 Ni, bal Fe.
Annealed: 67,200 TS; 3 El; 180-210 Brin.
For furnace parts, muffles, heat treating equipment; corrosion and heat resistant.

THERMAX 75.
M-1485; 0.10 C, 1.0 max Si, 1.0 max Mn, 5.0 max Fe, 0.4 Ti, 20 Cr, bal Ni.
For furnace castings and parts for gas turbines; resists scaling and thermal shock.

THERMAX 90.
M-1485, 0.10 C, 1.0 max Si, 1.0 max Mn, 0.9 Al, 1.6 Ti, 5.0 max Fe, 20 Cr, 18 Co, bal Ni.
For gas turbines and jet engine components; high creep properties in the range 1100-1650°F.

THERMAX 102.
M-1485, C, 25 Cr, 12 Ni, 3 W, bal Fe.
Annealed: 78,400 TS; 10 El; 240 Brin.
For furnace parts, heat resistant.

THERMAX 104.
M-1485; C, 25 Cr, 12 Ni, bal Fe.
Annealed: 78,400 TS; 10 El; 240 Brin.
For furnace parts, heat resistant

THERMCO 50.
M-1347, 0.1 C, 0.18 Ti, 0.6 Cb, 26-30 Cr, 47-52 Co, bal Fe
Cast: 135,000 TS, 48,000 YS; 10 El; 10 RA; 250 Brin
For furnace baffles, burner tips, sintering grates, quench baskets.
Corrosion, heat and thermal shock resistant.

THERMENOL
M-38; 16 Al, 4-5 Mo, bal Fe.
Cold drawn: 62,000-135,000 TS; 3 El.
For aircraft applications, high resistance to oxidation.

THERMIMPHY.
M-104, C, Cr, Mo, V, bal Fe.
121,000 TS; 93,000 YS; 18 El.
For gears, crankshafts, high temperature parts; tough.

THERMISILID.
M-72; special cast iron, 14-16 Si.
350-290 Brin.
For chemical equipment construction, acid plants; acid proof and heat resisting to H_2SO_4.

THERMISILID EXTRA.
Eng.; 14-18 Si, bal Fe.
Cast: 250 Brin.
For acid plants, explosives manufacturing; corrosion and acid resistant.

THERMIT.
M-528; 14-16 Sb, 5-7 Sn, 0.8-1.2 Cu, 0.7-1.5 Ni, 72-78.5 Pb, 0.3-0.8 As, 0.7-1.5 Cd.
29 Brin.
For bearings for pumps, railroads, engines; Standard German white metal; cast alloy.

THERMO.
M-260; C, alloy, bal Fe.
For tools, dies; oil hardening.

THERMOCROM.
M-918, 3.2 C, 2.2 Si, 0.2 Mo, 0.8 Cr, bal Fe.
For piston rings; cast iron.

THERMODUR 10CN5050
M-1290; 0.10 max C, 0.10-0.30 Si, 0.20-0.50 Mn, 50-52 Cr, bal Ni.
Cast. 64,000 min TS; 42,000 min YS; 5 min El.
Rupture strength: 2400 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1110°C.
DIN G-X10CrNi5050; ASTM A560-50/50.

THERMODUR 10CN6040.
M-1290, 0.10 max C, 0.10-0.30 Si, 0.20-0.50 Mn, 58.0-61.0 Cr, 2.0 max Fe, bal Ni.
Cast: 100,000 min TS; 71,000 min YS.
Rupture strength 1850 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1110°C.
DIN G-X10CrNi6040, ASTM A560-60/40

THERMODUR 15CN13.
M-1290; 0.10-0.15 C, 0.50-1.0 Si, 1.0-1.5 Mn, 22.5-24.0 Cr, 12.0-13.0 Ni, bal Fe
Cast: 70,000 min TS; 30,000 min YS, 30 min El.
Rupture strength 1850 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1150°C
DIN G-X15CrNiSi2512, ASTM A351-CH20.

THERMODUR 15CN15T.
M-1290; 0.10-0.15 C, 0.50-1.0 Si, 1.0-1.5 Mn, 19-20 Cr, 14.5-15.5 Ni
Cast 64,000-85,000 TS, 28,000 min YS, 20 min El.
Rupture strength 1850 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1050°C.
DIN G-X15CrNiSi2014.

THERMODUR 15CN20
M-1290; 0.10-0.15 C, 0.50-1.0 Si, 1.0-1.5 Mn, 23.5-25.0 Cr, 20-21 Ni, bal Fe.
Cast: 64,000-92,000 TS; 30,000 min YS; 30 min El.
Rupture strength: 2300 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1150°C.
SEW-Nr.1.4849; DIN G-X15CrNiSi2520-ASTM A351-CK20.

THERMODUR 15CN1775.
M-1290; 0.10-0.15 C, 0.50-1.0 Si, 1.0-1.5 Mn, 15.0-16.0 Cr, 72.0-74.0 Ni, 8.0-10.0 Fe.
Cast: 68,000-82,000 TS, 31,000 min YS; 12 min El.
Rupture strength: 4500 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 950°C.
DIN G-X15NiCrSi7517

THERMODUR 15CN2035.
M-1290; 0.10-0.15 C, 0.50-1.0 Si, 1.0-1.5 Mn, 20-22 Cr, 34-35 Ni, bal Fe.
Cast: 64,000-78,000 TS; 28,000 min YS; 20 min El.
Rupture strength: 2700 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulphur free atmosphere to 1100°C.
DIN G-X15NiCrSi3520.

THERMODUR 15CN2535.
M-1290; 0.10-0.15 C, 0.50-1.0 Si, 1.0-1.5 Mn, 25-26.5 Cr, 34-35 Ni, bal Fe.
Cast: 64,000-92,000 TS; 30,000 min YS; 10 min El.
Rupture strength: 2700 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1150°F.
DIN G-X15NiCrSi3525.

THERMODUR 30CN13.
M-1290; 0.25-0.30 C, 0.50-1.0 Si, 1.0-1.5 Mn, 24-25 Cr, 12-13 Ni, bal Fe.
Cast: 64,000-92,000 TS; 10 min El.
Rupture strength: 2400 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1150°C.
SEW-Nr. 1.4837; DIN G-X35CrNiSi2512; ASTM A447-II.

THERMODUR 30CN15T.
M-1290, 0.25-0.30 C, 0.50-1.0 Si, 0.50-1.0 Mn, 19-20 Cr, 14.5-15.5 Ni, bal Fe
Cast: 64,000-92,000 TS; 28,000 min YS; 12 min El.
Rupture strength: 3000 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1050°C.
SEW-Nr. 1.4832, DIN G-X25CrNiSi2014.

THERMODUR 30CN20.
M-1290; 0.25-0.30 C, 0.50-1.0 Si, 1.0-1.5 Mn, 23.5-25.0 Cr, 20.0-21.0 Ni, bal Fe
Cast 64,000-92,000 TS; 35,000 min YS; 10 min El.
Rupture strength: 4700 psi, 10,000 hrs, 800°C
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1150°C.
SEW-Nr 1.4848, DIN G-X35CrNiSi2520; ASTM A351-HK30

THERMODUR 30CN2035.
M-1290; 0.25-0.30 C, 0.50-1.0 Si, 1.0-1.5 Mn, 20-22 Cr, 34-35 Ni, bal Fe.
Cast· 64,000-92,000 TS, 10 min El.
Rupture strength· 5100 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1100°C.
DIN G-X30NiCrSi3520

THERMODUR 30CN2055.
M-1290; 0.25-0.35 C, 0.50-1.0 Si, 1.0-1.5 Mn, 20-22 Cr, 52-54 Ni, bal Fe.
Cast. 57,000-78,000 TS; 28,000 min YS; 4 min El.
Rupture strength. 4800 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1000°C.
DIN G-X35NiCr5422.

THERMODUR 30CN2535.
M-1290; 0.25-0.30 C, 0.50-1.0 Si, 1.0-1.5 Mn, 25.0-26.5 Cr, 34.0-35.0 Ni, bal Fe
Cast· 64,000-92,000 TS; 35,000 min YS; 10 min El.
Rupture strength: 5100 psi, 10,000 hrs, 800°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1150°C.
SEW-Nr. 1.4857, DIN G-X30NiCrSi3525.

THERMODUR 40CNCW25.
M-1290; 0.35-0.40 C, 0.50-1.0 Si, 0.50-1.0 Mn, 25.0-26.5 Cr, 34.0-35.0 Ni, 14.0-15.0 Co, 5.0-5.5 W, bal Fe.
Cast: 71,000-100,000 TS; 38,000 min YS, 4 min El.
Rupture strength· 2800 psi 10,000 hrs, 1000°C

Resistance to scaling in oxidizing and ashfree and sulphur free atmosphere to 1200°C.
DIN G-X40NiCrCoW352515.

THERMODUR 50CNW3050.
M-1290; 0.45-0.55 C, 0.50-1.0 Si, 0.50-1.0 Mn, 27.0-28.5 Cr, 46-48 Ni, 4.5-5.0 W, bal Fe.
Cast: 57,000-85,000 TS; 35,000 min YS; 4 min El.
Rupture strength: 2400 psi, 10,000 hrs, 1000°C.
Resistance to scaling in oxidizing and ashfree and sulfur free atmosphere to 1150°C.
SEW-Nr. 2.4879; DIN G-X50NiCrW4828.

THERMODUR C18·8ES.
M-1290; 0.07 max C, 0.50-1.0 Si, 0.50-1.0 Mn, 18-19 Cr, 10-11 Ni, 2.0-2.2 Mo, bal Fe.
Cast: 64,000-92,000 TS; 35,000 min YS; 35 min El.
Rupture strength: 47,000 psi, 10,000 hrs, at 550°C.
Resistance to scaling in oxidizing and ashfree atmosphere without sulphur compounds: 750°C.
SEW-Nr. 1.4408; DIN G-X6CrNiMo1810;
ASTM A351-CF8M.

THERMDUR C18 8ESS.
M-1290; 0.08 max C, 0.50-1.0 Si, 0.50-1.0 Mn, 17-18 Cr, 10.5-11.5 Ni, 2.0-2.2 Mo, Nb = 8 × %C, bal Fe.
Cast: 64,000-92,000 TS, 27,000 min YS; 20 min El.
Rupture strength: 48,000 psi, 10,000 hrs, 550°C.
Resistance to scaling in oxidizing and ashfree and sulphur free atmosphere to 750°C.
SEW-Nr. 1.4581; DIN G-X7CrNiMoNb1810.

THERMODUR C18 8S.
M-1290; 0.07 max C, 0.50-1.0 Si, 0.50-1.0 Mn, 18-19 Cr, 9-10 Ni, 0.75 max Mo, bal Fe.
Cast: 64,000-92,000 TS; 30,000 min YS; 35 min El
Rupture strength: 30,000 psi, 10,000 hrs, at 500°C
Resistance to scaling in oxidizing and ashfree atmosphere without sulphur compounds: 750°C.
SEW-Nr. 1.4308; DIN G-X6CrNi189,
ASTM A351-CF8.

THERMODUR C18·8SS.
M-1290; 0.08 max C, 0.50-1.0 Si, 0.50-1.0 Mn, 18-19 Cr, 9.5-10.5 Ni, 0.75 max Mo, Nb = 8 × %C, bal Fe.
Cast. 64,000-92,000 TS; 30,000 min YS; 30 min El.
Rupture strength. 42,000 psi, 10,000 hrs, at 550°C
Resistance to scaling in oxidizing and ashfree atmosphere without sulphur compounds: 750°C.
SEW-Nr. 1.4552; DIN G-X7CrNiNb189;
ASTM A351-CF8C.

THERMODUR CMVW5.
M-1290, 0.15-0.20 C, 0.30-0.50 Si, 0.50-0.80 Mn, 1.2-1.5 Cr, 0.9-1.1 Mo, 0.20-0.30 V, bal Fe.
Cast: 85,000-112,000 TS, 64,000 min YS; 15 min El.
Resistance to scaling in oxidizing and ashfree atmosphere without sulphur compounds.
SEW-Nr. 1.7706; DIN GS-17CrMoV511

THERMODUR CMVW11.
M-1290; 0.22 C, 12.0 Cr, 0.85 Ni, 1.1 Mo, 0.3 V, 0.5 W, bal Fe.
Cast: heat treated: 100,000-128,000 TS, 85,000 min YS, 16 min El.
For elevated temperature operation
Werkstoff Nr. 1.4932; DIN G-X22CrMoWV121.

THERMODUR CMW3.
M-1290; 0.15-0.20 C, 0.30-0.50 Si, 0.50-0.80 Mn, 1.0-1.5 Cr, 0.45-0.55 Mo, bal Fe.
Cast: 71,000-92,000 TS; 45,000 min YS; 20 min El.
Resistance to scaling in oxidizing and ashfree atmosphere without sulphur compounds: 570°C.
SEW-Nr. 1.7357; DIN GS-17CrMo55; ASTM A217-WC6.

THERMODUR CMW3K.
M-1290; 0.17 C, 0.75 Mn, 0.75 Cr, 0.35 Mo, bal Fe.
Cast: heat treated: 78,000 min TS; 42,500 min YS; 20 min El.
Resistant to scaling at elevated temperatures.
DIN GS-17CrMo33.

THERMODUR CMW5.
M-1290; 0.10-0.15 C, 0.30-0.50 Si, 0.50-0.70 Mn, 2.0-2.5 Cr, 0.9-1.1 Mo, bal Fe.
Cast: 71,000-100,000 TS; 45,000 min YS; 20 min El.
Resistance to scaling in oxidizing and ashfree atmosphere without sulphur compounds: 580°C.
SEW-Nr. 1.7380; DIN GS-12CrMo910; ASTM A217-WC9.

THERMODUR CMW11.
M-1290; 0.20-0.26 C, 0.20-0.40 Si, 0.50-0.70 Mn, 11.3-12.2 Cr, 0.7-1.0 Ni, 1.0-1.2 Mo, 0.25-0.35 V, bal Fe.
Cast· 100,000-127,000 TS; 85,000 min YS; 15 min El.
Resistance to scaling in oxidizing and ashfree atmosphere without sulphur compounds.
SEW-Nr. 1.4931; DIN G-X22CrMoV121.

THERMODUR CW11.
M-1290, 0.22 C, 12.0 Cr, 0.85 Ni, 0.12 V, bal Fe
Cast· heat treated. 92,000-113,000 TS; 71,000 min YS, 16 min El.
For elevated temperature operation.
DIN G-X22CrV12

THERMODUR MVW2
M-1290; 0.17 C, 0.50 Mo, 0.30 V, bal Fe.
Cast heat treated; 71,000-92,000 TS; 42,500 min YS, 20 min El.
Resistant to scaling at elevated temperature.
Werkstoff Nr. 1.5402; DIN GS-17MoV53.

THERMODUR MW2.
M-1290; 0.18-0.23 C, 0.30-0.50 Si, 0.50-0.80 Mn, 0.30 max Cr, 0.35-0.45 Mo, bal Fe.
Cast. 64,000-85,000 TS; 35,000 min YS, 22 min El.
Resistance to scaling in oxidizing and ashfree atmosphere without sulphur compounds. 560°C.
SEW-Nr 1.5419, DIN GS-22Mo4; ASTM A217-WC1

THERMODUR P6M.
M-1290, 0.08-0.15 C, 0.30-0.50 Si, 0.40-0.70 Mn, 4.5-5.5 Cr, 0.45-0.55 Mo, bal Fe
Cast 92,000-120,000 TS; 60,000 min YS; 18 min El.
Resistance to scaling in oxidizing and ashfree atmosphere without sulphur compounds: 600°C.
SEW-Nr 1.7363; DIN GS-12CrMo195; ASTM A217-C5

THERMODUR P7M.
M-1290, 0.08-0.15 C, 0.30-0.50 Si, 0.50-0.80 Mn, 9.0-10.0 Cr, 1.1-1.2 Mo, bal Fe.
Cast. 92,000-120,000 TS, 60,000 min YS; 18 min El.
Resistance to scaling in oxidizing and ashfree atmosphere without sulphur compounds. 630°C.
SEW-Nr 1.7389, DIN G-X12CrMo101; ASTM A217-C12.

THERMODUR T-C 16 13 S.
M-1290; 0.06 C, 16.5 Cr, 12.5 Ni, bal Fe.
Cast, annealed: 64,000-85,000 TS, 28,000 min YS; 20 min El.
Austenitic stainless casting; for elevated temperature operation.
DIN G-X6CrNi1613.

THERMODUR T-C 16.13 SS.
M-1290; 0.07 C, 16.5 Cr, 12.5 Ni, Nb, bal Fe.
Cast, annealed: 64,000-85,000 TS; 28,000 min YS; 20 min El.
Austenitic stainless casting; for elevated temperature operation.
Werkstoff Nr. 1.4968; DIN G-X7CrNiNb1613.

THERMODUR T-C 16.16 ES.
M-1290; 0.07 C, 16.5 Cr, 16.0 Ni, 2.25 Mo, bal Fe.
Cast, annealed: 64,000-85,000 TS; 28,000 min YS; 20 min El.
Austenitic stainless casting; for elevated temperature operation.
DIN G-X8CrNiMo1616.

THERMODUR T-C 16.16 ESS.
M-1290; 0.07 C, 16.5 Cr, 16.0 Ni, 2.25 Mo, Nb, bal Fe.
Cast, annealed: 64,000-85,000 TS; 28,000 min YS; 20 min El.
Austenitic stainless casting; for elevated temperature operation.
DIN G-X7CrNiMoNb1616.

THERMODUR T-C 18.8.
M-1290; 0.10 C, 18.0 Cr, 8.5 Ni, bal Fe.
Cast, annealed: 70,000 min TS; 30,000 min YS; 25 min El.
Austenitic stainless casting; for elevated temperature operation.
Werkstoff Nr. 1.4312; DIN G-X10CrNi188.

THERMODUR T-C 18.8 ES.
M-1290; 0.07 C, 17.5 Cr, 10.5 Ni, 2.25 Mo, bal Fe.
Cast, annealed 70,000 min TS; 30,000 min YS; 25 min El.
Austenitic stainless casting; for elevated temperature operation.
Werkstoff Nr 1.4408; DIN G-X6CrNiMo1810;
ASTM A351 Gr. CF8M.

THERMODUR T-C18.8 ESS.
M-1290, 0.08 C, 17.5 Cr, 11.0 Ni, 2.25 Mo, Nb, bal Fe.
Cast, annealed: 70,000 min TS; 30,000 min YS; 20 min El.
Austenitic stainless casting, for elevated temperature operation
Werkstoff Nr. 1.4581; DIN G-X7CrNiMoNb1810

THERMODUR T-C 18.8 S
M-1290; 0.07 C, 18.0 Cr, 9.5 Ni, bal Fe.
Cast, annealed· 70,000 min TS, 30,000 min YS; 25 min El.
Austenitic stainless casting; for elevated temperature operation
Werkstoff Nr 1.4308, DIN G-X6CrNi189.
ASTM A351 Gr. CF8.

THERMODUR T-C 18.8 SS.
M-1290, 0.08 C, 18.0 Cr, 10.0 Ni, Nb, bal Fe.
Cast, annealed: 70,000 min TS, 30,000 min YS; 20 min El.
Austenitic stainless casting, for elevated temperature operation.
Werkstoff Nr 1.4552, DIN G-X7CrNiNb189;
ASTM A351 Gr CF8C

THERMODUR T-CN 13W.
M-1290, 0.12 C, 23.0 Cr, 12.5 Ni, bal Fe.
Cast, annealed: 64,000-85,000 TS; 28,000 min YS; 20 min El.
Austenitic stainless casting; for elevated temperature operation.
DIN G-X12CrNiSi2312, ASTM A351 Gr. CH20.

THERMODUR T-CN 15 TW
M-1290; 0.15 C, 19.5 Cr, 15.0 Ni, bal Fe.
Cast, annealed. 64,000-85,000 TS, 28,000 min YS; 20 min El.
Austenitic stainless casting; for elevated temperature operation
DIN G-X15CrNiSi2015.

THERMODUR T-CN 20
M-1290; 0.30 C, 25.0 Cr, 20.0 Ni, bal Fe.
Austenitic stainless casting; for high temperature operation.
Werkstoff Nr. 1.4848; DIN G-X40CrNiSi2520;
ASTM A297 Gr. HK.

THERMODUR T-CN 20 W.
M-1290; 0.15 C, 25.0 Cr, 21.0 Ni, bal Fe.
Cast, annealed: 64,000-85,000 TS; 28,000 min YS; 20 min El.
Austenitic stainless casting; for elevated temperature operation.
Werkstoff Nr. 1.4849; DIN G-X15CrNiSi2520.
ASTM A351 Gr. CK-20.

THERMODUR T-CN 35 W.
M-1290; 0.10 C, 35.0 Ni, 20.5 Cr, bal Fe.
Cast, annealed. 64,000-85,000 TS; 28,000 min YS; 20 min El.
Austenitic stainless casting, for high temperature operation.
DIN G-X10NiCrSi3520.

THERMODUR T-CN 60.
M-1290; 0.35 C, 53.0 Ni, 21.0 Cr, bal Fe.
As cast: 64,000-85,000 TS; 28,000 min YS; 4 min El.
Austenitic stainless casting, for high temperature operation
DIN G-X35NiCr5422.

THERMODUR T-CN 80
M-1290; 0.15 C, 78.0 Ni, 14.0 Cr, bal Fe.
Cast, annealed: 64,000-85,000 TS, 28,000 min YS; 12 min El.
Austenitic stainless casting; for high temperature operation.
DIN G-X15NiCr7814.

THERMODUR W1.
M-1290, 0.18-0.23 C, 0.30-0.50 Si, 0.50-0.80 Mn 0.30 max Cr, bal Fe
Cast 64,000-85,000 TS; 35,000 min YS, 22 min El.
Resistance to scaling in oxydizing and ashfree atmosphere without sulphur compounds: 560°C.
SEW-Nr 1.0619, DIN GS-C25; ASTM A216-WCA.

THERMODUR W2
M-1290, 0.27-0.30 C, 0.30-0.50 Si, 0.60-0.80 Mn, 0.30 max Cr, bal Fe.
Cast 70,000 min TS; 40,000 min YS, 20 min El.
Resistance to scaling in oxydizing and ashfree atmosphere without sulphur compounds: 560°C.
DIN GS-C30, ASTM A216-WCB.

THERMODYNE.
M-815; Sb, Pb, bal Sn.
For bearings; Babbitt.

THERMO-ELECTRIC NICKEL BABBITT.
M-143; 2.25 Cu, 90 Sn, 0.25 Ni, 7.5 Sb
10,660 TS, 13 El; 24 Brin.
For Babbitt service, bearings; C.E.L. 6300.

THERMOFLEX.
M-919
For thermostatic and contact alloy, bi-metal.

THERMO-KANTHAL
Germany, 2-3 Si, bal Ni
For thermocouples, high oxidation resistance and stability

THERMO-KANTHAL-N.
M-1150; 2-3 Si, bal Ni.
For thermocouples
Max operating temperature 2300°F.

THERMO-KANTHAL-P.
M-1150; 90 Ni, 10 Cr.
For thermocouples.

THERMOLD 75.
M-114; 0.35 C, 1.0 Si, 0.3 Mn, 3.5 Cr, 0.75 V, 2.5 Mo, 2.0 Co, bal Fe.
Heat Treated: 296,000 TS; 247,000 YS; 9 El; 16 RA; 9 Charpy, C 59 Rock.
For aluminum die casting dies and inserts, cores, plungers, sleeves, slides, extrusion and forging dies.
Hot work steel. Air hardening. Good thermal fatigue resistance.

THERMOLD A replaced by THERMOLD H11.

THERMOLD AV replaced by THERMOLD H13.

THERMOLD B replaced by THERMOLD H12.

THERMOLD H10.
M-114; 0.40 C, 0.55 Mn, 1.0 Si, 3.25 Cr, 0.4 V, 2.5 Mo, bal Fe.
Heat treated: 233,000-301,000 TS; 201,000-260,000 YS; 8-10 El; 26-32 RA; Rock C 46-55.
For mandrels, dies, bolsters, dummy blocks, punches, gripper and header dies, hot shears, aluminum die casting dies.
Resists softening at high temperatures.
Type H10 hot work steel.

THERMOLD H11.
M-114; 0.35 C, 0.40 Mn, 1.0 Si, 5.0 Cr, 0.45 V, 1.5 Mo, bal Fe.
Heat Treated: 225,000-305,000 TS; 195,000-255,000 YS; 8-15 El; 29-50 RA; C 45-56 Rock
For die casting dies, punches, piercing tools, mandrels, extrusion tooling, forging dies.
Type H11 hot work steel.
High hardenability. Good resistance to softening.

THERMOLD H12.
M-114; 0.35 C, 0.40 Mn, 1.0 Si, 5 0 Cr, 1.5 W, 0.4 V, 1 5 Mo, bal Fe.
Heat treated: 192,000-263,000 TS; 175,000-241,000 YS; 8-15 El; 25-43 RA; C 41-52 Rock
For extrusion dies, dummy blocks, gripper and header dies, forging die inserts, punches, mandrels
High hardenability, tough.
Type H12 hot work steel.

THERMOLD H13.
M-114; 0.35 C, 0.40 Mn, 1.0 Si, 5.0 Cr, 1 0 V, 1.5 Mo, bal Fe.
Heat treated: 189,000-258,000 TS; 170,000-238,000 YS; 8-18 El; 28-48 RA; C 41-51 Rock.
For die casting dies and inserts, cores, ejector pins, plungers, sleeves, extrusion and forging dies.
High hardenability and toughness.
Type H13 hot work steel. Air harden.

THERMOLD H19.
M-114; 0.40 C, 4.25 Cr, 4.25 W, 2.0 V, 4 25 Co, bal Fe.
Heat treated: 233,000 TS; 217,000 YS; 5.6 El; 17 RA; C 58 Rock.
For extrusion dies and inserts, dummy blocks, punches, mandrels, forging dies and inserts.
Good red hardness and shock resistance.
Type H19 hot work steel.

THERMOLD H21.
M-114; 0.35 C, 0.25 Mn, 0.35 Si, 3.5 Cr, 9 5 W, 0.5 V, bal Fe
Heat treated: 242,500 TS; 220,500 YS; 7.4 El; 27 RA; C 54 Rock.
For mandrels, hot punches, and blanking dies, fly shear blades, extrusion and gripper dies, piercing points, dummy blocks. Resists softening.
Type H21 hot work steel.

THERMOLD H22.
M-114; 0.38 C, 0.25 Mn, 0.35 Si, 3.0 Cr, 11.0 W, 0.4 V, bal Fe.
Heat treated: 225,000 TS; 200,500 YS; 8.8 El; 30 RA; C 55 Rock.
For mandrels, hot blanking dies, hot punches, flying shear blades, extrusion dies, dummy blocks, gripper dies.
Shock resistant. Resists softening.
Type H22 Hot work steel.

THERMOLD H23.
M-114; 0.32 C, 0.35 Mn, 0.50 Si, 12.0 Cr, 12.0 W, 1.0 V, bal Fe.
Heat treated: (at 1000°F) 167,500 TS; 135,000 YS; 7.4 El; 13.5 RA; C 34 Rock.
For extrusion dies, die casting dies, mandrels, hot punches, gripper dies.
High resistance to softening. Retains hot hardness.
Type H23 hot work steel.

THERMOLD H26.
M-114; 0.50 C, 0.25 Mn, 0.35 Si, 4.0 Cr, 18.0 W, 1.0 V, bal Fe.
Heat treated· 258,000 TS; 235,500 YS; 3.6 El; 6 RA; C 57 Rock.
For mandrels, hot blanking dies and punches, flying shear blades, extrusion and trim dies.
Maximum hot strength and resistance to softening.
Type H26 hot work steel.

THERMOLD J COLD WORK.
M-114, 0 50 C, 0 40 Mn, 1.1 Si, 5.0 Cr, 1 0 V, 1 4 Mo, 1.5 Ni, bal Fe
For cold heading dies, die inserts, coining dies, forming rolls.
AISI Type A9 air hardening cold work tool steel.

THERMOLD J HOT WORK.
M-114, 0.50 C, 0 4 Mn, 1 0 Si, 5.0 Cr, 1.0 V, 1 4 Mo, 1 5 Ni, bal Fe
For punches, piercing tools, forging dies, gripper dies, extrusion tooling, coining dies.
AISI Type A9 Air hardening tool steel

THERMOLD KL.
M-114; 0 35 C, 0 60 Mn, 1 5 Si, 7.25 Cr, 7.25 W, bal Fe
Heat treated· 232,000 TS, 203,000 YS; 10.5 El; 34 RA.
For extrusion and gripper dies, forming and blanking dies, hot punches.
Good toughness and red hardness
Hot work steel Oil hardening.

THERMOLD Z
M-114, 0.37 C, 0.8 Mn, 0 3 Si, 1.25 Cr, 0.15 V, 0.35 Mo, 0.001 B, bal Fe.
Hardenable to 35-54 Rc.
For plastic molds, zinc die casting molds.
AISI P20 Mold Steel.

THERMO-LECTRIC COPPER-HARDENED BABBITT.
M-143; 20 Sn, 68 Pb, 11 Sb, 1 Cu.
9950 TS; 1 7 El, 18 Brin.
For Babbitt bearings; C.E.L. 4000.

THERMON 7.
M-1331; 0.45 C, 1 05 Cr, 0.20 V, 1.85 W, bal Fe.
For upsetters, heading dies, punches; oil hardened, tough.

THERMON 7H.
M-1331; 0.55 C, 1.05 Cr, 0.2 V, 1.85 W, bal Fe.
For upsetters, riveters, heading dies; oil hardened, tough.

THERMON 7W.
M-1331; 0.35 C, 1.05 Cr, 0.2 V, 1.85 W, bal Fe.
For upsetters, punches, heading dies; oil hardened, tough.

THERMON 12.
M-1331; 0.32 C, 0.30 Mn, 0.30 Si, 3 Cr, 2.8 Mo, 0.50 V, bal Fe.
For hot dies.
Hot work tool steel, tough, shock resistant.

THERMON 15.
M-1331; 0.30 C, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For upsetters, punches, extrusion press parts; oil hardened, tough.

THERMON 17.
M-1331; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For extrusion press parts, rams, punches; hot work steel, oil hardened.

THERMON 17 EXTRA.
M-1331; 0.30 C, Cr, Co, V, W, bal Fe.
For extrusion press parts, rams, punches; hot work steel, oil hardened.

THERMON 21.
M-1331; 0.40 C, Cr, Mo, V, W, bal Fe.
For hot work tools, extrusion press parts; oil hardened, hot work steel.

THERMON 34.
M-1331; 0 30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams and liners, punches, upsetters; oil hardened, hot work steel.

THERMON 34 EXTRA.
M-1331; 0 30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion press parts, rams, punches; hot work steel, oil hardened.

THERMON A
M-1331; 0 45 C, Cr, Ni, W, bal Fe.
For hot work tools, dies, punches; hot work steel, oil hardened.

THERMONEAL 10.
M-64, 0 30-0 36 C, 0 2-0.4 Mn, 0.8-1.2 Si, 4.25-5.25 Cr, 1 75-2 00 Mo, bal Fe
At 80°F: 217,000 TS; 184,000 YS; 13 El; 40 RA.
At 1000°F: 145,000 TS, 105,000 YS; 20 El, 65 RA.
For upsetting and forging dies, aluminum die casting dies, extrusion dies
Type H11 hot work tool steel. Air hardening.

THERMONEAL 11.
M-64; 0.37-0 42 C, 5.0-5.5 Cr, 0 23-0 38 Mn, 0.85-1.1 Si, 1.0-1 2 Mo, 0 45-0.55 V, bal Fe.
At 80°F. 217,000 TS; 184,000 YS; 13 El; 40 RA
At 1000°F: 145,000 TS; 105,000 YS; 20 El; 65 RA
For die casting dies, upsetting and press forging dies, extrusion dies.
Type H11 hot work tool steel.

THERMONEAL 13.
M-64; 0.37-0.42 C, 5.0-5.5 Cr, 0.23-0.38 Mn, 1.0-1.3 Mo, 0.85-1.10 Si, 0.90-1.0 V, bal Fe.
At 80°F: 217,000 TS; 184,000 YS; 13 El; 40 RA.
At 1000°F: 145,000 TS, 105,000 YS; 20 El; 65 RA.
For upsetting and press forge dies, extrusion dies.
Type H13 hot work steel.

THERMON RR.
M-1331; 0.20 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
Cold drawn: 105,000 TS, 85,000 YS; 17 El; 50 RA; 215 Brin.
For turbine blades, cutlery, valves, surgical instruments; Type 420; stainless.

THERMON SS.
M-1331; 0.65 C, 3.75 Cr, 0.85 Mo, 0.7 V, 8.5 W, bal Fe.
For cutting tools, drills, taps, hot work tools; high

THERMON U.
M-1331; 0.45 C, 1.35 Cr, 0.45 Mo, 0.8 V, 0.45 W, bal Fe.
For upsetters, riveters, punches; oil hardened.

THERMOPERM.
M-72; 70 Fe, 30 Ni.
For compensating shunts for electrical equipment; temperature-sensitive, magnetic.

THERMOTEM.
M-64; 0.33 C, 4.75 Cr, 1.87 Mo, bal Fe.
Annealed: 250 Brin
Heat treated: 510 Brin.
For extrusion parts, dies, shear knives; oil hardened.

THERMOTEM 10.
M-64; 0.30-0.36 C, 4.25-5.25 Cr, 0.80-1.20 Si, 0.2-0.4 Mn, 1.75-2.00 Mo, bal Fe.
At 80°F: 217,000 TS; 184,000 YS; 13 El; 40 RA.
At 1000°F: 145,000 TS; 105,000 YS; 20 El; 65 RA.
For upsetting and forging dies, aluminum die casting dies, extrusion dies.
Type H11 hot work steel. Air hardening.

THERMOTEM-11.
M-64; 0 40 C, 1.0 Si, 5.25 Cr, 1.1 Mo, 0.5 V, bal Fe.
For hot work dies and punches; hot work steel, air hardened

THERMOTEM-12.
M-64; 0 37 C, 1.0 Si, 5 0 Cr, 1 45 Mo, 1.25 W, 0.3 V, bal Fe
For hot work dies and punches; hot work steel, air hardening.

THERMOTEM-13.
M-64; 0.40 C, 1.0 Si, 5.25 Cr, 1.1 Mo, 0.95 V, bal Fe.
For hot work dies and punches; hot work steel, air hardening.

THESSCAL A.
M-1522; 5 Ag, Zn.
Melt range: 420-450°C.
Yield point: 8 4 t.s i.; 5 El.
For torch brazing wrought aluminum.

THESSCAL P12.
M-1522; Zn, Al.
Melt range; 440-510°C.
Yield point: 18.6 t.s.i.; 6 El.
For torch brazing aluminum castings

THESSCO 625.
M-1522; Au, Ag, Cu.
Wrought: 13.7 density; 160 HV hardness 12% elec. cond.
For tarnish resistant slip ring or brush spring alloy.

THESSCO E5.
M-1522; 20 Ag, Cu, Zn.
Melt range: 770-810°C.
Yield point: 30.0 t.s.i.; 4 El.
For silver brazing, high melt point, high strength, low cost.

THESSCO GD.25.
M-1522; Ag, CdO (internally oxidized).
Wrought. 10.0 density; 60 HV hardness; 8.2% elect. cond.
For anti-welding contacts.

THESSCO GD.35.
M-1522; Ag, CdO (internally oxidized).
Wrought: 9.9 density; 65 HV hardness; 75% elec. cond.

THESSCO H12.
M-1522; 72 Ag, Cu.
Melt range: 780-780°C.
Yield point: 19.0 t.s.i.; 10 El.
Silver brazing,-high quality joints in protective atmosphere.

THESSCO HT5.
M-1522; 5 Ag, Cd, Zn.
Melt range: 270-285°C.
Yield point: 10 t.s.i.; 8 El.
Silver bearing soft solder, high melting point, good strength.

THESSCO HX0.
M-1522; 60 Ag, Cu, Sn.
Melt range: 600-720°C.
Yield point: 18.5 t.s.i.; 5 El.
Silver brazing, for use in protective atmospheres.

THESSCO L3.
M-1522; 10 Ag, Cu, Zn.
Melt range: 840-855°C.
Yield point: 31.5 t.s.i.; 7 El.
For silver brazing, high melt point, high strength, low cost.

THESSCO L7.
M-1522; 14 Ag, Cu, Zn.
Melt range: 810-835°C.
Yield point: 33.5 t.s.i.; 3 El.
For silver brazing, high melt point, high strength, low cost.

THESSCO LX13.
M-1522; 20 Ag, Cu, Zn, Cd.
Melt range: 720-775°C
Yield point. 20.5 t.s.i.; 9 El.
For silver brazing, high melt point

THESSCO LX16.
M-1522; 23 Ag, Cu, Zn, Cd.
Melt range: 610-720°C.
Yield point: 17.0 t.s.i.; 18 El.
For silver brazing, general purpose, wide melt range.

THESSCO LX18
M-1522; 25 Ag, Cu, Zn, Cd.
Melt range: 605-710°C.
Yield point: 20.0 t.s.i., 14 El.
For silver brazing, general purpose, wide melt range

THESSCO M1.
M-1522; 31 Ag, Cu, Zn.
Melt range: 715-755°C.
Yield point: 30.5 t.s.i.; 23 El
For silver brazing, high melt point, high strength

THESSCO MX0.
M-1522; 30 Ag, Cu, Zn, Cd.
Melt range: 605-680°C.
Yield point: 15 t.s.i.; 10 El.
For silver brazing, general purpose.

THESSCO MX4.
M-1522; 34 Ag, Cu, Zn, Cd.
Melt range: 610-665°C.
Yield point: 15.0 t.s.i.; 15 El.
For silver brazing, general purpose.

THESSCO MX8.
M-1522; 38 Ag, Cu, Zn, Cd.
Melt range: 605-650°C.
Yield point: 16.0 t.s.i.; 24 El.
For silver brazing, general purpose, low melt point.

THESSCO MX12.
M-1522; 42 Ag, Cu, Zn, Cd.
Melt range: 610-620°C.
Yield point: 17.0 t.s.i.; 27 El.
For silver brazing, lowest melting point

THESSCO MX18.
M-1522; 48 Ag, Cu, Zn, Cd.
Melt range: 630-640°C.
Yield point: 19.5 t.s.i.; 43 El.
For silver brazing, extremely fluid.

THESSCO MX18 PLUS.
M-1522; 48 Ag, Cu, Zn, Cd, 3 Ni.
Melt range: 640-660°C.
Yield point: 20.0 t.s.i.; 35 El.
For silver brazing tungsten carbide and hard metals.

THESSCONITE G.4.
M-1522; Ag, W.
Sintered: 15.0 density; 225 HV hardness; 43% elec. cond.
For heavy duty arc resistant contacts.

THESSCONITE G.7.
M-1522; Ag, W.
Sintered: 13.9 density; 165 HV hardness; 50% elec. cond.
For heavy duty arc resistant contacts.

THESSCONITE G.9
M-1522, Ag, W
Sintered: 13.5 density; 140 HV hardness 55% elec. cond.
For heavy duty arc resistant contacts.

THESSCONITE GC.15.
M-1522; Ag, C
Sintered: 10.2 density; 64 HV hardness; 85 elec. cond
For sliding electrical contacts

THESSCONITE GD.10
M-1522; Ag, CdO.
Sintered 10.0 density, 60 HV hardness; 82% elec cond.
For anti-welding contacts.

THESSCONITE GN.1.
M-1522, Ag, Ni.
Sintered. 9.9 density, 90 HV hardness, 66% elec. cond
For medium duty electrical contacts.

THESSCONITE HW.10.
M-1522; Ag, WC.
Sintered: 12.5 density, 130 HV hardness, 60% elec. cond.
For arc resistant and anti-welding contacts

THESSCONITE U.3.
M-1522; Cu, W
Sintered. 14.9 density; 240 HV hardness, 28% elec. cond
For oil immersed circuit breaker contacts.

THESSCONITE U.4.
M-1522; Cu. W.
Sintered 14.6 density; 220 HV hardness, 35% elec. cond
For oil immersed circuit breaker contacts.

THESSCONITE U.8.
M-1522; Cu, W
Sintered: 13.2 density; 180 HV hardness, 40% elec. cond.
For oil immersed circuit breaker contacts.

THESSCO P.G.S.
M-1522; Au, Ag, Pt.
Wrought: 17.0 density; 60 HV hardness; 16% elec. cond.
For light duty tarnish resistance contacts.

THESSCO PHOSPHALLOY NO. 1.
M-1522; 15 Ag, Cu, P.
Melt range: 645-700° + C.
Yield point: 30.5 t.s.i.; 25 El.
For silver brazing, self fluxing on copper

THESSCO PHOSPHALLOY NO. 2.
M-1522; 2 Ag, Cu, P.
Melt range: 645-740° + C.
Yield point: 16.5 t.s.i.; 5 El.
For silver brazing, self fluxing on copper.

THESSCO PHOSPHALLOY NO. 5.
M-1522; 5 Ag, Cu, P.
Melt range: 645-700° + C.
Yield point: 25.0 t.s.i.; 6 El.
For silver brazing, self fluxing on copper.

THESSCO PROOF SILVER.
M-1522; 99.99 Ag.
Melt point: 960°C.
Yield point: 2.9 t.s.i.; 45 El.
For brazing.

THESSCO REDIBRAZE.
M-1522; Bimetal of either GD.25 or GD.35 on silver.

THESSCO SILBRAZE.
M-1522, 1 Ag, Cu, Zn, Si.
Melt range: 885-895°C
Yield point: 14.2 t.s.i.; 43 El.
For brazing; low cost silver bearing brass.

THESSCO SX4.
M-1552; 4 Ag, Sn.
Melt range: 221-224°C
Yield point: 3 t.s.i.; 48 El.
Soft solder, excellent corrosion resistance.

THESSCO SX25
M-1522; 2.5 Ag, Pb, Cu.
Melt point: 302-305°C
Yield point: 1.4 t.s.i.; 45 El.
Soft solder, high melting point.

THESSCO TRIMETAL.
M-1522; 48 Ag, Cu, Zn, Cd, 3 Ni: on copper.
Melt range: 640-660°C
Silver brazing sandwich for carbide tool tipping.

THESSCO TYPE 7
M-1522; Cu, P
Melt range 705-800°C.
Yield point 20.0 t.s.i., 2 El.
Brazing alloy, self fluxing on copper.

THETALOY.
M-1278, 0.38 C, 25 Cr, 7 W, 3 Mo, 12.5 Co, 6 Fe, 2.5 Mn, bal Ni.
For high temperature applications; corrosion and heat resistant.

THIN FIN.
M-33, 99.9 Cu, 0.10 Cd
Sheet: 65,000 TS, 62,000 YS; 1.5 El.
98% IACS Electrical conductivity.
54,000 psi TS after 10 min, anneal at 650°F.
Automotive radiators.

THOR replaced by **THERMOLD H23.**

THORAN.
Germ.; tungsten carbide plus molybdenum carbide, 95.85 W, 3.94 C, Mo.
For hard cutting tools and dies, tips for high speed tools; cast alloy; $W_2C + WC$.

THOR DOPPELKREUZ EXTRA ZH.
M-1310; 0.6 C, 0.25-0.50 Si, 0.20-0.80 Mn, bal Fe.
For gears, rails, shafts, axles, crankshafts; water hardened.

THOR DOPPELKREUZ H.
M-1310; 0.9 C, 0.25-0.50 Si, 0.20-0.80 Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For drills, tools, springs, cutters; Type W1; water hardened.

THOR DOPPELKREUZ MH.
M-1310; 0.75 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated: 185,000 TS; 140,000 YS; 14 El; 38 RA; 375 Brin.
For rails, springs, tools, hammers, axes; Type W1; water hardened.

THOR DOPPELKREUZ SEHR ZAH
M-1310; 0.15 C, 0.15-0.35 Si, 0.25-0.50 Mn, bal Fe.
Cold drawn. 72,000 TS, 60,000 YS; 22 El; 58 RA; 145 Brin.
For gears, pinions, cams, bolts, camshafts; case hardening steel

THOR DOPPELKREUZ ZAH.
M-1310; 0.35 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled 85,000 TS, 54,000 YS; 30 El; 53 RA; 185 Brin.
For gears, bolts, fasteners, shafts; water hardened

THOR DOPPELKREUZ ZH.
M-1310; 0.45 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled. 98,000 TS; 58,000 YS; 24 El; 45 RA; 212 Brin.
For gears, bolts, fasteners, shafts; water hardened.

THOR EXTRA EXTRA ZH
M-1310, 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS, 53,000 YS, 21 El; 42 RA; 200 Brin.
For drills, taps, reamers, cutters, hobs; Type W1; water hardened

THOR EXTRA SEHR ZAH.
M-1310, 0.75 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated. 185,000 TS; 140,000 YS; 14 El; 38 RA, 375 Brin
For springs, rails, axes, shafts, Type W1, water hardened.

THOR EXTRA ZAH.
M-1310; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated 190,000 TS; 145,000 YS; 12 El; 35 RA, 390 Brin
For springs, tools, drills, cutters; Type W1; water hardened

THOR EXTRA ZH
M-1310, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed 100,000 TS, 53,000 YS; 21 El, 42 RA; 200 Brin
For drills, taps, cutters, springs, tools; Type W1; water hardened

THOR PRIMA EXTRA ZH.
M-1310; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS, 58,000 YS; 18 El; 38 RA; 215 Brin
For drills, taps, cutters, springs, Type W1; water hardened.

THOR PRIMA MH.
M-1310; 1.3 C, 0.25 max Mn, 0.25 max Si, bal Fe.
For cutting and engraving tools, taps; Type W1; water hardened.

THOR PRIMA SEHR ZAH.
M-1310, 0.7 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 130,000 YS; 12 El; 36 RA, 355 Brin
For rails, springs, tools, axes, hammers; Type W1; water hardened.

THOR PRIMA ZAH.
M-1310, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For drills, taps, springs, tools, reamers; Type W1; water hardened

THOR PRIMA ZH.
M-1310; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, taps, hobs, saws, cutters, springs; Type W1; water hardened.

THREAD GAUGE STEEL.
M-32; 0.20 C, 1.3 Mn, 0.20 Si, bal Fe.
For thread gauges; case hardening.

THREADING BRASS-223.
M-8; 65 Cu, 34.75 Zn, 0.25 Pb.
Soft: 45,000 TS; 17,000 YS; 55 El.
Hard: 73,000 TS; 60,000 YS; 10 El.
For drawing, forming, switch plates; high ductility.

THREDWELL.
M-307; 0.08-0.25 C, 0.075-0.150 S, bal Fe.
Hot rolled: 50,000-60,000 TS; 25,000-35,000 YS; 35-20 El; 60-35 RA.
For bolts, studs, machine parts; rapid machinability.

THREE STAR.
M-85; 0.72 C, 4 Cr, 18.5 W, 1.2 V, 4 Co, 0.75 Mo, bal Fe.
For cutting tools; high speed steel; obsolete.

THREE-TWENTY.
Eng.; 77 Al, 20 Zn, 3 Cu.
For light alloy parts; non-hardenable.

THURSTON BRASS.
U.S.; 44.5 Zn, 0.5 Sn, bal Cu.
For architectural trim; corrosion resistant.

THURSTON BUTTON.
England; 33-37 Zn, 1.5-6 Sn, 12-15 Pb, bal Cu.
For ornamental and architectural parts; free-cutting

Ti 01.
M-1268; 4 Cu, 0.6 Mg, 0.5 Mn, bal Al.
Heat treated: 58,300 TS, 41,000 YS; 8-12 El.
For aircraft structures; age hardenable.

Ti-0.15 Pd.
M-144; 0.15 Pd, bal Ti
At R.T.: 55,000 TS; 45,000 YS; 22 El; 35 RA (min).
At 800°F: 19,800 TS; 11,700 YS; 25 El; 76 RA.
For chemical industry applications where environments are moderately reducing.
Resists sea water corrosion.
All alpha-type alloy

Ti-0.20 Pd.
M-144; 0.15-0.20 Pd, bal Ti.
Plate: 62,000 TS; 46,000 YS; 27 El; 38 RA; 200 Brinell.
For chemical industry equipment, for special corrosion applications.
Alpha type. Resists seawater corrosion.

Ti. 03.
M-1268; 1 Cu, 1 Mg, 1 Si, bal Al.
W(T4): 38,100 TS; 22,400 YS; 15 El.
WP(T6): 56,000 TS; 44,800 YS; 6 El.
For structures, marine trim; age hardenable.

Ti-3Al-2.5V.
3 Al, 2.5 V, bal Ti.
Tube: 105,000-135,000 TS; 75,000-120,000 YS; 3-30 El.
For aerospace equipment, airplane components.
High strength, ductility and fabricability.
Used at temperatures up to 600°F.

Ti-3Al-8Mo-8V-2Fe.
M-144; 3 Al, 8 Mo, 8 V, 2 Fe, bal Ti.
Ht. Tr.: 184,000 TS; 167,000 YS; 8 El; 13 RA.
For high temperature applications.
Good notch-toughness, age-hardenable.
Good weldability

Ti. 04.
M-1268; 4.0 Cu, 0.6 Mg, 0.5 Mn, bal Al.
Heat treated: 53,800 TS; 31,400 YS; 15 El.
For aircraft structures; age hardenable.

Ti-4Al-3Mo-1V.
M-144; 3.75-4.75 Al, 2.5-3.5 Mo, 0.75-1.25 V, 0.15 max H, 0.08 max C, bal Ti.
Annealed: 140,000 TS; 85,000 YS; 13-18 El.
Aged: 195,000 TS; 165,000 YS; 5-10 El.
For airframe structures; heat treatable, good strength and high temperature stability.

Ti. 05.
M-1268; 5 Mg, bal Al.
O-temper: 38,100 TS; 18,000 YS; 18 El.
½H-temper: 40,300 TS, 31,400 YS; 5 El.
For marine parts; resists sea water corrosion.

Ti-5Al-2.5Sn.
M-144; 4.5-6.0 Al, 2.0-3.0 Sn, bal Ti
Sheet: 125,000 TS, 120,000 YS; 15 El; 40 RA.
For airframes, high temperature applications; resists oxidation to 1200°F.

Ti-5Al-2.5Sn ELI.
M-144; 5 Al, 2.5 Sn, 0.25 max Fe, 0.12 max O, bal Ti.
At −423°F: 229,000 TS, 206,000 YS; 10 El; 1.03 notch ratio.
Annealed: 100,000 TS; 90,000 YS; 10 El; C 36 Rock
For high temperature applications, fasteners, airframes.
Extra low interstitials; improved notch strength at −423°F.

Ti-5Al, 2.5Sn, 2.5V, 1.3Cb, 1.3Ta.
M-144; 5 Al, 2.5 Sn, 2.5 V, 1.3 Cb, 1.3 Ta, bal Ti
Sheet. At 70°F: 134,000 TS, 121,000 YS;
At −320°F: 210,000 TS; 199,000 YS; 14 El
For structural applications from ambient to liquid hydrogen temperatures.
Good formability and weldability. Good low temperature properties.

Ti-5Al-4Fe-Cr
M-144, 4.75-5.75 Al, 0.75-1.75 Fe, 2.25-3.25 Cr, bal Ti
At R.T.: 150,000 TS; 140,000 YS; 10 El; 25 RA; Rock C 32-38
At 800°F. 109,500 TS, 79,800 YS; 15 El; 22 RA.
For airframe components.
Alpha-beta type alloy. Age hardenable.

Ti-5Al-5Sn-5Zr.
M-144, 5 Al, 5 Sn, 5 Zr, bal Ti.
Alpha Anneal: 128,300 TS; 118,000 YS, 18 El; 37.3 RA.
Alpha-Beta Anneal: 132,300 TS; 122,700 YS; 15 El, 32 RA
At 1000°F: 84,500 TS; 67,400 YS; 20 El, 37 RA.
For high temperature applications, turbine engines, airframes.
Alpha type titanium alloy for use up to 1100°F. Minimum creep.

Ti-5Al-6Sn-2Zr-Mo-0.25Si.
M-144; 5 Al, 6 Sn, 2 Zr, Mo, 0.25 Si, bal Ti.
Heat treated: 158,000 TS; 144,000 YS; 12 El; 37 RA.
For forged engine discs.
Corrosion resistant, high strength, good heat resistance.

Ti-6Al-2Cb-1Ta-0.8Mo.
M-144; 6 Al, 2 Cb, 1 Ta, 0.8 Mo, bal Ti.
Rolled: 122,000 TS; 103,000 YS; 13 El; 28 RA.
Stress-Relieved: 124,000 TS; 106,000 YS; 13 El; 27 RA.
For pressure hulls.
Improved resistance to salt water cracking.
Tough, shock resistant

Ti-6Al-2Sn-4Zr-2Mo.
M-144; 6 Al, 2 Sn, 4 Zr, 2 Mo, bal Ti.
Heat Treated: 148,000 TS; 138,000 YS; 20 El; 46 RA.
Annealed: 130,000 TS; 120,000 YS, 10 El; 25 RA, C 36 Rock.
For high temperature components to 1050°F, compressor wheels, missiles, space craft.
High temperature alloy. Alpha type. Good creep and tensile strength to 1050°F.

Ti-6Al-2Sn-4Zr-2Mo-Si.
M-144; 6 Al, 2 Sn, 4 Zr, 2 Mo, 0.2 Si, bal Ti.
Heat treated: 167,000 TS; 151,000 YS; 7 El; 15 RA.
For engine discs.
For 800-1000°F service, good heat resistance

Ti-6Al-4V.
M-144; 5.5-6.75 Al, 3.5-4.5 V, bal Ti
Annealed: 136,500 TS, 130,000 YS; 16 El, 40 RA; 320 Brin
Heat treated: 137,000-168,000 TS, 128,500-157,000 YS; 9-16 El; 45 RA.
For high temperature applications, stable under stress to 950°F; heat treatable.

Ti-6Al-4V ELI.
M-144, 6 Al, 4 V, 0.07 O_2, 0.15 Fe, bal Ti.
Annealed. 125,000 TS; 115,000 YS; 10 El; C 36 Rock. At −423°F: 263,000 TS.
For high temperature applications, jet engine components, fasteners, aircraft forgings.
Extra low interstitials Improved notch strength at −423°F

Ti 6Al-6V-2Sn
M-144, 5.0-6.0 Al, 5.0-6.0 V, 1.5-2.5 Sn, 0.35-1.0 Fe, bal Ti
Sheet heat treated: 213,000-219,000 TS, 200,000-213,000 YS, 4.0-0.5 El, Rock C 46-48.
Annealed Bar 165,000 TS, 152,000 YS, 15 El; 45 RA.
For high strength pressure vessels operating at ambient temperatures
Heat treatable, alpha-beta type alloy.

Ti 6.5Al-2Cb-1Ta-1.2Mo
M-144; 6.5 Al, 2.0 Cb, 1.0 Ta, 1.1 Mo, 0.05 Fe, bal Ti.
Rolled: 131,000 TS; 109,000 YS; 12 El; 25 RA
Stress-Relieved 132,000 TS, 113,000 YS; 13 El, 23 RA
For pressure hulls. Tough, shock resistant

Ti-6.5Al-3Mo-1V
M-144, 6.5 Al, 3 Mo, 1 V, bal Ti.
Bar: 155,000 TS; 150,000 YS, 17 El
For high temperature applications

Ti. 07.
M-1268; 7 Mg, bal Al.
O-temper. 44,800 TS; 20,000 YS; 18 El.
½H-temper 56,000 TS; 35,900 YS; 5 El.
H-temper: 58,300 TS; 40,300 YS.
For marine parts, resists sea water corrosion.

Ti-7Al-2Cb-1Ta.
M-144, 7 Al, 2 Cb, 1 Ta, bal Ti.
Plate: CYS 115,000
For submarine hulls.
Tough, high strength, corrosion resistant

Ti-7Al-2.5Mo.
M-144; 7 Al, 2.5 Mo, bal Ti.
Plate: 129,000 TS; 109,000 YS; 10 El; 25 RA.
Heat Treated: 148,000 TS; 124,000 YS; 6 El; 10 RA.
For hulls of deep-diving vehicles.

Ti-7Al-4Mo.
M-144; 7 Al, 4 Mo, bal Ti.
Annealed. 140,000 TS; 130,000 YS; 10 El; 20 RA.
For aircraft gas turbine engines, compressor wheels, hub shafts; creep resistant, high temperature strength.

TI-7Al-12Zr.
M-144; 7 Al, 12 Zr, bal Ti
Annealed: 135,300 TS; 123,800 YS; 15.5 El; 24.8 RA
At 1000°F: 87,100 TS; 68,900 YS, 18 El, 38.8 RA.
At R T: 137,500 TS; 127,400 YS; 15.2 El.
For high temperature applications, turbine engines, airframe components, fasteners.
Alpha type titanium alloy use up to 1100°F. High creep strength.

TI-8
M-1697; Sintered carbide tool material.
For cutting tools for precision finishing of carbon and alloy steel.

Ti-8Al-1Mo-1V.
M-144, 8 Al, 1 Mo, 1 V, bal Ti.
At 70°F: 165,000 TS; 148,000 YS; 17 El; 25 RA.
At 600°F: 128,000 TS; 110,000 YS, 16 El; 37 RA.
At 1000°F. 110,000 TS, 90,000 YS; 16 El; 33 RA.
For jet engine components to 900°F, excellent creep and rupture life

Ti-8Al-2Cb-1Ta.
M-144; 8 Al, 2 Cb, 1 Ta, bal Ti.
Annealed 126,000 TS; 120,000 YS; 17 El.
At 2000°F 1051 TS, 552 YS; 40 El.
At 600°F 100,000 TS, 81,000 YS, 25 El.
For parts requiring high impact strength, deep diving vehicles
Resists sea water corrosion

Ti-8Al-10V
M-97, 8 Al, 10 V, bal Ti
Sheet Heat Treated: 208,000-223,000 TS; 199,000-214,000 YS; 1.0-5.0 El; Rock C 47.
For rocket motor cases
Heat treatable. Corrosion resistant.

Ti. 11.
M-1268; 1.25 Mn, bal Al
O-temper: 13,400-16,500 TS; 30-25 El
H temper 26,000-28,000 TS; 5-3 El.
For tank cars, storage bins, resists reducing and oxidizing atmospheres

Ti-13V-11Cr-3Al
M-144; 13 V, 11 Cr, 3 Al, bal Ti
Bar 125,000 TS; 120,000 YS; 10 El.
For high temperature applications.

Ti. 22
M-1268, 2 Mg, bal Al.
O-temper: 24,600-31,400 TS; 18 El, 45 Brin.
½H-temper. 33,600 TS, 26,900 YS, 5 El, 70 Brin.
For deckhousings, gasoline tanks, marine parts; corrosion resistant.

Ti. 33
M-1268; 3 Mg, bal Al.
O-temper: 31,400 TS; 13,500 YS, 18 El.
¼H-temper: 38,100 TS; 24,700 YS; 8 El.
For light weight structural parts; corrosion resistant, not heat treatable.

Ti-35A.
M-144; 0.08 max C, 0.05 max N, 0.15 max H, 0.25 max Fe, bal Ti.
Rolled: 35,000 TS; 25,000 YS; 22 El; 35 RA; 170 Brin.
For high temperature applications; commercially

Ti. 40.
M-1268; 0.75 Mg, 0.5 Si, bal Al.
M-temper: 15,700 TS; 15 El.
W(T4): 20,200 TS; 11,200 YS; 18 El.
WP(T6): 26,900 TS; 22,400 YS; 12 El.
For architectural and building applications; corrosion resistant.

Ti. 44.
M-1268; 0.75 Mg, 1.0 Si, bal Al.
T4: 29,100 TS; 15,700 YS; 15 El.
T6: 42,600 TS; 33,600 YS; 8 El.
O-temper: 24,600 TS; 20 El.
For light weight parts; good workability.

Ti-45A.
M-144; 0.10 C, 0.05 N, bal Ti
Annealed: 68,000 TS; 48,000 YS, 23 El.
For non-structural members, fasteners
Corrosion resistant.

Ti-50A.
M-144; 0.08 max C, 0.20 max Fe, 0.0125 max H, 0.05 max N, bal Ti.
Annealed: 50,000 TS; 40,000 YS; 22 El; 35 RA; 200 Brin.
For non-structural parts, fasteners.
Corrosion resistance.

Ti. 53.
M-1268; 3.4 Cu, 0.7 Mg, 0.5 Sb, 0.2 Sn, bal Al.
M-temper: 35,900 TS; 15,700 YS, 10 El.
For screw machine products; free-cutting.

Ti. 55.
M-1268; 2.6 Cu, 1 Si, 0.3 Mn, 1 Fe, 0.7 Ni, bal Al.
WP(T6): 56,000 TS; 42,600 YS; 8 El
For general purpose forgings; age hardenable.

Ti-55A
M-144; 0.20 max C, 0.015 max H, bal Ti
Bar: 75,000 TS, 65,000 YS, 25 El.
For non-structural parts, fasteners
Corrosion resistant.

Ti 56.
M-1268, 2 Cu, 0.9 Mg, 0.8 Si, 0.9 Fe, 1 Ni, 0.1 Ti, bal Al.
WP(T6): 58,200-60,500 TS, 44,800-47,000 YS, 10 El.
For aircraft structures, age hardenable

Ti-65A.
M-144, 0.08 max C, 0.20 max Fe, 0.0125 max H, 0.05 max N, bal Ti
Annealed: 65,000 TS; 50,000 YS; 20 El, 35 RA; 225 Brin.
For aircraft structural members.
Corrosion resistant.

Ti 66.
M-1268; 4.4 Cu, 0.6 Mg, 0.7 Si, 0.6 Mn, bal Al.
W(T4): 53,800-58,300 TS; 31,400-35,900 YS; 15-12 El.
WP(T6): 62,800 TS; 51,500 YS, 8 El.
For aircraft structures, age hardenable.

Ti-75A.
M-144; 0.08 max C, 0.30 max Fe, 0.0125 max H, 0.05 max N, bal Ti.
Annealed 70,000 TS; 60,000 YS; 15 El; 35 RA; 265 Brin.
For moderately stressed aircraft parts and structures.
Corrosion resistant.

Ti. 77.
M-1268; 0.4 Cu, 2.7 Mg, 0.5 Mn, 5.3 Zn, bal Al.
WP-temper: 67,000-72,000 TS; 58,000-60,500 YS; 8 El.
For aircraft structures; Al coated, age hardenable

Ti. 88.
M-1268; 1 Cu, 2.7 Mg, 0.5 Mn, 5.3 Zn, bal Al.
WP(T6): 78,400-85,100 TS; 67,200-74,000 YS; 5 El.
For high strength forgings; age hardenable.

Ti-100A.
M-144, 0.08 max C, 0.05 max N, 0.15 max H, 0.25 max Fe, bal Ti
Rolled: 80,000 TS; 70,000 YS; 15 El; 30 RA; 290 Brin.
For high temperature applications; commercially pure titanium.

Ti-111.
M-1268, 0.15 Cu, 0.6 Si, 0.7 Fe, 1.0-1.5 Mn, bal Al.
O-temper: 15,000 TS, 30 El
½ H-temper: 24,000 TS; 7 El.
H-temper. 26,000 TS, 3 El.
For structural members; corrosion resistant.

Ti-140A.
M-144, 0.10 max C, 1.5-2.5 Fe, 1.5-2.5 Cr, 1.5-2.5 Mo, bal Ti
Annealed 130,000-150,000 TS; 120,000-140,000 YS, 15 min El, 286-336 Brin
For jet engine components; high strength, low weight

Ti-150B
M-144, 0.02 C, 5 Cr, 5 Fe, 0.5 Mo, 0.2 max W, bal Ti
Annealed: 160,000 TS, 130,000 YS; 10 El; 322 Brin.
For jet engine and missile components; high strength, low weight.

Ti-155A.
M-144, 1.1-1.7 Fe, 1.1-1.7 Cr, 0.9-1.5 Mo, 5-6 Al, bal Ti
Annealed 155,000 TS, 140,000 YS, 15 El, 35 RA; 360 Brin.
Heat treated: 180,000 TS, 173,000 YS, 15 El; 25 RA, 400 Brin
For aircraft propeller blades, cylinders and pistons; heat treatable

Ti-222.
M-1268, 0.15 Cu, 1.7-2.7 Mg, 0.6 Si, 0.7 Fe, 0.5 Mn, 0.2 Ti, 0.5 Cr, bal Al
O-temper: 31,000 TS; 20,000 YS; 18 El
½ H-temper 33,600 TS, 27,000 YS; 5 El
For structural members; corrosion resistant

Ti-223
M-1268, 0.15 Cu, 3-4 Mg, 0.6 Si, 0.7 Fe, 1 Mn, 0.5 Cr, 0.2 Ti, bal Al
O-temper: 34,500 TS, 13,500 YS, 18 El.
¼ H-temper. 38,100 TS, 24,500 YS; 8 El.
For structural members, corrosion resistant.

Ti-225
M-1268, 0.15 Cu, 4.4-5.5 Mg, 0.6 Si, 0.7 Fe, 1 Mn, 0.5 Cr, 0.2 Ti, bal Al
O-temper. 38,000 TS, 18,000 YS; 18 El.
¼ H-temper: 42,600 TS; 31,400 YS; 8 El
For structural members; corrosion resistant

Ti 227
M-1268; 0.15 Cu, 6.5-7.5 Mg, 0.6 Si, 0.7 Fe, 1 Mn, 0.2 Ti, bal Al.
O-temper: 44,800 TS; 20,200 YS; 18 El.
½ H-temper: 56,000 TS, 36,000 YS; 5 El.
For structural members; high strength, corrosion resistant

Ti 441.
M-1268; 0.15 Cu, 0.4-1.5 Mg, 0.75-1.3 Si, 0.6 Fe, 1 Mn, 0.2 Ti, bal Al.
W-temper: 27,000 TS, 15,700 YS; 18 El.
WP-temper: 40,000 TS; 33,600 YS; 10 El.
For structural members; age-hardened, corrosion resistant

Ti-444.
M-1268; 0.15 Cu, 0.4-1.5 Mg, 0.7-1.3 Si, 0.6 Fe, 1 Mn, 0.5 Cr, 0.2 Ti, bal Al.
Heat treated: 29,200-42,600 TS; 15,700-33,600 YS; 15-8 El.
For structural members; age-hardened.

Ti-445.
M-1268; 0.15 Cu, 0.4-1.5 Mg, 0.7-1.3 Si, 0.6 Fe, 1 Mn, 0.2 Ti, bal Al.
W-temper: 29,000 TS; 15,700 YS; 13 El.
WP-temper: 40,400 TS; 31,400 YS; 18 El.
For structural members; age-hardened, high strength.

Ti 551.
M-1268; 3.0-5.0 Cu, 0.4-1.2 Mg, 0.7 Si, 0.7 Fe, 0.4-1.2 Mn, 0.3 Ti, bal Al.
Heat treated: 53,800-56,000 TS, 31,400-33,600 YS; 15-10 El.
For structural members; age-hardened, corrosion resistant

Ti-554.
M-1268; 3.5-4.5 Cu, 0.4-1.2 Mn, 0.7 Si, 0.7 Fe, 0.4-1.2 Mn, bal Al.
Heat treated: 53,800 TS; 30,400 YS; 15 El.
For structural members; age-hardened.

Ti 663.
M-1268, 1-2 Cu, 0.5-1.2 Mg, 0.75-1.25 Si, 0.75 Fe, 1 Mn, 0.3 Ti, bal Al.
W-temper: 38,100 TS; 22,400 YS; 15 El.
WP temper: 56,000 TS; 44,800 YS; 8 El.
For structural members; age-hardened, corrosion resistant.

Ti-666.
M-1268, 3.5-4.8 Cu, 0.8 Mg, 0.9 Si, 1 Fe, 1.2 Mn, 0.3 Ti, bal Al.
W-temper: 54,800 TS; 31,400 YS; 15 El.
For structural members; age-hardened, high strength.

Ti-667.
M-1268; 3.5-4.8 Cu, 0.8 Mg, 0.9 Si, 1 Fe, 1.2 Mn, 0.3 Ti, bal Al
W-temper: 54,800 TS; 31,400 YS; 15 El
For structural members; age-hardened, high strength.

Ti-679
M-144, M-282; 2.0-2.25 Al, 10.5-11.0 Sn, 4.0-5.0 Zr, 0.8-1.0 Mo, 0.15-0.21 Si, bal Ti.
Heat treated: 140,000 TS; 130,000 YS, 10 El; 20 RA
For jet engine compressor wheels and blades
High stress stability at 900°F, good creep and short-time strength.

Ti 775.
M-1268; 1.5 Cu, 2-3.5 Mg, 0.5 Si, 0.5 Fe, 0.8 Mn, 4.5-6.5 Zn, 0.3 Ti, bal Al.
WP-temper: 72,000-78,400 TS, 60,500-67,200 YS; 7-5 El.
For structural members; age-hardened, high strength.

Ti 886.
M-1268; 1.8-2.5 Cu, 0.65-1.2 Mg, 0.55-1.25 Si, 0.6-1.4 Ni, 0.6-1.2 Fe, 0.2 Ti, bal Al.
WP-temper: 51,500-56,000 TS; 38,000-42,600 YS; 8-6 El.
For structural members; age-hardened, corrosion resistant

TIBON
M-294; C, bal Fe.

Ti-BRUSH 40.
M-739; 0.10 max C, 0.2 max O, 0.10 max Mn, 0.2 max Fe, bal Ti.
Rolled: 60,000 TS; 40,000 YS; 30 El; 50 RA; 141 Brin.
For aircraft and missile components; high fatigue-strength ratio.

Ti-BRUSH 50.
M-739; 0.1 max C, 0.2 max O, 0.8-1.0 Al, 0.02 max N, bal Ti.
At 70°F: 70,000 TS; 55,000 YS; 27 El; 41 RA; 160 Brin.
At 800°F: 26,000 TS; 18,000 YS; 21 El; 49 RA.
For aircraft and missile components; good weldability, low density.

Ti-BRUSH 65A.
M-739; 1.9-2.0 Al, 0.10 max C, 0.2 max O, 0.02 max N, bal Ti.
At 70°F: 85,000 TS; 65,000 YS; 20 El; 40 RA; 200 Brin.
At 1000°F: 32,250 TS; 25,100 YS, 33 RA.
For aircraft and missile components; heat resistant, low density.

Ti-BRUSH 120-AM.
M-739; 3.5-4.5 Al, 3.5-4.5 Mn, bal Ti.
At 70°F. 135,000 TS, 120,000 YS; 15 El, 30 RA; 300 Brin.
At 600°F: 96,000 TS; 74,000 YS; 11 El; 26 RA.
For jet engine components, fasteners; heat treatable, low density, heat resistant.

TICO.
Eng ; 27.5-30.4 Ni, 1.12 Mn, 1.1 Cu, bal Fe.
For electrical resistances; resistance alloy.

TICONAL.
M-1127; 6-9 Al, 12-18 Ni, 0-2.5 Ti, 2-5 Cu, 20-30 Co, bal Fe.
For permanent magnet, sand and precision cast; similar to Alnico 5

TICONAL 3A.
M-1127; 19 Ni, 12 Co, 10 Al, 6 Cu, bal Fe.
For permanent magnets in electrical and magnetic equipment.
High magnetic permeability.

TICONAL 600.
M-1127; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe.
Cast. 5450 TS; C 50 Rock.
Br-1200, Hc-560, BH max 5,600,000.
For relays, motors, voltage regulators, magnetos, generators
Similar to Alnico V permanent magnet.

TICONAL 700.
M-1127, 14 Ni, 8 Al, 24-35 Co, 3 Cu, bal Fe.
11,600 Br, 700 Hc, 5 BH max, Rock C 48.
Magnets for measuring instruments, electrical and magnetic equipment.
Permanent magnet, high magnetic permeability.

TICONAL 750.
M-1127; 14 Ni, 8 Al, 24-35 Co, 3 Cu, bal Fe.
11,000 Br, 750 Hc, 4.4 BH max., C 52 Rock.
For magnets in electrical apparatus and magnetic equipment.
Permanent magnet, high magnetic permeability.

TICONAL 800.
M-1127; 14 Ni, 8 Al, 24-35 Co, 3 Cu, bal Fe.
10,600 Br, 800 Hc, 4.3 BH max., C 52 Rock.
For magnets in electronic, electrical and magnetic equipment.
Same as Alcomax IV.
Permanent magnet. Thermal stability and resistant

TICONAL 1500.
M-1127; 35 Co, 13.5 Ni, 7.5 Al, 5 Ti, 3 Cu, bal Fe.
8500 Br, 1450 Hc, 5 BH max; Cast: 10,000 TS.
For magnets in electric clocks, electrical and magnetic equipment, magnetic separators, generators. Permanent magnet. Lowest losses after stabilization.
Same as Alnico VIII.

TICONAL 2000.
M-1127; 40 Co, 7.5 Ti, bal Fe
Coercive force 2000.
For electric motors and magnetic equipment.
Permanent magnet, high magnetic permeability.

TICONAL C.
M-1127; 24 Co, 13.5 Ni, 8 Al, 3 Cu, 0.5 Cb, bal Fe.
For permanent magnets in electrical and magnetic equipment.
High magnetic permeability.

TICONAL D.
M-1127; 24 Co, 14 Ni, 8 Al, 3 Cu, 1.0 Ti, bal Fe.
For permanent magnets in electrical and magnetic equipment
High magnetic permeability.

TICONAL E.
M-1127; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe.
For permanent magnets; high permeability.

TICONAL E.
M-1188; 15 Ni, 8 Al, 25 Co, 3 Cu, bal Fe.
For permanent magnets, high permeability

TICONAL F.
M-1127; 24 Co, 14 Ni, 8 Al, 3 Cu, 0.5 Ti, bal Fe.
For permanent magnets in electrical and magnetic equipment.
High magnetic permeability

TICONAL-G.
M-1127; 28 Co, 13 Ni, 8 Al, 3 Cu, bal Fe.
For permanent magnets; Br. 12000, Hc 700

TICONAL GG.
M-1127; 8 Al, 14 Ni, 24 Co, 3 Cu, bal Fe
For permanent magnets; high permeability

TICONAL GX.
M-1127; 24 Co, 14 Ni, 8 Al, 3 Cu, bal Fe.
For permanent magnets in metering devices, electrical and magnetic equipment
High magnetic permeability Strong permanent magnet.

TICONAL H.
M-1127; 24 Co, 13.5 Ni, 8 Al, 3 Cu, 2 Cb, bal Fe.
For permanent magnets in electrical and magnetic equipment.
High magnetic permeability.

TICONAL K.
M-1127; 6 Al, 18 Ni, 34 Co, 8 Ti, bal Fe
For permanent magnets; high permeability.

TICONAL L.
M-1127; 19.5 Co, 14.5 Ni, 7 Al, 1.5 Cu, 0.8 Si, bal Fe.
For permanent magnets in electrical and magnetic equipment.
High magnetic permeability.

TICONAL S.
M-1127; 24 Co, 14 Ni, 8 Al, 3 Cu, bal Fe.
For permanent magnets in electrical and magnetic equipment.
High magnetic permeability.

TICONAL X.
M-1127; 34 Co, 14.5 Ni, 7.0 Al, 4.5 Cu, 5.0 Ti, bal Fe.
Max. energy product 13,400,000. 8800 Br, 1500 Hc, 5,300,000 (BH) max.
For permanent magnets, in electrical equipment.
High magnetic permeability.

TICONAL XX.
M-1127; 7 Al, 15 Ni, 2 Ti, 4 Cu, 5 Ti, 34 Co, bal Fe.
For permanent magnets; highly directional crystal oriented.

TICONIUM.
M-38, M-313, M-920; 35 Ni, 31 Co, 23 Cr, 6 Mo, 0.01 C, bal Fe
Cast. 110,000 TS; 65,000 YS, 6 El; 350 Brin.
For bone surgery Corrosion resistant.

TICUNI.
M-1493, M-856; 70 Ti, 15 Cu, 15 Ni.
For brazing titanium and stainless steel components.

TIERS ARGENT.
Eng, 66 Al, 33 Ag
For ornamental parts; corrosion resistant.

TIFICO
M-294, C, alloy, bal Fe.
For engine crankshaft, die blocks, marine service parts, oil hardening

TIGER BRAND
M-24, 0.7-0.9 C, 18 W, 4 Cr, 1 V, bal Fe.
For tools, cutters, reamers, high speed steel.

TIGERLOY.
M-467, 0.3 C, 1.5 Ni, 0.2 Mo, bal Fe.
Heat treated: 100,000 TS; 60,000 YS; 25 El; 45 RA, 207 Brin
For castings, impact resistant.

TIGER SPECIAL
M-334, 0.75 C, 4.2 Cr, 18 W, 0.5 Mo, 1.1 V, 5 Co, bal Fe
For lathe and planer tools, hobs, drills; high speed steel

TIGER VAN
M-334, 0.8 C, 4.2 Cr, 18.5 W, 0.5 Mo, 2.1 V, bal Fe
For drills, hobs, cutters, reamers, broaches, taps; high speed steel

TIG-TECTIC 2-24.
M-717,
High nickel filler metal for inert arc welds for cast iron.

TIG-TECTIC 5-AH.
M-717,
Inert arc or torch overlays on gauges, blanking dies, forming dies.

TIG-TECTIC 5-HSS.
M-717,
Inert arc or torch high speed steel overlays.

TIG-TECTIC 5-HW.
M-717;
Inert arc or tooth overlays for hot work tools and dies.

TIG-TECTIC 5-OH.
M-717;
Inert arc or torch overlays for oil hardening steels.

TIG-TECTIC 5-WH.
M-717;
Inert arc or torch overlays for water hardening steels.

TIG-TECTIC 21.
M-717;
Inert arc overlays for aluminum

TIG-TECTIC 21FC.
M-717;
Inert arc overlays for aluminum.

TIG-TECTIC 23.
M-717;
Inert arc overlays for aluminum.

TIG-TECTIC 66.
M-717;
Inert arc electrode for medium carbon steel welding and repair.

TIG-TECTIC 182.
M-717;
Inert arc for joining copper base alloys and to steel.

TIG-TECTIC 183.
M-717;
For inert arc welding of copper.

TIG-TECTIC 222.
M-717;
Inert arc electrode for nickel alloys.

TIG-TECTIC 670.
M-717;
Inert arc welding of alloy and stainless steel.

TIG-TECTIC 680.
M-717;
Inert arc electrode for welding alloy steel, 120,000 TS.

TIG-TECTIC 1851.
M-717;
Aluminum bronze filler rod for inert arc joining and overlaying on bronze and other copper alloys.

TIG-TECTIC 6800.
M-717;
Inert arc electrode for corrosion resistant welds on nickel alloys

TIG-TECTIC A.
M-717;
Columbium stabilized stainless electrode for inert arc welding stainless steel.

TIG-TECTIC A-MO.
M-717;
Mo bearing stainless electrode for inert arc welding stainless steel.

TIG-TECTIC B.
M-717;
For inert arc welding 18-8 stainless.

TIG-TECTIC D.
M-717;
25/20 stainless rod (Type 310) for inert arc welding 309-310 type stainless or dissimilar stainless.

TILOY.
M-294; Cr, Mo, C, bal Fe.
For die blocks; oil hardening.

TIMANG (TISCO NO. 4).
M-271; 0.6-0.8 C, 12-15 Mn, 3.0 Ni, bal Fe.
Rolled: 135,000-155,000 TS; 45,000-55,000 YS; 80-50 El; 50-35 RA; 170-210 Brin.
Annealed: 100,000-115,000 TS.
For welding rods for welding high Mn steels, woven screens, commercial castings, elevator buckets; austenitic, wear resisting steel.

TIMANG 11-7.
M-271; C, 11 Mn, 7 Ni, bal Fe.
For earth moving equipment; wear resistant, nonmagnetic, work hardens.

TIMANG 13-3.
M-271; C, 13 Mn, 3 Ni, bal Fe.
For earth moving equipment; wear resistant, nonmagnetic, work hardens.

TIMAXX #5.
M-271; 0.6-0.8 C, 13-15 Mn, 1.25-1.75 Si, 2.75-3.25 Ni, 4.0-4.5 Cr, bal Fe.
Cast: 100,000 TS; 40,000 YS; 40 El; 30 RA; 180 Brin.
For castings; wear and abrasion resistant to 800°F.

TIME-GRAPH.
M-1705; 1.45 C, 0.8 Mn, 1.2 Si, 0.2 Cr, 0.25 Mo, bal Fe.
Oil hardening tool steel. AISI 06.

TIMKEN 0.50 Mo.
M-376; 0.08-0.25 C, 0.3-0.8 Mn, 0.1-0.5 Si, 0.45-0.65 Mo, bal Fe.
Annealed: 55,000 TS, 30,000 YS; 30 El; 150 Brin.
For cracking furnace tubes; to 1050°F.

TIMKEN 2 Cr-½ Mo.
M-376; 0.15 max C, 1.75-2.25 Cr, 0.45-0.65 Mo, bal Fe.
Annealed: 60,000 TS; 25,000 YS; 30 El; 163 Brin.
For heat exchangers; resists heat to 1150°F.

TIMKEN 2¼ Cr-1-Mo.
M-376; 0.15 max C, 2-2.5 Cr, 0.9-1.1 Mo, bal Fe.
Annealed: 60,000 TS; 25,000 YS; 30 El; 50 RA; 163 Brin
For high temperature tubing in oil refineries; resist heat to 1150°F.

TIMKEN 5% Cr-Mo.
M-376; 0.15 C, 0.50 Mn, 0.50 Si, 4.0-6.0 Cr, 0.4-0.6 Mo, bal Fe.
At 850°F: 66,600 TS; 26,000 YS; 39 El.
At 1400°F 13,300 TS; 7250 YS; 65 El.
For still tubes, oil refinery tubing; age-hardenable, resists oil corrosion and heat to 1200°F.

TIMKEN 5% Cr-Mo PLUS Ti.
M-376; 0.12 max C, 4-6 Cr, 0.45-0.65 Mo, Ti = 4 × C min, bal Fe.
Annealed. 60,000 TS, 25,000 YS; 30 El; 163 Brin.
For high temperature tubing, to 1700°F; corrosion resistant

TIMKEN 16-15-6.
M-376, 0.08 max C, 6.5-8.5 Mn, 15.0-17.5 Cr, 14-17 Ni, 5-7 Mo, bal Fe.
Rolled: 140,000 TS; 90,000 YS, 35 El.
For gas turbine wheels and shafting, bolts, high temperature components.
High heat and oxidation resistant.

TIMKEN 16-25-6.
M-376, 0.10 max C, 2.0 Mn, 1.0 Si, 15-17.5 Cr, 24-27 Ni, 5.0-7.0 Mo, 0.10-0.20 N, bal Fe.
Forged: 115,000 TS; 60,000 YS; 35 El; 201 Brin.
Cold worked: 150,000 TS; 120,000 YS; 19 El; 40 RA; 300 Brin.
For high temperature applications, gas turbines; heat resistant, austenitic.

TIMKEN 17-22 (A).
M-376; 0.41-0.48 C, 0.45-0.65 Mn, 0.55-0.70 Si, 1.0-1.5 Cr, 0.4-0.6 Mo, 0.2-0.3 V, bal Fe.
Normalized: 125,000 TS; 105,000 YS; 16 El; 50 RA; 250 Brin.
For high temperature bolting; air hardening.

TIMKEN 17-22 (A) S.
M-376; 0.28-0.33 C, 1.0-1.5 Cr, 0.4-0.6 Mo, 0.2-0.3 V, 0.55-0.75 Si, 0.45-0.65 Mn, bal Fe.
Normalized: 125,000 TS; 105,000 YS; 16 El; 50 RA; 250 Brin.
For bolting, flanges, valves; resists thermal cracking

TIMKEN 17-22 "A" V.
M-376; 0.25 C, 0.8 Mn, 0.75 Si, 1.25 Cr, 0.5 Mo, 0.85 V, bal Fe.
For high temperature applications; good creep strength.

TIMKEN 18-8 Cb (347 TP).
M-376; 0.08 max C, 2 max Mn, 17-20 Cr, 9-13 Ni, 1 max Cb, bal Fe.
Quenched: 75,000 TS; 30,000 YS; 35 El; 200 Brin.
For high temperature tubing; corrosion and heat resistant.

TIMKEN 18-8 Ti (321 TP).
M-376; 0.08 max C, 2 max Mn, 17-20 Cr, 9-13 Ni, 0.6 max Ti, bal Fe.
Quenched: 75,000 TS; 30,000 YS; 35 El; 200 Brin.
For tubing; heat and corrosion resistant.

TIMKEN 25-12 (309 TP).
M-376; 0.20 max C, 2 max Mn, 1 max Si, 22-24 Cr, 12-15 Ni, bal Fe.
Quenched: 75,000 TS; 30,000 YS; 35 El; 200 Brin.
For tubing; heat and corrosion resistant.

TIMKEN 25-20 (310 TP).
M-376; 0.15 max C, 2 max Mn, 0.75 max Si, 24-26 Cr, 19-22 Ni, bal Fe.
Quenched: 75,000 TS; 30,000 YS; 35 El; 200 Brin.
For tubing; heat and corrosion resistant.

TIMKEN 301.
M-376; 0.08-0.15 C, 16-18 Cr, 6-8 Ni, 2.0 max Mn, 1.0 max Si, bal Fe.
Annealed: 110,000 TS; 40,000 YS; 60 El; 165 Brin
Cold drawn: 185,000 TS; 140,000 YS; 8 El, 410 Brin.
For stainless structures, household utensils, trailer bodies; austenitic.

TIMKEN 302.
M-376; 0.08-0.15 C, 17-19 Cr, 8-10 Ni, 2.0 max Mn, 1.0 max Si, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 45 El; 67 RA; 150 Brin.
For chemical plant equipment; stainless, austenitic.

TIMKEN TYPE 302B STAINLESS.
M-376; 0.08-0.15 C, 2.0 max Mn, 2.0-3.0 Si, 17-19 Cr, 8-10 Ni, bal Fe.
For heat resistant and stainless parts; oxidation resistant, stainless, austenitic

TIMKEN 303.
M-376, 0.15 max C, 17-19 Cr, 8-10 Ni, 2.0 max Mn, 1.0 max Si, 0.15-0.20 P, 0.15-0.20 Si, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 40 El; 60 RA; 160 Brin.
For screw machine products; free-cutting, stainless

TIMKEN 304.
M-367; 0.08 max C, 18-20 Cr, 8-11 Ni, 2.0 max Mn, 1.0 max Si, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El; 330 Brin.
For architectural molding and trim, chemical plant equipment; stainless, austenitic.

TIMKEN TP-304L.
M-376; 0.035 max C, 18-20 Cr, 8-13 Ni, bal Fe.
Annealed: 70,000 TS; 25,000 YS; 35 El.
For corrosion resistant and welded tubes; heat treatment not required after welding.

TIMKEN TYPE 308 STAINLESS.
M-376; 0.08 max C, 2 max Mn, 19-21 Cr, 10-12 Ni, bal Fe.
For corrosion and heat resistant parts; austenitic.

TIMKEN 309.
M-367, 0.20 max C, 22-24 Cr, 12-15 Ni, 2.0 max Mn, 1.0 max Si, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; 65 RA; 160 Brin.
For furnace and oil burner parts, heat treat equipment; austenitic, heat resistant.

TIMKEN 310.
M-367; 0.25 max C, 24-26 Cr, 19-22 Ni, 2.0 max Mn, 1.5 max Si, bal Fe.
Annealed: 100,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin.
For furnace equipment, heat treat boxes, valves, pumps; austenitic, heat resistant.

TIMKEN 316.
M-376; 0.08 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe
Annealed: 80,000 TS; 30,000 YS; 60 El; 80 RA; 135 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El; 300 Brin
For chemical plant equipment, tanks, vessels, agitators, pumps; stainless, austenitic.

TIMKEN TP-316.
M-376; 0.04-0.10 C, 16-18 Cr, 11-14 Ni, 2-3 Mo, bal Fe.
Annealed 75,000 TS; 30,000 YS; 35 El.
For superheater tubing, main steam lines; Type 316L; suited at 1100-1200°F, stainless.

TIMKEN TYPE 321 STAINLESS.
M-376, 0.10 max C, 2 max Mn, 17-19 Cr, 8-11 Ni, Ti = 5 × C min, bal Fe.
For welded structures, stainless, austenitic.

TIMKEN TP-321H
M-376, 0.04-0.10 C, 17-20 Cr, 9-13 Ni, Ti = 4 × C, bal Fe
Annealed: 75,000 TS; 30,000 YS; 35 El.
For superheater tubing, heat exchanger tubes; heat resistant, for use above 1000°F.

TIMKEN TYPE 347 STAINLESS.
M-376, 0.10 max C, 2 max Mn, 17-19 Cr, 9-12 Ni, Cb = 10 × C min, bal Fe
For welded structures, stainless, austenitic

TIMKEN TYPE 403 STAINLESS.
M-376, 0.15 max C, 1 max Mn, 0.5 max Si, 11.5-13.0 Cr, bal Fe
For steam turbine blades, corrosion resistant; hardenable

TIMKEN TYPE 405 STAINLESS.
M-376; 0.08 max C, 1 max Mn, 11.5-13.5 Cr, 0.1-0.3 Al, bal Fe
For welded structures; corrosion resistant.

TIMKEN TYPE TP 405 STAINLESS.
M-376, 0.08 max C, 1 max Mn, 11.5-13.5 Cr, 0.5 max Ni, 0.1-0.3 Al, bal Fe.
For welded structures, corrosion resistant.

TIMKEN TYPE 410 STAINLESS.
M-376, 0.15 max C, 1 max Mn, 11.5-13.5 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant, hardenable

TIMKEN TYPE TP 410 STAINLESS.
M-376; 0.15 max C, 1 max Mn, 11.5-13.5 Cr, 0.5 max Ni, bal Fe.
For stainless tubes; corrosion resistant.

TIMKEN TYPE 414 STAINLESS.
M-376; 0.15 max C, 1 max Mn, 11.5-13.5 Cr, 1.25-2.50 Ni, bal Fe.
For stainless tubes; corrosion resistant, hardenable.

TIMKEN TYPE 416 STAINLESS.
M-376; 0.15 max C, 0.60 max P, 0.15 min S, Se or 0.6 max Zr, Mo, 12-14 Cr, bal Fe.
For corrosion resistant parts; free-cutting, corrosion resistant.

TIMKEN TYPE 420 STAINLESS.
M-376; 0.15 min C, 12-14 Cr, bal Fe.
For valve parts; corrosion resistant, hardenable.

TIMKEN TYPE TP 420 STAINLESS.
M-376; 0.15 min C, 12-14 Cr, 0.5 max Ni, bal Fe.
For tubes; corrosion and heat resistant, hardenable.

TIMKEN TYPE 430 STAINLESS.
M-376; 0.12 max C, 14-18 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant, not hardenable.

TIMKEN TYPE 430F STAINLESS.
M-376; 0.12 max C, 0.60 max P, 0.15 min S, Se or 0.6 max Zr, Mo, 14-18 Cr, bal Fe.
For corrosion resistant parts; free-cutting.

TIMKEN TYPE 431 STAINLESS.
M-376; 0.2 max C, 15-17 Cr, 1.25-2.50 Ni, bal Fe.
For corrosion resistant parts; corrosion and heat resistant, hardenable.

TIMKEN TYPE 440 A STAINLESS.
M-376; 0.6-0.75 C, 16-18 Cr, 0.75 max Mo, bal Fe.
For stainless parts; hardenable, corrosion resistant.

TIMKEN TYPE 440 B STAINLESS.
M-376; 0.75-0.95 C, 16-18 Cr, 0.75 max Mo, bal Fe.
For bearings, cutlery; hardenable, corrosion resistant.

TIMKEN TYPE 440 C STAINLESS
M-376; 0.95-1.20 C, 16-18 Cr, 0.75 max Mo, bal Fe.
For bearings, hardenable; corrosion resistant.

TIMKEN TYPE TP 443 STAINLESS
M-376, 0.2 max C, 1 max Mn, 18-23 Cr, 0.9-1.25 Cu, bal Fe
For corrosion resistant tubing, not hardenable, corrosion resistant.

TIMKEN TYPE 501 STAINLESS.
M-376; 0.10 min C, 1 max Mn, 4-6 Cr, 0.45-0.65 Mo, bal Fe.
Annealed 60,000 TS; 25,000 YS, 30 El, 163 Brin.
For corrosion resistant parts; corrosion and heat resistant

TIMKEN 4422.
M-376; 0.20-0.25 C, 0.7-0.9 Mn, 0.2-0.35 Si, 0.35-0.45 Mo, bal Fe
For bearings, case hardening.

TIMKEN 4427.
M-376; 0.24-0.29 C, 0.35-0.45 Mo, 0.7-0.9 Mn, 0.3 Si, bal Fe.
For bearings, liners. Case hardening.

TIMKEN 4620.
M-376; 0.17-0.22 C, 0.5 Mn, 1.6-2.0 Ni, 0.2-0.3 Mo, bal Fe.
At 850°F: 72,400 TS; 52,500 YS, 37.5 El; 70.0 RA.
At 1200°F: 24,800 TS; 12,000 YS; 59.3 El, 79.9 RA.
For gears, pinions, shafts, high temperature steam service; case hardening steel; corrosion resistant.

TIMKEN 4718.
M-376; 0.16-0.21 C, 0.35-0.55 Cr, 0.90-1.2 Ni, 0.3-0.4 Mo, 0.7-0.9 Mn, bal Fe.
Heat treated: 210,000 TS; 154,000 YS, 13.5 El; 50 RA; 470 Brin.
For gears, bolts, camshafts, cams, case hardened, shock resistant

TIMKEN 52100.
M-376; 0.95-1.10 C, 0.25-0.45 Mn, 1.3-1.6 Cr, bal Fe.
Annealed: 94,500 TS; 62,000 YS; 27 El; 62 RA; 179 Brin.
Cold drawn: 107,000 TS; 87,000 YS; 17 El; 55 RA; 229 Brin.
For bearings, races, balls, bushings; water or oil hardenable.

TIMKEN CARBON
M-376; 0.10-0.20 C, 0.3-0.6 Mn, bal Fe.
Annealed. 61,500-48,000 TS; 45,000-30,000 YS; 31-28 El; 70 RA; 132-125 Brin.
For oil refinery tubing, cracking furnace tubes, condenser tubes, heat exchanger tubes; for services to 900°F.

TIMKEN CBS-600.
M-376, 0.16-0.22 C, 0.9-1.2 Si, 1.25-1.65 Cr, 0.9-1.1 Mo, bal Fe.
Heat treated 98,000-177,500 TS; 25,000-118,250 YS; 29-18 El; 72-45 RA; 197-341 Brin.
For jet engine and rocket components, anti-friction bearings; case hardening

TIMKEN DM.
M-376; 0.15 max C, 0.30-0.60 Mn, 0.50-1.0 Si, 1.0-1.5 Cr, 0.45-0.65 Mo, bal Fe.
Annealed· 60,000 TS, 25,000 YS; 30 El; 50 RA; 163 Brin
For high temperature tubing; heat resistant to 1150°F.

TIMKEN DM2
M-376, 0.15 max C, 0.3-0.6 Mn, 0.5 max Si, 0.8-1.25 Cr, 0.45-0.65 Mo, bal Fe.
Annealed· 60,000 TS; 25,000 YS; 30 El; 163 Brin.
For superheaters, steam pipes, resists heat to 1150°F

TIMKEN FINE GRAINED CARBON-MOLYBDENUM (0.50 Mo).
M-376, 0.15 C, 0.45 Mn, 0.50 Mo, bal Fe
At 850°F 64,000 TS, 32,500 YS; 37 El
At 1400°F. 11,700 TS, 5900 YS, 82.5 El.
For oil refinery tubing; still tubes; case hardening steel, Ch 40 64

TIMKEN HS 250 (4741).
M-376, 0.37-0.44 C, 0.65-0.95 Mn, 0.4-0.6 Si, 0.8-1.1 Cr, 0.7-1.0 Ni, 0.3-0.4 Mo, bal Fe.
Heat treated 187,000 TS, 182,000 YS, 14.5 El; 51 RA, 388 Brin
For gears, shafts, bolts, crankshafts; oil hardened, shock resistant

TIMKEN IRON-CHROMIUM (TYPE 430).
M-376; 0.12 max C, 1.0 max Mn, 1.0 max Si, 14-18 Cr, bal Fe
Non-hardenable stainless; for parts requiring stainless properties or for high temperature service. AISI 430

TIMKEN KRUPP
M-376, 0.08-0.16 C, 0.30-0.60 Mn, 0.15-0.30 Si, 3.75-4.25 Ni 1.25-1.75 Cr, bal Fe.
For carburizer gears and pinions, roller bearings; tough.

TIMKEN NITRIDING STEEL NO. 2.
M-376, 0.3-0.4 C, 0.4-0.7 Mn, 0.9-1.4 Cr, 0.15-0.25 Mo, 0.85-1.2 Al, bal Fe
Nitriding steel, for gears, shafts.

TIMKEN NITRIDING NO 2 M.
M-376, 0.30-0.40 C, 0.6-1.1 Mn, 0.9-1.4 Cr, 0.15-0.25 Mo, 0.85-1.2 Al, 0.08-0.13 S, bal Fe.
Nitriding steel, for gears, cams, shafts; free-machining

TIMKEN NITRIDING STEEL NO. 3.
M-376; 0.38-0.43 C, 0.5-0.7 Mn, 1.4-1.8 Cr, 0.3-0.4 Mo, 0.95-1.3 Al, bal Fe.
Nitriding steel; for gears, shafts, cylinders.

TIMKEN T-1 (TM-NO. 1).
M-376; 0.95-1.1 C, 1.2-1.5 Cr, 0.2-0.3 Mo, bal Fe.
For anti-friction bearings; deep hardening.

TIMKEN T-2 (TM-NO. 2).
M-376; 0.95-1.1 C, 1.05-1.35 Mn, 1.2-1.5 Cr, 0.45-0.55 Mo, bal Fe.
Heat treated.
For anti-friction bearings; deep hardening.

TIMKEN TBS-600.
M-376; 0.95-1.1 C, 1.25-1.65 Cr, 0.25-0.35 Mo, 0.8-1.2 Si, bal Fe.
For jet engine and rocket components; anti-friction bearings; hard and abrasion resistant; for service up to 600°F.

TIMKEN TBS 1000.
M-376; 0.80 C, 0.50 Mn, 0.50 Si, 0.90-1.20 Cr, 5.0 Mo, 1.05 V, bal Fe.
For dies, cutters, punches, headers; oil or air hardening.

TIMKEN TDS-30.
M-376; 0.17-0.22 C, 0.45-0.65 Mn, 0.20-0.35 Si, 0.4-0.6 Cr, 1.65-2.0 Ni, 0.2-0.3 Mo, bal Fe.
Tubular drill steel, must be carburized to harden.

TIMKEN TDS-70.
M-376; 0.25-0.31 C, 0.8-1.2 Mn, 0.5-0.8 Si, 1.9-2.4 Cr, 0.10 max Ni, 0.25-0.35 Mo, bal Fe.
Tubular drill steel, air hardenable.

TIMKEN TDS-90.
M-376; 0.23-0.28 C, 0.4-0.6 Mn, 0.20-0.35 Si, 3.0-3.5 Cr, 0.45-0.6 Mo, bal Fe.
Tubular drill steel, air hardenable.

TIMKEN WHS-100.
M-376; 0.13-0.21 C, 1.0-1.3 Mn, 0.2-0.35 Si, 0.65-0.9 Cr, 0.4-0.7 Ni, 0.15-0.25 Mo, 0.03-0.08 V, 0.003 B, bal Fe.
A weldable 100,000 psi yield strength material.

TIMKEN WHS-130.
M-376; 0.20-0.27 C, 0.6-0.8 Mn, 0.2-0.35 Si, 0.7-0.9 Cr, 1.55-2.0 Ni, 0.2-0.3 Mo, bal Fe.
A weldable 130,000 psi minimum yield strength material.

Ti-NAMEL.
M-67; 0.06 C, 0.30 Mn, 0.12 max Cu, 0.05 Al, 0.30 Ti, bal Fe.
Hot rolled. 55,000 TS, 33,000 YS, 27 El; 121 Brin
For sheets for enameling, specially prepared.

TINEA CLASSIC.
M-921; 45 Sn, 42 Pb, 10 Sb, 3 Cu.
For bearings; anti-friction metal.

TINEA DIESEL.
M-921; 83 Sn, 11 Sb, 6 Cu.
Cast: 26 Brin.
For bearings; M.P. 380°C; antifriction

TINEA DIESEL R.S.
M-921; 76.5 Pb, 10 Sn, 13.5 Sb, 1 Cu.
Cast: 26.7 Brin
For bearings; M P. 400°C; antifriction.

TINEA MARINE EK.
M-921; 72.5 Sn, 16 Pb, 7 Sb, 4.5 Cu.
For bearings; M.P. 380°C, antifriction.

TINEA SUPER MARINE.
M-921; 90 Sn, 6.5 Sb, 3.5 Cu.
Cast: 23.7 Brin.
For automobile bearings; M.P. 330°C; antifriction.

TIN FOIL.
88 Sn, 8 Pb, 4 Cu, 0.5 Sb.
For bearings, packing foil.

TINICOSIL NO 10.
M-122; Zn, Ni, bal Cu.
For hardware; corrosion resistant.

TINICOSIL NO. 14.
M-122; 42.5 Cu, 15 Ni, bal Zn.
Rolled: 105,000 TS; 70,000 YS; 20 El; 215 Brin.
For valve parts, instrument parts; nickel silver, corrosion resistant.

TINICOSIL NO. 15.
M-122; 41.75-42.25 Cu, 14.75-15.25 Ni, bal Zn.
Hard: 215,000 TS, 192,000 YS; 8 El; 10 RA; 140 Brin.
Soft 118,000 TS; 84,000 YS; 11 El; 10 RA; 122 Brin.
For hot forgings, hardware; corrosion resistant.

TINICOSIL NO 20
M-122, 46-47 Cu, 1.4-1.6 Pb, 15-16 Ni, bal Zn.
For pressure die castings; corrosion resistant.

TINICOSIL NO 21
M-122; 50 Cu, 10 Ni, 1 Pb, 1 Fe, 3 Mn, bal Zn.
Extrusion. 140 Brin.
For valve parts, instrument parts; extrusions, forgings, nickel silver, corrosion resistant.

TINICOSIL NO 53
M-122, 46 Cu, 10 Ni, bal Zn.
Hard. 105,000 TS; 80,000 YS; 20 El; 15 RA; 158 Brin
Forged 92,000 TS; 42,000 YS; 26 El; 25 RA; 140 Brin.
For forgings, hardware parts, plumbing fixtures; corrosion resistant.

TINICOSIL NO. 54
M-122, 46.5 Cu, 2.2 Pb, 10 Ni, 2 Mn, bal Zn.
Cold drawn 88,000 TS; 68,000 YS; 30 El; 20 RA; 150 Brin.
For screw machine products, fishing tackle, leaded nickel silver, corrosion resistant.

TINIDUR.
M-72, 0.15 max C, 30 Ni, 15 Cr, 1.8 Ti, bal Fe.
Rolled. 135,000 160,000 TS, 85,000-115,000 YS; 30 20 El, 55-30 RA.
For gas turbine blades, jet engine components; heat and corrosion resistant

TINIDUR 1650
M-72, 0.04 C, 14.7 Cr, 26 Ni, 2 3 Ti, 1 Mn, 0.15 Al, bal Fe.
For jet engine components, heat and corrosion resistant.

TINIDUR 1875
M-72, 0.04 C, 14.7 Cr, 26 Ni, 2-3 Ti, 1 Mn, 0.15 Al, bal Fe
For jet engine components, heat and corrosion resistant.

TINITE.
M-123, Pb, Sb, bal Sn
For bearings, hard and tough without being brittle

TINMAN'S SOLDER.
66.5 Sn, 33.5 Pb.
For solder, soft

TINSEL.
60 Sn, 40 Pb
For tinsel for decorative purposes.

TIOGA.
M-1; 0.67 C, 0.65 Cr, 1.4 Ni, 0.2 Mo, bal Fe
For lathe centers, clutch parts, cams, arbors; oil hardened, tough.

TIONA.
M-114; 1.0 C, 0.85 Cr, 2.0 Mn, 0.85 Mo, bal Fe.
For blanking dies; air hardened.

TIPALOY 130.
M-1157; Cu alloy.
Cast: 55,000 TS; 31,000 YS; 22 El; 125 Brin.
Wrought: 80,000 TS; 62,000 YS; 17 El; 165 Brin.
For resistance-welder electrodes; wear resistant.

TIPALOY 200.
M-1157; Cu alloy.
Cast 90,000 TS; 70,000 YS; 8-10 El; 190 Brin.
Wrought: 100,000 TS; 80,000 YS; 8-10 El; 210 Brin.
For resistance-welder electrodes; wear resistant.

TIRANO EXTRA.
M-616; 0.5 C, 1.5 Cr, 2.25 W, 0.25 V, bal Fe.
For tools, dies, hot dies; hot work steel.

TIRANO PRIMA
M-616; 0.50 C, 0.7 Mn, 1.8 Si, 0.2 Mo, bal Fe.
For tools, chisels; tough.

TIRFING 1.
M-111; 0.55 C, 1.75 Si, 0.75 Mn, 0.2 Cr, bal Fe.
For springs, chisels; oil hardening.

TIRFING 2.
M-111; 0.6 C, 1.5 Si, 0.5 Mn, 0.5 Cr, bal Fe.
For springs, punches; oil hardening.

TIRFING 3
M-111; 0.5 C, 0.85 Mn, 1.05 Cr, 0.15 V, bal Fe.
For springs, dies; oil hardening.

TISCO NO 1.
M-271, 1.0-1.4 C, 11-14 Mn, 1.0 max Si, bal Fe.
Cast W Q: 80,000-125,000 TS; 35,000-45,000 YS, 15-48 El; 15-40 RA, 180-200 Brin.
Hot rolled. 160,000 TS, 40 El; 30 RA; 120 Brin.
For chains, crushers, gears, crusher rolls, sprockets, liners, wearing plates, drums; tough, wear resistant.

TISCO NO 2
M-271, 1.0-1.4 C, 11 min Mn, 1.0 max Si, 1.9-2.1 Cr, bal Fe.
Hardened: 125,900 TS, 45,000 YS; 25 El; 20 RA; 220 Brin.
For wear resisting parts, shovels, dippers; wear resisting

TISCO 5.
M-271, 0.7 C, 14 Mn, 1.5 Si, 3 Ni, 4.25 Cr, bal Fe.
Cast and normalized: 100,000 TS, 40,000 YS; 25 El, 20 RA, 180 Brin.
For shovels, dippers, dredging pumps, resists heat to 750°F, abrasion resistant.

TISCO NO. 6.
M-271, 0.2-0.3 C, 10-12 Mn, 1.0 max Si, 6-8 Ni, 0.15 max Cr, bal Fe.
Cast: 67,500 TS; 27,400 YS, 27.5 El; 37.5 RA; 112-150 Brin.
For castings; non-magnetic.

TISCO 17.
M-271, 0.15 C, 0.6 Mn, 0.45 Si, bal Fe.
Cast 65,000 TS; 35,000 YS; 30 El; 50 RA, 120 Brin.
For machine tool castings, gears, housings; ASTM-A-27; water hardened.

TISCO NO. 18.
M-271; 0.25-0.35 C, 0.6-0.8 Mn, 0.25-0.50 Si, bal Fe
Annealed: 65,000-75,000 TS; 35,000-45,000 YS; 25-35 El; 30-50 RA; 126-146 Brin.

TISCO NO. 20.
M-271; 0.40-0.44 C, 0.6-0.8 Mn, 0.25-0.50 Si, bal Fe.
Annealed: 80,000-95,000 TS; 43,000-53,000 YS; 18-28 El; 18-38 RA; 146-166 Brin.
For frogs, track crossings, railway track switches; machinable.

TISCO NO. 21.
M-271; 0.45-0.55 C, 0.60-0.80 Mn, 0.25-0.50 Si, bal Fe.
Annealed: 85,000-100,000 TS; 45,000-55,000 YS; 15-25 El; 15-35 RA; 156-176 Brin.
For track work, frogs, crossings, railway track switches; machinable.

TISCO NO. 23.
M-271; 0.20-0.30 C, 1.15-1.75 Mn, 0.25-0.50 Si, bal Fe.
Normalized: 75,000-86,000 TS; 40,000-50,000 YS; 25-35 El; 40-55 RA; 140-160 Brin.
For tractor and moving machinery parts; shock and fatigue resistant.

TISCO 23 W.
M-271; 0.3-0.4 C, 1.35 Mn, 1.35 Cr, 0.20 Mo, 0.4 Si, bal Fe
Cast and hardened: 162,500 TS; 156,500 YS; 4 El; 11.1 RA; 364 Brin.
For high strength castings, shock and fatgue resistant.

TISCO NO 23X
M-271; 0.20-0.25 C, 1.3-1.6 Mn, 0.6-0.9 Cr, 0.2 0.3 Mo, bal Fe
Heat treated 90,000-110,000 TS, 68,000-90,000 YS; 20-30 El; 42-65 RA, 210-260 Brin
For caps, levers, castings, high strength.

TISCO NO 41
M-271, 0.45-0.55 C, 0.6-0.8 Mn, 0.3-0.5 Si, 1.0-1.25 Cr, bal Fe.
Heat treated 115,000-130,000 TS; 60,000-80,000 YS; 6-12 El, 8-20 RA; 220-235 Brin.
For liners for ball mills; hard, wear resistant with moderate toughness.

TISCO NO. 50
M-271; 0.45-0.55 C, 0.8-1.0 Mn, 0.3-0.5 Si, 0.9-1.0 Cr, 0.25-0.35 Mo, bal Fe.
Normalized 130,000-150,000 TS; 95,000-115,000 YS, 5-12 El, 8-25 RA; 250-280 Brin.
For roll shells; machinable.

TISCO NO 51
M-271; 0.75-0.85 C, 0.7-0.9 Mn, 0.3-0.5 Si, 1.5-2.0 Cr, 0.35-0.45 Mo, bal Fe
Normalized 140,000-170,000 TS, 90,000-115,000 YS, 2-5 El, 4-8 RA; 300-400 Brin.
For ball mill liners, resists abrasive wear with little shock.

TISCO 52.
M-271, 0.85 C, 2.25 Cr, 0.35 Mo, 0.8 Mn, 0.4 Si, bal Fe.
325 Brin
For high temperature applications; ASTM-A-148; good to 1100°F.

TISCO NO 53.
M-271; 0.15-0.35 C, 0.45-0.85 Mn, 0.20-0.60 Si, 4.0-6.5 Cr, 0.4-0.65 Mo, bal Fe.
Heat treated: 110,000-125,000 TS, 75,000-90,000 YS; 16-20 El, 30-55 RA; 215-255 Brin.
For oil still valves and fittings; resists H_2S gas; low creep at high temperature.

TISCO 54.
M-271; 0.45-0.55 C, 0.6-0.8 Mn, 0.3-0.5 Si, 2.75-3.25 Cr, 0.65-0.75 Mo, bal Fe.
Cast: 275-325 Brin

TISCO 60.
M-271; 0.3 C, 5 Cr, 0.5 Mo, 0.25 V, 0.8 Mn, bal Fe.
325 Brin.
For high temperature applications; ASTM-A-148.

TISCO NO. 65.
M-271; 0.2-0.3 C, 0.8-1.0 Mn, 0.3-0.5 Si, 0.75-1.0 Ni, bal Fe.
Annealed: 65,000-75,000 TS; 40,000-50,000 YS; 20-35 El; 40-65 RA; 130-150 Brin.
For tractor and moving machinery parts; shock and fatigue resistant.

TISCO NO. 70.
M-271; 0.3-0.4 C, 0.6-0.8 Mn, 0.3-0.5 Si, 0.8-1.0 Cr, 2.5-3.0 Ni, bal Fe.
Cast: 95,000-120,000 TS; 65,000-85,000 YS; 10-15 El; 10-15 RA; 210-230 Brin.
For pinions and gears; resists wear and repeated high stresses.

TISCO NO. 71.
M-271; 0.3-0.4 C, 0.6-0.8 Mn, 0.3-0.5 Si, 0.6-0.8 Cr, 1.25 Ni, bal Fe.
Cast: 95,000-110,000 TS; 55,000-65,000 YS; 15-25 El; 20-40 RA; 197-217 Brin.
For pinions and racks for steam shovel; tough.

TISCO NO. 72.
M-271; 0.45-0.55 C, 0.6-0.8 Mn, 0.3-0.5 Si, 0.8-1.0 Cr, 2.75-3.25 Ni, bal Fe.
Cast: 95,000-115,000 TS; 55,000-75,000 YS; 12-22 El; 15-40 RA; 207-227 Brin.
For track work, frogs, crossings, and railway track switches; machinable.

TISCO NO. 80.
M-271, 0.45 C, 0.7 Mn, 1.75-2.25 Ni, 1.5 Cr, 0.3 Mo, bal Fe.
Heat treated: 115,000-215,000 TS; 80,000-200,000 YS; 12-4 El; 25-4 RA; 300-450 Brin.
For sand pumps, dredges; abrasion resistant, oil hardened.

TISCO NO. 81.
M-271; 0.5-0.6 C, 0.6-0.8 Mn, 0.4-0.6 Si, 1.4-1.6 Cr, 1.75-2.25 Ni, 0.3-0.4 Mo, bal Fe.
Normalized· 232,000 TS; 230,000 YS; 1.6 El; 2.2 RA; 300-650 Brin.
For centrifugal pumps handling sand; hard and brittle; air hardened.

TISCO 90 HIGH STRENGTH.
M-271; 2.7 C, 4.4 Ni, 1.7 Cr, bal Fe
Cast: 50,000 TS; 525 Brin.
For liners, pulverizers, pump plungers; martensitic, white cast iron.

TISCO 90 REGULAR.
M-271; 3.3 C, 0.55 Mn, 0.50 Si, 4.4 Ni, 1.7 Cr, bal Fe.
Cast: 45,000 TS; 550 Brin
For liners, pulverizers, pump plungers, grinding balls; martensitic, white cast iron.

TISCO 105.
M-271; 0.05 C, 19.5 Cr, 10.5 Ni, 2.5 Mo, bal Fe.
Cast: 80,000 TS; 42,000 YS; 50 El; 160 Brin.
For chemical plant equipment, tanks, mixers; Type CF8M; stainless, austenitic.

TISCO 106A.
M-271; 0.13-0.20 C, 18-22 Cr, 7-11 Ni, 2-4 Mo, 0.2-0.3 Se, bal Fe.
70,000-75,000 TS; 60-50 El; 60-45 RA; 130-150 Brin.
For stainless parts; stainless, heat and corrosion resistant.

TISCO 107.
M-271; 0.21-0.30 C, 26-30 Cr, 8-12 Ni, bal Fe.
75,000-85,000 TS; 18-12 El; 12-8 RA; 150-160 Brin.
For heat and corrosion resistant parts; heat and corrosion resistant.

TISCO 108.
M-271; 0.13-0.20 C, 23-27 Cr, 17-21 Ni, bal Fe.
80,000-90,000 TS; 25-15 El; 25-15 RA; 160-180 Brin.
For heat and corrosion resistant parts; heat and corrosion resistant.

TISCO 109.
M-271; 0.20 max C, 22-26 Ni, 18-22 Cr, 1.5 max Si, bal Fe
60,000-70,000 TS; 15-10 El; 20-30 RA.
For heat and corrosion resistant parts; heat and corrosion resistant.

TISCO 120.
M-271; 0.50 C, 1.0 Mn, 2 Si, 15-18 Cr, 35-40 Ni, bal Fe.
150 Brin
For heat and corrosion resistant parts; max operating temperature 2000°F.

TISCO 130.
M-271, 0.10 max C, 26-30 Cr, 0.4-0.6 Mn, 2.0 max Si, bal Fe.
40,000-60,000 TS; 3-0 El; 5-0 RA.
For heat and corrosion resistant parts; heat and corrosion resistant.

TISCO 131.
M-271; 0.10 max C, 16-18 Cr, 0.4-0.6 Mn, 2.0 max Si, bal Fe.
75,000-100,000 TS; 12-5 El; 15-6 RA; 190-210 Brin
For corrosion resistant parts; corrosion resistant.

TISCO 132.
M-271; 0.10 C, 12.5 Cr, 0.5 Mn, bal Fe.
Heat treated· 200,000 TS; 150,000 YS; 7 El, 390 Brin
For oil refinery and chemical plant equipment; Type CA5, stainless.

TISCO 133.
M-271; 0.30 C, 12.5 Cr, 0.5 Mn, bal Fe.
Heat treated: 220,000 TS, 165,000 YS, 2 El; 470 Brin
For chemical and textile plant equipment; Type CA40, stainless

TISCO 150.
M-271; 2.5-3.2 C, 0.5 max Mn, 2.0 max Si, 28-32 Cr, 1.0-1.5 Ni, bal Fe
Heat treated· 400-600 Brin.
For centrifugal pumps handling sand and other materials in acid mine waters, unmachinable.

TISCO 150 X
M-271, 3-3.75 C, 0.4 Mn, 1-1.25 Si, 1-1.6 Ni, 12-13 Cr, bal Fe
Oil hardened· 600-650 Brin.
For wheel abrator blades; hard, brittle, unmachinable.

TISCO 150-Y.
M-271; 3.4 C, 0.4 Mn, 1.1 Si, 12.5 Cr, 0.2 Mo, bal Fe.
Heat treated: 700 min Brin.
For brick making equipment, mixing paddles; abrasion and wear resistant.

TISCO 160.
M-271; 2.5-3.5 C, 1.0-1.5 Mn, 1.25-2.00 Si, 1.5-4.0 Cr, 12-15 Ni, 5-7 Cu, bal Fe.
20,000-35,000 TS; 120-170 Brin.
For heat and corrosion resistant parts; heat and corrosion resistant; Ni-Resist

TISCO HIGH CHROME IRON.
M-271; 0.10 max C, 0.4-0.6 Mn, 2.0 max Si, 26-30 Cr, bal Fe.
Cast: 40,000-60,000 TS; 30,000-40,000 YS; 3-0 El; 5-0 RA; 200-220 Brin.
For apparatus to resist sulfur rich atmospheres at high temperature; now Tisco No. 130.

TISCO LOW CHROME IRON.
M-271; 0.10 max C, 0.4-6.0 Mn, 2.0 max Si, 11.5-16.0 Cr, bal Fe.
Cast: 70,000-90,000 TS; 40,000-55,000 YS; 18-24 El; 25-45 RA; 160-180 Brin.
For apparatus and vessels to resist alkaline liquors, food stuffs, steam and some acids; now Tisco No. 132.

TISCO MEDIUM CHROME IRON.
M-271; 0 10 max C, 0.4-0.6 Mn, 2.0 max Si, 16-19 Cr, bal Fe.
Cast: 75,000-100,000 TS, 45,000-60,000 YS; 10-20 El; 15-35 RA; 190-210 Brin.
For apparatus and vessels to resist HNO_3, food stuffs, sea water, steam; now Tisco No. 131.

TISCO NIROSTA 28-11
M-271; 0.30 max C, 1 0 max Mn, 0.5-1.5 Si, 26-30 Cr, 8-12 Ni, bal Fe.
Normalized· 75,000-85,000 TS; 45,000-50,000 YS; 12-18 El; 8-12 RA, 150-160 Brin.
For heat and corrosion resistant parts, now Tisco No. 107.

TISCOR.
M-997, 0.1 C, 0 7 Cr, 0 35 Cu, bal Fe.
Rolled. 78,000 TS, 45,000 YS; 25 El.
For structural work; weldable.

TISCO "TAPPI" CORROSION RESISTING STEEL.
M-271; 0.13-0.35 C, 16-23 Cr, 7-11 Ni, Mo, bal Fe.
Annealed· 70,000-75,000 TS; 60-50 El; 60-45 RA; 130-160 Brin.
For machinery parts in paper and pulp machinery; now Tisco No 110.

TISCROM
M-997, 0 22 C, 1 Mn, 0.55 Cr, 0.3 Cu, 0.1 Si, bal Fe
Rolled 90,000 TS, 50,000 YS; 18 El.
High tensile structural steel; riveting grade, not suitable for welding.

TISSIERS METAL-1
Eng ; 97 Cu, 2 Zn, 1 As
For hardware, arsenical bronze; good conductivity

TISSIERS METAL-2.
Eng , 97 Cu, 2 Zn, 0 5 Sn
For hardware; arsenical bronze; good conductivity.

TITAN
M-32; 1 00 C, bal Fe
For tools; water hardening.

TITAN NO. 4.
M-122; 65 Cu, 35 Zn.
For cold headed products, rivets, bolts; cold heading brass, good ductility.

TITAN NO. 4 FORGE.
M-122; 59-59 5 Cu, 0.9-1.1 Pb, 0 5-0.7 Sn, bal Zn.
63,000-68,000 TS; 35,000-47,000 YS; 30-44 El; 20-32 RA; 86-107 Brin.
For screw machine parts, free cutting.

TITAN NO. 6A.
M-122; 60.0-60.5 Cu, 0.65-0.85 Sn, bal Zn.
Hard: 63,000 TS; 36,000 YS; 42 El; 46 RA; 70 Brin.
Soft: 62,000 TS; 29,000 YS; 48 El; 53 RA; 72 Brin.

TITAN NO. 25.
M-122; 59.0-59.5 Cu, 0.90-1.10 Pb, 0.5-0.7 Sn, bal Zn.
Hard: 68,400 TS; 47,600 YS; 30 El; 20 RA; 99 Brin.
Soft: 66,000 TS; 35,050 YS; 38 El; 25 RA; 93 Brin.
For hardware, screw machine products; free-cutting.

TITAN NO. 35.
M-122; 64.0-64.5 Cu, 0.70-1.00 Pb, bal Zn.
Hard: 45,500 TS; 24,000 YS; 54 El; 73 RA; 66 Brin.
Soft: 42,000 TS; 20,000 YS; 62 El; 74 RA; 60 Brin.
For hardware, screw machine products; free-cutting swaging brass.

TITAN NO. 36.
M-122, 59 Cu, 2 Pb, bal Zn.
Extruded: 55,000 TS; 23,000 YS; 40 El; 80 Brin.
For hardware, screw machine products; forging brass, free-cutting.

TITAN NO. 51.
M-122; 59 Cu, 0.7 Pb, 0.9 Sn, 0.9 Fe, 0.2 Mn, bal Zn.
Soft: 65,000 TS; 30,000 YS; 30 El; 116 Brin.
½ H-temper: 78,000 TS; 52,000 YS; 22 El; 150 Brin.
H-temper: 85,000 TS; 60,000 YS; 12 El; 165 Brin.
For screw machine products, marine hardware; leaded manganese bronze.

TITAN NO. 52
M-122; 56 Cu, 2.5 Pb, bal Zn.
For screw machine products, free cutting.

TITAN 60.
M-1086, TiC, Co.
For cutting tools in turning, boring and milling operations.
Sintered carbide. Wear and crater resistant.

TITAN NO. 65.
M-122, 59 Cu, 0 9 Sn, 0 9 Fe, 0.2 Mn, bal Zn.
Soft. 65,000 TS, 35,000 YS; 30 El; 116 Brin.
½ H-temper· 78,000 TS; 52,000 YS; 22 El; 150 Brin.
H-temper: 85,000 TS; 60,000 YS; 12 El; 165 Brin.
For propellers, marine hardware, bolts; corrosion resistant, manganese bronze.

TITAN NO. 68.
M-122; 56-60 Cu, 0.8-1.3 Fe, 0.7-1.2 Al, 0.5 max Mn, bal Zn.
Cast: 80,000 TS; 40,000 YS; 30 El, 137 Brin.
For propellers, shafts, marine hardware; manganese bronze

TITAN NO. 73
M-122, 89 min Cu, 1.5-3 0 Si, 6.5-8.0 Al, bal Zn.
Cast· 85,000 TS; 43,000 YS; 30 El; 135 Brin.
For impellers, marine hardware; aluminium-silicon bronze.

TITAN NO. 74.
M-122, 81.5 Cu, 4 Si, bal Zn.
Cold drawn: 90,000 TS; 45,000 YS; 25 El; 170 Brin.
For valve stems, line pole hardware; die castings and forgings

TITAN NO. 75.
M-122; 70 Cu, 30 Zn.
For cold headed products, rivets, bolts; cartridge brass, high ductility.

TITAN 80.
M-1086; TiC, MoC, Ni.
Sintered: A 92.7 Rock, 200,000 min Tr.S.
For cutting tools in high speed machining.

TITAN NO. 83.
M-122; 56 Cu, 0.5 Pb, bal Zn.
For marine hardware; high strength.

TITAN NO. 92.
M-122; 57-61 Cu, 0.5-1.5 Si, 0.5-3.0 Al, 1.5-3.5 Mn, bal Zn.
Cast: 85,000 TS; 45,000 YS; 18 El; 156 Brin.
For propellers, impellers, marine hardware; high manganese bronze, corrosion resistant.

TITAN NO. 95.
M-122; 62.5 Cu, 0.60 Sn, bal Zn.
Soft: 56,000 TS; 24,000 YS; 37 El; 104 Brin.
¼ H: 64,000 TS; 32,000 YS; 32 El; 121 Brin.
Hard: 70,000 TS; 46,000 YS; 24 El; 150 Brin.
For marine hardware, propeller shafts; corrosion resistant.

TITAN NO. 96.
M-122; 90 Cu, 2 Pb, 1 Ni, bal Zn.
Soft: 38,000 TS; 12,000 YS; 45 El; 57 Brin.
½ H: 52,000 TS; 48,000 YS; 20 El; 107 Brin.
For marine hardware, screw machine products; free cutting, corrosion and wear resistant.

TITANAL.
English; 12 Cu, 0.8 Mg, 0.5 Si, 0.5 Fe, bal Al.
For pistons; cast.

TITANALOY.
M-1511; 0.12 Ti, 1.0 Cu, bal Zn.
Sheet: 24,000 TS; 10 El; 55 Brin.
For roofing, gutters, trim, housings, fuses, curtain walls; high creep resistance.

TITAN BRONZE "A."
M-122; 53.5 Cu, 46 Zn, 0.3 Fe, 0.3 Al.
Hot rolled: 75,000-85,000 TS; 40,000-48,000 YS; 25-30 El; 45-50 RA.
Cast: 50,000-55,000 TS, 30,000-35,000 YS; 15-20 El.
For gears, pinions, roller bearings, pump rods; non-corrosive.

TITAN BRONZE "B."
M-122; 60.5 Cu, 1.02 Sn, 38.5 Zn.
Annealed: 74,740 TS; 40,277 YS; 34 El; 37 RA; 109 Brin.
Hard drawn: 73,560 TS; 52,443 YS; 31 El; 44 RA.
For marine shafts, underwater fittings; non-corrosive.

TITAN BRONZE WELDING ROD.
M-122; 58.75 Cu, 0.75 Sn, bal Zn.
Cold drawn: 94,000 TS; 75,000 YS; 14 El; 80 RA; 174 Brin.
Welded: 52,000 TS; 40,000 YS; 15 El; 104 Brin.
For welding rod; M.P. 1615°F; non-forming.

TITANIA.
M-1579; 0.8 Cu, 0.15 Ti, bal Zn
Sheet: 32,000-42,000 TS; 21-38 El.
For architectural and industrial products, gift ware, electrical and electronic components.
Good workability.

"TITANIC" CARBON STEEL.
M-233; 0.55-1.6 C, 0.15-0.30 Si, 0.2-0.4 Mn, bal Fe.
For cutting tools; water hardening.

TITANIT.
M-459, M-276; Mo-Ti-W-carbides.
For cutting tools, high speed cutters; "Cutanit" high resistance to wear and abrasion.

TITANITE.
M-190, M-955, M-681; 4 Cu, 0.2 Ti, bal Al.
Heat treated: 30,000-37,000 TS; 15,000-24,000 YS; 6-5 El; 60-75 Brin.
For flywheel and axle housings, aircraft wheels, fittings; age-hardenable

TITANITE.
M-1279; 1 Cu, 4.5 Zn, 0.2 Ti, 1.2 Mn, 0.5 Mg, bal Al.
Cast: 30,000 TS; 4-5 El; 55 Brin.
Aged: 35,000 TS; 4-5 El; 65 Brin.
For aircraft castings; self-aging, corrosion resistant.

TITANIT FM.
M-1246; WC.
Sintered.
For cutting tools; sintered carbides.

TITANIT F Ti 1.
M-459, carbides.
For cutting tools; sintered carbide.

TITANIT G 1.
M-1246, M-459; carbides.
For cutting tools; sintered carbide.

TITANIT G 2.
M-1246, M-459; carbide.
For cutting tools; sintered carbide.

TITANIT G 3.
M-1246, M-459; carbide.
For cutting tools, sintered carbide.

TITANIT G 4
M-1246, M-459; carbide.
For cutting tools; sintered carbide.

TITANIT G 5
M-1246, M-459; carbide.
For cutting tools; sintered carbide.

TITANIT G 6.
M-1246, M-459; carbide.
For cutting tools, sintered carbide

TITANIT H 1.
M-1246, M-459; carbides.
For cutting tools; sintered carbide.

TITANIT S1T
M-1246; WC.
Sintered.
For cutting tools; sintered carbides.

TITANIT S2T.
M-1246, WC.
Sintered.
For cutting tools; sintered carbides.

TITANIT S3T
M-1246, WC.
Sintered.
For cutting tools; sintered carbides.

TITANIT S4T.
M-1246; WC.
Sintered
For cutting tools; sintered carbides.

TITANIT S Ti 1.
M-459, carbides.
For cutting tools; sintered carbide.

TITANIT S Ti 2.
M-459; carbides
For cutting tools; sintered carbide.

TITANIT S Ti 3.
M-459; carbides.
For cutting tools; sintered carbide.

TITANIT S Ti 4.
M-459; carbides.
For cutting tools; sintered carbide.

TITANIT U.
M-1246, M-459; carbides.
For cutting tools; sintered carbide

TITANIT WZ1.
M-1246; WC.
Sintered.
For cutting tools; sintered carbides.

TITANIT WZ2.
M-1246; WC.
Sintered.
For cutting tools; sintered carbides.

TITANIUM 120.
M-282; Ti alloy.
Annealed: 67,200 TS; 20 El.
For aircraft frames; low density.

TITANIUM 130.
M-282; Ti alloy.
Annealed: 56,000-89,600 TS; 40,400 YS; 15 El.
For aircraft frames; low density.

TITANIUM 160.
M-282; Ti alloy.
Annealed: 89,600 TS; 67,200 YS; 12 El.
For aircraft frames; low density.

TITANIUM 314A.
M-282; 4 Al, 4 Mn, bal Ti.
Annealed: 139,000 TS; 127,000 YS; 10 El.
Hot rolled: 154,000 TS; 132,700 YS; 21 El; 33 RA.
For jet engine and guided missile components; high temperature applications

TITANIUM 314C.
M-282; 2 Al, 2 Mn, bal Ti.
Annealed: 89,600 TS; 67,200 YS; 15 El.
Heat treated: 94,900 TS; 72,400 YS; 23 El; 47 RA.
For aircraft and missile components; high temperature use.

TITANIUM 317.
M-282; 5 Al, 2.5 Sn, bal Ti.
Annealed: 112,000 TS; 101,000 YS; 10 El.
For welded rings, compressor blades; weldable, good creep and fatigue strength to 800°F.

TITANIUM 318A.
M-282, 6 Al, 4 V, bal Ti.
Annealed: 139,000 TS; 130,000 YS; 10 El.
For jet engine components, airframe forgings, weldable, good hot strength.

TITANIUM 371.
M-282; Sn, Al, bal Ti.
Heat treated: 148,000 TS; 126,600 YS; 17 El; 19 RA
For high temperature applications to 1000°F, heat treatable.

TITANIUM ALUMINUM BRONZE NO. 1
M-58; 90 Cu, 10 Al.
65,000-80,000 TS; 22,000-26,000 YS, 25-15 El; 24-16 RA; 90-100 Brin
For gears; C.Y.P. 19,000.

TITANIUM ALUMINUM BRONZE NO. 5.
M-58; 89 Cu, 10 Al, 1 Fe
65,000-80,000 TS; 23,000-28,000 YS; 30-15 El; 29-21 RA; 92-100 Brin.
For gears; C.Y.P. 19,000.

TITANIUM BRONZE.
M-92; 6 Ti, bal Cu.
Cast: 120,000 TS; 105,000 YS; 8 El.
For high strength castings; age-hardenable.

TITANIUM DISILICIDE.
M-109; 44.7 Ti, 51.8 Si, 1.5 Al, 2.1 Fe.
For special alloy applications; cermet.

TITANIUM EP 20-2.
M-1504; 20 Al, 2 V, bal Ti.
At 70°F: 190,000 TS; 171,000 YS; 6 El; 380 Brin.
At 1100°F: 120,000 TS; 105,000 YS; 15 El.
For high temperature applications, aircraft and missile components; high temperature strength, weldable.

TITANIUM EP 90-10.
M-1504; 9.8-10.2 Cr, 0.005-0.05 Fe, bal Ti.
At 70°F: 201,000 TS; 175,000 YS; 6 El.
At 800°F: 150,000 TS; 121,000 YS; 12 El.
For pressure vessels, fasteners, clamps, airplane skins; heat treatable, high strength.

TITANIUM GR. NDA.
M-522; 97 min Ti, 0.3 max Fe, 0.2 N, 0.15 C.
For ladle additions to stainless steels; unsintered pellets.

TITANIUM STEEL.
U.S.; 0.3-9.0 Ti, 0.1-0.8 C, bal Fe.
For machinery parts, tools; water hardening.

TITANIUM STEEL.
M-67; 0.2 C, 0.3 Ti, bal Fe.
For jet engine parts; heat resistant; coated with porcelain enamel.

TITANIUM TYPE TI-75 A.
M-144; 0.1 Fe, 0.02 N, 0.04 max C, 0.08 max W, bal Ti.
Annealed: 70,000-80,000 TS; 45,000-55,000 YS; 30-20 El; 70-45 RA; 175 Brin.
For aircraft parts; not heat treatable.

TITANIUM TYPE TI-100 A.
M-144; 0.1 max C, 0.02 max W, bal Ti.
Annealed: 100,000 TS; 75,000 YS; 20-25 El; 45 Brin.
For aircraft parts; not heat treatable.

TITANIUM TYPE TI-125 A.
M-144; 1.8 Cr, 0.9 Fe, 0.02 C, 0.08 W, 0.04 N, bal Ti.
For aircraft parts; work hardens.

TITANIUM TYPE TI-150A.
M-144, 2.7 Cr, 1.3 Fe, 0.02 N, 0.04 max W, 0.02 C, bal Ti.
Annealed: 150,000 TS; 135,000 YS; 12-20 El; 40 RA
For bars, forgings; heat treatable.

TITAN LEADED MANGANESE BRONZE.
M-122, 59 Cu, 0.60 Pb, 0.90 Sn, 0.4 Mn.
Rolled: 75,000 TS; 35 El.
For machine parts; free-cutting.

TITAN MANGANESE BRONZE.
M-122; 59.2 Cu, 0.9 Fe, 0.9 Sn, 0.4 Mn, bal Zn.
Cold drawn: 89,000 TS; 58,700 YS; 21.5 El; 40 RA; 159 Brin.
For bolts, rods, forgings; corrosion resistant, high tensile.

TITAN MANGANESE BRONZE WELDING ROD.
M-122; 58.75 Cu, 0.8 Sn, 0.3 Fe, bal Zn.
Cold drawn: 96,000 TS; 79,000 YS; 16 El; 81 RA; 180 Brin.
Welded: 53,000 TS; 38,000 YS; 12 El; 107 Brin.
For welding rod for cast iron; M.P. 1620°F; general purpose rod.

"TITAN" MANGANESE STEEL.
M-233; 1.2 C, 0.5 Si, 12.5 Mn, 0.03 S, 0.05 P, bal Fe.
For wear parts; wear resistant.

TITAN MUNTZ METAL.
M-122; 61 Cu, bal Zn.
Cold drawn: 72,500 TS; 52,500 YS; 30 El; 66 RA; 135 Brin.

TITAN NAVAL BRONZE.
M-122; 60.25 Cu, 0.75 Sn, 39.0 Zn.
Annealed: 62,000 TS; 31,150 YS; 41 El; 95 Brin.
Cold drawn: 69,000 TS; 46,000 YS; 32 El; 46 RA; 137 Brin.
For ship construction, high strength forgings; corrosion resistant.

TITAN NAVAL BRONZE WELDING ROD.
M-122; 60 Cu, 0.75 Sn, bal Zn.
Cold drawn: 90,000 TS; 70,000 YS; 16 El; 78 RA; 170 Brin.
Welded: 50,000 TS; 15 El; 104 Brin.
For welding rod; M.P. 1625°F.

TITAN PENN BRONZE WELDING ROD.
M-122; 58.75 Cu, bal Zn.
Welded: 57,000 TS; 35,000 YS; 16 El; 107 Brin.
Cold drawn: 103,000 TS; 89,000 YS; 13 El; 83 RA; 207 Brin.
For welding rod; M.P. 1628°F; high strength; ductile.

TITAN PRESSURE CASTING ALLOY.
M-122; 60.5-62 Cu, 0.75-1.25 Pb, 0.5-0.7 Sn, bal Zn.
For pressure die castings; high strength.

TITAN-SEEWASSER.
Germ.; 2-4 Mg, 1.2 Mn, 0-0.2 Sb or Ti, bal Al.
Sand cast: 20,000-27,000 TS; 11,400-14,300 YS; 3-8 El; 50-60 Brin.
For marine hardware, chemical plant equipment; resists salt water corrosion.

TITAN SWAGING BRASS.
M-122; 64-64.5 Cu, 0.70-1.0 Pb, bal Zn.
42,000-51,000 TS; 20,000-34,000 YS; 41-62 El; 71-74 RA; 58-84 Brin.
For swagings, spinnings, stampings; high strength.

TITUS.
M-114; 0.7 C, 0.75 Cr, 0.2 V, bal Fe.
Heat treated: 220,000-125,000 TS; 200,000-100,000 YS; 5-20 El; 5-53 RA; 487-320 Brin.
For punches and chisels, axes, ball races, dies, shear blades; "Cyclops Titus."

TiWZ-12.
M-1197, M-1246; TiC.
For gas turbines, jet engines, nuclear power plants; sintered, oxidation resistant.

TIZIRBE.
M-1493, M-856; 48 Ti, 48 Zr, 4 Be.
For brazing titanium stainless steel components.
Corrosion resistant.

TIZIT.
M-1246; 40-80 W, 3-40 Fe, 4-15 Ti, 2-4 C, 1-5 Ce, 4 Cr.
Cast.
For hard cutting tools and dies; cast alloy.

TIZIT A.
M-1246; carbides.
For cutting tools, dies; sintered carbides.

TIZIT CR1.
M-1246; CrC, bal Ni.
For valves and pump parts; corrosion resistant.

TIZIT CR2.
M-1246; WC, bal Co.
For valves and pump parts; corrosion resistant.

TIZIT FM.
M-1246; WC, TiC, TaC, Co.
For cutting tools and dies; carbides, wear resistant.

TIZIT G1.
M-1246; WC, Co.
For cutting tools and dies; carbides, wear resistant.

TIZIT G2.
M-1246; WC, Co.
For cutting tools and dies; carbides, wear resistant.

TIZIT G3.
M-1246; WC, Co.
For cutting tools and dies; carbides, wear resistant.

TIZIT G4.
M-1246; WC, Co.
For cutting tools and dies; carbides, wear resistant.

TIZIT G5.
M-1246; WC, Co.
For cutting tools and dies; carbides, wear resistant.

TIZIT G6.
M-1246; WC, Co.
For cutting tools and dies; carbides, wear resistant.

TIZIT H1.
M-1246; WC, Co.
For cutting tools and dies; carbides, wear resistant.

TIZIT H2.
M-1246; WC, Co.
For cutting tools and dies; carbides, wear resistant.

TIZIT H3.
M-1246; WC, Co.
For cutting tools and dies; carbides, wear resistant.

TIZIT S1T
M-1246; WC, TiC, TaC, Co.
For cutting tools and dies; carbides, wear resistant

TIZIT S2T.
M-1246; WC, TiC, TaC, Co.
For cutting tools and dies; carbides, wear resistant

TIZIT S3T.
M-1246; carbide.
For cutting tools; extreme wear resistance, sintered.

TIZIT S4T.
M-1246; WC, TiC, TaC, Co.
For cutting tools and dies; carbides, wear resistant.

TIZIT-U.
M-1246; carbide.
For cutting tools; wear resistant, sintered

T-K ALLOY see **CARPENTER T-K**

TL-ALLOY.
M-8; 3.2-3.8 Mn, bal Cu.
For tachometer drag cups.
Corrosion resistant, high electrical conductivity.

T-LOY 34.
M-634; 0.30-0.38 C, 0.8 Mn, 0.4 Si, 0.6-0.9 Ni, 0.4-0.6 Cr, 0.20 Mo, bal Fe.
Heat treated: 90,000 TS; 60,000 YS; 20 El; 40 RA, 187 Brin
For shovel bottoms, gears, shafts, racks; oil hardened, shock resistant.

T-LOY 42
M-634; 0.38-0.46 C, 0.8 Mn, 0.9-1.1 Ni, 0.6-0.8 Cr, 0.25-0.35 Mo, bal Fe.
Normalized: 100,000 TS; 75,000 YS; 12 El; 25 RA; 250 Brin.
Oil hardened: 175,000 TS; 145,000 YS; 10 El; 25 RA; 250 Brin.
For tractor treads, wear parts, dies; tough, oil hardened.

TM-6 LOW CARBON.
M-275; 0.60 C, 4 Cr, 2 V, 6 W, 5 Mo, bal Fe.
For brass extrusion dies, hot forming dies, shear blades, cold heading inserts; AISI H42.

TMC.
M-69; 0.7 C, 9.5 Mo, 1.5 W, 4 Cr, 1 V, bal Fe.
Hardened: 64-67 Rock C.

For cutting tools, lathe and planer cutters, drills, taps, reamers.
Type M1 high-speed steel.

TMO DREADNOUGHT.
M-260, M-38; C, alloy, bal Fe.
For tools; oil hardening.

TM QUALITY.
M-1405; 0.58 C, 0.4 Mn, 0.2 Si, bal Fe.
For spring collets, feed chucks; water hardened.

TOBIN BRONZE 452 see TOBIN BRONZE 4641.

TOBIN BRONZE 470.
M-8; 59 Cu, 0.6 Sn, bal Zn.
For welding rod, for steel, cast iron and copper alloys; oxy-acetylene welding.

TOBIN BRONZE NO. 1875.
58.2 Cu, 39.5 Zn, 2.3 Sn.
For piston rods, propeller shafts, bolts, nuts; corrosion resistant to sea water.

TOBIN BRONZE 4641.
M-8; 60 Cu, 0 75 Sn, bal Zn.
Hard: 63,000 TS; 35,000 YS; 35 El; 100 Brin.
Soft. 56,000 TS, 22,000 YS; 45 El; 59 Brin.
For piston rods, propeller shafts; corrosion resistant.

TOKUSHU-RHM5
M-1647; 0.25-0 35 C, 12-14 Cr, 0.3-0 5 Mo, bal Fe.
Annealed· 75,000 TS; 40,000 YS; 25 El; B 78 Rock.
Heat treated. 200,000 TS, 150,000 YS; 10 El, C 45 Rock.
For oil refinery and chemical plant equipment, cutlery, tableware, knives.
Corrosion resistant, hardenable.

TOKUSHU-RHM7.
M-1647; 0 15-0 20 C, 11-12.5 Cr, 0.9-1.2 Mo, 0.7 max Ni, bal Fe.
Annealed· 70,000 TS; 35,000 YS, 30 El, B 80 Rock.
Heat treated: 190,000 TS; 145,000 YS, 15 El; C 40 Rock
For chemical plant and oil refinery equipment.
Corrosion resistant, hardenable

TOKUSHU-RHM8.
M-1647; 0 12-0 17 C, 11.0-12.5 Cr, 0.9-1.2 Mo, 0.6 max Ni, bal Fe.
Annealed· 70,000 TS; 35,000 YS; 30 El, B 80 Rock.
Heat treated. 135,000 TS, 105,000 YS; 10 El; C 29 Rock
For chemical plant and oil refinery equipment
Corrosion resistant

TOKUSHU-RHM9
M-1647; 0 20 max C, 11.5-14 Cr, 0 8-1.3 Mo, 1 max Ni, bal Fe.
Annealed· 70,000 TS; 35,000 YS; 30 El, B 80 Rock.
Heat treated: 145,000 TS; 115,000 YS; 20 El; 300 Brin
For oil refinery and chemical plant equipment.
Corrosion resistant, hardenable.

TOKUSHU-RHM10.
M-1647; 0.08-0 18 C, 12.0-13.5 Cr, 0.3-0.6 Mo, 0.6 max Ni, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 30 El; B 80 Rock.
Heat treated: 180,000 TS; 140,000 YS; 15 El; 375 Brin.
For chemical plant and oil refinery equipment.
Corrosion resistant.

TOKUSHU-RHM11.
M-1647; 0.1-0.2 C, 11.5-13.0 Cr, 0.6-1.5 Mo, 0.5 max Ni, bal Fe.
Annealed: 75,000 TS; 38,000 YS; 28 El; B 82 Rock
Heat treated: 135,000 TS; 105,000 YS; 10 El; C 29 Rock.
For oil refinery and chemical plant equipment.

TOKUSHU-RHM37.
M-1647; 0.08-0.18 C, 11.5-14.0 Cr, 0.3-0.6 Mo, 0.6 max Ni, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 30 El; Rock B 80.
For oil refinery equipment, chemical and rubber processing apparatus.
Corrosion resistant.

TOKUSHU-RHMV4.
M-1647; 0.20-0.25 C, 11.0-12.5 Cr, 0.9-1.2 Mo, 0.4-0.8 Ni, 0.25-0.35 V, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened: 240,000 TS; 205,000 YS; 9 El; C 50 Rock
For valves, cutlery, bearings, surgical instruments.
Corrosion resistant, hardenable.

TOKUSHU-RHMW1.
M-1647; 0.20-0.25 C. 11.0-12.5 Cr, 0.9-1.25 Mo, 0.5-0.9 Ni, 0.25 V, 1.1 W, 0.05 Al, 0.25 Co, 0.04 Sn, 0.05 Ti, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 25 El; B 94 Rock.
Hardened: 250,000 TS; 210,000 YS; 8 El; C 52 Rock.
For valves, cutlery, surgical instruments, bearings.
Corrosion resistant, hardenable.

TOKUSHU-RHMW2
M-1647; 0 18-0.23 C, 12-14 Cr, 0.75-1.25 Mo, 0.5-1.0 Ni, 0.2-0 5 V, 0 8-1.2 W, bal Fe
Annealed: 85,000 TS, 40,000 YS; 25 El; B 94 Rock.
Heat Treated· 240,000 TS, 205,000 YS; 9 El; C 50 Rock
For surgical instruments, valves, bearings, cutlery, shafts.
Corrosion resistant, hardenable.

TOLEDO.
M-1704; 0.90 C, 1.2 Mn, 0.5 Cr, 0 2 V, 0.5 W, bal Fe
Oil hardening cold work tool steel.
AISI O1.

TOLEDO.
M-352; 1.47 C, 0 48 Mn, 4 16 W, bal Fe
For tools, dies; oil hardening.

TOLEDO ¾% NICKEL.
M-985, 0 50-0 60 C, 0 5-0 8 Ni, 0.5-0.8 Mn, bal Fe.
For gears, bolts, crankshafts, machine tool parts; oil or water hardened, tough.

TOLEDO 1% CHROME
M-985; 0.35-0.45 C, 0 85-1 15 Cr, 0 60-0 95 Mn, bal Fe
Heat treated: 102,000-133,000 TS; 72,000-92,000 YS; 22-18 El; 200-302 Brin.
For gears, bolts, crankshafts, machine tool parts; Brit EN18, oil hardened.

TOLEDO 1% CHROME-MOLYBDENUM.
M-985; 0 35-0.45 C, 0 9-1.2 Cr, 0.20-0 35 Mo, 0.5-0 8 Mn, bal Fe
For gears, bolts, crankshafts; Brit. EN19A-B-C, oil hardened, tough.

TOLEDO 1% Ni-Cr.
M-985; 0.30-0.40 C, 1.0-1.5 Ni, 0.45-0.75 Cr, bal Fe.
Heat treated: 100,000-135,000 TS; 72,000-103,000 YS; 22-17 El; 200-320 Brin.
For gears, bolts, machine tool parts; Brit. EN 111, oil hardened, shock resistant.

TOLEDO 1% Ni-Cr-Mo.
M-985; 0 35-0.45 C, 1.2-1.6 Ni, 0.9-1.4 Cr, 0 10-0.20 Mo, bal Fe.
Heat treated: 112,000-157,000 TS; 81,000-123,000 YS; 20-15 El; 223-375 Brin.
For gears, bolts, crankshafts, machine tool parts;

TOLEDO NO. 3.
M-634; 0.15 C, 1.5 Ni, 0.2 Mo, bal Fe.
Hardened: 110,000-115,000 TS; 70,000-80,000 YS; 26-24 El; 50-40 RA.
For mining equipment, carburized parts; case-hardening steel.

TOLEDO 3% CHROME MOLYBDENUM.
M-985; 0.15-0.35 C, 2.5-3.5 Cr, 0.3-0.7 Mo, bal Fe.
Heat treated: 101,000-224,000 TS; 72,000-180,000 YS; 22-10 El; 200-500 Brin.
For oil refinery equipment; Brit. EN29, creep resistant.

TOLEDO 3% Ni-Cr-Mo.
M-985; C, 3 Ni, Cr, Mo, bal Fe.
For gears, bolts, camshafts, cams; Brit. S107, case hardened.

TOLEDO NO. 4.
M-634; 0.7 C, 2 Si, 0.2 Mo, bal Fe.
90,000-115,000 TS; 60,000-75,000 YS; 207-228 Brin.
For coal mining equipment, pug mill parts, paddles, liners; abrasion resistant.

TOLEDO NO. 6.
M-634; 0.9 C, 1.2 Mn, bal Fe.
For dies, trimming, stamping, forming and embossing; non-deforming, cast-to-shape.

TOLEDO NO. 7.
M-634; 0.5 C, 1.2 Cr, 0.2 V, bal Fe.
90,000-95,000 TS; 60,000-67,000 YS; 25-22 El; 50-40 RA; 179-200 Brin.
For railway locomotive parts; tough, shock resistant.

TOLEDO NO. 8.
M-634; 0.4 C, 1.5 Ni, 0.8 Cr, 0.2 Mo, bal Fe.
110,000-120,000 TS; 75,000-85,000 YS; 26-20 El; 50-40 RA; 228-241 Brin.
For automotive and aircraft parts, gears, short-run dies; oil hardening.

TOLEDO 13.
M-985; 0.15-0.25 C, 0.15-0.35 Mo, 0.4-0.7 Ni, 1.4-1.8 Mn, bal Fe.
Heat treated: 90,000 TS; 22 El; 180-230 Brin.
For gears, cams, camshafts; Brit. EN13, case hardened.

TOLEDO 15.
M-985; 0.15-0.25 C, 0.4-0.6 Mn, bal Fe.
Annealed: 73,000 TS; 41,000 YS; 22 El, 58 RA; 140 Brin.
For nails, rivets, gears, cams, bushings; Brit. EN2C, case hardened.

TOLEDO 20.
M-985; 0.20-0.25 C, 0.05-0.35 Si, 0.6-1.0 Mn, bal Fe.
Cold drawn: 60,000 TS; 25 El; 140 Brin.
For gears, bolts, fasteners, brackets; Brit. EN3C, water hardened.

TOLEDO 25.
M-985; 0.25-0.30 C, 0.05-0.35 Si, 1.0 max Mn, bal Fe.
Normalized: 80,000 TS; 25 El; 179 Brin.
For gears, bolts, shafts, keys, brackets; Brit. EN4, water hardened.

TOLEDO 28.
M-985; 0.25-0.40 C, 3.0-4.5 Ni, 0.75-1.25 Cr, 0.20-0.65 Mo, bal Fe.
Heat treated: 135,000-180,000 TS; 103,000-144,000 YS; 35-25 El; 270-415 Brin.
For gears, bolts, machine tool parts; Brit. EN 28, oil hardened, shock resistant.

TOLEDO 30.
M-985; 0.25-0.35 C, 0.05-0.35 Si, 0.60-1.0 Mn, bal Fe.
Hot rolled: 80,000 TS; 50,000 YS; 30 El; 56 RA; 163 Brin.
For armature shafts, gears, bolts, axles, screws; Brit. EN5, water hardened.

TOLEDO 40.
M-985; 0.35-0.45 C, 0.05-0.35 Si, 0.60-1.0 Mn, bal Fe.
Hot rolled· 91,000 TS; 58,000 YS; 27 El; 50 RA; 200 Brin.
For gears, shafts, bolts, axles, fasteners; Brit. EN8, water hardened.

TOLEDO 55.
M-985; 0.50-0.65 C, 0.05-0.35 Si, 0.60-0.80 Mn, bal Fe.
Cold drawn: 110,000-140,000 TS; 12 El; 223-302 Brin.
For wheels, die blocks, rails, girders, springs; Brit. EN9, water hardened.

TOLEDO 60 CARBON CHROME.
M-985, 0.5-0.7 C, 0.5-0.8 Cr, 0.5-0.8 Mn, bal Fe.
Heat treated: 123,000-155,000 TS; 15-21 El.
For axes, hammers, punches, die blocks; Brit. EN11, water or oil hardened.

TOLEDO ALLOY 131.
M-634; 0.22-0.28 C, 1.1 Cu, 0.06 V, 0.5 Si, 0.8 Mn, bal Fe.
Cast: 90,000-100,000 TS.
For machinery parts, gears, bolts; water hardened.

TOLEDO ALLOY 135.
M-634, 0.4-0.5 C, 0.8 Mn, 1 Cr, 1 Cu, 0.3 Mo, bal Fe.
Cast: 120,000 TS; 217 Brin
For guides, bolts, gears, housings; water or oil hardened

TOLEDO 160
M-985; 0.35-0.45 C, 1.5-2.0 Ni, 0.20-0.35 Mo, bal Fe.
Heat treated: 102,000-134,000 TS; 72,000-104,000 YS; 22-17 El; 200-300 Brin
For gears, bolts, crankshafts, machine tool parts; Brit. EN160, oil hardened, shock resistant.

TOLEDO 206.
M-985; 0.12-0.17 C, 0.3-0.5 Cr, 0.3-0.5 Mn, bal Fe.
For gears, fasteners, machine tool parts; Brit. EN206, case hardened.

TOLEDO 207.
M-985, 0.16-0.21 C, 0.6-0.8 Cr, 0.6-0.8 Mn, bal Fe.
For gears, fasteners, machine tool parts; Brit. EN207, case hardened.

TOLEDO 325.
M-985; 0.22 C, 1.5-2.0 Ni, 0.4-0.6 Cr, 0.2-0.3 Mo, bal Fe.
Heat treated: 123,000 TS; 15 El.
For gears, bolts, cams, machine tool parts; Brit. EN325, case hardened

TOLEDO 351.
M-985; 0.20 max C, 0.6-1.0 Ni, 0.4-0.8 Cr, 0.1 max Mo, bal Fe.
Heat treated: 101,000 TS; 18 El.
For gears, bolts, cams, machine tool parts; Brit. EN351, case hardened, shock resistant.

TOLEDO 352.
M-985; 0.20 max C, 0.85-1.25 Ni, 0.6-1.0 Cr, 0.10 max Mo, bal Fe.
Heat treated: 123,000 TS; 15 El.
For gears, bolts, cams, machine tool parts; Brit. EN352, case hardened, shock resistant.

TOLEDO 353.
M-985; 0.20 max C, 1.0-1.5 Ni, 0.75-1.25 Cr, 0.08-0.15 Mo, bal Fe.
Heat treated: 146,000 TS; 12 El.
For gears, bolts, cams, machine tool parts; Brit. EN353, case hardened, shock resistant.

TOLEDO 354.
M-985; 0.20 max C, 1.5-2.0 Ni, 0.75-1.25 Cr, 0.10-0.20 Mo, bal Fe.
Heat treated: 168,000 TS; 12 El.
For gears, bolts, cams, machine tool parts; Brit. EN354, case hardened, shock resistant.

TOLEDO 355.
M-985; 0.20 max C, 1.8-2.2 Ni, 1.4-1.7 Cr, 0.15-0.25 Mo, bal Fe.
Heat treated. 190,000 TS; 12 El.
For gears, bolts, machine tool parts; Brit. EN 355, case hardened, shock resistant.

TOLEDO 361.
M-985; 0.13-0.17 C, 0.4-0.7 Ni, 0.55-0.85 Cr, 0.08-0.15 Mo, bal Fe.
Heat treated: 100,000 TS; 18 El.
For gears, bolts, machine tool parts; Brit. EN 361, case hardened, shock resistant.

TOLEDO 362.
M-985, 0.18-0.23 C, 0.4-0.7 Ni, 0.55-0.80 Cr, 0.08-0.15 Mo, bal Fe
Heat treated: 123,000 TS, 15 El.
Heat gears, bolts, camshafts, cams; Brit. EN362, case hardened, shock resistant.

TOLEDO 363.
M-985; 0.22-0.26 C, 0.4-0.7 Ni, 0.55-0.80 Cr, 0.08-0.15 Mo, bal Fe
Heat treated 146,000 TS.
For gears, bolts, crankshafts, axles; Brit EN 363, case hardened, shock resistant.

TOLEDO B.C.H
M-985; 0.18 max C, 3.0-3.7 Ni, 0.6-1.1 Cr, 0.25 max Mo, bal Fe.
Heat treated: 123,000-156,000 TS, 13 El
For gears, bolts, camshafts, cams, Brit. EN36, case hardened, shock resistant

TOLEDO B C M F
M-985, 0.27-0.44 C, 2.3-2.8 Ni, 0.5-0.8 Cr, 0.4-0.7 Mo, bal Fe
Heat treated: 123,000-224,000 TS; 92,000-180,000 YS; 18-10 El; 248-500 Brin
For gears, bolts, shafts, axles, machine tool parts, Brit EN25 and 26, oil hardened, shock resistant

TOLEDO B C M O
M-985, 0.25-0.35 C, 3.0-3.7 Ni, 0.50-1.3 Cr, 0.2-0.65 Mo, bal Fe
Heat treated: 123,000-157,000 TS, 92,000-123,000 YS; 18-15 El; 248-375 Brin
For gears, bolts, machine tool parts, axles; Brit EN27, oil hardened, shock resistant

TOLEDO B.C N
M-985; 0.25-0.35 C, 0.5-1.0 Cr, 2.75-3.5 Ni, 0.65 max Mo, bal Fe
Heat treated. 112,000-146,000 TS; 81,000-112,000 YS; 20-16 El; 223-340 Brin.
For gears, bolts, crankshafts, machine tool parts; Brit. EN23, oil hardened, shock resistant.

TOLEDO B R.
M-985; 0.90-1.2 C, 0.30-0.75 Mn, 1.0-1.6 Cr, bal Fe
For bearings, races, gauges, cutters; Brit. EN31, wear resistant, water hardened.

TOLEDO B.S.N.1.
M-985; 0.30-0.45 C, 0.6-1.0 Ni, 1.5 Mn, 0.10-0.35 Si, bal Fe.
Normalized: 90,000 TS; 22 El; 179-229 Brin.
For gears, bolts, crankshafts, machine tool parts;

TOLEDO B.S.N.3.
M-985; 0.25-0.35 C, 2.75-3.25 Ni, 0.3 max Cr, bal Fe.
Rolled: 100,000 TS; 70,000 YS; 22 El; 200-235 Brin.
For gears, bolts, crankshafts, axles; Brit. EN21, oil hardened, shock resistant.

TOLEDO B S.N.35.
M-985; 0.35-0.45 C, 3.25-3.75 Ni, 0.5-0.8 Mn, 0.3 max Cr, bal Fe.
Rolled: 110,000-125,000 TS; 75,000-88,000 YS, 20-18 El; 223-302 Brin.
For gears, bolts, crankshafts, axles; Brit. EN22, oil hardened, shock resistant.

TOLEDO CARBON FILE.
M-985; 0.8 C, bal Fe.
For files; water hardened.

TOLEDO CARBON-MANGANESE.
M-985; 0.15-0.25 C, 1.3-1.7 Mn, 0.25 Cr, 0.40 max Ni, bal Fe.
Normalized: 80,000 TS; 20 El; 152-207 Brin.
For gears, cams, camshafts, fasteners; Brit. EN14A, water hardened.

TOLEDO CARBON SPRING.
M-985; 0.45-0.90 C, 0.10-0.40 Si, 0.55-0.90 Mn, bal Fe.
For laminated and coil springs; Brit. EN42, and 43, water hardened.

TOLEDO CHROME FILE
M-985, 0.8 C, Cr, bal Fe.
For files; water hardened.

TOLEDO CHROME SPRING.
M-985; 0.45-0.60 C, 1.0-1.6 Si, 0.5-0.9 Mn, 0.55-1.4 Cr, bal Fe.
For springs; Brit EN48, oil or water hardened.

TOLEDO CHROME VANADIUM VALVE. SPRING
M-985; 0.40-0.50 C, 1.0-1.5 Cr, 0.15 min V, 0.5-0.7 Mn, bal Fe
For valve springs; Brit EN50, oil hardened, tough.

TOLEDO EXTRA.
M-352; C, bal Fe.
For tools, fixtures, jigs, water hardened

TOLEDO G 105
M-985; 0.35-0.45 C, 1.3-1.6 Ni, 0.90-1.4 Cr, 0.20-0.35 Mo, bal Fe.
Heat treated 112,000-224,000 TS; 81,000-179,000 YS; 20-8 El; 223-500 Brin
For gears, bolts, crankshafts, machine tool parts; Brit. EN24, oil hardened, shock resistant

TOLEDO G. 110.
M-985, 0.26-0.34 C, 3.9-4.3 Ni, 1.1-1.4 Cr, 0.40 max Mo, bal Fe.
Heat treated: 224,000 TS; 180,000 YS; 10 El; 440-500 Brin
For gears, bolts, crankshafts; Brit. EN30A, oil hardened, shock resistant.

TOLEDO HARD DRAWING CARBON SPRING.
M-985; 0.45-0.85 C, 1.0 max Mn, 0.30 max Si, bal Fe.
For springs; Brit EN49, water hardened.

TOLEDO HIGH CARBON SPRING.
M-985, 0.90-1.2 C, 0.30 max Si, 0.45-0.70 Mn, bal Fe.
For laminated and coil springs; Brit. EN44, water hardened.

TOLEDO HIGH SPEED.
M-352; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.

TOLEDO H-O SILICOMANGANESE.
M-985; 0.50-0.60 C, 1.5-2.0 Si, 0.70-1.0 Mn, bal Fe.
For laminated springs, torsion bars; Brit. EN45 and 46, water or oil hardened, tough.

TOLEDO LANTERN.
M-985; 0.15 max C, 0.05-0.35 Si, 0.4-0.7 Mn, bal Fe.
Rolled: 70,000 TS; 20 El; 140 Brin.
For gears, bolts, rivets, nails, fan blades; Brit. EN32A, case hardened.

TOLEDO LOW ALLOY STEEL.
M-985; 0.25-0.45 C, 1.2-1.5 Mn, 0.50-1.0 Ni, 0.3-0.6 Cr, 0.15-0.25 Mo, bal Fe.
For gears, bolts, machine tool parts; Brit. EN 100, oil hardened, shock resistant.

TOLEDO MANGANESE MOLYBDENUM.
M-985; 0.25-0.40 C, 1.3-1.8 Mn, 0.20-0.55 Mo, bal Fe.
Heat treated: 101,000-146,000 TS; 72,000-112,000 YS; 22-16 El; 200-340 Brin.
For gears, bolts, crankshafts, machine tool parts; Brit. EN16 and 17, oil hardened, shock resistant.

TOLEDO-MOLYBDENUM BOLT STEEL.
M-985; 0.20-0.45 C, 0.5-1.5 Cr, 0.5-0.9 Mo, 0.4-0.7 Mn, bal Fe.
Heat treated: 123,000-146,000 TS; 92,000-112,000 YS; 18-16 El; 248-360 Brin.
For gears, bolts, machine tool parts; Brit. EN20A-B, oil hardened, tough.

TOLEDO NON-SHRINKING.
M-352; 0.9 C, 1.2 Mn, 0.2 V, bal Fe
For tools and dies; non-deforming.

TOLEDO N.T.R.1.
M-985; 0.10-0.30 C, 0.4 max Ni, 2.9-3.5 Cr, 0.4-0.7 Mo, bal Fe.
Heat treated: 100,000-135,000 TS; 72,000-103,000 YS; 22-17 El; 200-277 Brin
For gears, bolts, shafts, machine tool parts; Brit. EN40A, nitriding steel.

TOLEDO N.T.R.2.
M-985; 0.30-0.50 C, 0.4 max Ni, 2.5-3.5 Cr, 0.7-1.2 Mo, bal Fe.
Heat treated: 190,000 TS; 153,000 YS; 10 El; 375-444 Brin
For gears, bolts, shafts, machine tool parts; Brit. EN40C, nitriding steel

TOLEDO N.T.R.3.
M-985; 0.25-0.45 C, 0.4 max Ni, 1.4-1.8 Cr, 0.10-0.25 Mo, bal Fe.
Heat treated: 100,000-123,000 TS; 72,000-92,000 YS; 20-17 El, 200-302 Brin
For gears, bolts, shafts, machine tool parts; Brit. EN41, nitriding steel

TOLEDO R.S.2
M-985; 0.14-0.28 C, 1.5-2.0 Ni, 0.2-0.3 Mo, 0.3-0.6 Mn, bal Fe.
Heat treated: 123,000 TS; 15 El.
For machine tool parts, gears, bolts, cams; Brit. EN34 and 35, case hardened.

TOLEDO R.S.3
M-985; 0.10-0.15 C, 2.75-3.5 Ni, 0.3 max C, bal Fe
Rolled: 100,000 TS; 18 El.
For gears, bolts, camshafts, cams; Brit. EN33, case hardened.

TOLEDO R.S.5.
M-985; 0.16 max C, 4.5-5.5 Ni, 0.3 max Cr, bal Fe.
Rolled: 90,000 TS; 20 El.
For gears, cams, camshafts; Brit. EN37, case hardened.

TOLEDO S.82.
M-985; 0.12-0.18 C, 3.8-4.5 Ni, 1.0-1.4 Cr, 0.35 max Mo, bal Fe.
Heat treated. 190,000 TS; 12 El.
For gears, bolts, camshafts, cams; Brit. EN39, case hardened, shock resistant.

TOLEDO S.90.
M-985; 0.16 max C, 4.5-5.5 Ni, 0.15-0.35 Mo, 0.3 max Cr, bal Fe.
Heat treated: 146,000 TS; 13 El.
For gears, cams, camshafts; Brit. EN38, case hardened.

TOLEDO SCIMITAR.
M-352; C, W, Cr, bal Fe.
For tools, dies; oil hardened.

TOLEDO SILICO CHROME SPRING.
M-985; C, Si, Cr, bal Fe.
For spiral and coil springs; Brit. STA 2D, oil hardened, tough.

TOLEDO SPECIAL.
M-352; 0.7-1.2 C, bal Fe.
For general tools; water hardened.

TOLEDO SUPERIOR.
M-352, 0.7-1.2 C, bal Fe.
For general tools; water hardened

TOLEDO T P C
M-985; 0.45-0.55 C, 0.80-1.2 Cr, 0.15 min V, bal Fe.
For springs, Brit EN47, water hardened.

TOLEDO X.B P
M-487; 0.65-1.25 C, bal Fe.
For drills, taps, reamers, hobs, water hardened.

TOMBAC-A
French, 20 Zn, 80 Cu
38,000 TS; 30 El.
For jewelry, bearings, corrosion resistant

TOMBAC, ARCET.
82.3 Cu, 17.7 Zn
For water pipes; red brass

TOMBAC-B
French, 17-20 Zn, 0-3 Sn, 80 Cu.
For jewelry, bearings; corrosion resistant.

TOMBAC, CAST.
87 Cu, 13 Zn.
For hardware, red brass.

TOMBAC, GALDEN
82 Cu, 17.5 Zn, 0.5 Sn
For pipes, hardware, red brass.

TOMBAC, LUDENSCHEIDT
82.3 Cu, 17.5 Zn
For pipes, red brass.

TOMBAC, OKER
85.3 Cu, 14.7 Zn
For pipes; red brass.

TOMBAC, RED BRASS.
6 Zn, 85 Cu, 9 Sn.
Hard 75,000 TS; 18,000 YS; 4 El; 135 Brin.
Soft: 42,000 TS; 7,000 YS; 43 El; 52 Brin.
For hardware, ornaments, tubing, marine parts; corrosion resistant.

TOMBAC, RED VIENNA.
Austrian; 2 Zn, 98 Cu.
For jewelry, bearings; corrosion resistant.

TOMBAC, SHEET, PARIS.
92-84 Cu, 8-16 Zn.
For hardware, tubes; red brass.

TOMBASIL.
M-123, M-346; 4 Si, 13 Zn, bal Cu.
Sand cast: 65,000 TS; 30,000 YS; 20 El; 130 Brin.
Die cast: 90,000 TS; 50,000 YS; 25 El; 150 Brin.
Corrosion resistant bronze; for valve stems, brush holders, pump impellers, structural castings.

TOMBASIL.
M-122; 81 Cu, 4 Si, bal Zn.
Rolled: 98,000 TS; 45,000 YS; 20 El; 22 RA; 185 Brin.
For gears, shafts, propellers; corrosion and wear resistant.

TONCAN ENAMELING IRON.
M-97; 0.03 max C, 0.04 max Mn, bal Fe.
Rolled: 45,000-50,000 TS; 30,000-33,000 YS; 32-30 El; 56-50 RA; 90 Brin.
For roofing and siding, pipes, locomotive boiler tubes; porcelain enameling.

TONCAN IRON.
M-97; 0.03 C, 0.12 Mn, 0.035 S, 0.01 P, 0.07 Mo, 0.005 Si, 0.45 Cu, bal Fe.
Normalized: 50,000 TS; 40,000 YS; 35 El; 110 Brin.
For highway culverts, roofing, siding.
Atmosphere corrosion resistant.
Was TONCAN COPPER MOLYBDENUM.

TOOL.
M-364; 0.9 C, 0.2 V, bal Fe.
For drills, chisels, crow-bars; water or oil hardened.

TOOL-ARC AIR HARDENING.
M-1713; 1.0 C, 5 Cr, 1 Mo, 0.2 V, bal Fe.
For tool steel welding electrodes; for air hardening die steels.

TOOL-ARC HIGH SPEED.
M-1713; 0.7 C, 1.5 W, 9.5 Mo, 1 V, bal Fe.
For tool steel welding electrodes; for cutting tools.

TOOL-ARC HOT-WORK
M-1713; 0 3 C, 5 Cr, 1.3 Mo, 1 W, bal Fe
For tool steel welding electrodes; for hot die steels

TOOL-ARC OIL HARDENING.
M-1713, 0 9 C, 1 2 Mn, 0.5 Cr, 0.5 W, bal Fe.
For tool steel welding electrodes; for non-deforming steel tools and dies

TOOL-ARC WATER HARDENING
M-1713; 0.9 C, 2 V, bal Fe.
For tool steel welding electrodes; for water hardening steel parts.

TOOLCRAFT.
M-175; 1.0 C, 1 Cr, bal Fe.
Welded: 600 Brin.
For hard facing electrodes, cutting tools; wear resistant.

TOOL HOLDER.
M-85; 1.2 C, 3 Cr, 13 W, 1.2 Mo, bal Fe.
For cutting tools; obsolete.

TOOL-N-DIE NO. 10-WH
M-1000; high C, bal Fe.
Heat treated: 600 Brin.
For welding electrodes for C tool steels; coated.

TOOL-N-DIE NO. 15-AH.
M-1000; C, 5 Cr, bal Fe.
Heat treated: 610 Brin.
For welding electrodes for air hardening steels; coated, air hardening.

TOOL-N-DIE NO. 16-HS.
M-1000; C, 6 W, 5 Mo, V, bal Fe.
Heat treated: 650 Brin.
For welding electrodes for Mo high speed steel; coated

TOOL-N-DIE NO. 24-HA.
M-1000; C, alloy, bal Fe.
Welded: 250 Brin.
For welding electrodes for alloy steels; coated, austenitic.

TOOL-N-DIE NO. 34-DA.
M-1000; C, alloy, bal Fe.
Welded: 350 Brin.
For welding electrodes for alloy steels; coated, austenitic.

TOOL-N-DIE NO. 70-OH.
M-1000; high C, Min, bal Fe.
Heat treated: 620 Brin.
For welding electrodes for tool steel; coated.

TOOL-N-DIE NO. 71-OH.
M-1000; high C, 1.2 Mn, bal Fe.
Heat treated: 600 Brin.
For welding electrodes for Mn tool steel; coated.

TOOL-N-DIE NO. 72-HW.
M-1000; C, Cr, Mo, W, bal Fe.
Heat treated: 540 Brin.
For welding electrodes for hot work steel; coated, hot work steel.

TOOL-N-DIE NO. 73-HW.
M-1000; C, Mo, Cr, bal Fe.
Heat treated: 580 Brin.
For welding electrodes for hot work steels; coated, hot work steel.

TOOL-N-DIE NO. 75-WH.
M-1000; high C, V, bal Fe.
Heat treated: 600 Brin.
For welding electrodes for C tool steels; coated.

TOOL-ROD NO. 650.
M-1096, 0.5-0.7 C, 3-4 W, 6-8 Cr, 0.8 V, 0.4 Mn, bal Fe.
Welded: 500 Brin.
For hard facing electrode, for tool steels, for wear resistance

TOOLTECTIC 6 HSS.
M-717;
For high speed steel overlays on tools by AC-DC Rev arc.
Hardness: C-62 Rock

TOOLTECTIC 6HW
M-717,
For hard overlays on hot working punches.
Hardness C-52-55 Rock.

TOOLTECTIC 6SH.
M-717;
For hard overlays on steels
Hardness: C 53-61 Rock.

TOOLTECTIC 6WH.
M-717;
For hard overlays on water hardening tools.
Hardness: C 56-59 Rock.

TOOLTECTIC 60H.
M-717;
For wear resistant overlays on steel machine parts.
Hardness: C 59-62 Rock.

TOOLTECTIC 623.
M-717;
For arc build up on cast iron.
58,000 TS.

TOOLTEC 10675.
M-717;
Nickel base alloy powder for steel, cast iron, stainless, nickel alloys

TOOLWELD A & O.
M-578; C, 5 Cr, bal Fe.
Welded: 650 Brin.
For hard surfacing electrodes; wear resistant, shielded arc.

TOPAL H.
M-2; 80 Cu, 20 Mn + Fe + Al.
Chill cast: 90,000 TS; 5 El; 170 Brin.
Hot pressed: 114,000 TS; 5 El; 200 Brin.
For shafts, bearings, dies, pump rods, steering nuts, gears; non-corrosive.

TOPAL "W."
M-2; 0.5 Mn, 1 Fe, 9 Al, bal Cu.
Cast: 50,000-60,000 TS; 30-15 El; 130-150 Brin.
Hot pressed: 60,000-80,000 TS; 30-15 El; 150-170 Brin.
For shafts, bearings, dies, gears; resists steam at 550°F.

TOPHAL X.
M-897; 35 Cr, 3 Al, 62 Fe.
Annealed: 85,000 TS; 57,000 YS; 20 El.
For heating elements; for induction furnaces.

TOPHAL Y.
M-897; 12 Cr, 5 Al, bal Fe.
Annealed: 80,000 TS; 65,000 YS; 15 El.
For heating elements; heat resistant.

TOPHAL Z.
M-897; 22 Cr, 5 Al, bal Fe.
Annealed: 85,000 TS; 65,000 YS; 20 El.
For heating elements; for electric furnaces.

TOPHEL.
M-61; 10 Cr, bal Ni.
Wire: 88,000 TS; 30,000 YS; 35 El
For positive thermoelement for the standard Type K thermocouple.
Oxidation resistant and stabile.

TOPHEL II.
M-61; 90 Ni, 10 Cr.
For positive thermoelement for the standard Type K thermocouple.
Resists preferential oxidation of chromium. Oxidation resistant and stabile.

TOPHET "A."
M-61; 77-79 Ni, 19-20.5 Cr, 0.15 max C, 2 Mn
Hard: 160,000 TS; 90,000 YS; 3 El; 45 RA.
Soft: 120,000 TS; 70,000 YS; 30 El; 45 RA; 190 Brin.
For resistance wire, heating elements, percolators, toasters, rheostats; tough to machine; max operating temperature 2100°F.

TOPHET A.
M-897; 80 Ni, 20 Cr.
Annealed: 105,000 TS; 70,000 YS; 40 El.
For heating elements; for high temperatures.

TOPHET B.
M-61; 0.10-0.15 C, 68-71 Ni, 19-20.5 Cr, bal Fe.
Annealed: 100,000 TS; 60,000 YS; 30 El; 45 RA.
Drawn: 160,000 TS; 85,000 YS; 3 El.
For heat and corrosion resistant parts; conveyor belts; heat and corrosion resistant.

TOPHET "C."
M-61; 57-60 Ni, 14-18 Cr, 0.15 max C, bal Fe.
Hard: 100,000-140,000 TS; 85,000 YS; 100-3 El; 16 RA.
Soft: 100,000 TS; 60,000 YS; 25 El; 45 RA; 165 Brin.
For resistance wire, heating elements, percolators, toasters, rheostats; resists some common acids, max operating temperature 1850°F.

TOPHET C.
M-897; 60 Ni, 16 Cr, bal Fe.
Annealed: 105,000 TS; 70,000 YS; 30 El.
For heating elements; for domestic use.

TOPHET D.
M-61; 34 Ni, 20 Cr, 0.15 C, bal Fe.
Annealed: 75,000 TS; 20 El.
For moderate temperature service; used up to 1600°F.

TOPHET E.
M-897; 75.5 Ni, 20 Cr, 2.5 Ti, 0.5 Si, 0.5 Mn, 0.5 Si, 0.5 Al.
Hardened: 280,000 TS; 210,000 YS; 2.5 El.
For springs, gas turbine accessories; age-hardenable.

TOPHET-F.
M-61; 77 Ni, 20 Cr, 3 Al.
Wire: 100,000-200,000 TS; 60,000-175,000 YS; 2-30 El.
For furnace belts in strongly reducing atmospheres at 1800-2100°F.
High heat and corrosion resistant.

TOPHET-F
M-897; 36-38 Ni, 17-19 Cr, 2 Si, bal Fe.
For heating elements; useful operating temperature to 1000°C.

TOPHET-H.
M-897; 75-77 Ni, 19-21 Cr, 3.5 Al.
For heating elements; useful operating temperature to 1250°C.

TOPHET I-304.
M-897; 0.08 max C, 18-20 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000 TS; 30,000 YS; 60 El; 70 RA; 160-140 Brin
For tubing for chemical and food industries; stainless, austenitic.

TOPHET I-316.
M-897; 0.10 max C, 16-18 Cr, 10-14 Ni, 2.5 Mo, bal Fe.
Annealed. 80,000 TS; 30,000 YS; 50 El; 70 RA; 140-160 Brin.
For tubing for chemical and food industries; stainless, austenitic.

TOPHET M.
M-897; 8 Ni, 18 Cr, bal Fe.
290,000 TS; 1 El.
For magnetic recording wire; corrosion resist

TOPHET M-5.
M-61, 65 Ni, 30 Cr, 5 Mo.
Wire: 130,000-190,000 TS; 66,000-155,000 YS; 25-39 El.
For pickling hooks, wire cloth, containers, baskets, reaction vessels.
Corrosion resistant in strong oxidizing acids.

TOP NOTCH.
M-69; 0.50 C, 2.5 W, 1.25 Cr, 0.25 V, bal Fe.
For tools, chisels, track tools; shock resisting.

TORDAL.
M-297; 4 Cu, 0.5 Pb, 0.5 Bi, bal Al.
T3-temper: 55,000 TS; 43,000 YS; 15 El; 95 Brin.
T6-temper: 57,000 TS; 39,000 YS; 17 El; 97 Brin.
For screw machine products, machinery parts, fasteners; free-cutting.

TOREADOR.
M-489; C, alloy, bal Fe.
For high speed tools; high speed steel.

TOREADOR SUPRA.
M-489; C, alloy, bal Fe.
For high speed tools; high speed steel.

TORMANC.
M-1724; 0.35 C, 1.5 Mn, bal Fe.
Oil hardened: 84,000-101,000 TS; 54,000-67,000 YS; 30-27 El; 60-50 RA.
For nuts, bolts; oil hardening; Iz-30-70.

TORMANC MAJOR.
M-1724; 0.25-0.4 C, 1.5 Mn, 0.3 Mo, bal Fe.
Oil hardened: 123,000-156,000 TS; 105,000-139,000 YS; 26-18 El; 65-50 RA.
For automobile crankshafts, axles, drive shafts, studs, bolts; oil hardening, Iz-50-90.

TORMANC SPECIAL.
M-430; 0.20 C, 1.5 Mn, Ni, Mo, bal Fe.
Heat treated: 105,000 TS; 92,000 YS; 22 El; 64 RA.
For pistons, couplings, connecting rods; for highly stressed parts.

TORMANC SPECIAL.
M-1724; 0.15-0.25 C, 1.4-1.8 Mn, 0.4-0.7 Ni, 0.15-0.35 Mo, bal Fe.
Hardened: 90,000-107,000 TS; 67,000-80,000 YS; 30-22 El; 70-50 Brin.
For gears, shafts, axles; oil hardened.

TORMOL.
M-1724; 0.30 C, 2.5 Ni, 0.7 Cr, 0.5 Mo, bal Fe.
Oil hardened: 134,500-202,000 TS; 119,000-190,000 YS; 23-13 El; 63-45 RA.
For crankshafts, gears, axle shafts, connecting rods; Izod 15-70.

TORPEDO.
M-688; 0.9 C, 0.5 Cr, 1.3 Mn, 0.5 W, bal Fe.
For dies, punches, rivet sets; non-deforming, oil hardened.

TORPEDO BRONZE.
England; 0.5-1.5 Sn, 62-59 Cu, bal Zn.
For torpedo parts; corrosion resistant.

TOTO HS-Al.
M-1544; 0.15-0.18 C, 1 1-1.4 Mn, 0.35-0.60 Si, 0.20 min Cu, bal Fe.
Rolled: 70,000-81,000 TS; 46,000 min YP; 20% min El.
For agricultural equipment, structural members, buildings, bridges.
Structural steel.

TOTO HS-B.
M-1544; 0 19-0.26 C, 1-1-1 4 Mn, 0.40 max Si, 0.20 min Cu, bal Fe.
Rolled 85,000-100,000 TS; 54,000 min YP; 17% min El
For structural members, buildings, bridges, agricultural equipment.
Structural steel.

TOUCAS
36 Cu, 29 Ni, 7.1 Fe, 7.1 Pb, 7.1 Sn, 7.1 Sb, 7.1 Zn.
For ornamental white metal parts; corrosion resistant.

TOUGH.
M-388; 0.6 C, bal Fe.
For tools, dies; water or oil hardened.

TOUGH DEVIL NO. 1.
M-712; 13 Mn, 3 Ni, C, bal Fe.
Cast: 135,000 TS; 45,000 YS; 80 El; 50 RA; 180-200 Brin.
For welding rods for high Mn steels; wear resistant, austenitic.

TOUGH DEVIL NO. 2.
M-712; 0.8 C, 14 Mn, 0.2 Mo, bal Fe.
520 Brin.
For hard surfacing electrodes; wear and abrasion resistant.

TOUGHDIE.
M-289; 0.45-0.55 C, 0.6-0.7 Mn, 0.25 Si, 3.0-3.25 Cr, 1.3-1.4 Mo, bal Fe.
AISI Type S7 shock resisting tool steel.

TOUGH HARD.
M-388; 0.9 C, 1.0 Mn, bal Fe.
For tools, dies; water or oil hardened.

TOUGH HARD.
M-1405; 1.15 C, 0.4 Mn, 0.2 Si, 0.1 V, bal Fe.
For knurling tools, taps, punches; water hardened; Type W2.

TOUGH-ITE.
M-1036; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutting tool bits; high speed steel.

TOUGHITE NO. 5.
M-922; 0.7 C, 0.9 Cr, 0.2 V, bal Fe.
For tires and rollers in kilns, coolers and dryers; oil hardened.

TOUGH M.
M-24; 0 45 C, 0.55 Mn, 0.20 Si, 0.95 Cr, 0.20 V, bal Fe.
Low alloy, oil hardening tool steel, AISI L2.

TOUGH ONE.
M-1113; 1.00-1.15 C, bal Fe.
For tools, drills, taps, chasers; water hardened.

TOUGH TWO.
M-1113; 0.9-1.0 C, bal Fe.
For tools, drills, chasers; water hardened.

TOUGH THREE.
M-1113; 0.7-0.8 C, bal Fe.
For tools, springs, punches; water hardened.

TOURNAY METAL.
French; 82 5 Cu, 17.5 Zn
For cheap jewelry; brass.

TOURUN LEONARD'S METAL.
90 Sn, 10 Cu.
For bearings; bronze, tough.

TP.
M-459, 1 0 C, 0.3 Cr, 0.9 V, 1 W, bal Fe.
For steel trimming and weld steel; oil hardening.

T.P A.
M-513; 0.45 C, 13-15 Ni, 13-15 Cr, 0.5 Mo, 1.75-3.0 W, bal Fe.
At 70°F. 120,600 TS; 84,000 YS; 30 El; 44 RA; 215 Brin.
At 1600°F: 23,000 TS; 20 El; 27 RA.
For valves, valve seats, exhaust valves; heat resistant, austenitic.

TRABUK.
England; 5.5 Ni, 5 Sb, 2 Bi, bal Sn.
For food utensils; resists vegetable acids.

TRAKALOY.
M-1128; Ti, Mn, Ni, Cr.
300 Brin.
For hard facing electrodes; for rails and wheels.

TRANCE PHOSPHOR BRONZE.
M-103; 90 Cu, 5 Sn, 5 Pb, trace P.
For hardware; free cutting.

TRANCOR 3 W.
M-10; Si, bal Fe.
For transformer cores; oriented grains.

TRANCOR 4 W.
M-10; Si, bal Fe.
For transformer cores; oriented grains.

TRAN-COR A-5.
M-10; Si, bal Fe.
For audio transformer cores, low induction elect. equipment; for radio use.

TRAN-COR A-6.
M-10; Si, bal Fe.
For audio transformers, elect. equipment; low induction.

TRAN-COR M-14.
M-10; 4.5 Si, bal Fe.
For transformers; core loss 52; high permeability.

TRAN-COR M-15.
M-10; 4.0-4.4 Si, bal Fe.
For distribution transformers, rotating equipment; core loss 58; high permeability.

TRAN-COR M-17.
M-10; 4.0-4.4 Si, bal Fe.
For transformers, motors, magnetic cores; core loss 65; high permeability.

TRAN-COR M-19.
M-10; 3.0-3.4 Si, bal Fe.
For generators, transformers, magnetic cores; core loss 72; high permeability.

TRAN-COR M-22.
M-10; 3.2 Si, bal Fe.
For transformers, motors, magnetic cores; high permeability; core loss 82.

TRAN-COR M-27.
M-10; 2.8 Si, bal Fe.
For transformers, motors, magnetic cores; high permeability; core loss 101.

TRAN-COR M-36.
M-10; 1.0 Si, bal Fe.
For magnetic cores, rotating machines, elect. equipment; high permeability; core loss 117

TRAN-COR M-43.
M-10; 0.5 Si, bal Fe.
For armatures, rotating machines, motors; high permeability; core loss 130.

TRAN-COR T.
M-10; Si, bal Fe.
For thin sheets for electric generators; high permeability.

TRAN-COR T-O.
M-10; Si, bal Fe.
For electric generators, armatures; high permeability.

TRAN-COR T-O-S.
M-10; Si, bal Fe.
For wound type transformers and reactors; high inductance, low core loss.

TRANSMISSION GLYCO.
M-240; Sn, Sb, bal Pb.
For bearings; Babbitt.

TRANSPARENT.
M-1318; 0.40 C, 13 Cr, 0.3 Mn, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For cutlery, valves, surgical and dental instruments; corrosion resistant; Type 420.

TRANSPARENT 3003.
M-1318; 0.20 C, 13 Cr, 0.3 Mn, 0.4 Si, bal Fe.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For cutlery, turbine blades, knives; Type 420; corrosion resistant.

TRANSWELD.
M-578; 0.2 C, bal Fe.
Cast: 85,000 TS; 20 El.
For welding rods; *for mild steel*

TRANTINYL.
M-977; 0.7 C, 1 Cr, bal Fe.
For guide shoes, tools; abrasion resisting.

TREM BRONZE.
M-1194; 2 Sn, bal Cu.
Annealed: 90,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For springs, clips, hardware, fasteners; tough, corrosion resistant.

TRENITE.
M-535; 0.1 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 25 El; 45 RA; 150 Brin.
For chemical plant equipment, evaporators, tanks, Type 302; austenitic, stainless.

TRENITE-H.
M-535; 0.2 C, 18 Cr, 8 Ni, bal Fe.
45,000 TS; 0.4 El; 250 Brin.
For heat, wear, corrosion resistant parts; heat, wear, corrosion resistant.

TRENITE P.
M-535, 0.25 C, 20 Cr, 10 Ni.
Cast: 45,000 TS; 300 Brin.
For lead spots, heat treating equipment; resists heat to 1650°F.

TRENITE WX.
M-535; 0.3 C, 14 Cr, bal Fe.
500 Brin.
For coal grinders, hot coke car sides and mill liners; abrasion resistant.

T.R.I.
M-1398; 21 Sn, 1.8 Cu, 0.15 Si, 0.13 Fe, bal Al.
Cast: 15,500 TS; 4 8 El; 43 Brin.
For railroad bearings.

TRI-ALLOY.
M-747; 35-40 Pb, 4.5 Ag, bal Cu.
For engine bearing for trucks and crankshafts; for heavy load and high speed.

TRIALLOY.
M-909; Ni alloy.
For sanitary fittings and valves; corrosion resistant.

TRIANGLE 10.
M-1677; 65 Cu, 25 Zn, 10 Ni.
Hard: 115,000 TS; 5 El.
Soft: 55,000 TS; 45 El; 20,000 YS.
For hardware, costume jewelry, optical parts, holloware.
Nickel silver, elect. cond. 9%, corrosion resistant

TRIANGLE 12
M-1677; 65 Cu, 23 Zn, 12 Ni.
Hard· 115,000 TS; 3 El.
Soft: 58,000 TS; 45 El; 20,000 YS.
For slide fasteners, hardware, optical parts.
Elect. cond. 8%, nickel silver, corrosion resistant.

TRIANGLE 15
M-1677; 65 Cu, 20 Zn, 15 Ni
Hard· 103,000 TS; 5 El
Soft. 58,000 TS; 45 El; 20,000 YS.
For camera goods, optical equipment, jewelry, etching stock.
Nickel silver, elect. cond. 7%, corrosion resistant.

TRIANGLE 18.
M-1677; 65 Cu, 17 Zn, 18 Ni.
Hard· 103,000 TS; 3 El; 90,000 YS.
Soft: 58,000 TS; 45 El; 25,000 YS.
For rivets, screws, zippers, hollow ware, truss wire, costume jewelry.
Elect. cond. 6%; nickel silver, corrosion resistant.

TRIANGLE 30.
M-1677; 98 Cu, 2 Ni.
Hard: 67,000 TS; 4 El.
Soft: 37,000 TS; 46 El.
For resistances.
Elect. cond. 34%.

TRIANGLE 60.
M-1677; 94 Cu, 6 Ni.
Hard: 73,000 TS; 4 El.
Soft: 37,000 TS; 46 El.
For resistances.
Elect. cond. 17.

TRIANGLE 70/30.
M-1677; 70 Cu, 30 Zn.
Hard: 110,000 TS; 7 El.
Soft: 50,000 TS; 50 El; 18,000 YS.
For fasteners, therminal plugs, plumbing goods, cartridge cases.
Elect. cond. 28%, high strength and ductility.

TRIANGLE 90.
M-1677; 89 Cu, 11 Ni.
Hard: 83,000 TS; 5 El.
Soft: 47,000 TS; 46 El; 16,000 YS; B 15 Rock.
For condensers, condenser plates, distiller tubes, ferrules, piping.
Elect. cond. 9%, corrosion resistant.

TRIANGLE 91/09.
M-1677; 91.5 Cu, 8 Zn, 0.5 Sn.
Hard: 77,000 TS; 6 El.
Soft: 44,000 TS; 40 El.
For metal hose braid.
Elect. cond. 39.

TRIANGLE 170.
M-1677; 70 Cu, 30 Zn, 0.02-0.05 P.
Hard: 110,000 TS; 7 El.
Soft. 50,000 TS, 50 El.
For condensers, heat exchangers, ferrules.
Elect. cond 28%, inhibited.

TRIANGLE 171.
M-1677, 70 Cu, 30 Zn, 0.02-0.05 As.
Hard: 110,000 TS; 7 El.
Soft: 50,000 TS; 50 El.
For marine hardware, condensers, heat exchangers.
Elect cond 28% inhibited Free from dezincification.

TRIANGLE "X."
M-111; 1.0-1.2 C, bal Fe
For rock drill pistons, punches, dies, broaches; water hardened

TRIANGLE X-EXTRA.
M-111; 0.7 C, bal Fe.
For tools, drills, taps; water hardened.

TRIANGLE X-SPECIAL.
M-111; 0.9-1.2 C, bal Fe
For tools, punches; water hardened

TRICENT.
M-68, M-24; 0.43 C, 1.6 Si, 0.8 Mn, 1.8 Ni, 0.85 Cr, 0.38 Mo, 0.08 V, bal Fe.
Heat treated: 290,000 TS; 250,000 YS; 10 El; 36 RA; 54 Brin.
For aircraft structures, landing gears; tough, shock resistant.

TRI-CLOVER.
M-909; 0.3-0.5 C, bal Fe.
For machinery parts; water hardening.

TRI-CORE.
M-1073; 40-60 Pb, bal Sn.
For solder; self fluxing soft solder.

TRIDENT.
M-73; 0.57 C, 0.65 Si, 0.30 Mn, 0.60 Cr, 0.35 Mo, 0.2 V, bal Fe.
For cold forming dies, punches, mandrels, chisels; cold work die steel.

TRI-LOK.
M-924; 0.4 C, bal Fe.
For gears, shafts; water hardened.

TRI-LOK.
M-923; 0.4 C, bal Fe.
For gears, shafts; water hardened.

TRIMCO.
M-954; 0.6 C, 1.5 Ni, 0.8 Cr, bal Fe.
For pipe wrenches; oil hardening.

TRIMMAX.
M-64; 0.95 C, 3.75 Cr, 0.23 Mb, 0.16 V, bal Fe.
Annealed: 220 Brin.
Heat treated: 510 Brin.
For hot and cold trimmers; oil hardened.

TRIMMAX, H41.
M-64; 0.95 C, 0.30 Mn, 0.25 Si, 3.75 Cr, 0.17 V, 0.20 Mo, bal Fe.
Air hardening tool and die steel for cold work operations.

TRIMMER DIE.
M-80; C, alloy, bal Fe.
For tools; tough.

TRI-MO
M-111; 1.5 C, 12 Cr, 2 V, 0.8 Mo, bal Fe.
Annealed: 102,000 TS; 14 El; 225 Brin.
For tools, dies, reamers, gages, forming and blanking dies, thread rolling dies.
Type D2 air hardening, non-deforming tool steel.

TRI-MO NO. 19.
M-341; 1.5 C, 12 Cr, 0.2 V, 0.9 Mo, bal Fe.
For forming and blanking dies; air hardened, non-deforming.

TRI-MO AIR-HARDENING.
M-350; C, Cr, Mo, bal Fe.
For heavy dies for severe requirements; air hardened.

TRIPLE A ALMAG 55.
M-1022; 10.0-11.5 Mg, 0.2-1.0 Be, 0.0001-0.05 B, bal Al.
Cast: 50,000-60,000 TS, 32,000-35,000 YS; 20-30 El; 80-100 Brin.
For light alloy castings, meters; sand or permanent mold.

TRIPLE ALLOY PUNCH.
M-38; 0.6 C, 0.15-0.25 V, 1.3 Cr, 0.5 W, bal Fe.
For punches, dies; oil hardened.

TRIPLE CONQUEROR.
M-1406, 1.3 C, 4 W, 1.0 Cr, 0.3 Mo, bal Fe.
For drawing and extrusion dies, broaches; finishing steel, wear resistant.

TRIPLE ECLAIR.
M-1043; 0.78 C, 18 W, 0.6 Mo, 0.6 V, bal Fe.
For lathe and planer tools; oil hardened.

TRIPLE ECLAIR.
M-1546; 0.78 C, 18.5 W, 1 V, 0.4 Mo, bal Fe.
For lathe and planer tools, hobs, milling cutters, taps, thread chasers, broaches, drills.
High-speed steel. Oil hardening. Good red-hardness.

TRIPLE EXPRESS 3X.
M-1546; 1.30 C, 10.5 W, 3.1 V, 0.5 Mo, bal Fe.
Hardened: C 64-68 Rock.
For finishing cutters, tools, deburrers, drills, broaches, milling cutters.
High speed steel, oil hardening, good red-hardness.

TRIPLE EXPRESS "A."
M-344; 0.7 C, 6 W, 6 Mo, 5 Co, 4 Cr, bal Fe.
For high speed lathe tools, twist drills, reamers; high speed steel.

TRIPLE EXPRESS "B."
M-344; 0.7 C, 8 Mo, 1 W, 4 Cr, 5 Co, bal Fe.
For high speed lathe tools, twist drills, reamers; high speed steel.

TRIPLE EXPRESS B.
M-1546; 0.80 C, 18 W, 5 Co, 1.1 V, 0.9 Mo, bal Fe.
Hardened: C 64-66 Rock.
For turning tools, lathe and planer finishing cutters, hobs, reamers, broaches, taps, drills.
High-speed steel, oil hardening; high red-hardness.

TRIPLE EXPRESS SUPER-4X.
M-1546; 1.55 C, 13 W, 5 Co, 5 V, 5 Cr, 0.5 Mo, bal Fe.
Hardened: C 64-68 Rock.
For lathe and planer finishing tools, engraving tools, milling cutters, textile needles.
High-speed steel, oil hardening.
High red-hardness.

TRIPLE EXPRESS T.M.
M-1546; 0.82 C, 6.0 W, 4.5 Mo, 1.4 V, bal Fe.
Hardened: 64-66 Rock C.
For lathe and planer tools, drills, saws, form cutters, broaches, milling cutters.
High speed steel, oil hardening, high red-hardness.

TRIPLE EXPRESS V.
M-1546; 0.85 C, 18.5 W, 1.9 V, 0.4 Mo, bal Fe.
Hardened: 64-66 Rock C.
For turning tools, lathe and planer cutters, drills, thread cutters, broaches, reamers, hobs.
High speed steel, oil hardening, high red-hardness.

TRIPLE EXTRA 2 STEEL (T.E.R.2).
M-1116; 0.82 C, 4.5 Cr, 18 W, 0.6 Mo, 2 V, bal Fe.
Air or oil harden to 63-66 Rc.
For cutting tools, lathe, gear cutters, broaches.
AFNOR: Z 85 WV 18.02.
US-AISI T2 high speed steel.
Germany: W.nr 1.3357.

TRIPLE EXTRA 60 STEEL (T.E.R.60).
M-1116; 0.65 C, 4 Cr, 18 W, 0.4 Mo, 1 V, bal Fe.
Air or oil harden to 60-63 Rc.
For cutting tools, or cold work tools.
AFNOR: Z 65 W 18.
US-AISI T1 high speed steel.

TRIPLE EXTRA D STEEL (T.E.D.).
M-1116; 0.80 C, 4.3 Cr, 12.5 W, 1.8 Mo, 1.8 V, bal Fe.
Air or oil harden to 62-66 Rc
For lathe tools, drills, taps, reamers, cut-off tools.
AFNOR: Z 80 WDV 12.02.02.
US-AISI T7 High speed steel.
Germany: S 12.1.2. (D); W.nr 1.3318.

TRIPLE EXTRA LION.
M-1415; 0.75 C, 19 W, 4.25 Cr, 1.25 V, 5 Co, 0.75 Mo, bal Fe.
For lathe and planer tools, drills, hobs, broaches; high speed steel.

TRIPLE EXTRA M STEEL (T.E.M.).
M-1116; 0.83 C, 4.2 Cr, 6.5 W, 5 Mo, 1.9 V, bal Fe.
Air or oil harden to 63-66 Rc.
For twist drills, centre drills, reamers, taps, cutters, broaches.
AFNOR: Z 85 WDV 06.05.02.
US-AISI M2 high speed steel.
Germany: S 6.5.2 (DMo5); W.nr 1.3343.

TRIPLE EXTRA STEEL (T.E.R.).
M-1116; 0.78 C, 4.5 Cr, 18 W, 0.6 Mo, 1.25 V, bal Fe.
Air or oil harden to 63-66 Rc.
For cutting tools, taps, thread chasers, turning tools.
AFNOR: Z 80 W 18.
US-AISI T1 high speed steel.
Germany: S 18.0.1 (B-18); W.nr 1.3355.

TRIPLE GRIFFIN.
M-1112; 1.35 C, 0.4 Mn, 0.35 Cr, 2.75 W, 0.3 Si, bal Fe.
For cold drawing dies, cutters; water hardened, hard case and tough core.

TRIPLE LIFE D-C.
M-40, 1.2 C, 4 Cr, bal Fe.
For dies, reamers; air hardened.

TRIPLE MUSHET.
M-233; C, 19 W, 4 Cr, 2.25 V, bal Fe.
For tools, dies, cutters; high speed steel.

TRIPLE SATAN.
M-1043; 0.32 C, 9 W, 3.3 Cr, bal Fe.
For extrusion rams, dies and liners, punches; hot work steel, oil hardened.

TRIPLEX.
M-748; 0.35-0.45 C, 0.6-0.9 Mn, 0.8-1.1 Cr, 0.15-0.25 Mo, bal Fe.
Heat treated: 105,000-125,000 TS; 85,000-100,000 YS; 17-15 El; 55-50 RA.
For high temperature bolting; ASTM-A193 Gr. B 7.

TRIPLI-CAST.
M-838; C, alloy, bal Fe.
Rolled: 69,000-109,600 TS; 5-1.5 El; 132-205 Brin.
For shafts; M.P. 1710°F.

TRI-PLY.
M-114; three-ply composite steel with steel center and Uniloy backing.
For heat and corrosion resistant parts; stainless clad steels.

TRI-STEEL.
M-67; 0.22 C, 1.25 Mn, 0.30 Si, 0.02 V, bal Fe.
Rolled. 70,000 TS; 50,000 YS; 22 El.
For railroad and agriculture equipment, mine cars; high-strength, low alloy construction steel.

TRI-TEN.
M-604; 0.22 max C, 1.25 max Mn, 0.2-0.6 Cu, 0.02 min V, bal Fe.
Rolled. 70,000 TS; 50,000 YS; 25 El, 140 Brin.
For cranes, shovels, derricks, mine cars, truck bodies.
Shock resistant. Good resistance to atmospheric corrosion.

TRI-TEN E.
M-604; 0.25 C, 1.3 Mn, 0.2 Si, 0.5-1.0 Ni, 0.2 min Cu, bal Fe
Rolled: 70,000 TS; 50,000 YS; 22 El; 140 Brin.
For structural parts, truck bodies, rail cars; high strength, good weldability.

TRITON.
M-140, 0.50-0.55 C, 0.90-1.1 Si, 0.6 Mo, bal Fe.
For tools, cutters, punches, pneumatic chisels, rivet sets; shock resistant

TRI-TUNG see UHB TRITUNG.

TRIUMPH.
M-486; 0.68 C, 3.75 Cr, 0.6 Mo, 0.6 V, 14 W, bal Fe.
For slitting and hacksaw blades, punches; high speed steel.

TRIUMPH.
M-261; 0.68 C, 3.75 Cr, 0.6 V, 14.0 W, bal Fe.
Hardened: 64-66 Rock C.
For slitting saws, hacksaws, lathe centers, cold punches, reamers.
High-speed steel for cutting operations under conditions of heavy vibration.

TRIUMPH 2000.
M-261; 0.7 C, Cr, W, V, bal Fe.
For lathe and planer tools, reamers, hobs, drills, taps; high speed steel.

TRIUMPHATOR.
M-1308; 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies, punches; oil or air hardened, nondeforming.

TRIUMPHATOR M.
M-1308; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, punches; air hardened, nondeforming.

TRIUMPHATOR W.
M-1308; 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For blanking and forming dies, punches; oil or air hardened, nondeforming.

TRIUMPH SUPERB.
M-486; 0.76 C, 4.25 Cr, 0.6 Mo, 1.4 V, 18 W, bal Fe.
For drills, broaches, reamers, hobs, gear cutters; high speed steel.

TRIUMPH SUPERB.
M-261; 0.76 C, 4.25 Cr, 1.4 V, 18 W, bal Fe.
Hardened: 64-66 Rock C.
For drills, reamers, broaches, hobs, form and gear cutters, chasers, end mills, taps, cold punches.
High-speed steel, high red-hardness.

TRIUMPH SUPERB 1000.
M-261, 0.80 C, 4.75 Cr, 1.6 V, 18.5 W, 5.7 Co, bal Fe.
Hardened: 64-66 Rock C.
For turning and boring tools, milling cutters, hobs, end mills, form tools, gear cutters.
High speed steel. High red-hardness.

TRIUMPH SUPERB 1000.
M-486; 0.8 C, 4.75 Cr, 0.6 Mo, 1.6 V, 18.5 W, 5.7 Co, bal Fe.
For turning and boring tools, milling cutters, hobs, high speed steel.

TRIUMPH SUPERB DOUBLE 1000.
M-261; 0.80 C, 4.75 Cr, 1.6 V, 20.5 W, 10.5 Co, bal Fe
Hardened: 64-67 Rock C.
For milling cutters, end mills, form tools, gear cutters, hobs, boring and turning tools.
High speed steel. High red-hardness.

TRIUMPH SUPERB DOUBLE 1000.
M-486; 0.82 C, 4.75 Cr, 0.6 Mo, 1.6 V, 20 W, 10.5 Co, bal Fe
For tools, cutters, hobs, high speed steel

TRIUMPH SUPERB EXTRA
M-261, 0.78 C, 4.25 Cr, 1.4 V, 22 W, bal Fe
Hardened: 64-68 Rock C.
For form cutters, hacksaws, slotting cutters, tools for chilled roll turning
High speed steel. High wear resistance, and good red-hardness.

TRIUMPH SUPERB EXTRA.
M-486; 0.78 C, 4.25 Cr, 0.6 Mo, 1.4 V, 22 W, bal Fe.
For form cutters, tools for chilled roll turning; high speed steel.

TRIUNFADOR
M-616; 2.25 C, 13 Cr, bal Fe.
For tools, dies; non-deforming.

TRIUNFADOR Z.
M-616; 1.5 C, 11.5 Cr, 0.75 Mo, bal Fe.
For tools, dies; non-deforming.

TRI-VAN.
M-111, M-111a; 2.25 C, 12 Cr, bal Fe.
Hardened: 64-66 Rock C.
For blanking and drawing dies, punches, shears, slitters, lamination and coining dies, gauges.
Oil hardening, abrasion resistant. Type D4 die steel.

TRIVAN.
M-350; C, Cr, V, bal Fe.
For blanking and coining dies; oil hardened.

TROJAN.
M-435; 0.8 C, 18 W, 4 Cr, 2 V, 0.5 Mo, bal Fe.
For tools, dies, hobs, cutters; high speed steel.

TROJAN BABBITT.
M-428, M-88; Sb, Sn, Pb.
At 70°F: 27.4 Brin.
At 212°F: 11.2 Brin.
For bearings for steam and internal combustion engines; Babbitt, antifriction.

TROMALIT.
M-1120; 11 Co, 24 Ni, 11 Al, 3.5 Cu, bal Fe.
For electrical and magnetic equipment.
Permanent magnet; high permeability.

TROMALIT-III.
M-1120; 12 Ni, 10 Al, 4-20 Co, 2 Cu, bal Fe. (Bakelite bonded).
3500 Br, 680 Hc, 0.8 BH max.
For magnets in speedometers and small battery motors.
Permanent magnet, high permeability.

TROMALIT-IV
M-1120; 12 Ni, 10 Al, 4-20 Co, 2 Cu, bal Fe. (Bakelite bonded).
3500 Br, 1000 Hc, 1 BH max.
For magnets in speedometers and in small battery motors.
Permanent magnet, high permeability.

TROMALIT-AlNi
M-1120, 27 Ni, 13 Al, bal Fe.
For permanent magnets in electrical and magnetic equipment
High magnetic permeability

TROMALIT-AlNi090.
M-1120, 22 Ni, 12 Al, bal Fe.
For permanent magnets in electrical and magnetic equipment.
High magnetic permeability.

TROMALIT-AlNiCo160.
M-1120; 24 Ni, 11 Al, 9.5 Co, 3.5 Cu, bal Fe.
For permanent magnets in electrical and magnetic equipment
High magnetic permeability.

TRONAMANG.
M-1550, 100 Mn.
For an addition agent in the melting of steel and non-ferrous alloys.
Electrolytic manganese.

"TROPIC" HOT DIE STEEL.
M-233; 0.35 C, 0.3 Si, 0.4 Mn, 9.5 W, 3.00 Cr, 0.5 V, bal Fe.
For hot dies; hot work steel.

TROY.
M-1705; 1.25 C, 0.3 Mn, 0.35 Si, 0.4 Cr, 0.2 V, 1.4 W, bal Fe.
Oil hardening tool steel. AISI 07.

T.R.S.
M-750; C, Cr, Mo, W, bal Fe.
Rolled: 134,000 TS; 16 El, 37 RA; 269-550 Brin.
For tools, fixtures; general purpose tools, shock resistant.

TRS SPECIALTY.
M-750; low C, Cr, Mo, W, bal Fe.
Heat treated: 140,000 TS; 260-300 Brin.
For tools, dies, machine parts, gears, cams, pump shafts, clutches; tough, wear and fatigue resistant.

TRUALOY ALUMINUM.
M-925; 5 Si, bal Al.
Cast: 22,000 TS; 2 El; 60 Brin.
For light alloy castings; die or sand castings.

TRUALOY ALUMINUM BRONZE.
M-925; 9 Cu, bal Al.
Cast: 65,000 TS; 25,000 YS; 20 El; 115 Brin.
For sand castings.

TRUALOY BEARING BRONZE.
M-925; Sn, Pb, bal Cu.
Cast: 25,000 TS; 12,000 YS; 8 El; 60-80 Brin.
For bearings; high compressive strength.

TRUALOY COPPER.
M-925; Cu.
For current conductors; high conductivity 90%.

TRU-CAST.
M-221; Be, bal Cu.
Cast: 125,000 TS; 110,000 YS; 200 Brin.
Hardened: 180,000 TS; 140,000 YS; 460 Brin.
For stamping and casting dies, molds; hardenable.

TRU-COR.
M-339; 0.9-1.05 C, 0.3-0.5 Mn, 0.15-0.30 Si, bal Fe.
For machine tool parts, drills, boring tools; Type W1; water hardened.

TRU-COR DRILL ROD.
M-1703; 0.95-1.05 C, 0.3-0.5 Mn, bal Fe.
Water hardening drill rod; AISI W1.

TRU-DIE.
M-750; C, alloy, bal Fe.
For dies; non-shrinking.

TRUEWEAR.
M-69; 2.45 C, 12.25 Cr, 4.25 V, 1.1 Mo, bal Fe.
For dies, punches, pins, tools and forming rolls.
Extreme wear resistance.
AISI D7 cold work tool steel.

TRUFLEX A-1.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 300°F.

TRUFLEX A-2.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 300°F.

TRUFLEX B-1.
M-926; Alloy of 22 Ni, 3 Cr, 75 Fe bonded to alloy of 36 Ni, 64 Fe.
For thermostaic bimetal.
Differential expansion.
Max. operating temperature 1200°F

TRUFLEX B-2.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1200°F.

TRUFLEX B3.
M-926; Ni-Cr-Fe.
For thermostats (0 to 650°F); bimetal max 1000°F.

TRUFLEX B12½.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1100°F.

TRUFLEX B-15.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1100°F.

TRUFLEX B-20.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1100°F.

TRUFLEX B-25.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1100°F.

TRUFLEX B-30.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1100°F.

TRUFLEX B-35.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1100°F.

TRUFLEX B-40.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1100°F.

TRUFLEX B-47.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1100°F.

TRUFLEX D.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1200°F.

TRUFLEX E-1.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1200°F.

TRUFLEX E-2.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1200°F.

TRUFLEX E3.
M-926; Ni-Cr-Fe.
For thermostats (0 to 650°F); bimetal max 1000°F.

TRUFLEX E4.
M-926; Ni-Cr-Fe.
For thermostats (0 to 750°F); bimetal max 1000°F.

TRUFLEX E5
M-926; Ni-Cr-Fe.
For thermostats (0 to 750°F); bimetal max 1000°F.

TRUFLEX F
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1200°F.

TRUFLEX G-1.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1200°F.

TRUFLEX G-2.
M-926; Ni-Cr-Fe
For thermostatic bimetal; max temperature 1200°F.

TRUFLEX H.
M-926, Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1200°F.

TRUFLEX J.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 500°F.

TRUFLEX J1.
M-926, Ni-Cr-Fe.
For thermostats (−50 to 400°F); bimetal max 625°F.

TRUFLEX J7.
M-926; Ni-Cr-Fe
For thermostats; corrosion resistant, bimetal.

TRUFLEX K
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1200°F.

TRUFLEX L.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 800°F.

TRUFLEX L1.
M-926; Ni-Cr-Fe.
For thermostats (−50 to 400°F); bimetal max 1000°F.

TRUFLEX M.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1200°F.

TRUFLEX N.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1000°F.

TRUFLEX NI.
M-926; Nickel bonded to Invar (36 Ni, bal Fe).
For thermostats.
Differential expansion bimetal. Low electrical resistance.

TRUFLEX O.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 400°F.

TRUFLEX P675R.
M-926; Ni-Cr-Fe.
For thermostats, thermal cutouts and circuit breakers; bimetal, high elec. resist.

TRUFLEX P850R.
M-926; Ni-Cr-Fe.
For thermal cutouts and circuit breakers; bimetal, high elec. resist.

TRUFLEX Q.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 1000°F.

TRUFLEX R.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 700°F.

TRUFLEX T.
M-926; Ni-Cr-Fe.
For thermostatic bimetal; max temperature 800°F.

TRUFORM.
M-69; 0.90 C, 1.2 Mn, 0.50 W, 0.50 Cr, bal Fe.
For dies, gages, tools, taps, reamers, screw dies; non-deforming tool steel. AISI 01.

TRUFORM SPECIAL
M-261, C, alloy, bal Fe.
For tools, dies; non-deforming

TRUFORM SPECIAL.
M-389; 0.9 C, 1.2 Mn, bal Fe.
For tools, dies, non-deforming.

TRU-GROUND.
M-69, C, alloy, bal Fe
For punches, dies, crimpers, tools; tempered and ground flat stock.

TRU-HEADERDIE.
M-69, 1.4 C, 3.5 V, bal Fe.
For header and forming dies; cold work steel

TRUMPET BRASS
M-1426, 83 Cu, 1.5 Sn, bal Zn
Soft: 47,000 TS;
Spring 92,000 TS, 190 Brin
For hardware, plumbing; corrosion resistant.

TRUMPET BRASS-435
M-8, 81 Cu, 18 Zn, 1 Sn
Soft: 48,000 TS; 60 El
Hard 80,000 TS; 10 El.
For Bourdon gauge tubes

TRU-WEAR FM.
M-69; 2.2 C, 12.5 Cr, 4 V, 1.1 Mo, bal Fe.
For header and forming dies; cold work steel.

TRW-1900.
M-513; 10 Co, 0.11 C, 9 W, 1.5 Cb, 0.03 B, 0.1 Zr, 10.3 Cr, bal Ni.
For jet engine and gas turbine components, space vehicles.
High heat and oxidation resistance.

T.S.B.
Russ; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutting tools, reamers; high speed steel.

TSR BRAKE DIE.
M-1684; 0.50 C, 1.0 Mn, 1.2 Cr, 0.25 V, 0.3 Mo, bal Fe.
Oil hardening, low alloy tool steel.

T.S.S. 3 ALLOY.
M-916; 2.5 Mg, 0.3 Ti, 0.7 Si, bal Al.
Heat treated: 33,000 TS; 20,600 YS; 4 El; 5 RA; 75-90 Brin.
For furniture, interior light fixtures, wire, castings; resists sea water corrosion.

T.S.S. 5 ALLOY.
M-196; 5 Mg, 0.3 Ti, bal Al.
Sand cast: 27,000-33,000 TS; 14,000 YS; 5.5-12 El; 3-15 RA; 65 Brin.
For furnature, interior light fixtures, wire, castings; resists sea water corrosion.

T.S.S. 8 ALLOY.
M-196; 7.5 Mg, 0.3 Ti, bal Al.
Heat treated: 30,000-37,000 TS; 20,000 YS; 4.5-8 El; 2-20 RA; 80 Brin.
For furniture, interior light fixtures, wire, castings; resists sea water corrosion.

TT7K12.
M-Russia; 4 TiC, 3 TaC, 81 WC, 12 Co.
For hard cutting tools, wear plates.
Sintered carbide, abrasion resistant.

TT7K15.
M-Russia; 78 WC, 4 TiC, 3 TaC, 15 Co.
For hard cutting tools, wear plates.
Sintered carbide, abrasion resistant.

T.T.Q. HIGH SPEED.
M-69; 0.73 C, 22 W, 5 Cr, 11 Co, 1.6 V, bal Fe.
For lathe and planer tools, reamers, hobs, broaches, taps; high speed steel, oil hardened.

TUBE BORIUM.
M-202; 60 WC, 40 steel.
For welding electrodes, hard facing rod; abrasion resistant.

TUBELOY.
M-314; 0.02 Ca, 0.02 Mg, 0.02 Sn, bal Pb.
Extruded: 40,000 TS; 15 El; 8 Brin.
For water service pipe; corrosion resistant.

TUBE MANDREL.
M-365; 1.15-1.35 C, 0.35 Cr, bal Fe.
For tools, mandrels, cutters; tough.

TUC-TUR-1.
Eng; 63 Cu, 15 Ni, 22 Zn.
For machine parts, hardware; close grained.

TUC-TUR-2.
Eng., 61-59 Cu, 13-18 Sn, 21-29 Zn, 0.3 Fe.
For fittings, machine parts.

TUCUNSIL.
M-1493, M-856; 10 Ti, Ag, bal Cu.
For brazing titanium and stainless steel components.

TUFALOY.
M-875; 3.3 C, 2.1 Si, bal Fe.
For rolls; cast iron.

TUFALOY.
M-164, 0.25-0.35 C, 1.25-1.35 Mn, bal Fe.
Normalized: 95,000 TS; 60,000 YS; 25 El; 55 RA; 180 Brin.
Heat treated: 160,000 TS; 110,000 YS; 12 El; 25 RA; 350 Brin.
For gears, shafts, high pressure castings; shock and wear resistant.

TUFANHARD 250.
M-1000; C, Cr, Mo, bal Fe.
250 Brin.
For hard facing electrodes; shielded arc, coated, high impact.

TUFANHARD 400.
M-1000; C, Cr, Mo, bal Fe.
400 Brin.
For hard facing electrodes, surface hardening; shielded arc, coated, for moderate abrasion and high impact.

TUFANHARD 600.
M-1000; C, Cr, Mo, bal Fe.
Welded: 600 Brin
For welding electrodes; hard surfacing; coated for high abrasion and moderate impact

TUFCUT.
M-750; C, alloy, bal Fe.
For tools; water hardened.

TUF-CUT.
M-1215; C, Mo, bal Fe. For tools; water hardened

TUFFALOY
M-790; 0.8 C, 0.2 V, bal Fe
For tools, dies, fixtures; water hardened

TUFFALOY 1W.
M-663, Cu-W.
For facing and inserts for flash and butt welding dies; Class 10 alloy

TUFFALOY 1W3.
M-1092; Cu alloy.
Rolled: 135,000 TS; 130 Brin.
For resistance welding electrode; 35% conductivity, for stainless steel and brass.

TUFFALOY 10W.
M-663; Cu-W
For facing and inserts for flash and butt welding dies; Class 11 alloy for stainless steel spot welds

TUFFALOY 10W3.
M-1092; 23 Cu-77W
Bars· 160,000 TS, 205 Brin.
For resistance welding electrode, 28% conductivity, for inserts and facings.

TUFFALOY 20W.
M-663; Cu-W.
For heavy duty projection welding electrodes, Class 12 alloy.

TUFFALOY 20W3.
M-1092; Cu-W.
Bars. 170,000 TS; 228 Brin.
For resistance welding electrode; for heavy projection welding.

TUFFALOY 44
M-1092; Cu alloy.
Cast 90,000 TS, 60,000 YS; 1 El; 330 Brin.
Rolled. 140,000 TS, 85,000 YS, 2 El; 330 Brin.
For resistance welding electrode; for flash, butt and projection welds.

TUFFALOY 53.
M-663; Cu-W.
Cast: 100,000 TS; 20 El.
For resistance welding electrodes, RWMA 3, heat treatable.

TUFFALOY 55.
M-663; Cu alloy.
Rolled: 100,000 TS; 50,000 YS; 10 El; 185 Brin.
For resistance welding electrodes, current carrying shafts; heat treatable.

TUFFALOY 55
M-1092; 0.4 Be, 2.6 Co, bal Cu.
Cast: 90,000 TS; 55,000 YS; 10-15 El.
Rolled: 125,000 TS; 65,000 YS; 8-15 El.
For springs, bellows, diaphragms; age-hardenable, corrosion resistant.

TUFFALOY 55S.
M-663; Cu alloy.
For resistance welding electrodes, current carrying shafts, heat treatable.

TUFFALOY 66
M-1092; Cu alloy
Cast: 65,000-75,000 TS, 12,000-16,000 YS; 10-2 El, 116-165 Brin
For resistance welding electrode; for high strength backing material

TUFFALOY 77.
M-1092; Cu alloy.
Rolled: 55,000-65,000 TS, 25,000-35,000 YS; 15 El.
Cast. 45,000 TS; 20,000 YS; 12 El.
For resistance welding electrode; 75% conductivity, for steel and brass.

TUFFALOY 88
M-1092; Cu alloy
Bars 50,000-60,000 TS; 15,000-20,000 YS, 25-20 El; 100-116 Brin
For resistance welding electrode, for coated metals, terneplate, galvanized stock

TUFFALOY 100W.
M-1092; Cu-W
Bars: 200,000 TS; Rockwell A76.
For resistance welding electrode for nonferrous metals; 30% conductivity, for Red Brass and copper.

TUFF-CAST
M-1029, 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutting tools, hobs, drills, high speed steel.

TUFKUT
M-1067; 0.5 C, 0.7 Mn, 1.5 Si, 0.35 Mo, bal Fe.
For tools, chisels; tough, shock resistant.

TUF-STUFF 224-C.
M-266, 87.5 Cu, 9.75 Al, 2.75 Fe.
Forged 60,000-107,000 TS, 35,000-82,000 YS, 35-15 El, 140-225 Brin
Annealed. 75,000-90,000 TS, 40,000-52,000 YS; 25-15 El, 30 RA, 150 Brin.
For pickling equipment, piston rods, valve stems, gears, pumps, nuts, impellers, screws, valve seats in oil refineries, corrosion and wear resistant.

TUF-STUF 224E-30 see MUELLER 6162

TUF-STUF 224E-75 see MUELLER 6180

TUF-STUF 224H
M-266, 86-87 Cu, 10.5-11.5 Al, 2-3 Fe
Forged 80,000 TS, 45,000 YS, 10 El, 170 Brin
Heat treated· 90,000 TS; 70,000 YS, 3 El; 200 Brin.
For cams, rollers, gears, bearings, trolley shoes, shifter forks
Aluminum bronze Heat treatable. Wear and corrosion resistant

TUF-STUF 224K
M 266; 78.0-82.0 Cu, 2.0-3.5 Fe, 4.5-5.5 Ni, 1.5 max Mn, 9.7-10.9 Al
Forged· 90,000 TS; 50,000 YS; 20 El, 35 RA; 180-200 Brinell.
Heat treated· 105,000 TS, 65,000 YS; 15 El; 20 RA; 200-240 Brinell.
For valves, gears, worms, shafts, molds.
High strength, non-galling, wear resistant aluminum bronze Heat treatable.

TUFTEST
M-1441; 3 C, Si, Mn, bal Fe.
For grinding discs; cast iron, abrasion resistant.

TUF-TIMBER.
M-32; 0.6-1.1 C, bal Fe.
For general forgings; water hardening.

TUFWEAR NO. 2.
M-927; C, Ni, Mn, bal Fe.
For sleeves, steel castings; for oil well drilling machines.

TUFWEAR NO. 3.
M-927; C, Ni, Cr, Mo, bal Fe.
For jaw clutches; for oil well drilling machines.

TUFWEAR NO. 4.
M-927; C, Ni, Mo, bal Fe.
For oil well equipment; tough.

TULA.
Ag with a small amount of Cu and Pb.
For jewelry, silverware, corrosion resistant.

TULIPE 10.
M-1494; C, Mn, Si, bal Fe.
Heat treated: 50,000-92,000 TS; 30,000 YS; 20 El.
For punchings, bolts, rivets; water hardened, Afnor XC109.

TULIPE 12
M-1494; C, Mn, Si, bal Fe.
Heat treated· 99,000-171,000 TS; 53,000 YS; 6 El.
For bolts, fasteners, forgings, water hardened, Afnor XC12G.

TULIPE 18.
M-1494; C, Mn, Si, bal Fe.
Heat treated. 78,000-107,000 TS; 54,000 YS; 16 El.
For bolts, fasteners, forgings; water hardened, Afnor XC18G.

TULIPE 18S.
M-1494; C, Mn, Si, bal Fe.
Heat treated: 74,000-103,000 TS; 50,000 YS; 16 El
For bolts, fasteners, forgings; water hardened, Afnor XC18S.

TULIPE 32
M-1494; C, Mn, Si, bal Fe
Heat treated· 107,000-128,000 TS; 82,000 YS; 12 El.
For shunts, connecting rods, spindles, water hardened, Afnor XC32G.

TULIPE 35
M-1494, C, Mn, Si, bal Fe
Heat treated· 107,000-135,000 TS; 85,000 YS; 11 El
For connecting rods, spindles; water hardened, Afnor XC35G.

TULIPE 38.
M-1494, C, Mn, Si, bal Fe.
Heat treated· 114,000-144,000 TS; 89,000 YS; 112 El
For machinery parts, gears, bolts, shafts; water hardened, Afnor XC38G.

TULIPE 42.
M-1494; C, Mn, bal Fe
Heat treated: 128,000-157,000 TS; 101,000 YS, 9 El.
For bolts, fasteners; water hardened, Afnor XC42G.

TULIPE 48.
M-1494; C, Mn, Si, bal Fe.
Heat treated: 150,000 TS; 96,000 YS; 9 El
For agriculture and machine tool parts; water hardened, Afnor XC48G.

TULIPE 55.
M-1494; C, Mn, Si, bal Fe.
Heat treated: 135,000-164,000 TS; 98,000 YS; 6 El.
For agriculture and machine tool parts; water hardened, Afnor XC55G.

TULIPE 65.
M-1494; 0.60-0.80 C, 0.65-0.90 Mn, 0.40 max Si, bal Fe.
Heat treated: 125,000 TS; 65,000 YS.
For agricultural equipment; water hardened, Afnor XC65G

TULIPE 70.
M-1494; 0.67-0.75 C, 0.60-0.85 Mn, 0.40 max Si, bal Fe.
Heat treated: 128,000 TS; 70,000 YS.
For agricultural equipment; water hardened, Afnor XC70G.

TULIPE 80.
M-1494; 0.75-0.85 C, 0.50-0.75 Mn, 0.40 max Si, bal Fe.
Heat treated: 142,000 TS; 72,000 YS.
For tool equipment; water hardened, Afnor XC80G.

TUNCO see SIMONDS TUNCO.

TUNCRO.
M-353; 0.50 C, 1.4 Cr, 0.25 V, 2 W, bal Fe.
For chisels, punches, pneumatic tools, hot work dies; hot work steel.

TUNG-ALLOY.
M-507; 0.1 C, 35 W, 16 Mo, 8 Co, 0.05 B, bal Fe.
Welded. 225,000 TS; 675 Brin.
For hard surfacing electrodes; high wear resistant; resists heat and abrasion.

TUNGALOY.
M-336; 1.2 C, 0.6 Cr, 0.3 Mo, bal Fe.
For blanking and forming dies; oil or water hardened.

TUNGAY.
Eng.; Zn, Si, Al, Ni, bal Cu.
For corrosion resistant parts; alloyed by special process

TUNGROD.
M-9; WC.
For hard facing electrodes; WC encased in a steel tube.

TUNGSIL
M-237; 27-75 Ag, bal W.
For electrical contacts for circuit breakers; sintered.

TUNGSIT.
M-1046, W_2C + WC.
For hard facing and rebuilding bits; wear resist.

TUNGSITE
M-1432, 0.33 C, 0.94 Cr, 0.48 Mo, 0.5 W, bal Fe.
Heat treated. 164,000 TS; 136,500 YS; 14 El, 43 RA; 275 Brin.
For punches, chisels, gauges, shear blades, gears; oil hardened, tough.

TUNGSTEEL.
M-1684; 0.35 C, 0.65 Mn, 0.35 Si, 0.75 Cr, 0.45 W, 0.40 Mo, bal Fe.
Oil or water hardening steel for shock resisting applications, as riveting hammers.

TUNGSTEN ALLOY 5H.
M-987; Sintered carbide tool material.
For cutting cast iron when cratering is a factor.

TUNGSTEN ALLOY 5S
M-987; Sintered carbide tool material.
For fine finishing and precision boring of carbon and alloy steel.

TUNGSTEN 6%.
M-1076; 6 W, 0.75 C, bal Fe.
For permanent magnets; Br-10300; Hc-65.

TUNGSTEN ALLOY 8H.
M-987; Sintered carbide tool material.
High speed planing cast iron where cratering is a factor; also for heat and wear resistant parts as gages.

TUNGSTEN ALLOY 8T.
M-987; Sintered carbide tool material.
For finishing cuts on steel

TUNGSTEN ALLOY 9.
M-987; Sintered carbide tool material.
For rough cutting cast iron, non-ferrous metals and non-metallics; wear resistant applications, light shock.

TUNGSTEN ALLOY 9A.
M-987; Sintered carbide tool materials.
For wear resistant applications including heavy shock.

TUNGSTEN ALLOY 9A15.
M-987; Sintered carbide tool material.
For wear resistant applications, including heavy shock.

TUNGSTEN ALLOY 9A20.
M-987; Sintered carbide tool material.
To withstand heavy impact.

TUNGSTEN ALLOY 9A25.
M-987; Sintered carbide tool material.
To withstand heavy impact

TUNGSTEN ALLOY 9A30
M-987; Sintered carbide tool material.
To withstand heavy impact.

TUNGSTEN ALLOY 9B.
M-987; Sintered carbide material.
Cutting tools for fine finishing and precision boring of cast iron, non-ferrous metals and non-metallics

TUNGSTEN ALLOY 9C
M-987; Sintered carbide tool material.
Cutting tools for light finishing cast iron, non-ferrous metals and non-metallics.

TUNGSTEN ALLOY 9H.
M-987, Sintered carbide tool material.
Cutting tools for general purpose machining of cast iron, non-ferrous metals and non-metallics

TUNGSTEN ALLOY 9K.
M-987, Sintered carbide tool material.
Cutting tools for general purpose machining of steel on non-rigid machines

TUNGSTEN ALLOY 9M
M-987, Sintered carbide tool material.
For wear resistant applications subject to only light shock.

TUNGSTEN ALLOY 9S
M-987; Sintered carbide tool material.
For general purpose and heavy duty machining of carbon and alloy steels.

TUNGSTEN ALLOY 9T.
M-987; Sintered carbide tool material.
Cutting tools for semi-finish cuts on carbon and alloy steels.

TUNGSTEN ALLOY 10T.
M-987, Sintered carbide tool material
Cutting tools for general purpose machining of carbon and alloy steels.

TUNGSTEN ALLOY 11C
M-987; Sintered carbide tool material.
For light to medium impact applications in mining and rock drilling.

TUNGSTEN ALLOY 11H.
M-987; Sintered carbide tool material.
Cutting tools for planing steel when cratering is a factor.

TUNGSTEN ALLOY 11T.
M-987; Sintered carbide tool material.
Cutting tools for roughing operations on carbon and alloy steels.

TUNGSTEN ALLOY 12C.
M-987; Sintered carbide tool material.
Tools for mining and rock drilling applications.

TUNGSTEN ALLOY 12H.
M-987; Sintered carbide tool material.
Cutting tools where cratering and shock are factors as in shaping and planing.

TUNGSTEN ALLOY 13H.
M-987; Sintered carbide tool material.
Cutting tools for special applications, as: machining uranium, removal of hot flashwelds, extremely heavy roughing where cratering is a factor.

TUNGSTEN ALLOY 15C.
M-987; Sintered carbide tool material.
For percussion applications subject to medium to heavy impact

TUNGSTEN ALLOY 16G.
M-987, Sintered carbide tool material
Cutting tools for special applications, as: machining hot flash from steel welds.

TUNGSTEN ALLOY 20H
M-987, Sintered carbide tool materials.
For parts and tools subject to heavy impact, galling conditions.

TUNGSTEN #21
M-1422, C, W, alloy, bal Fe.
Hardenable in oil or water to 54-56 Rock C.
Used for arbors, axles, boring bars, mandrels.

TUNGSTEN ALLOY 25H.
M-987; Sintered carbide tool material.
For parts and tools subject to very heavy impact, non-galling conditions.

TUNGSTEN ALLOY 30H.
M-987; Sintered carbide tool material.
For parts and tools subject to extra heavy impact, non-galling conditions

TUNGSTEN BRASS.
England; 60 Cu, 2-4 W, 1-14 Ni, 0-3 Al, 0-0.2 Sn, bal Zn.
For hardware, fittings, corrosion resistant

TUNGSTEN BRONZE.
England, 10 W, bal Cu
For electrical contacts, wear resistant.

TUNGSTEN DIAMOND
M-1405, 1.38 C, 4.5 W, 0.25 Si, 0.75 Cr, 0.35 Mn, bal Fe
For form tools, chasers, reamers, hobs; oil hardened, wear resistant

TUNGSTEN HACK SAW.
M-38; 1.3 C, 1.4 W, bal Fe
For hack saw blades; oil hardening

TUNGSTEN HACKSAW
M-69, 1.15 C, 1.1 W, 0.30 Mn, bal Fe.
For hacksaws, oil or water hardened, tough.

TUNGSTEN HACK SAW.
M-357, 1.2 C, 0.10 V, 1.0 W, bal Fe.
For hack saws; water hardened.

TUNGSTEN HOT WORK.
M-365; 0.43 C, 2.5 Cr, 0.1 V, 9 W, bal Fe.
For hot shearing, hot punches, hot drawing; hot work steel.

TUNGSTEN MAGNET.
M-1; 0.70 C, 0.50 Cr, 5 W, bal Fe
Permanent magnet.

TUNGSTEN MAGNET.
M-115; 0.65-0.76 C, 0.15-0.25 Si, 5.25-5.75 W, bal Fe.
For permanent magnets; Br - 12500; Hc-62.

TUNGSTEN MAGNET.
M-73; 0.7 C, 5.3 W, 0.8 Cr, bal Fe.
For permanent magnets.

TUNGSTEN MAGNET M-5.
M-38; 0.7 C, 5.2 W, bal Fe.
For permanent magnets.

TUNGSTEN MAGNET M-6.
M-38; 0.7 C, 6 W, bal Fe
For permanent magnets.

TUNGSTEN METAL.
M-394; 100% and 97% W.
For special metallurgical applications, obsolete.

TUNGSTEN-RHC
M-1681, M-33, 4 Re, 0.35 Hf, 0.25 C, bal W
At 3500°F: 75,000 min TS.
For components for electrical equipment and die casting machines, furnace heating elements, rocket engines.
High heat and oxidation resistance.

TUNGSTEN SPECIAL.
M-15, 0.34 C, 0.5 Mo, 0.5 W, 1.0 Cr, 0.8 Mn, bal Fe
Heat treated 167,000 TS; 137,000 YS, 13 El, 43 RA; 280 Brin.
For shafts, chuckjaws, chisels, punches, gears; shock resistant, oil or water hardened

TUNGSTEN TAP.
M-38, 1.2 C, 1.25 W, bal Fe.
For taps, oil hardening

TUNGSTEN TAP.
M-387, 0.9 C, 3.5 W, bal Fe
For tools, dies, oil hardened.

TUNGTEC 10112.
M-717,
Tungsten carbide and nickel base alloy powder for hard surfacing

TUNGTIC TC1
M-1667, 5 Mo, bal TiC
Sintered 120,000 Tr S, Rock A 93.5
For tools, bearings, seals
Resists heat and wear

TUNGTIC TC2
M-1667, 10 Mo, bal TiC
Sintered 170,000 Tr S, Rock A 92.5
For tools, bearings, seals
Resists heat and wear

TUNGUM
M-110, 0.99 Al, 82.48 Cu, 0.3 Fe, 0.72 Ni, 14.6 Zn, 0.76 Si
Sand cast 46,600 TS, 23,000 YS, 51 El, 98 Brin
Chill cast: 49,300 TS; 22,000 YS; 67 El, 112 Brin.
Forged hard: 114,700 TS, 104,800 YS, 11 El, 218 Brin.
For compressor parts, pumps, centrifugal driers, chemical apparatus, resists acid corrosion and fatigue

TUNGUM C.
M-110, 75 Cu, 3 Al, 2 Ni, 20 Zn
Cast 78,500 TS.
For castings in marine applications, hardware, shafts
High strength and corrosion resistant.

TUNGWELD C.
M-578; WC alloy.
For hard facing electrode; abrasion resistant.

TUNGWELD F.
M-578; WC alloy.
For hard facing electrode; abrasion resistant.

TUNGWIN.
M-1510; 0.34 C, 0.78 Mn, 0.28 Si, 0.82 Cr, 0.40 Mo, 0.51 W, bal Fe.
Heat treated: 194,000-267,000 TS; 185,000-216,000 YS; 37-51 El; 9-15 RA; 395-498 Brin.
For arbors, dies, gears, shafts, spindles; oil or water hardened, non-tempering.

TURBADIUM BRONZE.
M-179; 48 Cu, 0.5 Sn, 0.1 Pb, 0.2 Al, 1.75 Mn, 2.0 Ni, 46.5 Zn.
Cast. 84,000 TS; 50,000 YS; 18 El; 150 Brin.
For propellers, turbine runners, impellers; non-corrosive, high strength casting alloy; resists erosion

TURBADIUM BRONZE.
M-309; 50.96 Cu, 0.47 Sn, 0.30 Pb, 2.21 Mn, 1.75 Ni, 43 Zn, 1.36 Fe For propellers.

TURBIDE R34.
Eng., TiC, Cr_3C_2, bal Ni.
For gas turbine blades; sintered, oxidation resistant.

TURBIDE R45
TiC, Cr_3C_2, bal Ni
Sintered 670 Brin.
For gas turbine blades, sintered, oxidation resistant

TURBINE ALLOY
M-115; 0.18-0.23 C, 0.75-1.25 W, 12-14 Cr, 0.40 V, 0.75-1.25 Mo, 0.5-1.0 Ni, bal Fe
Rolled 144,000 TS, 122,000 YS; 16 El; 42 RA, 302 Brin.
For turbine buckets and blades, discs, shafts, bolts; corrosion and heat resistant.

TURBINE BLADING-1
82.1 Cu, 14.7 Ni, 2.5 Al, 0.7 Zn, 0.04 Si
For turbine blades; corrosion resistant

TURBINE BLADING-2
78-81 Cu, 21-19 Ni, 0.75 max Fe
For turbine blades, corrosion resistant

TURBINE BRASS
England, 22-32 Zn, 0.25 Pb, 0.4 Fe, bal Cu.
For turbine parts

TURBINE BUSHING
England, 11 Zn, 15 Ni, 2 Sn, 10 Pb, bal Cu
For turbine bearings and bushings, heavy duty

TURBINE METAL.
M-129, 55 Cu, 35 Zn, Al, Mn, 3 Ni, bal Fe
Cast 80,000 TS, 40,000 YS, 20 El, 20 RA, 125 160 Brin.
For turbine runners, corrosion and erosion resisting.

TURBISTON BRONZE.
U.S., 55 Cu, 41 Zn, 2 Ni, 1 Al, 0.84 Fe, 0.16 Mn.
For pistons, highly resistant to sea water, also called a brass

TURBISTONS BRASS
England, 41 Zn, 0.5 Fe, 2 Ni, 1 Al, 0.2 Mn, bal Cu
For hardware, fittings; corrosion resistant, high strength

TURBO
M-2, 77 Cu, 10 Al, 1 Ni
Cast 78,000-98,000 TS, 15-8 El, 140-170 Brin.
Hot pressed 98,000-121,000 TS, 20-10 El; 170-190 Brin
For worm wheels, pumps, spindles, worm shafts; White alloy, resists acid corrosion

TURBO GLYCO.
M-240; Sn, Sb, bal Pb.
For turbine bearings, Babbitt.

TURBO "S"
M-2, 8 Ni, 12 Al, bal Cu.
Cast 86,000-69,000 TS; 8-15 El; 150-130 Brin.
Hot pressed: 100,800-127,700 TS; 15-5 El; 180-220 Brin.
For worm wheels, pumps, spindles, worm shafts; White alloy, resists acid corrosion; resists steam at 550°F

TURBOTHERM 12.
M-27; 0.1 max C, 1 Si, 16 Cr, 15 Ni, 2 Mo, Ta, Nb, bal Fe.
Water quenched: 90,000 TS; 50,000 YS; 39 El; 50 RA.
For jet engine turbochargers; austenitic, heat resistant.

TURBOTHERM 13CO-10.
M-27; 0.40 C, 13 Cr, 13 Ni, 2 Mo, 10 Co, 2.5 W, 3 Cb, bal Fe.
Heat treated: 92,500 TS; 49,800 YS
For gas turbine blades, jet engine parts; heat resistant to 1560°F.

TURBOTHERM 15M.
M-27; 0.15 C, 13 Cr, 1 Mo, bal Fe.
Heat treated: 106,700 TS; 78,300 YS.
For gas turbine blades, jet engine parts, heat resistant to 1076°F.

TURBOTHERM 20CO-20S.
M-27; 0.40 C, 20 Cr, 20 Ni, 4 Mo, 20 Co, 4 W, 4 Cb, bal Fe.
Heat treated: 113,800 TS; 71,200 YS.
For gas turbine blades, jet engine parts; heat resistant to 1560°F.

TURBOTHERM 20CO-45.
M-27; 0.40 C, 20 Cr, 20 Ni, 42 Co, 4 W, 4 Mo, 3 Cb, bal Fe.
Heat treated: 121,000 TS; 64,000 YS.
For gas turbine blades, jet engine parts, heat resistant to 1560°F.

TURBOTHERM 20 M.
M-27; 0.20 C, 12 Cr, 1.2 Mo, bal Fe.
Annealed: 95,000 TS, 40,000 YS; 25 El; 55 RA; B 92 Rock.
Heat treated: 250,000 TS; 210,000 YS; 8 El; 25 RA, C 50 Rock.
For cutlery, surgical instruments, oil refinery and chemical plant equipment.
Corrosion resistant, hardenable

TURBOTHERM 20 MV.
M-27; 0.20 C, 12 Cr, 1 Mo, 0.3 V, bal Fe
Heat treated; 106,700 TS; 78,000 YS.
For engine components; heat resistant to 1076°F

TURBOTHERM 20 MVNb.
M-27; 0.20 C, 12 Cr, 1 Mo, 0.3 V, 0.5 W, bal Fe
Annealed: 80,000 TS; 40,000 YS; 24 El; B 94 Rock
Hardened: 230,000 TS; 195,000 YS; 11 El; C 48 Rock.
For cutlery, hardware, surgical instruments, valves, bearings
Corrosion resistant, hardenable.

TURBOTHERM 20 MVW.
M-27; 0.20 C, 12 Cr, 1 Mo, 0.5 W, 0.3 V, bal Fe.
Heat treated: 106,700 TS, 85,400 YS.
For engine components, heat resistant to 1076°F.

TURBOTHERM 35CO-20.
M-27; 0.14 C, 17 Cr, 35 Ni, 4 W, 4 Mo, 20 Co, 2 Cb.
For gas turbine blades, jet engine parts; heat resistant

TURBOTHERM 1613MV.
M-27; 0.10 C, 16 Cr, 13 Ni, 1.3 Mo, V. N, Cb, bal Fe.
Heat treated: 78,300 TS; 31,300 YS.
For steam boilers, jet engine components; heat resistant to 1470°F.

TURBOTHERM 1613Nb.
M-27; 0.10 C, 16 Cr, 13 Ni, Nb, bal Fe.
Heat treated: 78,300 TS; 31,300 YS.
For steam boilers, jet engine components; heat resistant.

TURBOTHERM 1616M.
M-27; 0.10 C, 16 Cr, 16 Ni, 2 Mo, Cb, bal Fe.
Heat treated: 78,300 TS; 31,300 YS.
For steam boilers, jet engine components; heat resistant to 1470°F.

TURBOTHERM 1810Nb.
M-27; 0.10 C, 18 Cr, 10 Ni, Nb, bal Fe
Annealed. 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
For corrosion and heat resistant parts; stainless, austenitic

TUREX 4.
M-884, 0.3 C, 1.0 Si, 1.3 Cr, 0.2 V, 4.0 W, bal Fe.
For forging dies, hot shears, rivet sets; hot work steel, oil hardened.

TURNING-1.
58.5 Cu, 29 Zn, 12 Ni, 0-5 Pb.
For white metal parts, corrosion resistant.

TURNING-2.
65 Cu, 22 Zn, 12 Ni, 1 Pb
For white metal parts; corrosion resistant.

TUSCA.
M-275, 0.50 C, 0.60 Mn, 1.3 Cr, 0.3 Mo, 0.25 V, bal Fe
For punches, upsetters, riveting machines, plastic dies, jewelry dies, coining and silverware dies; oil hardened, shock resistant.

TUT-A-BRASE.
M-750; C, alloy, bal Fe.
For wear resistant plates; preheat treated, abrasion resistant

TUTANIA, CAST
Eng.; 92 Sn, 4.7 Sb, 2.5 Cu, 0.3 Pb
For bearings, table and kitchenware; anti-friction

TUTANIA, ENGLISH
Eng.; 80 Sn, 16 Sb, 2.7 Cu, 1.3 Zn
For dishes, ornamental pieces, corrosion resistant

TUTANIA, PLATE
Eng.; 91-90 Sn, 8-6 Pb, 0.7-2.7 Cu, 0.3-1.3 Zn
For household ware, platters, dishes; free-cutting

TUTENAG
Commercial Zn
For roofing, alloying

TV2 ALLOY
Russia; Ti alloy.
For high temperature applications, corrosion resistant

TWIN-Mo
M-345; 0.85 C, 4 Cr, 5.5 W, 4.5 Mo, 1.5 V, bal Fe.
For reamers, hobs, drills, taps, broaches; high speed steel; Type M2.

TWIN Mo-Co
M-345; 0.80 C, 4 Cr, 2 V, 6 W, 5 Mo, 8 Co, bal Fe.
For lathe and planer tools, hobs, broaches; Type M36; high speed steel

TWIN Mo-VA 3.
M-345; C, alloy, bal Fe
For cutting tools; oil hardened

TWIN VAN 96
M-140; 0.96 C, 4.25 Cr, 2.1 V, 18.5 W, 0.65 Mo, bal Fe.
High speed steel for cutting tools, tungsten type; AISI T2

TWOSCORE.
M-472; 0.25 max C, 16-20 Cr, 1-3 Ni, bal Fe.
Heat treated: 100,000-168,000 TS; 15-20 El; 250-400 Brin.
For propeller shafts, spindles, rams, seaplane hardware; corrosion and heat resistant.

TWO-TONE H.C.
M-507; C, Cr, Ni, Mo, V, B, bal Fe.
For hard facing electrodes; wear resistant.

TWO-TONE T.H.
M-507, 2 C, 12 Cr, 2 Mo, 8 Ni, 1 B, 4 Ti, bal Fe.
Welded: 60,000 TS; 540 Brin.
For hard facing electrodes; wear resistant.

TWO-TO-ONE.
66.7 Cu, 33.3 Zn.
For drawn or spun brass parts, high ductility

TYCROME
M-240; 0.4 C, 0.9 Mn, 0.9 Cr, 0.2 Mo, bal Fe
Heat treated: 105,000-135,000 TS; 105,000 YS, 16-20 El; 54-61 RA; 269-302 Brin.
For crankshafts, pinions, bolts, studs; formerly "Nikrome."

TYLER
M-1705, 1.10 C, 0.3 Mn, 0.25 Si, 0.6 Cr, bal Fe
Water hardening tool steel, AISI W5.

TYLERITE
M-929, 3.2 C, 2.2 Si, 1.5 Ni, bal Fe
For molding machine parts, match plates; cast iron

TY-LOY
M-929, 0.7 C, 1.2 Cr, bal Fe
For wire screens, abrasion resistant

TYPE 5 NICKEL-COBALT
M-580, Ni-Co
For anodes, electroplating

TYPE 5 STEEL.
M-1061, 0.18-0.23 C, 0.7-0.9 Mn, 1.6-2.0 Ni, 0.2-0.3 Mo, bal Fe
Rolled 88,000 TS, 70,000 YS, 35 El, 65 RA, 174 Brin
For oil well sucker rods, case hardened

TYPE METAL.
U.S., 50 Pb, 28 Sb, 22 Bi
For type casting

TYPE METAL, COMMON
U.S.; 60-56 Pb, 4.5-30 Sb, 10-40 Sn
For type metal

TYPE METAL, ENGLISH
English, 78-55 Pb, 5-30 Sb, 2-35 Sn, 0-1 Cu
For type metal

TYPE METAL, FRENCH
French, 78-55 Pb, 5-30 Sb, 2-35 Sn, 0-1 Cu.
For type metal

TYPE METAL, GERMAN
German, 78-55 Pb, 5-30 Sb, 2-35 Sn, 0-1 Cu
For type metal

TYPE METAL, MONOTYPE
U.S., 76 Pb, 16 Sb, 8 Sn
For type casting.

TYPE METAL, STANDARD.
U.S., 79 Pb, 16 Sb, 5 Sn
For type casting

TYPE METAL, STANDARD.
U.S.; 58 Pb, 15 Sb, 26 Sn, 1 Cu.
For type casting

TYPE METAL, STEREOTYPE.
U.S.; 83.75 Pb, 11.75 Sb, 4 Sn, 0.4 Cu.
For type casting.

TYPEWRITER METAL.
57 Cu, 20 Ni, 20 Zn, 3 Al.
For typewriter parts; corrosion resistant.

TYPLEX.
M-289; 0.4 C, 4 Ni, 1.5 Cr, 0.8 Mo, 0.4 Mn, bal Fe
For hot forging dies, gauges; air or oil hardened, shock resistant.

TYRANN EXTRA
M-1308; 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For upsetters, crimpers, header dies; cold working steel, oil hardened.

TYSELEY ALLOY.
Eng., 3.5 Cu, 8.7 Al, 87 Zn, 0.3 Si.
For castings, ornaments

TZC.
M-114, M-151; 1.25 Ti, 0.3 Zr, 0.15 C, bal Mo.
Stress Relieved. 144,000 TS; 105,000 YS, 22 El, 36 RA
At 2000°F: 93,000 TS
At 2400°F 60,000 TS
For aerospace equipment and components.
High hot strength, heat treatable

TZM
M-114, M-151, 0.5 Ti, 0.08 Zr, 0.015 C, bal Mo.
Recrystallized 80,000 TS; 55,000 YS; 20 El.
At 2000°F 73,000 TS; 150 DPH hard.
At 2400°F: 53,500 TS.
For heat engines, heat exchangers, nuclear reactors, radiation shields, extrusion dies, boring bars.
High strength and hardness at high temperatures, heat and corrosion resistant

U-20
M-249, 13 Cu, 0.25 Mg, 1.5 Mn, 1.0 Ni, bal Al.
Heat treated 40,000-43,000 TS, 0.5 El, 120-130 Brin
For pistons, heat resistant

U B DOUBLE BOLT
M-111; 0.40-0.50 C, bal Fe
Annealed 2 El
For tools, chisels; water hardened

U.C.A. 2-2
M-111, 0.90 C, 1.6 Mn, 1.5 Cr, bal Fe
640 Brin
For blanking and forming dies, pressing dies, oil hardened, non-deforming

UCAR-75
M-280, 75 Mn, 25 Al
Hardener for aluminum alloys
Hardener dissolves in aluminum at 1290°F

UCHATIUS BRONZE
England, 8 Sn, 92 Cu
For bearings, gears, worm wheels; wear resistant

UDDCO-12
M-111, 0.20 C, 12 Cr, 1 Mo, 0.3 V, 0.5 W, bal Fe.
Annealed 90,000 TS, 40,000 YS, 25 El; B 92 Rock.
Hardened. 240,000 TS, 205,000 YS. 9 El, C 50 Rock
For cutlery, valves, bearings, surgical instruments, hardware
Corrosion resistant, hardenable

UDDEHOLM 5.75
M-111, 0.35 C, 23-27 Cr, bal Fe.
Annealed 90,000 TS, 60,000 YS; 20 El; 45 RA; 180 Brin.
For furnace parts, heat treating boxes; Type 446; heat resistant

UDDEHOLM 6.31 26.
M-111; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS, 40,000 YS; 32 El; 68 RA; 170 Brin
For cutlery, valve trim, turbine blades, Type 420; stainless, hardenable.

UDDEHOLM 63.
M-111; 0.08 max C, 17-19 Cr, 9-12 Ni, Cb = 10 × C, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 55-50 El; 175 Brin.
For welded structures, chemical plant equipment; Type 347, corrosion and heat resistant.

UDDEHOLM 121.
M-111; 0.08 max C, 11.5-13 Cr, 0.1-0.3 Al, bal Fe
Annealed: 71,000 TS; 42,600 YS; 22 El; 70 RA; 150 Brin.
Heat treated: 175,000 TS, 145,000 YS; 21 El; 64 RA; 352 Brin.
For oil refinery and chemical plant equipment; Type 405; corrosion resistant.

UDDEHOLMS STAINLESS 16.
M-111; 0.27 C, 13.5 Cr, 1.5 Mo, bal Fe
Annealed. 80,000 TS; 40,000 YS; 24 El; B 94 Rock
Hardened: 240,000 TS; 210,000 YS, 9 El; C 52 Rock.
For cutlery, surgical instruments, hardware, bearings, valves, gears.
Corrosion resistant, hardenable.

UDDEHOLMS STAINLESS 51
M-111; 0.10 C, 14 Cr, 1 Mo, bal Fe.
Annealed: 80,000 TS; 38,000 YS, 25 El; B 93 Rock
For springs, shafts, table flatware, oil refinery equipment.
Corrosion resistant

UDDEHOLMS STAINLESS 851.
M-111; 0.20 C, 11.5 Cr, 1 Mo, 0.3 V, bal Fe.
Annealed· 95,000 TS; 40,000 YS; 25 El; B 92 Rock
Hardened: 240,000 TS; 105,000 YS, 10 El, C 50 Rock.
For valves, bearings, cutlery, gears, surgical instruments, shafts.
Corrosion resistant, hardenable.

UDIMET 41
M-1317, 0.09 C, 19 Cr, 11 Co, 10 Mo, 3 Ti, 1.5 Al, bal Ni
Heat treated: 206,000 TS; 154,000 YS, 14 El; 400 Brin
At 1200°F: 194,000 TS; 145,000 YS; 14 El.
At 1700°F· 58,000 TS; 50,000 YS, 26 El
For jet engine components, afterburner parts, bolting, for severely stressed high temperature applications.

UDIMET 500
M-1317; 0.15 max C, 2.5-3.2 Al, 2.5-3.2 Ti, 3-5 Mo, 15-20 Cr, 13-20 Co, bal Ni
At 70°F: 197,000 TS; 18 El; 22 RA.
At 1000°F: 185,000 TS, 11 El; 16 RA.
At 1800°F: 46,000 TS; 22 El; 41 RA.
For jet engine components, high heat resistance.

UDIMET 520
M-1317, 0.05 C, 19 Cr, 6 Mo, 3 Ti, 2 Al, 12 Co, 1 W, 0.005 B, bal Ni
Heat treated: at 70°F· 190,000 TS, 135,000 YS; 21 El.
At 1200°F· 170,000 TS, 115,000 YS; 17 El.
At 1800°F: 45,000 TS, 40,000 YS, 22 El
For high temperature applications, jet engine parts; high heat resistance

UDIMET 625
M-1317; 0.05 C, 22 Cr, 3 Fe, 9 Mo, 4 Cb, 0.2 Ti, 0.2 Al, bal Ni.
Annealed:
At 70°F: 140,000 TS; 70,000 YS; 55 El.
At 1200°F· 103,000 TS; 37,000 YS; 80 El.
Good oxidation and corrosion resistance; high strength and toughness from cryogenic temperatures to 2000°F.

UDIMET 700.
M-1317; 0.15 max C, 3.7-4.7 Al, 3-4 Ti, 4.5-5.7 Mo, 13-17 Cr, 17-20 Co, B, bal Ni.
Rolled: 204,000 TS; 140,000 YS, 17 El; 20 RA.
Ht.Tr.: at 1200°F: 180,000 TS; 140,000 YS; 16 El.
Ht.Tr.· at 1400°F· 150,000 TS; 125,000 YS; 33 El.
Ht.Tr.: at 1800°F: 50,000 TS; 45,000 YS; 28 El.
For turbine blades, discs, combustion chambers; high creep and oxidation resistance.

UDIMET 710
M-1317; 0.13 C, 18 Cr, 15 Co, 3 Mo, 1.5 W, 5 Ti, 2.5 Al, 0.02 B, 0.08 Zr, bal Ni.
Heat treated (for optimum stress rupture properties):
At 1200°F· 190,000 TS; 130,000 YS; 8 El.
At 1600°F 105,000 TS, 95,000 YS; 32 El
At 1800°F· 60,000 TS; 40,000 YS; 30 El.
Land based gas turbine blades, high temperature application to 1800°F.

UDIMET 718
M-1317, 0.05 C, 18 Cr, 18 Fe, 3 Mo, 5.2 Cb, 1 Ti, 0.06 Al, 0.004 B, bal Ni
Heat treated
At 70°F· 190,000 TS; 165,000 YS; 20 El.
At 1200°F· 170,000 TS; 140,000 YS; 18 El
For components of gas turbines, missile and booster assemblies, heat resistant, weldable, −423°F to +1300°F applications

UDIMET 901
M-1317, 0.07 C, 13 Cr, 36 Fe, 5.8 Mo, 2.8 Ti, 0.3 Al, 0.015 B, bal Ni
Heat treated
At 70°F 180,000 TS; 125,000 YS; 25 El
At 1200°F. 140,000 TS, 110,000 YS; 22 El
At 1400°F· 90,000 TS; 80,000 YS; 22 El.
For turbine discs and parts; for applications in the 1000-1400°F temperature range

UDIMET WASPALOY
M-1317, 0.07 C, 19 Cr, 13 Co, 4 Mo, 3 Ti, 1.3 Al, 0.005 B, 0.05 Zr, bal Ni.
Heat treated
At 70°F. 190,000 TS, 130,000 YS, 25 El
At 1200°F 165,000 TS, 105,000 YS, 34 El
At 1400°F· 125,000 TS, 95,000 YS, 28 El
For gas turbine blading and discs, high temperature applications up to 1500°F where combined tensile and stress rupture properties are required

U D R. see CARPENTER UDR

U-E3-S
French, Cu alloy
100 Brin
For aircraft construction

UGIMAX
M-1120, 14 Ni, 8 Al, 24-35 Co, 3 Cu, bal Fe.
13,500 Br, 700 Hc, 6.4 × 10^6 BH max, C 48 Rock.
For magnets in loudspeakers, micro-phones, measuring instruments
Permanent magnet, high magnetic permeability.

UGINE 2.
M-1120, 1.1 C, bal Fe.
For tools, drills, taps, water hardened

UGINE 2P1CS
M-1120; 0.85 C, bal Fe
For agricultural and edge tools; Type W1, water hardened

UGINE 3-E3
M-1120; 0.95 C, bal Fe.
For tools, dies, punches, drills; water hardened

UGINE 4-E4.
M-1120; 0.75 C, bal Fe.
For tools, springs, punches; water hardening.

UGINE 5-E5.
M-1120; 0.75 C, bal Fe.
For springs, punches; water hardening.

UGINE AGT.
M-1120; 0.1 C, 12.5 Cr, 12.5 Ni, bal Fe.
Annealed. 68,000-74,000 TS, 28,000-43,000 YS; 50-45 El; 150-160 Brin.
Cold drawn: 120,000-128,000 TS; 14 El; 200-210 Brin.
For tableware, decorative trim, valve trim, corrosion resistant, good drawability

UGINE BUL
M-1120, 1.1 C, bal Fe
For chisels, engraving tools, spindles; Type W1, water hardened

UGINE C2.
M-1120, 0.12 C, bal Fe
Annealed: 43,000 TS, 30,000 YS; 28 El.
Heat treated: 60,000 TS, 35,000 YS; 23 El.
For gears, pinions, cams, shafts; SAE 1015, case hardening steel

UGINE C4.
M-1120, 0.25 C, bal Fe
Heat treated 114,000-135,000 TS, 88,000 YS, 18-11 El; 187-255 Brin
For machinery parts, water hardened

UGINE C7
M-1120, 0.80 C, bal Fe
Annealed 85,000 TS, 45,000 YS, 13 El
Heat treated 110,000 TS, 85,000 YS, 10 El.
For springs, tools, fixtures, punches, SAE 1080, water hardened.

UGINE C500
M-1120, 0.5 C, bal Fe
For gears, shafts, housings; water hardened

UGINE C600
M-1120, 0.6 C, bal Fe
For punches, flat springs, shafts, water hardened.

UGINE C700
M-1120, 0.7 C, bal Fe
For punches, flat springs, water hardened

UGINE C800
M-1120, 0.8 C, bal Fe
For tools, dies, punches, Type W1, water hardened

UGINE CH110
M-1120, 1.1 C, 1.1 Cr, bal Fe.
For blanking and drawing dies, tools, water hardened

UGINE CHOC
M-1120, 0.9 C, bal Fe
For punches, dies, cutters, coining dies; Type W1, water hardened

UGINE CU
M-1120, 0.10 C, bal Fe
Annealed. 35,000-42,000 TS; 20,000-30,000 YS, 35-26 El, 112-140 Brin
For gears, pinions, shafts, cams; SAE 1010; case hardening steel.

UGINE D36
M-1120; 0.12 C, bal Fe
Annealed: 40,000 TS, 25,000 YS, 35 El, 110 Brin.
For gears, pinions, shafts; SAE 1010; case hardened.

UGINE D100
M-1120; C, bal Fe
For machinery parts; extra hard.

UGINE DS-TF.
M-1120; 1.3 C, 4.5 W, bal Fe.
For tools, drills, taps, oil hardened.

UGINE E1.
M-1120; 1 C, bal Fe.
For tools, drills, taps; water hardened.

UGINE F1.
M-1120, 0.1 C, 13 Cr, 0.5 max Si, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For tableware, flat springs, pump parts; Type 403 and 410, corrosion resistant

UGINE F1.
M-1120, 0.15 max C, 12-14 Cr, 1.2-2.5 Ni, 0.07 min S, Se, bal Fe.
Annealed 75,000 TS; 40,000 YS; 30 El, 60 RA; 155 Brin
Cold drawn: 100,000 TS; 85,000 YS; 13 El; 50 RA; 205 Brin
For screw machine products, valve trim, pumps; Type 416, free-cutting, stainless

UGINE F15
M-1120, 0.1 C, 16 Cr, bal Fe
Annealed: 71,200-92,500 TS; 35,600-50,000 YS, 25-20 El, 55-50 RA, 140-170 Brin.
For tableware, dairy and domestic equipment, Type 430, corrosion resistant.

UGINE F17.
M-1120, 0.1 C, 17 Cr, bal Fe.
Annealed: 68,000-83,000 TS, 36,000-50,000 YS; 25-20 El, 140-170 Brin
For furnace parts, heat treat boxes; oxidation resistant to 750°C.

UGINE FC
M-1120, 0.08 max C, 15-18 Cr, bal Fe
Normalized: 78,000-92,000 TS; 15-25 El; 160 Brin.
For chemical plant equipment, corrosion resistant

UGINE FJ
M-1120; 0.06 C, 11.5-14.5 Cr, 0.1-0.3 Al, bal Fe.
Annealed: 70,000 TS; 45,000 YS, 30 El, 160 Brin
For annealing boxes, quenching racks, furnace parts, oil refinery equipment
Type 405 stainless steel, heat and corrosion resistant.

UGINE FIA
M-1120, 0.05 max C, 13 Cr, bal Fe.
Normalized 72,000-85,000 TS; 50,000-65,000 YS; 20-30 El, 150 Brin.
For oil refinery equipment, corrosion resistant.

UGINE FIB
M-1120, 0.08 max C, 13 Cr, Al, bal Fe
Normalized 72,000-85,000 TS.
For oil refinery equipment; corrosion resistant.

UGINE FN
M-1120, 0.1 C, 15 Cr, 2 Ni, bal Fe
Cast: 85,000 TS, 50,000 YS, 20 El; 40 RA; 180 Brin
For hydraulic turbine wheels; corrosion resistant.

UGINE FN2
M-1120, 0.2 C, 15-17 Cr, 1.25-2.5 Ni, bal Fe.
Heat treated: 100,000-135,000 TS, 78,000-112,000 YS, 25-15 El; 60-45 RA; 240-280 Brin.
For pump spindles, propeller shafts, aircraft structures; Type 431; stainless, hardenable.

UGINE G1.
M-1120; 0.15 C, 2.8 Ni, 0.8 Cr, bal Fe.
Annealed: 65,000 TS, 35,000 YS; 179 Brin
Heat treated 100,000 TS; 90,000 YS; 10 El; 311 Brin
For gears, pinions, shafts, cams, camshafts; SAE 3415; case hardening steel, tough.

UGINE G1T.
M-1120; 0.1 C, 3.5 Ni, 0.8 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 187 Brin.
Heat treated: 110,000 TS; 90,000 YS; 10 El; 293 Brin.
For gears, pinions, shafts, cams, camshafts; SAE 3312; case hardening steel, tough.

UGINE G2.
M-1120; 0.15 C, 2.8 Ni, 0.8 Cr, bal Fe.
Annealed: 70,000 TS; 38,000 YS; 187 Brin.
Heat treated: 120,000 TS; 100,000 YS; 9 El; 341 Brin.
For gears, pinions, shafts, cams, camshafts; SAE 3415; case hardening steel, tough.

UGINE G4.
M-1120; 0.15 C, 3.25 Ni, 0.8 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 197 Brin.
Heat treated: 135,000 TS, 115,000 YS; 7 El; 363 Brin
For gears, pinions, shafts, cams, camshafts; SAE 3415; case hardening steel, tough

UGINE G5.
M-1120; 0.15 C, 3.25 Ni, 0.8 Cr, bal Fe
Annealed: 80,000 TS; 42,000 YS; 207 Brin
Heat treated: 145,000 TS, 125,000 YS, 7 El; 370 Brin.
For gears, pinions, shafts, cams, camshafts; SAE 3415; case hardening steel, tough

UGINE G5T.
M-1120; 0.1 C, 4 Ni, 0.9 Cr, bal Fe
Annealed: 80,000 TS; 43,000 YS; 207 Brin
Heat treated: 130,000 TS; 100,000 YS, 8 El; 352 Brin.
For gears, pinions, shafts, cams, camshafts; SAE 3312; case hardening steel, tough.

UGINE G11S
M-1120; 0.1-0.2 C, 1.5 Ni, 1.0 Cr, 0.2 Mo, bal Fe.
Heat treated. 135,000-164,000 TS, 115,000 YS, 10 El.
For gears, cams, camshafts, fasteners; case hardened.

UGINE G12S.
M-1120; 0.1-0.2 C, 1 Cr, 1.5 Ni, 0.2 Mo, bal Fe
Heat treated: 170,000-193,000 TS; 135,000 YS, 9 El.
For gears, bolts, camshafts, cams; case hardened.

UGINE G14S.
M-1120; 0.1-0.2 C, 1.5 Ni, 1.0 Cr, 0.2 Mo, bal Fe.
Heat treated: 192,000-222,000 TS; 150,000 YS, 7 El
For gears, cams, camshafts, fasteners; case hardened

UGINE HD20.
M-1120; 0.20 C, 0.50 Cr, 0.55 Ni, Mo, Mn, bal Fe.
Heat treated: 185,000-228,000 TS; 142,000 YS; 7 El.
For gears, cams, camshafts, bolts; case hardened, SAE8620.

UGINE IK
M-1120; 1.0 C, 4 Cr, 1.1 Mo, 0.4 V, bal Fe.
For molds, plugs, gages; air hardening, non-deforming.

UGINE K2C.
M-1120, 0.2 C, 1.3 Ni, 1.0 Cr, 0.1 Mo, bal Fe.
Annealed: 55,000 TS; 30,000 YS; 179 Brin.
Heat treated: 105,000 TS; 88,000 YS; 10 El; 320 Brin.
For gears, pinions, shafts, cams, camshafts; case hardening steel, shock resistant.

UGINE K2D.
M-1120; 0.15 C, 1.3 Ni, 1 Cr, 0.2 Mo, bal Fe.
Annealed: 60,000 TS; 30,000 YS; 187 Brin.
Heat treated: 125,000 TS; 95,000 YS; 9 El; 340 Brin.
For gears, pinions, shafts, cams, camshafts; SAE 4315; case hardening steel, tough.

UGINE K2F.
M-1120; 0.2 C, 1.6 Ni, 1 Cr, 0.25 Mo, bal Fe.
Annealed: 64,000 TS; 35,000 YS; 187 Brin.
Heat treated: 140,000 TS; 120,000 YS; 7 El; 401 Brin
For gears, pinions, shafts, cams, camshafts; SAE 4120; case hardening steel, tough.

UGINE K12.
M-1120; 2.25 C, 13 Cr, bal Fe.
For tools, dies; non-deforming.

UGINE KMD.
M-1120; 0.2 C, 1 Cr, 0.3 Mo, bal Fe.
Normalized: 78,000 TS; 50,000 YS; 12 El; 197 Brin.
Heat treated: 100,000 TS, 70,000 YS; 11 El; 277 Brin.
For welded structures; requires no heat treatment after welding.

UGINE KN.
M-1120; 0.35 C, 2.8 Ni, 0.8 Cr, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 217 Brin.
Heat treated: 185,000 TS; 150,000 YS; 7 El; 375 Brin.
For gears, pinions, crankshafts; SAE 3435; shock resistant, oil hardened.

UGINE KN9
M-1120, C, alloy, bal Fe.
Rolled. 128,000 TS; 100,000 YS; 12 El.
For machinery parts, oil hardened.

UGINE KNA.
M-1120; C, 4.25 Ni, 1.3 Cr, bal Fe.
Annealed 90,000 TS; 50,000 YS, 229 Brin
Heat treated: 175,000 TS; 150,000 YS; 7 El; 444 Brin
For tools, dies, fixtures; air hardened, shock resistant.

UGINE KNAMO.
M-1120, C, 4.25 Ni, 1.3 Cr, 0.3 Mo, bal Fe.
Annealed: 100,000 TS; 241 Brin.
Heat treated: 190,000 TS; 160,000 YS; 5 El; 477 Brin
For tools, dies, fixtures; air hardened, shock resistant.

UGINE KNB
M-1120, 0.35 C, 2.8 Ni, 0.8 Cr, bal Fe.
Annealed: 70,000 TS, 35,000 YS; 201 Brin.
Heat treated: 85,000 TS; 70,000 YS; 235 Brin.
For gears, shafts, pinions; SAE 3435; shock resistant, oil hardened.

UGINE KNE.
M-1120, 0.35 C, 3.5 Ni, 1.0 Cr, bal Fe.
Annealed: 78,000 TS; 40,000 YS; 217 Brin.
Heat treated: 165,000 TS; 142,000 YS; 7 El; 444 Brin.
For gears, pinions, crankshafts; SAE 3435; shock resistant, oil hardened.

UGINE KNH.
M-1120; 0.35 C, 2.8 Ni, 0.8 Cr, bal Fe.
Annealed: 85,000 TS; 229 Brin.
Heat treated. 195,000 TS; 165,000 YS; 6 El; 460 Brin.
For gears, pinions, shafts, SAE 3435, shock resistant, oil hardened.

UGINE KNMO.
M-1120; 0.35 C, 2.8 Ni, 0.8 Cr, 0.25 Mo, bal Fe.
Annealed: 78,000 TS; 40,000 YS; 241 Brin.

Heat treated: 165,000 TS; 150,000 YS; 7 El; 444 Brin.
For gears, pinions, crankshafts; SAE 4335; shock resistant, oil hardened.

UGINE KOR.
M-1120; 2.1 C, 13 Cr, 0.10 V, Mo, bal Fe.
For blanking and forming dies, shear blades; non-deforming, oil hardened.

UGINE KORS.
M-1120; 1.75 C, 13 Cr, 0.9 V, Mo, bal Fe.
For shear blades, blanking and forming dies; non-deforming, cold work steel.

UGINE KS.
M-1120; 0.95 C, 1.5 Cr, bal Fe.
Annealed: 201 Brin.
Heat treated: 600 Brin.
For ball and roller bearings; SAE 52100; water or oil hardening.

UGINE KS2.
M-1120, 0.9 C, 2 Cr, bal Fe.
For cold rolling rolls; high surface hardness.

UGINE KT.
M-1120; 0.4 C, 0.8 Cr, 1.6 W, 0.2 V, bal Fe.
For punches, headers, crimpers, upsetters; hot work steel, oil hardened.

UGINE KTD.
M-1120; 0.5 C, 0.8 Cr, 1.6 W, 0.7 Si, bal Fe.
For hot punches and shear blades, chisels; high shock resistant, oil hardened.

UGINE KTH.
M-1120; 1.0 C, 1 Cr, 1 W, 1 Mn, bal Fe.
For milling cutters, taps, drills, water or oil hardened, wear resistant.

UGINE KVR.
M-1120; 0.5 C, 1 Cr, 0.15 V, bal Fe.
Annealed: 75,000 TS; 38,000 YS, 217 Brin.
Heat treated: 200,000 TS; 185,000 YS; 477 Brin.
For springs, gears, shafts; SAE 6150; oil hardened.

UGINE KW.
M-1120; 1.1 C, 0.8 Cr, W, bal Fe.
For cutting tools, dies, taps, reamers; water hardened, wear resistant.

UGINE M51S
M-1120; 0.08 max C, 17-20 Cr, 9-12 Mn, 1.5-2.5 Ni, Ti, bal Fe.
Annealed: 85,000-100,000 TS; 58,000-72,000 YS; 30-40 El; 170-180 Brin.
For chemical plant equipment; corrosion resistant.

UGINE MA.
M-1120; 0.35 C, 4.5 Ni, 1.5 Cr, 0.5 Mo, bal Fe.
For hot stamping dies; hot work steel, oil hardened.

UGINE MARS
M-1120; 0.4 C, 3.5 Cr, 15 W, 0.1 V, bal Fe.
For extrusion dies, rams, punches; hot work steel, oil hardened.

UGINE MBA
M-1120; 0.35 C, 3 Cr, 3 W, 0.5 V, bal Fe.
For extrusion and stamping dies, punches, molds; hot work steel, resists repeated shock.

UGINE MFC.
M-1120; 0.9 C, 0.4 Cr, bal Fe.
For punches and dies for bolt work; cold work steel.

UGINE Mn 12.
M-1120; 1.0-1.2 C, 12-13.5 Mn, bal Fe.
For wear plates, railroad frogs; wear and abrasion resistant.

UGINE MP14.
M-1120; 0.3 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 200 Brin.
For plastic molding dies; high abrasion resistant, Type 420, stainless.

UGINE MS.
M-1120; 0.8 C, 1.9 Si, 0.7 Mn, bal Fe.
Annealed: 85,000 TS; 45,000 YS; 229 Brin.
Heat treated: 150,000 TS; 125,000 YS; 7 El; 429 Brin.
For springs; water or oil hardened.

UGINE MSS.
M-1120; 0.9 C, 1.3 Si, 0.7 Mn, bal Fe.
Annealed: 84,000 TS; 45,000 YS; 229 Brin.
Heat treated: 160,000 TS; 140,000 YS; 6 El; 450 Brin.
For springs, oil hardened.

UGINE MTC.
M-1120; 0.38 C, 5 Cr, 1.35 Mo, 1.25 W, V, bal Fe.
For dies, molds, anvils, rams; hot work steel.

UGINE N2C.
M-1120; 0.10 C, 2 Ni, bal Fe.
Annealed: 40,000 TS; 25,000 YS; 30 El; 123 Brin.
Heat treated: 75,000 TS; 60,000 YS; 17 El; 155 Brin.
For gears, pinions, cams, camshafts; SAE 2110; case hardening steel, tough.

UGINE N3C.
M-1120; 0.10 C, 3 Ni, bal Fe.
Annealed: 45,000 TS; 35,000 YS; 25 El; 135 Brin.
Heat treated: 110,000 TS; 60,000 YS; 12 El; 187 Brin.
For chain links, gears, pinions, shafts; SAE 2310; case hardening steel, tough.

UGINE N5C.
M-1120; 0.15 C, 5 Ni, bal Fe.
Annealed: 55,000 TS; 38,000 YS; 25 El; 140 Brin.
Heat treated: 140,000 TS; 120,000 YS; 11 El; 375 Brin.
For transmission shafts, gears, pinions, axles; SAE 2515; case hardening steel, tough.

UGINE NC16.
M-1120; 0.1-0.2 C, 1 Cr, 1.4 Ni, bal Fe.
Heat treated: 157,000-188,000 TS, 128,000 YS; 7 El.
For gears, bolts, camshafts, cams, fasteners; case hardened.

UGINE NC20.
M-1120, 0.1-0.2 C, 1 Cr, 1.4 Ni, bal Fe.
Heat treated: 170,000-206,000 TS; 142,000 YS; 6 El.
For gears, bolts, camshafts, cams, fasteners; case hardened.

UGINE NC32.
M-1120; 0.3 C, 1.3 Ni, 1 Cr, 0.15 Mo, bal Fe.
Annealed. 75,000 TS; 40,000 YS; 187 Brin.
Heat treated: 185,000 TS, 150,000 YS; 3 El; 350 Brin
For shafts, gears, crankshafts; SAE 4330; oil hardened.

UGINE NC35.
M-1120; 0.35 C, 1.0 Cr, 1.5 Ni, bal Fe.
Heat treated. 228,000-270,000 TS; 200,000 YS; 5 El.
For gears, axles, crankshafts, bolts; oil hardened, shock resistant.

UGINE NCM3.
M-1120; 0.35 C, 1.0 Cr, 1.5 Ni, 0.25 Mo, bal Fe.
Heat treated: 214,000-290,000 TS; 198,000 YS; 5 El.
For gears, axles, crankshafts, bolts; oil hardened, shock resistant.

UGINE NK8.
M-1120; Ni, Cr.
For electric resistances; heat resistant to 1150°C.

UGINE NS10.
M-1120; 0.08-0.16 C, 12 Cr, 12 Ni, bal Fe.
For valves, pumps; corrosion resistant.

UGINE NS20.
M-1120; 0.1 C, 18 Cr, 10 Ni, bal Fe.
Annealed: 85,000-99,000 TS; 36,000-43,000 YS; 50-45 El; 65-60 RA; 150-170 Brin.
For springs, wire cloth; Type 302, stainless, austenitic.

UGINE NS20C.
M-1120; 0.1 C, 18 Cr, 10.5 Ni, bal Fe.
Annealed: 85,000-100,000 TS; 36,000-43,000 YS; 50-45 El; 150-180 Brin.
For chemical plant equipment; oxidation resistant to 800°C, austenitic.

UGINE NS20CT.
M-1120; 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe.
Normalized: 93,000 TS; 36,000 YS; 45 El; 60 RA; 165 Brin.
Annealed: 87,000 TS; 33,000 YS; 57 El; 73 RA; 155 Brin.
For chemical plant equipment; Type 321; stainless, austenitic.

UGINE NS20E.
M-1120; 0.1 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 92,500-107,000 TS; 45-40 El; 150-170 Brin.
Cold drawn: 142,000-155,000 TS; 30-25 El, 200-220 Brin.
For chemical plant equipment; Type 302, stainless, austenitic.

UGINE NS20P.
M-1120; 0.1 C, 18 Cr, 10 Ni, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-43,000 YS; 45-50 El; 65-60 RA; 150-180 Brin
For polished and decorative parts, Type 302, stainless, austenitic.

UGINE NS20S.
M-1120; 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe.
Normalized· 93,000 TS; 36,000 YS; 45 El; 60 RA; 165 Brin.
Annealed: 87,000 TS; 33,000 YS; 57 El, 73 RA; 155 Brin.
For chemical plant equipment; Type 321; stainless, austenitic.

UGINE NS21.
M-1120; C, Ni, Cr, bal Fe.
For springs, austenitic, stainless.

UGINE NS21A.
M-1120; 0.08 max C, 17-19 Cr, 9-12 Ni, bal Fe.
Annealed: 78,000-92,000 TS; 30,000-42,000 YS; 45-55 El; 140 Brin.
For chemical plant equipment; austenitic, stainless.

UGINE NS21S.
M-1120; 0 12 max C, 17-19 Cr, 9-12 Ni, 0.5 Ti, bal Fe.
Annealed. 85,000-100,000 TS; 35,000-43,000 YS; 45-50 El.
For chemical plant equipment, welded tanks; austenitic, stainless.

UGINE NS22.
M-1120; 0.05 max C, 18 Cr, 10 Ni, bal Fe.
Annealed: 85,000 TS; 36,000 YS; 55 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El; 330 Brin.
For hardware, decorative parts, welding rods; Type 304, stainless, austenitic.

UGINE NS22S.
M-1120; 0.05 max C, 18 Cr, 10 Ni, bal Fe.
Annealed· 85,000 TS; 36,000 YS; 55 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El; 330 Brin
For chemical plant equipment, welded structures; Type 304, stainless, austenitic.

UGINE NS24.
M-1120, 0 15 C, 24 Cr, 13 Ni, bal Fe
Annealed· 92,000-107,000 TS, 50,000-64,000 YS; 40-35 El; 180-200 Brin.
For carburizing and annealing boles; Type 309, heat resistant to 1050°C.

UGINE NS30.
M-1120; 0 15 C, 25 Cr, 20 Ni, 2 max Mn, 1.5 max Si, bal Fe.
Annealed 85,000-100,000 TS; 43,000-57,000 YS; 40-35 El, 150-180 Brin
For furnace parts, heat treat boxes; Type 310, heat resistant to 1150°C

UGINE NS80C
M-1120, 0 1 C, 18 Cr, 10.5 Ni, W, bal Fe.
Annealed 78,000-93,000 TS, 36,000-50,000 YS; 50-45 El, 60 55 RA, 150-180 Brin
For chemical plant equipment; oxidation resistant to 800°C, austenitic

UGINE NS95
M-1120, 0 06 C, 17-19 Cr, 9-13 Ni, 0 6 Cb, bal Fe.
Annealed 85,000 TS, 35,000 YS, 60 El; B 82 Rock
For chemical plant equipment, welded structures, evaporators
Type 347 stainless steel, austenitic, stabilized, welding grade

UGINE NS190
M-1120, 0 10 C, 17 Cr, 13 5 Ni, 3.5 W, bal Fe.
For high temperature applications; heat and corrosion resistant

UGINE NSCD
M-1120, 0 08 C, 17 Cr, 13 Ni, Mo, Cu, bal Fe.
Annealed 92,000-107,000 TS, 36,000-43,000 YS, 40-35 El, 60-55 RA; 160-200 Brin
For chemical plant equipment; stainless, austenitic

UGINE NSF
M-1120, C, Ni, Cr, bal Fe.
Cast
For corrosion resistant castings, stainless.

UGINE NSM
M-1120, 0 1 C, 17 Cr, 11 Ni, 2 Mo, bal Fe.
Cast· 90,000 TS; 45,000 YS, 40 El; 50 RA; 160 Brin
For castings for welded equipment, stainless, austenitic, Type 316

UGINE NSM20.
M-1120, 0.1 C, 18 Cr, 10 Ni, 2 Mo, bal Fe.
Annealed: 85,000-99,000 TS; 36,000-43,000 YS; 50-45 El, 65-60 RA; 160-190 Brin
For springs, chemical plant equipment, Type 316, stainless, austenitic.

UGINE NSM22.
M-1120; 0.06 C, 17 Cr, 11 Ni, Mo, bal Fe
Cold drawn: 78,000-93,000 TS; 36,000-43,000 YS; 50-45 El; 65-60 RA; 150-180 Brin.
For welded structures, chemical plant equipment; Type 316, austenitic, stainless.

UGINE NSM22S.
M-1120; 0.03 C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; B 82 Rock.
For chemical plant equipment, welded tanks, digesters, evaporators, valve trim.
Type 316L stainless steel, austenitic, acid resistant.

UGINE NSMB.
M-1120; 0.12 max C, 19 Cr, 10-12 Ni, 2.5-3.5 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 170 Brin.
For acid resistant chemical plant equipment, tanks; Type 316 and 317; stainless, austenitic

UGINE NSMC.
M-1120; 0.1 C, 17 Cr, 11 Ni, 2 Mo, bal Fe.
Annealed: 85,000-99,000 TS; 36,000-43,000 YS; 50-45 El; 65-60 RA; 160-190 Brin
For chemical plant equipment; Type 316, stainless, austenitic.

UGINE NSMC (Cu, Ti).
M-1120; 0.10 max C, 16-18 Cr, 10-14 Ni, 1.7-2.7 Mo, Cu, Ti, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 60-50 El; 75-60 RA; 150-190 Brin
For acid resistant, chemical plant equipment, Type 316 Ti; stainless, austenitic.

UGINE ORH.
M-1120; 2 C, 12 Cr, 3 Co, 1 Mo, bal Fe
For cutters for hard wood at high speeds; non-deforming, wear and abrasion resistant.

UGINE P
M-1120, 0.15 min C, 12-14 Cr, bal Fe.
Annealed· 88,000 TS; 40,000 YS, 32 El; 68 RA; 170 Brin
Heat treated· 256,000 TS, 190,000 YS, 6 El; 10 RA; 540 Brin
For cutlery, valve trim, turbine blades, springs; Type 420; stainless, hardenable.

UGINE P12
M-1120, 0.3 C, 13 Cr, bal Fe.
Annealed· 92,500-114,000 TS; 50,000-65,000 YS, 180 Brin.
Heat treated· 230,000-250,000 TS, 200,000-230,000 YS, 430 Brin
For shafts, valves, fittings, hydraulic turbines; Type 420, corrosion resistant.

UGINE PCV.
M-1120, 0.5 C, 1 Cr, 0.15 V, 0.8 Mn, bal Fe
For screw drivers, lathe tongs, chuck jaws; tough and wear resistant

UGINE PM
M-1120, 0.1 C, 5 Cr, 0.5 Mo, bal Fe
Annealed 64,000-78,300 TS, 35,000-40,000 YS; 175 Brin.
Heat treated: 92,500-107,000 TS; 78,300-92,500 YS; 14-20 El, 225 Brin
For oil refinery equipment; resists sulphurous attack.

UGINE PM1.
M-1120; 0.15 max C, 4-6 Cr, Mo, bal Fe.
Annealed: 65,000 TS; 140 Brin.
Heat treated· 108,000 TS; 14 El, 225 Brin.
For oil refinery equipment, corrosion resistant.

UGINE PM2.
M-1120; 0.1 C, 5 Cr, 0.5 Mo, bal Fe.
Annealed: 75,000 TS; 38,000 YS; 175 Brin.
Heat treated: 105,000 TS; 92,000 YS; 22 El; 225 Brin.
For oil refinery equipment; resists sulphurous attack.

UGINE PMV.
M-1120; 0.1 C, 5 Cr, 0.5 Mo, 0.2 V, bal Fe.
Annealed: 75,000 TS; 38,000 YS; 175 Brin.
Heat treated: 110,000 TS; 95,000 YS; 20 El; 230 Brin.
For oil refinery equipment; resists sulphurous attack.

UGINE PY.
M-1120; C, Cr, bal Fe.
For wood working tools; water hardened.

UGINE QA2.
M-1120; 0.2 C, 18 Cr, 38 Ni, bal Fe.
Annealed: 71,000-86,000 TS; 36,000-50,000 YS; 30-25 El; 180-200 Brin.
For furnace parts, heat treat boxes; heat resistant to 1150°C.

UGINE QA6.
M-1120; 0.1 C, 20 Cr, 67 Ni, bal Fe.
Annealed: 48,000-65,000 TS; 43,000-57,000 YS.
For heat resistant castings; heat resistant to 1200°C.

UGINE QA8.
M-1120; 20 Cr, 80 Ni.
Annealed: 95,000 TS, 25-35 El; 55 RA; Rockwell B90.
For heat resistant castings, resistors; high heat resistance

UGINE QA18.
M-1120; C, Ni, Cr, bal Fe
For gas turbine components; heat resistant.
For furnace parts, heat treat boxes; oxidation resistant to 1150°C.

UGINE QMS.
M-1120; 0.25 max C, 17 Cr, 2 Ni, bal Fe.
Annealed: 125,000 TS; 90,000 YS; 20 El; 55 RA; 260 Brin
For pumps, marine hardware, valves; Type 431; corrosion resistant.

UGINE R.
M-1120, 0.15 min C, 12-14 Cr, bal Fe.
Annealed. 88,000 TS; 40,000 YS, 32 El; 68 RA; 170 Brin.
Heat treated: 256,000 TS; 190,000 YS; 6 El; 10 RA; 540 Brin
For cutlery, valve trim, springs, turbine blades; Type 420; stainless, hardenable.

UGINE R12.
M-1120, 0.35 C, 14 Cr, bal Fe.
Annealed 95,000 TS, 50,000 YS; 25 El; 55 RA; 195 Brin.
Heat treated. 250,000 TS; 215,000 YS, 8 El; 25 RA; 512 Brin
For cutlery, gages, surgical instruments; Type 420, corrosion resistant.

UGINE R18.
M-1120; 0.35 C, 14 Cr, bal Fe.
Annealed. 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin
Heat treated: 250,000 TS; 215,000 YS; 8 El; 25 RA, 512 Brin.
For cutlery, gages, surgical instruments; Type 420, corrosion resistant.

UGINE RC.
M-1120; 0.3 C, 5 W, 3 Cr, 0.5 V, bal Fe.
For extrusion dies and punches, mandrels; hot work steel, oil hardened

UGINE RD
M-1120; 0.5 C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe.
For hot work dies and tools, hot work steel.

UGINE RDS.
M-1120; 0.25 C, 10 W, 2.5 Cr, 0.5 V, bal Fe.
For extrusion dies, punches, rams; hot work steel, oil hardened.

UGINE ROC.
M-1120; 0.7 C, 18 W, 4.5 Cr, 1 Mo, 1.5 V, 10 Co, bal Fe.
For tools, cutters, hobs, reamers, lathe tools; high speed steel, oil hardened, Type T5.

UGINE ROV.
M-1120; 1.5 C, 4.5 Cr, 13 W, 5 V, 5 Co, bal Fe.
For permanent magnets; high permeability.

UGINE RS.
M-1120; 0.7 C, 18-20 W, 4 Cr, 1 V, bal Fe.
For drills, reamers, saws, shaving and planer tools; high speed steel, oil hardened, Type T1.

UGINE RSA.
M-1120; 0.7 C, 6 W, 4.5 Cr, 1.5 V, 6 Mo, bal Fe.
For turning and slotting tools, milling cutters; Type H42, high speed steel.

UGINE RSE.
M-1120; C, W, Mo, bal Fe.
For drills, taps, reamers; high speed steel, oil hardened.

UGINE RSK.
M-1120; 0.7 C, 4 Cr, 18 W, 0.5 Mo, 2 V, bal Fe.
For drills, taps, reamers, broaches; high speed steel.

UGINE RSO.
M-1120; 0.7 C, 4 Cr, 18 W, 1 Mo, 0.7 V, 6.0 Co, bal Fe.
For cutting tools, lathe and planer tools; high speed steel.

UGINE RSS.
M-1120; 0.7 C, 19 W, 4 Cr, 2.2 V, bal Fe.
For tools, dies, cutters; high speed steel.

UGINE S.
M-1120; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS; 40,000 YS; 32 El, 68 RA; 170 Brin.
Heat treated: 256,000 TS; 190,000 YS; 6 El; 10 RA; 540 Brin.
For cutlery, valve trim, turbine blades; Type 420; stainless, hardenable.

UGINE S12.
M-1120; 0.35 C, 14 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
Heat treated: 250,000 TS; 215,000 YS; 8 El; 25 RA; 512 Brin.
For cutlery, gages, surgical instruments; Type 420, corrosion resistant.

UGINE SPECIAL 400.
M-1120; 0.35 C, 4.5 Ni, 1.5 Cr, bal Fe.
For cold stamping and deep drawing punches and dies; tough and hard.

UGINE SPECIAL 460.
M-1120; 1.0 C, 0.5 Cr, bal Fe.
For drills, spindles for clock industry; drill rod.

UGINE TP.
M-1120; 1.3 C, bal Fe.
For wood working tools; water hardened.

UGINE U12.
M-1120; 0.15 max C, 11.5-13.5 Cr, bal Fe.
Heat treated: 120,000-135,000 TS; 110,000-117,000 YS; 16-15 El; 63-58 RA; 220-240 Brin.
For cutlery, valves, turbine blades; Type 410; corrosion resistant.

UGINE U12.
M-1120; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS; 40,000 YS; 32 El; 68 RA; 170 Brin.
Heat treated: 256,000 TS; 190,000 YS; 6 El; 10 RA; 540 Brin.
For cutlery, valve trim, turbine blades; Type 420; stainless, hardenable.

UGINE UM3.
M-1120; 0.20 C, 1 Cr, 0.25 Mo, bal Fe.
Annealed: 55,000 TS; 40,000 YS; 22 El; 197 Brin.
Heat treated: 145,000 TS; 110,000 YS; 8 El.
For gears, shafts, pinions; SAE 4119; case hardening steel, tough.

UGINE UM6.
M-1120, 0.35 C, 1 Cr, 0.25 Mo, bal Fe.
Annealed: 64,000 TS; 35,000 YS; 197 Brin.
Heat treated: 95,000 TS; 75,000 YS; 12 El; 285 Brin.
For transmission shafts, gears, crankshafts; SAE 4135; oil hardened.

UGINE UM7.
M-1120; 0.35 C, 1 Cr, 0.25 Mo, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 207 Brin.
Heat treated: 190,000 TS; 160,000 YS; 12 El; 375 Brin.
For shafts, axles, gears, pinions, crankshafts; SAE 4135; oil hardened.

UGINE UM8.
M-1120; 0.4 C, 1 Cr, 0.25 Mo, bal Fe.
Annealed: 78,000 TS; 40,000 YS; 217 Brin.
Heat treated: 190,000 TS; 180,000 YS; 5 El; 350 Brin.
For shafts, gears, crankshafts; SAE 4140; oil hardened.

UGINE VR.
M-1120, 0.5 C, 1 Cr, 0.15 V, bal Fe.
Heat treated: 170,000-200,000 TS; 160,000 YS; 7 El, 375 Brin
For springs; oil hardening.

UGINE W.
M-1120, 1.2 C, 1 W, bal Fe.
For milling cutters, drills, reamers, boring blades, water hardened, high surface hardness.

UGINE WF.
M-1120; 0.4 C, 4.3 Ni, 0.6 Cr, 1.2 Mo, bal Fe.
For extrusion tools, wear resistant parts; hot work steel, air hardened.

UGINE XLX.
M-1120, C, Ni, Cr, Cu, bal Fe
For heat resistant castings; austenitic, stainless.

UGINIUM
M-1120; 0.1 C, 12 Cr, 12 Ni, bal Fe.
For tableware, cutlery, valves, valve trim.
Type 12-12 stainless steel. Does not tarnish in air.

U H B
M-111; 0.8 C, 0.2 V, bal Fe.
For dies for cold heading, embossing, trimming and swaging; cold work steel.

UHB-3
M-111, M-111a, 0.15 C, 0.70 Mn, 0.25 Si, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For screws, bolts, bushings, rivets; SAE1015, case hardened.

UHB 3 M 15
M-111; 0.12 C, 1.35 Mn, bal Fe.
For gears, shafts, case hardened.

UHB-3S.
M-111; 0.15 C, 0.25 Si, 0.70 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, cams, camshafts; case hardened.

UHB-7.
M-111, M-111a; 0.35 C, 0.35 Mn, 0.20 Si, bal Fe.
Hot rolled: 85,000 TS; 54,000 YS; 30 El; 53 RA; 185 Brin.
For gears, shafts, axles, bolts, screws; SAE1035, water hardened.

UHB 8 M 10.
M-111; 0.4 C, 1.25 Mn, bal Fe.
For gears, shafts; tough.

UHB-14.
M-111, M-111a; 0.70 C, 0.35 Mn, 0.20 Si, bal Fe.
Heat treated: 174,000-122,000 TS; 128,000-82,000 YS; 12-22 El; 37-52 RA; 352-240 Brin.
For die blocks, girders, rails, clutch discs; SAE1070, water hardened.

UHB 15.
M-111; 0.75 C, bal Fe.
For hollow mine drills; oil hardening.

UHB 16.
M-111; 0.8 C, bal Fe.
For tools, mine drills; water hardening.

UHB 16 VA.
M-111; 0.8 C, 0.1 V, bal Fe.
For chisels.

UHB 19VA.
M-111; 1.0 C, 0.2 Si, 0.25 Mn, 0.1 V, bal Fe.
Heat treated: 120,000-215,000 TS; 85,000-150,000 YS; 20-10 El; 48-33 RA; 240-500 Brin.
For drills, taps, hobs, cutters, reamers; Type W2; water hardened.

UHB-19 VA.
M-111a; 0.92 C, 0.1 V, 0.30 Mn, 0.25 Si, bal Fe.
For cold heading and coining dies; water hardened, cold work steel.

UHB 20.
M-111, 1.05 C, bal Fe.
For tools, water hardening

UHB 20C15.
M-111; 1 C, 1.45 Cr, bal Fe.
For ball bearings; water hardening

UHB 20 VA
M-111; 1.05 C, 0.15 V, bal Fe.
For dies, for cold work.

UHB 21.
M-111; 1.05 C, bal Fe
For solid mine drills, water hardening.

UHB 21C5
M-111; 1.1 C, 0.2 Si, 0.3 Mn, 0.4 Cr, bal Fe.
Heat treated: 125,000-220,000 TS; 90,000-155,000 YS; 18-8 El; 45-30 RA, 245-560 Brin.
For bearings, liners, races, sleeves; water hardened.

UHB 21C10
M-111, 1.05 C, 0.25 Si, 0.3 Mn, 1.0 Cr, bal Fe
Heat treated 225,000 TS; 160,000 YS; 7 El, 28 RA; 575 Brin
For bearings, liners, races, sleeves; water hardened.

UHB-22.
M-111, M-111a; 1.1 C, 0.55 Mn, 0.20 Si, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, cutters, drills, taps, hobs; Type W1; water hardened.

UHB 24.
M-111; 1.2 C, bal Fe.
For tools; water or oil hardening.

UHB 24C5.
M-111; 1.15 C, 0.2 Si, 0.3 Mn, 0.65 Cr, 0.1 V, bal Fe.
Heat treated: 230,000 TS; 165,000 YS; 6 El; 25 RA; 580 Brin.
For cold header dies, punches, drills, cutters; water hardened.

UHB-25C.
M-111, M-111a; 1.25 C, 0.35 Mn, 0.20 Si, 0.17 Cr, bal Fe.
For bearings, pivots, bushings, liners; water hardened.

UHB 27C5.
M-111; 1.35 C, 0.3 Cr, bal Fe.
For files; water hardening.

UHB 30C5.
M-111; 1.4 C, 0.2 Si, 0.3 Mn, 0.3 Cr, 0.1 V, bal Fe.
For engravers tools, cutters, drills, taps; water hardened.

UHB 46.
M-111, M-111a; 0.9 C, 0.3 Si, 1.1 Mn, 0.5 Cr, 0.5 W, 0.1 V, bal Fe.
For gauges, reamers, taps, hobs, knurling tools; Type O1; non-deforming, oil hardened.

U.H.B. NO. 46 CROWN.
M-111; 0.9 C, 1.2 Mn, 0.5 W, 0.5 Cr, bal Fe.
Annealed 104,000 TS; 21 El.
For tools, dies, gauges, reamers; oil hardened; non-deforming.

UHB-151.
M-111, M-111a, 1.0 C, 0.6 Mn, 0.25 Si, 5.25 Cr, 1.1 Mo, 0.2 V, bal Fe.
Annealed 200-228 Brin.
For crimpers, gages, blanking and forming dies; Type A2, air hardened, nondeforming.

UHB-711.
M-111, M-111a; 0.5 C, 0.2 Mn, 0.75 Si, 1.25 Cr, 2.5 W, 0.2 V, bal Fe.
Annealed: 180-220 Brin.
For rivet sets, upsetters, punches, dies; Type S1, oil hardened.

UHB-AEB.
M-111; 1 C, 13.5 Cr, bal Fe.
For cutting, forming and blanking dies; air hardened, non-deforming

UHB-BORE 2.
M-111; 1.1 C, 0.25 Cr, 1 W, 0.1 V, bal Fe.
For twist drills, taps; water hardened.

U H B CALDUR.
M-111, 0.25 C, 12 Cr, 7 W, 4 Co, bal Fe.
Tempered at 600°F. C 50.5 Rock.
Tempered at 900°F. C 54 Rock.
Tempered at 1200°F: C 45 Rock.
For die casting dies for brass and aluminum, forging and extrusion dies
Hot work tool steel Resists heat checking. Good hardness and toughness.

UHB-CALIX.
M-111; 0.40 C, 1.3 Cr, 4 W, 0.25 V, bal Fe.
For upsetters, punches, extrusion dies and mandrels; hot work steel, oil hardened.

UHB-CALMAX.
M-111a; 0.28 C, 12 Cr, 7 W, 0.4 V, 9 Co, bal Fe.
For hot press dies, die casting dies, extrusion dies; air hardened.

U.H B CARBON TOOL STEEL.
M-111a; 1.05 C, 0.3 Mn, 0.25 Si, bal Fe.
For cold heading dies, punches, gauges; water hardening.

UHB-CASTOR 32.
M-111; 0.80 C, 4 Cr, 5 Mo, 6.5 W, 1.9 V, bal Fe.
For lathe and planer tools, hobs, reamers; high speed steel.

UHB CLOMO.
M-111; 0.95 C, 1.1 Cr, 0.33 Mo, bal Fe.
For tools, cutters, mining drills; oil hardened, tough.

UHB COLD HEADER DIE.
M-111; 0.91-0.98 C, bal Fe.
For cold heading dies; water hardened.

UHB COMPAX.
M-111, M-111a; 0.13 C, 0.50 Mn, 0.30 Si, 1.4 Cr, 3.8 Ni, bal Fe.
Annealed: 200-220 Brin, 100,000 TS.
Ht. Tr.: 145,000 TS; 112,000 YP; 17 El; 290 Brin.
For plastic molds, large-cavity dies for compression molding of plastics.
Type P6 tool steel, case hardening.

"U.H.B." CROWN.
M-111; 0.9 C, bal Fe.
Annealed: 84,000 TS; 24 El.
For cold heading dies, stamping dies, punches; water hardened.

UHB-DECOL LEDLOY.
M-111; 0.97 C, 0.20 Si, 0.45 Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For drills, hobs, reamers, taps; Type W1; water hardened.

UHB EXTRA.
M-111, M-111a; 1.05 C, 0.25 Si, 0.3 Mn, bal Fe.
For blanking dies, drills, hobs, reamers; Type W1; water hardened.

U.H.B. FINGAL.
M-111; 0.5 C, 0.6 Cr, 0.5 W, 0.2 Mo, bal Fe.
For pneumatic tools; oil or water hardening.

UHB FORMA.
M-111; 0.05 max C, bal Fe.
For plastic molding dies; case hardened.

UHB-FORMA-1.
M-111; 0.05 max C, 0.10 max Si, 0.15 max Mn, bal Fe.
Annealed: 58,000 TS; 45,000 YS; 30 El; 66 RA; 125 Brin.
For plastic mold dies; case hardened.

U.H.B. HEADER.
M-111, M-341; 0.9 C, 0.2 V, bal Fe.
For tools, cold heading dies; water hardened.

UHB IMPAX.
M-111, M-111a; 0.36 C, 1.4 Cr, 1.4 Ni, 0.2 Mo, bal Fe.
Heat treated: 300-330 Brin.
For molds, dies, tools, plastic molds, die casting tools for zinc.
Prehardened, Type P20 tool steel.

UHB-Mn-Mo.
M-111; 0.90 C, 1.4 Mn, 0.3 Si, 0.25 Mo, bal Fe.
For tools, dies, punches; oil hardened, ground flat stock.

UHB-NICRO 33.
M-111, 0.13 C, 0.75 Cr, 3 Ni, bal Fe.
For gears, cams, camshafts; case hardened, oil hardened.

UHB-NICRO 43.
M-111; 0.18 C, 0.75 Cr, 3 Ni, bal Fe.
For gears, cams, camshafts; case hardened, oil hardened.

UHB ORVAR-1.
M-111; 0.38 C, 5.2 Cr, 1.3 Mo, 1.0 V, bal Fe.
Ht. Tr.: 300,000 TS; 227,000 YS; 9 El; C 55 Rock.
For hot dies, fasteners, extrusion and die casting dies, punches.
Type H11 hot work tool steel, high toughness and wear resistance.

UHB OVAR-2.
M-111a, M-111; 0.35-0.40 C, 0.8-1.2 Si, 5.0-5.5 Cr, 1.2-1.5 Mo, 0.9-1.1 V, bal Fe.
For die casting dies, punches, hot shears, forging dies; Type H13; hot work steel.

UHB-PILGRIM.
M-111; 0.40 C, 0.50 Cr, 4 Ni, 1 Mo, 0.5 W, bal Fe.
For forging dies, upsetters; hot work steel, oil hardened.

UHB PISTON.
M-111; 1.05 C, 0.1 V, bal Fe.
For pistons, drills, taps; water hardening.

UHB-PREGA.
M-111; 0.45 C, 3 Cr, 0.45 Mo, 0.6 Mn, bal Fe.
For drop forging dies, hobbing dies; hot work steel, oil hardened.

UHB PREMO
M-111, M-111a; 0.04 C, 4 Cr, 0.5 Mo, 0.1 Si, 0.1 Mn, bal Fe.
For plastic mold dies, cold hubbed dies; case hardened, oil or water hardened.

UHB PREXI
M-111, M-111a; 0.15 C, 0.25 Si, 1.0 Mn, 1.2 Cr, 0.25 Mo, bal Fe.
For die casting dies, plastic mold dies; case hardened, oil hardened.

U.H.B. REGIN 1.
M-111; 0.42 C, 0.9 Si, 1 Cr, 2.5 W, bal Fe.
For hot work tools, chisels; hot work steel.

UHB-RESISTO.
M-111a; 0.6 C, 1.85 Si, 0.7 Mn, 0.45 Mo, 0.2 V, bal Fe.
For shear blades, pneumatic chisels; shock resistant, oil hardened.

U H.B SPECIAL.
M-111, 0.35 C, 1.05 Si, 5.0 Cr, 0.4 V, 1.5 W, 1.65 Mo, bal Fe
For blanking and forming dies; non-deforming; AISI H-12

UHB STAINLESS 1.
M-111, 0.10 C, 13.5 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

U.H.B. STAINLESS 1H.
M-111; 0.13-0.20 C, 12-15 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

UHB STAINLESS 2.
M-111; 0.1 C, 17.5 Cr, 1 Si, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 30 El; 50 RA; 140 Brin.
For chemical plant and oil refinery equipment; Type 430; corrosion resistant.

UHB STAINLESS 2M.
M-111; 0.08 C, 17 Cr, bal Fe.
Annealed: 80,000 TS; 45,000 YS; 30 El; 140 Brin.
For chemical plant equipment, kitchen sinks, auto trim.
Type 430 stainless steel, ductile, non-hardenable.

UHB STAINLESS 3.
M-111; 0.1 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment; Type 302; austenitic, stainless.

U.H.B. STAINLESS 3H.
M-111; 0.15 C, 18 Cr, 8.5 Ni, bal Fe.
For heat and corrosion resistant parts; stainless, heat and corrosion resistant.

UHB-STAINLESS 3L.
M-111; 0.08 C, 18 Cr, 10 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 304; stainless, austenitic.

UHB STAINLESS 3M.
M-111; 0.06 C, 19 Cr, 10 Ni, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 60 El; 150 Brin.
For welded structures, chemical plant equipment, evaporators.
Type 304 stainless steel, austenitic.

UHB STAINLESS 3MM.
M-111; 0.07 max C, 9.5 Ni, 18 Cr, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El; 330 Brin.
For chemical plant equipment, tanks, mixers, agitators; Type 304; stainless, austenitic.

UHB STAINLESS 3 (P).
M-111; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 300 Brin.
For chemical plant equipment, tanks, mixers, agitators; Type 302; stainless, austenitic.

UHB STAINLESS 4.
M-111; 0.10 C, 18 Cr, 8 Ni, 1.3 Mo, bal Fe.
For stainless parts; stainless, austenitic.

U.H B. STAINLESS 4H
M-111; 0 13-0 20 C, Mo, 16-23 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts; stainless, heat and corrosion resistant.

U.H B. STAINLESS 4M.
M-111; 0.07 max C, Mo, 16-23 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts; stainless, heat and corrosion resistant

UHB STAINLESS 4MM
M-111; 0.07 max C, 18 Cr, 2 1 Mo, 11.5 Ni, bal Fe.
Annealed. 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin
For acid resistant chemical plant equipment, tanks; Type 316; stainless, austenitic.

UHB STAINLESS 5.
M-111; 0 20 C, 24 Cr, 1 Si, bal Fe
For corrosion resistant parts; corrosion resistant

UHB STAINLESS 6.
M-111; 0.35 C, 13.5 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

U.H B STAINLESS 6H.
M-111; 0.36-0.50 C, 12 15 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

UHB STAINLESS 7
M-111; 0.95 C, 14 Cr, 1 Mn, bal Fe.
For corrosion resistant parts, corrosion resistant.

UHB STAINLESS 15.
M-111; 0.07 max C, 18.5 Cr, 20.5 Ni, bal Fe.
For chemical plant equipment; austenitic, heat and corrosion resistant.

UHB STAINLESS 16.
M-111; 0.27 C, 13.5 Cr, 1.5 Mo, bal Fe.
For surgical instruments, cutlery; hardenable, corrosion resistant.

UHB-STAINLESS 17H.
M-111; 0.25 C, 17.5 Cr, 12.5 Ni, W, Cb, bal Fe.
For chemical plant equipment; corrosion and heat resistant.

UHB STAINLESS 18.
M-111; 0.2 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, filters, mixers; Type 302; stainless, austenitic.

UHB STAINLESS 20.
M-111; 0.2 C, 20 Cr, 10 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; 60 RA; 170 Brin.
For chemical plant equipment; austenitic, stainless.

UHB STAINLESS 21.
M-111; 0 06 max C, 14 Cr, bal Fe.
For stainless parts; unhardenable, corrosion resistant parts.

UHB STAINLESS 22.
M-111; 0.18 C, 17 Cr, 1.5 Ni, bal Fe.
Heat treated: 135,000 TS; 112,000 YS; 15 El; 45 RA; 280 Brin.
For propeller shafts, pump spindles; Type 431; corrosion resistant.

UHB STAINLESS 24.
M-111; 0.06 max C, 17 Cr, 11.5 Ni, 3 Mo, bal Fe.
Annealed· 95,000 TS; 45,000 YS; 50 El; 60 RA; 190 Brin.
For chemical plant equipment, acid resistant parts; Type 317; stainless, austenitic.

UHB-STAINLESS 24L.
M-111; 0.08 C, 17.5 Cr, 13 Ni, 2.8 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

UHB STAINLESS 25.
M-111; 0.07 max C, 23.5 Cr, 21.5 Ni, bal Fe.
Annealed. 95,000 TS; 45,000 YS; 55 El; 65 RA; 200 Brin.
For furnace parts, chemical plant equipment; Type 310, corrosion and heat resistant.

UHB STAINLESS 26.
M-111; 0.5 C, 14 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 200 Brin.
For cutlery, valves, surgical instruments; Type 420; stainless, hardenable.

UHB-STAINLESS 27
M-111; 0.12 C, 16 Cr, 13.5 Ni, W, Ti, bal Fe
For chemical plant equipment; corrosion resistant.

UHB STAINLESS 31.
M-111; 0.18 C, 13.5 Cr, 0.7 Ni, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 196 Brin.
For cutlery, surgical instruments, valves, turbine blades, Type 420; stainless, hardenable.

UHB STAINLESS 32.
M-111; 0.15 C, 16.5 Cr, 1 Ni, 0 5 Mo, bal Fe.
Heat treated· 130,000 TS; 110,000 YS; 16 El; 48 RA; 250 Brin.
For chemical plant equipment, pump parts; corrosion resistant, hardenable.

UHB STAINLESS 33.
M-111; 0.10 C, 14 Cr, 13 Ni, bal Fe.
Annealed: 75,000 TS; 30,000 YS; 35 El; 200 Brin.
For furnace parts, chemical plant equipment; stainless, austenitic.

UHB-STAINLESS 33MM.
M-111; 0 06 C, 12.5 Cr, 12.5 Ni, bal Fe.
For valves, pumps; corrosion and heat resistant.

UHB-STAINLESS 34.
M-111; 0.06 C, 17.4 Cr, 14 Ni, 4.5 Mo, Cb, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 40 El; 55 RA; 200 Brin.
For welded chemical plant equipment, tanks; Type 317 Cb; stainless, austenitic.

UHB STAINLESS 35.
M-111; 0.20 max C, 24 Cr, 12 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; 65 RA; 170 Brin.
For furnace parts and equipment, salt pots; Type 309; heat resistant.

UHB-STAINLESS 41.
M-111; 0.13 C, 13.5 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For valves, cutlery, turbine blades; Type 410; corrosion resistant.

UHB STAINLESS 43.
M-111; 0.08 C, 18 Cr, 9.5 Ni, 0.5 Mo, bal Fe.
Annealed: 85,000 TS; 55,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 120,000 TS; 95,000 YS; 25 El; 55 RA; 275 Brin.
For chemical plant equipment; stainless, austenitic.

UHB STAINLESS 44.
M-111; 0.13 C, 25 Cr, 4.5 Ni, 1.5 Mo, bal Fe.
Normalized: 103,000 TS; 78,000 YS; 18 El; 45 RA; 235 Brin.
For valves, pumps, chemical plant equipment; Type 329; corrosion resistant

UHB STAINLESS 45.
M-111; 0.13 C, 26 Cr, 4.5 Ni, bal Fe
For chemical plant equipment; Type 327, corrosion resistant.

UHB STAINLESS 51.
M-111; 0.10 C, 14 Cr, 1 Mo, bal Fe
For stainless parts; hardenable, corrosion resistant.

UHB STAINLESS 51 H.
M-111; 0.15 C, 14 Cr, Mo, bal Fe
Annealed: 95,000 TS; 46,000 YS; 24 El; B 92 Rock.
Ht. Tr.: 240,000 TS; 210,000 YS; 10 El, C 50 Rock.
For cutlery, surgical instruments, needle valves, gauges.
Type 420 stainless steel, hardenable.

UHB STAINLESS 52.
M-111; 0.10 C, 17 Cr, 1.5 Mo, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, oil heaters; Type 430Mo; corrosion resistant.

UHB STAINLESS 53.
M-111; 0.08 max C, 18 Cr, 9.5 Ni, Ti, bal Fe.
Annealed: 85,000 TS; 33,000 YS; 58 El; 75 RA; 150 Brin.
Cold drawn: 95,000 TS; 60,000 YS; 40 El, 60 RA; 185 Brin.
For welded structures, chemical plant equipment; Type 321; stainless, austenitic.

UHB-STAINLESS 54C.
M-111; 0.06 C, 17.5 Cr, 11.5 Ni, 2.2 Mo, Ti, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 180 Brin.
For welded acid resistant equipment; Type 316 Ti; stainless, austenitic.

UHB STAINLESS 55.
M-111; 0.20 max C, 24 Cr, 12 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, filters, mixers; Type 304; stainless, austenitic.

UHB STAINLESS 62.
M-111; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For welded oil refinery equipment, sinks; Type 430 Ti; austenitic, stainless.

UHB STAINLESS 63.
M-111; 0.12 max C, 18 Cr, 9.5 Ni, Cb = 8 × C, bal Fe
Annealed: 90,000 TS; 45,000 YS; 56 El; 65 RA; 160 Brin.
For welded chemical plant equipment, tanks, mixers; Type 347; austenitic, stainless.

UHB STAINLESS 63 H.
M-111; 0.06 C, 16 Cr, 13 Ni, 0.6 Cb, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; B 82 Rock.
For exhaust manifolds, superheaters, low temperature processing equipment.
Austenitic, non-hardenable
Type 16-13 Cb stainless steel.

UHB-STAINLESS 64.
M-111; 0.06 C, 18 Cr, 18 Ni, 2 Mo, 2 Cb + Cu, bal Fe
For chemical plant equipment; stainless, austenitic.

UHB-STAINLESS 72.
M-111, 0.13 C, 17 Cr, bal Fe.
Annealed: 80,000 TS, 50,000 YS; 25 El; 50 RA; 150 Brin
For oil refinery equipment, oil burners and heaters; Type 430; corrosion resistant.

UHB STAINLESS 75.
M-111; 0.25 C, 25 Cr, bal Fe.
For corrosion and heat resistant parts; unhardenable, corrosion resistant

UHB-STAINLESS 524.
M-111, 0.08 C, 17.5 Cr, 13 Ni, 2.8 Mo, Ti, bal Fe.
Annealed 90,000 TS, 40,000 YS, 45 El; 60 RA; 180 Brin.
For acid resistant chemical plant equipment; Type 316 Ti; stainless, austenitic

UHB-STAINLESS 525.
M-111; 0.10 C, 24 Cr, 18 Ni, Ti, bal Fe.
Annealed 100,000 TS; 45,000 YS; 50 El; 65 RA; 185 Brin
For furnace parts, valves, pumps; Type 310; stainless

UHB-STAINLESS 624.
M-111; 0.06 C, 17.5 Cr, 13 Ni, 2.8 Mo, Cb, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 180 Brin.
For acid resistant chemical plant equipment; Type 316 Cb; stainless, austenitic.

UHB-STAINLESS 703.
M-111; 0.09 C, 17.5 Cr, 10.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin
For chemical plant equipment, tanks, mixers; Type 304; stainless, austenitic.

UHB-STAINLESS 716.
M-111; 0.35 C, 13.5 Cr, 1 Mo, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 20 El; 50 RA; 210 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; corrosion resistant.

UHB STAINLESS 731.
M-111; 0.20 C, 12-14 Cr, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 25 El; B 92 Rock.
Ht. Tr.: 250,000 TS; 215,000 YS; 8 El; C 52 Rock.
For cutlery, surgical instruments, gauges, needle valves.
Type 420 stainless steel, hardenable.

UHB STAINLESS 734.
M-111; 0.07 C, 18-20 Cr, 11-15 Ni, 3-4 Mo, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 70 El; B 70 Rock.
Cold Rolled: 150,000 TS; 125,000 YS; 15 El; C 30 Rock.
For paper and pulp equipment, textile and dye equipment, acid tanks, evaporators, digesters.
Type 317 stainless steel, austenitic, acid resistant.

UHB STANDARD.
M-111; 1.0 C, bal Fe.
For tools, drills, taps; water hardened.

UHB-STATO 7.
M-111; 0.35 C, 1.1 Cr, 0.20 Mo, bal Fe.
For gears, shafts, mandrels; oil hardened.

UHB-STATO 21.
M-111; 0.15 C, 0.25 Si, 0.60 Mn, 0.32 Mo, bal Fe.
For gears, cams, camshafts; case hardened, tough.

UHB-STATO 28.
M-111; 0.10 C, 2.5 Cr, 1.0 Mo, bal Fe.
For gears, cams, camshafts; case hardened, tough.

UHB STAVAX.
M-111a; 0.35 C, 0.45 Mn, 0.45 Si, 13.6 Cr, bal Fe.
Annealed: 210-220 Brin.
High strength, deep hardening plastic mold steel with ultra high polish potential; oil hardening, non-deforming.
AISI Type 420 corrosion resistant steel.

U.H.B. SUPER.
M-111; C, Mo, W, bal Fe.
For chisels; shock resistant

UHB TRIMO.
M-111a; 1.5 C, 0.3 Mn, 0.4 Si, 12.0 Cr, 0.8 Mo, 0.9 V, bal Fe.
Annealed· 200-210 Brin.
For dies, punches, shear blades, cold forming dies, exceptional wear resistance; air and oil hardening
Type D2 cold work tool steel.

UHB TRITUNG.
M-111a, M-111; 2.0 C, 0.75 Mn, 0.3 Si, 13.0 Cr, 1.25 W, bal Fe.
Annealed: 230-260 Brin.
For cold and hot trimming dies; exceptional wear resistance; air and oil hardening non-deforming.
Type D6 cold work tool steel.

UHB "TRI-Z."
M-111a; 1.5 C, 12 Cr, 0.8 Mo, 0.9 V, bal Fe.
For blanking and drawing dies, thread rolling and cold forming dies, broaches; air hardened, low impurity count, non-deforming.

UHB UDDCO 1.
M-111a; 0.14 C, 5 Cr, bal Fe.
Annealed: 70,000 TS; 30,000 YS; 28 El; 65 RA; 160 Brin.
For petroleum and oil refinery equipment; Type 501; creep resistant.

UHB UDDCO 2.
M-111a; 0.14 C, 5 Cr, 0.5 Mo, bal Fe.
Annealed: 75,000 TS; 35,000 YS; 25 El; 60 RA; 170 Brin.
For petroleum and oil refinery equipment; Type 502; creep resistant.

UHB UDDCO 3.
M-111a; 0.06 C, 3 Cr, 0.5 Mo, bal Fe.
Annealed: 65,000 TS; 30,000 YS; 35 El; 70 RA; 150 Brin.
For petroleum and oil refinery equipment; Type 502; creep resistant.

UHB UDDCO 6.
M-111a; 0.18 C, 6 Cr, Si, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 25 El; 60 RA; 180 Brin.
For petroleum and oil refinery equipment; Type 501; creep resistant.

UHB-VA.
M-111, M-111a; 1.05 C, 0.3 Mn, 0.25 Si, 0.2 V, bal Fe.
For drills, taps, reamers, blanking dies; Type W2; water hardened.

U.H.B. VALAND 1.
M-111; 0.3 C, 3 Cr, 1.75 Ni, 9.5 W, 0.3 V, bal Fe.
For hot work tools; hot work steel.

UHB VALAND 2.
M-111; 0.32 C, 2.5 Cr, 2.0 Co, 0.35 V, 8 W, bal Fe.
For hot work tools and dies; hot work steel.

UHB-WATER.
M-111, M-111a; 1.05 C, 0.30 Mn, 0.25 Si, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For blanking and cutting and forming dies; water hardened.

UHB-X1.
M-111a; C, alloy, bal Fe.
For dies; tools; oil hardened.

ULCONY.
65 Cu, 35 Pb.
For heavy duty bearings; for poor lubricating conditions.

ULMAL.
M-982; 0.5-2.0 Mg, 0.3-1.5 Si, 0-1.5 Mn, bal Al.
Heat treated: 48,000-52,000 TS; 38,000-44,000 YS; 10-14 El; 90-100 Brin.
For light alloy parts; corrosion resistant, hardenable.

ULMINIUM S.
M-764; 4.2 Cu, 1.6 Mg, 0.6 Mn, bal Al.
Aged: 65,000 TS; 43,000 YS; 14 El; 120 Brin.
For transportation and aircraft construction; high strength, age hardened.

U-LOY.
M-97; 0.06-0.10 C, 0.25-0.40 Mn, 0.25 Cu, bal Fe.
Rolled: 42,000-45,000 TS; 27,000-30,000 YS; 34-36 El; 42-47 RA.
For culverts, roofing; sheets.

ULTIMIUM N 112.
M-717;
Tungsten carbide containing electrodes for super hard overlays on steel; AC-DC; for surfacing conveyor screws, crusher liners, muller blades, wear plates.
Hardness C 68-72 Rock.

ULTIMIUM N 113
M-717;
Tungsten carbide type super abrasion resistant overlays; AC-DC; for all steels and cast irons. For wear plates, mining teeth, crusher liners.
Hardness C 60 Rock.

ULTIMIUM N 114 EXPRESS.
M-717;
Tungsten carbide containing electrodes for super hard overlays on steel. AC-DC; for conveyor wear surfaces, plows, wear plates.
Hardness C 67-69 Rock.

ULTIMO 4.
M-435; 0.45 C, 0.75 Mn, 1.25 Cr, 0.35 Mo, bal Fe.
Normalized: 110,000 TS; 85,000 YS; 25 El; 60 RA; 228 Brin.
For shafts, gears, arbors; heavy duty.

ULTIMO 6.
M-435; 0.5 C, 0.7 Cr, 0.7 Mo, 2 Ni, bal Fe.
For tools, punches, dies, shears; hot work steel.

ULTIMO 200.
M-1636, M-435; 0.30 C, 0.8 Mn, 1.65 Cr, 0.4 Mo, bal Fe.
Annealed: 114,000 TS; 90,000 YS; 25 El; 229 Brin.
Hardened: 150,000 TS; 135,000 YS; 22 El; 302 Brin.
For heavy duty shafts, gears, crusher rolls, spindles, couplings, clamps.
Oil hardening, shock resisting.

ULTRA CAPITAL.
M-1112; 0.75 C, 4 Cr, 18 W, 1 V, bal Fe.
For broaches, drills, reamers, hobs, lathe tools; high speed steel.

ULTRA CAPITAL 22.
M-1112; 0.75 C, 4.1 Cr, 22 W, 1.25 V, bal Fe.
For broaches, drills, reamers, milling cutters, hobs; high speed steel.

ULTRA CAPITAL PLUS ONE.
M-1112; 0.85 C, 4.25 Cr, 1.3 V, 5 Co, 18 W, bal Fe.
For lathe and planer tools, hobs, taps, reamers, drills; high speed steel, oil hardened.

ULTRA CAPITAL PLUS 2.
M-1112; 0.75 C, 4.2 Cr, 20 W, 1.5 V, bal Fe.
For broaches, reamers, drills, hobs, cutters, taps, high speed steel, oil hardened.

ULTRA-CAPITAL STEEL.
M-350, M-1112; 17 W, 3.4 Cr, 0.1 V, 0.7 C, bal Fe.
For turning tools and cutters; high speed steel

ULTRADIE 1.
M-114; 2.25 C, 12 Cr, 0.8 Mo, 0.2 V, bal Fe.
For dies, for punching hard, brittle material, drills, reamers, shear blades, lamination dies; non-deforming; cold work die steel; AISI D3.

ULTRADIE 1M.
M-114; 2.25 C, 12 Cr, 2 V, 0.8 Mo, bal Fe.
For lamination and drawing dies, punches, gauges; Type D3; oil hardened, non-deforming

ULTRADIE 2.
M-114; 1.5 C, 12 Cr, 0.8 Mo, bal Fe.
For tools, dies, reamers, taps; non-deforming.

ULTRADIE 3.
M-114; 1.5 C, 12 Cr, 1 V, 0.8 Mo, bal Fe.
For lamination and blanking dies, punches, shear knives; non-deforming; cold work die steel AISI D2.

ULTRADUR.
M-1246; carbides.
For hard facing electrodes; sintered alloy.

ULTRALLOY.
M-1351; 48.5 Sn, 48.5 Zn, 2 Cu, 0.6 Si, 0.03 Ag.
Cast: 12,250 TS; 20 El; 23 Brin.
Solder for aluminum; M.P. 700-750°F.

ULTRALOY.
M-605; C, 37 Cr, 7.5 Al, bal Fe.
For furnace parts; see Smith Alloy No. 10.

ULTRALOY 10611.
M-717;
Cobalt base alloy powder containing particles of tungsten carbide for hard, wear-resistant overlays.

ULTRA SUPERIOR 25.
M-1294; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For forming and blanking dies, cutters; high speed steel.

ULTRA SUPERIOR 25Z.
M-1294, 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

ULTRATHERM 7.
M-1309; 0.25 C, 2.25 Si, 6.5 Cr, bal Fe.
Cast, ann: 95,000-130,000 TS; 4 El; 200-280 Brin.
Ferrite-pearlite, weldable
For parts used at temperatures up to 850°C.
DIN G-X30 CrSi 6.

ULTRATHERM 13.
M-1309; 0.45 C, 2.25 Si, 13 Cr, bal Fe
Cast, ann: 95,000-135,000 TS; 4 El; 200-300 Brin.
Ferrite-pearlite; weldable
For parts used at temperatures up to 900°C.
DIN G-X45 CrSi 13

ULTRATHERM 17.
M-1309; 0.45 C, 2.25 Si, 17 Cr, bal Fe.
Cast, ann. 95,000-135,000 TS, 2 El; 200-300 Brin.
Ferrite-carbide; weldable.
For parts used in oxidizing atmospheres at temperatures up to 950°C.
DIN G-X40 CrSi 17.

ULTRATHERM 18-9
M-1309, 0.18 C, 1.5 Si, 18.0 Cr, 9.0 Ni, bal Fe.
Cast, ann. 75,000-110,000 TS, 15 El, 130-200 Brin.
Austenitic, weldable
For parts used at elevated temperatures
DIN G-X25 CrNiSi 18 9

ULTRATHERM 19
M-1309; 1.60 C, 1.50 Si, 18.0 Cr, bal Fe
Cast, ann· 250-300 Brin
Ferrite-carbide structure, machinability only fair.
For parts used at temperatures up to 950°C.
DIN G-X 160 CrSi 18.

ULTRATHERM 20-40
M-1309, 0.35 C, 1.35 Si, 17.5 Cr, 37.25 Ni, bal Fe.
Cast 70,000 TS; 40,000 YS, 9 El, 170 Brin.
Aged 73,000 TS, 43,000 YS; 5 El; 200 Brin
For retorts, carburizing containers, rails, fixtures, furnace parts
Corrosion and oxidation resistance.
Heat resistant, Type HU, austenitic

ULTRATHERM 23.
M-1309; 0.45 C, 1.50 Si, 23.0 Cr, bal Fe.
Cast, ann: 200-300 Brin.
Ferrite-carbide structure, weldable.
For parts to be used in oxidizing atmospheres at temperatures up to 1050°C.
DIN G-X40 CrSi 22

ULTRATHERM 23-11.
M-1309; 0.35 C, 1.75 Si, 22.0 Cr, 10.0 Ni, bal Fe.
Cast, ann: 75,000-110,000 TS; 12 El; 150-220 Brin.
Austenitic, weldable.
For parts used at elevated temperatures.
DIN G-X40 CrNiSi 229.

ULTRATHERM 23-15.
M-1309; 0.25 C, 1.75 Si, 20.0 Cr, 14 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; B 83 Rock.
For heat treating equipment, heat exchangers, furnace parts and fixtures, salt pots, oil burners.
Non-hardenable Heat resistant austenitic

ULTRATHERM 25-12.
M-1309; 0.35 C, 1.75 Si, 25.0 Cr, 12.0 Ni, bal Fe.
Ht. Tr.: 92,000 TS; 45,000 YS; 8 El; 200 Brin.
At 1400°F: 35,000 TS; 18,000 YS; 12 El.
For furnace parts, conveyor screws, salt pots, dampers, grate bars.
High corrosion and oxidation resistance.
Heat resistant, Type HH, austenitic.

ULTRATHERM 26-21.
M-1309; 0.35 C, 1.75 Si, 25.5 Cr, 20.0 Ni, bal Fe.
Cast: 75,000 TS; 50,000 YS; 17 El; 170 Brin.
Aged: 85,000 TS; 50,000 YS, 10 El; 190 Brin.
For salt pots, heat treating boxes, furnace parts, skids, rabble arms.
Corrosion and oxidation resistant. Heat resistant, austenitic.

ULTRATHERM 26-21 W
M-1309; 0.15 C, 1.75 Si, 25.5 Cr, 20.0 Ni, bal Fe
Annealed: 95,000 TS; 45,000 YS; 50 El; B 89 Rock.
For furnace parts and equipment, heat treating boxes and fixtures, boiler baffles, retorts, kiln linings
High corrosion and oxidation resistance. Heat resistant, Type 310, austenitic.

ULTRATHERM 27-15.
M-1309; 0.35 C, 1.75 Si, 26.5 Cr, 14 Ni, bal Fe.
Cast. 80,000 TS; 45,000 YS, 12 El; 180 Brin.
At 1400°F· 38,000 TS; 6 El.
For retorts, skids, brazing fixtures, lead pots, hearth plates, furnace parts
Heat resistant High corrosion and oxidation resistance

ULTRATHERM 28-4H
M-1309, 0.40 C, 1.5 Si, 27.0 Cr, 4.0 Ni, bal Fe.
Cast. 85,000 TS; 48,000 YS; 16 El, 190 Brin.
At 1400°F 36,000 TS, 14 El.
For ore roasting furnaces, rabble arms, sintering bars, salt pots, furnace blowers, recuperators.
High oxidation resistance in sulphur atm. Heat resistant, Type HD

ULTRATHERM 30.
M-1309, 0.40 C, 1.5 Si, 28.5 Cr, bal Fe
Cast· 110,000 TS, 75,000 YS; 19 El, 223 Brin
For ore roasting furnaces, grate bars, salt pots, soot blowers, kiln parts.
Oxidation resistant to high sulphur atm
Heat resistant

ULTRATHERM 30 H
M-1309; 1.30 C, 1.50 Si, 28.50 Cr, bal Fe
Cast, ann 250-350 Brin.
Ferrite, carbide structure.
For parts used in oxidizing atmospheres at temperatures up to 1100°C
DIN G-X130 CrSi 29

U.M.A (AGATHON) SPRING.
M-97; 0.47-0.52 C, 0.80-1.0 Mn, 1.0-1.2 Cr, bal Fe
255,000-165,000 TS; 222,000-145,000 YS; 13-20 El; 32-58 RA; 490-355 Brin
For leaf springs, lock units; flexible and shock resistant.

UMCo-50.
M-1644, M-1722; 48-52 Co, 0.05-0.12 C, 27-29 Cr, 0.5-1.0 Mn, 0.5-1.0 Si, bal Fe.
As cast, RT.: 80,000 TS; 45,600 YS; 8 El.
1830°F: 11,400 TS; 10,000 YS; 18 El.
Forged, RT.: 134,000 TS; 88,500 YS; 10 El.
1830°F: 11,400 TS; 8,600 YS; 18 El.
Excellent strength and corrosion resistance at elevated temperature; for furnaces, heat treat equipment, gas and pulverized coal burners.

UMCo-51.
M-1644, M-1722; 48-52 Co, 0.25-0.40 C, 27-29 Cr, 2.0-2.2 Nb, 0.5-1.0 Mn, 0.5-1.0 Si, bal Fe.
As cast, RT.: 91,500 TS; 72,000 YS; 2.2 El.
1650°F: 30,400 TS; 26,200 YS; 13.8 El.
(properties vary with carbon content).
Excellent strength and corrosion resistance at elevated temperatures; for furnace parts, heat treat equipment, gas and pulverized coal burners.

UNA.
M-930; 0.1 C, bal Fe.
For welding rod.

UNA HIGH SPEED NO. 44.
M-930; 0.08 max C, 0.2-0.3 Mn, bal Fe.
For welding rod; flux coated for high speed.

UNA HIGH SPEED NO. 45.
M-930; 0.12-0.18 C, 0.4-0.6 Mn, bal Fe.
For welding rod; flux coated for high speed.

UNA HIGH TENSILE NO. 65.
M-930; 0.13-0.18 C, 0.4-0.6 Mn, bal Fe.
For welding rod; flux coated.

UNA NO 76
M-930; 0.13-018 C, 0.4-0.6 Mn, bal Fe.
For welding rod; flux coated.

UNA NO. 156
M-930; 0.13-0.18 C, bal Fe
For welding rod, flux coated.

UNA NO 158
M-930; 0.08 C, 0.2-0.3 Mn, bal Fe
For welding rod; flux coated

UNA NO 160
M-930; 0.13-0.18 C, 0.4-0.6 Mn, bal Fe.
For welding rod, flux coated.

UNA NO. 200.
M-930, 0.07-0.12 C, 0.3-0.5 Mn, bal Fe.
For welding rod; flux coated

UNA NO 300
M-930; 0.13-0.18 C, 0.4-0.6 Mn, bal Fe.
For welding rod; flux coated

UNA NO. 325.
M-930, 0.85-1.10 C, 0.3-0.6 Mn, bal Fe.
For welding rod; hard and abrasion resisting.

UNA NO 350
M-930; 0.17 C, 4.75-5.25 Ni, bal Fe.
For welding rod

UNA NO. 425.
M-930; 0.08 C, 0.2-0.3 Mn, bal Fe.
For welding rod, protected arc.

UNA NO. 470
M-930; Ni-Cu.
For welding rod; for machinable welds on cast iron.

UNA NO 560.
M-930; Cu
For welding rod for copper to steel; flux coated.

UNA NO. 601.
M-930; 0.5 Si, bal Al.
For welding rod; for Al.

UNA NO 712.
M-930; 0.15-0.25 C, 0.3-0.6 Mn, 3.25-3.75 Ni, bal Fe.
For welding rod; flux coated.

UNA NO. 911.
M-930; 0.07 C, 0.5 Mn, 18-20 Cr, 8-10 Ni, bal Fe.
For welding rod; for 18-8 stainless steel.

UNA NO. 912.
M-930; 0.20 C, 2.0 Mn, 22-26 Cr, 12-14 Ni, bal Fe.
For welding rod; for stainless steel

UNA NO. 914.
M-930; 0.10 C, 12-14 Cr, 0.25 Ni, bal Fe.
For welding rod; for corrosion resistant steel.

UNA NO. 916.
M-930; 0.10 C, 16-18 Cr, 0.25 Ni, bal Fe.
For welding rod; for stainless steel.

UNA NO. 917.
M-930; 0.10 C, 25-30 Cr, 0.25 Ni, bal Fe.
For welding rod; for stainless steel.

UNA NO. 918.
M-930; 0.15 C, 4-6 Cr, 0.4-0.6 Mo, bal Fe.
For welding rod; for 4-6 Cr steel.

UNA NO. 1500.
M-930; 0.08 C, bal Fe.
For welding rod.

UNA NO. 2150.
M-930; 0.03 C, 0.13 Mn, 0.46 Cu, 0.07 Mo, bal Fe.
For welding rod; for Cu-bearing steel.

UNA NO. 3175.
M-930; 0.08 C, 2 Ni, 1 Cu, bal Fe.
For welding rod; shielded coating.

UNA NO. 3200.
M-930; 0.10-0.14 C, 0.35-0.55 Mn, bal Fe.
For welding rod.

UNAMO 1.
M-1618; 0.8 C, 0.3 Mn, 0.3 Si, 4 Cr, 1 V, 1.5 W, 8 Mo, bal Fe.
Hardness: C 64-68 Rock.
For cutters, lathe and planer tools, drills, reamers, broaches, taps.
Type M-1 high speed steel, high red-hardness.

UNAMO 2.
M-1618; 0.8 C, 0.3 Si, 0.3 Mn, 4 Cr, 2 V, 6 W, 5 Mo, bal Fe.
Hardened: C 64-66 Rock.
For lathe and planer tools, reamers, broaches, chasers, hobs, taps, form cutters.
Type M-2 high-speed steel, high red-hardness.

UNAMO 7.
M-1618; 1.0 C, 0.3 Mn, 0.3 Si, 3.75 Cr, 2 V, 1.7 W, 8.75 Mo, bal Fe.
Hardened: C 64-67 Rock.
For broaches, chasers, reamers, hobs.
Type M-7 high speed steel, high red-hardness.

UNAMO 10.
M-1618; 0.85 C, 4 Cr, 2 V, 1.5 W, 8 Mo, bal Fe.
Hardened: C 64-67 Rock.
For twist drills, reamers, broaches, lathe and planer tools.
Type M-10 high speed steel, high red hardness.

UNAMO 35.
M-1618; 0.80 C, 4 Cr, 2 V, 6 W, 5 Mo, 5 Co, bal Fe.
Hardened: C 65-67 Rock.
For reamers, broaches, lathe and planer tools, chasers, drills, hobs, reamers, form cutters.
Type M-35 high speed steel, high red-hardness.

UNARAPID T-1.
M-1618; 0.7 C, 4 Cr, 1 V, 18 W, bal Fe.
Hardened: C 64-66 Rock.
For drills, saws, chasers, reamers, broaches, lathe and planer tools.
Type T-1 high speed steel, high red-hardness.

UNARAPID T-2.
M-1618; 0.8 C, 4 Cr, 2 V, 18 W, bal Fe.
Hardened: C 64-66 Rock.
For lathe and planer tools, forming tools, drills, broaches, reamers, taps.
Type T-2 high speed steel, high red-hardness.

UNARAPID T-4.
M-1618; 0.75 C, 4 Cr, 1 V, 18 W, 5 Co, bal Fe.
Hardened: C 64-66 Rock.
For lathe and planer tools, drills, chasers, reamers, broaches, hobs, taps.
Type T-4 high speed steel, high red-hardness.

UNARAPID T-5.
M-1618; 0.8 C, 4 Cr, 2 V, 18 W, 8 Co, bal Fe.
Hardened: C 64-67 Rock.
For lathe and planer tools, form cutters, drills, reamers, broaches, hobs.
Type T-5 high speed steel, high red-hardness.

UNARAPID T-6.
M-1618; 0.8 C, 4.5 Cr, 1.5 V, 20 W, 12 Co, bal Fe.
Hardened: C 64-68 Rock.
For lathe and planer tools, chasers, form cutters, reamers, broaches, taps, hobs.
Type T-6 high speed steel, high red-hardness.

UNARAPID T-15.
M-1618; 1.5 C, 4.5 Cr, 4.75 V, 13.5 W, 0.5 Mo, 5 Co, bal Fe.
Hardened: C 64-69 Rock.
For textile needles, form cutters, broaches, reamers, taps.
Type T-15 high speed steel, high red-hardness.

UNAVAN 3 Type 1
M-1618; 0.95-1.02 C, 4.5 Cr, 0.25 max Ni, 2.4-2.7 V, 5.8-6.3 W, 5.7-6.2 Mo, 0.25 max Co, bal Fe.
Hardened: C 64-68 Rock.
For lathe and planer tools, form cutters, reamers, broaches, taps.
Type M-3 high speed steel, high red-hardness

UNAVAN 4
M-1618, 1.3 C, 4 Cr, 4 V, 5.5 W, 4.5 Mo, bal Fe
Hardened: C 64-68 Rock.
For chasers, taps, reamers, form cutters, broaches, textile needles
Type M-4 high speed steel, high red-hardness.

UNBREAKABLE METAL.
M-815, Al, Cu, bal Zn.
For lamp bases, toys, novelties; slush or permanent mold castings.

UNIBRAZE 0 PHOSPHOR-COPPER.
M-1711; 92.8 Cu, 7.2 P
Melt range: 1300-1450°F, Braze: 1300-1450°F.
Filler metal for brazing copper in plumbing, air conditioning, electrical connections.
AWS A5.8-62T BCuP-2, ASTM B260-62T BCuP-2.

UNIBRAZE 2 PHOSPHOR-COPPER-SILVER.
M-1711; 91 Cu, 7 P, 2 Ag.
Melt range· 1190°-1425°F; Braze: 1190-1425°F.
Filler metal for brazing copper in plumbing, air conditioning, electrical connections
AWS A5 8-62T BCuP, ASTM B260-62T BCuP.

UNIBRAZE 5 PHOSPHOR-COPPER-SILVER.
M-1711; 89 Cu, 6 P, 5 Ag.
Melt range: 1185-1485°F; Braze: 1185-1485°F.
For brazing copper base alloys where close fit-ups cannot be maintained.
AWS A5.8-62T BCuP-3; ASTM B260-62T BCuP-3.

UNIBRAZE 6 PHOSPHOR-COPPER-SILVER.
M-1711; 88 Cu, 6 P, 6 Ag.
Melt range: 1185-1480°F; Braze: 1185-1480°F.
For brazing ferrous and non-ferrous alloys.
AWS A5.8-62T BCuP-3; ASTM B260-62T BCuP-3.

UNIBRAZE 6F PHOSPHOR-COPPER-SILVER.
M-1711; 86.75 Cu, 7.25 P, 6 Ag.
Melt range: 1190-1300°F; Braze: 1190-1300°F.
For brazing ferrous and non-ferrous alloys.
AWS A5.8-62T BCuP-4; ASTM B260-62T BCuP-4

UNIBRAZE 15 PHOSPHOR-COPPER-SILVER.
M-1711; 80 Cu, 5 P, 15 Ag.
Melt range: 1185-1460°F; Braze: 1185-1460°F.
For brazing ferrous and non-ferrous alloys.
AWS A5.8-62T BCuP-5; ASTM B260-62T BCuP-5.

UNIBRAZE 30.
M-1711; Copper cast iron rod; for torch brazing and build up maintenance on cast iron.

UNIBRAZE 31.
M-1711; 31.5 Ag, 34 Cu, 15.5 Zn, 19 Cd
Melt range: 1165-1390°F; Braze: 1165-1390°F.
For torch or induction brazing ferrous and non-ferrous metals.

UNIBRAZE 35.
M-1711; 35 Ag, 26 Cu, 21 Zn, 18 Cd.
Melt range: 1125-1295°F; Braze: 1125-1295°F.
For torch or induction brazing ferrous and non-ferrous metals where fit-up is poor.
AWS A5.8-62T BAg-2; ASTM B260-62T BAg 2; AMS 4768

UNIBRAZE 40.
M-1711, Cast iron machinable electrode; AC-DC, straight or reverse polarity.
For repairing cast iron cylinder heads, motor blocks

UNIBRAZE 45.
M-1711, 45 Ag, 15 Cu, 16 Zn, 24 Cd
Melt range 1125-1145°F, Braze 1125-1145°F.
For torch or induction brazing ferrous and non-ferrous metals where fit-up is good.
AWS A5.8-62T BAg-1, ASTM B260-62T BAg-1, AMS 4769

UNIBRAZE 50
M-1711, 50 Ag, 15.5 Cu, 16.5 Zn, 18 Cd.
Melt range: 1160-1175°F; Braze: 1160-1175°F.
For torch or induction brazing ferrous and non-ferrous metals.
AWS A5.8-62T BAg-1a, ASTM B260-62T BAg-1a; AMS 4770B

UNIBRAZE 60.
M-1711, Cast iron non-machinable electrode; AC-DC, reverse polarity.
For repairing gears, motor housings, farm equipment, cams, levers, where machining is not necessary

UNIBRAZE 80
M-1711, Machinable cast iron electrode; AC-DC, straight or reverse polarity
For repair work on cast iron and steel castings

UNIBRAZE 110 (bare,) UNIBRAZE 110 FC (flux coated)
M-1711, Nickel silver brazing rod.
For maintenance repair and build up of steel tubing, bicycles, furniture, buildings.

UNIBRAZE 130 (bare), UNIBRAZE 130 FC (flux coated).
M-1711, Nickel silver brazing rod
For repair and buildup of gears, valve seats, shafts

UNIBRAZE 160.
M-1711; Low alloy steel electrode, AC-DC, reverse polarity.
For welding mild steel and low alloy steel to cast iron and higher carbon steel.

UNIBRAZE 210.
M-1711; Phosphor copper brazing rod.
Maintenance repair on copper tubing, wire, sheet

UNIBRAZE 220.
M-1711; Silicon bronze electrode; AC-DC.
For surfacing steel, and for joining cast iron to steel and malleable iron.

UNIBRAZE 230.
M-1711; Phosphor copper silver brazing rod.
For brazing copper alloys.

UNIBRAZE 240.
M-1711; Phosphor bronze electrode; DC reverse polarity.
For welding and buildup on bronze castings, for joining steel, cast iron to bronze.

UNIBRAZE 250.
M-1711; All purpose stainless steel electrode, AC-DC, reverse polarity.
For maintenance repairs on steels, stainless, and clad steels.

UNIBRAZE 277.
M-1711; Nickel chrome high strength electrode, AC-DC.
For repairs of practically all steels.

UNIBRAZE 308 STAINLESS WELD WIRE.
M-1711; 0.07 max C, 20-22 Cr, 9.5-11.0 Ni, 1.0-2.0 Mn, 0.25-0.60 Si, bal Fe
For MIG, TIG, manual and submerged arc welding AISI Types 201, 202, 204, 301, 302, 304, 305, 308, 410, 430 stainless.
AWS A5.9-62T; ASTM A371-62T.

UNIBRAZE 308 ELC STAINLESS WELD WIRE.
M-1711, 0.03 max C, 20-22 Cr, 9.5-11.0 Ni. 1.0-2.0 Mn, 0.25-0.60 Si, bal Fe
For MIG, TIG, manual and submerged arc welding AISI 304L, 308L, 321 & 347 stainless.
AWS A5.9-62T, ASTM A371-62T.

UNIBRAZE 309 STAINLESS WELD WIRE.
M-1711; 0.12 max C, 23-25 Cr, 13-14 Ni. 1.0-2.0 Mn, 0.25-0.60 Si, bal Fe.
For MIG, TIG, manual and submerged arc welding AISI 309 stainless and stainless to mild steel.
AWS A5.9-62T; ASTM A371-62T.

UNIBRAZE 310
M-1711; Aluminum brazing rod
For use on light gage aluminum sheet, tubing, furniture, trucks, trailers

UNIBRAZE 310 STAINLESS WELD WIRE
M-1711, 0.10-0.15 C, 26-28 Cr, 20.5-22.5 Ni, 1.25-2.5 Mn, 0.25-0.60 Si, bal Fe
For MIG, TIG, manual and submerged arc welding AISI 310, 304 and some dissimilar stainless and carbon or alloy steels
AWS A5.9-62T, ASTM A371-62T, AMS 5694.

UNIBRAZE 312 STAINLESS WELD WIRE
M-1711, 0.08-0.15 C, 28-31 Cr, 8.5-10.5 Ni, 1.0-2.0 Mn, 0.25-0.60 Si, bal Fe.
For MIG, TIG, manual and submerged arc welding stainless to mild steels and high strength steels.
AWS A5.9-62T, ASTM A371-62T; AMS 5784

UNIBRAZE 316 STAINLESS WELD WIRE.
M-1711; 0.07 max C, 18-20 Cr, 12-14 Ni, 1.0-2.0 Mn, 0.25-0.60 Si, 2.0-2.5 Mo, 1.0 max Cb, bal Fe.
For MIG, TIG, manual and submerged arc welding AISI 316 stainless steel
AWS A5.9-62T; ASTM A371-62T; AMS 5690.

UNIBRAZE 316 ELC STAINLESS WELD WIRE.
M-1711; 0.03 max C, 18-20 Cr, 12-14 Ni, 1.0-2.25 Mn, 0.25-0.60 Si, 2.0-2.5 Mo, 1.0 max Cb, bal Fe.
For MIG, TIG, manual and submerged arc welding AISI 316 L stainless.
AWS A5.9-62T; ASTM A371-62T.

UNIBRAZE 330
M-1711; Aluminum brazing rod for build-up, and high strength joints; for castings also.

UNIBRAZE 345.
M-1711; Aluminum electrode-extruded coating, DC reverse polarity.
For miscellaneous maintenance repair of aluminum equipment.

UNIBRAZE 347 STAINLESS WELD WIRE.
M-1711; 0.07 max C, 19-21 Cr, 9.5-10.0 Ni, 1.2-2.0 Mn, 0.25-0.60 Si, Cb + Ta, bal Fe.
For MIG, TIG, manual and submerged arc welding AISI 321, 347, 304 and 304 L stainless.
AWS A5.9-62T; ASTM A371-62T.

UNIBRAZE 350.
M-1711; 50 Ag, 15.5 Cu, 15.5 Zn, 16 Cd, 3 Ni.
Melt range: 1195-1270°F; Braze: 1195-1270°F.
For torch or induction brazing ferrous and non-ferrous, including stainless steel; for brazing on carbide tips.
AWS A5.8-62T BAg-3; ASTM B260-62T BAg-3; AMS 4771.

UNIBRAZE 410 (bare), UNIBRAZE 410 FC (flux coated).
M-1711; Bronze brazing rod.
For joining and build-up on bronze, steel, cast iron, and miscellaneous alloys.

UNIBRAZE 410 STAINLESS WELD WIRE.
M-1711; 0.07-0.12 C, 12.0-13.5 Cr, 0.6 max Ni, 0.6 max Mn, 0.5 max Si, 0.5 max Mo, bal Fe
For MIG, TIG, manual and submerged arc welding of AISI 410, 403, 405, 414 & 416 stainless steels.
AWS A5.9-62T; ASTM A371-62T, AMS 5776

UNIBRAZE 430 STAINLESS WELD WIRE.
M-1711; 0.01 max C, 15.5-17 Cr, 0.6 max Ni, 0.6 max Mn, 0.5 max Si, bal Fe.
For MIG, TIG, manual and submerged arc welding of AISI 430 stainless steel.
AWS A5.9-62T; ASTM A371-62T.

UNIBRAZE 533.
M-1711, Die cast rod, Zinc-base.
For joining zinc to itself or other alloys.

UNIBRAZE 555.
M-1711; Aluminum solder rod, for torch or other heat application; melts at 700°F.
For miscellaneous maintenance on aluminum base materials.

UNIBRAZE 610
M-1711; Magnesium base rod.
For use on magnesium base materials.

UNIBRAZE No. 716 ALUMINUM BRAZING WIRE.
M-1711; Melting range: 970-1085°F
For torch brazing aluminum.
AWS & ASTM: BA1Si-3.

UNIBRAZE No. 718 ALUMINUM BRAZING WIRE.
M-1711; High silicon, aluminum base wire.
Melting range: 1070-1080°F.
For torch brazing aluminum.
AWS & ASTM: BA1Si-4.

UNIBRAZE 1000.
M-1711; High strength silver brazing rod, cadmium free.
For use on light gage materials.

UNIBRAZE 1010 (bare), UNIBRAZE 1010 FC (flux coated).
M-1711; Low melting point silver brazing rod.
For electrical, air conditioning, heating and ventilating work; joins dissimilar metals.

UNIBRAZE 1110.
M-1711; Lowest melting point silver brazing rod.
General purpose repair and salvage.

UNIBRAZE 1550 (bare), UNIBRAZE 1550 FC (flux coated).
M-1711; Premium silver brazing rod; cadmium free.
Particularly for joints that must be corrosion resistant.

UNIBRAZE 1640.
M-1711; Silver brazing rod for tool tipping with carbide.

UNIBRAZE ALUMINUM BRONZE.
M-1711; 88.2 Cu, 1.5 Fe, 10.0 Al, 0.25 P.
MP.: 1967°F approx.
For shielded metal arc and gas metal arc braze welding and build up on ferrous and non-ferrous alloys.
AWS A5.6-57T Class A1-A2; ASTM B225-57T Class ECuA1-A2.

UNIBRAZE ALUMINUM WELDING ROD.
M-1711, Available in all aluminum alloy weldable grades
For gas welding and inert tungsten gas (TIG) welding of aluminum alloys.
AWS A5-10, ASTM B285, Fed. QQ-R-566

UNIBRAZE ALUMINUM WELDING WIRE.
M-1711, Available in all aluminum alloy weldable grades
For inert gas metal arc (MIG) welding of aluminum alloys

UNIBRAZE CUT ROD.
M-1711, AC-DC; reverse polarity on DC A fast working electrode without use of oxygen.
For cutting, beveling, gouging, piercing on most commercial metals

UNIBRAZE DEOXIDIZED COPPER
M-1711, 98.8 Cu, 0.75 Sn, 0.25 Si, 0.2 Mn.
MP: 1967°F approx
For inert gas and oxyacetylene welding and build up on copper tanks and assemblies
AWS A5.6-57T Class ECU; 5.7-57T Class RCu, ASTM B225-57T Class ECU; B259-57T Class RCu.

UNIBRAZE FABWELD
M-1711, All purpose mild steel electrode, AC-DC, reverse polarity
For maintenance and sheet metal welding

UNIBRAZE GROOVING ROD.
M-1711; AC-DC; reverse polarity on DC.
For chamfering, routing, channeling, removing excess metal, gouging out old welds

UNIBRAZE LOW FUMING BRONZE.
M-1711, 57.8 Cu, 40.3 Zn, 0.95 Sn, 0.85 Fe, 0.10 Si, 0.03 Mn
MP. 1598°F approx.
For oxyacetylene braze welding of steel, cast iron and copper alloys
AWS A5.7-57T Class RCuZn-C; ASTM B259-57T Class RCuZn-C.

UNIBRAZE MAGNESIUM WELDING WIRE.
M-1711; Available as AZ92A, AZ61A, or EZ33A.
Meets AWS, ASTM and Government Specs.

UNIBRAZE NAVAL BRONZE.
M-1711; 59 Cu, 40.4 Zn, 0.60 Sn
MP. 1625°F Approx
For oxyacetylene braze welding and build-up on cast iron and steel
AWS A5.7-57T Class RBCuZn-A; ASTM B259-57T Class RBCuZn-A.

UNIBRAZE NICKEL BRONZE.
M-1711, 59 Cu, 39 Zn, 0.9 Sn, 0.32 Ni, 0.42 Fe, 0.23 Mn, 0.7 Si.
MP: 1598°F. approx.

For oxyacetylene braze welding on malleable iron and steel.
AWS A5.7-57T Class RCuZn-B; ASTM B259-57T Class RCuZn-B.

UNIBRAZE NICKEL SILVER.
M-1711; 48.6 Cu, 41 Zn, 10.2 Ni, 0.15 Si, 0.02 P.
MP: 1706°F. approx.
For oxyacetylene braze welding iron and steel for color match.
AWS A5.7-57T Class RBCuZn-D; ASTM B259-57T Class RBCuZn-D.

UNIBRAZE PHOSPHOR BRONZE A.
M-1711; 94.8 Cu, 5.0 Sn, 0.20 P.
MP: 1922°F. Approx.
For inert gas and carbon arc welding of phosphor bronze and copper, and repair of castings.
AWS A5 13-56T Class RCuSn; ASTM A399-56T Class RCuSn.

UNIBRAZE PHOSPHOR BRONZE C.
M-1711, 91 9 Cu, 8 0 Sn, 0.1 P.
MP: 1880°F approx.
For joining and repair of ferrous and non-ferrous parts, and for build-up.
AWS A5 6-57T Class ECuSn-C; ASTM B225-57T Class ECuSn-C

UNIBRAZE PHOSPHOR BRONZE D.
M-1711; 89.75 Cu, 10 0 Sn, 0.25 P.
MP. 1832°F approx
For inert gas and carbon arc braze welding of ferrous and non ferrous alloys and for wear resistant surfacing and build-up.
AWS A5.13-56T Class RCuSn-D; ASTM A399-56T.

UNIBRAZE SILICON BRONZE.
M-1711; 95 8 Cu, 3.1 Si, 1.1 Mn
MP: 1866°F. approx
For inert gas, carbon-arc and oxyacetylene welding of copper base alloys and ferrous metals
AWS A5 6-57T Class ECuSi, A5 7-57T Class RCuSi-A; ASTM B225-57T Class ECuSi; B259-57T Class RCuSi-A.

UNIBROACH
M-114, 0.8 C, 4 Cr, 6 25 W, 6.25 Mo, 2.4 V, bal Fe
For finishing tools, cutters, hobs, reamers; high speed steel

UNICO
M-344, 0 7 C, 0.4 Mn, 0 4 Si, 0 7 Cr, 1.4 W, bal Fe
For pneumatic and flogging tools, shears, oil hardened, shock resistant.

UNICUT
M-114, 1.0 C, 6 25 W, 4 Cr, 2 4 V, 6.25 Mo, bal Fe For lathe and planer tools, drills, taps, reamers, hobs; Type M3; high speed steel.

UNICUT-2.
M-114, 1.2 C, 6.0 Mo, 6 0 W, 4.0 Cr, 3.0 V, bal Fe.
Hardened C64-68 Rock.
For cutters, drills, taps, end mills, reamers, hobs, form tools, lathe and planer tools, slitting saws, punches, drawing dies. Abrasion resistant, good red-hardness.
AISI M3, Type 2. High speed steel

UNIDAL.
M-249; 4-6 Zn, 0.5-1.5 Mg, bal Al.
Extruded: 40,000 TS; 24,000 YS; 17 El; 85 Brin.
For architecture; heat treatable.

UNI-DIE.
M-35; 0.7 C, 2 0 Mn, 1.3 Mo, bal Fe.
Annealed: 180 Brin.
For tools, blanking, cutting and forming dies; oil hardening, non-deforming.

UNI-DIE SMOOTHCUT.
M-35; 0.67-0.75 C, 2.0-2.25 Mn, 1.2-1.4 Mo, S, 0.90-1.10 Cr, bal Fe.
Ht. Tr.: 292,000 S; 264,000 YS; 1 El; C 55 Rock.
For coining and notching dies, shear blades, blanking and forming dies, plastic mold dies.
Air hardening, cold work tool steel Type A6.

UNIFONT.
M-249, M-1605, M-1634; 4-6 Zn, 0.5-1.5 Mg, bal Al.
Sand cast: 28,000 TS; 20,000 YS; 4.5 El; 65 Brin.
Chill cast: 33,000 TS; 22,000 YS; 6 El; 75 Brin.
For architecture, ship and auto construction; not heat treatable.

UNIFONT 5.
M-1605; 0.8-1.0 Mg, 4.8-5.2 Zn, bal Al.
Sand cast & Aged. 37,000 TS; 24,000 YP; 3-6 El; 70 Brin.
Die cast and Aged: 40,000 TS; 31,000 YP; 4-8 El; 80 Brin
For architecture, ship and auto components.
Self-hardening Sand and die castings.

UNILOY 14 CMV replaced by UNITEMP 14 CMV.

UNILOY 14 HV replaced by UNITEMP 14 HV.

UNILOY 14 HW replaced by UNITEMP 14 HW.

UNILOY 14 MV replaced by UNITEMP 14 MV.

UNILOY 15-35 replaced by UNITEMP 330.

UNILOY 16-8 replaced by UNILOY 301.

UNILOY 16-18
M-114; 0 08 max C, 15-17 Cr, 17-19 Ni, 2 max Mn, 1.0 max Si, bal Fe.
Wire: 75,000 TS, 35,000 YS, 55 El
For cold headed fasteners and parts.
Stainless, austenitic, Excellent cold headability.

UNILOY 17-4 MO.
M-114; 0 10 C, 17.0 Cr, 4 0 Ni, 3.0 Mo, bal Fe.
At R.T 191,900 TS, 146,900 YS, 13 5 El
At 1200°F: 45,240 TS, 29,230 YS, 42.0 El
For knife blades, valves, springs, high strength structural applications up to 1000°F.
Precipitation hardening stainless.
Name changed to Unitemp 350.

UNILOY 18-8 replaced by UNILOY 302.

UNILOY 18-8M replaced by UNILOY 303.

UNILOY 18-8S replaced by UNILOY 304.

UNILOY 18-8Ti replaced by UNILOY 321.

UNILOY 18-12S replaced by UNILOY 305.

UNILOY 18-14S-Mo replaced by UNILOY 316.

UNILOY 19-9 DL replaced by UNITEMP 19-9 DL.

UNILOY 19-9 W Mo replaced by UNITEMP 19-9 W Mo

UNILOY 19-9 WX replaced by UNITEMP 19-9 WX.

UNILOY 19-14 SM replaced by UNILOY 317.

UNILOY 20-10S replaced by UNILOY 308.

UNILOY 20-25 replaced by UNILOY 311.

UNILOY 24-11.
M-114; 0 15-0.30 C, 0.5-0.8 Mn, 0 9-1.2 Si, 22-25 Cr, 10-12 Ni, bal Fe.
At 70°F.: 112,500 TS; 33 El; 236 Brin.
At 1200°F.: 67,500 TS; 22 El.
For heat resisting purposes; cannot be hardened by heat treatment; resists heat up to 2100°F.

UNILOY 25-12 replaced by UNILOY 309.

UNILOY 25-12S replaced by UNILOY 309 S.

UNILOY 25-20 replaced by UNILOY 310.

UNILOY 25-20H replaced by UNILOY 314.

UNILOY 36.
M-114; 35-36 Ni, 0.35 Mn, 0.12 Si, 0.04 C, bal Fe.
Bar: 68,000 TS, 36,000 YS, 44 El, 78 RA.
At −100°F: 87,000 TS, 60,000 YS, 42 El, 73 RA.
For thermostats, temperature control devices, bimetals, length standards.
Low coefficient expansion.

UNILOY 42 replaced by UNISEAL 42.

UNILOY 49 replaced by UNISEAL 52.

UNILOY 50 Cr/50 Ni.
M-114; 50 Cr, 1.0 Ti, 0.06 C, bal. Ni.
Annealed: 125,000 TS, 72,000 YS, 18 El, 20 RA, C28 Rock.
For equipment in the pulp and paper industry, power production, waste incinerator, petroleum refining, fuel-oil fired heaters. Excellent resistance to oil and acid corrosion. Resists sulfidation.

UNILOY 201.
M-114; 0.15 max C, 16-18 Cr, 3.5-5.5 Ni, 5.5-7.5 Mn, 1.0 max Si, 0.25 max N, bal Fe.
Ann: 115,000 TS; 55,000 YS; 55 El, 90 Rock B
Good corrosion resistance, nonmagnetic (Ann.), good resistance to scaling to 1450°F; good impact strength.
For parts requiring corrosion resistance
AISI Type 201 stainless steel; SAE 30201.

UNILOY 202
M-114; 0.15 max C, 17-19 Cr, 4-6 Ni, 7.5-10.0 Mn, 1.0 max Si, 0.25 max N, bal Fe
Ann: 105,000 TS; 55,000 YS; 55 El; 90 Rock B.
Good corrosion resistance, non-magnetic (Ann.), good resistance to scaling to 1500°F; good impact strength.
For parts requiring corrosion resistance
AISI Type 202 stainless steel; SAE 30202.

UNILOY 301.
M-114; 0.15 max C, 16-18 Cr, 6-8 Ni, 2.0 max Mn, 1.0 max Si, bal Fe.
Ann: 110,000 TS; 40,000 YS; 60 El; 85 Rock B.
Corrosion resistant; work hardens rapidly to max of about 180,000 psi TS.
Cold worked materials for springs and strong, stainless stampings.
AISI Type 301 stainless steel, SAE 30301; AMS 5519.

UNILOY 302
M-114; 0.15 max C, 17-19 Cr, 8-10 Ni, 2.0 max Mn, 1.0 max Si, bal Fe
Ann: 85,000 TS; 35,000 YS; 60 El; 150 Brin.
Austenitic, non-magnetic (Ann.), corrosion resistant, ductile.
For stainless steel parts and assemblies, particularly stampings; food industry.
AISI Type 302 Stainless; SAE 30302.

UNILOY 303, 303 Se.
M-114; 0.15 max C, 17-19 Cr, 8-10 Ni, 2.0 max Mn, 1.0 max Si, 0.15 min S or Se, 0.6 max Mo, bal Fe.
Ann: 90,000 TS; 35,000 YS; 50 El; 160 Brin.
Corrosion resistant, austenitic, free machining.
For stainless parts made on automatic screw machines, screws, studs, nuts.
AISI Type 303; SAE 30303; AMS 5640.

UNILOY 303 MA.
M-114; 0.15 max C, 2 max Mn, 1 max Si, 0.11-0.16 S, 17-19 Cr, 8-10 Ni, 0.4-0.6 Mo, 0.6-1.0 Al, bal Fe.
Cold drawn, 100,000 TS, 60,000 YS, 40 El, 55 RA, 228 Brin.
Ann: 90,000 TS, 40,000 YS, 50 El, 60 RA, 160 Brin.
For stainless screw machine products, switch gears, pump and valve parts, fittings.
Free machining, stainless, austenitic, non-magnetic.
AMS 5638.

UNILOY 304.
M-114; 0.08 max C, 18-20 Cr, 8-10 Ni, 2.0 max Mn, 1.0 max Si, bal Fe.
Ann: 85,000 TS; 35,000 YS; 60 El; 150 Brin.
Austenitic, corrosion resistant.
For stainless stampings, structural parts, cold formed parts, rivets, beer barrels.
AISI Type 304 Stainless; SAE 30304.

UNILOY 304 L.
M-114; 0.03 max C, 2.0 Max Mn, 1.0 max Si, 18-20 Cr, 8-10 Ni, bal Fe.
Ann, R.T.: 85,000 TS; 37,000 YS; 57 El.
−320°F; 235,000 TS; 56,000 YS; 40 El.
1400°F, 29,000 TS; 11,000 YS, 36 El.
Austenitic, stainless, weldable.
For welded assemblies for cryogenic to room temperature to elevated temperature operation, tanks, etc.
AISI Type 304L; SAE 30304 L.

UNILOY 305
M-114, 0.12 max C, 17-19 Cr, 10-13 Ni, 2.0 max Mn, 1.0 max Si, bal Fe.
Ann. 85,000 TS, 38,000 YS; 50 El; 8 Rock B.
Austenitic, corrosion resistant; less tendency to work harden.
For stainless stampings, formed parts
AISI Type 305 Stainless; SAE 30305.

UNILOY 308
M-114, 0.08 max C, 2.0 max Mn, 1.0 max Si, 19-21 Cr, 10-12 Ni, bal Fe.
Wire. Ann 115,000 TS; 80,000 YS, 40 El.
For weld rod, industrial furnaces, equipment for hot sulphite liquor
AISI Type 308 Stainless

UNILOY 308L
M-114, 0.03 max C, 2.0 max Mn, 1.0 max Si, 19-21 Cr, 10-12 Ni, bal Fe
Main use is weld rod for welding austenitic and ferritic stainless steels.

UNILOY 309
M-114; 0.20 max C, 2.0 max Mn, 1.0 max Si, 22-24 Cr, 12-15 Ni, bal Fe
Ann, 70°F: 90,000 TS; 40,000 YS; 45 El; 160 Brin.
1600°F 21,000 TS, 17,500 YS; 50 El
Austenitic, corrosion resistant, good resistance to scaling to 1800°F, weldable.
For furnace parts, aircraft and jet engine parts, heat exchangers, chemical equipment
AISI Type 309 Stainless; SAE 30309.

UNILOY 309 S
M-114; 0.08 max C, 2.0 max Mn, 1.0 max Si, 22-24 Cr, 12-15 Ni, bal Fe.
Ann, 70°F 90,000 TS, 40,000 YS; 45 El, 160 Brin.
1600°F. 21,000 TS; 17,500 YS; 50 El.
Austenitic, corrosion resistant, good resistance to scaling to 1800°F, preferred for welding
For furnace parts, welded assemblies for aircraft and jet engine parts, heat exchangers.
AISI Type 309S, SAE 30309S; AMS 5650.

UNILOY 309S-Cb.
M-114; 0.08 max C, 2.0 max Mn, 1.0 max Si, 22-24 Cr, 12-15 Ni, Cb + Ta = 10 × %C, bal Fe.
Low carbon, columbium stabilized, austenitic weld rod for welding Type 309 and similar metals for high temperature service.

UNILOY 310.
M-114; 0.25 max C, 2.0 max Mn, 1.5 max Si, 24-26 Cr, 19-22 Ni, bal Fe.
Ann, RT: 95,000 TS; 45,000 YS; 50 El; 89 Rock B.

1600°F: 25,000 TS; 17,000 YS; 33 El.
For furnace parts, aircraft and jet engine parts, heat exchangers, petroleum refining, weld rods, chemical equipment.
AISI Type 310 stainless; SAE 30310; AMS 5651, 5521.

UNILOY 310S.
M-114; 0.08 max C, 2.0 max Mn, 1.50 max Si, 24-26 Cr, 19-22 Ni, bal Fe.
Similar to Uniloy 310, but preferred for weld rods and some welded assemblies.
AISI Type 310S.

UNILOY 314.
M-114; 0.25 max C, 2.0 max Mn, 1.5-3.0 Si, 23-26 Cr, 19-22 Ni, bal Fe.
Ann, RT: 95,000 TS; 45,000 YS; 50 El; 89 Rock B.
1600°F: 25,000 TS; 17,000 YS; 33 El.
For furnace parts, heat exchangers, oil refining; particularly for carburizing atmospheres as carburizing boxes and retorts.
AISI Type 314; SAE 30314; AMS 5652.

UNILOY 316.
M-114, 0.08 max C, 2.0 max Mn, 1.0 max Si, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Ann: 80,000 TS; 30,000 YS; 60 El; 149 Brin.
Ann, CD: 90,000 TS; 60,000 YS; 45 El; 190 Brin.
Excellent corrosion resistance, weldable.
For photographic equipment, pulp and paper, pharmaceutical and textile equipment
AISI Type 316; SAE 30316; AMS 5648.

UNILOY 316F.
M-114; 0.08 max C, 2.0 max Mn, 1.0 max Si, 0.10 min S, 0 10 min P, 17-19 Cr, 10-14 Ni, 1.75-3.0 Mo, bal Fe.
Free machining grade of Uniloy 316.
For stainless parts requiring appreciable machining.
AMS 5649.

UNILOY 316L.
M-114; 0.03 max C, 2.0 max Mn, 1.0 max Si, 16-18 Cr, 10-14 Ni, 2.0-3 0 Mo, bal Fe.
Preferred for weld wire and welded assembiles for high temperature operation and for equipment for chemical plants.
AISI Type 316L; SAE 30316 L: AMS 5653.

UNILOY 317
M-114; 0.08 max C, 2.0 max Mn, 1.0 max Si, 18-20 Cr, 11-15 Ni, 3.0-4.0 Mo, bal Fe.
Ann: 80,000 TS; 30,000 YS; 60 El; 149 Brin
Austenitic, excellent corrosion resistance, maximum resistance to pitting.
For boat trim, chemical processing equipment, exhaust manifolds.
AISI Type 317; SAE 30317.

UNILOY 317L
M-114; 0.03 max C, 2.0 max Mn, 1.0 max Si, 18-20 Cr, 11 15 Ni, 3.0-4.0 Mo, bal Fe
For weld rod and for welded assemblies for corrosive conditions.

UNILOY 318.
M-114; 0 08 max C, 2.0 max Mn, 1.0 max Si, 17-19 Cr, 13-15 Ni, 2 0-3.0 Mo, Cb + Ta = 10 × %C, bal Fe.
Ann. RT: 80,000 TS; 30,000 YS; 60 El; 149 Brin.
1600°F: 24,000 TS; 16,000 YS; 39 El
For weld wire, welded assemblies and for elevated temperature operation; furnace parts, heat exchangers, exhaust manifolds.

UNILOY 321.
M-114; 0.08 max C, 2.0 max Mn, 1 0 max Si, 17-19 Cr, 9.0-12.0 Ni, Ti = 5 × %C min, bal Fe.
Ann. RT: 85,000 TS; 35,000 YS; 45 El; 150 Brin.
1600°F: 17,000 TS; 13,500 YS; 57 El.
For parts and welded assemblies operating intermittently in 900-1600°F range.
Aircraft exhaust manifolds, jet engine parts, pressure vessels, heat treat equipment.
AISI Type 321; SAE 30321; AMS 5510, 5645.

UNILOY 325.
M-114; 0.4 C, 1.2 Si, 0.6 Mn, 7-10 Cr, 19-23 Ni, bal Fe.
Forged: 141,000-108,000 TS; 27-50 El; 248-167 Brin.
For applications where superheated steam, hot oils, sulphides, hot sulphur are encountered; non-corrosive and heat resistant; resists scaling up to 1500°F.

UNILOY 326.
M-114; 0.05 max C, 1.0 max Mn, 0.60 max Si, 25-27 Cr, 6-7 Ni, 0.25 max Ti, bal Fe.
About 30% austenitic but ferro magnetic.
Ann: 90,000-100,000 TS; 75,000 YS; 30 El.
Hardenable to about 180,000 TS by cold work;
Resistant to corrosion and stress corrosion.
For cold headed bolts and cold headed fasteners for paper pulp, food and chemical industries.

UNILOY 330.
M-114; 0.20 max C, 2.0 max Mn, 1.5 max Si, 14.50-16.50 Cr, 34-37 Ni, bal Fe.
Ann. RT.: 85,000 TS; 42,000 YS; 43 El.
2000°F: 5100 TS; 3900 YS; 72 El.
Good strength and scaling resistance at high temperature.
For annealing fixtures, carburizing boxes, furnace parts operating up to 2100°F.

UNILOY 347.
M-114; 0.08 max C, 2.0 max Mn, 1.0 max Si, 17-19 Cr, 9-13 Ni, Cb + Ta = 10 × %C min, bal Fe.
Stabilized stainless for weld rod, welded assemblies, and for operation 900-1600°F.
For aircraft exhaust manifolds, fire walls, pressure vessels, high temperature chemical handling equipment.
AISI Type 347; SAE 30347; AMS 5512, 5646.

UNILOY 347F-Se.
M-114; 0.08 max C, 2.0 max Mn, 1.0 max Si, 0.10 min P, 0.030 max S, 17-19 Cr, 9-12 Ni, Cb + Ta = 10 × %C min, 0 15 min Se, bal Fe.
Ann. RT.: 90,000 TS; 35,000 YS; 50 El, 160 Brin.
1600°F: 20,000 TS; 15,000 YS; 84 El.
Free machining, stabilized, austenitic, stainless.
For machined parts to operate intermittently to 900-1600°F range.
AMS 5642

UNILOY 348
M-114; 0 08 max C, 2.0 max Mn, 1.0 max Si, 17-19 Cr, 9-13 Ni, Cb + Ta = 10 × %C min, 0 10 max Ta, 0.20 max Co, bal Fe.
Stabilized, austenitic, weldable stainless,—similar to Uniloy 347 except restricted Tantalum and Cobalt content.
For nuclear applications
AISI Type 348; SAE 30348; AMS 5646.

UNILOY 403
M-114; 0.15 max C, 1.0 max Mn, 0.5 max Si, 11 5-13.0 Cr, bal Fe.
Ann: 75,000 TS; 40,000 YS; 35 El; 155 Brin
Heat treatable, martensitic, weldable, stainless.
Hardenable to 100,000-195,000 psi TS.
For turbine wheels, valve parts, cutlery, sporting goods, rifle barrels.
AISI Type 403; SAE 51403; AMS 5613

UNILOY 405.
M-114; 0.08 max C, 1.0 max Mn, 1.0 max Si, 11.5-14.5 Cr, 0.10-0.30 Al, bal Fe.
Ann, CD.: 85,000 TS; 70,000 YS; 20 El, 185 Brin.
Weldable, not readily hardenable; good corrosion resistance.
Designed for welded assemblies that harden only slightly in the welded area.
AISI 405; SAE 51405.

UNILOY 410.
M-114; 0.15 max C, 1.0 max Mn, 1.0 max Si, 11.5-13.5 Cr, bal Fe.
Ann: 75,000 TS; 40,000 YS; 35 El; 155 Brin.
Hardenable to 100,000-190,000 TS; weldable, magnetic, martensitic, corrosion resistant.
For turbine blades, cutlery, pump parts, mining machinery, fishing poles
AISI Type 410; SAE 51410; AMS 5504, 5613.

UNILOY 414.
M-114; 0.15 max C, 1.0 max Mn, 1.0 max Si, 11.5-13.5 Cr, 1.25-2.50 Ni, bal Fe.
Hardenable, martensitic, stainless.
Air or oil hardenable to approximately 200,000 TS max.
For beater bars, fasteners, gage parts, springs, mining equipment cutlery, shafts, valve seats.
AISI 414; SAE 51414; AMS 5615.

UNILOY 416.
M-114; 0.15 max C, 1.25 max Mn, 0.06 max P, 0.15 min S, 1.0 max Si. 12-14 Cr, 0.60 max Mo, bal Fe.
Ann, CD: 100,000 TS; 85,000 YS; 15 El; 215 Brin.
Ht. Tr.: 100,000-190,000 TS, 90,000-145,000 YS; 9-18 El; 26-42 Rock C.
Free machining, martensitic, corrosion resistant.
For shafts, valves, parts made on automatic screw machines, studs, pump parts
AISI 416; SAE 51416; AMS 5610.

UNILOY 420.
M-114; 0.15 min C, 1.0 max Mn, 1.0 max Si, 12-14 Cr, bal Fe.
Air hardened: 110,000-250,000 TS; 70,000-200,000 YS; 22-7 El; 500-200 Brin.
Martensitic, magnetic, corrosion resistant.
For cutlery, hand tools, dental and surgical instruments, valve trim and parts, shafts
AISI 420; SAE 51420; AMS 5506, 5621.

UNILOY 420 F.
M-114; 0.15 min C, 1.0 max Mn, 1.0 max Si, 0.04 max P, 0.15 min S, 12-14 Cr, 0.60 max Mo, bal Fe.
Martensitic, free-machining, air hardenable, corrosion resistant
Air hardenable to 110,000-250,000 TS.
For shafts, hardware, screw machine parts, small turbine wheels, splined shafts.
AISI 420 F; SAE 51420 F; AMS 5620.

UNILOY 420 F-Se.
M-114; 0.15 min C, 1.0 max Mn, 1.0 max Si, 0.040 max P, 0.030 max S, 12-14 Cr, 0.60 max Mo, 0.15 min Se, bal Fe.
Same as Uniloy 420 F except that Selenium replaces Sulphur for free machining properties.

UNILOY 430
M-114; 0.12 max C, 1.0 max Mn, 1.0 max Si, 14-18 Cr, bal Fe.
Ann: 80,000 TS; 55,000 YS; 30 El; 170 Brin.
Ferritic, magnetic, non-hardenable by heat treat, corrosion resistant.
For architectural and automotive trim and moldings, nitric acid tanks, table ware, plumbing supplies.
AISI 430: AMS 51430: AMS 5503. 5627.

UNILOY 430 F.
M-114; 0.12 max C, 1.25 max Mn, 1.0 max Si, 0.060 max P, 0.15 min S, 14-18 Cr, 0.60 max Mo, bal Fe.
Ann: 80,000 TS; 55,000 YS; 25 El; 170 Brin.
Ferritic, magnetic, non-hardenable by heat treat, free machining, corrosion resistant.
For corrosion resistant studs, bolts, nuts, etc. being machined on automatic screw machines.
AISI 430 F; SAE 51430 F.

UNILOY 430 F-Se.
M-114, 0.12 max C, 1.25 max Mn, 1.0 max Si, 0.060 max P, 0.060 max S, 14-18 Cr, 0.15 min Se, bal Fe.
Same as Uniloy 430 F except that Selenium replaces Sulphur for free machining properties.
AISI 430 F-Se, SAE 51430 F-Se.

UNILOY 430 Ti.
M-114; 0.12 max C, 1.0 max Mn, 1.0 max Si, 16-18 Cr, Ti = 6 × %C min, bal Fe.
Same as Uniloy 430 except that Titanium improves ductility of welds.

UNILOY 431.
M-114, 0.20 max C, 1.0 max Mn, 1.0 max Si, 15-17 Cr, 1.25-2.50 Ni, bal Fe.
Ann 125,000 TS, 95,000 YS; 20 El; 260 Brin.
Oil hardened. 150,000-210,000 TS; 110,000-165,000 YS; 20-14 El; 31-45 Rock C.
Martensitic, weldable, corrosion resistant; good strength to 900°F
Aircraft fittings, pump shafts, marine hardware, valve parts, conveyor parts
AISI 431; SAE 51431; AMS 5628.

UNILOY 434.
M-114, 0.12 max C, 1.0 max Mn, 1.0 max Si, 14-18 Cr, 0.75-1.25 Mo, bal Fe.
Same as Uniloy 430 except that added Molybdenum improves resistance to pitting from de-icing chemicals. AISI 434

UNILOY 435.
M-114; 0.12 max C, 1.0 max Mn, 1.0 max Si, 14-18 Cr, 0.40-0.60 Cb + Ta, bal Fe
Same as Uniloy 430 except that Cb + Ta improves surface smoothness when metal is stretch bent or deep drawn

UNILOY 436
M-114, 0.12 max C, 1.0 max Mn, 1.0 max Si, 14-18 Cr, 0.75-1.25 Mo, 0.40-0.60 Cb + Ta, bal Fe
Similar to Uniloy 430 but produces smoother surfaces on deep drawing and improved resistance to pitting from de-icing chemicals. AISI 436.

UNILOY 440 A
M-114; 0.60-0.75 C, 1.0 max Mn, 1.0 max Si, 16-18 Cr, 0.75 max Mo, bal Fe.
Ann: 115,000 TS; 90,000 YS, 12 El; 240 Brin.
Ht Tr. 260,000 TS; 240,000 YS; 5 El; 510 Brin.
Martensitic, magnetic, corrosion resistant.
For cutlery, bearings, valves, surgical and dental instruments.
AISI 440 A; SAE 51440 A; AMS 5631.

UNILOY 440 B
M-114; 0.75-0.95 C, 1.0 max Mn, 1.0 max Si, 16-18 Cr, 0.75 max Mo, bal Fe.
Air or oil hardenable to 270,000-280,000 TS.
Holds high hardness to 900°F.
Corrosion resistant, magnetic.
For bearings, cutlery, spatula blades, food processing knives.
AISI 440 B; SAE 51440 B

UNILOY 440 C.
M-114; 0.95-1.20 C, 1.0 max Mn, 1.0 max Si, 16-18 Cr, 0.75 max Mo, bal Fe.
Air or oil hardenable to 275,000-285,000 TS, and 580 Brin; retains hardness after tempering to 900°F of 55-57 Rc; corrosion resistant.
For cutlery, bearings, nozzles, balls and seats for oil well pumps.
AISI 440 C; SAE 51440 C; AMS 5630.

UNILOY 440 F.
M-114; 0.95-1.20 C, 1.0 max Mn, 1.0 max Si, 0.040 max P, 0.05 min S, 16-18 Cr, 0.75 max Mo, bal Fe.
Free machining grade of Uniloy 440 C.
For parts requiring considerable machining before heat treating.
SAE 51440 F; AMS 5632.

UNILOY 440 F-Se
M-114; 0.95-1.20 C, 1.0 max Mn, 1.0 max Si, 0.040 max P, 0.030 max S, 16-18 Cr, 0.75 max Mo, 0.10 min Se, bal Fe.
Similar to Uniloy 440 F except that Selenium replaces Sulphur for free machining properties.
SAE 51440 F-Se.

UNILOY 442.
M-114; 0.20 max C, 1.0 max Mn, 1.0 max Si, 18-23 Cr, bal Fe.
Ann, RT: 75,000 TS; 45,000 YS; 30 El; 160 Brin.
1600°F 4500 TS, 3500 YS; 87 El.
Ferritic, non-hardenable stainless, weldable.
For annealing boxes, oil burner parts, nozzles, heating elements.
AISI 442

UNILOY 443
M-114, 0.20 max C, 1.0 max Mn, 1.0 max Si, 18-23 Cr, 0.90-1.25 Cu, bal Fe.
Same properties and characteristics as Uniloy 442, but more resistant to action of dilute sulphuric acid

UNILOY 446.
M-114, 0.20 max C, 1.5 max Mn, 1.0 max Si, 23-27 Cr, 0.25 max N, bal Fe
Ann, RT.: 80,000 TS, 50,000 YS: 25 El; 170 Brin.
1800°F: 2500 TS; 2000 YS, 135 El
Ferritic, non-hardenable, stainless, weldable.
Oxidation resistant at high temperatures.
For annealing boxes, salt bath electrodes, oil burner parts, metal to glass seals
AISI 446; SAE 51446.

UNILOY 501
M-114; 0.10 min C, 4-6 Cr, bal Fe
Annealed: 70,000 TS; 30,000 YS; 28 El; 65 RA, 160 Brin
Heat treated: 175,000 TS; 135,000 YS; 15 El, 50 RA, 370 Brin
For oil refinery equipment, fittings, grate bars; Type 501, corrosion resistant.

UNILOY 502.
M-114; 0.10 max C, 4-6 Cr, 0.5 Mo, bal Fe.
Annealed: 70,000 TS; 32,000 YS; 28 El; 65 RA, 160 Brin
Heat treated: 180,000 TS; 140,000 YS; 13 El; 45 RA; 380 Brin.
For oil refinery equipment, fittings, grate bars; Type 502; corrosion resistant.

UNILOY 1409 replaced by UNILOY 410.

UNILOY 1409 Al
M-114; 3.25-4.50 Al, 12-14 Cr, bal Fe
For electrical resistance rod and wire, oxidation resistant to 1600°F.

UNILOY 1409 NH replaced by UNILOY 405.

UNILOY 1409 Ni replaced by UNILOY 414.

UNILOY 1409 TB replaced by UNILOY 403.

UNILOY 1415 NW replaced by UNITEMP 1415 NW.

UNILOY 1420 WM replaced by UNITEMP 1420 WM.

UNILOY 1430 MV replaced by UNITEMP 1430 MV.

UNILOY 1435 replaced by UNILOY 420.

UNILOY 1435 M replaced by UNILOY 420 F.

UNILOY 1809 replaced by UNILOY 430.

UNILOY 1809 M replaced by UNILOY 430 F.

UNILOY 1809 Ni replaced by UNILOY 431.

UNILOY 1860 replaced by UNILOY 440 A.

UNILOY 1890 replaced by UNILOY 440 B.

UNILOY 2009 replaced by UNILOY 442.

UNILOY 2525 replaced by UNILOY 446.

UNILOY 15100 Mo.
M-114; 1.05 C, 14.5 Cr, 4.0 Mo, bal Fe
Martensitic, corrosion resistant, high strength and hardness to 1000°F.
For bearings, gears, shafts, loaded stress parts operating up to 1000°F.
AISI 618; Modified 440 C + Mo.

UNILOY 18100 replaced by UNILOY 440 C.

UNILOY 18100 F Se replaced by UNILOY 440 F Se.

UNILOY 18110 BM replaced by UNILOY 440 C.

UNILOY A286 replaced by UNITEMP A286.

UNILOY D319.
M-114, 0.07 max C, 2.0 max Mn, 1.0 max Si, 17.5-19.5 Cr, 11-15 Ni, 2.25-3.0 Mo, bal Fe.
Austenitic, corrosion resistant.
For parts, and assemblies for chemical industry,- certain improvements over Uniloy 316.

UNILOY EB 26-1.
M-114, 0.005 max C, 25.0-27.0 Cr, 0.40 max Mn, 0.75-1.25 Mo, 0.40 max Si, bal Fe.
Ann: 65,000-78,000 TS, 53,000-61,000 YS, 24-30 El; 83-86 Rock B
Hardenable to about 116,000 TS by cold work.
Corrosion and stress corrosion resistant, weldable, magnetic.
For marine equipment, chemical equipment, food and beverage equipment, pulp and paper.

UNILOY-HC
M-114, 0.06 C, 15 Cr, 1.5 Co, 16 Mo, 3.75 W, 5.75 Fe, 0.2 V, bal. Ni
Heat Treated: 116,000 TS, 56,000 YS, 52 El, Rock B 95.
At 1600°F: 57,000 TS, 38,000 YS, 49 El.
For chemical processing equipment, process vessels, pump parts, valves, aircraft and aerospace components Corrosion resistant Resists repeated thermal shock at 1600 to 1800°F.

UNILOY HV replaced by UNITEMP HV.

UNILOY M-252 replaced by UNITEMP M252.

UNILOY N-155 replaced by UNITEMP N-155.

UNILOY S 590 replaced by UNITEMP S 590.

UNILOY S-817
M-114; 0.32-0.42 C, 1-2 Mn, 19-21 Cr, 3.5-4.5 W, 19-21 Ni, 4 Mo, bal Co.
Rolled: 125,000-145,000 TS; 55,000-75,000 YS; 35-22 El; 31-20 RA.
For turbine rotors, buckets, shafts, bolts;

UNILOY SPECIAL NO. 2 (21-12)
replaced by UNILOY 21-12 N.

UNIMACH NO. 1.
M-114; 0.40 C, 0.40 Mn, 1.0 Si, 5 Cr, 1.4 Mo, 1.0 V, bal Fe.
Heat treated: 225,000-305,000 TS; 195,000-255,000 YS; 15.0-8.5 El; 50.2-29.5 RA; 455-560 Brin.
For die casting dies, hot work punches, hot shears, dummy blocks; hot work steel, air hardened, non-deforming.

UNIMAG 50.
M-114; 0.05 C, 0.05 Mn, 0.35 Si, 48.0 Ni, bal Fe.
After hydrogen anneal has high saturation flux of 15,000 gausses, and low hysteresis loss in DC, or in AC circuits with frequencies less than 400 cycles per second.
For laminated cores, magnetic shielding, relays, solenoid cores and electric motor rotors.

UNIMAR 250.
M-114; 0.02 C, 0.05 Mn, 0.05 Si, 18 Ni, 8 Co, 4.8 Mo, 0.4 Ti, 0.1 Al, bal Fe.
Ht. Tr.: 268,000 TS, 258,000 YS, 11 El, C52 Rock.
For jet engine, gas turbine and spacecraft components, pressure vessels, rocket motor cases.
Maraging steel, tough, ductile and shock resistant.
Ppt. hardened.

UNIMAR 300.
M-114; 0.02 C, 0.05 Mn, 0.05 Si, 18.5 Ni, 9 Co, 4.8 Mo, 0.6 Ti, 0.1 Al, bal Fe
Annealed: 50,000 TS; 110,000 YS; 18 El; C32 Rock.
Ht. Tr.; 315,000 TS, 310,000 YS, 10 El, C55 Rock.
For aluminum die casting dies, pressure vessels, rocket motor cases, bolts and fasteners
Maraging steel, vacuum melted Precipitation hardened.

UNIMAR 350.
M-114; 0.02 C, 0.05 Mn, 0.05 Si, 17.5 Ni, 12 Co, 4.8 Mo, 1.5 Ti, 0.1 Al, bal Fe.
Ht. Tr. 360,000 TS, 350,000 YS, 10 El, C58 Rock.
For jet engine, gas turbine and spacecraft components
Maraging steel, tough, ductile and shock resistant
Precipitation hardened

UNIMATIC 6000.
M-717; Mild steel electrode for AC-DC welding of mild steel; 68,000 TS

UNIMET.
M-897; 1.57 Al, 1.35 W, 0.42 U, bal Ni.
For electron tube elements, heat resistant

UNIMETAL.
M-391, Sn, Sb, bal Pb.
For welding of white metal; white metal

UNIMET U-10.
M-1706; Sintered carbide tool material.
For roughing cuts on cast iron, non-ferrous and non-metallic materials

UNIMET U-20.
M-1706; Sintered carbide tool material.
For general purpose roughing and finishing on cast iron, non-ferrous and non-metallic materials.

UNIMET U-20F.
M-1706; Sintered carbide tool material.
For use on plastics, glass and highly abrasive exotic materials and for drilling plastic laminates.

UNIMET U-30.
M-1706; Sintered carbide tool material.
For light roughing and average finishing of cast iron, non-ferrous and non-metallic materials, Medium high wear resistance and medium low shock resistance

UNIMET U-40.
M-1706; Sintered carbide tool material.
For precision boring of cast iron, non-ferrous and non-metallic materials.

UNIMET U-53.
M-1706; Sintered carbide tool material.
For heavy duty roughing cuts on steel and steel alloys at extremely heavy feeds.

UNIMET U-60.
M-1706; Sintered carbide tool material.
For general purpose machining and roughing on steel and steel alloys.

UNIMET U-70.
M-1706; Sintered carbide tool material.
For average finishing and light roughing cuts on steel and steel alloys.

UNIMET U-73.
M-1706; Sintered carbide tool material.
For light roughing and general finishing cuts on steel and steel alloys; fine feeds.

UNIMET U-80
M-1706, Sintered carbide tool material.
For precision boring of steel and steel alloys. High wear resistance coupled with better than average shock resistance. For precision turning, facing and high speed finishing

UNIMET U-110.
M-1706; Sintered carbide tool material.
For heavy duty and interrupted cutting of cast iron and non-ferrous materials Also for wear parts.

UNIMET U-130
M-1706; Sintered carbide tool material
For shock resistant tools; withstands medium impact.

UNIMET U-135
M-1706, Sintered carbide tool material.
For fabrication of wear parts; resistant to impact, wear and abrasion.

UNIMET U-140
M-1706, Sintered carbide tool material.
To resist heavy impact.

UNION
M-586, Sb, Pb, bal Sn
For bearings; Babbitt.

UNION 20-CB
M-1562, 0.07 max C, 20.0 Cr, 29.0 Ni, 2.0 min Mo, 3.0 min Cu, Cb = 8 × C min, 1.0 max Cb + Ta, bal Fe.
Annealed: 90,000 TS, 50,000 YS, 45 El; 65 RA; B 90 Rock
For chemical plant equipment to resist sulphuric acid
Stainless, austenitic, heat resistant

UNIONALOY
M-112, 3.2 C, 2.5 Si, 0.6 Mn, bal Fe.
For mill guides, tube mill plugs, hopper liners; resistant to abrasion, cast iron.

UNION FREECUT.
M-397; 0.13 C, 0.6-0.9 Mn, 0.07-0.12 P, 0.10-0.23 S, bal Fe.
Cold rolled: 80,000-100,000 TS; 70,000-80,000 YS; 20-10 El; 50-40 RA; 170-202 Brin
For automatic screw machine parts; free machining steel

UNION-LARSSEN STEEL "RESISTA."
M-383, M-222; C, 0.4 Cu, bal Fe
71,300-86,000 TS; 55,000-61,000 YS; 22-26 El
For storage bins, retaining walls for canals; corrosion resistant

UNION METAL.
M-931; 0.3 C, bal Fe.
Rolled: 60,000-70,000 TS.
For bracers, stands, supports; seamless tubing.

UNION SUPERCUT.
M-397; 0.13 max C, 0.7-1.0 Mn, 0.08-0.12 P, 0.2-0.3 S, bal Fe.
Cold rolled: 80,000-95,000 TS; 70,000-80,000 YS; 20-10 El; 50-40 RA; 170-202 Brin.
For automatic screw machine parts; free machining steel.

UNISEAL 29-17.
M-114; 0.02 max C, 0.30 Mn, 0.10 max Si, 29 Ni, 17 Co, 53.5 Fe.
For glass to metal seal, 2.4-6.36 in/in/°F X10^{-6} at various temperature ranges.
Resistant to corrosion and to thermal shock.

UNISEAL 42.
M-114; 42 Ni, bal Fe.
For glass-to-metal and ceramic-to-metal seals.
Controlled thermal expansion matching glasses.

UNISEAL 42-6.
M-114; 0.05 C, 0.5 Mn, 5.75 Cr, 42.5 Ni, bal Fe.
Co-eff. of thermal expansion closely matches that of glass grade 0120.

UNISEAL 52.
M-114; 52 Ni, bal Fe.
For glass to metal and ceramic to metal seals.
Controlled thermal expansion matching 0120 and 9010 glass

UNISEAL 281 ON.
M-114, 0.10 C, 0.6 Mn, 0.4 Si, 0.4 Ni, 28.0 Cr, bal Fe
For glass to metal seal
Thermal expansion 77-1472°F: 6.48 in/in/°F × 10^{-6}.

UNISON
M-1425; C, alloy, bal Fe
For well bits, arbors, punches, crimpers; non-tempering, shock resistant.

UNISPAN 36
M-114; 0.04 C, 0.35 Mn, 0.12 Si, 36.0 Ni, bal Fe.
Ann 71,400 TS; 40,000 YS; 41 El; 80 Rock B
Co-eff thermal expansion: −1.07 to +1.8 in/in/°F × 10^{-6} from −300 to +500°F, depending on previous treatment of metal and temperature range measured
For precision instruments.

UNISPAN LR 35.
M-114; 0.10 max C, 0.05 max Mn, 0.05 max Si, 36.5 max Ni, bal Fe.
Ann. 64,000-68,000 TS, 37,000-39,000 YS, 33-34 El, 74 Rock B
Co-eff thermal expansion: −8 to 212°F: 0.312 in/in/°F × 10^{-6}
For precision instruments

UNITEMP 14-14 W.
M-114; 0.45 C, 13-15 Cr, 13-15 Ni, 1.75-3.0 W, 0.2-0.5 Mo, bal Fe
Annealed 110,000 TS, 48,500 YS, 38 El, 51 RA
Aged: 130,000 TS, 68,500 YS, 28 El, 46 RA.
For parts requiring corrosion resistance to combustion products at elevated temperatures.
Austenitic, stainless.

UNITEMP 14CMV.
M-114; 0.20 C, 1.0 Cr, 1.0 Mo, 0.10 V, 0.75 Si, 0.50 Mn, bal Fe
Heat treated: 138,000 TS; 117,000 YS; 7 El; 45 RA.
For high temperature welded structures; good

UNITEMP 14 HV.
M-114; 0.45 C, 1 Cr, 0.5 Mo, 0.3 V, bal Fe.
Ht. Tr.: 110,000-140,000 TS.
High temperature, high strength alloy;
For truck bodies, transportation equipment.
AISI 601.

UNITEMP 14 HW.
M-114; 0.45 C, 14 Cr, 14 Ni, 2.4 W; 0.35 Mo, bal Fe.
For parts for high temperature operation, heat resistant.

UNITEMP 14 MHV.
M-114; 0.25-0.30 C, 0.6-0.9 Mn, 0.7 Si, 1.0-1.5 Cr, 0.4-0.6 Mo, 0.75-0.95 V, bal Fe
At R.T.: 150,000 TS, 140,000 YS, 16 El, 302 Brin.
At 1000°F: 86,000 TS, 74,000 YS, 28 El, 82 RA.
For special bolting in steam turbines, hot dies, brake disks Heat resistant. Useful to 1000°F.

UNITEMP 14 MV.
M-114; 0.28-0.33 C, 0.5 Mn, 0.6 Si, 1.0-1.5 Cr, 0.4-0.6 Mo, 0.2-0.3 V, bal Fe.
Heat treated: 167,000-298,000 TS; 164,000-272,000 YS, 16.5-8 El; 341-534 Brin.
For steam and gas turbine bolting up to 1050°F, brake disks, resists scaling and oxidation to 1200°F

UNITEMP 19-9 DL.
M-114, 0.3 C, 19.2 Cr, 9 Ni, 1.25 W, 1.2 Mo, 0.4 Cb, 0.3 Ti, bal Fe.
Hot rolled: 118,000 TS; 69,000 YS; 55 El.
For jet engine components, exhaust manifolds; corrosion and heat resistant, austenitic.

UNITEMP 19-9 W-Mo
M-114; 0.08-0.12 C, 0.4-1.0 Mn, 18-20 Cr, 1.0-1.75 W, 8-10 Ni, 0.2-0.5 Mo, 0.3-0.6 Cb, 0.2-0.5 Ti, bal Fe
For supercharger wheels, blades, casings, turbine blades; heat resistant.

UNITEMP 19-9 WX.
M-114; 0.07-0.13 C, 1-2 Mn, 19-22 Cr, 8-9.5 Ni, 0.5 Mo, 1.5 W, 1.2 Cb, 0.2 Ti, bal Fe.
For jet engine components, welding rod; heat and corrosion resistant.

UNITEMP 41
M-114, 0.09 C, 19.0 Cr, 11.0 Co, 10.0 Mo, 3.1 Ti, 1.5 Al, 1.8 Fe, 0.005 B, bal Ni.
For highly stressed parts at high temperature; afterburner parts, turbine casings, nozzle parts, gas turbine parts, high temperature fasteners.
AISI 683 (René 41).

UNITEMP 212.
M-114; 0.05-0.15 C, 15-17 Cr, 23-27 Ni, 4 Ti, 0.6 Cb, 0.1 B, 0.07 Zr, bal Fe
At room temperature: 187,000 TS, 135,000 YS; 20 El, 32 RA
At 1200°F: 145,000 TS; 123,000 YS; 15 El; 23 RA.
At 1400°F: 108,000 TS; 103,000 YS, 16 El; 25 RA.
For aircraft and guided missile components; age-hardenable, stainless, good to 1400°F service.

UNITEMP 350.
M-114; 0.10 max C, 16.5-17.5 Cr, 4.0-4.5 Ni, 2.5-3.0 Mo, 0.50-0.75 Mn, 0.2-0.5 Si, bal Fe.
Heat Treated: 200,000 TS, 118,000 YS; 10 El; C 43 Rock.
Annealed: 164,000 TS; 45,000 YS; 22 El; B 43 Rock
For valves, springs, structures. Heat treatable,

UNITEMP 355.
M-114; 0.13 C, 0.75 Mn, 0.3 Si, 15.5 Cr, 4.25 Ni, 2.75 Mo, 0.10 N, bal Fe.
Sol. Tr. & Age: 180,000-220,000 TS; 170,000-185,000 YS; 12-19 El; 40-48 Rock C.
Corrosion resistant, good strength to 1000°F.
For jet engine parts, parts for high speed airplanes.
AISI 634 (AM-355).

UNITEMP 500.
M-114; 0.12 C, 17.5 Cr, 18.5 Co, 4.2 Mo, 3.1 Ti, 3 Al, 0.06 Zr, 0.005 B, 1.75 Fe, 0.03 Cu, bal Ni.
Heat treated: 195,000 TS; 125,000 YS; 31 El; 54 RA.
For jet engine components, turbine buckets, discs; corrosion and heat resistant.

UNITEMP 750.
M-114; 15.0 Cr, 73 Ni, 0.85 Cb, 2.5 Ti, 0.8 Al, 6.75 Fe.
Austenitic, age hardenable, nickel base alloy.
For springs operating up to 1300°F, for aircraft gas turbine parts.
AISI 688 (Inconel X).

UNITEMP 901.
M-114; 0.05 C, 12.5 Cr, 42.5 Ni, 6.0 Mo, 2.5 Ti, 0.20 Al, 0.015 B, bal Fe.
High temperature alloy.
For parts requiring high strength and corrosion resistance at 1000-1400°F.
AISI 601 or 602, (Incoloy 901).

UNITEMP 1415 NW.
M-114; 0.17 C, 0.4 Mn, 13.0 Cr, 2.0 Ni, 0.2 Mo, 2.95 W, bal Fe.
Hardenable to 140,000-180,000 TS.
Martensitic, corrosion resistant, good high temperature strength to 1200°F.
For compressor blades, turbine discs, hardware for jet engines and gas turbine engines.
AISI 615 (Greek Ascoloy).

UNITEMP 1420 WM.
M-114; 0.23 C, 0.75 Mn, 12 Cr, 0.8 Ni, 1.0 Mo, 1.0 W, 0.25 V, bal Fe
Hardenable to 190,000-240,000 TS; good strength to 1000°F.
For parts for missiles, jet engines, gas turbines, aircraft, steam turbines; corrosion resistant.
AISI 616; AISI Type 422

UNITEMP 1430 MV.
M-114; 0.25-0.35 C, 11-12 Cr, 0.5 max Ni, 2.5-3.0 Mo, 0.2 V, bal Fe
Ht. Tr.: 125,000-210,000 TS; 85,000-120,000 YS; 12-20 El; 32-40 RA; 260-470 Brin
For steam and gas turbine buckets, disks, bolts.
Heat resistant to 1200°F.

UNITEMP 1753.
M-114; 0.24 C, 16.2 Cr, 7.2 Co, 1.6 Mo, 8.4 W, 3.2 Ti, 1.9 Al, 0.008 B, 0.06 Zr, 9.5 Fe, bal Ni.
Heat treated: 195,000 TS, 130,000 YS, 20 El; 23 RA.
For high temperature applications, fasteners, turbine wheels; oxidation resistant to 1675°F

UNITEMP A286.
M-114; 0.08 max C, 13-16 Cr, 24-27 Ni, 1-2 Mo, 1.7-2.2 Ti, 0.4 V, 0.35 max Al, bal Fe.
Rolled: 135,000-160,000 TS; 85,000-115,000 YS; 30-20 El; 50-30 RA.
For jet engine gas turbine buckets, disks and bolts; austenitic, corrosion and heat resistant.

UNITEMP AF2-1DA.
M-114; 0.33-0.37 C, 0.05-0.15 Zr, 0.015 B, 4.6 Al, 2.8-3.2 Ti, 11.5-12.5 Cr, 5.8-6.2 W, 2.8-3.2 Mo, 9.5-10.5 Co, 1.3-1.7 Ta, bal Ni.
For gas turbine wheels and buckets.
High heat and oxidation resistance.

UNITEMP BHT.
M-114; 0.80 C, 0.3 Mn, 4 Cr, 4.25 Mo, 1 V, bal Fe.
For good strength at elevated temperature, bearings, races, gears, cams, and constant speed drive components; dies. AISI 613.

UNITEMP CMV.
M-114; 0.2 C, 1.0 Cr, 0.12 V, bal Fe.
For machine tool parts, gears, bolts; case hardened, tough.

UNITEMP D6C.
M-114; 0.45 C, 0.7 Mn, 0.3 Si, 1.1 Cr, 0.6 Ni, 1.0 Mo, 0.1 V, bal Fe.
Heat treated 280,000 TS; 235,000 YS; 10 El; 38 RA.
For rocket motor cases; high strength and stability.

UNITEMP EME
M-114; 0.1-0.2 C, 18-20 Cr, 11-13 Ni, 3.0-3.5 W, 0.85-1.2 Cb, 0.1-0.2 N, bal Fe.
Rolled: 135,000 TS; 100,000 YS; 20 El; 45 RA; 280 Brin.
For gas turbine components, high temperature bolts; good strength and ductility to 1200°F, austenitic.

UNITEMP HV
M-114; 0.45 C, 1.0 Cr, 0.55 Mo, 0.30 V, bal Fe
Ht Tr: 167,000-298,000 TS; 164,000-272,000 YS; 8-17 El; 346-534 Brin.
Oil hardened, for die casting dies, high temperature bolts, brake discs.

UNITEMP HX
M-114; 0.10 C, 0.65 Mn, 21.5 Cr, 1.5 Co, 9.0 Mo, 0.6 W, 18.5 Fe, bal Ni
High temperature alloy for furnace parts and fixtures, jet engine tail pipes, afterburner components, shroud rings, turbine blades; forgeable, weldable, machinable.
AISI 680 (Hastelloy X)

UNITEMP L-605.
M-114, 0.12 C, 1.65 Mn, 20 Cr, 15 Ni, 15 W, 1.6 Fe, bal Co.
Annealed: 160,000 TS, 86,000 YS; 47 El.
At 1500°F. 55,300 TS, 44,900 YS; 16 El.
For afterburners, jet engine components; corrosion and heat resistant

UNITEMP M252
M-114; 0.15 C, 18-20 Cr, 9-11 Co, 9-11 Mo, 2.5 Ti, 0.8 Al, bal Ni
At 70°F: 173,000 TS
At 1000°F 155,000 TS; 93,000 YS.
For jet engine and gas turbine buckets; high temperature strength, heat resistant.

UNITEMP M-308
M-114, 0.08 C, 32.5 Ni, 13.75 Cr, 4.1 Mo, 6.5 W, 2.15 Ti, 0.3 Al, 0.004 B, 0.25 Zr, bal Fe.
For high temperature applications; heat and corrosion resistant.

UNITEMP N-155
M-114, 0.10 C, 1.5 Mn, 20.7 Cr, 19.8 Ni, 19.5 Co, 3 Mo, 2.3 W, 1.2 Cb, 0.13 N, 2.0 Cu, bal Fe.
At 70°F 119,000 TS, 57,000 YS; 43 El; 50 RA.
At 1200°F: 80,000 TS; 43,000 YS; 31 El, 42 RA.
For afterburners, engine tail pipes, combustion chambers, oxidation resistant to 1800°F.

UNITEMP S590.
M-114, 0.38-0.48 C, 19-22 Cr, 18-21 Ni, 18-21 Co, 4 Mo, 4 W, 4 Cb, bal Fe.
Rolled: 152,000 TS; 80,000 YS; 19 El; 25 RA; 300 Brin
Cast: 84,000 TS; 38,000 YS; 4 El; 10 RA.
For jet engine tail pipes, after burners; austenitic, corrosion and heat resistant.

UNITEMP S-816.
M-114; 0.38 C, 1.35 Mn, 20 Cr, 20 Ni, 3.75 Mo, 4.2 W, 4.1 Cb, 5 max Fe, bal Co.
Heat treated: 140,000 TS; 55,000 YS; 35 El; 29 RA.
For jet engine components, turbine blades; high heat resistance.

UNITEMP VIRGO.
M-114; 0.60 C, 1.2 Si, 0.3 Mn, 5 Cr, 0.6 V, 5.25 Mo, bal Fe.
For punches, hot heading dies; hot work steel.

UNITEMP WASPALOY.
M-114; 0.07 C, 19.75 Cr, 13.50 Co, 4.45 Mo, 3.0 Ti, 1.4 Al, 0.75 Fe, 0.005 B, 0.04 Zr, bal Ni.
High strength at high temperature.
For turbine buckets for jet engines, discs, engine components.
AISI 685 (Waspaloy).

UNITO DRILL ROD.
M-339; C, bal Fe.
For drills, tools, water hardened.

UNIVAN.
M-11; C, Mn, V, bal Fe.
For fixtures, housings; tough.

UNIVAN.
M-112, M-1222, 0.28-0.32 C, 1.5 Ni, 0.12 V, 0.90-1.10 Mn, bal Fe.
Cast· 90,000 TS; 60,000 YS; 25 El; 50 RA; 175 Brin.
For locomotive frames, wheel centers, crossheads, coupling boxes, spindles, gears, pinions; castings to resist severe shocks and stresses.

UNIVAN C
M-112; 0.30-0 35 C, 1.3-1.7 Mn, 0.40-0.60 Cr, 0.27-0.33 Mo, bal Fe
Cast· 85,000 TS, 55,000 YS; 22 El; 45 RA, 190-210 Brin
For general castings, road construction and railway equipment, tough, shock resistant.

UNIVAN C.
M-1222; 0.30-0 35 C, 1.3-1.7 Mn, 0.4-0.6 Cr, 0 27-0 33 Mo, bal Fe.
Cast: 85,000 TS; 55,000 YP; 22 El; 45 RA.
For locomotive frames, wheel centers, gears, axles, coupling boxes
Wear resistant.

UNIVERSAL.
M-72; 0.45 C, 0.7 Si, 1.5 Cr, 0.5 Mo, 0.8 V, 0.5 W, bal Fe.
For tools, dies, punches; tough, oil hardening.

UNIVERSAL.
M-1309; 0.90 C, 1.9 Mn, 0 1 V, bal Fe.
For punches, blanking and forming dies; oil hardened, shock resistant.

UNIVERSAL.
M-1331; 1.25 C, 1.15 Si, 0.70 Mn, bal Fe.
For cold work tools, punches, oil hardened, tough.

UNIVERSAL ALLOY NO. 10.
M-932; Cu alloy.
Welded: 65,000 TS; 60,000 YS; 20 El; 125 Brin.
For electrode tips, seam welding rolls, 85% conductivity.

UNIVERSAL NO. 10 BRASS.
M-1341; 57-62 Cu, 1-2 Sn, 1.5 max Pb, 0.4 Al, bal Zn.
Cast: 50,000 TS; 25,000 YS; 15 El; 83 Brin.
For bearings, gears, retainers, hardware; high

UNIVERSAL NO. 20.
M-1341; 82 min Cu, 5 max Fe, 2 max Mn, bal Al.
Cast: 83,000 TS; 30,000 YS; 9 El; 150 Brin.
For gears, sprockets, bearings, pumps, marine parts; heat treatable, corrosion and wear resistant.

UNIVERSAL NO. XX.
M-1341; 60-68 Cu, 3.0-7.5 Al, 2-4 Fe, 2.5-5.0 Mn, 0.2 max Pb, bal Zn.
Cast: 95,000 TS; 60,000 YS; 5 El; 200 Brin.
For valve bodies, gears, boat fittings; resists sea water corrosion.

UNIVERSAL UC101.
M-1341; 6.5-7.5 Si, 0.3 Mg, 0.5 max Fe, 0.3 max Mn, bal Al.
Heat treated: 36,000 TS; 25,000 YS; 3 El; 70 Brin.
For fuel pump impellers; heat treatable.

UNIVERSUM HARTE 1.
M-1306; 0.35 C, 0.90 Si, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For shear blades, pneumatic tools, punches; oil hardened, shock resistant.

UNIVIT.
M-10; 0.1 C, bal Fe.
For steel for porcelain enameling.

UNIX.
M-1294; 1.05 C, 1.15 W, 0.90 Mn, bal Fe.
For cutters, blanking and forming dies; water or oil hardened.

UNMAGNETIZABLE WATCH WHEEL ALLOY.
Eng.; 62 75 Pt, 18 Ni, 18 Cu, 1.25 Cd.
For watch wheels; corrosion resistant.

UNNAMESSING MWU.
M-1371; Al alloy.
For light alloy parts.

URANIUM B.
M-73, C, alloy, bal Fe.
For tools, dies; oil hardened.

URANIUM R.
M-764; 0.2-2.0 Mg, 3.5-5 5 Cu, 0.2-1.0 Si, 0.1-1.2 Mn, bal Al.
For aircraft structures; age-hardenable.

URANIUM STEELS.
3 U, 0.2-0.7 C, Mn, Si, V, bal Fe.
For machinery parts; water hardening.

URANUS 3
M-1303; 0 25 max C, 15 Cr, 35 Ni, bal Fe.
For heat treating boxes, furnace parts; Type 330; heat resistant.

URANUS 4
M-1546; 0.25 C, 20.0 Ni, 12.0 Cr, bal Fe.
Annealed. 85,300 TS; 49,800 YS; 30 El.
Forged: 107,000 TS; 71,000 YS; 25 El.
For pumps, turbines, valves.
Heat and corrosion resistant to 1000°C.

URANUS 10.
M-1303; 0.8-0.20 C, 2 max Mn, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 125,000 TS; 95,000 YS; 25 El; 55 RA; 277 Brin.
For oil refinery and chemical plant equipment; Type 302; stainless, austenitic.

URANUS 10M.
M-1303; 0.17-0.25 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 50 El; 70 RA; 180 Brin.
For chemical plant equipment, mixers, filters; Type

URANUS 10SL.
M-1303; 0.08 max C, 17-19 Cr, 8-11 Ni, Ti = 5 × C,, bal Fe.
Normalized: 93,000 TS; 36,000 YS; 45 El; 60 RA; 165 Brin.
Annealed: 87,000 TS; 33,000 YS; 57 El; 73 RA; 155 Brin.
For chemical plant equipment; Type 321; stainless, austenitic.

URANUS 10ST.
M-1303; 0.08 max C, 18 Cr, 8 Ni, Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, tanks, mixers; Type 321; stainless, austenitic.

URANUS 15.
M-1303; 0.08 max C, 18-20 Cr, 8-11 Ni, 2 max Mn, bal Fe.
Annealed: 90,000 TS; 45,000 YS; 60 El; 135 Brin.
Cold drawn: 180,000 TS; 150,000 YS; 10 El; 330 Brin.
For chemical plant equipment, welded structures; Type 304; stainless, austenitic.

URANUS 30.
M-1302; 0.2 C, 7 Ni, 4 Cr, 20 Cr, 1 7 Si, bal Fe.
For gas turbine components; heat and creep resistant.

URANUS 50.
M-1303; 0.10 max C, 16-18 Cr, 10-14 Ni, 2-3 Mo, bal Fe.
Annealed: 85,000-95,000 TS, 35,000-45,000 YS; 60-50 El; 75-60 RA; 150-190 Brin.
For acid-resistant chemical plant equipment; Type 316; stainless, austenitic-ferritic.

URANUS 50T.
M-1302, M-1546; 0.03 C, 17 Cr, 13 Ni, 1.5 Cu, 2.5 Mo, bal Fe.
Annealed: 78,000 TS; 32,000 YS; 50 El; 80 Rock B.
For chemical and oil refinery plant equipment
Stainless, heat resistant.

URANUS 65.
M-1546; 0.03 max C, 25.5 Cr, 20 0 Ni, 0.25 Cb, bal Fe.
Annealed: 78,200 TS; 31,300 YS; 40 El.
For chemical equipment for hot concentrated nitric acid, oil burners, furnace parts, baffle plates.
Resists nitric acid, resists intergranular corrosion, austenitic. Oxidation resist.

URANUS 65M.
M-1546; 0.08 C, 25 Cr, 20 Ni, 1 Cb, bal Fe.
Annealed: 78,000 TS; 31,300 YS; 40 El.
For chemical equipment for hot concentrated nitric acid, oil burner parts, baffle plates
Austenitic, corrosion and heat resistant.

URANUS B6.
M-1302; 0.03 C, 20 Cr, 25 Ni, 1.5 Cu, 4 5 Mo, bal Fe
For chemical plant equipment, salt pots; corrosion resistant.

URANUS B6Si.
M-1546; 0 02 max C, 0.8 Mn, 2.7 Si, 25.0 Ni, 18.0 Cr, 3.8 Mo, 1.5 Cu, bal Fe.
Annealed: 136,000 TS; 61,700 YS; 40 El.
For chemical plant equipment, furnace parts, conveyor belts, high temperature equipment.
Corrosion and heat resistant. Austenitic.

URANUS CH.
M-1546; 0.2 C, 1.0 Si, 1.0 Mn, 22.5 Cr, 3.5 Ni, 2.5 Mo, 1.5 Cu, bal Fe.
Heat treated: 121,000-135,000 TS; 75,000-100,000 YS; 25-35 El.
For chemical and petroleum industries, oil refineries.
Austenitic-ferritic, corrosion and heat resistant.

URANUS EXTRA.
M-344; 1.0 C, 0.2 Si, 0.2 Mn, 0.1 V, bal Fe.
For cold dies, punches, drills, taps, reamers; water hardened; Type W2.

URANUS F 1.
M-344; 0.1 C, 2.5 Ni, 20 Cr, 1.5 Cu, bal Fe.
For furnace parts, chemical plant equipment; heat and corrosion resistant.

URANUS IIW.
M-614; 1 3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers tools, reamers, broaches, hobs; Type W1; water hardened.

URANUS S.
M-1546, 0.02 max C, 0.8 Mn, 3.7 Si, 14.0 Ni, 17.5 Cr, bal Fe.
Annealed· 132,300 TS; 55,200 YS; 35 El; 60 RA.
For heat exchangers, chemical and atomic energy plants, nitric acid equipment, cryogenic equipment.
Corrosion and heat resistant. Austenitic.

URANUS SD
M-1546; 0.02 max C, 0.8 Mn, 3.7 Si, 15.0 Ni, 17 0 Cr, 2 5 Mo, bal Fe.
Annealed: 143,300 TS; 60,000 YS; 35 El.
For chemical plant equipment, digesters, acid containers
Heat and corrosion resistant. Austenitic.

URBACH SK5.
M-1320; 0 79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.55 V, 18 W, bal Fe
For lathe and planer tools, drills, reamers, hobs; high speed steel

URBACH SK10.
M-1320, 0 76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe
For lathe and planer tools, drills, broaches, high speed steel

URBACH SS17.
M-1320; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8 7 W, bal Fe
For lathe and planer tools, form cutters, drills; high speed steel

URBACH SS17Mo
M-1320, 0 95 C, 4 Cr, V, W, Mo, bal Fe.
For lathe and planer tools, form cutters, reamers, taps; high speed steel.

URBACH SS25.
M-1320; 0 86 C, 4.1 Cr, 0.85 Mo, 2 5 V, 12 W, bal Fe.
For lathe and planer tools, drills, hobs, reamers; high speed steel.

URBACH SS35
M-1320; 0.85 C, W, Mo, 4 Cr, V, bal Fe.
For lathe and planer tools, drills, reamers; high speed steel.

URBACH SS45.
M-1320; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For blanking and forming dies, cutters; high speed steel.

URBACH U19.
M-1320; 0.74 C, 4.3 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel

URBACH V120.
M-1320; 0.74 C, 4.3 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, taps, drills; high speed steel.

USAMET.
M-1712; 17 Cr, 7.2 Ni, 2 Mn, 1.4 Si, 0.10 C, bal Fe.
Hardened: 280,000 min TS; 265,000 YS.
For strip springs.

USCO 5.
M-585; 0.5 Cu, 0.6 Fe, 0.5 Zn, 5 Si, 0.4 Mn, bal Al.
Sand cast: 22,000 TS; 10,000 YS; 5 El; 47 Brin.
Die cast: 32,000 TS; 15,000 YS; 5 El.
For general castings; good corrosion resistance.

USCO 5-A.
M-585; 0.3 max Cu, 0.5 Fe, 0.3 max Zn, 5 Si, 0.3 max Mn, bal Al.
Sand cast: 19,000 TS; 9000 YS; 6 El; 40 Brin.
Die cast: 30,000 TS; 14,000 YS; 7 El.
For food handling and chemical equipment; sand, permanent mold or die castings.

USCO 5-B.
M-585; 0.2 max Cu, 0.4 max Fe, 0.2 Zn, 7 Si, 0.3 Mg, 0.1 Mn, bal Al.
Heat treated: 34,000 TS; 30,000 YS; 2 El; 75 Brin.
For highly stressed parts; excellent corrosion resistance.

USCO 5-W.
M-585; 1.3 Cu, 0.6 max Fe, 0.3 Zn, 5 Si, 0.5 Mg, 0.4 max Mn, bal Al.
Sand cast: 24,000 TS; 21,000 YS; 4.5 El; 55 Brin.
Heat treated: 37,000 TS; 29,000 YS; 2.5 El; 85 Brin.
For highly stressed parts; good corrosion resistance.

USCO 13.
M-585; 0.6 max Cu, 0.7 Fe, 0.5 max Zn, 12 Si, 0 05 Mg, 0 3 Mn, bal Al
Sand cast: 26,000 TS; 12,000 YS; 8 El; 60 Brin.
Die cast: 35,000 TS; 16,000 YS; 3.5 El.
For pressure tight castings; corrosion resistant.

USCO 13A.
M-585; 0.7 Cu, 0.8 Fe, 0.1 Zn, 12 Si, 1 Mg, 0.1 Mn, 2.5 Ni, bal Al.
Permanent mold cast and heat treated: 47,000 TS; 33,000 YS; 0.5 El; 125 Brin.
For automotive and diesel pistons; high strength.

USCO A.
M-585; 6.5 Cu, 1 Fe, 1.4 Zn, 3 25 Si, 0.4 Mn, 0 05 Mg, bal Al.
Sand cast: 26,000 TS; 20,000 YS; 2 El; 74 Brin.
For general purpose castings; for low stress applications.

USCO A-3.
M-575; 7 Cu, 1 Fe, 1.5 Zn, 2 Si, 0.05 Mg, 0.4 Mn, 0.25 Ni, bal Al.
Sand cast: 26,000 TS; 23,000 YS; 1.5 El; 75 Brin.
For general purpose castings; for low stress applications.

USCO B-1.
M-585; 7 Cu, 0.9 Fe, 0.5 Zn, 5.5 Si, 0.3 Mg, 0.4 Mn, 0.3 Ni, bal Al.
Die cast: 28,000 TS; 26,000 YS; 1 El; 95 Brin.
Heat treated: 35,000 TS; 26,000 YS; 0.5 El; 100 Brin.
For automotive pistons; die and permanent mold castings.

USCO C-1.
M-585; 4.5 Cu, 0.8 Fe, 0.3 Zn, 1.2 max Si, 0.03 max Mg, 0.4 Mn, bal Al.
Sand cast: 25,000 TS; 11,000 YS; 4 El; 65 Brin.
Heat treated: 36,000 TS; 26,000 YS; 4.5 El; 74 Brin.
For bus wheels, crankcases, transmission housings; for highly stressed parts.

USCO C-2.
M-585; 4.5 Cu, 0.8 Fe, 0.3 max Zn, 2.5 Si, 0.3 max Mn, bal Al.
Permanent mold cast: 27,000 TS; 15,000 YS; 2.5 El; 70 Brin.
Heat treated: 45,000 TS; 28,000 YS; 5 El; 90 Brin.
For automotive and aircraft parts; for highly stressed applications.

USCO D.
M-585; 4 Cu, 0.7 Fe, 0.6 Zn, 5 Si, 0.5 Mg, 0.3 Ni, bal Fe.
Sand cast: 25,000 TS; 13,000 YS; 2 El; 70 Brin.
Die cast: 39,000 TS; 22,000 YS; 3 El.
For general purpose castings; heavy section die castings.

USCO D-3.
M-585; 4.0 Cu, 0.7 Fe, 1 max Zn, 3 Si, 0.4 Mn, 0.3 Ni, bal Fe.
Sand cast: 27,000 TS; 18,000 YS; 2.5 El; 66 Brin.
Heat treated: 38,500 TS; 29,000 YS; 3 El; 90 Brin.
For cylinder heads, manifolds; heat treatable.

USCO D-4.
M-585; 2.9 Cu, 1 max Fe, 0.7 Zn, 5.25 Si, 0.15 max Mg, 0.5 Mn, 0.3 Ni, bal Al.
Sand cast: 28,500 TS; 16,300 YS; 2.7 El; 60 Brin.
Heat treated: 41,000 TS; 32,000 YS; 1.5 El; 80 Brin.
For general castings; age-hardenable.

USCO D-5.
M-585; 2.9 Cu, 1 max Fe, 0.7 Zn, 5.25 Si, 0.15 max Mg, 0 5 Mn, 0.3 Ni, bal Al.
Sand cast: 25,000 TS, 13,000 YS; 2 El; 70 Brin.
Aged permanent mold: 33,000 TS; 21,000 YS; 2 El; 79 Brin.
For general purpose castings; sand or permanent mold castings.

USCO K.
M-585; 3.5 Cu, 0.7 Fe, 0.5 Zn, 8.5 Si, 0.1 max Mg, 0.5 Mn, 0.5 max Ni, bal Al.
Sand cast: 25,000 TS; 14,000 YS; 2 El; 70 Brin.
Die cast: 43,000 TS; 27,000 YS; 2.5 El.
For general purpose castings; low shrinkage, very fluid.

USCO K-3.
M-585; 3 5 Cu, 1 max Fe, 1 max Zn, 6 5 Si, 0.2 Mg, 0.6 Mn, 0.3 max Ni, bal Al.
Sand cast: 28,000 TS; 16,000 YS; 3.5 El; 75 Brin.
Heat treated: 36,000 TS; 24,000 YS; 2 El; 80 Brin.
For highly stressed castings; heat treatable.

USCO K-5.
M-585; 2.5 Cu, 0.7 Fe, 0.35 Zn, 6.1 Si, 0.13 max Mg, 0.4 Mn, bal Al.
Sand cast: 27,000 TS; 15,500 YS; 3 El; 60 Brin.
Permanent mold cast: 32,000 TS; 17,500 YS; 3.5 El; 65 Brin.
For pressure tight castings; sand, plaster or permanent mold castings.

USCO K-Z.
M-585; 2 max Zn, bal Al.
For die castings.

USCO L.
M-585; 4 Cu, 0.6 Fe, 0.1 Zn, 0.7 Si, 1.5 Mg, 0.1 Mn, 2 Ni, bal Al.
Heat treated: 44,000 TS; 0.5 El; 101 Brin.
Permanent mold: 47,000 TS; 42,000 YS; 0.5 El; 110 Brin.
For high temperature applications; high properties at elevated temperatures.

USCO R.
M-585; 0.1 max Cu, 0.5 Fe, 0.3 Zn, 0.3 max Si, 3.8 Mg, 0.6 max Mn, bal Al.
Sand cast: 25,000 TS; 12,000 YS; 9 El; 50 Brin.
For food processing equipment, fittings, hardware; corrosion resistant.

USCO S-1.
M-585; 9.5 Cu, 0.8 Fe, 0.5 max Zn, 4 Si, 0.25 Mg, 0.3 Mn, 0.1 Ni, bal Al.
Sand cast: 25,000 TS; 20,000 YS; 0.5 El; 80 Brin.
Permanent mold cast: 30,000 TS; 27,000 YS; 1 El; 90 Brin.
For high temperature applications; hard wearing surface.

USCO-S-22.
M-585; 8 Cu, 0.8 Fe, 0.2 Zn, 1.5 Si, 4 Mn, 0.1 Ni, bal Al.
Sand cast: 23,000 TS; 14,000 YS; 2 El; 74 Brin.
For general castings; low stress applications.

USCO T.
M-585; 0.8 Cu, 0.25 Fe, 8 Zn, 0.1 Si, 0.3 Mg, 0.15 Mn, bal Al.
Sand cast. 29,000 TS; 16,000 YS; 6.5 El; 60 Brin.
Aged: 35,000 TS; 25,000 YS; 4.5 El; 74 Brin.
For high strength castings; no heat treatment.

USCO Z-3.
M-585; Al, Mg.
For hardener for Zamac 3 alloys; hardener.

USCO Z-5.
M-585; Al, Mg.
Hardener.

USMAC 16.
M-1534; 0.10 C, 0.75 Mn, 0.65 Si, 12.5 Cr, 0.50 Ni, 0.20 S, bal Fe.
Cast and heat treated: 103,000-203,000 TS; 75,000-173,000 YS; 6-28 El; 9-62 RA; 185-415 Brin.
For chemical and food processing equipment, valve bodies, pump casings.
Type 416 stainless steel.

USMAC 40C.
M-1534; 1.05 C, 0.50 Mn, 0 50 Si, 17.5 Cr, 0.25 Ni, 0.50 Mo, bal Fe
Cast: 110,000 TS; 70,000 YS; 10 El; 210 Brin.
For cutlery, valve parts, nozzles, pump parts.
Type 440 C stainless steel, wear and corrosion resistant.

USMAC 43
M-1534; 0.25 C, 0.70 Mn, 0.60 Si, 21.0 Cr, 0.40 Ni, 1.00 Cu, bal Fe.
Cast: 85,000 TS; 55,000 YS; 5.0 El; 6.0 RA; 190 Brin.
For chemical plant and oil refinery equipment.
Type 443 stainless steel.

USMAC 436.
M-1534; 0.14 C, 0.50 Mn, 0.80 Si, 13.25 Cr, 1.8 Ni, 2.25 W, bal Fe
Cast: 200,000 TS; 140,000 YS; 12.5 El; 40 0 RA; Rock C 43-44.
For jet engine and super charger parts, turbine blades and wheels.
Spec. AMS 5616. Ultra high strength.

USMAC ML.
M-1534; 0.18 C, 1.25 Mn, 1.0 Si, 31.75 Cu, 2.5 Fe, bal Ni.
Cast: 63,000 TS; 31,000 YS; 20 El; 135 Brin.
For chemical plant and plastic industry equipment.
Similar to Monel Metal. Corrosion resistant.

USO.
M-344; C, alloy, bal Fe.
For striking dies; water hardened.

USO 5S.
M-344; 0.1 max C, 4-6 Cr, 0.5 Mo, bal Fe.
Corrosion resistant.

USO 30CF.
M-344; 0.30 C, 3 Cr, 0.25 V, 8.8 W, bal Fe.
For hot dies and tools; hot work steel.

USO-AD.
M-344; 1.55 C, 11 Cr, 0.2 V, 0.7 Mo, bal Fe.
For blanking and trimming dies; oil hardened.

USO-HE.
M-344; 1.5 C, 0.5 Cr, 0.25 V, 1.6 W, bal Fe.
For dies, gages; oil hardened, non-deforming.

USO-NS.
M-344; 0.8 C, 0.2 Cr, 1.5 Mn, bal Fe.
For broaches, gages, blanking and forming dies; oil hardened, non-deforming.

USO VANADIUM.
M-344; 0 9 C, 0 2 V, bal Fe.
For heading and gripping dies, shear blades; water hardened.

USO TUNGSTEN.
M-344; 4 Cr, 0.8 V, 18 W, C, bal Fe.
For lathe tools, drills, milling cutters; high speed steel

USO VANADIUM.
M-344; 0 8 C, 0.2 V, bal Fe.
For striking dies; water hardened.

USS ½% Cr-½% Mo
M-604, 0 10-0.20 C, 0 30-0 61 Mn, 0.50 0 81 Cr, 0 44-0.65 Mo, bal Fe
Annealed 67,600 TS, 40,700 YS; 30 El; 65 RA.
Normalized· 77,000 TS; 45,000 YS; 27 El; 60 RA
At 900°F 63,000 TS; 31,500 YS; 34 El, 75 RA.
For high pressure boilers, superheaters, drying ovens, air preheaters, heat exchangers, cracking still tubes
Reduced graphitization to 950°F.

U.S S 4/6 Cr-Mo STEEL.
M 90, 0 15 max C, 0 5 max Mn, 0 5 max Si, 4-6 Cr, 0 45-0 65 Mo, bal Fe.
Annealed (minimum) 60,000 TS, 25,000 YS; 30 El, 163 max Brin
For oil cracking stills, hot oil piping, high temperature steam piping, higher creep strength than 4/6 Cr Steel.

U S S 4/6 Cr-Mo STEEL.
M-90, 0 20 max C, 0.5 max Mn, 0 5 max Si, 4-6 Cr, 0 45-0 65 Mo, bal Fe.
Annealed (minimum): 60,000 TS; 25,000 YS, 30 El; 170 max Brin
For oil cracking stills, hot oil piping, high temperature steam piping; higher creep strength than 4/6 Cr Steel

U.S.S 4/6 Cr-Mo-Ti STEEL
M-90; 0 15 max C, 0.5 max Mn, 0 5 max Si, 4-6 Cr, 0.45-0 65 Mo, 4 × C = Ti, bal Fe.
Annealed (minimum): 60,000 TS; 25,000 YS; 30 El; 163 max Brin.
For oil cracking still tubes, superheater tubes, high temperature steam piping; does not air harden; higher corrosion resistance than 4/6 Cr or 4/6 Cr-Mo Steel.

USS 5.
M-604; 0.1 min C, 0.3-1.0 Mn, 0.1-1 0 Si, 4-6 Cr, 0 4-0.65 Mo, bal Fe
Annealed: 65,000-85,000 TS; 25,000-45,000 YS; 25-35 El; 60-75 RA; B 70-80 Rock.
For petroleum and chemical plant equipment.
Type 501 corrosion resistance

U.S.S. 5 Mo.
M-604; 0.10 min C, 4-6 Cr, 0.40-0.65 Mo, bal Fe.
Annealed: 70,000 TS; 30,000 YS; 28 El; 65 RA; 160 Brin.
Heat treated: 115,000 TS; 90,000 YS; 20 El; 60 RA; 240 Brin.
For petroleum industry, high temperature service; Type 501, scaling temperature 1150°F.

USS 5S.
M-604, 0.10 max C, 0.30-0.60 Mn, 0.50 max Si, 4.0-6.0 Cr, 0.40-0.65 Mo, bal Fe.
Annealed: 65,000-85,000 TS; 25,000-45,000 YS; 25-35 El; 60-75 RA; B 70-85 Rock
For petroleum and chemical plant equipment
Heat and corrosion resistant. Good creep and oxidation resistant.

U.S.S 5S-Mo.
M-604, 0.10 max C, 4-6 Cr, 0.40-0.65 Mo, bal Fe.
Annealed: 65,000 TS; 25,000 YS, 150 Brin
For petroleum industry, high temperature service; Type 502, scaling temperature 1150°F.

USS 9% NICKEL STEEL
M-604; 0.13 max C, 0.80 max Mn, 0.15-0.30 Si, 0.035 max P, 0.040 max S, bal Fe
Minimum 90,000 TS, 60,000 YS; 20 El.
For pressure vessels for low temperature operation; cryogenic alloy, good ductility and ease of fabrication

U S S 12
M-90, 0.10 max C, 0.5 max Mn, 0.5 max Si, 12-14 Cr, bal Fe
Annealed 65,000 TS, 35,000 YS; 35 El; 140 Brin
Quenched and drawn 125,000 TS, 100,000 YS; 20 El, 230 Brin
For oil and chemical industries requiring high strength and corrosion resistance, corrosion resistant

U S S 12
M-604, 0.15 max C, 1.0 max Mn, 1.0 max Si, 11.5-13.0 Cr, bal Fe
Annealed 75,000 TS, 40,000 YS, 35 El, 70 RA; 155 Brin
For turbine blades, pump rods, mine pumps, valve stems, bolts, coal screens, golf clubs, moderate corrosion and heat resistance

U S S 12 Cr Al
M-90, 0.08 max C, 11.5-14.5 Cr, 0.10 0.30 Al, bal Fe
Annealed 60,000 TS, 30,000 YS, 25 El, 163 Brin
Drawn 85,000 TS, 70,000 YS, 20 El, 60 RA, 185 Brin
For oil and chemical industries, petroleum equipment, corrosion and oxidation resisting

U S S 12 F M
M-604, 0.15 max C, 0.15 min S, 0.6 max Mo or Zr, 1.25 Mn, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 30 El; 60 RA; 155 Brin
Heat treated: 110,000 TS, 85,000 YS, 18 El; 55 RA; 212 Brin.
For golf clubs, bolts, shafts, nuts, screws, good machinability, moderate corrosion and heat resistance; Type 416

U S S 12 HIGH CARBON.
M-604; 0.15 min C, 1 max Mn, 1 max Si, 12-14 Cr, bal Fe.
Annealed: 95,000 TS, 50,000 YS, 25 El, 55 RA; 195 Brin.
Heat treated: 230,000 TS, 195,000 YS; 8 El; 25 RA; 500 Brin.
For cutlery, paper knives, meat blades; heat

USS 12 MoV.
M-604; 0.25 C, 12 Cr, 0.7 Ni, 1.0 Mo, 0.3 V, bal Fe.
Ht. Tr.: 256,000 TS; 205,000 YS; 10 El.
For compressor blades, steam turbines, bolting, furnace parts
Corrosion resistant. For use up to 1200°F.

USS 12 Ni-5 Cr-3 Mo.
M-604; 0.025 C, 0.08 Mn, 0.008 P, 0.010 S, 12 Ni, 4.75 Cr, 3 Mo, 0.25 Ti, 0.3 Al, 0.002 B, bal Fe.
Annealed: 135,000 TS; 110,000 YS; 16 El; 70 RA.
Aged: 200,000 TS; 190,000 YS, 12 El; 50 RA.
For motor cases, solid fuel rockets, hydrospace equipment
Maraging steel. High strength, corrosion resistant.

U. S. S 12 TURBINE.
M-604; 0.15 max C, 11.5-13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS, 35 El, 70 RA; 155 Brin
For turbine blading; Type 403; corrosion and heat resistant

USS 12-15
M-12, 0.08 max C, 2 max Mn, 14-16 Ni, 11-13 Cr, bal Fe.
For cold headed parts, stainless

USS 15-7 AMV
M-604, 0.24 C, 0.60 Mn, 0.80 Si, 7.0 Ni, 15.0 Cr, 2.5 Mo, 0.2 V, 1.4 Al, N, bal Fe.
Long 140,000 TS; 55,600 YS; 35 El.
Trans 135,400 TS, 56,500 YS; 39.5 El
Ht Tr: 264,400 TS, 233,500 YS, 6 El
For aircraft and missile components, valves, fittings
Stainless Semi-austenitic, precipitation hardening

USS-16-2
M 12, 0.2 max C, 15 17 Cr, 1.25-2.5 Ni, 1 max Si, 1 max Mn, bal Fe.
For springs, corrosion resistant.

U S S. 16-6
M-604, 0.13-0.20 C, 16 Cr, 6 Ni, bal Fe
For corrosion resistant parts; corrosion resistant.

U S S 17
M-11; 0.10 max C, 0.6 Mn, 0.5 Si, 15 min Cr, 0.035 max P, 0.03 max S, bal Fe
Minimum 70,000 TS, 35,000 YS; 22 El.
For oil refinery equipment, preheaters, kitchen equipment; corrosion resistant, heat resistant below 1550°F

U.S.S 17
M-12, 0.12 max C, 1.0 max Mn, 1.0 max Si, 14-18 Cr, bal Fe
Annealed: 75,000 TS, 55,000 YS, 40 El; 60 RA.
For corrosion resistant parts, decorative trim; corrosion resistant.

U S. S 17
M-90; 16-18 Cr, 0.10 max C, bal Fe, 0.5 max Mn, 0.5 max Si
Annealed 75,000 TS; 40,000 YS; 27 El; 55 RA; 175 Brin.
Cold worked 100,000-190,000 TS, 40-20 RA; 185-270 Brin
For oil refinery equipment, preheaters, kitchen equipment, nitric acid tanks, high resistance to corrosion, stainless.

U.S.S 17.
M-604; 0.12 max C, 1.0 max Mn, 1.0 max Si, 14-18 Cr, bal Fe
Annealed: 75,000 TS; 40,000 YS; 30 El; 50 RA; 212 Brin
For tanks for manufacture of HNO$_3$, auto tire covers, interior decoration; heat and corrosion

USS 17-4-6.
M-604; 0.15 max C, 5.5-7.5 Mn, 3.5-5.5 Ni, 16-18 Cr, bal Fe.
Annealed: 115,000 TS; 55,000 YS; 55 El.
For stainless parts; stainless, alternate for Type 301.

USS 17-5 MnV.
M-604; 0.11 C, 13.5 Mn, 4.6 Ni, 16.2 Cr, 2 Mo, 0.92 V, 0.36 N, bal Fe.
Heat treated: 270,000 TS; 260,000 YS; 2 El.
For corrosion resistant parts; corrosion and heat resistant.

U.S.S. 17-7.
M-604; 0.15 max C, 16-18 Cr, 6-8 Ni, bal Fe.
Annealed: 110,000 TS; 40,000 YS; 60 El; B85 Brin.
For aircraft, trailers, car construction; Stainless Type 301.

U.S.S. 17-FM.
M-604; 0.12 max C, 1.25 max Mn, 1.0 max Si, 14-18 Cr, 0.15 min S, 0.6 max Mo or Zr, bal Fe.
Annealed: 80,000 TS; 55,000 YS; 25 El; 60 RA; 170 Brin.
Cold drawn: 90,000 TS; 80,000 YS; 15 El; 55 RA; 190 Brin.
For stainless parts; free-cutting, stainless.

U.S.S. 17 HIGH-CARBON.
M-604; 0.60-0.75 C, 1 max Mn, 1 max Si, 16-18 Cr, 0.75 max Mo, bal Fe.
Annealed: 105,000 TS; 60,000 YS; 20 El; 45 RA; 215 Brin.
Heat treated: 260,000 TS; 240,000 YS; 5 El; 20 RA; 510 Brin.
For cutlery, valves; heat treatable, corrosion and wear resistant.

USS 17-TV.
M-604; 0.08 max C, 16 min Cr, 0 35 min Ti, bal Fe.
For television picture tubes, metal to glass seals; expansion equal to glass.

USS 18-5-8.
M-604; 0.15 max C, 7.5-10 Mn, 4-6 Ni, 17-19 Cr, bal Fe.
Annealed: 105,000 TS; 55,000 YS; 55 El
For stainless parts; austenitic, alternate for Type 302.

U.S.S. 18-8.
M-12; 0.20 max C, 2.0 max Mn, 0.75 max Si, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000-100,000 TS; 25,000-40,000 YS; 65-50 El; 75-60 RA.
Cold worked: 300,000 TS; 250,000 YS; 1 El; 40 RA.
For corrosion resistant parts; stainless, marked workability.

U.S.S. 18-8.
M-90; 0.1 max C, 2 max Mn, 17.5-20.0 Cr, 10-14 Ni, 3-4 Mo, bal Fe.
Annealed: 75,000 TS; 30,000 YS; 35 El; 190 Brin.
For corrosion and heat resistant applications; stainless, austenitic.

U.S.S. 18-8.
M-604; 0.20 max C, 2.0 max Mn, 0.75 max Si, 8-10 Ni, 17-19 Cr, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; 50 RA; 207 Brin.
For food containers, sinks, pipes, shafts, bolts, railroad passenger cars, inside trim, architectural; heat and corrosion resistant; Type 302

USS 18-8 Cb.
M-12; 0.08 C, 2 max Mn, 1 max Si, 17-19 Cr, 9-12 Ni, Cb = 10 × C, bal Fe.
88,000-90,000 TS; 30,000 YS; 45-55 El; 70 RA; 165 Brin.
For engine manifolds, exhaust stacks, pressure vessels; stainless, austenitic.

U.S.S. 18-8 Cb-TA.
M-604; 0.08 max C, 17-19 Cr, 9-12 Ni, Cb = 10 × C, 2 max Mn, 1 max Si, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 45 El.
For exhaust stacks, airplane gasoline tanks, welded structures; resists intergranular corrosion; Type 347.

U.S.S. 18-8 COLUMBIUM BEARING TYPE 345.
M-604; 0.15 max C, 17 min Cr, 7 min Ni, Cb = 6 to 10 × C, bal Fe.
Rolled: 80,000 TS; 30,000 YS; 50 El.
For exhaust stacks, airplane gasoline tanks, welded structures; resists intergranular corrosion.

U.S.S. 18-8FM.
M-12; 0 20 max C, 2 max Mn, 0.07 min each P, S and Se, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 91,000 TS; 50,000 YS; 45 El; 75 RA; 135 Brin.
For stainless screw machine products; stainless, free-cutting.

U S.S. 18-8 F.M.
M-604, 0.15 max C, 2.0 max Mn, 1.0 max Si, 8-10 Ni, 17-19 Cr, 0 15 min S, 0.6 max Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 35 El; 50 RA; 217 Brin
Drawn: 110,000 TS; 75,000 YS; 30 El; 50 RA; 240 Brin
For bolts, nuts, shafts, couplings, piston rods, propellers; heat and corrosion resistant and good machinability, Type 303.

USS-18-8FS.
M-12, 0 12 max C, 2 max Mn, 17-19 Cr, 10-13 Ni, bal Fe
Annealed: 50,000 TS, 30,000 YS; 60 El; 70 RA; 150 Brin.
For cold heading applications; stainless, austenitic

U.S S. 18-8 FS TYPE 305.
M-604; 0.12 max C, 0 2 max Mn, 0.95 max Si, 17-19 Cr, 10-13 Ni, bal Fe.
Annealed: 85,000 TS, 38,000 YS, 50 El.
For food and dairy equipment, cold headed parts; corrosion resistant; Type 305.

USS 18-8-L
M-604; 0.03 max C, 8-12 Ni, 18-20 Cr, bal Fe.
Annealed: 75,000 TS; 28,000 YS; 50 El; 140 Brin.
For welded stainless parts; resists intergranular corrosion after welding.

U.S.S. 18-8 Mo.
M-90; 0 08 max C, 1.5 min Mn, 17.5-19.5 Cr, 13 min Ni, 0.5-0.9 Cb, bal Fe.
Annealed: 75,000 TS; 30,000 YS; 35 El; 190 Brin.
For corrosion and heat resistant applications; stainless, austenitic.

U.S.S. 18-8 Mo.
M-604, M-12; 0.08 max C, 2.0 max Mn, 1.0 max Si, 10-14 Ni, 16-18 Cr, 2-3 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 55 RA; 150 Brin.
For textile industry, paper and pulp mill equipment, tubes; corrosion resistant; Type 316

U.S.S. 18-8 Mo (TYPE 316).
M-90; 0.1 max C, 2 max Mn, 16-18 Cr, 11-14 Ni, 2-3 Mo, bal Fe.
Annealed: 75,000 TS; 30,000 YS; 35 El; 190 Brin.
For corrosion and heat resistant applications; stainless, austenitic.

USS 18-8-Mo-L.
M-604; 0.03 max C, 10-14 Ni, 16-18 Cr, 2-3 Mo, bal Fe
Annealed· 75,000 TS; 32,000 YS; 50 El.
For welded stainless parts; resists intergranular corrosion after welding

U.S.S. 18-8-S.
M-90; 0.08 max C, 2.0 max Mn, 1.75 max Si, 8-12 Ni, 17-20 Cr, bal Fe.
Annealed: 80,000-95,000 TS; 35,000-45,000 YS; 60-40 El, 135-185 Brin.
For food-dairy-oil-chemical industries; resistant to corrosion and oxidation

U.S.S. 18-8 S.
M-604, M-12; 0.08 max C, 2.0 Si, 2.0 Mn, 8-12 Ni, 18-20 Cr, bal Fe
Annealed: 85,000 TS, 35,000 YS; 50 El; 135 Brin.
For stainless parts, acid resisting apparatus, food-dairy, chemical and oil industries, corrosion resistant; minimized intergranular corrosion; Type 304

U.S.S. 18-8 Si.
M-604; 0.15 max C, 2 max Mn, 2-3 Si, 17-19 Cr, 8-10 Ni, bal Fe
Annealed· 90,000 TS, 40,000 YS; 50 El; 65 RA; Rockwell B85.
For furnace parts, air preheaters, still liners, oxidation and heat resistant

U.S.S. 18 8 STABILIZED
M 90, 0.10 max C, 2.5 max Mn, 1.75 max Si, 8-12 Ni, 17-20 Cr, 4 × C = Ti, bal Fe
Annealed 80,000-95,000 TS, 35,000-45,000 YS, 60-40 El, 135-185 Brin
For food-dairy-oil chemical industries; resistant to corrosion and oxidation, adaptable to welding.

U.S.S. NO. 18 8 STABILIZED
M-604; 17-19 Cr, 8-10 Ni, 0.05-0.15 C, 0.3-0.9 Ti, bal Fe
Stabilized: 85,000-95,000 TS, 40,000-45,000 YS, 55 El; 55 RA; 150-185 Brin
For stainless and heat resisting parts; stainless and heat resistant, complete freedom from intercrystalline corrosion

U.S.S. 18-8 Ti
M-12, 0.10 max C, 2.0 max Mn, 1.0 max Si, 17-19 Cr, 8-11 Ni, Ti = 5 × C, bal Fe
Annealed: 85,000-100,000 TS, 30,000-40,000 YS, 65-50 El; 75-60 RA.
For engine manifolds, exhaust stacks; stainless, austenitic.

U.S.S. 18-8 Ti.
M-604; 0.08 max C, 2.0 max Mn, 1.0 max Si, 9-12 Ni, 17-19 Cr, 5 × C = Ti, bal Fe.
Annealed: 90,000 TS; 35,000 YS; 50 El; 60 RA; 202 Brin.
For tubes for stills, smoke stacks, gasoline tanks, oil tanks, aircraft exhaust; for heat and corrosion resistance (1000-1600°F) and when not practical to anneal after welding; Type 321

USS 18-8-2.
M-640; 0.06 C, 18 Cr, 18 Ni, 2 Si, bal Fe.
Annealed: 80,000 TS; 36,000 YS; 54 El.
At 1000°F: 65,000 TS; 17,400 YS; 47 El.

food processing industries, tanks, kettles, pump parts.
Resists stress corrosion, austenitic, stainless.

U.S.S. 19-9 Mo.
M-604; 0.08 max C, 2 max Mn, 1 max Si, 18-20 Cr, 11-14 Ni, 3-4 Mo, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 45 El; Rockwell B85.
For pulp and paper mill equipment, chemical industry; corrosion, heat and creep resistant.

U.S.S. 20-10.
M-12; 0.20 max C, 0.5 Mn, 0.75 Si, 9 min Ni, 19 min Cr, bal Fe.
For stainless parts, chemical apparatus; corrosion and acid resistant.

U.S.S. 20-10 S
M-604, 0.08 max C, 2.0 max Mn, 1.5 max Si, 10-12 Ni, 19-21 Cr, bal Fe
Annealed. 80,000 TS, 35,000 YS; 35 El, 50 RA; 217 Brin.
For trim and structural purposes, furnace parts, weld rods; heat and corrosion resistance; Type 308.

U.S.S. 21.
M-604, 0.35 max C, 18-23 Cr, 1.0 Si, 2.0 Mn, bal Fe
Annealed: 75,000 TS, 40,000 YS; 22 El; 50 RA, 212 Brin.
For chemical apparatus, oil burner parts; corrosion and heat resistant.

U.S.S. 25-12.
M-11, 0.30 max C, variable Mn, S, P, Si, 12 min Ni, 22 min Cr, bal Fe
Annealed· 90,000 TS, 40,000 YS; 30 El.
For annealing boxes, furnace conveyors, furnace linings, air preheaters, for high temperature service between 1500-2100°F.

U.S.S. 25-12
M-12; 0.20 max C, 2.0 max Mn, 0.75 max Si, 22-24 Cr, 12-15 Ni, bal Fe
Annealed. 90,000-105,000 TS, 30,000-45,000 YS; 65-50 El, 75-60 RA
For corrosion and eat resistant parts; increased corrosion resistance and minimum scaling at high temperatures

U.S.S. 25-12
M-604, 0.20 max C, 2 max Mn, 1.0 max Si, 12-15 Ni, 22-24 Cr, bal Fe
Annealed, 90,000 TS, 45,000 YS; 45 El; 45 RA; 217 Brin.
For preheaters, furnace lining, furnace doors, annealing boxes; heat and corrosion resistant.

USS 25-12-S
M-604, 0.08 max C, 12-15 Ni, 22-24 Cr, bal Fe.
Annealed 90,000 TS; 45,000 YS; 45 El, 217 Brin.
For preheaters, furnace parts; corrosion and heat resistant.

U.S.S. 25-20.
M-12, 0.25 max C, 2.0 max Mn, 1.5 max Si, 24-26 Cr, 19-22 Ni, bal Fe
Annealed: 90,000-110,000 TS; 40,000-60,000 YS; 35-50 El; 45-60 RA.
For corrosion and heat resisting parts; high heat resisting

U.S.S. 25-20 (TYPE 310).
M-90; 0.25 max C, 2 max Mn, 24-26 Cr, 19-22 Ni, bal Fe.
Annealed: 75,000 TS; 30,000 YS; 35 El; 210 Brin.
For corrosion and heat resistant applications; stainless, austenitic, oxidation resistant to 2000°F

U.S.S. 25-20-Si.
M-604; 0.25 max C, 2 max Mn, 1.5-3.0 Si, 23-26 Cr, 19-22 Ni, bal Fe.
Annealed: 100,000 TS; 50,000 YS; 40 El; Rockwell B85.
For heat exchangers, furnace doors, carburizing boxes; oxidation and heat resistant.

U.S.S. 27.
M-11; 0.20 max C, 0.6 max Mn, 0.5 max Si, 23 min Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 20 El
For furnace linings and parts, air and gas preheaters, conveyors; toughness reduced by long periods of heating.

U.S.S. 27.
M-12; 0.35 max C, 1.0 max Mn, 1.0 max Si, 23-27 Cr, bal Fe.
Annealed: 75,000-90,000 TS; 50,000-60,000 YS; 30-20 El; 60-50 RA.
For heat and corrosion resistant parts; minimum scaling at elevated temperatures.

U. S. S. 27.
M-90; 23-27 Cr, 0.20 max C, 2.0 max Mn, 1.0 max Si, bal Fe
Annealed: 75,000-95,000 TS; 30,000-60,000 YS; 30-20 El; 160-190 Brin.
For furnace linings, air and gas preheaters, annealing boxes, valves; heat resistant 1500-2100°F; scaling temperature 2100°

U.S.S. 27
M-604; 0.20 max C, 1.0 max Mn, 1.0 max Si, 23-27 Cr, bal Fe.
Annealed: 80,000 TS; 50,000 YS, 20 El, 50 RA; 217 Brin.
For furnace linings, furnace parts, gas preheaters, annealing boxes; heat resistant 1500-2000°F; Type 446.

USS 304 LN.
M-604; 0.03 max C, 8-12 Ni, 18-20 Cr, 0.10-0.15 N, 2 max Mn, 1 max Si, bal Fe
Rolled: 85,000 TS; 42,000 YS; 59 El; 75 RA
For stainless parts, chemical plant equipment; austenitic, stainless.

U.S.S. 9260.
M-12; 0.55-0.65 C, 0.6-0.9 Mn, 0.04 max P, 0.05 max S, 1.8-2.2 Si bal Fe
Annealed: 200 max Brin.
For springs; tough.

USS AIRSTEEL X-200
M-604; 0.43 C, 0.85 Mn, 1.5 Si, 2 Cr, 0.5 Mo, 0.05 V, bal Fe.
Heat treated: 280,000 TS, 238,000 YS; 7 El
Annealed. 110,000 TS; 77,400 YS, 19 El; 220 Brin
For missile and rocket components; air hardening, tough.

USS AMER-LED BESSEMER
M-12; 0.09 max C, 0.7-1.0 Mn, 0.07-0.12 P, 0.25-0.35 S, 0.15-0.35 Pb, bal Fe.
For screw machine products; free cutting.

USS AMER-LED GR. A
M-12; 0.15 max C, 0.8-1.2 Mn, 0.04-0.09 P, 0.15-0.35 Pb, 0.25-0.35 S, bal Fe.
For screw machine products; free-cutting.

USS AMER-LED GR. B.
M-12; 0.15 max C, 0.85-1.35 Mn, 0.04-0.09 P, 0.40 min S, 0.15-0.35 Pb, bal Fe.
For screw machine products; free-cutting.

U.S.S. ARMATURE
M-604; approx 0.70 Si, bal Fe.
For silicon steel sheets for electrical purposes, motors, armature parts; Res. 21.

U.S.S. AR STEEL.
M-604; 0.35-0.50 C, 1.5-2.0 Mn, 0.15-0.30 Si, bal Fe.
Heat treated: 150,000 TS.
Rolled: 125,000 TS; 250 Brin.
For fan blades, coke screens, liner plates, tile dies; wear resistant.

USS AUSTENITIC MANGANESE STEEL.
M-604, 1.0-1.35 C, 10.5-15.0 Mn, bal Fe.
For perforated screens, dipper teeth, liners, rails; abrasion resistant, work hardens.

U.S.S. CARILLOY F.C.
M-604; 0.6 max C, Mn, Cr, Mo, S, bal Fe.
Oil hardened: 125,000-175,000 TS; 255-340 Brin.
For shafts, pinions, gears; good machinablity.

USS CHAR-PAC.
M-604; 0.17 C, 1.25 Mn, 0.35 Si, 0.25 Cu, 0.15 Ni, 0.12 Cr, 0.04 Mo, bal Fe.
Plate: 60,000 min YS; 80,000-100,000 TS
For pressure vessels, storage tanks, structural parts; bridges, buildings.
Normalized and quenched plates.
Maintains strength down to −75°F.

USS CON-PAC
M-604; 0.17 C, 1.35 Mn, 0.40 Si, 0.30 Cu, bal Fe
Heat treated 100,000 min TS, 80,000 min YS
For plate girders, bridge and building members, construction machinery, railroad cars, trucks, mobile equipment
Heat treated plates

U S S COPPER STEEL.
M-377, C, 0.2 min Cu, bal Fe
For culverts, buildings and general fabrication; hot rolled annealed and galvanized sheets

U S S COR-TEN
M-11; 0.10 max C, 0.1-0.3 Mn, 0.1-0.2 P, 0.5-1.0 Si, 0.3-0.5 Cu, 0.5-1.5 Cr, bal Fe
Annealed: 65,000-75,000 TS, 50,000-60,000 YS; 27-22 El
For tanks, ships, trucks, railroad cars, buses, light weight construction; 4 to 6 times more resistant to atmosphere corrosion than mild steel.

U S S COR-TEN
M-604, M-377, 0.12 max C, 0.2-0.5 Mn, 0.07-0.15 P, 0.5 Ni, 0.25-0.75 Si, 0.2-0.5 Cu, bal Fe.
Rolled: 70,000-63,000 TS; 50,000-43,000 YS; 22 El
For light weight construction, buses, trucks; corrosion resisting properties.

U.S.S COR-TEN-B
M-604; 0.10 max C, 0.10-0.30 Mn, 0.50-1.00 Si, 0.5-1.5 Cr, 0.3-0.5 Cu, bal Fe.
Normalized: 70,000 TS; 50,000 YS; 22 El
For pipes where strength superior to low C steel as well as better resistance to corrosion is desired

USS Cu-Ni-Mo.
M-604; 0.15 C, 0.95 Mn, 1.35 Ni, 0.25 Mo, 0.65 Cu, bal Fe.
Hot rolled: 65,000 YS
For power shovels, gun carriages, oil rigs; good weldability.

U S.S. DYNAMO.
M-604; approx 3.2 Si, bal Fe
For silicon steel sheets for electrical purposes, dynamo parts; Res. 50.

U.S S. ELECTRICAL.
M-604; approx 1.4 Si, bal Fe.
For silicon steel sheets for electrical purposes, motors; Res. 24.

U.S.S. FIELD.
M-604; approximately 0.25 Si, bal Fe.
For silicon steel sheets for small motors; res 15.

USS FREE-MACHINING STEEL, LEADED.
M-604; 0.15 max C, 1.0 Mn, 0.07 P, 0.30 S, 0.25 Pb, bal Fe.
For automatic screw machine products; open hearth, free-cutting.

USS FREMAX 15.
M-604; 0.15 C, 0.90-1.3 Mn, 0.06-0.12 P, 0.20-0.30 S, 0.10-0.30 Si, bal Fe.
1½" T: 64,700 TS; 38,700 YS; 32 El; 126 Brin.
3" T: 60,800 TS; 37,900 YS; 31 El; 126 Brin.
For gears, sprockets, rings, cams, dies, wheels, rolls; free-cutting plate.

USS FREMAX 45.
M-604; 0.40-0.50 C, 0.90-1.3 Mn, 0.2-0.3 S, bal Fe.
1½" T: 91,800 TS; 44,100 YS; 18 El; 167 Brin.
3" T: 89,400 TS; 43,200 YS; 20 El; 183 Brin.
For gears, sprockets, rings, cams, dies, wheels, rolls; free-cutting plate.

U.S.S. LYNORE.
M-604; 0.20 Cu, Cr, Ni, bal Fe.
For structural parts; sheets.

U.S.S. MANGANESE-NICKEL-COPPER.
M-604, 0.25 max C, 1.5 max Mn, 0.5-1.0 Ni, 0.25-0.50 Cu, bal Fe
Rolled: 70,000 TS; 50,000 YS; 22 El.
For road and agricultural equipment; now Tri-Ten.

U.S.S MAN-TEN.
M-11, 0.35 max C, 1.25-1.7 Mn, 0.15 min Si, 0.2 Cu, bal Fe.
Annealed 80,000-90,000 TS; 55,000-65,000 YS; 25-20 El.
For use where high strength is desired; resists abrasion

U S S MAN-TEN.
M-377, M-604; 0.25 max C, 1.10-1.60 Mn, 0.045 max P, 0.05 max S, 0.15 min Si, 0.20 min Cu, bal Fe
Rolled 75,000-65,000 TS; 50,000-40,000 YS, 20 El.
For light weight construction, truck and trailer frames, crane masts; high strength, resists atmospheric corrosion

USS MARAGING STEEL Gr 200
M-604, 0.03 max C, 17-19 Ni, 7.0-8.5 Co, 4.0-4.5 Mo, 0.10-0.30 Ti, 0.05-0.15 Al, B, Zr, Ca, bal Fe.
Maraged 225,000 TS; 215,000 YS; 12 El, 40 RA; C 48 Rock.
For rocket fuel cases, aircraft landing gears, missile and jet engine components, pressure vessels.
Maraging, strong and tough

USS MARAGING STEEL Gr 250
M-604; 0.03 max C, 17-19 Ni, 7.0-8.5 Co, 4.6-5.1 Mo, 0.3-0.5 Ti, 0.05-0.15 Al, B Zr, Ca, bal Fe.
Maraged. 255,000 TS; 245,000 YS; 10 El; 35 RA; C 52 Rock.
For rocket fuel cases, aircraft landing gears, missile and jet engine components, pressure vessels.
Maraging steel Strong and tough.

USS MARAGING STEEL Gr. 300.
M-604; 0.03 C, 17-19 Ni, 8.0-9.5 Co, 4.6-5.1 Mo, 0.6-0.8 Ti, 0.05-0.15 Al, B, Zr, Ca, bal Fe.
Maraged: 295,000 TS; 290,000 YS; 8 El; 30 RA; C 54 Rock.
For rocket fuel cases, aircraft landing gears, missile and jet engine components, pressure vessels. Maraging. Strong and tough.

U.S.S. MOTOR.
M-604; approximately 2.7 Si, bal Fe.
For silicon steel sheets for rotating electrical machinery; res. 40

USS "MX."
M-604; 0.09 max C, 0.7-1.0 Mn, 0.07-0.12 P, 0.24-0.33 S, bal Fe.
For machinery parts; open hearth or Bessemer free-cutting steel.

USS MX-BESS.
M-12; 0.09 max C, 0.7-1.0 Mn, 0.07-0.12 P, 0.24-0.33 S, bal Fe.
For automatic screw machine products; free-cutting.

USS MXI.
M-604; 0.09 C, 0.70-1.0 Mn, 0.05-0.12 P, 0.24-0.33 S, bal Fe.
Bar: 77,500 TS; 68,000 YS; 17.5 El; 50.2 RA; B 88 Rock; 40,000 Fatigue limit.
For screw machine products, bolts, fasteners, case-hardened parts, cams, camshafts.
Free-cutting, carburizing steel.

USS MX-OH.
M-12; 0.09 max C, 0.70-1.0 Mn, 0.07-0.12 P, 0.24-0.33 S, bal Fe.
For automatic screw machine products; free-cutting.

U.S.S OPEN HEARTH IRON
M-604; 0.02 C, 0.03 Mn, 0.01 P, 0.02 S, bal Fe.
For culverts, drainage products.

USS PAR-TEN.
M-604, 0.12 max C, 0.75 max Mn, 0.07 max V, or 0.04 max Cb, 0.05 max S, 0.04 max P, 0.10 max Si, bal Fe.
Hot rolled sheet: 62,000 TS; 45,000 YP; 29 El.
For polished and plated components.
Good formability and weldability.

U.S S POLE.
M-604, approximately 0.60 Si, 0.11-0.15 C, bal Fe.
For poles in rotating electrical machinery; res. 18; formerly "Pole Steel."

USS Q-TEMP 10B18Q.
M-604: 0.15-0.20 C, 0.8-1.1 Mn, 0.005 min B, bal Fe
Quenched 194,000 TS, 152,000 YS; 14 El; 57 RA.
Tempered: 188,700 TS; 156,000 YS; 15 El; 61 RA.
For fasteners, hardware, bolts, extruded parts.
Readily cold headed and extruded.

USS Q-TEMP 10B21Q.
M-604, 0.18-0.23 C, 0.8-1.1 Mn, 0.005 min B, bal Fe
Heat treated. 189,000 TS; 156,000 YS; 15 El; 61 RA.
For fasteners, hardware, bolts, extruded parts.
Readily cold headed and extruded

USS Q-TEMP 10B22Q.
M-604, 0.17-0.23 C, 1.0-1.3 Mn, 0.005 min B, bal Fe.
Heat treated: 189,000 TS; 156,000 YS; 15 El; 61 RA.
For fasteners, hardware, bolts, extruded parts.
Readily cold headed and extruded.

USS Q-TEMP 10B23Q
M-604; 0.17-0.23 C, 1.1-1.4 Mn, 0.005 min B, bal Fe
Heat treated: 189,000 TS; 156,000 YS; 15 El; 61 RA.
For fasteners, hardware, bolts, extruded parts.
Readily cold headed and extruded.

USS Q-TEMP 41B20Q.
M-604; 0.18-0.23 C, 0.75-1.00 Mn, 0.25-0.40 Cr, 0.005 min B, 0.15-0.25 Mo, bal Fe.
Heat treated: 189,000 TS; 156,000 YS; 15 El; 61 RA.
For fasteners, hardware, bolts, extruded parts.
Readily cold headed and extruded.

USS Q-TEMP 41BV20Q.

M-604; 0.18-0.23 C, 0.75-1.00 Mn, 0.25-0.40 Cr, 0.005 min B, 0.15-0.25 Mo, 0.03-0.08 V, bal Fe.

Heat treated: 189,000 TS; 156,000 YS; 15 El; 61 RA.

For fasteners, hardware, bolts, extruded parts.

Readily cold headed and extruded.

USS Q-TEMP 50B23Q.

M-604; 0.20-0.25 C, 0.75-1.0 Mn, 0.25-0 40 Cr, 0.005 min B, bal Fe.

Heat treated: 189,000 TS; 156,000 YS; 15 El; 61 RA.

For fasteners, hardware, bolts, extruded parts

Readily cold headed and extruded.

USS Q-TEMP 60B20Q.

M-604; 0.18-0.23 C, 0.75-1.0 Mn, 0.25-0.40 Cr, 0.03-0.08 V, 0 005 min B, bal Fe.

Heat treated: 189,000 TS; 156,000 YS; 15 El; 61 RA.

For fasteners, hardware, bolts, extruded parts.

Readily cold headed and extruded

USS RADIO TRANSFORMER 58

M-604; approximately 3.8 Si, bal Fe.

For audio transformers; high permeability

USS RADIO TRANSFORMER 65

M-604; approximately 3 8 Si, bal Fe.

For audio transformers; high permeability

U.S S. SIL-TEN.

M-377; 0.40 max C, 0.6 min Mn, 0.2 min Si, 0.0-0.2 min Cu, bal Fe.

Hot rolled: 80,000-95,000 TS; 45,000 YS, 30-18 El.

For structural parts, mine cars, bus bodies, 0.20 min Cu added as ordered to increase corrosion resistance.

USS SPECIAL MOTOR.

M-604; approximately 2 3 Si, bal Fe

For rotating electrical machines; Res 38.

U.S.S. STAINLESS W.

M-604; 0 07 C, 7 Ni, 17 Cr, 0.7 Ti, 0.2 Al, bal Fe.

Annealed: 120,000-150,000 TS; 75,000-115,000 YS; 20-3 El; 50-25 RA; 225-305 Brin

Hardened: 150,000-225,000 TS; 150,000-210,000 YS; 20-3 El; 50-25 RA; 325-450 Brin.

For stainless machinery parts; stainless, age-hardenable.

U.S S. STRUX.

M-604; 0.43 C, 0.75 Ni, 0.05 V, 0.90 Cr, 0.55 Mo, B, 0.9 Mn, bal Fe.

Heat treated: 280,000 TS.

For aircraft structural parts, bolts, landing gears; tough, shock resistant.

U.S.S. SUPER-KORE A.

M-604; 0.10 C, 0 3 min V, 0 0005 min B, 1 8 Ni, 0.5 Cr, 0.25 Mo, bal Fe.

Oil hardened: 168,000-180,000 TS; 120,000-150,000 YS; 18-15 El; 58-52 RA; 352 Brin

For gears, shafts, pinions; case-hardening steel

U.S.S. SUPER-KORE AA.

M-604; 0.15 C, 1.8 Ni, 0.5 Cr, 0.25 Mo, 0.0005 min B, 0.85 Mn, bal Fe.

Oil hardened: 180,000 TS; 160,000 YS; 13 El; 50 RA; 363 Brin.

For gears, pinions, shafts; case-hardening, heavily loaded applications.

U.S.S. SUPER-KORE B.

M-604; 0.15 C, 0.6 Mn, 1.8 Ni, 0 25 Mo, 0.0008 min B, bal Fe.

Oil hardened: 185,000-160,000 TS; 155,000-145,000 YS; 14 El; 51-53 RA; 352 Brin.

For gears; shafts, pinions; case-hardening, heavily loaded applications.

U.S.S. SUPER-KORE C.

M-604; 0.15 C, 0.55 Ni, 0.5 Cr, 0.2 Mo, 0.0005 min B, bal Fe.

Oil hardened: 170,000 TS; 135,000 YS; 11 El; 50 RA; 341 Brin.

For gears, pinions, shafts; case-hardening.

USS SUPERKORE CC.

M-604; 0.20 C, 0.80 Mn, 0.55 Ni, 0.50 Cr, 0.20 Mo, 0.0005 min B, bal Fe.

Heat treated: 170,000 TS; 150,000 YS; 11 El; 45 RA; 340 Brin.

For gears, shafts, pinions; case hardened steel.

USS-"T-1."

M-604; 0.20 max C, 0 3 Cu, 0 85 Ni, 0.5 Cr, 0 003 B, 0.45 Mo, 0 05 V, bal Fe.

Heat treated: 105,000-115,000 TS, 90,000-100,000 YS; 18-16 El; 55-45 RA; 250-321 Brin.

For power shovels, earth moving equipment, railroad cars, good weldability

USS T-1 TYPE A

M-604, 0.12-0.21 C, 0.70-1 00 Mn, 0.04 max P, 0.05 max S, 0 20-0.35 Si, 0.40-0 65 Cr, 0.15-0.25 Mo, 0 03-0.08 V, 0.0005-0.005 B, 0 01-0.03 Ti, bal Fe

Rolled: 115,000-135,000 TS; 100,000 YS; 18 El; 40 RA; 321 Brin.

For earth moving and mining equipment, bridges, oil field rigs; quenched and tempered constructional steel.

USS T-1, Type B.

M-604; 0.16 C, 0.95-1 30 Mn, 0 3-0.7 Ni, 0 4-0 6 Cr, 0.2-0 3 Mo, 0 03-0 08 V, 0.0005 min B, bal Fe.

Heat treated: 100,000 min YS, 115,000-135,000 TS.

For bridges, storage tanks, shovels, buckets, mobile equipment.

Good fabricability and weldability. High impact properties at −50°F

U S.S TENELON

M-604, 0 12 max C 17-19 Cr, 14 5 Mn, 0.4 N, bal Fe

Annealed. 125,000 TS, 70,000 YS; 45 El; 240 Brin

At 1400°F: 46,000 TS; 30,000 YS; 18 El; 22 RA.

For railroad cars, trailers, tanks, pots, stainless, austenitic, non-magnetic.

U.S S TRANSFORMER 52.

M-604, 4 5 Si, bal Fe.

For transformers, sheets, high permeability.

U S S TRANSFORMER 58.

M-604, approximately 4 3 Si, bal Fe.

For silicon steel sheets for transformers in rotating electrical equipment, radio parts; res 60.

U S S. TRANSFORMER 65.

M-604, approximately 3.8 Si, bal Fe.

For silicon steel sheets for transformers in rotating electrical equipment, radio parts; res. 59.

USS TRANSFORMER 66.

M-604, approximately 3 25 Si, bal Fe.

For high efficiency power and distribution transformers; Res. 50, watt loss 0.66.

U.S.S TRANSFORMER 72.

M-604, approx 3 5 Si, bal Fe.

For silicon steel sheets for transformers, rotating machinery, electrical purposes; Res. 57.

USS TRI-TEN.

M-604; 0.22 max C, 1.25 max Mn, 0.2-0.6 Cu, 0 02 min V, bal Fe.

Rolled: 63,000-70,000 TS; 43,000-50,000 YS; 25 El.

For cranes, shovels, mine cars, truck bodies, derricks.

Good resistance to atmospheric corrosion, shock resistant.

US ULTRA.
M-1618, M-1182; 0.36 C, 0.4 Mn, 1.1 Si, 5.0 Cr, 0.35 V, 1.3 Mo, bal Fe.
Ht. Tr.: 300,000 TS; 227,000 YS; 9 El; C 55 Rock.
For hot dies, fasteners, extrusion and die casting dies, bulkheads.
Type H-11 hot-work steel, high toughnes and wear resistance.

US ULTRA 2.
M-1618, M-27; 0.4 C, 10.5 Si, 0.4 Mn, 1.1 V, 1.3 Mo, bal Fe.
Heat treated: 272,000 TS, 230,000 YS; 10 El; 46 RA; C 52 Rock.
For hot dies, brass forging and pressing dies, hot shears and punches.
Type H13 hot work steel. Resists shock and heat checking.

US ULTRA-4.
M-27; 0.36 C, 1 Si, 5 Cr, 1.3 W, 1.4 Mo, 0.4 V, bal Fe.
For die casting dies, punches.
Hot work, oil hardening steel.

US ULTRA-4.
M-1618; M-1182; 0.36 C, 0.4 Mn, 1.0 Si, 5.0 Cr, 0.35 V, 1.3 W, 1.4 Mo, bal Fe
Heat treated. 205,000 TS; 185,000 YS; 12 El; 42 RA; Rock C 44.
For die blocks, extrusion rams, shell piercing tools, upsetters, punches.
Type H12 hot work tool steel, air hardening. Resists heat checking.

U.S.S. VITRENAMEL.
M-604; 0.2 C, bal Fe.
For enameling purposes; sheets

UTALOY.
M-1003; 35 Ni, 12 Cr, Mo, 0 20 max C, bal Fe.
Cast: 375 Brin
For heat resisting parts, mining machinery, impact and abrasion resistant.

UTEX.
M-822; 0.95 C, 2.0 W, 0.6 Cr, bal Fe.
For tools; oil hardened

UTICA.
M-1; 1.25 C, 1 5 W, 0 4 Cr, 0.20 V, bal Fe
Heat treated: 444-740 Brin.
For taps, reamers, tools, drills, broaches, punches, dies; non-deforming, non-shrinking steel.

UTILITY.
M-688; 0.6-0.9 C, 0.25-0.60 Mn, bal Fe.
For drills, chisels, blacksmith tools; water hardened.

UTILITY BEARING METAL.
M-575; Cu alloy.
For bearings, bushings; low cost.

UTILOY 12.
M-1055; 0.12 max C, 11-13 Cr, 0.4 Mn, 0.9 Si, bal Fe.
For castings; corrosion resistant.

UTILOY 12N.
M-1055; 0.12 max C, 11-13 Cr, 1.7-2.5 Ni, bal Fe.
For castings; corrosion resistant.

UTILOY 20.
M-1055; 29 Ni, 20 Cr, 2-3 Mo, 4 Cu, 0.07 max C, 1 Si, bal Fe.
Cast: 65,000-75,000 TS; 28,000-38,000 YS; 50-35 El; 50-40 RA; 120-150 Brin.

UTILOY 46.
M-1055; 4-7 Cr, 0.25 max C, 0.5 Mo, 0.7 Mn, 0.4 Si, bal Fe.
For castings; corrosion resistant.

UTILOY 3085.
M-1055; 0.28-0.35 C, 0.8-1.1 Ni, bal Fe.
Cast: 82,000 TS; 45,000 YS; 22 El; 35 RA.
For pump parts; water or oil hardened.

UTILOY H.
M-1055; 0.28-0.32 C, 23-26 Cr, 11-13 Ni, 0.9-1.1 Si, bal Fe.
For castings; corrosion and heat resistant.

UTILOY NH.
M-1055; 35 Ni, 15 Cr, C, bal Fe.
For salt bath pots; heat and corrosion resistant.

UTILOY X
M-1055, 0.15 max C, 18 Cr, 8 Ni, bal Fe.
For stainless castings; stainless.

UTILOY X-7.
M-1055; 0.08 max C, 1.5 max Mn, 2 max Si, 18-21 Cr, 8-11 Ni, bal Fe.
Cast: 78,000 TS; 43,000 YS; 45 El; 150 Brin.
Annealed· 78,000 TS; 38,000 YS; 55 El; 140 Brin.
For pumps, valves, autoclaves, mixers, kettles; ACI-CF8; stainless, austenitic.

UTILOY XX.
M-1055; 0.07 max C, 18 Cr, 8 Ni, 3.5-4.5 Mo, bal Fe.
For stainless castings; heat and corrosion resistant.

UTTER.
M-111; 0.5 C, 0.9 Si, 0.9 Cr, bal Fe.
For springs; oil hardening.

V2AED.
German; 0.15 C, 18 Cr, 8 Ni, W, Ti, Ta, bal Fe.
For turbine blading and nozzles; heat resistant.

V-5 ALLOY.
M-394, 40 Cr, 10 Mn, 15 Si, bal Fe.
Used in iron manufacturing; for chill reduction.

V20M7K25
M-Russia; 0.8 C, 18.9 W, 24.9 Co, 6.6 Mo, bal Fe.
For wear resistant cutting tools, wear plates.
Wear resistant, high red-hardness.

V-22.
England; W-alloy.
For gyro and counterweight components; high heat resistant.

V 45 STEEL.
M-24, 0.22 max C, 1.25 Mn, 0.04 P, 0.05 S, 0.02 min V, 0.015 max N, bal Fe.
Rolled: 65,000 min TS; 45,000 min YS; 18 El.
For structures, buildings, bridges, booms, derricks, mine cars.
Structural plates, tough.

V 50 STEEL.
M-24; 0.22 max C, 1.25 Mn, 0.04 P, 0.05 S, 0.02 min V, 0.015 max N, bal Fe.
Rolled: *70,000 min TS; 50,000 min YS; 18 El.*
For structures, buildings, bridges, booms, derricks, mine cars.
Structural plates, tough.

V 55 Steel.
M-24; 0.22 max C, 1.25 Mn, 0.04 P, 0.05 S, 0 02 min V, 0.015 max N, bal Fe.
Rolled: 70,000 min TS; 55,000 min YS; 17 El.
For structures, buildings, bridges, booms, derricks, bus bodies.
Structural plates, good weldability

V 60 STEEL.
M-24; 0.22 max C, 1.25 Mn, 0.04 P, 0.05 S, 0.02 min V, 0.015 max N, bal Fe.
Rolled: 75,000 min TS; 60,000 min YS; 16 El.
For structures, buildings, bridges, derricks, mine cars, bus bodies.
Structural plates, good weldability and fabricability.

V 65 STEEL.
M-24; 0.22 max C, 1.25 Mn, 0.04 P, 0.05 S, 0.02 min V, 0.015 max N, bal Fe.
Rolled: 80,000 min TS; 65,000 min YS; 15 El.
For structures, buildings, bridges, derricks, mine cars, bus bodies.
Structural plate, good weldability.

V 76 (was KOLSTER V-76).
M-335; 0.6 C, 1.85 Si, 0.7 Mn, 0.45 Mo, 0.2 V, bal Fe.
Oil or water hardening.
For tools, dies.
AISI S5 Shock resisting tool steel.

V444D.
M-459; 0.4 C, 2.45 Si, 1 Mn, 10 Ni, 18.5 Cr, 1.5 V, bal Fe.
For valves; corrosion and heat resistant.

VA-ALLOY.
Eng.; 80.2 Al, 5.01 Cu, 13.7 Zn, 0.72 Fe, 0.2 V.
For light alloy parts; non-hardenable.

VAC-ARC AGT.
M-73; 0.08-0.13 C, 3.0-3.5 Ni, 1.0-1 4 Cr, 0.08-0.15 Mo, bal Fe.
Heat treated: 131,000-179,000 TS; 96,000-143,000 YS; 21-15 El; 67-59 RA; 289-363 Brin
For gears, shafts, pawls, arbors, pneumatic tool parts, ratchets; high core strength, case hardening steel.

VAC-ARC BG41.
M-73; 1.05 C, 14.5 Cr, 0.12 V, 4 Mo, 0.5 Mn, bal Fe.
For bearings for high temperature operation; hardenable, stainless.

VAC-ARC REGENT.
M-73; 1.0 C, 0.35 Mn, 1.5 Cr, bal Fe.
Annealed: 100,000 TS; 81,000 YS; 25 El; 57 RA; 192 Brin.
Heat treated: 237,000 TS; 226,000 YS; 444 Brin.
For bearings, liners, bushings; vacuum melted, deep hardening.

VACCUTHERM 5-32.
M-1307; 0.15 C, 11.5 Cr, 1.0 Mo, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 40 El; B 92 Rock.
Heat treated: 200,000 TS; 160,000 YS; 15 El; C 45 Rock.
For chemical plant and oil refinery equipment, springs, table flatware.
Corrosion resistant, hardenable.

VACCUTHERM 5-32 h.
M-1307; 0.20 C, 11.5 Cr, 1.0 Mo, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; 55 RA; B 92 Rock.
Heat treated: 240,000 TS; 210,000 YS; 8 El; 25 RA; C 50 Rock.
For gears, shafts, cutlery, knives, surgical instruments, stainless hardware, oil refinery equipment.
Corrosion resistant, hardenable.

VACCUTHERM 5-34.
M-1307; 0.20 C, 11.5 Cr, 1 Mo, 0.3 V, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; B 92 Rock.
Heat treated: 245,000 TS; 210,000 YS; 10 El; C 50 Rock.
For gears, shafts, hardware, surgical instruments, oil refinery and equipment.
Corrosion resistant, hardenable.

VACCUTHERM 5-36.
M-1307; 0.20 C, 12 Cr, 1 Mo, 0.3 V, 0.5 W, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 24 El; B 94 Rock.
Hardened: 240,000 TS; 205,000 YS; 9 El; C 50 Rock.
For cutlery, surgical instruments, valves, bearings, chemical plant and oil refinery equipment.
Corrosion resistant, hardenable.

VACCUTHERM 5-40 h
M-1307; 0.18 C, 0.2 Cb, 11.5 Cr, 0.6 Mo, 0.6 Ni, 0.25 V, bal Fe.
Annealed: 85,000 TS; 40,000 YS; 24 El; B 95 Rock.
Hardened: 240,000 TS, 205,000 YS; 10 El; C 50 Rock.
For cutlery, surgical instruments, valves, bearings, pivots.
Corrosion resistant, hardenable.

VACON.
M-1631; 29 Ni, 17 Co, bal Fe.
For glass-to-metal seals
Low expansion.

VACRO 5.
M-111; 0.27 C, 1.15 Mn, 0.75 Cr, 0 15 V, bal Fe.
For gears, shafts; shock resistant.

VACRO 62.
M-111, 0.30 C, 2 5 Cr, 0.2 Mo, 0.15 V, bal Fe.
For die casting and plastic mold dies; oil hardened, tough.

VACUMET WASPALLOY
see CARPENTER WASPALLOY.

V.A G 160.
Eng , 2-5 Si, 0 6 Mg, 0 7 Mn, bal Al.
For light alloy parts, corrosion resistant.

VALAND-1.
M-111; 0.3 C, 1.7 Ni, 9 W, 0.3 V, 3 Cr, bal Fe
For die casting dies, hot working tools; hot work steel, oil hardened

VALAND 2
M-111, 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8 5 W, bal Fe.
For extrusion dies, rams and liners, punches, hot work steel, oil hardened.

VALENITE VC-1.
M-1668, Sintered carbide tool material.
Primarily for roughing cuts on cast iron; tough and abrasion resistant; good at withstanding shock of interrupted cuts.

VALENITE VC-2.
M-1668, Sintered carbide tool material.
General purpose grade machining cast iron and non-ferrous metals; more wear resistant than VC-1.

VALENITE VC-3.
M-1668, Sintered carbide tool material
For finish machining on cast iron and on non-ferrous metals and non-metallics.
Withstands abrasion but not shock.

VALENITE VC-4.
M-1668; Sintered carbide tool material.
Hardest grade, good wear resistance; for finish machining and precision boring of cast iron and non-ferrous metals; low shock resistance.

VALENITE VC-6.
M-1668; Sintered carbide tool material.
For general purpose and light cuts on steel, where cratering is a problem.

VALENITE VC-7.
M-1668; Sintered carbide tool material.
High grade for finish cutting steel.

VALENITE VC-8
M-1668; Sintered carbide tool material.
Very hard grade for fine finishing and precision boring steel.

VALENITE VC-9.
M-1668; Sintered carbide tool material.
Very hard wear resistant grade,—for finishing and wear application where no shock exists.

VALENITE VC-10
M-1668, Sintered carbide tool material
Excellent general purpose, wear grade,—for gage blocks, plug gages.

VALENITE VC-11.
M-1668; Sintered carbide tool material
For wear applications where some shock is encountered, as planer tools.

VALENITE VC-12.
M-1668; Sintered carbide tool material.
High strength and shock resistant, for punches, blanking dies, lamination dies.

VALENITE VC-13.
M-1668; Sintered carbide tool material.
Good shock resistance, for blanking and punching dies

VALENITE VC-14.
M-1668, Sintered carbide tool material
For heavy shock resistance as in blanking dies, swaging, coining dies.

VALENITE VC 28
M-1668, Sintered carbide tool material
Premium grade for heavy duty and general purpose machining of cast iron and non-ferrous and non-metallic materials.
Good resistance to edge wear and chipping.

VALENITE VC-55.
M-1668, Sintered carbide tool material
Premium grade for rough and general purpose machining of steel, heavy and interrupted cuts

VALENITE VC-83.
M-1668, Sintered carbide tool material
High titanium carbide content; finishing grade for light precision cuts

VALENITE VC-125
M-1668, Sintered carbide tool material
For general purpose and roughing cuts on steel, including interrupted cuts

VALENTINE STEEL.
0.75 C, 5.25 Cu, 1.2 Mn, 1.2 V, 12.5 W, bal Fe

VALIANT.
M-1411, 1.5 C, 4 W, 0.5 Cr, bal Fe
For cutting tools, engraving cutters; water hardened, keen cutting edge

VALIMP
M-1653, 0.11 C, 12.5 Cr, 0.5 Mo, bal Fe
Annealed. 80,000 TS, 40,000 YS, 25 El, B 92 Rock
Hardened: 200,000 TS; 160,000 YS, 12 El, C 45 Rock
For springs, table flatware, oil refinery and chemical plant equipment
Corrosion resistant, hardenable.

VALIMPHY
M-104; C, 8 Cr, 1 Mo, 0.5 V, bal Fe.
For petroleum industries, heat transfer tubes;

VALIMPHY 550.
M-771; C, alloy, bal Fe.
For oil refinery equipment; oxidation resistant.

VALIMPHY 600.
M-771; C, alloy, bal Fe.
For oil refinery equipment; oxidation resistant.

VALIW.
M-1653; 0.22 C, 12.5 Cr, 1.5 Mo, 0.75 Ni, 0.25 V, 1.0 W, bal Fe.
Annealed: 98,000 TS, 42,000 YS; 22 El; B 95 Rock.
Hardened: 245,000 TS; 210,000 YS; 8 El, C 50 Rock.
For surgical instruments, knives, gears, shafts, hardware, pivots
Corrosion resistance, hardenable.

VALRAY 1
M-121, 80 Ni, 20 Cr.
For coating automobile exhaust valves; facing alloy, heat resistant

VALVE BEARINGS.
Eng.; 71 Sn, 24 Sb, 5 Cu.
For bearings, valve packing; Babbitt.

VALVE BRONZE.
M-129; 85-89 Cu, 2-10 Sn, 3-7 Zn, 3-6 Pb,
Cast.
For valves, corrosion resistant

VALVE COPPER
M-234; 88 Cu, 4 Sn, 3 Zn, 3 Pb, 3 Ni
Cast: 30,000 TS; 15,000 YS; 15 El
For valves and pipe fittings

VALVE-LOY
M-507, 0.6 C, 35 Cr, 10 Mo, 8 W, 6 Co, 14 Cu, 0.02 B, bal Fe
Welded: 590 Brin
For hard facing electrodes, for valve faces

VALVE STEEL
U.S.; 5.8 Si, 1.5 Ti, 1.5 V, bal Fe
For valves, heat resistant

VALVE STEEL CHROME I.
Eng., 11-14 Cr, 0.4-1.2 C, 0.1-0.2 Si, bal Fe
For valves, heat resistant

VALVE STEEL CHROME II.
6.3 Cr, 0.5-1.0 C, 0.1-0.3 Si, bal Fe
For valves; heat resistant

VALVE STEEL, TUNGSTEN.
14 W, 3 Cr, 0.6 C, bal Fe
For valves, heat resistant

VALVE STEEL VERY HARD
60 W, 26 Fe, 5 Ti, 4 Cr, 3 C, 2 Ce
For valves; heat resistant

VAMPIRE
M-1411; 0.90 C, 0.30 Cr, 1.5 Mn. bal Fe.
For forming and heading dies, punches, crimpers; oil hardened, non-deforming

VANADIN 40.
M-1331; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For engravers' tools, heading and blanking dies, high speed steel

VANADIN 40 Co.
M-1331; 1.35 C, Cr, Co, Mo, V, W, bal Fe
For engravers' tools, heading and blanking dies, high speed steel

VANADIUM 4
M-1326; 1.25 C, 4.15 Cr, 0.85 Mo, 3.75 V, 12.0 W, bal Fe.
For lathe tools, reamers and milling cutters, mainly for finish cutting; good wear hardness; high speed

VANADIUM 6-6-2 see VASCO M2.

VANADIUM 40.
M-1331; 1.3 C, 4.3 Cr, 0.85 Mo, 5.8 V, 12 W, bal Fe.
For blanking and forming dies, engravers' tools; high speed steel.

VANADIUM 40 Co.
M-1331; 1.35 C, Cr, Co, Mo, V, W, bal Fe.
For blanking and forming dies, engravers' tools; high speed steel.

VANADIUM BRASS.
U.S.; 70 Cu, 29.5 Zn, 0.5 V.
For condenser tubes, sheets, hardware.

VANADIUM BRONZE.
U.S.; 38.5 Zn, 0.5 V, bal Cu.
For pipes; high strength.

VANADIUM CASTDIE.
M-35; 0.35 C, 5 Cr, 1 V, 1.5 Mo, bal Fe.
For hot work tools and dies; hot work steel, oil hardened.

VANADIUM EXTRA.
M-35; 0.9 C, 0.2 V, bal Fe.
For drills, taps, cutters, reamers, broaches; Type W2; water hardened.

VANADIUM FIREDIE.
M-35; 0.35 C, 5 Cr, 1 V, 1.5 Mo, bal Fe
For Al and Mg die casting dies; Type H13; oil hardened.

VANADIUM GRAINAL NO. 1.
M-394; 25 V, 15 Ti, 10 Al, 0 2 B, bal Fe.
Used in steel manufacturing; increases hardenability

VANADIUM HOT WORK.
M-364; 0.5 C, 0.5 Cr, 1 V, bal Fe.
For hot work tools; hot work steel

VANADIUM METAL.
M-394; 99.5% and 90% V.
For special metallurgical applications; "Vancoram."

VANADIUM PERMANDUR.
M-1; 48 Co, 2 V, bal Fe. For diaphragms, pole pieces; high permeability at high inductions.

VANADIUM PERMENDUR.
M-22, M-205; 49 Fe, 49 Co, 2 V.
For electrical apparatus working at high flux density, high permeability at high flux density.

VANADIUMSTAHL EXTRA ZH.
M-1310; 1.15 C, 0.65 Cr, 0 10 V, bal Fe.
For blanking and forming dies; oil or water hardened.

VANADIUM STANDARD.
M-35; 1.06 C, 0.25 Mn, 0.20 Si, 0 2 V, bal Fe.
For mandrels, cold chisels, blacksmith tools, jigs. Type W 2 water hardening tool steel.

VANADIUM STRIKING DIE.
M-275; 0.90 C, 0.25 V, bal Fe.
For drills, reamers, hobs, taps, striking dies; Type W2; water hardened.

VANADIUM TOOL.
Eng.; 0.9 C, 1 Cr, 0.2 V, bal Fe.
For tools; oil hardening.

VANALIUM.
80.2 Al, 5.1 Cu, 13.7 Zn, 0.72 Fe, 0.20 V.
Cast: 22,000 TS, 16,000 YS; 8 El.
For cast parts, for aircraft and automotive engines; resists corrosion and erosion

VAN ALLEN.
Eng.; 64 Au, 18.75 Ag, 9 Cu, 8 Pd, 0.25 Al.
For dental alloy; corrosion resistant

VANASIL.
M-1477; 21-23 Si, 1-1.5 Cu, 2-2.5 Ni, 0.75-1.25 Mg, 0.1 V, 0.15 Ti, bal Al.
Cast: 20,000-36,000 TS, 0.5 El; 90-150 Brin.
For pistons, cylinder sleeves and liners; low coefficient of friction.

VAN CHIP.
M-57; 1 C, 4 Cr, 2.7 V, 6 W, 5 Mo, bal Fe.
For broaches, hobs, reamers, taps, drills; Type M3; high speed steel.

VAN CHIP.
M-57; 1.15 C, 6 W, 4.1 Cr, 3 V, 5.75 Mo, bal Fe.
For plane and lathe tools, reamers, broaches, hobs, taps, drills; high speed steel, Type M3.

VANCO 5
M-487; 1 5 C, 12 W, 5 Cr, 5 V, 6 Co, bal Fe.
For taps, shear blades, boring and turning tools; high speed steel.

VANCORAM ALSIFER.
M-394; 20 Al, 40 Si, 40 Fe
For deoxidizer in manufacture of steel

VANCORAM ALUMINUM VANADIUM.
M-394; 10-80 V, bal Al.
For use in manufacture of non-ferrous alloys; Vancoram Three Grades.

VANCORAM FERRO CHROMIUM HIGH CARBON.
M-394, 4-6 C, 66-70 Cr, bal Fe.
For use in manufacture of steel and stainless alloys.

VANCORAM FERROVANADIUM.
M-394; 0 35-3.50 C, 1.25-12 Si, 30-60 V, bal Fe
For use in manufacture of steel; Vancoram Four Grades

VANCORUM FERRO VANADIUM CRUCIBLE GRADE B
M-394; 50-80 V, 0.5 max C, 2.2 max Si, bal Fe.
Used in steel manufacturing; for high V content.

VANCORUM FERRO VANADIUM OPEN HEARTH GRADE A.
M-393; 50-55 V, 2 0 max C, 7 5 max Si, bal Fe
Used in the manufacture of steel; for low V content.

VANCORUM FERRO VANADIUM PRIMOS GRADE C.
M 394; 50-80 V, 0.2 max C, 1 25 Si, bal Fe.
Used in steel manufacturing, for high V content.

VANCRO
M-908, 0.45 C, 0.7 Mn, 1 0 Cr, 0 15 V, bal Fe
For dies, cold work tools; water hardening.

VANCRO
M-1067, 0 45 C, 1 Cr, 0 15 V, bal Fe.
For dies, tools; tough, water hardening.

VAN-CRO 12.
M-1684; 1.5 C, 12 0 Cr, 1 0 V, 1.0 Mo, bal Fe.
Air or oil hardening cold work tool steel, high carbon-high chromium type; for shear blades, blanking and trimming dies, gages AISI D2

VANCROM.
M-1425; C, alloy, bal Fe.
For gears, machine parts, pins, spindles; oil hardened, tough.

VAN CUT.
M-115, 1.0 C, 6 W, 4 Cr, 2.5 V, 5.5 Mo, bal Fe.
For broaches, form tools, chasers; high speed steel.

VANDERLOY.
M-1500; 99.9 Fe.
For electroformed molds and dies, electrolytic iron

VANGUARD.
M-1411; 1.3 C, 1 W, 1.5 Cr, 0.75 Mn, bal Fe.
For heading and forming dies, punches; cold work steel, oil hardened.

VANICK.
M-79; 2.5 C. 2.5 Si, 0.5 Ni, 0.50 Mn, trace V, bal Fe.
Cast: 50,000 TS.
For general castings; high test gray iron.

VANIDUR.
M-Germany, 0.10 C, 18.0 Cr, 10.0 Ni, 1.0 V, 0.6 Ti, bal Fe.
Annealed: 85,000 TS, 30,000 YS, 55 El; B 80 Rock.
For welded structures, and tanks, chemical and dairy plant equipment
Corrosion and heat resistant, austenitic, stabilized.

VANIMOLOY.
M-1387; 3 C, 2 Ni, Si, Mn, bal Fe.
For valve lifters; cast iron.

VANITE.
M-35; 0.82 C, 18 W, 4 Cr, 2 V, 0.6 Mo, bal Fe.
For tools, cutters, reamers, broaches, hobs, milling cutters
Type T2 high speed steel.

VAN-LOM.
M-115, 0.85-0.89 C, 3.8-4.2 Cr, 8.0-8.5 Mo, 2.0 V, bal Fe.
For tools, cutters, chasers, reamers, drills, broaches, lathe and planer tools.
AISI M1.

VAN LOM FM.
M-115, 0.85 C, 4.0-4.5 Cr, 8.0-8.5 Mo, 2 V, bal Fe.
For reamers, drills, punches, high speed steel, free-cutting

VANQUISH
M 1411, 0.95 C, 0.25 V, bal Fe.
For drills, reamers, punches, taps, crimpers; Type W2, water hardened

VAN SNAP.
M-1409, low C, Cr, V, M, Mo, bal Fe.
For rivet snaps, oil hardened, non-tempering

VANTRO-S.
M-115; 1.27 C, 2.5 Si, 0.3 Mn, 5.5 W, 8.0 Cr, 4.0 V, 4.5 Mo, 5.0 Co, bal Fe
For antifriction bearings, high temperature bearings.
High resistance to heat and wear in high temperature service Corrosion resistant

VARIOPERM
England; 70 Fe, 30 Ni
For compensating shunts for electrical equipment, temperature-sensitive, magnetic

VAROSS.
M-1068; 35 Ni, bal Fe.
For springs, low expansion, corrosion resistant, non-magnetic

VAR STEEL Gr. 250.
M-1602; 0.03 max C, 18 Ni, 4.8 Mo, 8 Co, 0.4 Ti, 0.1 Al, 0.003 B, Zr, bal Fe.
Heat treated forging. 254,000 TS, 245,000 YS; 10.5 El; 55 RA;
For missile components, aerospace and jet engine parts, rocket motor cases.
Maraging High strength and fracture toughness.

VAR STEEL Gr. 280
M-1602; 0.03 max C, 18.5 Ni, 4.8 Mo, 9.0 Co, 0.7 Ti, 0.1 Al, 0.003 B, 0.02 Zr, bal Fe.
Annealed: 155,000 TS; 110,000 YS; 15 El, 70 RA;
Maraged: 290,000 TS; 280,000 YS; 10 El; 55 RA; C 54 Rock.
For missile components, rocket motor cases, engine parts, pressure vessels.
High strength and fracture toughness. Maraging. Shock resistant.

VASCO 8-N-2
M-115; 0.72-0.81 C, 1.3-1.8 W, 3.5-4 Cr, 8.0-9.2 Mo, 0.9-1.3 V, bal Fe.
For cutting tools, reamers, taps, broaches, drills; high speed steel.

VASCO 8-N-2 COBALT.
M-115; 0.7 C, 8 Mo, 0.5 V, 4 Cr, 1 W, 5 Co, bal Fe.
For lathe and planer tools, reamers, drills, taps; high speed steel.

VASCO 8N2 FM.
M-115, 0.8 C, 1.5 W, 4 Cr, 9 Mo, 1.2 V, bal Fe.
For cutting tools, reamers, taps, broaches, hobs; high speed steel, free-cutting.

VASCO 14-4 CVM.
M-115, 1.05 C, 0.3 Si, 0.5 Mn, 14.25 Cr, 4.0 Mo, bal Fe
Ht Tr Rock C 25-61.
For ball and seats for oil well pumps, cutlery, piston rings and seals, bushings, cryogenic applications, ball bearings.
Hardenable, stainless. Good to 900°F.

VASCO 1741 CVM.
M-115, 1.3 C, 17.5 Cr, 4 Mo, 1 V, 0.3 max Mn, bal Fe
For high temperature bearings, pistons, rings and seals, cryogenic applications
Good wear and heat resistance in high temperature service

VASCO 6379.
M-115; 0.82 C, 1.0 Si, 0.3 Mn, 7.75 Cr, 2.5 V, 1.55 Mo, bal Fe.
Heat Treat 200,000-280,000 TS; 170,000-230,000 YS; 8-6 El, 29-31 RA; C 42-57 Rock.
For shears, slitters, insert dies, hot and cold punches, forging dies, hot and cold shear blades.
Wear resistant, tough with good hot hardness.

VASCO 7152
M-115, 1.6-1.8 C, 17.0-17.5 Cr, bal Fe
For pump parts, bearings, pivots; corrosion and wear resistant.

VASCO CHROMOLD CVM
M-115, 0.06-0.12 C, 0.15-0.25 Si, 0.10-0.40 Mn, 0.01 max S, 0.01 max P, 2.15-2.45 Cr, bal Fe.
Hardened 120,000 TS; 90,000 YS; Rock C 25.
For plastic molds, glass molds, die cavities.
Case hardening steel, easy hubbing for mold cavities Vacuum melted.

VASCO CM.
M-115, 1.2-1.3 C, 0.25 Si, 0.6 Mn, 0.5 Cr, 0.2 Mo, bal Fe.
Heat treated: 212,000 TS, 6 El, 7 RA, 480 Brin.
Hardened: C 60-65 Rock
For taps, reamers, broaches, punches, arbors, threading dies, drills.
Maintains fine cutting edge.

VASCO DIE.
M-115; 0.82 C, 1.0 Si, 0.3 Mn, 7.75 Cr, 2.5 V, 1.55 Mo, bal Fe.
Ht. Tr 224,000-349,000 TS; 190,000-279,000 YS; 6.8-3.8 El; 22.7-11.5 RA; 47-60 Rock C.
For trim dies, thread roll dies, coining dies, plastic molds, slitter knives, shear blades, punches, back

VASCO HYPERCUT.
M-115; 1.07 C, 8 Co, 3.75 Cr, 1.5 W, 9.5 Mo, 1.15 V, bal Fe.
Ht. Tr.: C 22-70 Rock.
For cutters, drills, tool bits, reamers, broaches, milling cutters.
High-speed steel, Type M-42.

VASCOJET 90.
M-1723; 0.12-0.18 C, 0.20 max Si, 0.80-1.10 Mn, 1.25-1.50 Cr, 0.80-1.0 Mo, 0.20-0.30 V, bal Fe.
Air or oil hardenable.
Hardened: 140,000-184,000 TS; 112,000 min YS; 10 min El.
High strength, low carbon-low alloy steel.
Can be welded; can be case hardened for improved wear resistance AFNOR 15 CDV 6.

VASCOJET 1000.
M-115; 0.40 C, 5 Cr, 1.3 Mo, 0.5 V, bal Fe.
Heat treated: 136,000-310,000 TS; 101,000-241,000 YS; 16-3 El; 42-7 RA, 290-570 Brin.
For die blocks, fasteners; air hardened, thermal stability.

VASCOJET 1000 CVM.
M-115; 0.37-0.43 C, 4.75-5.25 Cr, 1.3 Mo, 0.5 V, 0.9 Si, 0.3 Mn, bal Fe
Ht. Tr.: 136,000-311,000 TS; 101,000-240,000 YS; 16-9 El; 42-29 RA; 290-570 Brin.
For aircraft landing gear components, engine mounts, fatigue resistant, high strength.

VASCOJET M-A.
M-115; 0.50-0.55 C, 12.0 W + Mo + Cr + V, bal Fe.
Heat treated: 305,000-362,000 TS; 266,000-293,000 YS; 6-8.5 El; 20-34 RA; C 56-61 Rock.
For airframes, fasteners, pressure vessels, engine mounts, gears, axles, rotors.
Ultra high-strength to 1000°F. Tough and fatigue resistance.

VASCO JET X5 NOW VASCOJET 1000 CVM, 5 TEMPER.

VASCOLOY see VR/WESSON.

VASCOLOY RAMET see VR/WESSON.

VASCOLOY VR-75.
M-329; WC.
Sintered: 250,000 TS; Rockwell 91A.
For cutting tools for high strength steels, sintered carbide, shock resistant.

VASCO M-2
M-115, 0.80-0.85 C, 6.0-6.75 W, 4.75-5.25 Mo, 1.75-2.05 V, 3.9-4.4 Cr, bal Fe.
High speed tool steel, Mo-W type
For cutting tools, taps, broaches, hobs, milling cutters; AISI M2.

VASCO M-2 DRILL ROD.
M-342; 0.82 C, 4.25 Cr, 1.9 V, 6.4 W, 5 Mo, bal Fe.
For tools, cutters; high speed steel.

VASCO M7.
M-115; 0.99 C, 1.75 W, 3.75 Cr, 2.05 V, 8.75 Mo, bal Fe.
Ht. Tr. Rock C 22-26.
For drills, end mills, reamers, hobs, lathe and planer tools, slitting saws, blanking and trimming dies, chasers.
Type M-7 high speed steel.

VASCO M10.
M-115; 0.85 C, 4 Cr, 2 V, 8 Mo, bal Fe.
For cutting tools, lathe and planer tools; high speed steel.

VASCO M50 CVM.
M-115; 0.80 C, 0.30 Mn, 0.30 Si, 4.0 Cr, 1.0 V, 4.0 Mo, bal Fe.
Annealed: 202 Brin.
For gears, valve parts, elevated temperature bearings; cutting tools. AISI M50.

VASCO MARVEL 721.
M-115; 0.33 C, 3.5 Cr, 9.75 W, 0.45 V, bal Fe.
For extrusion rams and dies, hot punches and shears; hot work steel.

VASCO MATRIX II-CVM.
M-115; 0.50-0.55 C, 20 total W-Mo-Cr-V-Co, bal Fe.
Annealed. 95,000 TS; 48,000 YS; 25 El; 55 RA; B 90 Rock
Heat treated: 406,000 TS, 393,000 YS; 2 El; 2.3 RA, C 63 Rock
For rocket motor cases, gears, pressure vessels, shears, springs, torsion bars.
Good high temperature strength

VASCOMAX 250
M-115; 0.03 max C, 17-19 Ni, 7.0-8.5 Co, 4.6-5.1 Mo, 0.3-0.5 Ti, 0.05-0.15 Al, bal Fe
Annealed 140,000 TS; 95,000 YS, 17% El; 75% RA, 290 Brinell
Heat treated. 275,000 TS, 268,000 YS; 10% El; 48% RA; 520 Brinell.
For missile and aircraft components, rocket cases
Maraging steel, high strength, tough and ductile.

VASCOMAX 250W
M-115, 0.03 max C, 0.10 max Si, 0.10 max Mn, 17.5-18.5 Ni, 7.5-8.5 Co, 4.0-5.0 Mo, 0.05-0.15 Al, 0.40-0.55 Ti, bal Fe
For filler metal in MIG and TIG welding of 18% Nickel Maraging Steel.

VASCOMAX 300 CVM.
M-115, 0.03 max C, 4.8 Mo, 18.0 Ni, 9.0 Co, 0.1 Al, 0.6 Ti, bal Fe.
Annealed: 150,000 TS, 110,000 YS, 18 El; 72 RA, Rock C 30-32
Heat treated 294,000-315,000 TS; 290,000-310,000 YS; 9-12 El; 35-56 RA; Rock C 54-55.
For missiles and aircraft components. High tensile strength and toughness, good corrosion resistance, high notch to smooth tensile ratios

VASCOMAX 300 W
M-115; 0.03 max C, 0.10 max Si, 0.10 max Mn, 17.5-18.5 Ni, 9.5-10.5 Co, 4.0-5.0 Mo, 0.05-0.15 Al, 0.55-0.75 Ti, bal Fe
For filler metal in MIG and TIG welding of 18% nickel maraging steel

VASCOMAX 350.
M-115, 0.03 max C, 18 Ni, 8.5 Co, 5 Mo, 0.7 Ti, 0.10 Al, bal Fe.
Annealed 165,000 TS; 120,000 YS; 18 El; C 35 Rock
Heat treated: 340,000-360,000 YS; 350,000-370,000 TS; 10 El, 50 RA, C 58 Rock
For shear blades, gripper dies, punches, extrusion tools, torsion bars, collets. Missile and aircraft components
Maraging steel, durable and tough. Consumable vacuum melted.

VASCO MC
M-115; 0.32-0.38 C, 0.7-1.0 Cr, 0.3-0.5 Mo, 0.8 Mn, bal Fe.
For die casting dies, gears, arbors, spindles; oil hardened, tough, mold and cavity steel.

VASCO MOMARC CVM.
M-115; 1.0 C, 0.25 Si, 1.4 Cr, 1.0 Mo, bal Fe.
Hardened: Rockwell C 67-68.

Normalized: 185,000 TS; 139,000 YS; 13 El; 363 Brin.
Annealed: 100,000 TS; 81,000 YS; 25 El; 192 Brin.
For high temperature bearings, bearing races, special rolls, arbors, dies, gauges.
Good wear and heat resistance in high temperature service.

VASCO NON-SHRINKABLE see COLONIAL NO. 6.

VASCO STAINLESS 440C.
M-115; 0.95 C, 0.30 Si, 0.35 Mn, 17.5 Cr, bal Fe.
For pump parts, wear plates; high corrosion and wear resistance.

VASCO SUPREME FM.
M-115; 1.5 C, 12.5 W, 5 V, 5 Co, bal Fe.
For circular form tools, broaches, cutting tools, high speed steel, free-cutting

VASCO TUF.
M-115; 0.50 C, 0.90 Si, 0.30 Mn, 7.75 Cr, 1.4 V, 1.35 Mo, bal Fe.
Ht Tr : 234,000-314,000 TS; 198,000-236,000 YS; 9.4-8.0 El; 22-34 RA; C 48-56 Rock
For chipper knives, shear blades, heavy duty slitters, punches, gripper dies, plastic molds

VASCO VANADIUM TYPE "BB"
M-115; 0.95-1.10 C, 0.15-0.25 V, 1.30-1.50 Cr, bal Fe
Heat treated: 213,000-178,000 TS; 190,000 YS; 3-8 El; 13-28 RA; 400-337 Brin
For tools, gages, rolls, ball bearings; oil hardening

VASCO VANADIUM TYPE "D"
M-115, 0.45-0.55 C, 0.15-0.25 V, 0.70-0.90 Cr, bal Fe.
Annealed: 60,000-70,000 TS; 34 El, 70 RA
For spindles, gears, arbors, sprockets, wrenches, springs, tools, shear blades, jack screws; tough

VASCO VANADIUM TYPE "G"
M-115; 0.56-0.65 C, 0.15-0.25 V, 0.70-0.90 Cr, bal Fe.
Heat treated: 240,000-220,000 TS, 190,000-180,000 YS, 5-3 El, 10-8 RA, 390-412 Brin
For rivet sets, chisels, springs, piston rods, drive shafts, wrist pins, screws; shock resistant.

VASCO VANADIUM TYPE "H"
M-115, 0.66-0.75 C, 0.15-0.25 V, 0.70-0.90 Cr, bal Fe.
Oil treated 255,000 TS, 222,000 YS, 6 El, 8 RA, 460 Brin
For punches, dies, tools, axes, hatchets, caulking tools, cold cutters, swedges, shock resistant

VASCO VANADIUM TYPE "K."
M-115, 0.76-0.85 C, 0.15-0.25 V, 0.70-0.90 Cr, bal Fe.
Oil treated, 220,000 TS, 200,000 YS, 5 El; 5 RA, 450 Brin
For cold heading dies, blanking, forming and trimming dies, shear knives, broaches, punches; tough

VASCO VANADIUM TYPE "N."
M-115, 0.86-1.0 C, 0.15-0.25 V, 0.8 Cr, bal Fe.
Oil treated: 195,000 TS, 180,000 YS; 10 El; 15 RA; 395 Brin.
For broaches, drills, knives, files, cutlery; oil hardening.

VASCO-VJ and VASCO-
VJVM New VASCOJET 1000 CVM

VASCO WCC.
M-115; 0.38-0.43 C, 4.0-4.5 Cr, 4.0-4.5 W, 4.0-4.5 Co, 2.1 V, 0.4 Mo, bal Fe.
For punches, dies, extrusion dies, permanent molds; hot work steel, wear and thermal fatigue resistant.

VASCO WCC 27202.
M-115; 0.40 C, 0.30 Mn, 4.25 Cr, 4.25 Co, 0.40 Mo, 4.25 W, 2.1 V, bal Fe.
For hot work tools and dies; hot work steel.

VASCO-WEAR.
M-115; 1.12 C, 1.2 Si, 0.3 Mn, 1.1 W, 7.75 Cr, 1.6 Mo, 2.4 V, bal Fe.
Air hardened to Rockwell C 62-64.
Has high compressive strength and excellent toughness.
For cold finishing rolls, cold forming rolls, cold extrusion dies, trim dies, blanking dies, shear blades.

VASCO X-2.
M-115; 0.24 C, 0.89 Si, 0.32 Mn, 4.9 Cr, 0.54 V, 1.3 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 28 El; 70 RA; 160 Brin.
Heat treated: 262,000 TS; 206,000 YS; 12 El; 50 RA; 512 Brin.
For tools and dies, punches, crimpers, high strength structures, air or oil hardened, hot work steel.

VATOOL
M-357; 0.95 C, 0.25 V, 0.15 max Ni and Cr, bal Fe.
For shear blades, arbors, dies, rivet sets; water hardened.

VAUCHER'S ALLOY.
75 Zn, 18 Sn, 4.5 Pb, 2.5 Sb.
For bearings

VC see Valenite VC

VCA ALLOY.
13 V, 11 Cr, 3 Al, bal Ti.
Annealed. 135,000 TS; 131,000 YS; 21 El.
Aged: 221,000 TS; 207,500 YS; 4 El.
For missile cases, fasteners, welded pressure vessels, recommended for service from −65°F to 600°F.

VC06
M-Russia; Co, VC, bal WC.
For hard cutting tools and wear parts.
Sintered carbides Abrasion resistant.

VC08
M-Russia; Co, VC, bal WC
For hard cutting tools and wear parts.
Sintered carbides, abrasion resistant.

VC015
M-Russia; Co, VC, bal WC.
For hard cutting tools and wear parts
Sintered carbides, abrasion resistant.

V.D. see RYERSON VD.

V.D. CHISEL.
M-240, 0.77 C, 0.3 Mn, 0.018 S, 0.18 Mo, bal Fe.
For hand and pneumatic chisels, water hardening.

V.D. TOOL STEEL
M-240; 0.95-1.05 C, 0.27 Mn, 0.15-0.18 V, 0.19-0.21 Si, bal Fe.
For punches, dies, forming tools, shear blades, mandrels; water hardened; special analysis.

VECTOLITE.
M-38; 30 Fe_2O_3, 44 Fe_3O_4, 26 Co_2O_3.
Sintered oxides for permanent magnets.
1600 Br, 900 Hc, 940 B

VEDAL.
English; Si, Mg, bal Al.
For light alloy parts; non-hardenable.

VEDAS.
M-1411; 0.8-1.2 C, bal Fe.
For springs, drills, taps, cutters; Type W1; water hardened.

VEGA see also CARPENTER VEGA.

VEGA 1.
M-1303; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS; 40,000 YS; 32 El; 68 RA; 170 Brin.
Heat treated: 256,000 TS; 190,000 YS, 6 El; 10 RA; 540 Brin.
For cutlery, valve trim, turbine blades, Type 420; stainless, hardenable.

VEGA 2.
M-1303; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS; 40,000 YS; 32 El; 68 RA; 170 Brin.
Heat treated: 256,000 TS; 190,000 YS; 6 El; 10 RA; 540 Brin.
For cutlery, valve trim, turbine blades; Type 420; stainless, hardenable.

VEGA 3.
M-1303; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS; 40,000 YS; 32 El; 68 RA; 170 Brin.
Heat treated: 256,000 TS; 190,000 YS, 6 El, 10 RA; 540 Brin.
For cutlery, valve trim, turbine blades, Type 420; stainless, hardenable.

VEGA 10.
M-1303, 0 15 max C, 11.5-13.5 Cr, bal Fe
Heat treated: 120,000-135,000 TS; 110,000-117,000 YS; 16-15 El, 63-58 RA; 220-240 Brin.
For cutlery, valves, turbine blades; Type 410; corrosion resistant.

VEGA 12.
M-1546; 0 10 C, 12 5 Cr, bal Fe.
Heat treated: 87,000 TS; 64,000 YS, 18 El.
Annealed: 64,000 TS; 37,000 YS; 32 El.
For turbine parts, cutlery, oil refinery equipment, valves, pivots.
Martensitic stainless steel Hardenable

VEGA 12VS.
M-1546; 0.20 C, 12 5 Cr, 1.1 Mo, 1.1 W, 0.25 V, bal Fe
Heat treated: 114,000-143,000 TS, 85,000-114,000 YS; 12-17 El.
For gas and steam turbine blades and rotors, surgical instruments
Martensitic stainless steel. Useful to 650°C, hardenable.

VEGA 15.
M-1546; 0 05 C, 12.5 Cr, bal Fe.
Annealed: 78,000 TS; 57,000 YS, 30 El
For oil refinery and food industry equipment, tanks, vessels, trim.
Ferritic stainless steel Not hardenable.

VEGA 16.
M-1303; 0 10 max C, 17 Cr, 1 5 Mo, bal Fe
Annealed: 80,000 TS, 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, oil burners and heaters, blowers; Type 430 Mo; corrosion resistant.

VEGA 20.
M-1303; 0.2 C, 15-17 Cr, 1.25-2.5 Ni, bal Fe
Heat treated: 100,000-135,000 TS; 78,000-112,000 YS; 25-15 El; 60-45 RA; 240-280 Brin.
For pump spindles, propeller shafts, aircraft structures; Type 431; stainless, hardenable.

VEGA 100.
M-1303; 0.10 C, 21 Cr, 1.5 Ni, bal Fe.
For furnace parts, heat treating boxes; heat resistant.

VELINVAR.
Japan; 55-63 Co, 7-13 V, bal Fe.
For instruments, chronometers; low coefficient of expansion

VELOCITAS SPEZIAL HI.
M-614; 0.48 C, Cr, Si, bal Fe
For gears, pinions, bolts, shafts; oil hardened, tough

VELOCITAS SPEZIAL HII.
M-614; 0 45 C, Cr, Si, V, bal Fe.
For gears, shafts, crankshafts, fasteners; oil hardened, tough.

VELODAL
M-764; 4 5 Zn, 1 Mg, bal Al.
For light alloy parts.

VELODUR
M-764; 6.7 Zn, 2 3 Mg, 2 Cu, 0.1 Mn, 0.3 Cr, bal Al.
Aged 85,000 TS; 74,000 YS; 7 El; 160 Brin.
For transportation and aircraft construction; age-hardened, high strength.

VELVET.
Eng ; C, W, bal Fe
For tools, drills, taps; water hardened

VELVET.
M-588, 10 Sn, 2 Pb, bal Cu.
For bushings, Babbitts, bars, hard.

VELVET ANTIFRICTION METAL
M-914, Pb, Sn, Sb.
For bearings; Babbitt.

VELVETOUCH.
M-933; Cu-Pb-Sn-graphite.
For clutch and brake discs, linings, bearings, facings; sintered

VENANGO replaced by CYCLOPS S2

VENANGO SPECIAL SHOCK RESISTING STEEL.
M-114, 0.65 C, 0 5 Mn, 1.1 Si, 0 2 V, 0 5 Mo, bal Fe
Oil harden 250,000-340,000 TS, 7-10 El, 10-14 Izod (notched), 50-59 Rc
Good strength, hardness, shock resistance
For power shock tools, driver bits, knock out pins

VENIVICI
M-1307; 0 82 C, 4 Cr, 0 85 Mo, 1.6 V, 8.7 W, bal Fe
For lathe and planer tools, reamers, broaches, taps, high speed steel.

VENTOS 4631.
M-1326; 0 05 C, 20 0 Cr, 2.4 Ti, 1 4 Al, bal Ni.
High temperature alloy, for valves.
DIN NiCr20TiAl; Werkstoff Nr. 2 4631

VENTOS 4718.
M-1326; 0.45 C, 3.0 Si, 9.0 Cr, bal Fe
(Formerly Ventos 11C)
For exhaust valves in hot going accelerator, and fuel oil motors.
Martensitic, oil or air hardenable.
DIN X 45 CrSi93; Werkstoff Nr. 1.4718.

VENTOS 4721.
M-1326; 2.1 C, 11.5 Cr, bal Fe.
For valves, valve seat rings in hot running motors.
DIN X 210 Cr12; Werkstoff Nr. 1.4721.

VENTOS 4732.
M-1326; 0.80 C, 2.0 Si, 15.0 Cr, 1.0 Mo, 1.0 W, bal Fe. (formerly Ventos 16 CMW)
Valve Steel.
High temp. strength: 11 Kg/mm^2 at 700°C.
Martensitic, oil hardenable.
DIN X 80 CrSiMoW 152; Werkstoff Nr. 1.4732.

VENTOS 4747.
M-1326; 0.80 C. 2.2 Si, 20.0 Cr, 1.5 Ni, bal Fe. (formerly Ventos 23 C)
For highly stressed exhaust valves in high speed motors.
Martensitic, air hardenable.
DIN X 80 CrNiSi 20; Werkstoff Nr. 1.4747.

VENTOS 4748.
M-1326; 0.85 C, 17.5 Cr, 2.2 Mo, 0.45 V, bal Fe. (formerly Ventos 20 CMV)
Valve steel.
High temp. strength: 11 Kg/mm^2 at 700°C.
Martensitic, oil hardenable.
DIN X 85 CrMoV 182; Werkstoff Nr. 1.4748.

VENTOS 4780.
M-1326; 0.45 C, 7.5 Mn, 23.0 Cr, 2.0 Mo, 0 70 Cu, 0.30 N. 2.0 Co, bal Fe (formerly Ventos K)
Austenitic valve steel.
DIN X 45 CrMnN 238; Werkstoff Nr. 1.4780.

VENTOS 4790.
M-1326; 0.70 C, 6.0 Mn, 21.0 Cr, 1.7 Ni, 0.25 N, 0 05 S, bal Fe (formerly Ventos 25 CM)
Austenitic valve steel.

VENTOS 4871.
M-1326; 0.50 C, 9 0 Mn, 21.0 Cr, 4.0 Ni, 0.45 N, 0 05 S, bal Fe (formerly Ventos 24 N).
Austenitic valve steel.
DIN X 50 CrMnNiN 229; Werkstoff Nr 1.4871.

VENTOS 4873
M-1326, 0 45 C, 2.5 Si, 18.0 Cr, 9 0 Ni, 1.0 W, bal Fe (formerly Ventos 27 CNW).
For highly stressed valves in flying and racing motors; Austenitic
DIN X 45 CrNiW 189; Werkstoff Nr 1.4873.

VENTOS 4875.
M-1326; 0 55 C, 8.5 Mn, 20.5 Cr, 2 2 Ni, 0.30 N, 0 05 S, bal Fe (formerly Ventos 22 N).
Austenitic valve steel
DIN X 55 CrMnNi 208; Werkstoff Nr. 1 4875.

VENTOS 4971.
M-1326; 0.12 C, 20.0 Cr, 20 0 Ni, 3.0 Mo, 20.0 Co, 2.5 W, 1 3 Nb, 0.15 N, bal Fe.
High temperature alloy; for valves.
DIN X 12 CrCoNi 2120; Werkstoff Nr. 1.4971

VENTURELOY II.
M-1430; Ag alloy.
For electrical contacts; 75% electrical conductivity.

VERALOY Gr. V.
M-1289; WC.
For cutting tools; sintered carbide.

VERESTA.
M-459; 1 C, 1 Cr, 1 W, bal Fe.
For cutters, form tools, heading dies; oil hardened, wear resistant.

VERESTA SPECIAL.
M-459; 1.4 C, 1.4 Cr, bal Fe.
For thread cutters, chasers, taps, engravers tools; oil or water hardened, wear resistant.

VERESTA-V.
M-459, M-1496; 0.90 C, 1.2 Mn, 0.2 V, 0.5 W, 0.5 Cr, bal Fe.
Annealed: 84,000 TS; 60,000 YS; 26 El; 185 Brin.
Heat treated: 145,000-280,000 TS; 125,000-272,000 YS; 2-8 El; 2-31 RA; 290-535 Brin.

For blanking and bending dies, master tools, knurling tools, punches, cutters, master dies, gauges.
Type O1, oil hardening, cold work tool steel, shock resistant.

VERIBEST DRILL ROD.
M-822; 0.9 C, 1.1 Mn, 0.6 Cr, 0.9 W, 0.24 V, bal Fe.
For dies, tools, punches; oil hardening drill rod.

VERILITE-1.
M-274; 0.3 Ni, 2.5 Cu, 0.7 Fe, 0.4 Si, bal Al.
Cast: 16,000 TS; 4 El; 4 RA.
For aircraft cylinder heads; age-hardenable.

VERILITE-2.
M-274; 1.5 Ni, 1.0 Cu, 1.5 Cr, 0.5 Mn, bal Al.
For aircraft cylinder heads; age-hardenable.

VERILOY.
M-44; 0.35-0.45 C, 20-22 Ni, 10-12 Cr, bal Fe
For chemical engineering equipment, furnace parts; heat and corrosion resistant to 1500°F.

VERNALLOY.
M-934; 0.2 C, 20 Cr, 10 Ni, bal Fe.
For heat resistant parts; heat resistant.

VERNIAL.
M-303; 0.6-1 4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, 0 3 max Cr, bal Al.
Annealed: 21,000 TS; 8000 YS; 24 El.
For window frames, fan blades, gutters, boats; good forming and welding properties.

VERNIDUR.
M-303; 2 5-5.0 Cu, 0.2-1.8 Mg, 0.3-1.5 Mn, bal Al.
Annealed: 27,000 TS; 11,000 YS; 22 El; 47 Brin
Heat treated: 72,000 TS; 57,000 YS; 130 Brin.
For aircraft structures and fittings, fasteners; age-hardenable.

VERNIKORR
M-303; 0 5-1.5 Mn, 0.3 max Cr, bal Al
Soft: 16,000 TS; 6000 YS, 40 El.
Hard: 29,000 TS; 27,000 YS; 10 El.
For cooking utensils, heat exchangers, tanks, furniture; good forming and welding properties.

VERNIMAG M.
M-303, 1.5-3.0 Mg, 0.5-1.5 Mn, 0.3 max Cr, bal Al.
Soft: 26,000 TS; 10,000 YS; 20 El; 45 Brin
Hard: 41,000 TS; 36,000 YS; 5 El; 77 Brin.
For roofing, hydraulic tubing, architectural trim; good forming and welding properties.

VERONICA C33.
M-1352; 0.95 C, W, Mo, Cr, V, bal Fe.
For lathe and planer tools, hobs, drills, taps; high speed steel.

VERONICA C65.
M-1352; 0.85 C, 4 Cr, W, Mo, V, bal Fe.
For lathe and planer tools, hobs, reamers; high speed steel.

VERONICA EXTRA.
M-1352; 0.74 C, 4 Cr, 1.1 V, 18 5 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel

VERONICA HOCHLEISTUNG 1000.
M-1352, 0.86 C, 4.1 Cr, 0 85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, reamers, hobs, drills; high speed steel.

VERONICA HOCHLEISTUNG GOLD.
M-1352; 0.76 C, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, hobs, broaches, taps; high speed steel.

VERONICA HOCHLEISTUNG K3.
M-1352; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, taps, drills; high speed steel.

VERONICA HOCHLEISTUNG SILBER.
M-1352; 0.79 C, 4.7 Co, 4.3 Cr, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

VERONICA HOCHLEISTUNG SILBER 4V.
M-1352; 1.35 C, Co, Cr, V, W, bal Fe.
For engravers tools, blanking dies; high speed steel.

VERONICA HOCHLEISTUNG VS10.
M-1352; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For engravers tools, blanking and forming dies, high speed steel.

VERONICA SPEZIAL.
M-1352; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, hobs, drills; high speed steel.

VERSASTEEL.
M-38, 1.0 C, 0.3 Mn, 2.0 Si, 4.25 Cr, 1.15 V, 0.3 W, 2.5 Mo, bal Fe.
Air hardening tool steel.

VERSATILE.
M-1411; 0.4 C, 1 Cr, 1.5 Ni, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, shock resistant.

VERTOMAR 1
M-677; 0.015 max C, bal Fe. (ingot iron)
For electroslag welding wire; extra low carbon

VERTOMAR 2M.
M-677; 0.11-.17 C, 1.75-2.1 Mn, bal Fe.
For electroslag welding wire; 2% manganese steel

VERTOMAR 2MM.
M-677; 0.11-.17 C, 1.75-2.1 Mn, 0.4-.6 Mo, bal Fe.
For electroslag welding wire, 2% manganese 0.5% molybdenum steel.

VERTOMAR 6.
M-677; 0.06 max C, 0.15 max Mn, bal Fe.
For electroslag welding wire, 0.06 max carbon.

VERTOMAR 8.
M-677, 0.10 max C, 0.35-.65 Mn, 0.1-.2 Si, bal Fe.
For electroslag welding wire; silicon killed.

VERTOMAR 10.
M-677; 0.07-.13 C, 0.4-.7 Mn, bal Fe
For electroslag welding wire, 0.10 max carbon.

VERTOMAR 15.
M-677; 0.13-.19 C, 0.95-1.3 Mn, 0.15-.3 Si, bal Fe.
For electroslag welding wire; 1% manganese 0.2 C

VERTOMAR 60.
M-677; 0.55-.66 C, 0.9-1.25 Mn, 0.1-.2 Si, bal Fe.
For electroslag welding wire, medium carbon steel.

VERTOMAR 410 Ni.
M-677; 0.04 C, 0.6 Mn, 0.4 Si, 12 Cr, 4 Ni, 0.8 Mo, bal Fe.
For electroslag welding wire; welding CA6NM castings.

VERTOMAR CM30.
M-677; 0.28-.33 C, 0.4-.6 Mn, 0.2-.35 Si, 0.8-1.1 Cr, 0.15-.25 Mo, bal Fe.
For electroslag welding wire; AISI type 4130 steel.

VERTOMAR CNM20.
M-677; 0.18-.23 C, 0.7-.9 Mn, 0.2-.35 Si, 0.4-.6 Cr, 0.4-.7 Ni, 0.15-.25 Mo, bal Fe.
For electroslag welding wire; AISI type 8620.

VERTOMAR CV50.
M-677; 0.48-.53 C, 0.7-.9 Mn, 0.2-.35 Si, 0.8-1.1 Cr, 0.15 min V, bal Fe.
For electroslag welding wire; AISI type 6150.

VERY BEST.
M-336; 1.05 C, 0.3 Mn, 0.5 Cr, 0.1 V, bal Fe.
Annealed. 185 Brin.
For dies and tools, drawing and forming dies, taps, drills, mandrels; tough and hard; water hardened.

VERY HARD.
M-338; 1.2 C, bal Fe.
For tools, dies, fixtures; water hardened.

VES.
M-1307; 1.0 C, 0.1 V, 0.25 Mn, 0.20 Si, bal Fe.
For drills, taps, springs, tools, cutters; Type W2; water hardened.

VESTALIN.
28 Ni, C, bal Fe.
For electrical resistances; resistance alloy.

VESUVIUS.
M-56, M-521; 0.10 C, 30 Cr, 1.7 Ni, bal Fe.
Oil treated: 78,000-101,000 TS; 58,000-85,000 YS; 25-15 El, 40-30 RA, 175-225 Brin.
For furnace parts, fire bars, stokers, grids; heat and corrosion resistant, Firth Brown J-182

"V" HIGH SPEED STEEL.
M-81; 0.5-0.9 C, 18 W, 4 Cr, 1.5 V, bal Fe
For turning and boring tools, special dies, reamers; tough high speed tool steel.

VIADUCT 15.
M-1112, 0.45 C, 1 Cr, 2 W, 0.3 V, 0.55 Si, 0.45 Mn, bal Fe.
Annealed: 220 Brin.
For pneumatic chisels, shear blades, cutters, tough, oil hardened.

VIAG.
M-935; 4.5-5.0 Cu, bal Al
For light alloy parts, age-hardenable.

VIBRAC STEEL.
M-117, 0.4 C, 1.5 Ni, 0.9 Cr, bal Fe.
Heat treated 135,000 TS, 23 El, 59 RA
For steel cylinders; oil hardened.

VIBRAC V 30
M-50, M-1414, 0.30 C, 0.60 Mn, 2.60 Ni, 0.65 Cr, 0.55 Mo, bal Fe
Oil harden. 128,000-258,000 TS; 110,000-168,000 YS, 14-24 El, 43-62 RA; 25-86 IZOD.
For bolts and studs, shafts, connecting rods, crankshafts, mandrels
Oil hardening, shock resistant.

VIBRAC V.45.
M-50, M-1414; 0.40 C, 0.60 Mn, 2.60 Ni, 0.65 Cr, 0.55 Mo, bal Fe.
Oil Harden: 148,000-280,000 TS; 125,000-168,000 YS; 15-27 El, 36-52 RA, 20-53 IZOD.
For connecting rods, crankshafts, airframe components, axles, mandrels, die blocks
Oil hardening, shock resistant.

VIBRALLOY.
M-22, M-205, 9 Mo, 38-42 Ni, bal Fe.
For vibrating reed selectors
Constant modulus, controlled temperature coefficient.

VIBRALLOY.
M-670; 9 Mo, 38-42 Ni, bal Fe.
For instruments, diaphragms, mechanical filters, vibrating reeds; constant modulus, high permeability.

VIBRALOY.
M-936; 0.9 C, 0.8 Cr, bal Fe.
For vibrating screens; abrasion resistant.

VIBRESIST.
M-435, 1.0 C, 1.25 V, 0.3 Mo, bal Fe
For mining drills; oil hardened, hollow drill.

VIBRO.
M-140; 0.5 C, 1.4 Cr, 0.3 V, 1.9 W, bal Fe.
For tools, dies, hot work steel.

VICALLOY.
M-108; 10 V, 52 Co, 0.3 Mn, 1.9 W, 0.6 Si, bal Fe
Rolled: 600 Brin. Annealed: 200 Brin
100,000 TS, 9000 Br; 300 H_c.
For electrical and electronic equipment; magnetic and recording tape; machinable, permanent magnet.

VICALLOY I.
M-22, 10 V, 52 Co, 0.3 Mn, 1.9 W, 0.6 Si, bal Fe.
For permanent magnets, cold workable
9000 Br; 300 H_c, 5500 Bo; 60 Rock C.

VICALLOY I.
M-670; 10 V, 52 Co, bal Fe
Permanent magnet material
7500 Br ; 250 H_c, 0.80 (BH) max (MGO)

VICALLOY VS30
M-72; 30 Co, 15 Cr, bal Fe
Coercive force-25, remanence 18,000.
For electrical and magnetic equipment
Permanent magnet High magnetic permeability

VI-CHROME.
M-694, 2.0 C, 0.3 Mn, 12-14 Cr, 0.2 V, bal Fe.
For dies, nondeforming, oil hardening

VI-CHROME "W."
M-694, 2.0 C, 13.0 Cr, 1.2 W, bal Fe.
Air or oil hardening cold work tool and die steel; chromium type; AISI D6

VICKERS B C T
M-117, M-50, 0.55-0.65 C, 0.20-0.30 Si, 0.5-0.8 Mn, 0.43-0.70 Cr, bal Fe
Annealed 55,000-100,000 TS, 15-7 El
Hardened 120,000 140,000 TS, 80,000 YS; 15 El; 40 RA, 255-341 Brin.
For gear wheels, gun barrels, dies, drop stamps and springs, water hardening

VICTOR BRONZE
U.S., 39 Zn, 1.5 Al, 1 Fe, 0.03 V, bal Cu
For pipes, corrosion resistant

VICTOR DRILL ROD.
M-38, 1.05 C, bal Fe
For shafts, rollers, pins, dowels, push rods; water hardened

VICTOR HI-CHROME A
M-694; 2.25 C, 0.4 Mn, 12-14 Cr, 0.2 V, bal Fe.
For dies, broaches, lamination and drawing dies, reamers, oil hardening

VICTOR HI-CHROME B
M-694, 1.5 C, 13 Cr, bal Fe
For tools, cutters, dies, punches; nondeforming.

VICTORIA ALUMINUM.
Eng ; Cu, Zn, Si, Fe, bal Al
For light alloy parts; v. "Partinium."

VICTORIEUX SAINT JUERY.
M-1119; 0.7 C, 9.5 W, 2.5 Cr, 0.1 V, bal Fe
For hot work dies and tools, hot work steel.

VICTOR METAL.
50 Cu, 35 Zn, 15 Ni.
For cast fittings; corrosion resisting.

VICTORY.
M-688; 0.8 C, 4 Cr, 2 V, 6 W, 5 Mo, bal Fe
For drills, hobs, taps, broaches, reamers; Type M2; high speed steel.

VICTORY COBALT.
M-115; 0.85 C, 6 W, 5 Mo, 4 Cr, 2 V, 8.5 Co, bal Fe.
For cutting tools; high speed steel

VICTRIX SPECIAL.
M-96, 0.15 C, 1 Cr, 3.65 Ni, 0.35 Mo, bal Fe
For gears, shafts; case hardening.

VICULOY NO. 1
M-1058; 2.0-2.2 Be, bal Cu
Cast: 85,000-90,000 TS, 60,000-70,000 YS, 4-12 El; 9 RA; 200-220 Brin.
For gears, shafting welding dies and welding electrodes; corrosion resistant, age hardening.

VICULOY NO 2.
M-1058, 1.6-1.8 Be, bal Cu
Cast: 45,000-50,000 TS; 30,000-35,000 YS, 17-22 El; 40 RA; 120-140 Brin
For circuit breakers, contacts, electrode jaws, corrosion resistant, age-hardenable

VICULOY NO 3.
M-1058, 1.8-2.2 Be, bal Cu.
Heat treated 160,000-170,000 TS, 120,000 YS, 2-8 El, 4 RA; 370-400 Brin.
For gears, die molds, rocker arms, non-sparking tools; corrosion resistant, age-hardenable

VIENNESE ORNAMENTS
Austria, 55 Cu, 25 Zn, 20 Ni
For brass ornaments, corrosion resistant

VIENNESE SHEET
Austria, 60 Cu, 20 Zn, 20 Ni
For onranments, hardware, corrosion resistant.

VIENNESE TABLEWARE
50 Cu, 25 Zn, 25 Ni
For cutlery, ornaments; corrosion resistant

VIGILANT.
M-1406; 0.5-1.0 C, bal Fe.
For chisels, hard tools, springs, water hardened.

VIKING
M-140, 1.05 C, 1.05 Cr, 0.45 Mo, bal Fe
For mandrels, rams; oil hardened

VIKMANSHYTTAN VH94.
M-1447, 0.15 max C, 11.5-13.5 Cr, 1.25-2.50 Ni, bal Fe.
For chemical plant and oil refinery equipment, corrosion resistant

VIKMANSHYTTAN VH217
M-1447, 0.19-0.25 C, 13 Cr, bal Fe
Annealed 95,000 TS; 50,000 YS, 25 El; 55 RA; 195 Brin.
For valves, cutlery, surgical and dental instruments, Type 420, stainless.

VIKMANSHYTTAN VH273
M-1447, 0.08 max C, 13 Cr, bal Fe.
Annealed: 75,000 TS, 40,000 YS; 35 El; 70 RA; 155 Brin.
For valves, cutlery, turbine blades, Type 403, stainless.

VIKMANSHYTTAN VH274.
M-1447; 0.10 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, Type 302; stainless, austenitic.

VIKMANSHYTTAN VH276.
M-1447; 0.07-0.12 C, 18 Cr, 9 Ni, 1.5 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant equipment, tanks, mixers; Type 316; stainless, austenitic.

VIKMANSHYTTAN VH280.
M-1447; 0.14 C, 13 Cr, 1 Mo, bal Fe.
For chemical plant and oil refinery equipment; corrosion resistant.

VIKMANSHYTTAN VH295.
M-1447; 0.75-0.95 C, 16-18 Cr, 0.75 max Mo, bal Fe.
Annealed: 107,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin.
Heat treated: 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin.
For cutlery, valves, ball bearings; Type 440 B; corrosion resistant.

VIKMANSHYTTAN VH376.
M-1447; 0.06 max C, 18 Cr, 9 Ni, 1.5 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant equipment, tanks, mixers; Type 316; stainless, austenitic.

VIKMANSHYTTAN VH399.
M-1447; 0.10 max C, 17 Cr, 1.5 Mo, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, oil burners and heaters, corrosion resistant.

VIKMANSHYTTAN VH406
M-1447; 0.13-0.18 C, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For valves, cutlery, surgical and dental instruments; Type 420; stainless.

VIKMANSHYTTAN VH407.
M-1447; 0.12 max C, 20 Cr, 20 Ni, bal Fe.
For furnace parts and equipment; corrosion and heat resistant.

VIKMANSHYTTAN VH417.
M-1447; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For valves, cutlery, surgical and dental instruments, Type 420; stainless.

VIKMANSHYTTAN WH605.
M-1447; 0.20 C, 12-14 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 196 Brin.
Hardened: 250,000 TS; 190,000 YS; 10 El; C 48 Rock.
For cutlery, surgical instruments, valves, gears, shafts.
Type 420 stainless steel, hardenable.

VIKMANSHYTTAN WH620.
M-1447; 0.10 C, 14-18 Cr, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 28 El; 140 Brin.
Cold Rolled: 110,000 TS; 90,000 YS; 10 El; 195 Brin.
For automotive trim, kitchen sinks, oil burners, fasteners.
Type 430 stainless steel, nonhardenable.

VIKMANSHYTTAN WH627.
M-1447; 0.30 C, 23-30 Cr, bal Fe.
Annealed: 85,000 TS; 55,000 YS; 25 El; B 83 Rock.
For oil burners, heat treating equipment, valves and fittings, furnace parts.
Type 446 stainless steel. High heat and corrosion resistant.

VIKMANSHYTTAN WH638.
M-1447; 0.06 C, 19 Cr, 10 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 150 Brin.
For chemical and dairy plant equipment, agitators, tanks, digesters.
Type 304 stainless steel, austenitic.

VIKMANSHYTTAN WH639.
M-1447; 0.06 C, 18-20 Cr, 9-11 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 150 Brin.
For chemical plant equipment, digesters, agitators, vessels.
Type 304 stainless steel, austenitic.

VIKMANSHYTTAN WH640
M-1447; 0.06 C, 17-19 Cr, 9-12 Ni, 0.5 Cb, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; B 83 Rock.
For welded chemical plant equipment, tanks, vessels, agitators.
Type 347 stainless steel, austenitic.

VIKMANSHYTTAN WH642.
M-1447; 0.12 C, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed 90,000 TS; 40,000 YS; 50 El; B 85 Rack.
For chemical plant equipment, tanks, vessels, digesters, trim, agitators.
Type 302 stainless steel, austenitic.

VIKMANSHYTTAN WH643.
M-1447; 0.06 C, 18 Cr, 11 Ni, 0.4 Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; B 80 Rock.
For welded chemical plant equipment, tanks, vessels, agitators, mixers.
Type 321 stainless steel, austenitic, stabilized.

VIKMANSHYTTAN WH645.
M-1447; 0.05 C, 18 Cr, 8 Ni, 2 Mo, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 50 El; B 80 Rock
For acid mixers, chemical plant equipment, agitators, tanks, valve trim
Type 18-8 Mo steel, austenitic.

VIKMANSHYTTAN WH649
M-1447, 0.08 C, 18 Cr, 12 Ni, 3 Mo, bal Fe.
Annealed: 80,000 TS, 40,000 YS; 40 El, B 85 Rock
For dairy and chemical plant equipment, mixers, digesters, tanks
Type 18-12 Mo stainless steel, austenitic, acid resistant

VIKMANSHYTTAN WH650.
M-1447; 0.06 C, 17 Cr, 12 Ni, 2 Mo, bal Fe
Annealed: 80,000 TS; 30,000 YS; 60 El; B 80 Rock.
For textile, pharmaceutical and chemical plant equipment.
Type 316-319 stainless steel, austenitic.

VIKMANSHYTTAN WH651.
M-1447; 0.08 C, 17 Cr, 13 Ni, 3 Mo, 0.8 Cb, bal Fe
Annealed: 85,000 TS; 40,000 YS; 50 El; B 82 Rock.
For chemical plant equipment, mixers, agitators, welded tanks.
Type 318 stainless steel, austenitic, welding grade.

VIKMANSHYTTAN WH662.
M-1447; 0.15 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 60 El; B 80 Rock.
For chemical and pharmaceutical plant equipment, tanks, digesters, mixers, agitators.
Type 302 stainless steel, austenitic.

VIKMANSHYTTAN WH662D.
M-1447; 0.06 C, 19 Cr, 11 Ni, bal Fe.
Annealed: 70,000 TS; 30,000 YS; 60 El; B 80 Rock.
For chemical plant equipment, mixers, tanks, vessels, digesters.
Type 304 stainless steel, austenitic.

VINCO.
M-140, 0.50 C, 0.25 Mn, 3.75-4.25 Cr, 1.0 V, 17.5-18.5 W, bal Fe
For cutters, hot nut dies, shear knives, Type T1; hot work steel.

VINCO HOT WORK.
M-140; 0.50 C, 18.0 W, 4.0 Cr, 1.0 Mo, bal Fe.
Hot work die steel; for hot nut dies, hot extrusion dies, press die inserts, gripper dies, punches, shear knives. Type H-26.

VINCO HW.
M-140; 0.50-0.55 C, 3.75-4.25 Cr, 0.85-1.0 V, 17.5-18.5 W, 0.15-0.25 Mo, bal Fe
For hot forming and upsetting dies, brass extrusion dies, high speed steel.

VINERTIA.
M-41; Co, Cr, Mo, V.
Cast 90,000 TS, 50,000 YS; 2.5 El, 200 Brin
Rolled. 190,000 TS, 175,000 YS, 9 El, 330 Brin.
For dental and surgical tools, corrosion resistant

VIOLA AT13
M 1452, 0.15 C, 23 Cr, 14 Ni, 0.15 S, bal Fe
Annealed 90,000 TS; 40,000 YS, 50 El; B 83 Rock
For furnace parts, skids, incinerators, heat treating boxes, permanent molds. Free-machining
Type 309S stainless steel, corrosion and heat resistant

VIOLA AT15.
M-1452, 0.20 C, 25 Cr, 21 Ni, bal Fe
Annealed 95,000 TS, 45,000 YS, 50 El, B 89 Rock
For furnace parts, skids, heat treating fixtures, pumps, valves
Free machining Type 310 S stainless steel, corrosion and heat resistant.

VIOLA ICS
M-1452, 0.10 C, 14-18 Cr, bal Fe
Annealed 70,000 TS; 40,000 YS, 30 El, 140 Brin.
Cold Rolled. 120,000 TS; 110,000 YS, 5 El, 195 Brin
For oil burners, oil refinery equipment, heaters, kitchen sinks, furnace parts, septic tanks, fasteners
Type 430 stainless steel, non-hardenable, ferritic

VIOLA IN
M-1452, 0.12 C, 18 Cr, 9 Ni, bal Fe
Annealed· 90,000 TS, 40,000 YS, 50 El, B 85 Rock.
For food processing and chemical plant equipment, tanks, valve trim.
Type 302 stainless steel, austenitic, non-hardenable

VIOLA INC
M-1452, 0.06 C, 18 Cr, 12 Ni, 0.6 Cb, bal Fe
Annealed 85,000 TS, 35,000 YS, 60 El, B 80 Rock.
For welded structures, tanks, mixers, agitators, chemical plant equipment
Type 347 stainless steel, stabilized, austenitic, welding grade.

VIOLA IND
M-1452, 0.10 C, 16-18 Cr, 6-8 Ni, bal Fe.
Annealed· 110,000 TS, 40,000 YS, 60 El; B 85 Rock
For aircraft and railroad car structures, trailer bodies, springs, automotive and architectural trim
Type 301 stainless steel, austenitic, good ductility.

VIOLA INF25.
M-1452; 0.18 C, 24 Cr, bal Fe.
Annealed: 88,000 TS; 56,000 YS; 24 El; B 83 Rock.
For heat treating boxes, fixtures and furnace parts, oil burners, conveyors, exhaust manifolds.
Type 446 stainless steel, corrosion and heat resistant

VIOLA INF30
M-1452; 0.20 C, 25 Cr, bal Fe.
Annealed· 90,000 TS; 58,000 YS; 23 El; B 85 Rock
For heat treating boxes, fixtures and furnace parts, oil burners, conveyors, exhaust manifolds
Type 446 stainless steel, corrosion and heat resistant

VIOLA INL
M-1452; 0.06 C, 19 Cr, 10 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS; 60 El, B 80 Rock
For welded structures, chemical and pharmaceutical plant equipment, tanks, mixers.
Type 304 stainless steel, austenitic, non magnetic

VIOLA INL/BC.
M 1452; 0.05 C, 20 Cr, 12 Ni, bal Fe.
Annealed 88,000 TS; 38,000 YS; 58 El, B 82 Rock
For chemical and pharmaceutical plant equipment, welded structures, tanks, mixers.
Type 304 stainless steel, austenitic, non-magnetic.

VIOLA INML/BC
M-1452, 0.8 C, 18 Cr, 2 Mo, 8 Ni, bal Fe
Annealed· 80,000 TS, 30,000 YS, 60 El; B 80 Rock
For chemical plant equipment, mixers, digesters, valve trim
Type 18-8 Mo stainless steel Acid resistant, austenitic

VIOLA INMS
M-1452, 0.06 C, 18 Cr, 12 Ni, 2 Mo, bal Fe.
Annealed· 85,000 TS, 35,000 YS; 50 El; B 80 Rock
For chemical plant equipment, agitators, mixers, digesters, valve trim
Type 18-12 Mo stainless steel, acid resistant, austenitic

VIOLA INS
M-1452, 0.06, 18 Cr, 11 Ni, 0.3 Ti, bal Fe.
Annealed 85,000 TS; 30,000 YS, 55 El; B 80 Rock
For welded structures, exhaust systems, engine manifolds, refinery equipment, radiant superheaters
Type 321 stainless steel, austenitic, welding grade.

VIOLA MIC
M-1452, 0.12 C, 12-14 Cr, bal Fe
Annealed 95,000 TS, 50,000 YS, 25 El, B 92 Rock
For cutlery, surgical instruments, gears, shafts, springs, bearings
Type 420 stainless steel, hardenable

VIOLET LABEL
M-694, 0.9 C, 0.5 Cr, 0.2 V, 1.5 W, bal Fe.
For cutting dies, tools, gages, drawing dies; non-deforming

VIPER.
M-1411; 1 C, 1 Cr, 0.45 Mn, bal Fe
For bearings, liners, sleeves; oil or water hardened

VIRGINIA SILVER.
Ni, Zn, bal Cu.
For ornaments; Nickel silver

VIRGINIA STEEL.
C, bal Fe.
For construction work.

VIRGO 1.
M-533; 0.09-0.12 C, 13 Cr, bal Fe.
For molten salt containers, pots; Type 410; corrosion resistant.

VIRGO 1.0.
M-1488, M-533; 0.15 max C, 13 Cr, 0.5 Mo, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For steam turbines, rotor blades, turbine blades; corrosion resistant; Type 410.

VIRGO 1B.
M-533; 0.07-0.12 C, 17 Cr, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For oil refinery equipment, oil burners and heaters; Type 430; corrosion and heat resistant.

VIRGO 1S.
M-1301, M-1488, M-533; 0.10 C, 11-13 Cr, bal Fe.
Annealed. 70,000 TS; 35,000 YS; 30 El; B 80 Rock.
For springs, trim, knives, tableware.
Type 410 stainless steel, magnetic.

VIRGO 1SA.
M-1488, M-533; 0.08 max C, 12 Cr, 0.2 Al, bal Fe
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For turbine blades, oil refinery equipment; Type 405; stainless.

VIRGO 2.
M-533; 0.19-0.25 C, 13 Cr, bal Fe.
Heat treated: 115,000 TS, 92,000 YS; 10 El.
For turbine blades, cutlery, valves; Type 420; corrosion resistant.

VIRGO 2.0.
M-1488, M-533; 0.25 max C, 13 Cr, 0.5 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El; 55 RA, 195 Brin.
For cutlery, valves, pumps, turbine blades; Type 420, stainless, hardenable

VIRGO 2/3.
M-533; 0.26-0.37 C, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS, 20 El, 50 RA; 210 Brin.
For valves, cutlery, surgical and dental instruments, Type 420; corrosion resistant.

VIRGO 2S.
M-1301, M-1488; 0.08 max C, 11-13 Cr, 0.2 Al, bal Fe.
Annealed· 60,000-75,000 TS, 32,000-50,000 YS; 20-40 El; 140-180 Brin.
For equipment in the petroleum industry, furnace parts in sulphur bearing atmospheres, heat exchangers, tank linings.
Corrosion resistant. Non-hardenable
AFNOR-Z6CA13 AISI 405.

VIRGO 3.
M-1301, M-1488; 0.25 max C, 12-14 Cr, 0.5 max Mo, bal Fe.
Heat treated: 240,000 TS; 200,000 YS; 8 El; C 50 Rock.
For valves, cutlery, bearings, surgical instruments, pivots.
Hardenable, corrosion resistant.

VIRGO 3S.
M-1301, M-1488; 0.15 max C, 12-14 Cr, 0.5 max Mo, bal Fe.
Heat treated: 100,000 TS; 71,000 YS; 15 El.
Annealed: 80,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened: 200,000 TS; 160,000 YS; 10 El; C 45 Rock.
For steam turbine blades, chemical plant and oil refinery equipment.
Corrosion resistant, hardenable. AFNOR-Z12CD13.

VIRGO 4.
M-1301, M-1488; 0.15 max C, 11.5-14.0 Cr, 1 max Ni, 1 max Mo, bal Fe.
Annealed: 75,000 TS; 38,000 YS; 28 El; B 82 Rock.
For springs, hardware, shafts, tableware.
Hardenable, corrosion resistant.

VIRGO 5.
M-1301, M-1488; 0.15 max C, 12-14 Cr, 1 max Al, 1 max Si, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 35 El; 160 Brin.
For oil refinery and chemical plant equipment, furnace parts
Corrosion and heat resistant

VIRGO 6.
M-1488, M-533; 0.12 max C, 13 Cr, 0.5 Mo, 0.5 Al, bal Fe.
Annealed· 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For oil refinery equipment, turbine blades, valves; Type 405, stainless.

VIRGO 7.
M-1301, M-1488, 0.25 max C, 10.5-12.5 Cr, 0.55 max Ni, 1.2 max Mo, 0.35 max V, bal Fe.
Ht. Tr.: 130,000 TS; 100,000 YS; 10 El.
For valve parts, pumps, fasteners, gears, shafts, steam turbine blades
Corrosion and heat resistant

VIRGO 7A.
M-1588, M-533, 0.22 C, 11.5 Cr, 1.1 Mo, 0.4 V, 0.4 Ni, bal Fe.
Heat treated. 100,000 TS; 72,000 YS, 10 El
For turbine blades, bolts, corrosion resistant.

VIRGO 8.
M-1301, M-1488, 0.20 C, 0.25 Cb, 11 Cr, 0.75 Mo, 0.5 max Ni, 0.30 V, bal Fe
Annealed 90,000 TS; 40,000 YS; 24 El, B 92 Rock.
Heat treated· 240,000 TS; 205,000 YS, 9 El, C 50 Rock
For surgical instruments, hardware, gears, knives, pivots, bearings
Corrosion resistant, hardenable

VIRGO 8S
M-1301, M-1488, 0.08 max C, 10.5-12.5 Cr, 1.0-1.5 Ni, 0.55 max Mo, 1.0 max Mn, 0.15 max V, 0.25 max Cb, bal Fe.
Annealed. 75,000 TS, 35,000 YS; 26 El, B 92 Rock.
For oil refining and chemical plant equipment, fasteners, table flatware
Corrosion resistant

VIRGO 10
M-1488, 0.14 C, 14.5 Cr, 1.0 Mo, bal Fe.
Annealed· 80,000 TS; 40,000 YS, 25 El, B 92 Rock.
Hardened: 200,000 TS; 160,000 YS; 12 El; C 45 Rock
For table flatware, springs, chemical plant and oil refinery equipment.
Corrosion resistant, hardenable.

VIRGO 11.
M-533; 0.11-0.16 C, 18 Cr, 8 Ni, bal Fe.
Annealed· 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers; Type 302; stainless, austenitic.

VIRGO 11A.
M-1488; 0.13 C, 9 Ni, 17.5 Cr, bal Fe.
Annealed: 92,000 TS; 40,000 YS; 43 El; 170 Brin.
For corrosion resistant equipment; stainless, austenitic.

VIRGO-11DS.
M-533; 0.08 C, 18 Cr, 8 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks; Type 304; stainless, austenitic.

VIRGO 11S.
M-533, M-1488; 0.08 max C, 17-20 Cr, 9-12 Ni, bal Fe.
Annealed: 85,000 TS; 30,000 YS; 60 El; B 80 Rock.
For chemical and oil and food industry equipment, welded structures, tanks, mixers.
Stainless, austenitic.
France Z6CN18-10 spec. AISI 304.

VIRGO 11SA
M-533, M-1488, 0.08 max C, 16-19 Cr, 11-14 N, bal Fe
Annealed: 85,000 TS; 32,000 YS, 60 El; B 80 Rock.
For chemical and food processing equipment, mixers, agitators, digesters.
Stainless, austenitic, non-magnetic.

VIRGO 11SB.
M-533, M-1488; 0.08 max C, 16-19 Cr, 10-13 Ni, bal Fe
Annealed: 83,000 TS; 30,000 YS; B 80 Rock
For chemical and food processing equipment, digesters, mixers.
Austenitic, stainless.

VIRGO 11SS.
M-1488; 0.04 max C, 17-19 Cr, 9-11 Ni, bal Fe.
Annealed: 75,000 TS, 35,000 YS, 50 El, 60 RA; 180 Brin
For chemical plant equipment, tanks, vessels, stainless, austenitic; Type 304

VIRGO 11SSB.
M-533, M-1488, 0.03 max C, 16-19 Cr, 10-13 Ni, bal Fe.
Annealed: 80,000 TS; 30,000 YS, 60 El; B 78 Rock
For welded structures, tanks, mixers, chemical and food processing equipment
Austenitic, stainless

VIRGO 12
M-533; 0.17-0.25 C, 18 Cr, 8 Ni, bal Fe.
Annealed. 85,000 TS, 40,000 YS; 53 El; 72 RA; 160 Brin
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic

VIRGO 13
M-533, 0.08-0.20 C, 18 Cr, 9 Ni, 2.5 Si, bal Fe.
Annealed: 85,000 TS, 40,000 YS; 50 El, 70 RA, 160 Brin.
For furnace parts, heat treating boxes, Type 302B; corrosion and heat resistant.

VIRGO 14.
M-533; 0.12 max C, 18 Cr. 10 Ni, 2.5 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, mixers; Type 316; stainless, austenitic.

VIRGO 14S.
M-533; 0.12 max C, 18 Cr, 10 Ni, 2.5 Mo, Ti, bal Fe
Annealed: 90,000 TS; 40,000 YS; 45 El; 60 RA; 170 Brin.
For welded acid resistant chemical plant equipment; Type 316 Ti; stainless, austenitic.

VIRGO 14SB.
M-533, M-1488; 0.08 max C, 16-19 Cr, 11-14 Ni, 2.0-2.7 Mo, bal Fe.
Annealed: 74,000 TS; 30,000 YS; 40 El.
For superheater tubes, blades, discs, steam pipes.
Austenitic, corrosion resistant.
Type 316 stainless.

VIRGO 14SR.
M-1488; 0.07 max C, 12.5 Ni, 18 Cr, 2.8 Mo, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 40 El; 50 RA; 180 Brin.
For acid resistant equipment in chemical plants; Type 316; stainless, austenitic.

VIRGO 14SR1.
M-533, M-1488; 0.08 max C, 17-20 Cr, 11-14 Ni, 3.0-3.7 Mo, bal Fe
Annealed: 80,000-90,000 TS; 35,000-55,000 YS; 50-70 El; 60-75 RA; B 70-90 Rock.
For textile and dye equipment, paper and pulp plant equipment
Austenitic, stainless.
AISI 317, acid resistant.

VIRGO 14SR2.
M-533, M-1488, 0.08 max C, 17-20 Cr, 12-15 Ni, 3.5-4.2 Mo, bal Fe.
Annealed: 800,000 TS; 35,000 YS; 35 El.
For chemical and textile plant equipment, agitators.
Type 317 stainless, austenitic.

VIRGO 14SS
M-533, M-1488; 0.03 max C, 17-20 Cr, 10-13 Ni, 2.0-2.7 Mo, bal Fe.
Annealed 80,000 TS; 30,000 YS; 60 El; B 78 Rock
For paper mill and die works equipment, acid tanks, mixers.
Resists sea water corrosion.
France Z3CND18-12, AISI 316L.

VIRGO 14SSB.
M-533, M-1488; 0.03 max C, 16-19 Cr, 11-14 Ni, 2.0-2.7 Mo, bal Fe.
Annealed: 85,000 TS, 35,000 YS; 50 El; B 80 Rock.
For chemical plant equipment, mixers, digesters, valve trim, kettles.
Corrosion resistant, austenitic.

VIRGO 14SSR
M-1301, M-1488; 0.03 max C, 17-20 Cr, 10-13 Ni, 2.5-3.2 Mo, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El; B 78 Rock
For chemical and food processing equipment, mixers, digesters.
Corrosion resistant, austenitic.
France spec. Z3CND 18-12, AISI 316L.

VIRGO 14SSR1
M-533, M-1488; 0.03 max C, 17-20 Cr, 11-14 Ni, 3.0-3.7 Mo, bal Fe.
Annealed: 85,000 TS; 45,000 YS; 60 El; B 80 Rock
For acid tanks, mixers, agitators, chemical plant equipment.
Stainless, austenitic, Type 317L.

VIRGO 14SSR2.
M-533, M-1488; 0.03 max C, 17-20 Cr, 12-15 Ni, 3.5-4.2 Mo, bal Fe.
Annealed: 85,000 TS; 45,000 YS; 60 El; B 80 Rock.
For acid tanks, agitators, mixers, chemical plant equipment.
Stainless, austenitic.
AISI 317L, acid resistant.

VIRGO 15.
M-533; 0.08 max C, 18 Cr, 8 Ni, Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment, tanks; Type 321; stainless, austenitic.

VIRGO 15S.
M-533, M-1488; 0.06 C, 18 Cr, 10 Ni, 0.3 Ti, bal Fe.
Annealed: 85,000 TS; 30,000 YS; 50 El; B 80 Rock.
For welded structures, chemical plant equipment, mixers, agitators.
Type 321 stainless steel, austenitic.

VIRGO 15SA.
M-1488; 0.07 max C, 13 Ni, 18 Cr, Ti = 5 × C, bal Fe.
Annealed: 86,000 TS; 31,000 YS; 45 El; 160 Brin.
For welded chemical plant equipment; stainless, austenitic; Type 321.

VIRGO 15SB.
M-1588, M-533; 0.06 C, 0.4 Si, 1.6 Mn, 18 Cr, 12 Ni, 0.4 Ti, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El; 330 Brin.
For chemical plant equipment; Type 304, stainless, austenitic.

VIRGO 17.
M-533; 0.08 C, 13 Ni, 17 Cr, 2.5 Mo, 0.50 Ti or 0.80 Cb, bal Fe.
Annealed: 100,000 TS; 72,000 YS; 18 El.
For rotors and rotor discs; stainless, austenitic.

VIRGO 17S.
M-533, M-1488; 0.08 max C, 17-20 Cr, 11-14 Ni, 2.0-2.7 Mo, 0.4 min Ti, bal Fe.
Annealed: 85,000 TS; 30,000 YS, B 82 Rock
For welded chemical plant equipment, mixers, digesters.
Corrosion resistant, non-magnetic. France spec. Z8CNDT18-12. Austenitic.

VIRGO 17SA.
M-1488; 0.08 C, 13 Ni, 18 Cr, 2.5 Mo, Ti, bal Fe.
Annealed: 85,000 TS; 43,000 YS; 50 El; 190 Brin.
For chemical plant equipment, welded structures; Type 316 Ti; stainless, austenitic.

VIRGO 17SB.
M-1588, M-533; 0.08 C, 17 Cr, 13 Ni, 2.5 Mo, 0.5 Ti or Cb, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El; 80 RA; 135 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El; 320 Brin.
For acid resistant equipment, mixers, evaporators; Type 316 Ti; stainless, austenitic.

VIRGO 17SR.
M-1301, M-1488; 0.08 max C, 17-20 Cr, 11.5-14.5 Ni, 2.5-3.2 Mo, 0.4 max Ti, bal Fe.
Annealed: 90,000 TS; 45,000 YS; B 90 Rock.
For welded structures, tanks, mixers, chemical plant equipment.
France spec. Z8CNDT18-12, austenitic, stainless, stabilized.

VIRGO 18S.
M-1301, M-1488; 0.08 max C, 17-20 Cr, 9-12 Ni, 0.9 max Cb + Ta, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 50 El; B 82 Rock.
For chemical and textile plant equipment, welded tanks, mixers.
Corrosion resistant, austenitic.
AISI 347. Welding grade.

VIRGO 18SB.
M-1301, M-1488; 0.08 max C, 16-19 Cr, 11-14 Ni, 0.9 max Cb + Ta, bal Fe.
Annealed: 74,000 TS; 30,000 YS; 40 El.
For superheater tubes, blades, discs, steam pipes, welded structures.
Austenitic, stainless, nonmagnetic, stabilized.

VIRGO 19S.
M-1301, M-1488; 0.08 max C, 17-20 Cr, 11-14 Ni, 2.0-2.7 Mo, 0.8 max Ta + Cb, bal Fe.
Annealed: 80,000 TS; 30,000 YS; 60 El; B 80 Rock.
For chemical and textile plant equipment, mixers, digesters.
Stainless, nonmagnetic.
Type 316 stabilized, non-hardenable.

VIRGO 19SB.
M-533; 0.06 C, 12 Ni, 18 Cr, 0.40 Ti, bal Fe.
Annealed: 70,000 TS; 35,000 YS; 25 El.
For welded structures, chemical plant equipment; Type 321; stainless, austenitic.

VIRGO 19SR.
M-1301, M-1488; 0.08 max C, 17-20 Cr, 11.5-14.5 Ni, 2.5-3.2 Mo, 0.8 max Cb + Ta, bal Fe.
For welded structures, tanks, mixers, chemical plant equipment.
Austenitic, stainless, welding grade.

VIRGO 19SR1.
M-1301, M-1488; 0.08 max C, 17-20 Cr, 12.5-15.5 Ni, 3.0-3.7 Mo, 0.8 max Cb + Ta, bal Fe.
Annealed. 85,000 TS, 40,000 YS; 60 El; B 80 Rock
For chemical plant equipment, welded structures, mixers, agitators
Welding grade, austenitic, stainless.

VIRGO 19SR2.
M-1301, M-1488; 0.08 max C, 17-20 Cr, 13.5-16.5 Ni, 3.5-4.2 Mo, 0.8 max Cb + Ta, bal Fe.
Annealed: 83,000 TS; 38,000 YS; B 80 Rock.
For welded structures, mixers, tanks, kettles, digesters, agitators.
Acid resistant, stabilized, austenitic, non-magnetic.

VIRGO 20.
M-533; 0.14 C, 13 Cr, 1 Mo, bal Fe.
Annealed: 80,000 TS; 45,000 YS; 30 El, 65 RA; 170 Brin
For oil refinery equipment, heat and creep resistant.

VIRGO 23.
M-1488; 0.05 max C, 18 Cr, 18 Ni, 2 Mo, 2 Cu, Ti = 5 × C, bal Fe.
Annealed 80,000 TS; 45,000 YS; 40 El; 180 Brin.
For autoclaves, chemical plant equipment; stainless, austenitic.

VIRGO 31.
M-1488; 0.12 max C, 15-18 Cr, bal Fe.
Annealed: 100,000 TS; 65,000 YS; 15 El; 200 Brin.
For furnace parts, grills, heat treating boxes
Heat resistant to 1050°C.

VIRGO 31S.
M-1301, M-1488; 0.08 max C, 15.5-18.5 Cr, bal Fe.
Cold Rolled: 120,000 TS; 110,000 YS; 5 El; 185 Brin.
For nitric acid containers, furnace parts in sulphur-bearing atmospheres.
Type 430 stainless steel, good formability and weldability.

VIRGO 32.
M-1488; 0.18 C, 24-26 Cr, 5 Ni, bal Fe.
Annealed: 97,000 TS; 71,000 YS; 6 El; 200 Brin.
For furnace parts, grills, heat treating boxes; heat resistant to 1050°C in O_2 and 900°C in S atmosphere.

VIRGO 41.
M-1488, M-533; 0.15 max C, 6 Cr, 0.5 Mo, bal Fe.
Rolled: 110,000 TS; 90,000 YS; 12 El.
For oil refinery equipment, pipes, fasteners; heat and creep resistant.

VIRGO 41B.
M-1488, M-533; 0.20 C, 0.5 Si, 0.5 Mn, 6 Cr, 0.5 Mo, bal Fe.
Rolled: 114,000 TS; 92,000 YS; 10 El.
For oil refinery equipment, pipes, fasteners; heat and creep resistant

VIRGO 41S.
M-533, M-1301, M-1488; 0.10 max C, 4-6 Cr, 0.4-0.7 Mo, bal Fe.
Annealed: 65,000 TS; 25,000 YS; 30 El; B 75 Rock.
For oil refinery and chemical plant equipment, valve trim, oil pump impellers.
AISI 502, corrosion and heat resistant.

VIRGO 42.
M-1488, M-533; 0.17 max C, 6 Cr, 0.5 Mo, 1 Al, bal Fe.
Rolled: 110,000 TS; 90,000 YS; 12 El.
For oil refinery equipment, pipes, fasteners; heat and creep resistant.

VIRGO 43.
M-1488, M-533; 0.17 max C, 6 Cr, 0.5 Mo, 0.3 V, bal Fe.
Rolled: 110,000 TS; 90,000 YS; 12 El
For oil refinery equipment, pipes, fasteners; heat and creep resistant.

VIRGO 51.
M-1301, M-1488; 0.20 max C, 23-27 Cr, 0.2 max N_2, bal Fe.
Annealed: 88,000 TS; 56,000 YS; 24 El; B 83 Rock.
For heat treating boxes, fixtures and furnace parts, oil burners, conveyors, exhaust manifolds.
AISI 446 Heat and corrosion resistant.

VIRGO 52.
M-1488; 0.50 C, 24-26 Cr, 1.5 Si, bal Fe.
For recuperators, furnace parts, grills; heat resistant to 1050°C in O_2 and 950°C in S atm.

VIRGO 60.
M-533; 0.25 max C, 25 Cr, 2.0 Ni, 1.5-3.0 Si, bal Fe.
90,000-110,000 TS; 40,000-60,000 YS; 50-60 El; 50-65 RA; 140-185 Brin.
For salt pots, heat treating boxes, heat resistant; AISI Type 314.

VIRGO 60A.
M-1488; 0.15 C, 2 Si, 26 Cr, 12 Ni, bal Fe.
Normalized: 83,000 TS; 43,000 YS; 25 El.
For recuperators, turbines, furnace parts; resists heat to 1100°C in O_2 atmosphere.

VIRGO 61.
M-533, M-1488; 0.20 max C, 23.5-26.5 Cr, 19.5-22.5 Ni, bal Fe.
Annealed: 95,000 TS; 45,000 YS; 50 El; B 90 Rock.
For furnace parts, heat treating equipment, carburizing boxes, valves, pumps.
Type 25-20 stainless steel.
AISI 310 heat and corrosion resistant

VIRGO 61SS.
M-533, M-1488; 0.03 max C, 23.5-26.5 Cr, 19.5-21.5 Ni, bal Fe.
Annealed: 90,000 TS; 40,000 YS; 55 El; B 85 Rock.
For pumps, valves, furnace and heat treating equipment.
AISI 310S, corrosion and heat resistant.

VIRGO 63.
M-1488; 0.12 C, 23-27 Cr, 20 Ni, 2 Si, bal Fe.
Annealed: 80,000 TS; 37,000 YS; 32 El.
For heat exchangers, furnace parts; heat resistant to 1200°C in O_2 atmosphere.

VIRGO 70.
M-533; 0.08 0.16 C, 12 Cr, 12 Ni, bal Fe.
For valves, pumps; corrosion resistant.

VIRGO 74.
M-533, M-1488; 0.10 max C, 16 Cr, 17 Mo, 5 W, 5 max Fe, bal Ni.
Annealed: 75,000 TS; 46,000 YS; 12 El; 14 RA; 200 Brin.
For chemical and oil refinery equipment, valves, pumps, combustion chambers.
Similar to Hastelloy-C. Corrosion and heat resistant.

VIRGO 81.
French; 0.24 C, 8 Ni, 18 Cr, 4.4 W, bal Fe.
For gas turbine components; heat and creep resistant,

VIRGO 84.
M-1488; 0.20 C, 22 Cr, 12 Ni, 3 W, bal Fe.
For heat resistant equipment; heat resistant to 1100°C in O_2 atmosphere.

VIRGO 86.
M-1301, M-1488; 0.45-0.55 C, 24-28 Cr, 8-12 Ni, 6-9 W, 2 Fe, bal Co.
Cast: 113,000 TS; 79,000 YS; 8 El; 9 RA.
Aged: 128,000 TS; 113,000 YS; 2 El; 3 RA
For jet engine and gas turbine blades.
Similar to Haynes Stellite No. 31.
Heat and corrosion resistant. High creep strength.

VIRGO 87B.
M-1301, M-1488; 0.14 C, 12.5 Cr, 4.5 Mo, 0.6 Ti, 2.1 Cb, 6 Al, 2.5 Fe, B, Zr, bal Ni.
Cast: 117,000 TS; 102,000 YS; 5 El; 400 Brin.
For jet engine and gas turbine blades.
High heat and corrosion resistance.
Similar to Inconel 713.

VIRGO 92.
M-1301, M-1488; 0.5 C, 13-16 Ni, 13-16 Cr, 2.2 W, 0.4 Mo, bal Fe.
For furnace parts and equipment, valves.
Heat and oxidation resistant.

VIRGO 94.
M-1588, M-533, M-1488; 0.1 C, 16-20 Cr, 40-48 Ni, 1.9-2.6 Ti, 20-24 Co.
Cold Drawn: 127,000 TS; 85,000 YS; 20 El.
For turbine components, valve and pump parts.
Austenitic, oxidation and heat resistant to 1150°C.

VIRGO 106.
M-1301, M-1488; 0.08 max C, 12-14 Cr, bal Fe.
Annealed: 75,000 TS, 40,000 YS; 35 El; 155 Brin.
For equipment in the petroleum industry, flat springs, table flatware, furnace parts.
Corrosion resistant. Non-hardenable.
AFNOR-Z6C13 Spec. AISI 410S.

VIRGO 112.
M-1301, M-1488; 0.15 max C, 12-14 Cr, bal Fe.
Annealed: 80,000 TS; 43,000 YS; 30 El; 160 Brin.
For furnace parts below 700°C, flat springs, table flatware, oil refinery equipment.
Corrosion resistant, hardenable.
AFNOR Z12C13 Spec. AISI 410

VIRGO 120.
M-1301, M-1488; 0.25 max C, 12-14 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; B 92 Rock.
For pump components, gears, cutlery, surgical instruments, gauges.
Corrosion resistant, hardenable.
AFNOR-Z20C13 Spec. AISI 420.

VIRGO L.16.
M-1488, M-533; 0.50 C, 14.5-17.0 Si, 0.50 Mn, bal Fe.
Cast: 16,000 TS; C 50 Rock.
For pumps, valves, drains, agitators, fittings, castings.
Acid resistant. Brittle as cast. Sensitive to thermal shock.

VIRILLIUM.
English; 67.9 Co, 24.1 Cr, 1.4 Ni, 5.3 Mo, bal Fe.
Cast: 96,000-98,000 TS; 64,000-69,000 YS; 10-11 El; 295 Brin.
For dental alloy, corrosion resistant.

VISCOTHERM 4.
M-1317; Cr, Co, Mo, bal Ni.
At 1400°F: 160,000 TS.
At 1700°F: 58,000 TS.
At 2000°F: 11,000 TS.
For glass making equipment, molds; high oxidation resistance to 2300°F.

VISCOTHERM 5.
M-1317; Cr, Co, Mo, bal Ni.
At 1400°F: 150,000 TS.
At 1700°F: 64,000 TS.
At 2000°F: 12,000 TS.
For glass making equipment, molds; high oxidation resistance to 2400°F.

VISCOTHERM 6.
M-1317; Cr, Co, Mo, bal Ni.
At 1400°F: 130,000 TS.
At 1700°F: 62,000 TS
At 2000°F: 10,000 TS.
For glass making equipment, molds; high oxidation resistance to 2400°F.

VISCOTHERM 7.
M-1317; Cr, Co, Mo, bal Ni.
At 1400°F: 150,000 TS.
At 1700°F: 76,000 TS.
At 2000°F: 15,000 TS.
For glass making equipment, molds, high oxidation resistance to 2200°F.

VISCOTHERM 1612.
M-1317; Cr, Co, Mo, bal Ni.
At 2000°F: 6000 TS.
For glass making equipment, molds; high oxidation resistance to 2400°F.

VISCOUNT 20.
M-73; 0.40 C, 5 Cr, 1 V, 1 Si, 0.3 Mn, 1.2 Mo, S, bal Fe.
For white metal extrusion dies; Type H13; hot work steel.

VISCOUNT 44.
M-73; 0.40 C, 5 Cr, 1 V, 1 Si, 0.3 Mn, 1.2 Mo, S, bal Fe.
Heat treated: 420-460 Brin.
For die casting dies, extrusion tools, forging die blocks; prehardened, air hardened, resists heat checking.

VISTA.
M-1705; 0.23 C, 0.6 Mn, 1.25 Si, 10.0 Cr, 0.75 Ni, 1.0 V, 0.45 W, 1.2 Mo, 0.10 N, bal Fe.
Air or oil hardening hot work tool and die steel, chromium type.

VISTA 11.
M-1705; 0.40 C, 0.3 Mn, 0.9 Si, 5.0 Cr, 0.5 V, 1.3 Mo, bal Fe.
Chromium type hot work tool and die steel.
AISI H 11.

VISTA 12.
M-1705, 0.32 C, 0.3 Mn, 0.9 Si, 5.0 Cr, 0.25 V, 1.25 W, 1.50 Mo, bal Fe.
Chromium type hot work tool and die steel.
AISI H 12.

VISTA 13.
M-1705; 0.40 C, 0.35 Mn, 1.0 Si, 5.0 C, 1.0 V, 1.2 Mo, bal Fe.
Chromium type hot work tool and die steel.
AISI H 13.

VISTA 21.
M-1705; 0 30 C, 0.3 Mn, 3.0 Cr, 0.5 V, 9.0 W, bal Fe
Hot work tool and die steel, tungsten type
AISI H21.

VISTA 24.
M-1705; 0 42 C, 3.5 Cr, 0.3 V, 14.0 W, bal Fe.
Hot work tool and die steel, tungsten type.
AISI H 24.

VISTA 26.
M-1705, 0 52 C, 3 75 Cr, 0.9 V, 17.5 W, bal Fe
Hot work tool and die steel, tungsten type
AISI H 26.

VISTA 43
M-1705; 0 50 C, 4 0 Cr, 1.95 V, 8 0 Mo, bal Fe.
Hot work tool and die steel, molybdenum type.
AISI W 43.

VISTO.
M-344; C, Cr, V, W, bal Fe.
For tools, cutters; high speed steel.

VISTO.
M-614, 0 7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutters, tools, high speed steel.

VISTO A50
M-614; 0 56 C, Ni, Cr, Mo, V, bal Fe.
For gears, shafts, crankshafts, bolts, fasteners; oil hardened, shock resistant.

VISTO ABC III.
M-614; 0 95 C, W, Mo, bal Fe.
For cutters, dies, bearings, liners; water hardened, wear resistant

VISTO DM1.
M-614; 0 45 C, 1.4 Cr, 0 7 Mo, 0 3 V, bal Fe
For gears, bolts, crankshafts; oil hardened, tough.

VISTO KD6.
M-614; 0.86 C, 4.1 Cr, 0 85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel.

VISTO KD13.
M-614; 0.86 C, 2 8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, drills, reamers, hobs; high speed steel.

VISTO KD15.
M-614; 0.79 C, 4.7 Co, 4 3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, broaches; high speed steel.

VISTO KD16.
M-614; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, form cutters; high speed steel.

VISTO KD22.
M-614; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For engravers tools, blanking and forming dies; high speed steel.

VISTO KD25.
M-614; 1.35 C, Cr, W, Co, V, bal Fe.
For engravers tools, blanking and forming dies; high speed steel.

VISTO PL.
M-614; 0.45 C, W, Cr, V, bal Fe.
For punches, crimpers, upsetters; hot work steel, oil hardened.

VISTO REKORD.
M-614; 0.74 C. 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, broaches, hobs; high speed steel.

VISTO SUPERIOR.
M-344; 0.8 C, 4 Cr, 0.8 Mo, 1.6 V, 8.7 W, bal Fe
For shear blades, dies, drills, reamers, broaches, taps; high speed steel, oil hardened.

VISTO W5.
M-614; 0.30 C, 2.3 Cr, 0.6 V, 4.2 W, bal Fe.
For punches, riveters, extrusion tools; hot work steel, oil hardened

VISTO W9.
M-614; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams and liners, punches; hot work steel, oil hardened.

VISTO W11C.
M-614, 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion tools, punches, shears, hot work steel, oil hardened

VISTO WC5
M-614, 0.40 C, Cr, W, V, Si, bal Fe
For hot work punches and shears; hot work steel, oil hardened

VISTO WC SPEZIAL
M-614; 0.38 C, Cr, Si, Mo, V, bal Fe
For upsetters, riveters, punches, shears; hot work steel, oil hardened.

VISTO 7652.
M-614; 0.85 C, Cr, V, W, Mo, bal Fe
For lathe and planer tools, drills, taps, hobs; high speed steel

VITAL.
German, 0.6 Si, 0.9 Cu, 1 Zn, bal Al
60,000 TS; 5 El.
For light alloy parts, non-hardenable.

VITAL
M-1411, 2 C, 13 Cr, bal Fe
For blanking and forming dies, punches; oil hardened, non-deforming.

VITALLIUM.
M-937; 0.5 max C, 0.6 max Si, 0.75 max Mn, 5-7 Mo, 28-32 Cr, bal Co.
Cast: 97,000-130,000 YS; 58,000-80,000 YS; 15-4 El; 20-2 RA; 250-450 Brin.
For orthopedic and dental appliances; corrosion resistant.

VITALU.
Eng.; 5 Si, bal Al.
For light alloy parts; die castings.

VITAL-X.
M-1411; 1.5 C, 12 Cr, 0.8 V, 0.25 Mo. bal Fe.
For blanking and forming dies; air hardened, non-deforming.

VITA M-1.
M-1396; 0.7 C, 8.5 Mo, 4 Cr, 1 V, 1.5 W, bal Fe.
For lathe and planer tools; high speed steel.

VITA M-2.
M-1396; 0.7 C, 5 Mo, 4 Cr, 2 V, 6 W, bal Fe.
For lathe and planer tools; high speed steel.

VITA M-3.
M-1396; 0.7 C, 6 Mo, 4 Cr, 2.4 V, 6 W, bal Fe.
For lathe and planer tools; high speed steel.

VITA M-4.
M-1396; 0.7 C, 4.5 Mo, 4.5 Cr, 4 V, 5.5 W, bal Fe.
For lathe and planer tools; high speed steel.

VITA M-6.
M-1396; 0.7 C, 5 Mo, 4 W, 12 Co, 4.5 Cr, 1.5 V, bal Fe.
For lathe and planer tools; high speed steel.

VITA M-8.
M-1396; 0.7 C, 4.5 Mo, 4.2 Cr, 1.5 V, 5.5 W, 1.2 Cb, bal Fe
For lathe and planer tools; high speed steel.

VITA M-10.
M-1396; 0.7 C, 8 Mo, 4 Cr, 2 V, bal Fe.
For lathe and planer tools; high speed steel

VITA M-15.
M-1396; 0.7 C, 3 Mo, 6.7 W, 5 V, 5 Co, bal Fe.
For lathe and planer tools; high speed steel.

VITA M-20
M-1396, 0.7 C, 8 Mo, 4 Cr, 1 V, 2.5 Co, bal Fe.
For lathe and planer tools; high speed steel.

VITA M-30.
M-1396; 0.7 C, 8 Mo, 4 Cr, 1 V, 2 W, 5 Co, bal Fe.
For lathe and planer tools, high speed steel.

VITA M-34
M-1396; 0.7 C, 8.5 Mo, 4 Cr, 2 V, 2 W, 8 Co, bal Fe
For lathe and planer tools; high speed steel.

VITA M-36.
M-1396, 0.7 C, 6 Mo, 4 Cr, 2 V, 6 W, 8 Co, bal Fe.
For lathe and planer tools; high speed steel

VITA M-40.
M-1396, 0.7 C, 8 Mo, 4 Cr, 1.5 V, 8 Co, bal Fe.
For lathe and planer tools; high speed steel.

VITA M-50.
M-1396; 0.7 C, 4.2 Mo, 4 Cr, 1 V, bal Fe
For lathe and planer tools; high speed steel

VITA M-52
M-1396; 0.7 C, 4.2 Mo, 4 Cr, 2 V, bal Fe.
For lathe and planer tools, high speed steel

VITA M-54.
M-1396, 0.7 C, 4.2 Mo, 4 Cr, 3 V, bal Fe.
For lathe and planer tools, high speed steel.

VITA M-56
M-1396, 0.7 C, 4.2 Mo, 4 Cr, 4 V, bal Fe.
For lathe and planer tools; high speed steel.

VITA T-1.
M-1396; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, reamers, taps; high speed steel.

VITA T-2.
M-1396; 0.7 C, 18 W, 4 Cr, 2 V, bal Fe.
For lathe and planer tools; high speed steel.

VITA T-3
M-1396; 0.7 C, 18 W, 4 Cr, 3.2 V, bal Fe.
For lathe and planer tools; high speed steel.

VITA T-4.
M-1396; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For lathe and planer tools; high speed steel.

VITA T-5.
M-1396; 0.7 C, 18 W, 4 Cr, 2 V, 8 Co, bal Fe.
For lathe and planer tools; high speed steel.

VITA T-6.
M-1396; 0.7 C, 22 W, 4.5 Cr, 1.5 V, 12 Co, bal Fe.
For lathe and planer tools; high speed steel.

VITA T-7.
M-1396; 0.7 C, 14 W, 4 Cr, 2 V, bal Fe.
For lathe and planer tools; high speed steel.

VITA T-8.
M-1396; 0.7 C, 14 W, 4 Cr, 2 V, 5 Co, bal Fe.
For lathe and planer tools; high speed steel.

VITA T-12.
M-1396; 0.7 C, 14 W, 4 Cr, 3 V, bal Fe.
For lathe and planer tools; high speed steel.

VITA T-15.
M-1396; 0.7 C, 13 W, 4.2 Cr, 5 V, 5 Co, bal Fe.
For lathe and planer tools; high speed steel.

VITA T-20.
M-1396; 0.7 C, 18.5 W, 4 Cr, 4 V, bal Fe.
For lathe and planer tools; high speed steel.

VITRIX.
M-1322; 0.35 C, 1.3 Cr, 4.5 Ni, 0.6 Mn, bal Fe.
For gears, bolts, crankshafts, forging dies; oil hardened, shock resistant.

VIVAL.
M-807; 0.5 Si, 1 Mg, 0.5 Mn, bal Al.
Rolled: 36,000 TS; 34,000 YS; 5 El.
For light alloy parts.

VIZOR.
M-1411; 0.80-1.2 C, bal Fe.
For springs, drills, taps, cutters; Type W1; water hardened.

VK2.
M-Russia; 2 Co, bal WC.
Sintered: Rock A 90-93.
For hard cutting tools, dies.
Sintered carbide of tungsten.

VK3.
M-Russia; WC, 3 Co.
Sintered: Rock A 92.
For cutting tools, dies.
Cemented carbides.

VK4.
M-Russia; WC, 4 Co.
Sintered: Rock A 92.
For cutting tools, dies.
Sintered carbide.

VK6.
M-Russia; 6 Co, bal WC.
Sintered: Rock A 92.
For hard cutting tools, dies.
Sintered carbide of tungsten.

VK6M.
M-Russia; 6 Co, bal WC.
Sintered: Rock A 92.
For hard cutting tools.
Sintered tungsten carbide. Low porosity.

VK8.
M-Russia; 8 Co, bal WC.
Sintered: Rock A 91.5.
For hard cutting tools, dies.
Cemented carbides of tungsten.

VK8V.
M-Russia; 8 Co, bal WC.
Sintered: Rock A 91.8.
For hard cutting tools, dies.
Sintered carbide.

VK15.
M-Russia; 15 Co, bal WC.
Sintered: Rock A 90.
For hard cutting tools, dies.
Sintered tungsten carbide.

VK20.
M-Russia; 20 Co, bal WC.
Sintered: Rock A 86-88.
For hard cutting tools, dies.
Sintered tungsten carbide.

VK25.
M-Russia; 25 Co, bal WC.
Sintered: Rock A 86-88.
For hard cutting tools, dies.
Sintered tungsten carbide.

VLM see ALLEGHENY LUDLUM VLM.

V.L.W. 1.
M-116; 5 Cu, 0.4 Si, bal Al.
For light alloy parts; similar to "Lautal."

V.L.W. 2
M-116; 4 Cu, 0.1 Li, bal Al.
For light alloy parts; similar to "Scleron."

V.L.W. 3
M-116; 11-14 Si, bal Al.
For light alloy parts; similar to "Silumin."

V.L.W. 6.
M-116 1 3 Mn, 2.2 Mg, 0.7 Si, bal Al.
For marine hardware; resists sea water.

V L.W. 14.
M-116; 5 Cu, 0 4 Si, bal Al.
For light alloy parts; same as "Lautal."

V.L.W. 17.
M-116; 4-5 Cu, bal Al.
For light alloy parts; same as "Duralumin."

V L.W. 19
M-116, 0.8 Mg, 0.8 Mn, 1.4 Si, bal Al.
For light alloy parts; same as "Pantal."

V.L.W. 23.
M-116; 0.1 Li, 4 Cu, bal Al.
For light alloy parts; same as "Scleron."

V.L.W. 31.
M-116; 11-14 Si, bal Al.
For light alloy parts; same as "Silumin."

V.L.W. 41.
M-116; 1-2 Mn, bal Al.
For light alloy parts; same as "Aluman."

V.L.W. 61.
M-116; 1.3 Mn, 2.2 Mg, 0.2 Sb, 0.7 Si, bal Al.
For marine hardware; same as "K.S. Seewasser."

V.L.W. 63.
M-116; 7.5 Mg, 0.3 Mn, bal Al.
For marine instruments; same as "B.S. Seewasser."

V.L.W. 99.
M-116; Al.
For cable; same as pure Al.

V.L.W. Leichtmetalle.
M-116; Al alloys.
For light alloy parts for airplanes, dirigible and automobiles; formerly known as "Leichstahl."

V-MANG.
M-9; C, 12-14 Mn, Mo, bal Fe.
For welding rod; for Mn steel.

VMARILITE.
England; Al-Mg.
For light alloy parts.

"V" MOLY HIGH SPEED.
M-81; 0.80 C, 5.5 W, 4 Cr, 4.25 Mo, 1.5 V, bal Fe.
For tools, dies; high speed steel.

"V.M." STEEL.
0.7-1 Cr, 0.35-0.85 Mo, 0.4 C, $\ngtr$ 0.17 V, 0.4-0.6 Mn, bal Fe.
For gears, shafts, blacksmith tools; oil hardening.

VOELKLINGEN DOCO.
M-1421; 1.6 C, 13 Cr, 1 Mo, 1 V, 2 Co, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

VOELKLINGEN NGSA.
M-1421; 0.45 C, 1.5 Cr, 0.4 W, 0.5 Mo, 0.8 V, bal Fe.
For punches, shear blades; hot work steel, oil hardened.

VOLKLINGEN NH4.
M-1421; 0.16 C, 23 Cr, 14 Ni, bal Fe.
Annealed: 75,000 TS; 30,000 YS; 40 El; 220 Brin.
For heat exchangers, combustion chambers, salt pots, oil burners.
Type 309 stainless steel, austenitic, heat and corrosion resistant.

VOLKLINGEN NH8G.
M-1421; 0.15 C, 24 Cr, 13 Ni, bal Fe.
Annealed: 75,000 TS; 32,000 YS; 210 Brin.
For furnace parts, salt pots, heat exchangers, combustion chambers.
Type 309 stainless steel, corrosion and heat resistant.

VOLKLINGEN NH22.
M-1421; 0.20 C, 19-22 Cr, 19-22 Ni, bal Fe
Annealed. 95,000 TS; 45,000 YS; 50 El; B 90 Rock
For furnace parts and equipment, valves, pumps, boiler baffles, turbine and jet engine components.
Type 310 stainless steel, heat and corrosion resistant

VOELKLINGEN RCC
M-1421; 2 C, 13 Cr, W, bal Fe.
For blanking and forming dies; oil or air hardened, non-deforming

VOELKLINGEN RCW1.
M-1421; 0.60 C, 3.8 Cr. 10 W, 1 Mo, 0.8 V, bal Fe.
For shears, punches, upsetters; hot work steel, oil hardened.

VOELKLINGEN RCW2
M-1421; 0.30 C, 3 Cr, 10 W, 0.3 Mo, 0.4 V, 2 Ni, bal Fe
For extrusion dies, liners, punches; hot work steel, oil hardened.

VOLKLINGEN RNO.
M-1421; 0.20 C, 12-14 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; B 92 Rock.
For pump and valve parts, surgical instruments, cutlery, gauges.
Type 420 stainless steel, heat and corrosion resistant. Hardenable.

VOLKLINGEN RNOF.
M-1421; 0.25 C, 12-14 Cr, bal Fe.
Annealed: 98,000 TS; 52,000 YS; 20 El; B 95 Rock.
For cutlery, surgical instruments, pump and valve parts.
Type 420 stainless steel, heat and corrosion resistant. Hardenable.

VOLKLINGEN RNOw.
M-1421; 0.12 C, 12-14 Cr, bal Fe.
Annealed: 80,000 TS; 40,000 YS; 30 El; B 85 Rock.
For furnace parts, oil refinery equipment, springs, tableware.
Type 410 stainless steel, corrosion and heat resistant.

VOLKLINGEN RNOww.
M-1421; 0.10 C, 14-18 Cr, bal Fe.
Annealed: 75,000 TS; 45,000 YS; 30 El; B 80 Rock.
For automotive trim, kitchen sinks, fasteners, heat treating boxes.
Type 430 stainless steel, corrosion resistant, Non-hardenable.

VOELKLINGEN RT10 EXTRA.
M-1421; 1 C, 0.15 Si, 0.30 Mn, bal Fe.
Heat treated: 185,000 TS; 120,000 YS; 10 El; 30 RA; 390 Brin.
For springs, taps, drills, reamers; Type W1; water hardened.

VOELKLINGEN RTWK.
M-1421; C, alloy, bal Fe.
For machine tool parts; oil hardened.

VOELKLINGEN RUS.
M-1421; 0.90 C, 2 Mn, 0.3 Si, bal Fe.
For punches, form dies, rolls; oil hardened, non-deforming.

VOELKLINGEN RUS4.
M-1421; C, alloy, bal Fe.
For machine tool parts; oil hardened.

VOELKLINGEN RWA.
M-1421; 0.30 C, 2.5 Cr, 4.5 W, 0.3 Mo, 0.5 V, bal Fe.
For extrusion press liners, mandrels, dies; hot work steel, oil hardened.

VOELKLINGEN RWS
M-1421, 0.40 C, 3.3 Cr, 3 W, 0.5 Mo, 0.3 Co, bal Fe.
For pneumatic shears, punches, chisels; hot work steel, oil hardened.

VOELKLINGEN RWS2.
M-1421; 0.25 C 1.3 Cr, 4.5 W, 0.5 Mo, 0.3 V, bal Fe
For extrusion press tools, liners; hot work steel, oil hardened.

VOELKLINGEN SGM2.
M-1421; 0.30 C, 2.5 Cr, 8 W, 0.5 V, 2.5 Co, bal Fe
For extrusion press tools; hot work steel, oil hardened

VOELKLINGEN SGM5.
M-1421, 0.35 C, 5 Cr, 4 W, 0.4 Mo, 0.4 V, 0.5 Co, bal Fe
For extrusion press tools; hot work steel, oil hardened.

VOELKLINGEN T7.
M-1421; C, alloy, bal Fe.
For forging and die casting dies; hot work steel.

VOIZIT.
Germany; 96.5 Fe, 3.5 Graphite.
Sintered: 25-50 Brin.
For antifriction metal, bearings; pressed powders, 30-40% porosity.

VOKAR.
Russia; 8-15 C, 78-86 W, Mn, bal Fe.
For cutting tools; sintered hard alloy.

VOLCANO.
M-688; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For high temperature die work; high speed steel.

VOLCO NO. 5.
M-998; 63 Cu, 32 Zn, 5 Ni.
Hard: 80,000 TS; 7 El.
Soft: 50,000 TS; 50 El.
For plumbing fixtures, jewelry; 12% cond.

VOLCO NO. 8.
M-998; 65 Cu, 27 Zn, 8 Ni.
Hard: 82,000 TS; 7 El.
Soft: 53,000 TS; 45 El.
For hardware; 9% conductivity.

VOLCO NO. 10.
M-998; 85 Cu, 15 Zn.
Hard: 69,000 TS; 7 El.
Soft: 40,000 TS; 45 El.
For jewelry, hardware; 37% cond.

VOLCO NO. 11.
M-998; 65 Cu, 25 Zn, 10 Ni.
Hard: 88,000 TS; 7 El.
Soft: 55,000 TS; 42 El.
For hardware; 8.4% conductivity.

VOLCO NO. 12.
M-998; 65 Cu, 23 Zn, 12 Ni.
Hard: 83,000 TS; 6 El.
Soft: 54,000 TS; 41 El.
For hardware; 6.3% conductivity.

VOLCO NO. 14.
M-998; 65 Cu, 21 Zn, 14 Ni.
Hard: 84,000 TS; 5 El.
Soft. 45,000 TS; 40 El.
For hardware; 6.2% conductivity.

VOLCO NO. 30.
M-998; 90 Cu, 10 Zn.
Hard: 62,000 TS; 6 El
Soft: 57,000 TS; 4 El.
For screen wire, jewelry, screw stock; 43% cond.

VOLCO NO. 65.
M-998; 65 Cu, 35 Zn.
Hard: 73,000 TS; 10 El.
Soft: 45,000 TS; 60 El.
For rivets, screws, eyelets, reflectors; brass.

VOLCO NO 68.
M-998; 70 Cu, 30 Zn
Hard: 105,000 TS; 1 El.
Soft: 49,000 TS; 48 El.
For cartridges, clips; brass.

VOLCO NO. 80.
M-998; 80 Cu, 20 Zn.
Hard: 73,000 TS; 5 El.
Soft: 43,000 TS; 8 El.
For flexible hose, stampings; 32.5% conductivity.

VOLCO NO. 95.
M-998; 95 Cu, 5 Zn.
Hard: 55,000 TS; 5 El.
Soft: 35,000 TS; 38 El.
For jewelry, coins, stampings; 56% cond.

VOLOMIT.
WC + MoC.
For cutting tools, dies; similar to "Stellite."

VOLTAL.
M-1355; 4.7 Cu, 2-4 Si, 2.5 max Zn, 1.1 max Fe, bal Al.
For light alloy parts; age-hardenable.

VOLUMIT.
Tungsten carbide plus molybdenum.
For hard cutting tools and dies; sintered alloy.

VOLVIC.
M-1115; 0.2-0 3 C, 2.5-3.5 Cr, 8-10 W, bal Fe.
For rivet sets, extrusion press parts, punches; hot work steel, oil hardened.

VOLVIT.
M-462; 9 Sn, 91 Cu.
For bearings.

VOLVO KLS.
M-1291, M-1114; 1.0 C, 1.5 Cr, 0.30 Mn, bal Fe.
For bearings, blanking dies, cutters; water or oil hardened.

"V"-PERMANDUR.
M-269; 49.3 Fe, 48.4 Co, 2.3 V.
For telecommunications, diaphragms in telephone receivers; high permeability.

V RED LABEL.
M-373; C, alloy, bal Fe.
For tools; oil hardening.

VR/WESSON 2A3
M-329, 89 0 WC, 11.0 Co
Sintered· 325,000 TrS; A 89.3 Rock.
Density: 14.40.
For heavy roughing cuts and interrupted machining of ferrous and non-ferrous metals, and for non-metallics. Excellent shock resistance.

VR/WESSON 2A5.
M-329, 94 WC, 6 Co.
Sintered: 250,000 TrS; A 91.8 Rock.
Density: 14 90
For general purpose machining, including hardened ferrous and non-ferrous. Very good wear resistance.

VR/WESSON 2A6
M-329; 92 WC, 8 Co.
Sintered: 300,000 TrS; A 89.5 Rock.
Density: 14 70
For heavy roughing and interrupted cuts, also for large wire drawing dies. Good shock resistance

VR/WESSON 2A7.
M-329, 95 5 WC, 4 5 Co.
Sintered: 225,000 TrS, A 92 2 Rock.
Density: 15.10.
For fine finishing of ferrous and non-ferrous alloys Excellent wear resistance.

VR/WESSON 2S68
M-329, 94 WC, 6 Co.
Sintered: 275,000 TS; A 90 8 Rock.
Density· 14.85.
For rough machining and interrupted cuts on ferrous and non-ferrous metals
Good shock and wear resistance

VR/WESSON 26.
M 329, 83 WC, 10 TiC, 7 Co.
Sintered; 225,000 TrS; A 91 8 Rock.
Density· 12 40
For general purpose and finish machining of steel and non-ferrous metals. Good shock and wear resistance

VR/WESSON VR-13.
M-329; 90 WC, 10 Co.
Sintered: 325,000 TrS; A 88.8 Rock.
Density: 14.50.
Cutting tools for mining, quarrying and percussion drilling

VR/WESSON VR-14.
M-329; 88.5 WC, 11.5 Co.
Sintered: 375,000 TrS; A 88.2 Rock.
Density: 14.40.
Cutting tools for mining, quarrying and percussion drilling.

VR/WESSON VR-15.
M-329; 87 WC, 13 Co.
Sintered: 400,000 TrS; A 87.5 Rock.
Density: 14.30.
Cutting tools for mining, quarrying and percussion drilling.

VR/WESSON VR-52.
M-329; 96 WC, 4 Co.
Sintered: 225,000 TrS; A 92.8 Rock.
Density: 15.10.
For high speed finishing and precision boring ferrous and non-ferrous alloys.

VR/WESSON VR-54.
M-329; 93 WC, 7 Co.
Sintered: 275,000 TrS; A 91.8 Rock.
Density: 14.60.
For milling, broaching, hobing cast ferrous and non-ferrous alloys. Very good shock resistance.

VR/WESSON VR-65
M-329; TiC, Mo, Ni.
Sintered: 200,000 TrS; A 92.1 Rock.
Density: 5.90.
For finishing cuts on steel; for alloy, 400 and 500 series stainless, and ductile irons. Excellent wear resistance

VR/WESSON VR-71.
M-329; 66 WC, 18 TiC, 10 TaC + CbC, 6 Co.
Sintered: 200,000 TrS; A 92.5 Rock.
Density: 10.70.
For high speed finishing and precision boring of steel. Excellent wear resistance.
High resistance to cutting temperature.

VR/WESSON VR-73.
M-329, 71.5 WC, 12 TiC, 10 TaC + CbC, 6.5 Co.
Sintered. 225,000 TrS; A 92.0 Rock.
Density 11.90
For finish machining of steel. Very good wear resistance, high resistance to cutting temperature.

VR/WESSON VR-75
M-329; 74.5 WC, 8.0 TiC, 10 TaC + CbC, 7.5 Co
Sintered. 250,000 TrS; A 91.5 Rock
Density: 12.70
For general purpose machining steel
Good shock and wear resistance, high resistance to cutting temperature.

VR/WESSON VR-77
M-329, 73.5 WC, 8 TiC, 10 TaC + CbC, 8.5 Co
Sintered 280,000 TrS; A 91.3 Rock
Density: 12.60
For heavy roughing and interrupted cuts on steel. Very good shock resistance

VR/WESSON VR-82
M-329, 92 WC, 2.5 TaC, 5.5 Co.
Sintered: 250,000 TrS; A 92.3 Rock.
Density: 14.95.
For machining malleable and nodular cast irons with semi-continuous chip where crater resistance and toughness are required Very good wear resistance.

VR/WESSON VR-87
M-329, 55 WC, 28 TaC, 17 Co
Sintered: 350,000 TrS; A 85.0 Rock
Density: 13.50
Good hot hardness, for machining hot flash from heavy weld in steel pipe Excellent resistance to shock and to cutting temperatures.

VR/WESSON VR-89.
M-329; 71 WC, 18 TaC, 11 Co.
Sintered: 275,000 TrS; A 89.9 Rock.
Density: 14.05.
For turning and milling tough alloy steels as high manganese steels; Excellent shock resistance.

VR/WESSON WH.
M-329; 78 WC, 13 TiC, 2 TaC, 7 Co.
Sintered: 220,000 TrS; A 92.0 Rock.
Density: 11.75.
For general purpose and finish machining of steel. Good wear resistance.

VR/WESSON WM.
M-329; 75 WC, 13 TiC, 2 TaC + CbC, 10 Co.
Sintered: 250,000 TrS; A 91.0 Rock.
Density: 11.50.
For roughing and general machining steel.
Good shock resistance

VR/WESSON WS
M-329, 83.5 WC, 4.0 TiC, 2.0 TaC + CbC, 10.5 Co.
Sintered: 300,000 TrS; A 89.7 Rock.
Density: 13.20.
For rough machining steel; interrupted cuts.
Excellent shock resistance.

V.S.4 STEEL.
M-210; 0.75-1.05 C, 0.30 Mn, 0.25 V, bal Fe.
For cold heading dies, hammers, pistons; Type W2; water hardened.

VS-30.
M-72; 15 Cr, 52 Co, bal Fe
Remanence 18,000; coercive force 25.
For hysteresis motors, electro and magnetic devices.
Vicalloy type permanent magnet.

VS SPEZIAL EXTRA
M-459; C, W, V, bal Fe.
For steel trimming and weld steel.

VT-5-1.
M-Russia; 4.0-5.5 Al, 2.0-3.0 Sn, bal Ti.
Annealed: 125,000 TS; 120,000 YS; 15 El.
For compressor blades, engine cowlings, support rings
Alpha alloy Corrosion resistant.

VT-6.
M-Russia, 5.0-6.5 Al, 3.5-4.5 V, bal Ti.
Annealed 150,000 TS, 140,000 YS; 15 El; C 30 Rock
For jet engine components, airframe parts, fasteners.
Alpha-beta alloy, good hot strength.

VTG 129.
M-686, 59.0-61.0 Pd, bal Ni
Uses: Brazing electron tubes
M P. 2260°F.

VTG 238.
M-686; 79.5-80.5 Au, 0.05 max Ag, bal Cu.
For brazing electron tubes.
M P 1630°F

VTG 255.
M-686; 81.6-82.5 Au, bal Ni.
For brazing electron tubes.
M.P. 1742°F.

VTG 260.
M-686, 34.5-35.5 Au, 0.05 max Ag, bal Cu.
For brazing electron tubes.
M. P. 1832-1870°F

VTG 261.
M-686; 74.5-75.5 Au, 4.5-5.5 Ag, bal Cu.
For brazing electron tubes
M.P 1625-1640°F

VTG 301.
M-686; 71-73 Ag, bal Cu.
For brazing of electron tubes.
M.P. 1435°F.

VTG 428.
M-686; 4.5-5.5 Pd, bal Ag.
For brazing electron tubes.
M.P. 1780-1850°F.

VTG 431.
M-686; 9.5-10.5 Pd, bal Ag.
For brazing electron tubes.
M.P. 1835-1950°F.

VTG 447.
M-686; 19.5-20.5 Pd, bal Ag.
For brazing electron tubes.
M.P. 1960-2150°F.

VTG 478.
M-686; 4.5-5.5 Pd, 67-69 Ag, bal Cu.
For brazing electron tubes.
M.P. 1480-1490°F.

VTG 490.
M-686; 14.5-15.5 Pd, 64-66 Ag, bal Cu.
For brazing electron tubes.
M.P. 1565-1650°F.

VTG 491.
M-686; 9.5-10.5 Pd, 57-59 Ag, bal Cu.
For brazing electron tubes.
M.P. 1520-1565°F.

VTG 492.
M-686; 24.5-25 5 Pd, 53-56 Ag, bal Cu.
For brazing electron tubes.
M.P. 1650-1740°F.

VTG T51.
M-686; 74-76 Ag, 0.25-0.75 Ni, bal Cu.
For brazing electron tubes.
M.P. 1435-1475°F.

V T-STEEL.
M-383; M-222; C, Cr, W, Mo, Va, bal Fe.
114,000-135,000 TS; 78,400 YS; 8 El
For steel rails, tires, rims, gears, taps; tough at very low temperature (−20°C.); wear resistant.

V T-STEEL (V T-STAHL).
M-383, M-222; 0.7 C, bal Fe
121,000-143,000 TS; 78,400 YS; 10-8 El.
For steel rails, tires, rims, gears, taps; wear resistant.

V-TOOL.
M-347; 0.9-1.0 C, 0.25-0.40 Mn, 0.2-0.3 V, bal Fe
For taps, reamers, drills, hobs, broaches; water hardened.

VUL-BRO
M-275; 1.0 C, 4 Cr, 2.7 V, 6 W, 5 Mo, bal Fe.
For lathe and planer tools, forming tools; Type M3; high speed steel.

VULCAN
M-275; 0.7-1.2 C, 0.2 V, bal Fe.
For tags, milling cutters, reamers, drills, priming tools; water hardened.

VULCAN #4.
M-275; 0.9 C, 4 Cr, 0.75 V, 0.45 Mo, bal Fe.
For hot work tools and dies, hot shears; hot work steel.

VULCAN 4 HW.
M-275; 0.9 C. 4 Cr, 0.4 Mo, 0.75 V, bal Fe.
For drawing and forming dies, hot bolt and rivet gripper dies; hot work steel.

VULCAN 6 HW
M-275; 0.6 C, 4 Cr, 0.4 Mo, 0.75 V, bal Fe.
For hot gripper dies, severe forming dies; hot work steel.

VULCAN 6-HW.
M-275; 0.60 C, 4 Cr, 0.75 V, 0.45 Mo, bal Fe.
For hot work tools, gripper dies; hot work steel, oil hardened.

VULCAN NO. 14.
M-275; C, alloy, bal Fe.
For tools, dies; oil hardening.

VULCAN NO. 50.
M-275; C, alloy, bal Fe.
For tools, dies; oil hardening.

VULCAN NO. 212.
M-275; 2.1-2.2 C, 0.3 Mn, 12-12.5 Cr, bal Fe.
For tools, dies, cutters; oil hardening, non-deforming.

VULCAN NO. 2300.
M-275; C, alloy, bal Fe.
For tools, dies; oil hardening.

VULCAN NO. 4870.
M-275; 0 5 C, 2.0 Si, 0.8 Mn, 0.25 V, 0.25 Cr, bal Fe.
For cold punches, shears, dies, chisels; shock resisting.

VULCAN A-24.
M-275; 0.3 C, 9 W, 2.75 Cr, bal Fe.
For die casting dies; oil hardening.

VULCAN A-41.
M-275; 0.45 C, 1.6 Cr, 0.25 V, 1.1 Mo, bal Fe.
For hot bolt and rivet headers, hot extrusion dies; hot work steel.

VULCAN A-42.
M-275; 0 25 C, 2 75 Cr, 10 W, 2 Ni, bal Fe.
For brass forging and die casting dies, extrusion and gripping dies, hot punches
AISI Type H21 modified.

VULCAN ALIDIE.
M-275; 1 55 C, 12 Cr, 0.75 Mo, 0.25 V, bal Fe.
For drawing and blanking dies, shear blades, cold swaging dies; air or oil hardening.

VULCAN AUTO
M-275; 0 3-0 55 C, 1.0 Cr, 0.2 V, 0.8 Mn, 0.25 Si, bal Fe
For drive shafts, spindles, clutch dogs, plastic dies, punches, arbors; water or oil hardening, tough and fatigue resistant

VULCAN CARBON VANADIUM.
M-275, 0.7-1 4 C, 0.2 V, bal Fe
For tools, dies, drills; water hardening.

VULCAN CK.
M-275; C, alloy, bal Fe
For tools; water hardening

VULCAN DRAWING DIE
M-275; C, alloy, bal Fe.
For tools, dies; oil hardening

VULCAN EXTRA.
M-275; 0.7-1.0 C, bal Fe.
For lathe tools, milling cutters, twist drills, taps, reamers, punches, dies, shear blades; water hardened.

VULCAN EXTRA VANADIUM.
M-275; 0.7-1.2 C, 0 2 V, bal Fe.
For tools, dies; water hardening.

VULCAN FORT PITT.
M-275; 0.7-1.2 C, 0.3 Mn, 0.25 Si, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 197 Brin.
Ht. Tr.: 200,000 TS; 138,000 YS; 12 El; 390 Brin.
For tools, cutters, drills, reamers, die blocks, chasers, chisels, shear blades, forming dies.
Type W1 water hardening tool steel. Wear resistant.

VULCAN-KIDD BFW.
M-275; 0.45 C, 0.35 Mn, 1.5 Si, 1.6 Cr, 0.25 V, bal Fe.
For coining and embossing dies, punches, stamps, rivet sets, upsetters.
Oil hardening, high toughness, shock resistant.

VULCAN "K.R."
M-275; 1.1 C, 0.3 Mn, 0.35 Si, 0.6 Cr, bal Fe.
For brake drum drawing dies, automotive rim rolls, dies and punches for deep drawing steel; wear and abrasion resistant; AISI W5.

VULCAN METAL.
Eng.; 80.5 Cu, 11.7 Al, 4.4 Fe, 0.25 Zn, 1.5 Ni, 0.7 Sn, 0.7 Cr.
For corrosion resistant structural parts; corrosion resistant.

VULCAN NON-SHRINKABLE.
M-275; 0.9 C, 1.6 Mn, 0.3 Cr, bal Fe.
For plug and ring gages, intricate dies; non-shrinking and non-deforming oil hardening.

VULCAN OIL HARD.
M-275; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, 0.15 V, bal Fe.
For arbors, bushings, dies, punches, cutters;
Oil hardening, tough and shock resisting;
AISI O1.

VULCAN PLASTIC DIE.
M-275; 0.08 max C, 0.3 max Mn, 0.1 max Si, bal Fe.
Water hardening steel for cavity dies, and plastic mold dies; usually case hardened; also for machine gaskets.

VULCAN Q.A.
M-275; 0.5 C, 1.2 Cr, 0 3 V, 2.2 W, bal Fe.
For hot punches, dies, shear blades, chisels, rivet sets swaging and forming dies; hot work steel; AISI S1

VULCAN REGAL.
M-275; 1.35 C, 3.5 W, bal Fe.
For cutters, tools, shears; finishing steel.

VULCAN REGAL NO 2.
M-275; 1.3 C, 5.5 W, 0 6 Cr, bal Fe.
For finishing tools, dies; keen cutting edge.

VULCAN RMK.
M-275; 0.52 C, 5 Cr, 1.1 Si, 1 V, 1.5 Mo, 1.5 Ni, bal Fe.
For hot and cold work tools, punches; Type A9, hot work steel, air hardened.

VULCAN SILICO-MANGANESE.
M-275; 0 9 C, 2 Si, 1.1 Mn, bal Fe.
For tools, dies; oil hardening.

VULCAN SPECIAL.
M-275; 1.0-1 2 C, bal Fe.
For milling cutters, lathe and planer tools, dies and punches; for excessive requirements.

VULCAN SPECIAL VANADIUM.
M-275; 0.85-1.05 C, 0.3 Mn, 0.3 Si, 0.3 V, bal Fe.
For taps, blanking dies, cold heading dies, reamers, chisels, shear blades, pneumatic rivet sets Water hardening tool steel. AISI W2.

VULCAN STAINLESS IRON C-2.
M-275; 0.12 max C, 15 max Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

VULCAN STAINLESS TYPE A.
M-275; 0.12 min C, 9-16 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

VULCAN SUPER.
M-275; 0.8 C, 19 W, 4 Cr, 2 V, 0.7 Mo, bal Fe.
For cutting tools for very hard metal; high speed steel.

VULCAN TCM.
M-275; 0.35 C, 5 Cr, 1.0-1.5 Mo, 1.0 Si, 0.25 V, 1.25 W, bal Fe.

VULCAN TM-5.
M-275; 0.7-0.8 C, 4 Cr, 1 V, 8-9 Mo, 1.5-1.6 W, bal Fe.
For broaches, chasers, forming dies, lathe and planer cutters, taps; high speed steel.

VULCAN TM-6.
M-275; 0.79-0.86 C, 4.15 Cr, 6.4 W, 5.0 Mo, 1.9 V, bal Fe.
For tools, cutters, broaches, drills, hobs; high speed steel.

VULCAN TOOL.
M-275; 0.7-1.2 C, 0.2 V, bal Fe.
For tools, cutters; water hardening.

VULCAN VAIRLOY.
M-275; 1.0 C, 2.0 Mn, 0.9 Cr, 0.9 Mo, bal Fe.
For air hardening, non-deforming blanking or bending dies, gauges, punches, cams, shaving dies. AISI Type A4.

VULCAN VULDIE.
M-275; 1 C, 5.25 Cr, 1.15 Mo, 0.25 V, bal Fe.
For cold work tools; air hardening, nondeforming, wear resistant.

VULCAN WOLFRAM COBALT.
M-275; 0.72 C, 18 W, 4 Cr, 1 V, 5 Co, 0.5 Mo, bal Fe.
For cutting tools. reamers, drills, hobs; high speed steel.

VULCAST.
M-275, 0 35 C, 1.5 Mo, 1 V, 5 Cr, bal Fe.
Heat treated: 215,000 TS; 184,000 YS; 13 El; 40 RA.
For upsetters, punches, forming dies; hot work steel; Type H.

VULC-IRON.
M-938; 3.3 C, 2.5 Si, bal Fe.
For die casting equipment; cast iron.

VULKAN.
M-1331; 0.56 C, Ni, Cr, Mo, V, bal Fe.
For gears, crimpers, crankshafts, bolts, studs; oil hardened, shock resistant.

VULKAN 1.
M-1288; 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For blanking, piercing and forming dies, punches; oil or air hardened, non-deforming.

VULKAN 2B.
M-1288; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking, piercing and forming dies, punches; air hardened, non-deforming.

VULKAN 2MC.
M-1288; 1.5 C, Co, Mo, Cr, bal Fe.
For blanking and piercing dies, punches; air hardened, non-deforming.

VULKAN 2MW.
M-1288; 1.65 C, Cr, Mo, W, V, bal Fe.
For blanking and piercing dies, punches; air hardened, non-deforming.

VULKAN 3.
M-1288; 2.1 C, 11.5 Cr, bal Fe.
For blanking, piercing and forming dies, punches; oil or air hardened, non-deforming.

VULKAN 3MW.
M-1288; 1.5 C, Cr, Mo, V, bal Fe.
For blanking and piercing dies; air hardened, non-deforming.

VULKAN 3V.
M-1288; 2.34 C, Cr, V, bal Fe.
For blanking, piercing, forming dies, punches; oil

VULKAN 4.
M-1288; 1.35 C, Cr, bal Fe.
For bearings, liners, cutters, engravers' tools; water hardened, wear resistant.

VULKAN 55.
M-1331; 0.55 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 14 El; 20 RA; 175 Brin.
For axes, axles, shafts, gears, crankshafts; water hardened.

VULKAN 65.
M-1331; 0.60 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated: 160,000 TS; 113,000 YS; 12 El; 40 RA; 325 Brin.
For rails, hammers, tools, shafts, crankshafts; water hardened.

VULKAN CM.
M-1331; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, fasteners, shafts, punches; water hardened.

VULKAN MS.
M-1331; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
Annealed: 98,000 TS; 55,000 YS; 15 El; 22 RA; 180 Brin.
For punches, cripers, gears, shafts; water hardened.

VULKAN N.
M-1331; 0.55 C, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For gears, shafts, crankshafts, bolts, studs; oil hardened, shock resistant.

VULKAN SPEZIAL.
M-1331; 0.35 C, 1.35 Cr, 0.25 Mo, 3.9 Ni, bal Fe
For gears, bolts, crankshafts; oil hardened, shock resistant.

VUL-MAX
M-275; C, alloy, bal Fe.
For hot work tools and dies; hot work steel, oil hardened.

VUL-MO.
M-275; high C, 3.25-4.25 Cr, 1.25-2 W, 0.75-1.5 V, 7.5-9.5 Mo, (Co), bal Fe.
For reamers, lathe tools, drills, broaches, dies, hot work dies, cutting tools; high speed steel; wear resistant.

VULMOLD.
M-275; 0.10 max C, 0.3 Mn, 1.4 Cr, 0.52 Ni, 0.25 Mo, bal Fe.
For plastic dies, hubbed cavities; carburized grade

VW MAGNESIUM.
Eng.; 8 Al, 0.6 Zn, 0.3 Mn, 0.005 Be, bal Mg.
Permanent mold: 20,000-21,500 TS, 14,000-18,500 YS; 3.25 El; 54-56 Brin.
Die cast: 21,500-24,000 TS; 17,000-20,000 YS; 2 El; 60-64 Brin.
For light alloy parts.

VZKG.
M-Czeckslovakia; 0.20 C, 11 Cr, Mo, V, W, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; B 92 Rock.
Hardened: 240,000 TS; 205,000 YS; 8 El; C 50 Rock.
For valves, cutlery, gears, bearings, surgical instruments.
Corrosion resistant, hardenable.

W-0.33.
85 Al, 14 Cu, 1 Mn.
For pistons, light alloy castings; non-hardenable.

W 2.
England; 0.7 C, 3.3 Cr, 0.8 V, 16 W, 4 Co, 0.4 Ni, 0.6 Mo, bal Fe.
For cutters, taps, drills; high speed steel.

W. 3 TUNGSTEN.
M-344; C, W, bal Fe.
For hot dies; heat resistant.

W4 ALLOY.
M-121; Si, Mn, bal Al.
For spark plug electrodes.

W4 ALLOY.
M-459; 1.0 C, 1.5 Cr, 0.30 Mn, bal Fe.
For bearings, cutters, cold work tools; oil hardened, abrasion resistant.

W4X see FINKL W4X.

W5.
M-69; 1.15 C, 0.25 Mn, 0.25 Si, 0.50 Cr, bal Fe.
AISI Type W5 water hardening tool steel.

W 5 ALLOY.
M-121; 0.5 Mn, 4.0 Si, bal Ni.
Annealed: 81,000 TS; 24,000 YS; 56 El; 77 RA; 130 Brin
For spark plug electrodes; resists engine fuels.

W ALLOY NO. 6
M-963; 0.9-1.4 C, 25-31 Cr, 3.5-6.0 W, 0.75-1.70 Si, bal Co.
Welded: 400-440 Brin.
For hard facing electrode, valve trim; for oxyacetylene welding; wear and corrosion resistant.

W6 AND 4
M-1113; C, 5.5 W, 4 Mo, 4 Cr, 1.5 V, bal Fe
For tools, cutters; high speed steel

W 6 ALLOY
M-121; 0.5 Mn, 2.0 Si, bal Ni
Annealed: 81,000 TS; 24,000 YS; 56 El, 77 RA, 130 Brin
For spark plug electrodes; resists engine fuels

W7 ALLOY
M-121; 2.75 Mn, 1.0 Si, bal Ni.
For spark plug electrodes; resists engine fuels

W8 ALLOY
M-121; Si, Mn, bal Al.
For spark plug electrodes

W. 9 TUNGSTEN.
M-344, C, W, bal Fe
For hot dies, heat resistant

W20S.
M-459, 0.3 C, 2.5 Cr, 0.1 Mo, 0.1 V, bal Fe.
For extrusion press tools and mandrels, bakelite molds; nitriding steel.

W22V.
M-459; 0.45 C, 1.7 Ni, 1.4 Cr, Mn, V, bal Fe
For extrusion press tools, die holders, hot work steel, oil hardened.

W65.
M-459, 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For axles, gears, bolts, bushings, crankshafts; water hardened.

W85.
M-459; 0.67 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 175,000 TS; 130,000 YS; 12 El; 35 RA; 360 Brin.
For springs, wheels, die blocks, hammers; water hardened.

W95-Cr.
M-459; 0.80 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 188,000 TS; 143,000 YS; 12 El; 35 RA; 390 Brin.
For drills, punches, springs, taps, reamers; Type W1; water hardened.

W100.
M-459; 0.90 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, drills, taps, punches, reamers; Type W1; water hardened.

WA-1.
M-1707; 94.0 WC; 6 Co.
Sintered: 290,000 TrS; A 91.0 Rock
Density: 14.95; Abrasion resistance: 75%.
For roughing cuts on cast iron and non-ferrous materials; burr blanks, lathe cutters, masonry drills.
Code C-1

WA-2.
M-1707; 94 WC, 6 Co.
Sintered: 270,000 TrS; A 92.0 Rock.
Density: 14.95; Abrasion resistance: 100%.
For general purpose machining cast iron and non ferrous materials.
Code C-2 or C-3.

WA-3.
M-1707; 95.7 WC, 4.3 Co
Sintered: 250,000 TrS; A 92.6 Rock.
Density: 15.1; Abrasion resistance: 110%
Good general purpose machining cast iron and non-ferrous materials.
Code C-3

WA-4
M-1707; 97 WC, 3 Co
Sintered 240,000 TrS, A 92.8 Rock
Density 15.2; Abrasion resistance: 140%
Hardest grade of tungsten carbide, used for sand blast nozzles, wear parts, precision boring tools, brittle
Code C-4

WA-5
M-1707; 72 WC, 8 TiC, 11.5 TaC, 8.5 Co
Sintered 300,000 TrS; A 91.2 Rock
Density: 12.45; Abrasion resistance 35%
General purpose roughing cuts on steel, premium steel cutting grade
Code C-5

WA-6
M-1707; 82 WC, 8 TiC, 10 Co
Sintered: 250,000 TrS; A 91.2 Rock
Density: 12.5; Abrasion resistance: 39%.
For roughing cuts on alloy steels, and general purpose machining
Code C-6.

WA-7.
M-1707; 76.5 WC, 12.0 TiC, 4.0 TaC, 7.5 Co.
Sintered: 225,000 TrS; A 92 Rock
Density: 11.70; Abrasion resistance: 41%.
For light roughing cuts or heavy finishing cuts on steel
Code C-7

WA-8.
M-1707; 75 WC, 16 TiC, 4 TaC, 5 Co.
Sintered: 150,000 TrS; A 93.0 Rock.
Density: 11.30; Abrasion resistance: 53%.
For precision boring or turning of steel.
Code C-8.

WA-9.
M-1707; 87 WC, 13 Co.
Sintered: 300,000 TrS; A 90.0 Rock.
Density: 13.0; Abrasion resistance: 70%.
Essentially for wear applications where there is only light shock load.
Code C-9.

WA-10.
M-1707; 91 WC; 9.0 Co.
Sintered: 325,000 TrS; A 89.2 Rock.
Density: 14.65; Abrasion resistance: 39%.
Essentially for wear applications with light shock, as light blanking dies, hard mandrels.
Code C-10.

WA-11.
M-1707, 90 WC, 10 Co.
Sintered: 360,000 TrS; A 88.9 Rock
Density: 14.55; Abrasion resistance: 36%.
Used for coal mining tools, rock bits, blanking dies.
Code C-11.

WA-12.
M-1707; 87 WC, 13.0 Co.
Sintered: 375,000 TrS; A 88.2 Rock.
Density: 14.20 Abrasion resistance: 21%
For impact applications as blanking and forming dies, rock bits, coal mining tools.
Code C-12

WA-13.
M-1707; 84 W, 16 Co.
Sintered: 380,000, A 86.0 Rock.
Density: 13.85; Abrasion resistance. 14%
Blanking die material with good chip and break resistant qualities.
Code C-13.

WA-14
M-1707, 75 WC, 25 Co.
Sintered: 400,000 TrS; A 84.5 Rock
Density 13.05
Strong material that can be drilled with carbide drills, cold header tooling.
Code C-14

WA-35.
M-1707, 94 WC, 6 Co
Sintered: 260,000 TrS; A 92.6 Rock.
Density: 14.95.
For light finishing cuts on cast iron and non-ferrous materials. Code C-3.

WA-40
M-1707; 80 WC, 20 Co.
Sintered. 390,000 TrS, A 85.0 Rock.
Density: 13.50.
For maximum strength as cold heading or heavy blanking die.
Code C-14.

WA-41
M-1707; 92 WC, 8 Co.
Sintered: 310,000 TrS; A 91.0 Rock
Density: 14.75.
For rough machining on cast iron; also for light percussion tools as vibrating masonry drills, percussion bits, etc
Code C-1.

WA-47.
M-1707; 78 WC, 8 TiC, 6 TaC, 8 Co.
Sintered: 250,000 TrS; A 91.9 Rock.
Density: 12.40.
Premium steel cutting grade; for heavy cuts on railroad wheels; milling cutter blades, trepanning tools.
Code C-7.

WA-54.
M-1707;
Sintered; 375,000 TrS; A 90.7 Rock.
Density: 13.5.
Very heavy roughing cuts on steel.
Code C-5.

WA-57.
M-1707;
Sintered: 300,000 TrS; A 91.8 Rock.
For medium to heavy cuts in steel; resists cutting edge deformation.
Code C-5.

WA-59.
M-1707; 9 WS, 1 TiC, 8 Co.
Sintered: 300,000 TrS; A 91.8 Rock.
Density: 14.75; Abrasion resistance 85%.
For roughing cuts on cast iron and non-ferrous materials; for general machining, including stainless.
Code C-1.

WA-63.
M-1707; 73 WC, 1 TiC, 20 TaC, 6 Co.
Sintered: 265,000 TrS, A 91.4 Rock.
Density: 14.6.
For general purpose cutting on cast iron, particularly pearlitic malleable brake drums; for lapping and burnishing rolls; resists cratering.
Code C-2.

WA-68.
M-1707; 79.5 WC, 8.5 TiC, 6.0 TaC, 6.0 Co.
Sintered: 200,000 TrS; A 93.0 Rock.
Density: 12.6.
High hardness; for finishing cuts on steel and special alloys; precision boring.
Code C-7.

WA-69.
M-1707; 91 WC, 4 TaC, 5 Co.
Sintered: 250,000 TrS; A 91.9 Rock.
Density: 14.9.
For general machining of cast iron rolls, brake drums.
Code C-2 or C-3.

WA-110.
M-1707;
Sintered: 375,000 TrS; A 91.7 Rock.
For end mills, drills, and for machining high tensile material and super alloys.
Code C-1—C-2.

WA-114.
M-1707; WC base.
Sintered: 400,000 TrS; A 90.0 Rock.
For light blanking dies, coal and rock drilling tools, impact and cold extrusion, shock resistant wear parts.
Code C-11 or C-12.

WA-119.
M-1707; WC base.
Sintered: 500,000 TrS; A 88.0 Rock.
High strength and toughness; for cold header punches and dies, blanking and stamping dies, coining punches, impact tooling.
Code C-12.

WA-301.
M-764; 1 Si, 0 8 Mg, 0.8 Mn, 2 Pb + Sn + Bi, bal Al
For screw machine products, hardware, fasteners; free-cutting.

WA-510.
M-1707;
Sintered: A 91.0 Rock.
Non-magnetic.
Main use is wear parts for magnetic tape handling equipment.

WA-800.
M-1707; TiC base.
Sintered: 225,000 TrS; A 92.7 Rock.
Finish machining pearlitic irons and steels.
Code C-7 or C-8.

WA-870.
M-1707; TiC base.
Sintered: 250,000 TrS; A 92.1 Rock.
For medium to light roughing cuts on pearlitic irons and steels.
Code C-7 or C-8.

WABCOLOY.
M-384; 2.6 C, 2.5 Si, 0.6 Mn, 1.1 Ni, 0.9 Mo, bal Fe
Cast: 55,000 TS; 0 El; 255-321 Brin.
For cylinders of steam driven compressors, crankshafts; cast iron; wear resistant.

WAGNERS FORMULA.
50-66 Cu, 19-31 Zn, 13-18 Ni.
For base for plated tableware; corrosion resistant.

WAGNER & GUHRS ALUMINUM.
80 Sn, 20 Zn.
For aluminum solder; soft

WAH CHANG 129Y.
M-1537; 9-11 W, 9-11 Hf, 0.5 Ta, 0 1-0.4 Y, 0.5 W, bal Cb
Recrystallized: 89,500 TS; 75,700 YS; 25 El.
At 1200°F: 65,000 TS; 41,600 YS; 17 El.
At 3000°F. 11,000 TS, 9900 YS, 75 min El.
For space vehicles, missiles, rocket components
High temperature refractory alloy Good weldability and fabricability.

WAH CHANG C-120.
M-1537; 5 Mo, 1 Zr, 15 W, bal Cb.
At 70°F: 116,000 TS; 103,000 YS; 4 El.
At 2500°F· 27,000 TS; 20,000 YS; 50 El.
For space vehicles, nuclear reactors.
Good combination of density, strength and oxidation resistant at high temperatures

WAH CHANG C129.
M-1537; 10 W, 10 Hf, bal Cb.
Recrystallized. 89,000 TS; 70,000 YS; 23 El.
At 1200°F: 60,000 TS; 37,000 YS; 17 El
At 3000°F: 10,000 TS; 9500 YS; 75 El.
For space vehicles, missiles, rocket components.
High temperature refractory alloy.
Good weldability and fabricability.

WAH CHANG W-25Re.
M-1537; 24-26 Re, bal W
Sintered· 177,000 TS; 175,000 YS; 33 RA.
Recrystallized· 178,000 TS; 164,000 YS; 1-2 El.
For electronic tubes, cathodes, heat exchangers, furnace parts.
High temperature properties, heat resistant.

WAH CHANG WC-1Zr.
M-1537; 0.8-1.2 Zr, bal Cb.
Recrystallized· 42,000 TS; 23,000 YS; 42 El.
For thermal barriers, high temperature parts.
High heat and oxidation resistant.

WAH CHANG WC103.
M-1537; 1.0 Ti, 10.0 Hf, 0.7 Zr, 0.5 Ta, 0.5 W, bal Cb.
Stress Relieved:
At 70°F: 93,500 TS; 88,000 YS; 9 El.
At 2000°F: 26,400 TS; 18,200 YS; 63 El.
Recrystallized:
At 70°F: 61,000 TS; 42,000 YS; 25-30 El.

At 2500°F: 13,000 TS; 10.500 YS; 70 min El.
For space vehicles, nuclear reactors.
Good combination of strength, density, and oxidation resistance at high temperatures.

WAH CHANG WC-3015.
M-1537; 28-30 Hf, 13-16 W, 0.4 Ta, 1-2 Zr, 0.07-0.30 C, bal Cb.
Extruded: 140,000-147,000 TS, 135,000-140,000 YS; 5-20 El.
For turbines, machine guns, high temperature components.
Resists high temperature oxidation
Develops its own surface coating.

WAH CHANG WC-3015.
M-1596; 28-30 Hf, 1-2 Zr, 13-16 W, 0-4 Ta, 0.07-0.33 C, bal Cb
Extruded 147,000 TS; 140,000 YS, 5-20 El.
For turbine components
Good creep and stress rupture properties.
High oxidation and heat resistance.

WAH CHANG XB-88.
M-1537, M-118, 28 W, 2 Hf, 0.067 C, bal Cb.
For gas turbine blades and buckets
Low resistance to shock, good fatigue properties Heat resistant.

WALCOLOY NO 1.
M 963, Stainless 18 8 type wire for metallizing gun
For metal spraying austenitic 18-8 stainless steels.

WALCOLOY NO 2
M-963, Martensitic stainless wire for metallizing gun.
For metal spraying worn parts of martensitic stainless steel.

WALCOLOY NO. 4
M-963, Stainless 18-10 (type 316) wire for metallizing gun

WALCOLOY NO 5
M 963, Austenitic type stainless wire for metallizing gun, good work hardening and wear properties.

WALCO METAL
M-88; Pb alloy
For anode for Cr plating, tank lining, resists chromic acid

W-Al Co TYPE 1
M-939, 5 Si, bal Al.
For arc welding electrodes, for Al

W-Al-Co TYPE 2
M-939, 5 Si, bal Al For gas welding rod, for Al.

W-Al-Co TYPE E-2S
M-939; 5 Si, bal Al.
For welding rod, for Al arc welding

W Al-Co TYPE G-2S
M-939, 5 Si, bal Al
For welding rod, for Al gas welding

WALDE-LOY #100 METAL
M-940, 87.5 Pb, 5.5 Sn, 5.3 Sb, 1.6 Cu, 0.10 As.
For storage battery cable terminals and lugs; resists H_2SO_4.

WALLEX NO 1.
M-963; 2-3 C, 25 33 Cr, 11-14 W, 0.75-1.75 Si, 43 min Co, bal Fe.
500-550 Brin
For hard facing electrode, dies, guides; M P. 2375°F, abrasion and impact resistant.

WALLEX NO 6
M-963; 0.90-1.4 C, 25-31 Cr, 3.5-6.0 W, 0.75-1.75 Si, 6.5 max others, 55 min Co.
Cast: 39-44 Rock C.
For hard facing electrode; corrosion, heat and wear resistant.

WALLEX NO. 50.
M-963; 0.8 C, 21.0 Cr, 17.0 Ni, 3.2 B, 3.0 Si, 1.0 Fe, 10.0 W, bal Co.
Weld: C 50-55 Rock.
For hard facing on bushings, sleeves, conveyor screws, knives, cams, dies.
Low coefficient friction, corrosion and oxidation resistant.

WALLEX NO 55
M-963; Wallex No. 50 with tungsten carbide particles added.
Cast: C 55-60 Rock; M.P. 2050°F (approx).
Atomized and crushed powder for hard facing areas requiring extreme abrasion resistance; good resistance to heat, galling and corrosion. Applied by Spraywelder.

WALLEX NO. 505.
M-963; Wallex No 50 with tungsten carbide particles added.
Cast C 55-60 Rock; M.P. 2050°F (approx).
Atomized and crushed powder for hard facing areas requiring extreme abrasion resistance; good resistance to heat, galling and corrosion. Applied by Fusewelder Torch

W-ALLOY.
82 Al, 12 Cu, 4.5 Zn, 1 W
For light alloy castings, leak proof, hard.

WALLRAM H1
M-1349; WC
For cutting tools, dies; sintered carbides

WALLRAM H1P.
M-1692; 94 WC, 6 Co
For cutters and dies.
Wear and abrasion resistant.
Sintered carbides

WALLRAM Z10
M-1692; MoC, WC, Ni, Co, V.
For extrusion dies and nibs
Sintered carbides High wear and abrasion resistant.

WALMANG NO. 3
M-963; 0.75 C, 3.5 Ni, 0.6 Si, 14 Mn, bal Fe
Weld metal 55 Rock C.
Electrode for hard facing; abrasion impact resisting deposits

WALMANG NO. 8
M-963, 0.75 C, 1 Mo, 0.6 Si, 14 Mn, bal Fe
Weld metal 50 Rock C
Electrode wire for hard facing; abrasion and impact resisting deposits

WALRAMITE
Tungsten carbide $W_2C + WC$.
For cutting tools, dies, sinteredf.

WANDO.
M-114; 0.95 C 1.2 Mn, 0.5 Cr, 0.2 V, 0.5 W, bal Fe
For dies, gauges, taps, reamers, punches, slitting saws; Type O1, non-deforming

WAPRESTA.
M-1308, 0.30 C, 0.18 V, 1.1 Cr, 3.75 W, bal Fe.
For pneumatic tools, chisels, punches, dies; oil hardened, shock resistant

WARALOY 20X.
M-959; 20 Sn, 1.25 Ag, bal Pb.
Cast: 7000 TS; 15 El.
For solders; M.P 440-490°F

WARALOY 30X.
M-959; 30 Sn, 1.2 Ag, bal Pb.
For solder, corrosion resistant.

WAR BABBITT.
M-993; Sn, Pb, Cu.
Cast: 10,750 TS; 5,630 YS; 2 El; 22 Brin.
For bearings; Babbitt.

WAR BRONZE.
Germ.; 2.19 Al, 4.85 Cu, 0.92 Pb, 0.15 Sn, 0.03 Fe, bal Zn.
For shell fuses; cast alloy.

WARDLOW'S.
M-392; 0.7-1.4 C, bal Fe.
For tools; water hardened.

WARDLOW'S TOUGH.
M-392; 0.9 C, 1.2 Mn, bal Fe.
For tools, dies; tough, oil hardened.

WARDLOWS UUT.
M-1113; 0.5 C, 1.5 Cr, 2.25 W, 0.25 V, bal Fe.
For hot work dies; hot work steel.

WARDLOWS WSV.
M-1113; 0.9 C, 0.1 V, bal Fe.
For tools, taps, drills, punches; water hardened.

WARMAN 5.
M-277; 0.13-0.20 C, 5 Cr, bal Fe.
For corrosion resistant parts, corrosion resistant.

WARMAN 5 M.
M-277; 0.13-0.20 C, 5 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant

WARMAN 6.
M-277; 0.15 C, 5-7 Cr, bal Fe.
Cast: 90,000 TS; 65,000 YS; 15 El; 35 RA
For corrosion resisting parts; corrosion resisting.

WARMAN 6 M
M-277; 5-7 Cr, 0.5-0.7 Mo, 0.18 min C, bal Fe
Heat treated 125,000 TS; 100,000 YS; 18 El; 42 RA.
For corrosion resisting parts; corrosion resistant.

WARMAN 13
M-277; 11-14 Cr, 0.12 min C, bal Fe.
Heat treated: 90,000 TS; 60,000 YS, 24 El; 50 RA
For corrosion resisting parts; corrosion resistant

WARMAN 13M.
M-277, 0.12 max C, 11.5-14.0 Cr, 0.5-0.7 Mo, bal Fe.
Heat treated: 95,000 TS; 65,000 YS; 25 El; 54 RA.
For corrosion resisting castings; corrosion resistant.

WARMAN CALDURO 13-2.
M-277; 0.20 C, 12.5-15.0 Cr, 1.5-2.5 Ni, bal Fe.
Cast: 80,000-110,000 TS; 60,000-90,000 YS; 25-10 El; 40-30 RA.
For corrosion resisting parts; corrosion and abrasion resisting; formerly "Nirosta Calduro KM-1."

WARMAN CALMAR 18-8
M-277, 0.16 C, 17-20 Cr, 7-10 Ni, bal Fe.
Cast: 70,000 TS; 30,000 YS; 50 El; 180 Brin.
For stainless parts; corrosion resisting; formerly "Nirosta Calmar KA2."

WARMAN CALMAR 18-8 M.
M-277; 17-20 Cr, 7-10 Ni, 3-4.5 Mo, 0.16 min C, bal Fe.
For stainless, heat and corrosion resisting parts; stainless, corrosion and heat resistant.

WARMAN CALOXO 8-18.
M-277; 7-10 Cr, 17-20 Ni, 0.16 min C, bal Fe.
For stainless, corrosion resisting parts, corrosion resistant; stainless.

WARMAN CALOXO 15-25.
M-277; 14-17 Cr, 23-27 Ni, 3.0-4.5 Mo, 0.20 min C, bal Fe.
For heat and corrosion resisting parts; heat and corrosion resistant.

WARMAN CALOXO 15-25 M.
M-277; 14-17 Cr, 23-27 Ni, 3.0-4.5 Mo, 0.20 min C, bal Fe.
For heat and corrosion resisting parts; heat and corrosion resistant.

WARMAN CALOXO 15-35.
M-277; 14-17 Cr, 33-37 Ni, 0.20 min C, bal Fe.
For heat and corrosion resisting parts; heat and corrosion resistant

WARMAN'S CALOXO-18.
M-277; 0.16 C, 16-20 Cr, bal Fe.
Cast: 90,000 TS; 45,000 YS; 15 El; 30 RA.
For corrosion resisting parts, corrosion resisting; formerly "Warman Chrome Stainless."

WARMAN CALOXO 18-2
M-277, 16-20 Cr, 1.5-2.5 Ni, 0.20 min C, bal Fe
For corrosion resisting parts; corrosion resistant.

WARMAN CALOXO 25-20.
M-277; 0.25 C, 23-27 Cr, 19-21 Ni, bal Fe.
Cast: 75,000 TS, 35,000 YS; 25 El; 200 Brin.
For furnace and heat resisting parts; corrosion and abrasion resisting, formerly "Nirosta Caloxo KNC-3."

WARMAN CALOXO 25-20 M
M-277; 23-27 Cr, 17-21 Ni, 3.0-4.5 Mo, 0.20 min C, bal Fe.
For heat and corrosion resisting parts; heat and corrosion resistant

WARMBRONZE
M-1426; 88 Cu, 2 Sn, 10 Zn.
¼ H-temper. 53,000 TS, 37 El, 107 Brin
H-temper 95,000 TS, 3 El, 172 Brin.
For hardware, plumbing; corrosion resistant.

WARMPRESSTAHL M43W
M-1310, 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion dies, rams and liners, oil hardened, hot work steel

WARNE'S METAL
37 Sn, 26 Ni, 26 Bi, 11 Co
Used as substitute for Ag in making ornamental articles, corrosion resistant.

WARPLIS
M-370, 0.90 C, 0.5 Cr, 1.1 Mn, 0.5 W, 0.15 V, bal Fe
Oil hardenable to 64 Rc max.
For tools, dies, gages, jigs.
Type O1 oil hardening tool steel.

WARRANTED 50-50
M-959, 50 Sn, 50 Pb.
Block solder, melt range 358-411°F

WARRANTED BEST
M-261; 0.7-1.0 C, bal Fe
For tools, water hardened

WARRANTED BEST CAST STEEL.
M-1408; high C, bal Fe.
For taps, reamers, broaches; water hardened, general purpose

WARRANTED BEST DOUBLE SHEAR STEEL.
M-1408; high C, bal Fe.
For dies, machine knives; water hardened.

WARRANTED C. 16.A
M-1415; 0.5 C, 1 Si, 1.5 Cr, bal Fe.
For pneumatic tools, chisels, beading tools; oil hardened, shock resistant.

WARRANTED CAST STEEL.
M-1112; 1.0 C, bal Fe.
For tools, taps, reamers; water hardened.

WASHCOTE.
M-828; 0.2 C, bal Fe.
Welded: 55,000-60,000 TS; 8-10 El.
For welded electrodes; general purpose.

WASHER BRASS
U.S.; 62 Cu, 38 Zn.
For washers, hardware; yellow brass.

WASHINGTON.
M-166, M-69; 0.6-1.4 C, bal Fe.
For tools, general tools, broaches, cold heading dies, cutters; water hardened.

WASHINGTON SPECIAL
M-69; 0.60 1.40 C, 0.2 V, 0.35 Mn, 0.25 Si, bal Fe
For drills, reamers, springs, punches, taps, cutters; Type W2; water hardened.

WASPALOY.
M-1, M-1214, M-1317; 59 Ni 19.5 Cr, 13.5 Co, 4.2 Mo, 3.0 Ti, 1.2 Al, 0.07 C, 0.7 Mn, 2 max Fe
Heat treated 188,000 TS, 115,000 YS; 28 El, 25 RA, 375 Brin.
At 1400°F 117,000 TS; 99,000 YS, 28 El; 41 RA.
For jet engine turbine buckets and discs, high temperature bolts, heat resistant, high strength, high stress rupture strength up to 1400°F.

WATCH ALLOY-1
70 Pd, 25 Cu, 4 Ag, 1 Ni
For watch cases, corrosion resistant

WATCH ALLOY-2
50 Cu, 47.2 Ni, 2.8 Cd
For watch cases, corrosion resistant

WATCH ALLOY 3
37.5 Au, 27 Cu, 23 Ag, 12.5 Pd
For watch cases; corrosion resistant

WATCH CASE BEZEL
60-63 Cu, 24-21 Zn, 16 Ni
For watch case bezel, corrosion resistant

WATCH CASE METAL
55-65 Cu, 30-16 Zn, 10-28 Ni
For watch cases, corrosion resistant.

WATCHMAKERS ALLOY
59 Cu, 40 Zn, 1.2 Pb
For watch parts, free-cutting

WATCH NICKEL
M-942, 12 Ni, 64 Cu, 1 Pb, 23 Zn

WATERBURY A5
M-1426, 65 Cu, 5 Ni, bal Zn.
¼ H-temper 72,000 TS; 130 Brin
H-temper 86,000 TS, 165 Brin
For hardware, cutlery, ornaments, nickel silver, corrosion resistant

WATERBURY A10
M-1426, 66 Cu, 10 Ni, 24 Zn
¼ H temper 65,000 TS, 116 Brin
H-temper 86,000 TS, 180 Brin
Spring temper 102,000 TS, 205 Brin.
For hardware, cutlery, ornaments, nickel silver, corrosion resistant.

WATERBURY A15
M-1426, 65 Cu, 15 Ni, 20 Zn.
¼ H-temper 65,000 TS, 125 Brin.
H-temper 85,000 TS; 176 Brin.
Spring temper. 97,000 TS, 195 Brin
For hardware, cutlery, ornaments, nickel silver, corrosion resistant.

WATERBURY A18
M-1426, 65 Cu, 18 Ni, 17 Zn
¼ H-temper· 60,000 TS; 107 Brin.
H-temper: 85,000 TS; 165 Brin
For hardware, ornaments, cutlery; nickel silver, corrosion resistant.

WATERBURY B-12-S.
M-1426; 56.5 Cu, 12 Ni, 31.5 Zn.
¼ H-temper: 74,000 TS; 130 Brin.
H-temper: 96,000 TS; 200 Brin.
Spring temper: 116,000 TS; 234 Brin.
For hardware, cutlery, ornaments; nickel silver, corrosion resistant.

WATERBURY B-18-S.
M-1426; 55 Cu, 18 Ni, 27 Zn.
¼ H-temper: 78,000 TS; 147 Brin
H-temper: 100,000 TS; 200 Brin
For hardware, cutlery, ornaments; nickel silver, corrosion resistant.

WATERBURY K-8.
M-1426; 65 Cu, 8 Ni, 25 Zn, 2 Pb.
For hardware, screw machine products; nickel silver, free-cutting.

WATERBURY K-12
M-1426; 65 Cu, 12 Ni, 21 Zn, 2 Pb.
For hardware, screw machine products; nickel silver, free-cutting.

WATERBURY PBA.
M-1426, 3.5-5.8 Sn, 0.03-0.35 P, bal Cu.
Soft: 40,000 TS, 56 Brin.
Spring· 105,000 TS; 216 Brin.
For springs, clips, diaphragms; P-bronze, wear resistant.

WATERBURY PBC.
M-1426, 7-9 Sn, 0.03-0.35 P, bal Cu.
Soft 53,000 TS, 62 Brin.
Spring 119,000 TS, 250 Brin
For springs, clips, diaphragms; P-bronze, wear resistant.

WATERBURY PBD.
M-1426, 9 11 Sn, 0.03-0.35 P, bal Cu.
Soft 58,000 TS, 64 Brin
Spring· 129,000 TS, 260 Brin
For springs, clips, diaphragms, P-bronze, wear resistant

WATERCRAT
M-1149, 1.05 C, 0.35 Mn, 0.2 Si, 0.5 Cr, bal Fe
For tools, dies, shear blades, punches; precision ground flat stock

WATERDIE EXTRA
M 35, 1.0 C, 0.5 Cr, 0.25 Mn, bal Fe
For dies, rolls, forming tools; water hardening

WATERDIE STANDARD.
M-35; 1.0 C, 0.55 Cr, bal Fe
Annealed 170 Brin
For forming and drawing dies, rolls, bearings; Type W5, deep hardening

WAUKESHA NO. 0.
M-941, 47-53 Cu, 4-6 Pb, 10-13 Sn, 28-32 Ni, 2.5-3.5 Sb.
Cast: 48,000-60,000 TS; 48,000-60,000 YS; 1 El; 240-260 Brin
For dairy and food processing equipment; corrosion and wear resistant.

WAUKESHA NO. 1.
M-941; 48-54 Cu, 5-7 Pb, 1.5-2.5 Sn, 20-30 Ni, 16-20 Zn.
Cast: 47,000-51,000 TS; 26-30 El; 93 Brin.
For dairy and food processing equipment; corrosion resistant

WAUKESHA NO. 3.
M-941; 61-67 Cu, 28-32 Ni, 2-3 Fe, 1-2 Si, 1-2 Mn.
Cast: 100,000-105,000 TS; 2-5 El; 262 Brin.
For dairy and food processing equipment; corrosion resistant

WAUKESHA NO. 4.
M-941; 54-60 Cu, 4-6 Sn, 23-27 Ni, 4 Fe, 6 Zn, 1 Si, 2-3 Mn.
Cast: 72,000-77,000 TS; 1-3 El; 227 Brin.
For dairy and food processing equipment; corrosion resistant.

WAUKESHA NO. 7.
M-941; 54-60 Cu, 5-7 Pb, 4 Sn, 23-27 Ni, 3 Fe, 4-7 Zn.
Cast: 48,000-52,000 TS; 18-22 El; 104 Brin.
For dairy and food processing equipment; corrosion resistant.

WAUKESHA NO. 8.
M-941; 57-63 Cu, 4-6 Pb, 1 Sn, 20-23 Ni, 1-2 Fe, 8-12 Zn.
Cast: 42,000-46,000 TS; 25-29 El; 77 Brin.
For dairy and food processing equipment; corrosion resistant.

WAUKESHA NO. 11.
M-941; 61-67 Cu, 23-27 Ni, 6-9 Fe, 1-2 Mn, 0.5 max Si.
Cast: 62,000-80,000 TS; 50,000-60,000 YS; 16-9 El, 158-164 Brin.
For dairy and food processing equipment; corrosion resistant.

WAUKESHA NO. 13.
M-941; 28-32 Cu, 4-6 Pb, 55-59 Ni, 1 Fe, 2.5-4.5 Zn, 1 Si, 1 Mn.
Cast: 72,000-75,000 TS; 30-34 El; 123 Brin.
For dairy and food processing equipment; corrosion resistant.

WAUKESHA NO. 18.
M-941; 54-60 Cu, 5-7 Pb, 4-6 Sn, 20-24 Ni, 7.5-11 Zn.
Cast: 68,000-72,000 TS; 2-5 El; 187 Brin
For dairy and food processing equipment; corrosion resistant.

WAUKESHA NO. 20
M-941; 0.07 max C, 29 Ni, 20 Cr, 3 Mo, 4 Cu, 1 Si, bal Fe.
Cast: 65,000 TS, 30,000 YS; 30-45 El; 40-50 RA, 130-150 Brin
For chemical and pharmaceutical plant equipment; stainless, austenitic.

WAUKESHA NO. 21.
M-941; 65-71 Cu, 4-6 Pb, 9-11 Sn, 13-16 Ni, 1.5-2.5 Mn.
Cast: 61,000-65,000 TS; 2-5 El; 171 Brin.
For dairy and food processing equipment; corrosion resistant.

WAUKESHA NO 22.
M-941; 47-53 Cu, 13-15 Sn, 31-35 Ni, 2.5-3.5 Sb.
Cast: 50,000-54,000 TS; 1 El; 264 Brin.
For dairy and food processing equipment; corrosion resistant.

WAUKESHA NO. 23.
M-941; 3.5-4.5 Pb, 7-9 Sn, 78-82 Ni, 6-9 Zn.
Cast: 50,000-75,000 TS; 50,000 YS; 10-7 El; 165-190 Brin.
For dairy and food processing equipment, bearings; corrosion and galling resistant.

WAUKESHA NO. 23C.
M-941; 3.[illegible]4.5 Pb, 7-9 Sn, 6-9 Zn, 0.05-0.20 C, 1.5-2.5 Mn, bal Ni.
Cast: 75,000 TS; 55,000 YS; 10 El; 165 Brinell.
For dairy and food processing equipment, bearings, bushings, pumps.
Non-galling, corrosion resistant.

WAUKESHA NO. 35.
M-941; 0.02 C, 27 Cr, 5 Ni, 2.5 Mo, 3 Cu, 1 Si, 0.75 Mn, bal Fe.
Heat treated: 140,000 TS; 90,000 YS; 25 El; 300 Brin.
For high strength stainless castings; low distortion in hardening.

WAUKESHA NO. 50.
M-941; 5-7 Sn, 56-60 Ni, 1.5-3.5 Bi, 1-3 Mn, 13-17 Cr, 0.5-0.8 Si, bal Fe.
Cast: 50,000 TS; 36,000 YS; 7 El; 170 Brin.
For bearings, sleeves, food and chemical plant equipment.
Non-galling, corrosion and wear resistant.

WAUKESHA NO. 54C.
M-941; 8 Sn, 8 Zn, 6 Ag, 0.2 C, 2 Mn, bal Ni.
Cast: 85,000 TS; 60,000 YS; 10 El; 220 Brin.
For pumps, valve parts, bushings, bearings, dairy and food processing equipment.
High wear and corrosion resistance. Non-galling.

WAUKESHA NO. 88.
M-941; 0.05 max C, 3-5 Sn, 3.0-4.5 Bi, 2.5-3.5 Mo, 11-14 Cr, 4-6 Fe, bal Ni.
Cast: 40,000 TS; 35,000 YS; 6 El; 7 RA; 150 Brin.
For food and chemical industry equipment; non-galling against stainless steel.

WAUKESHA NO 118.
M-941, 63-69 Cu, 3.5-4.5 Pb, 2.5-3.5 Sn, 18-21 Ni, 4 Fe, 3-5 Zn.
Cast: 52,000-56,000 TS; 16-20 El; 123 Brin.
For dairy and food processing equipment; corrosion resistant.

WAUKESHA NO 120
M-941; 58-61 Cu, 5.5-6.5 Sn, 3.5-4.5 Pb, 3-5 Zn, 23-26 Ni, 1.5-2.5 Fe.
Cast: 60,000 TS; 45,000 YS; 5 El; 160 Brin.
For scraper blades.
Good bearing and wear resistance.

WAUSAU
M-1106, 3.1 T.C., 0.6 C.C., 1.2 Mo, 2.2 Si, 0.8 Mn, 0.5 Ni, 0.15 Cr, bal Fe.
Cast: 250-270 Brin.
For valve seats; alloy cast iron.

W BRAND see DARWIN W BRAND.

WBZ 6 BRONZE.
German; 94 Cu, 6 Sn.
Cast: 35,600 TS, 15,600 YS; 32 El; 50 Brin.
Annealed: 36,900 TS; 15,650 YS; 40 El; 51 Brin.

WC-3015.
M-1596; 28-30 Hf, 1-2 Zr, 13-16 W, 0-4 Ta, 0.07-0.33 C, bal Cb.
Extruded: 147,000 TS; 140,000 YS; 5-20 El.
For turbine components.
Good creep and stress-rupture properties.
High oxidation and heat resistance.

WCC.
M-115; 0.40 C, 4 W, 4 Cr, 4 Co, 2 V, 0.4 Mo, bal Fe.
For dies; hot work die steel.

WCV.
M-459; 0.50 C, 1.05 Cr, 0.1 V, 0.95 Mn, bal Fe.
For gears, bolts, crankshafts, springs; oil hardened, shock resistant.

WCVH.
M-459; 0.58 C, 0.95 Mn, 1.05 Cr, 0.1 V, bal Fe.
For gears, bolts, springs, machine tool parts; oil hardened, shock resistant.

W.D.D.
M-73; 0.5 C, 3-6 W, bal Fe.
For tools, dies; hot work steel.

"W" DIE STEEL.
M-1409; 0.50 C, 2.2 W, 1 Cr, 0.35 V, 0.5 Mn, bal Fe.
For punches, piercing dies, chisels; oil or water hardened, tough.

WE.
M-459; 0.15 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin.
For gears, bolts, nails, rivets, camshafts; case hardened, water hardened.

WE-II.
M-206; 0.5 Si, bal Fe.
Annealed: 45,000 TS; 25,000 YS; 25 El.
For armatures, electrical equipment; high permeability.

WE III.
M-206; 1.0 Si, bal Fe.
Sheet: 60,000 TS; 40,000 YS; 15 El.
For electrical equipment, chokes, radio transformers; high permeability.

WE IV.
M-206; 1.0-3.5 Si, bal Fe
Sheet: 50,000-65,000 TS; 32,000-53,000 YS; 22-12 El.
For electrical equipment, motors, radio transformers; high permeability.

WE5.
M-459, 0.06 C, 5 Cr, 0.9 Mo, 0.3 V, bal Fe
For bakelite molds, case hardening

WE V.
M-206; 1.0-3.5 Si, bal Fe.
Sheet 50,000-65,000 TS; 32,000-53,000 YS, 12-22 El
For electrical equipment, motors, radio transformers; high permeability.

WE VI
M 206, 1.03-3.5 Si, bal Fe
Sheet: 50,000-65,000 TS; 32,000-53,000 YS, 12-22 El
For electrical equipment, motors, radio transformers, high permeability.

WE VII
M-206, 3.0-4.2 Si, bal Fe
Sheet: 67,000-70,000 TS; 55,000-65,000 YS; 8-4 El
For power and distribution transformers; high permeability.

WE VIII.
M-206; 3.0-4.2 Si, bal Fe.
Sheet: 67,000-70,000 TS; 55,000-65,000 YS; 8-4 El.
For power and distribution transformers; high permeability.

WE IX.
M-206; 3.0-4.2 Si, bal Fe
Sheet: 67,000-70,000 TS; 55,000-65,000 YS; 8-4 El.
For power and distribution transformers; high permeability.

WE-X.
M-206; 3.0-4.2 Si, bal Fe.
Rolled: 70,000 TS; 65,000 YS; 4 El.
For motors, electrical equipment; high permeability.

WEARALOY.
M-655; 0.5 C, 1.5 Ni, 0.9 Cr, 0.2 Mo, bal Fe.
For steam shovels, dipper teeth, sheaves, wear and abrasion resistant

WEAR-ARC.
M-692; 4.5 C, 5.0 Mn, 26.5 Cr, 1.8 Si, bal Fe.
Weld: C 57 Rockwell.
For hard surfacing steel mill twist guides, wire guys, conveyor screws.
Wear and abrasion resistant.

WEAR-ARC "3" I.P.
M-1713; 0.15 C, 2.2 Cr, 1.0 Mo, bal Fe.
Welded: 300 Brin.
For hard facing electrodes; impact and abrasion resistant.

WEAR-ARC "6" I.P.
M-1713; 2.3 C, 7 Cr, 1 Si, bal Fe
Welded: 440 Brin.
For hard facing electrodes; for heavy impact and abrasion.

WEAR-ARC CHROME-BORIDE.
M-1713; 2 C, 11 Cr, 1.3 Si, 0.9 B.
Welded: 620 Brin.
For hard facing electrodes; wear resistant.

WEAR-ARC SUPER WH.
M-1713; 0.35 C, 33 alloying elements, bal Fe.
For hard facing electrode for Mn steel; high strength and wear resistant

WEAR-ARC WH.
M-1713; 0.5 C, 4 Mn, 19 Cr, 9.5 Ni, bal Fe.
Welded: 127,000 TS; 19 El, 320 Brin.
For hard facing electrode; austenitic, stainless.

WEAR DEVIL A.
M-712; 0.65 C, 3.7 Cr, 0.2 V, 0.5 Mo, bal Fe.
550 Brin.
For hard facing welding electrodes; abrasion resisting.

WEAR DEVIL B.
M-712; 1 C, 5 Cr, 1.7 Mo, bal Fe
500 Brin.
For hard facing welding elecerodes; abrasion and erosion resistant.

WEAR-EX.
M-1432; C, alloy, bal Fe
For hammer mills, mine cars, crushers, pulverizers; tough and abrasion resistant.

WEAREX.
M-487, 0.7 C, 14.5 W, 4 Cr, 1 V, bal Fe.
For lathe and planer tools, wood working tools, milling cutters; high speed steel.

WEAR-FLAME 40.
M-692; 4.5 C, 5 Mn, 30 Cr, 1.8 Si, bal Fe.
Weld. 600 Brin
For hard facing electrodes
Wear and abrasion resistant.

WEARGARD.
M-1709; 3.6 C, 3.2 Ni, 1.3 Cr, 0.2 Mo, bal Fe
As cast: 555 Brin
Abrasion resistant cast iron
Resin bonded waffle patterns for overlays

WEARITE 4-11.
M-266, M-341; 10.0 11.2 Al, 3.0-4.26 Fe, 0.5 max others, bal Cu.
Plate: 100,000 TS, 50,000 YS; 7 El; 210 Brin.
For slides, cams, bushings, liners, bearings, chuck jaws, lathe beds.
Extruded aluminum bronze, tough.

WEARITE 4-13
M-266, M-341; 12.5-13.6 Al, 3.5-5.0 Fe, bal Cu.
Plate: 105,000 TS; 65,000 YS; 1.5 El; 313 Brin.
For slides, cams, bushings, liners, bearings, chuck jaws, lathe beds.
Extruded aluminum bronze tough

WEARLOY.
M-571; 0.7 C, 1.5 Ni, 0.6 Cr, bal Fe.
For brake drums; for buses and trucks.

WEARMANG.
M-435; 0.30 C, 1.5 Mn, 0.25 Si, 0.20 Mo, bal Fe.
Rolled: 125,200 TS; 94,000 YS; 20 El; 285 Brin.
For wear plates, mining equipment; high wear and abrasion resistance.

WEAR-O-MATIC 6.
M-692; 0.65 C, 2.6 Mn, 3.0 Cr, 0.2 Si, 0.5 Mo, bal Fe.
Weld: C 48 Rock.
For hard surfacing conveyor buckets, dragline and power shovel lips and sides, scraper blades.
Severe impact and abrasion resistant.
Good compressive strength and high hardness.

WEAR-O-MATIC 7.
M-692; 0.4 C, 3.0 Mn, 5.3 Cr, 1.2 Si, 1.5 Mo, 1.4 W, bal Fe.
Weld: C 55 Rock.
For hard surfacing cable sheaves, crane wheels, pinch and pipe forming rolls.
Resists severe abrasion and compression.

WEAR-O-MATIC 12A.
M-692; 3.0 C, 4.0 Mn, 14.5 Cr, 1.3 Si, 0.8 Mo, bal Fe.
Weld: C 48 Rock.
For hard surfacing crushing equipment, muller tires, steel mill pinch rolls, scraper blades.
Submerged arc wire.
Resists severe abrasion and impact.

WEAR-O-MATIC 12B.
M-692; 2.3 C, 0.3 Mn, 17.0 Cr, 1.0 Si, 0.8 Mo, bal Fe.
Weld. C 50 Rock.
For hard surfacing heavy rock handling equipment, crushers, impactors, power shovel and dragline bucket parts. Open arc wire.
Heavy impact and abrasion resistance.

WEAR-O-MATIC 14.
M-692; 0.25 C, 1.3 Mn, 5.0 Ni, 0.3 Si, 4.8 Mo, 0.5 W, bal Fe.
Weld: C 48 Rock.
For hard surfacing steel mill rolls, blast furnace bells and hoppers, roll necks, bearings, journals.
Resists heat and abrasion.

WEAR-O-MATIC 15.
M-692; 4.0 C, 0.3 Mn, 5.5 Cr, 0.6 Si, 5.0 Mo, bal Fe.
Weld: C 60 Rockwell.
For hard surfacing pug mill knives and augers, cement pump screws, conveyors.
Wear and abrasion resistant.

WEAR-O-MATIC 16.
M-692; 0.05 C, 1.6 Mn, 0.3 Si, 6.2 Ni, 5.3 Mo, bal Fe.
Weld: C 42-44 Rock
For hard surfacing of blast furnace bells and hoppers, steel mill twist rolls, pinch rolls.
For heat and abrasion resistance without heat checking.

WEAR-O-MATIC 40.
M-692; 4.0 C, 1.5 Mn, 27.0 Cr, 1.0 Mo, 1.5 Si, bal Fe.
Weld: C 58 Rockwell.
For hard surfacing compression type crusher parts and hammermills, mill guides.
Wear and abrasion resistant.

WEAR-O-MATIC 420.
M-692; 0.30 C, 1.5 Mn, 14 Cr, 1.0 Si, bal Fe.
Weld: C 52 Rock.
For hard surfacing paper mill rolls, pipe forming rolls, hot bar mill guides.
Corrosion and abrasion resistance.

WEAR-O-MATIC WH.
M-692; 0.38 C, 4.23 Mn, 0.47 Si, 20.2 Cr, 9.65 Ni, bal Fe.
Weld: 103,000 TS; 70,000 YS; 36 El.
For welding manganese steel to carbon steel, C 18 Rock. (C 47 Rock after work hardening).
Tough, resilient, work hardenable.

WEARPACT.
M-991; 0.23-0.33 C, 1.3-1.8 Mn, 0.4 Si, 0.4-1.0 Cr, 0.4-0.6 Mo, B, 0.5 Ce, bal Fe.
Heat treated: 120,000-260,000 TS; 100,000-195,000 YS; 20-10 El; 58-23 RA; 200-520 Brin.
For crushers, dipper teeth; high impact and abrasion resistant.

WEAR-PROOFT MAC HEMPITE.
M-229; 0.45 C, 1.25 Mn, 0.35 Mo, bal Fe
Hardened: 700 Brin.
For gears, pinions, mill couplings, boxes, cams; wear and shock resistant.

WEARWELD.
M-578; 0.37 C, 2.2 Mn, 0.15 Si, 3.3 Cr, bal Fe.
Hard surfacing arc welding electrode for resistance to metal-to-metal wear

WEARWELL.
M-1124, 0.30-0.35 C, 1.30-1.65 Mn, 0.15-0.30 Si, bal Fe
Primarily for riveted and bolted applications where resistance to abrasion is important.

WEBERT ALLOY
M-8, 14 Zn, 4 Si, Mn, bal Cu.
For pressure die castings

WE EXTRA
M-459; 0.1 C, bal Fe
For bakelite molds, case hardening

WEFAHUTTE HECN
M-1380; 0.13 C, 0.7 Cr, 2.5 Ni, 0.5 max Mn, bal Fe
For gears, bolts, plastic mold dies, shafts; case hardened, shock resistant

WEFAHUTTE HECN15.
M-1380, 0.15 C, 1.55 Ni, 1.55 Cr, bal Fe
For camshafts, cams, bolts, gears; case hardened, shock resistant.

WEFAHUTTE HECN35.
M-1380; 0.13 C, 0.7 Cr, 3.5 Ni, 0.5 max Mn, bal Fe.
For gears, bolts, plastic mold dies, shafts, case hardened, shock resistant.

WEFAHUTTE HK60.
M-1380; 0.30 C, 0.25 Si, 1.35 Mn, bal Fe
For punches, gears, crankshafts; water or oil hardened

WEFAHUTTE HK75.
M-1380; 0.37 C, 1.2 Si, 1.25 Mn, bal Fe.
For punches, upsetters, crimpers; oil hardened, shock resistant

WEFAHUTTE HKCN15W/H.
M-1380; 0.28-0.35 C, 0.5 Cr, 1.5 Ni, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant

WEFAHUTTE HKCN25W/H.
M-1380; 0.18-0.35 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, machine tool parts; oil hardened, shock resistant.

WEFAHUTTE HKCN35W/H.
M-1380; 0.22-0.30 C, 0.7 Cr, 3.5 Ni, 0.6 Mn, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

WEFAHUTTE HKCNX25.
M-1380; 0.36 C, 1.0 Ni, 1.0 Cr, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

WEFAHUTTE HLMF.
M-1380; 0.46 C, Mn, bal Fe.
For machine tool parts, gears, shafts; water hardened.

WEFAHUTTE HLSFH.
M-1380; 0.65 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, punches, crimpers; oil hardened, shock resistant.

WEFAHUTTE HLSFW.
M-1380; 0.55 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, punches, upsetters; oil hardened, shock resistant.

WEFAHUTTE HUK10.
M-1380; 0.34 C, 0.1 V, 0.65 Mn, bal Fe.
For gears, bolts, shafts, fasteners; water hardened.

WEFAHUTTE KWF.
M-1380; 0.46 C, 1.7 Si, 0.65 Mn, bal Fe.
For springs, rivet sets, punches; oil hardened, tough

WEGNER.
80 Sn, 20 Zn
For bearings; anti-friction

WEHRALLOY NO. 1
M-599; 0.07 max C, 16-23 Cr, 7-11 Ni, bal Fe
For heat and corrosion resistant parts; stainless, heat and corrosion resistant.

WEHRALLOY NO. 2
M-599; 0.12 max C, 16-23 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts; stainless, heat and corrosion resistant

WEHRALLOY NO. 3.
M-599, 0.21-0.35 C, 24-30 Cr, 12-15 Ni, bal Fe
For heat and corrosion resistant parts, stainless, heat and corrosion resistant

WEHRALLOY NO. 4
M-599; 0.13-0.35 C, 24-30 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts; stainless, heat and corrosion resistant.

WEHRALLOY NO. 5.
M-599; C, Cr. Ni, bal Fe.
For heat and corrosion resistant parts; stainless, heat and corrosion resistant

WEHRALLOY NO. 6.
M-599; 0.13-0.35 C, Si, 24-30 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY NO. 7.
M-599; 0.21-0.50 C, Si, 12-23 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY NO. 8.
M-599; 0.21-0.50 C, Si, 24-30 Ni, 16-23 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY NO. 9.
M-599; 0.36-0.50 C, Si, 31-39 Ni, 16-23 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY NO. 10.
M-599; 0.21-0.50 C, 58-66 Ni, 16-23 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY NO. 12.
M-599; 0.12 max C, 12-15 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

WEHRALLOY NO. 13.
M-599; 0.13-0.20 C, 12-15 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

WEHRALLOY NO. 14.
M-599; 0.21-0.35 C, 12-15 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

WEHRALLOY NO. 16.
M-599; 0.21-0.35 C, 16-23 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY NO. 17.
M-599; 0.81-1.10 C, 16-23 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY NO. 18.
M-599; 0.13-0.20 C, 24-30 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY NO 19.
M-599; 0.13-0.20 C, Si, 24-30 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant

WEHRALLOY NO 21.
M-599; 0.21-0.35 C, 24-30 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant

WEHRALLOY NO. 22
M-599; 0.13-0.20 C, 16-23 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts; stainless, heat and corrosion resistant.

WEHRALLOY NO. 23.
M-599, 0.21-0.35 C, 16-23 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts; stainless, heat and corrosion resistant

WEHRALLOY NO 24
M-599, 0.21-0.35 C, 16-23 Cr, 7-11 Ni, bal Fe.
For heat and corrosion resistant parts; stainless, heat and corrosion resistant.

WEHRALLOY NO. 26
M-599, 0.36-0.50 C, Si, 31-39 Ni, 16-23 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant

WEHRALLOY NO 27
M-599; 0.36-0.50 C, Si, 31-39 Ni, 16-23 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY NO 28.
M-599; 0.51-0.80 C, Si, 67-75 Ni, 16-23 Cr, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY NO. 29.
M-599; 0.21-0.35 C, 5-7 Cr, bal Fe.
For corrosion resistant parts; corrosion resistant.

WEHRALLOY NO 31
M-599, 0.13-0.20 C, 24-30 Cr, 12-15 Ni, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY NO. 43.
M-599; 0.13-0.20 C, 24-30 Cr, 12-15 Ni, bal Fe.
For heat and corrosion resistant parts; heat and corrosion resistant.

WEHRALLOY STAINLESS 18-8.
M-599; 0.13-0.20 C, 18 Cr, 8 Ni, bal Fe.
For stainless parts; stainless.

WEHRALLOY STAINLESS 18-8 SPECIAL.
M-599; 0.07 max C, 18 Cr, 8 Ni, bal Fe
For stainless parts; stainless.

WEIDRIUM.
German; Ni, Cu, Zn, Sn, Fe, Mg.

WEIGER.
77-80 Ag, 18-20 Cu, 2-5 Pt.
For silver solder; corrosion resistant.

WEIGHTS.
90 Cu, 8 Sn, 2 Zn.
For weights; corrosion resistant.

WEINGARTNER EW 1540 EXTRA.
M-1731; 1.0 C, bal Fe.
Water hardening tool steel.
Werkstoff Nr. 1.1540; AISI W1 tool steel.

WEINGARTNER EW 2343.
M-1731; 0.38 C, 1.0 Si, 0.4 Mn, 5.3 Cr, 1.1 Mo, 0.4 V, bal Fe.
Air or oil hardening hot work tool steel.
Werkstoff Nr. 1.2343; similar to AISI H11.

WEINGARTNER EW 2601.
M-1731; 1.65 V, 0.3 Si, 0.3 Mn, 12.0 C, 0.6 Mo, bal Fe.
Air or oil hardening cold work tool steel.
Werkstoff Nr. 1.2601; AISI D2.

WEINGARTNER EW 3343.
M-1731; 0.78-0.86 C, 4.0 Cr, 5.0 Mo, 1.75 V, 6.0 W, bal Fe.
High speed tool steel.
Werkstoff Nr. 1.3343; AISI M2.

WEINGARTNER EW 4024.
M-1731; 0.12-0.17 C, 1.0 max Si, 1.0 max Mn, 13.0 Cr, bal Fe.
Air or oil hardenable martensitic stainless steel.
Werkstoff Nr 1.4024; similar to AISI 410 stainless steel.

WEINGARTNER EW 4301.
M-1731; 0.07 max C, 1.0 max Si, 2.0 max Mn, 18.0 Cr, 10.0 Ni, bal Fe.
Austenitic stainless steel.
Werkstoff Nr. 1.4301; AISI 304 stainless.

WEINGARTNER EW 4704.
M-1731; 0.45 C, 0.4 Si, 0.45 Mn, 2.65 Cr, bal Fe.
Oil hardening valve steel.
Werkstoff Nr. 1.4704; DIN X 45 SiCr4.

WEINGARTNER EW 4841.
M-1731; 0.20 max C, 2.05 Si, 2.0 max Mn, 25 Cr, 20 Ni, bal Fe.
Austenitic high temperature alloy.
Werkstoff Nr. 1.4841; similar to AISI 310 stainless steel.

WEINGARTNER EW 5919.
M-1731; 0.15 C, 0.4 Mn, 1.55 Cr, 1.55 Ni, bal Fe.
Oil hardenable carburizing steel.
Werkstoff Nr. 1.5919; DIN 15 CrNi6.

WEINGARTNER EW 8159.
M-1731; 0.50 C, 0.25 Si, 0.95 Mn, 1.05 Cr, 0.10 V, bal Fe.
Oil hardening steel; for springs, shafts.
Werkstoff Nr. 1.8159; DIN 50 CrV4; AISI 6150.

WEINGARTNER EW 8507.
M-1731; 0.34 C, 0.6 Mn, 1.0 Cr, 0.2 Mo, 1.0 Al, bal Fe.
Nitriding steel.
Werkstoff Nr. 1.8507.

WEINGARTNER EW ORION III.
M-1731; 1.45 C, 0.20 Si, 0.6 Mn, 1.5 Cr, bal Fe.
Oil hardening cold work tool steel.
Werkstoff Nr. 1.2063.

WEINGARTNER EW URUS.
M-1731; 0.12 max C, 0.10 P, 0.27 S, 0.70 Mn, 0.20 Pb, bal Fe.
Leaded free machining steel.
Werkstoff Nr. 1.0716; DIN 9SPb23.

WEIRITE.
M-628; Sn coated soft steel.
For cans, roofing; tin plate, electrolytic.

WEIRZIN.
M-628; Zn coated steel.
For structural sheets; electrolytic plate.

WEISSPUNKT.
M-1331; 0.90 C, Mo, Cr, V, W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

WEISSPUNKT BMo9.
M-1331; C, 4 Cr, W, Mo, V, bal Fe.
For lathe and planer tools, reamers; high speed steel.

WELCH'S ALLOY.
52 Sn, 48 Ag.
For dental alloy, solder; corrosion resistant.

WELCON 2H.
M-1539; 0.15 C, 0.5 Si, 1.2 Mn, bal Fe.
Heat treated: 85,000-100,000 TS; 71,000 min YP; 16 *min* El.
For pressure vessels, bridges, mine cars, cranes, truck bodies.
Good fabricability and weldability.
Constructional steel plates, tough.

WELCON 2H-100
M-1539; 0.18 C, 0.45 Si, 0.60 Mo, 0.10 V, bal Fe.
Plate: 138,000-164,000 TS; 128,000 YP.
For pressure vessels, bridges, bus and trailer bodies, derricks, booms.
Wear and shock resistant.

WELCON-2H Cr.
M-1539; 0.11 C, 0.35 Si, 1.01 Mn, 0.014 P, 0.008 S, 0.14 Ni, 0.50 Cr, 0.34 Mo, bal Fe.
29 mm thick plate: 97,000 TS; 86,100 YS; 45 El.
High strength low alloy steel for structural purposes.

WELCON 2H SUPER.
M-1539; 0.08-0.16 C, 0.6-1.2 Mn, 0.55 Si, 0.5 Cr, 0.4 Mo, 1.0 Ni, bal Fe.
Plate: 100,000-114,000 TS; 90,000 min YS; 18 El.
For pressure vessels, bridges, bus and trailer bodies, cranes, mine cars.
Wear and shock resistant. Heat treated by mill.

WELCON 2H ULTRA.
M-1539; 0.08-0.16 C, 0.60-1.2 Mn, 0.006 B, 0.8 Cr, 0.7 Mo, 0.15-0.50 Cu, 1.5 Ni, 0.1 V, bal Fe.
Plate: 114,000-135,000 TS; 100,000 *min* YS; 18-22 El.
For pressure vessels, bridges, mine cars, power shovels, cranes, trucks, trailers.
Shock and wear resistant. Heat treated by mill.

WELCON 50.
M-1539; 0.18 C, 1.35 max Mn, 0.55 max Si, bal Fe.
Rolled Plate: 71,000-82,000 TS; 47,000 min YP; 25 min El.
For ship plate, oil tankers, thermal power generating equipment, mine cars, bus bodies.
Constructional steel plate, tough.

WELDANKA.
M-472; 0.2 C, 18-25 Cr, 7-12 Ni + alloys, bal Fe.
78,500 TS.
For turbine blading, chemical and aircraft parts, paper and pulp industry; high resistance to corrosion and heat.

WELDBEST ALBRONZE 100.
M-1230; Al, bal Cu.
Welded: 100 Brin.
For welding electrode for Cu alloys; all purpose, Al-bronze.

WELDBEST ALBRONZE 250.
M-1230; Al, bal Cu.
Welded: 250 Brin.
For welding electrode for Cu alloys; all purpose, Al-bronze.

WELDEX.
M-543; 2.2 C, (comb. C = 0.08), 0.25 Mn, 2.4 Si, 0.03 P, 0.01 S, bal Fe.
Malleable Iron
65,000-68,000 TS; 47,000-51,000 YS; 16-12 El.

WELDMACO.
M-943; 0.2 C, bal Fe.
For welding rod.

WELDOLOY NO. 685.
M-944; 95 Cd, 5 Ag.
For solder on steel, bronze and cast iron; flows at 750°F

WELDOLOY NO. 690.
M-944; 8 Si, bal Al.
Cast: 35,000 TS
For harder solder for Al; flows at 930°F.

WELDRAWN 18-8
M-945, 0.2 C, 18 Cr, 8 Ni, bal Fe.
For tubing; welded, stainless

WELLCAST NO 3S.
M-681; 6-8 Cu, 1.5-2 Si, 1.5 Zn, bal Al
Cast. 18,000-21,000 TS; 1-3 El, 60-80 Brin.
For crankcases, oil pans, transmission cases, good machinability

WELLCAST NO 4A
M-681; 4-5 Cu, 1 Si, 1 Fe, 1 Mg, bal Al
Cast: 20,000-24,000 TS; 1-2 El; 60-70 Brin.
For light alloy castings, heat treatable.

WELLCAST NO 5S.
M-681; 0.6 Cu, 4.5-6 Si, bal Al.
Cast: 17,000-20,000 TS; 2-4 El; 40-55 Brin
For marine fittings, aircraft engine parts; pressure tight

WELLCAST NO. 13A.
M-681; 2-3 Cu, 0.6 Fe, 11-13 Zn, bal Al.
Cast: 24,000-26,000 TS; 1-3 El; 60-80 Brin
For bearing caps, castings; non-hardenable.

WELLCAST NO 16S
M-681; 12-13 Si, bal Al.
Cast: 20,000-24,000 TS; 10-15 El; 40-50 Brin.
For light alloy castings; wear resisting.

WELLCAST NO 17S.
M-681; 1.4 Cu, 2 Zn, 0.3 Mg, 1.4 Mn, 0.15 Ti, bal Al.
Cast: 28,000-30,000 TS; 4-6 El; 50-60 Brin.
For light alloy parts; non-hardenable.

WELL-CAST A.
M-681; 6.2-7.5 Mg, 0.10-0.25 Mn, bal Al.
F-temper: 40,000 TS; 21,000 YS; 13 El; 70 Brin.
For light alloy parts; Almag 35

WELL-CAST E.
M-681; 4.5-6.0 Si, 0.8 max Fe, bal Al.
F-temper: 19,000 TS; 8000 YS; 8 El; 40 Brin.
For light alloy parts; Alloy 43, corrosion resistant.

WELL-CAST J.
M-681; 3.5-4.5 Cu, 2.5-3.5 Si, 1.2 max Fe, bal Al.
F-temper: 21,000 TS; 14,000 YS; 2.5 El; 55 Brin.
For light alloy parts; Alloy 108.

WELL-CAST K.
M-681; 9.5-10.6 Mg, 0.2 Ti, bal Al.
T4-temper: 46,000 TS; 25,000 YS; 14 El; 75 Brin.
For light alloy parts; Alloy 220, age-hardened.

WELL-CAST P.
M-681; 4.0-5.0 Cu, 1.2 max Si, bal Al.
T4-temper: 32,000 TS; 16,000 YS; 8.5 El; 60 Brin.
T6-temper: 36,000 TS; 24,000 YS; 5.0 El; 75 Brin.
T62-temper: 40,000 TS; 34,000 YS, 1.5 El; 95 Brin.
For light alloy parts; Alloy 195, age-hardened.

WELL-CAST R.
M-681; 2-4 Zn, 2.5-4.0 rare earths, 0.5-1.0 Zr, bal Mg
T5-temper: 23,000 TS; 16,000 YS; 50 Brin.
For light alloy parts; Alloy EZ33A, age-hardened

WELL-CAST T
M-681; 2.5-4.0 Th, 0.4-1.0 Zr, bal Mg.
T6-temper. 32,000 TS; 18,000 YS; 6 El.
For light alloy parts; age-hardened.

WELL-CAST V.
M-681, 3.0-4.5 Cu, 5.5-7.0 Si, bal Al.
F-temper: 27,000 TS; 18,000 YS; 2 El; 70 Brin.
T6-temper: 36,000 TS; 24,000 YS, 2 El; 80 Brin
For light alloy parts; Alloy 319, age-hardened.

WELL-CAST W.
M-681, 6.5-7.5 Si, 0.2-0.4 Mg, bal Al.
T4-temper: 28,000 TS; 16,000 YS; 6 El; 55 Brin.
T5-temper: 25,000 TS; 20,000 YS; 2 El; 60 Brin.
T6-temper: 33,000 TS; 24,000 YS; 3.5 El, 70 Brin.
For light alloy parts; Alloy 356, age-hardened.

WELL-CAST X
M-681; 5.3-6.7 Al, 2.5-3.5 Zn, bal Mg.
F-temper: 29,000 TS, 14,000 YS, 6 El; 50 Brin.
T4-temper: 40,000 TS; 14,000 YS; 12 El; 55 Brin.
T6-temper; 40,000 TS; 18,000 YS; 5 El, 73 Brin.
For light alloy parts; Alloy AZ63A, age hardened.

WELL-CAST Y.
M-681, 8.1-9.3 Al, 0.4-1.0 Zn, bal Mg.
F-temper. 24,000 TS; 14,000 YS; 2 El; 52 Brin.
T4-temper: 40,000 TS; 14,000 YS; 11 El, 55 Brin.
T6-temper. 40,000 TS; 19,000 YS; 4 El; 73 Brin.
For light alloy parts, Alloy AZ91C, age-hardened.

WELL-CAST Z
M-681; 8.3-9.7 Al, 1.8-2.4 Zn, bal Mg.
F-temper: 24,000 TS; 14,000 YS; 2 El; 65 Brin.
T4-temper: 40,000 TS, 14,000 YS, 10 El; 63 Brin.
T6-temper: 40,000 TS; 23,000 YS; 2 El; 84 Brin.
For light alloy parts; Alloy AZ92A, age-hardened.

WELMET NO. 1
M-946; 0.15 max C, 25 Cr, 35 Ni, 5 Mo, bal Fe.
For pipes, valves, fittings, steam nozzles; heat and corrosion resistant in SO_2 atmosphere.

WELMET 20.
M-946, 0.07 max C, 29 Ni, 20 Cr, 3-4 Mo, 4 Cu, bal Fe.
Cast: 65,000-75,000 TS; 28,000-38,000 YS; 50-35 El; 50-45 RA; 120-160 Brin.
For chemical plant equipment, valves, agitators, mixers; resists mixed acids, austenitic.

WEL-MET BRONZE.
M-1162; 84-86 Cu, 7-8 Sn, 5-6 Pb, 1-2 graphite.
Sintered: 12,000 TS; 5 El; 30 Brin.
For bearings; self-lubricating, sintered, oil impregnated.

WEL-MET STEEL.
M-1162; 89-92 Fe, 7-10 Cu, 0.5-2.0 graphite.
Sintered: 27,000 TS; 1-2 El; 60-80 Brin.
For bearings; sintered, self-lubricating.

WEL-TEN 50.
M-1540; 0.18 max C, 0.9-1.5 Mn, 0.25-0.45 Si, bal Fe.
Rolled: 71,000-82,000 TS; 47,000 min YS; 20 min El.
For pressure vessels, bridges, penstocks, construction machinery
Constructional steel. Good weldability.

WEL-TEN 55.
M-1540; 0.18 max C, 1.2-1.5 Mn, 0.35-0.55 Si, bal Fe.
Normalized: 78,000-90,000 TS; 51,000 min YP; 20% min El.
For pressure vessels, bridges, penstocks, construction machinery, booms, derricks.
Readily fabricated, tough, construction steel. Good weldability.

WEL-TEN 60.
M-1540; 0.16 max C, 1.3 max Mn, 0.55 max Si, 0.6 max Ni, 0.4 max Cr, 0.15 max V, bal Fe.
Heat treated: 85,000 min TS; 65,000 min YP; 16 min El.
For railroad and mine cars, pressure vessels, agricultural equipment, derricks.
Good weldability, tough. High-strength low-alloy constructional steel.

WEL-TEN 60H.
M-1540; 0.18 max C, 0.15-0.75 Si, 1.0-1.5 Mn, 1.0 max Ni, 0.15 max Nb + V, bal Fe.
Normalized: 85,000-102,000 TS; 64,000 min YP; 20 min El.
For pressure vesels, bridges, penstocks, construction machinery.
Good weldability and formability.

WEL-TEN 60-LT.
M-1540; 0.16 max C, 0.90-1.4 Mn, 0.60 max Ni, 0.30 max Cr, 0.12 V, bal Fe.
Plate: 85,300-102,000 TS; 64,500-71,100 YS.
For pressure vessels, cryogenic equipment.
High notch toughness. Good weldability.

WEL-TEN 62.
M-1540; 0.18 max C, 0.15-0.55 Si, 0.9-1.4 Mn, 0.6 max Ni, 0.3 max Cr, 0.12 max V, bal Fe.
Quenched and Tempered: 88,000-107,000 TS; 71,000 min YS; 19 min El.
For pressure vessels, penstocks, bridges, construction machinery.
Good formability and weldability.

WEL-TEN 70.
M-1732; 0.11 C, 0.45 Si, 1.0 Mn, 0.010 P, 0.003 S, 0.02 Cu, 0.90 Ni, 0.30 Cr, 0.40 Mo, 0.04 V, bal Fe.
50 mm thick: 112,800 TS; 103,000 YS; 44 El.
High strength low alloy steel for structural purposes.

WEL-TEN 80.
M-1540; 0.18 C, 0.6-1.2 Mn, 0.15-0.35 Si, 0.006 B, 0.4-0.8 Cr, 0.15-0.50 Cu, 0.6 Mo, 1.5 Ni, 0.1 V, bal Fe.
Plate: 114,000-135,000 TS; 100,000 min YS; 18-20 El; (Quenched and tempered).
For pressure vessels, bridges, mine cars, power shovels, cranes, trucks, trailers.
Shock and wear resistant. Good weldability.

WEL-TEN 80C.
M-1540; 0.18 max C, 0.15-0.35 Si, 0.6-1.2 Mn, 0.15-0.50 Cu, 0.7-1.3 Cr, 0.6 max Mo, 0.006 max B, bal Fe.
Quenched and Tempered: 114,000-135,000 TS; 100,000 min YP.
For pressure vessels, bridges, penstocks, construction machinery, bull dozers, power shovels.
Good formability and weldability.

WEL-TEN 80 C-LT.
M-1540; 0.18 max C, 0.60-1.20 Mn, 0.7-1.3 Cr, 0.6 max Mo, 0.15-0.50 V, 0.006 max B, bal Fe.
Plate: 113,800-135,100 TS; 99,600 min YS.
For pressure vessels, cryogenic equipment.
High notch toughness, good weldability.

WEL-TEN 80P.
M-1732; 0.10 C, 0.31 Si, 1.46 Mn, 0.010 P, 0.010 S, 0.07 Cu, 0.59 Mo, 0.003 B, 0.049 Cb, bal Fe.
25 mm thick plate. 116,000 TS; 111,000 YS; 14.3 El.
High strength low alloy steel for structural purposes.

WEL-TEN 80S.
M-1732; 0.08 C, 0.54 Si, 1.36 Mn, 0.016 P, 0.008 S, 0.14 Cu, 0.97 Ni, 1.03 Cr, 0.56 Mo, 0.05 V, 0.015 Ti, bal Fe.
25 mm thick plate: 118,000 TS; 108,000 YS; 26 El
High strength low alloy steel for structural purposes

WEL-TEN 100N
M-1540, 0.18 max C, 1.5 max Ni, 0.15-0.50 Cu, 0.4-0.8 Cr, 0.6 max Mo, 0.10 max V, 0.6-1.2 Mn, bal Fe.
Quenched and Tempered Plate· 140,000-163,000 TS; 130,000 YS; 15 El.
For heavy duty welded structures and equipment, pressure vessels, bridges.
Conforms to ASTM-A300 Cl.1.
Good weldability, high strength.

WENDT-SONIS see also CQ.

WENDT-SONIS Ti-8
M-1697, Sintered carbide tool material.
For precision finishing of carbon and alloy steels.

WESGO 35 Au-65 Cu.
M-1493, 35 Au, 65 Cu.
For brazing Cu, Kovar and nickel brass; M.P. 970-1005°C.

WESGO 40 Au-60 Cu.
M-1493; 40 Au, 60 Cu
For brazing Cu, Kovar and nickel brass.

WESGO 50 Au-50 Cu.
M-1493; 50 Au, 50 Cu. For brazing Cu, Kovar, nickel brass; M.P. 930-950°C.

WESGO DECARBONIZED.
M-1493; 28.1 Cu, bal Ag.
For brazing; M.P. 780°C.

WESSEL'S SILVER.
66-51 Cu, 19-32 Ni, 12.5-17 Zn, 0-0.5 Fe, 0-2 Ag.
For ornamental parts, architectural trim; corrosion resistant.

WESSLING.
M-1293; 0.38 C, 17.6 Si, 0.8 Mn, bal Fe.
Cast: 15,000 TS; C 50 Rock.
For pumps, valves, drains, fittings, agitators, castings.
Acid resistant. Brittle as cast.

WESSONMETAL 26.
M-1498; 83 WC, 10 TiC, 7 Co.
Sintered: 225,000 TrS; 91.7 Rock A.
For cutting tools, dies; high hardness and strength; wear and crater resistant.

WESSONMETAL Gr. 900.
M-1498; TiC, MoC, Ni.
Sintered: A 92.2-92.7 Rock; 200,000 TrS.
For cutters in high speed finish machining.
Excellent wear resistance with moderate shock resistance.

WESSONMETAL Gr. GA.
M-1498; 95.5 WC, 4.5 Co.
Sintered: A 92.5 Rock; 210,000 TrS.
For cutting tools to machine cast iron and non-ferrous materials.
Extreme abrasion resistant.

WESSONMETAL Gr. GF.
M-1498, 97 WC; 3 Co.
Sintered: A 92.7 Rock; 195,000 TrS.
For cutting tools to machine cast iron and non-ferrous materials.
High wear resistant. Hard and strong.

WESSONMETAL Gr. GI.
M-1498; 94 WC, 6 Co.
Sintered: A 91.5-92.5 Rock; 250,000 TrS.
For cutting tools to machine cast iron, non-ferrous materials.
High strength and hardness Abrasion resistant

WESSONMETAL Gr. GS.
M-1498; 93 WC, 7 Co
Sintered A 91 2 Rock; 260,000 TrS.
For cutting tools to machine cast iron and non-ferrous materials.
Shock resistant, high strength.

WESSONMETAL Gr HR
M-1498, W, TiC, TaC, CbC, Co
Sintered A 91 2 Rock, 300,000 TrS.
For cutting tools for roughing and interrupted cuts
High heat resistant.

WESSONMETAL Gr HV
M-1498; 83 WC, 13 TiC, 1 Mo, 3 Co
Sintered· A 94.0 Rock, 185,000 TrS.
For cutting tools for high speed machining.
Extremely high hardness.

WESSONMETAL Gr. M
M-1498, 83.5 WC, 3.5 TiC, 13 Co.
Sintered· A 90.2 Rock; 290,000 TrS.
For cutting tools in heavy or interrupted cuts on steel or cast iron
High strength and hardness

WESSONMETAL Gr. WH.
M-1498; 80 WC, 13 TiC, 7 Co
Sintered. A 92.4 Rock, 212,000 TrS.
For cutting tools in medium and light machining of steel at high speeds.
High crater resistance.

WESSONMETAL Gr WM.
M-1498, 77.25 WC, 12 75 TiC, 10 Co.
Sintered: A 91 2 Rock; 225,000 TrS.
For general purpose cutters.

WESSONMETAL Gr. WP.
M-1498; 87 WC, 13 Co.
Sintered: A 88.5-89.5 Rock; 312,000 TrS.
For cutting tools and mining tools.
High impact resistance.

WESSONMETAL Gr. WS.
M-1498; 83 WC, 4 TiC, 13 Co.
Sintered: A 90.5 Rock; 280,000 TrS.
For cutting tools in heavy, intermittent machining of tough steel.
High shock resistance.

WEST NO. 1
M-465; 0.28-0.20 C, 0.6-0.8 Mn, 0.3-0.4 Si, bal Fe.
Annealed: 38,000-65,000 TS; 112-149 Brin.
For machinery parts, shafts; S.A.E. 1225.

WEST NO. 2.
M-465; 0.4-0.5 C, 0.6-0.8 Mn, 0.3-0.4 Si, bal Fe.
Annealed: 45,000-80,000 TS; 156-196 Brin.
For machinery parts, gears, shafts, axles; tough; S A.E. 1245.

WEST NO. 3.
M-465; 0.15-0.20 C, 0.3-0.5 Mn, 2.0-3.0 Si, bal Fe.
70,000 TS; 170 Brin.
For heat treating boxes; cannot be welded.

WEST NO. 3A.
M-465; 0.15-0.20 C, 0 3-0.5 Mn, 1.5-2.0 Si. bal Fe.
Special: 70,000 TS; 156 Brin.
For heat resisting parts; heat resistant.

WEST NO. 4.
M-465; 0.20 max C, 0.3-0.5 Mn, 0.3-0.4 Si, bal Fe.
Annealed: 30,000-55,000 TS; 103-131 Brin.
For electrical and magnetic parts; S.A.E. 1215.

WEST NO. 4A.
M-465; 0.20 max C, 0.6-0.8 Mn, 0.3-0.4 Si, bal Fe.
Annealed: 35,000-60,000 TS; 103-137 Brin.
For machinery parts, case-hardened parts; carburizing steel; S A.E. 1215.

WEST NO 5.
M-465; 0.28-0 35 C, 0.6-0.8 Mn, 0.3-0.4 Si, bal Fe, Ti.
Annealed: 42,000-75,000 TS; 137-156 Brin.
For machinery parts; S.A.E. 1230.

WEST NO 6.
M-465; 0.30-0.40 C, 1.25-1.50 Mn, 0.30-0.40 Si, 0 12 V, bal Fe
Annealed: 60,000-95,000 TS; 126-228 Brin.
For cylinders, housings, valves; tough, close grained.

WEST NO 6A (HY-CAST)
M-465, 0 3-0.40 C, 0.8-1.1 Mn, 0 30-0.4 Si, bal Fe.
Annealed. 55,000-90,000 TS; 170-208 Brin.
For shafts, gears, axles; water hardening

WEST NO. 7 (DURACAST).
M-465, 0.3-0 4 C, 0 6-0 8 Mn, 0 3-0 4 Si, 0 15-0.20 Mo, bal Fe.
Annealed: 50,000-80,000 TS; 170-277 Brin.
For tools, dies; tough.

WEST NO. 7A (DURACAST).
M-465; 0 3-0.4 C, 0.6-0.8 Mn, 0.3-0.4 Si, 0 3-0 4 Mo, bal Fe.
Heat treated: 60,000-90,000 TS; 170-302 Brin.
For tools, dies; tough.

WEST NO. 8 (DURACAST).
M-465; 0.4-0.5 C, 0 6-0 8 Mn, 0.3-0.4 Si, 0 15-0.18 V, bal Fe
Heat treated: 60,000-90,000 TS; 170-402 Brin.
For tools, dies, shafts, gears, anvils; tough.

WEST NO. 9 (DURACAST).
M-465; 0.6-0.8 C, 0.6-0.8 Mn, 0.3-0.4 Si, 0.15-0 18 V, bal Fe.
Heat treated: 80,000-110,000 TS; 228-600 Brin.
For tools, dies, punches; water hardened.

WEST NO. 9A (CUMLOY).
M-465; 0.3-0.4 C, 1.25-1.50 Mn, 0.3-0.4 Si, 0.2-0 3 Mo, 0.12 V, bal Fe.
Heat treated: 70,000-100,000 TS; 196-514 Brin.
For shafts, gears, machinery parts; tough.

WEST NO. 10 (CUMLOY).
M-465; 0.4-0.5 C, 0.6-0.8 Mn, 0.3-0.4 Si, 0.8-1.1 Cr, 0.2-0.3 Mo, bal Fe.
Heat treated: 60,000-100,000 TS; 196-514 Brin.
For gears, shafts, machinery parts; S.A.E. 4145; resists wear, cannot be welded.

WEST NO. 11 (CUMLOY).
M-465; 0.3-0.4 C, 0.8-1.1 Mn, 0.3-0.4 Si, 0.8-1.1 Cr, 0.2-0.3 Mo, bal Fe.
Heat treated: 75,000-110,000 TS; 196-514 Brin.
For high strength forgings; S.A.E. 4153; wear resistant.

WEST NO. 12 (CUMLOY).
M-465; 0.2-0.3 C, 0.6-0.8 Mn, 0.7-0.8 Si, 0.9-1.25 Cr, 0.4-0.6 Mo, bal Fe.
Heat treated: 70,000-90,000 TS; 170-402 Brin.
Far machinery parts; tough

WEST NO. 13 (CUMLOY)
M-465; 0.35-0.45 C, 1.00-1.25 Mn, 0.7-0.8 Si, 0.8-1.1 Cr, 0.2-0.3 Mo, bal Fe
Heat treated: 80,000-120,000 TS; 217-600 Brin.
For dies; cannot be welded

WEST NO. 14.
M-465; 0.5-0.6 C, 0.6-0.8 Mn, 0.3-0.4 Si, 1.0-1.25 Ni, 0.4-0.5 Mo, bal Fe
Heat treated: 80,000-120,000 TS; 217-512 Brin.
For dies, blocks; Cumloy.

WEST NO 14A.
M-465; 0.3-0.4 C, 0.6-0.8 Mn, 0.3-0.4 Si, 1.25-1.50 Ni, 0.3-0.4 Mo, bal Fe.
Heat treated: 70,000-100,000 TS; 196-514 Brin.
For cams; Cumloy.

WEST 60 STANCAST.
M-465; C, alloy, bal Fe.
Cast: 60,000 TS; 35,000 YS; 32 El; 54 RA
For annealing boxes, pots, fittings, autoclaves; heat resistant.

WEST 75 HY-CAST.
M-465; C, alloy, bal Fe.
Cast: 75,000 TS; 42,000 YS; 28 El; 45 RA.
For anvil blocks, car wheels, pump impellers; oil hardening.

WEST 90 DURACAST.
M-465; C, alloy, bal Fe.
Cast: 90,000 TS; 58,000 YS; 22 El; 40 RA.
For gears, pipe fittings, clutch jaws; oil hardening.

WEST 110 SUPERCAST.
M-465; C, alloy, bal Fe.
Cast: 110,000 TS; 90,000 YS; 15 El; 25 RA
For die blocks, car wheels, skip buckets; oil hardening

WESTA 2.
M-1322; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers tools, drills, cutters, reamers; Type W1; water hardened.

WESTA 3.
M-1322; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 18 El; 38 RA; 210 Brin.
For reamers, taps, form and milling cutters, drills; Type W1; water hardened.

WESTA 003A.
M-1322; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 58,000 YS; 18 El; 38 RA; 210 Brin.
For drills, taps, reamers, broaches; Type W1; water hardened.

WESTA 4.
M-1322; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 120,000-215,000 TS; 85,000-150,000 YS; 20-10 El; 48-33 RA; 240-550 Brin.
For taps, drills, reamers, hobs, Type W1; water hardened.

WESTA 5.
M-1322; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 130,000-190,000 TS; 88,000-145,000 YS; 20-12 El; 50-35 RA; 255-390 Brin.
For tools, cutters, springs; Type W1; water hardened.

WESTA 6.
M-1322; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 122,000-175,000 TS; 82-000-128,000 YS, 22-12 El; 52-37 RA, 240-350 Brin.
For punches, rails, crimpers, springs; Type W1, water hardened.

WESTA 212
M-1322; 0.3 C, 2.6 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion rams, liners and dies; hot work steel, oil hardened.

WESTA 212D.
M-1322; 0.3 C, 2.3 Cr, 0.6 V, 4.25 W, bal Fe.
For hot and cold work tools and dies; oil hardened, tough.

WESTA 301.
M-1322; 0.3 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion rams and liners, punches, shears; hot work stel, oil hardened.

WESTA 425.
M-1322; 0.3 C, 1.1 Cr, 0.18 V, 3.75 W, 1.0 Si, bal Fe.
For cold work tools and dies, upsetters; oil hardened, tough.

WESTA 465M
M-1322; 0.90 C, 1.9 Mn, 0.1 V, bal Fe.
For punches, crimpers, blanking dies; oil hardened, non-deforming.

WESTA 546.
M-1322, 0.45 C, 1.3 Cr. 0.45 Mo, 0.8 V, 0.45 W, bal Fe
For cold work tools and dies, oil hardened, tough.

WESTA 725
M-1322, 0.65 C, 3.7 Cr, 0.85 Mo, 0.7 V, 8.5 W, bal Fe.
For lathe and planer tools, drills, reamers, hobs; high speed steel, oil hardened.

WESTA 2002.
M-1322, 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming

WESTA 2002 SPEZIAL.
M-1322; 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For blanking and forming dies, gages, punches; oil hardened, non-deforming.

WESTA 2002W.
M-1322; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, gages, punches; air hardened, non-deforming.

WESTA AK SPEZIAL.
M-1322; 0.4 C, 13 Cr, 0.4 Si, 0.3 Mn, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 20 El; 50 RA; 200 Brin.
Cold drawn: 110,000 TS; 90,000 YS; 15 El; 45 RA; 240 Brin.
For turbine blades, cutlery, gauges; Type 420; corrosion resistant.

WESTA AK2 SPEZIAL.
M-1322; 0.2 C, 0.4 Si, 0.3 Mn, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
Cold drawn: 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For turbine blades, surgical instruments; Type 420; corrosion resistant.

WESTA AL 14.
M-1322; 0.33 C, 1.1 Al, 1.7 Cr, 1.0 Ni, bal Fe.
For oil refinery equipment; creep resistant.

WESTA AL16.
M-1322; 0.27 C, 1.1 Al, 1.4 Cr, bal Fe.
For oil refinery equipment; creep resistant.

WESTA BE.
M-1322; 0.13 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, fasteners, camshafts, cams, machine tools parts; case hardened, shock resistant.

WESTA BOW.
M-1322; 0.28 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, fasteners, machine tool parts; oil hardened, shock resistant.

WESTA CA.
M-1322; 0.13 C, 0.5 Cr, bal Fe.
For gears, bolts, machine tool parts; case hardened.

WESTA CE.
M-1322; 0.15 C, 0.5 Mn, 0.65 Cr, bal Fe.
For gears, bolts, machine tool parts; case hardened.

WESTA CE SPEZIAL.
M-1322; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
For gears, bolts, machine tool parts; case hardened.

WESTA CE2 SPEZIAL.
M-1322; 0.2 C, 1.15 Cr, 1.25 Mn, bal Fe.
For gears, cams, camshafts, fasteners; case hardened, tough.

WESTA CM1.
M-1322; 0.15 C, 1.2 Cr, 0.2 Mo, bal Fe.
For gears, bolts, machine tool parts; case hardened, tough.

WESTA CM2.
M-1322; 0.20 C, 1.2 Cr, 0.2 Mo, bal Fe.
For gears, bolts, camshafts, fasteners; case hardened, tough.

WESTA CM3.
M-1322; 0.25 C, 1.0 Cr, 0.2 Mo, 0.65 Mn, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

WESTA CM4.
M-1322; 0.33 C, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

WESTA CM5.
M-1322; 0.42 C, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, crankshafts, studs; oil hardened, tough.

WESTA CNBD.
M-1322; C, alloy, bal Fe.
For machine tool parts; oil hardened.

WESTA CNE.
M-1322; 0.13 C, 2.5 Ni, 0.7 Cr, bal Fe.
For gears, bolts, cams, camshafts; case hardened, shock resistant.

WESTA CNH SPEZIAL.
M-1322; 0.50 C, 1 Cr, 3.5 Ni, 0.5 Mn, bal Fe.
For gears, bolts, crankshafts, axles, shafts; oil hardened, shock resistant.

WESTA CNL.
M-1322; 0.35 C, 0.6 Mn, 1.3 Cr, 4.5 Ni, bal Fe.
For gears, bolts, crankshafts, machine tool parts; oil hardened, shock resistant.

WESTA CNL EXTRA.
M-1322; 0.50 C, 1.05 Cr, 3.25 Ni, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, shock resistant.

WESTA CNS 95.
M-1322; 0.22-0.30 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, shafts, studs, fasteners; oil hardened, shock resistant.

WESTA CNSH.
M-1322; 0.22-0.30 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

WESTA CN SPEZIAL.
M-1322; 0.28-0.35 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, crankshafts, machine tool parts; oil hardened, shock resistant.

WESTA CNS SPEZIAL.
M-1322; 0.22-0.30 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, crankshafts, machine tool parts; oil hardened, shock resistant.

WESTA CR.
M-1322; 0.90 C, 0.8 Cr, 0.3 Mn, 0.25 Si, bal Fe.
For bearings, cutters, springs, liners, bushings; water hardened.

WESTA CR1.
M-1322; 1.0 C, 1.1 Cr, 0.07 Mn, 0.25 Si, bal Fe.
For bearings, liners, bushings; water hardened, wear resistant.

WESTA CR1/W.
M-1322; 0.90 C, 0.25 Si, 0.3 Mn, 0.8 Cr, bal Fe.
For bearings, liners, sleeves, bushings; water hardened, wear resistant.

WESTA CR2.
M-1322; 0.85 C, 0.25 Si, 0.35 Mn, 1.75 Cr, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant.

WESTA CRK.
M-1322; 1.05 C, Cr, bal Fe.
For bearings, liners, bushings; water hardened, wear resistant.

WESTA CVM.
M-1322; 0.50 C, 0.65 Mn, 1.0 Cr, 0.2 Mo, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, shock resistant.

WESTA CX(2).
M-1322; 0.38 C, Si, Cr, V, bal Fe
For gears, bolts, machine tool parts; oil hardened, shock resistant.

WESTA DS SPEZIAL.
M-1322; 1.15 C, 0.65 Cr, 1 V, bal Fe.
For bearings, cutters, liners; oil or water hardened.

WESTA E.
M-1322; 0.55 C, 0.10-0.40 Si, 0.5-0.7 Mn, bal Fe.
For gears, bolts, shafts, fasteners; water hardened.

WESTA ECN.
M-1322; 0.13 C, 0.35 max Si, 0.5 Mn, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, camshafts, cams; case hardened, shock resistant.

WESTA EK.
M-1322; 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For bearings, liners, sleeves, bushings; water hardened, wear resistant.

WESTA EKA.
M-1322; 1.45 C, 1.4 Cr, 0.6 Mn, bal Fe.
For bearings, liners, sleeves, bushings; water hardened, wear resistant.

WESTA ES EXTRA.
M-1322; 0.53 C, 0.9 Si, 0.9 Mn, bal Fe.
For machine tool parts, gears; water hardened.

WESTA EXTRA.
M-1322; 1.3 C, 0.3 Mn, 0.2 max Cr, 4.7 W, bal Fe.
For cutters; water hardened.

WESTA EXTRA ZH.
M-1322; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, drills, taps, reamers; Type W1; water hardened.

WESTA EZH.
M-1322; 1.0 C, 0.25 max Mn, 0.25 max Si, bal Fe.
For springs, tools, drills, taps, reamers; Type W1; water hardened.

WESTA EZH SPEZIAL.
M-1322; 1.0 C, 0.1 V, 0.25 Mn, 0.20 Si, bal Fe.
For drills, taps, cutters, springs; Type W2; water hardened.

WESTA F.
M-1322; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 56,000 YS; 18 El; 40 RA; 200 Brin.
For drills, taps, cutters, hobs, springs; Type W1; water hardened.

WESTA KZA.
M-1322; 1.45 C, 0.25 Si, 0.60 Mn, 1.4 Cr, bal Fe.
For bearings, bushings, cutters; water hardened, wear resistant.

WESTA MK.
M-1322; 0.76 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For lathe and planer tools, drills; high speed steel.

WESTA ORI.
M-1322; 1.25 C, 1.15 Si, 0.7 Mn, 1.2 Cr, bal Fe
For cutters, forming dies; oil hardened

WESTA R.
M-1322; 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For cutters, tools; water or oil hardened

WESTA RCR1
M-1322; 1.4 C, 0.30 Cr, 0.10 V, 0.30 Mn, bal Fe.
For forming and blanking dies, cutters; oil or water hardened, wear resistant.

WESTA R-SPEZIAL.
M-1322, 1.42 C, W, V, bal Fe
For bearings, cutters, forming dies; oil hardened, wear resistant.

WESTA SC.
M-1322; 0.67 C, 1.3 Si, 0.50 Mn, 0.50 Cr, bal Fe.
For springs, chisels, upsetters; oil hardened, shock resistant.

WESTA SP.
M-1322; 1.2 C, 0.20 Cr, 0.10 V, 1.0 W, bal Fe.
For cutters, reamers, forming dies; water or oil hardened.

WESTA T3.
M-1322; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 200,000 TS; 125,000 YS; 8 El; 27 RA; 400 Brin.
For springs, reamers, drills, taps; water hardened; Type W1.

WESTA T4.
M-1322; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 120,000 YS; 10 El; 30 RA; 390 Brin.
For drills, taps, reamers, broaches; Type W1; water hardened.

WESTA T5 EXTRA.
M-1322; 0.75 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 175,000 TS; 130,000 YS; 12 El; 37 RA; 360 Brin.
For springs, clutch discs, girders, rails; Type W1; water hardened.

WESTA T5 HART
M-1322; 0.61 C, 0.25-0.65 Si, 0.65 Mn, bal Fe.
Heat treated: 160,000 TS; 112,000 YS; 12 El; 40 RA; 330 Brin.
For wheels, die blocks, rails, girders; water hardened.

WESTA T5W.
M-1322; 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 160,000 TS; 112,000 YS; 12 El; 40 RA; 330 Brin.
For wheels, die blocks, rails, girders; water hardened.

WESTA T6H.
M-1322; 0.45 C, 0.25 Si, 0.65 Mn, bal Fe
Hot rolled 98,000 TS; 58,000 YS; 24 El; 45 RA; 212 Brin.
For axles, gears, bolts, crankshafts, water hardened

WESTA T6H EXTRA
M-1322; 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled 98,000 TS; 58,000 YS, 24 El, 45 RA; 212 Brin
For axles, gears, bolts, crankshafts; water hardened

WESTA T6W
M-1322; 0.35 C, 0.25 Si, 0.55 Mn, bal Fe.
Hot rolled 85,000 TS, 54,000 YS, 30 El, 53 RA; 180 Brin.
For gears, shafts, axles, bolts, water hardened

WESTA T6W EXTRA.
M-1322, 0.35 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled 85,000 TS, 54,000 YS, 30 El; 53 RA; 180 Brin
For gears, shafts, axles, bolts, water hardened.

WESTA T7.
M-1322; 0.22 C, 0.25 Si, 0.45 Mn, bal Fe.
Annealed: 73,000 TS, 40,000 YS, 22 El; 58 RA; 140 Brin
For fan blades, bolts, screws, gears; water hardened

WESTA TBM1
M-1322, 0.55 C, 0.60 Mn, 0.70 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For forging and heading dies, shear blades; oil hardened, tough.

WESTA TBM1 EXTRA.
M-1322; 0.56 C, 0.85 Cr, 0.20 Mo, 2.0 Ni, 0.1 V, bal Fe.
For forging and heading dies; oil hardened, tough.

WESTA TEJ.
M-1322; 0.13 C, 4.5 Ni, 1.1 Cr, bal Fe.
For gears, bolts, machine tool parts; case hardened, shock resistant.

WESTA TEM
M-1322; 0.13 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, bolts, machine tool parts; case hardened, shock resistant.

WESTA TE SPEZIAL.
M-1322; 0.13 C, 0.7 Cr, 3.5 Ni, bal Fe.
For gears, cams, camshafts, fasteners; case hardening steel.

WESTA TH.
M-1322; 1.05 C, 1.0 Cr, 0.3 Mn, 0.25 Si, bal Fe.
For bearings, liners, sleeves; water hardened, wear resistant.

WESTA TPA.
M-1322; 0.35 C, 1.3 Cr, 4.5 Ni, bal Fe.
For gears, bolts, crankshafts, axles; oil hardened, shock resistant.

WESTA TY 1 W.
M-1322; C, alloy, bal Fe.
For machine tool parts; oil hardened, tough

WESTA TY 2 W.
M-1322; 0.13 C, 0.2 Cr, 1.5 Ni, bal Fe.
For gears, bolts, shafts, cams, camshafts; case hardened, shock resistant.

WESTA VCN.
M-1322; 0.28-0.35 C, 0.7 Cr, 2.5 Ni, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

WESTA W8
M-1322; 0.15 C, 0.25 Si, 0.37 Mn, bal Fe.
For gears, bolts, machine tool parts; case hardened.

WESTA WM4
M-1322; 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.75 W, bal Fe
For pneumatic tools, chisels, upsetters, punches, oil hardened, tough.

WESTA WP.
M 1322; 0.45 C, 1.4 Cr, 0.70 Mo, 0.30 V, 0.7 Mn, bal Fe.
For forging and die casting dies; oil hardened, tough

WESTEECO NO. 4
M-468, 0.30 C, Ni, Cr, Mo, bal Fe
Heat treated. 110,000 TS; 80,000 YS, 20 El, 38 RA, 230 Brin
For gears, shafts, machinery parts, oil hardened, tough.

WESTEECO NO 5
M-468, 0.15 C, 55-60 Ni, 15-18 Cr, bal Fe.
For heat resisting castings, heat resistant

WESTEECO NO 6
M-468, 0.25 C, 1.0-1.25 Ni, 0.25 Mo, bal Fe.
Heat treated 95,000 TS; 70,000 YS, 24 El; 42 RA, 195-215 Brin.
For lift arms for dump trucks, oil hardened, shock resistant

WESTEECO NO 35-15.
M-468; C, 35 Cr, 15 Ni, bal Fe
For furnace parts, heat resisting castings; heat resistant

WESTERN ALLOY NO. 10
M-279, 10 Zn, bal Cu
Hard. 61,000 TS, 54,000 YS, 5 El
Soft: 37,000 TS, 10,000 YS; 45 El.
For jewelry, hardware, bullet jackets, screw-shells; good strength and corrosion resistance

WESTERN ALLOY NO. 13
M-279; 87 Cu, 13 Zn.
Hard: 66,000 TS; 56,000 YS; 5 El.
Soft: 39,000 TS; 11,000 YS; 46 El.
For decorative items, lipstick cases; gold color.

WESTERN ALLOY NO. 15.
M-279; 85 Cu, 15 Zn.
Hard: 70,000 TS; 57,000 YS; 5 El.
Soft: 40,000 TS; 12,000 YS; 47 El.
For belt buckles, escutcheons, pencil caps; red brass, resists stress cracking.

WESTERN NO. 30.
M-279; 30 Zn, bal Cu.
Hard: 76,000 TS; 62,000 YS; 8 El.
Soft: 47,000 TS; 15,000 YS; 62 El.
For cartridge cases, radiator tanks; high ductility, good workability.

WESTERN ALLOY 34.
M-279; 34 Zn, bal Cu.
Hard: 74,000 TS; 60,000 YS; 8 El.
Soft: 46,500 TS, 15,000 YS; 62 El.
For contacts, fasteners, ferrules; yellow brass, good deep drawing.

WESTERN ALLOY NO 51
M-279, 99.90 Cu, 0.028 Ag
Hard: 51,000 TS; 6 El
Soft: 33,000 TS; 45 El.
For automobile radiator fins, retains hardness to 600°F

WESTERN ALLOY NO 52.
M-279, 99.98 Cu, 0.02 P.
Hard 50,000 TS, 45,000 YS, 6 El
Soft 32,000 TS, 10,000 YS; 45 El
For headers for heat exchangers, for brazed and welded parts

WESTERN ALLOY NO 53
M-279, 99.92 Cu, Ag
Hard: 50,000 TS, 45,000 YS, 6 El.
Soft 32,000 TS, 10,000 YS, 45 El
For metal to glass seals, electronic parts; severe drawability

WESTERN ALLOY NO 55.
M 279, 99.96 Cu, 0.04 P.
Hard. 50,000 TS, 45,000 YS; 6 El
Soft 32,000 TS, 10,000 YS; 45 El
For cooking utensils, bus bars, heat exchangers, high heat and electrical conductivity.

WESTERN ALLOY NO 62
M 279, 64 Cu, 35 Zn, 1 Pb
Hard. 74,000 TS; 60,000 YS; 7 El
Soft 47,000 TS, 15,000 YS, 60 El.
For key stock, good machinability

WESTERN ALLOY NO 63.
M-279, 66.5 Cu, 32.5 Zn, 1 Pb
Hard 74,000 TS, 60,000 YS, 7 El
Soft 47,000 TS, 15,000 YS; 60 El
For gears, plates, washers, good blanking properties

WESTERN ALLOY NO 68.
M-279; 61.5 Cu, 36.65 Zn, 1.85 Pb
Hard 74,000 TS, 60,000 YS, 7 El.
Soft. 47,000 TS; 15,000 YS, 60 El
For clock and watch parts, free-cutting

WESTERN ALLOY NO. 86.
M-279, 95 Cu, 4 Zn, 1 Sn
Hard. 62,000 TS.
Soft: 38,000 TS, 46 El.
For electrical spring contacts, good electrical conductivity.

WESTERN ALLOY 98
M-279, 0.75 Sn, 39.25 Zn, bal Cu
Hard: 88,000 TS; 66,000 YS, 18 El.
Soft: 58,000 TS, 26,000 YS; 41 El.
For condenser tubes, bolts, marine hardware, spindles; resists sea water corrosion.

WESTERN ALLOY NO. 116.
M-279; 89.25 Cu, 2.75 Zn, 4 Pb, 4 Sn.
Hard: 75,000 TS; 7 El.
Soft: 46,000 TS; 45 El.
For thrust washers, clutch plates, wrist pin bearings; excellent bearing material.

WESTERN ALLOY NO. 133.
M-279; 61.5 Cu, 24 Zn, 13 Ni, 1.5 Pb.
Hard: 91,000 TS; 4 El.
For keys, hardware; nickel silver, corrosion resistant.

WESTERN ALLOY NO. 178.
M-279; 56.5 Cu, 12 Ni, 31.5 Zn.
Hard: 98,000 TS; 2 El.
For spring parts in optical goods; corrosion resistant, nickel silver.

WESTERN ALLOY NO. 180.
M-279; 66.5 Cu, 23.5 Zn, 10 Ni.
Hard: 86,000 TS; 75,000 YS; 4 El.
Soft: 51,000 TS; 19,000 YS; 46 El.
For builders' hardware; corrosion resistant, nickel silver.

WESTERN ALLOY NO. 222.
M-279; 93 Cu, 4.7 Zn, 2.3 Fe.
Hard: 67,000 TS; 6 El:
Soft: 49,000 TS; 35 El.
For furnace brazing of evaporators; good joining properties.

WESTERN ALUMINUM BRONZE.
M-279; 87 Cu, 4 Al, 1 Fe, 2 Zn.
For bearings, bushings, clutch plates; wear and corrosion resistant.

WESTERN BEARING BRONZE.
M-279; 88 Cu, 4 Zn, 4 Sn, 4 Pb.
Hard: 78,000 TS; 7 El.
Soft: 45,000 TS; 40 El.
For bushings, bearings, clutch plates; heavy duty.

WESTERN BEST QUALITY BRASS
M-279; 75 Cu, 25 Zn.
Hard: 73,500 TS; 8 El.
Soft: 46,000 TS; 51 El.
For springs, radio tube sockets; good for drawing and spinning.

WESTERN BRAZING BRASS #340.
M-279; 60.5 Cu, 0.17 P, bal Zn.
For brazing sheets; low melting temperature.

WESTERN BRONZE NO. 222.
M-279; 92 Cu, 2.3 Fe, bal Zn.
Hard: 68,000 TS; 5 El.
Soft: 48,000 TS; 35 El.
For refrigeration evaporators; resists grain growth.

WESTERN COPPER #55.
M-279; 99.96 Cu, 0.04 oxygen.
Hard: 50,000 TS; 45,000 YS; 6 El.
Soft: 32,000 TS, 10,000 YS; 45 El.
For bus bars, terminals, auto gaskets; high electrical conductivity.

WESTERN CUPRO NICKEL-7%.
M-279; 93.2 Cu, 6-8 Ni.
Hard: 58,000 TS; 6 El.
Soft: 40,000 TS; 38 El.
Corrosion resistant.

WESTERN CUPRO NICKEL 7%-#142.
M-279; 93 Cu, 7 Ni.
Hard: 59,000 TS.
Soft: 44,000 TS.
For fuse components, resistance strips; high electrical resistivity.

WESTERN CUPRO-NICKEL-9%.
M-279; 91 Cu, 9 Ni.
Hard: 63,000 TS; 5 El.
For corrosion resistant parts; corrosion resistant.

WESTERN CUPRONICKEL 1290.
M-279; 88 Cu, 12 Ni.
Hard: 65,000 TS; 4 El.
For corrosion resistant parts; corrosion resistant.

WESTERN DEOXIDIZED COPPER #52.
M-279; 99.98 Cu, 0.02 P.
Hard: 50,000 TS; 45,000 YS; 6 El.
Soft: 32,000 TS; 10,000 YS; 45 El.
For headers, deep drawn articles; resists hydrogen embrittlement.

WESTERN GILDING ALLOY NO. 5.
M-279; 5 Zn, bal Cu.
Hard: 56,000 TS; 50,000 YS; 5 El.
Soft: 34,000 TS; 10,000 YS; 45 El.
For jewelry, coins, spark plug gaskets, name plates; brass, high luster.

WESTERN HIGH BRASS.
M-279; 67.5 Cu, 38.5 Zn.
Hard. 74,000 TS; 9 El.
Soft: 46,500 TS; 52 El.
For hub caps, reflectors, hardware; good cold workability.

WESTERN HIGH CONDUCTIVITY BRONZE #86.
M-279; 95 Cu, 4 Zn, 1 Sn.
Hard: 60,000 TS; 7 El.
Soft: 38,000 TS; 45 El.
For electrical spring contacts; good electrical conductivity.

WESTERN HIGH LEADED BRASS #64.
M-279; 63.5 Cu, 34.65 Zn, 1.85 Pb.
Hard: 75,000 TS; 60,000 YS; 7 El.
Soft: 52,000 TS; 20,000 YS; 50 El.
For gear wheels, keys, dials, nuts; good machining and blanking properties.

WESTERN HIGH LEADED BRASS 64.
M-279; 34.6 Zn, 1.8 Pb, bal Cu.
Hard: 75,000 TS; 60,000 YS; 7 El.
Soft: 52,000 TS; 20,000 YS; 50 El.
For keys, hardware, gears, instrument plates; good blanking and machining.

WESTERN HIGH LEADED BRASS #68.
M-279, 61.5 Cu, 36.65 Zn, 1.85 Pb.
Hard: 74,000 TS; 60,000 YS; 7 El.
Soft: 47,000 TS; 15,000 YS; 60 El.
For clock and watch parts, gears, levers, cams; best machining and blanking properties.

WESTERN JEWELRY BRONZE #13.
M-279; 87 Cu, 13 Zn.
Hard: 66,000 TS; 56,000 YS; 5 El.
Soft: 39,000 TS; 11,000 YS; 46 El.
For jewelry, medals, slide fasteners; good cold workability.

WESTERN LEADED BEARING BRONZE #116.
M-279; 89.25 Cu, 4 Pb, 4 Sn, 2.75 Zn.
Hard: 77,000 TS; 72,000 YS; 7 El.
Soft: 46,000 TS; 17,000 YS; 45 El.
For wrist pin bearings, thrust washers; best bearing properties.

WESTERN LEADED NICKEL SILVER 8%, #130.
M-279; 63.5 Cu, 27.9 Zn, 7.9 Ni, 1.5 Pb.
Hard: 86,000 TS; 2 El.
¼ H-temper: 64,000 TS; 16 El.
For keys, watch wheels; corrosion resistant, free-cutting.

WESTERN LEADED NICKEL SILVER 10%, #131.
M-279; 61.5 Cu, 27 Zn, 10 Ni, 1.5 Pb.
Hard: 92,000 TS; 83,000 YS; 2 El.
¼ H-temper: 68,000 TS; 41,000 YS; 16 El.
For keys, watch plates, wheels and lock parts; corrosion resistant, free-cutting.

WESTERN LEADED NICKEL SILVER 12%, #133.
M-279; 61.5 Cu, 24 Zn, 13 Ni, 1.5 Pb.
Hard: 92,000 T; 4 El.
Soft: 57,000 TS; 41 El.
For keys, watch plates, lock parts; corrosion resistant, free-cutting.

WESTERN LOW BRASS 20.
M-279, 20 Zn, bal Cu
Hard 74,000 TS; 59,000 YS; 7 El.
Soft· 44,000 TS; 14,000 YS, 50 El.
For flexible hose, floats, bellows; good workability

WESTERN LUBALOY #84
M-279; 90 Cu, 9.5 Zn, 0 05 Sn.
Hard: 64,000 TS, 58,000 YS; 5 El
Soft. 40,000 TS; 11,000 YS; 46 El.
For bushings, bearings, thrust washers, good wear resistance and weldability.

WESTERN LUBALOY-X #80.
M-279; 90 Cu, 8 25 Zn, 1 75 Sn.
Hard· 70,000 TS, 59,000 YS; 7 El.
Soft· 45,000 TS, 19,000 YS, 50 El
For weatherstrip, jewelry, fuse clips, contact springs, good fatigue strength and resilience.

WESTERN LUBRONZE #83.
M-279, 87 Cu, 12 Zn, 1 Sn.
Hard 66,000 TS, 56,000 YS; 5 El
Soft 42,000 TS, 12,000 YS; 48 El.
For flat link chains and springs, good bending properties

WESTERN MANGANESE BRASS #277
M-279, 70 Cu, 28 75 Zn, 1 25 Mn
Hard 77,000 TS, 7 El
Soft 48,000 TS, 59 El
For evaporators, resistance strips, high electrical resistance

WESTERN MEDIUM LEADED BRASS #62
M-279, 64 Cu, 35 Zn, 1 Pb
Hard 74,000 TS, 60,000 YS, 7 El
Soft. 47,000 TS, 15,000 YS, 60 El
For keystock, hose couplings, good machinability and formability

WESTERN MEDIUM LEADED BRASS #63.
M 279, 66 5 Cu, 32 5 Zn, 1 Pb.
Hard· 74,000 TS; 60,000 YS, 7 El.
Soft 47,000 TS, 15,000 YS, 60 El
For sink strainers, gears, cams, hose couplings, good blanking and deep drawing properties

WESTERN MUNTZ METAL
M-279, 60 Cu, 40 Zn
Cast: 48,000 TS; 54 El
Hard· 80,000 TS; 9 5 El.
For condenser plates, tanks, high strength.

WESTERN NICKEL SILVER 55-18, #168.
M-279; 55 Cu, 18 Ni, 27 Zn.
Hard: 100,000 TS; 85,000 YS; 3 El
Soft 60,000 TS; 27,000 YS; 40 El.
For relay springs, contact arms, street car tokens; spring qualities, tarnish resistant.

WESTERN NICKEL SILVER 56-12, #178.
M-279; 56 5 Cu, 31.5 Zn, 12 Ni.
Hard· 98,000 TS; 91,000 YS; 2 El.
¼ H-temper: 74,000 TS; 44,000 YS; 14 El.
For surgical and dental instruments, spring contacts; high strength and durability.

WESTERN NICKEL SILVER 65-18, #164.
M-279; 65 Cu, 18 Ni, 17 Zn.
Hard: 86,000 TS; 74,000 YS; 3 El.
Soft: 54,000 TS; 25,000 YS; 40 El.
For fishing tackle, surgical instruments, terminals; corrosion resistant.

WESTERN NICKEL SILVER 66-10, #180.
M-279; 66.5 Cu, 23.5 Zn, 10 Ni.
Hard: 86,000 TS, 75,000 YS; 4 El.
Soft: 51,000 TS; 19,000 YS; 46 El.
For fishing reels, hardware; corrosion resistant.

WESTERN NICKEL SILVER 70-12, #176.
M-279; 70 Cu, 18 Zn, 12 Ni
Hard: 79,000 TS; 4 El.
Soft· 52,000 TS; 50 El.
For arch supports, builders hardware, corrosion resistant.

WESTERN NICKEL SILVER 72-18, #163.
M-279, 72 Cu, 18 Ni, 10 Zn
Hard 78,000 TS; 4 El.
Soft· 50,000 TS; 45 El
For musical instruments, trophies, ferrules; deep drawing properties.

WESTERN OFHC #55
M-279; 99 92 min Cu
Hard 50,000 TS, 45,000 YS, 6 El.
Soft· 32,000 TS, 10,000 YS; 45 El
For electronic parts; severe drawing properties.

WESTERN PHOSPHOR BRONZE 1 25%, #101.
M-279; 98 7 Cu, 1 3 Sn, 0 12 P
Hard: 64,000 TS, 59,000 YS; 6 El
Soft. 41,000 TS, 14,000 YS, 55 El.
For welded tubing, metal hose, clutch plates; good weldability and wear resistance

WESTERN PHOSPHOR BRONZE 5%, #106.
M-279; 96 Cu, 5 Sn, 0.35 max P.
Hard 85,000 TS; 75,000 YS, 10 El.
Soft 47,000 TS, 19,000 YS; 64 El
For diaphragms, contact springs, bellows, excellent spring qualities

WESTERN PHOSPHOR BRONZE 8%, #113
M-279. 92 Cu, 8 Sn, 0 25 max P.
Hard 95,000 TS, 91,000 YS; 13 El
Soft 55,000 TS, 21,000 YS, 68 El
For contact springs, diaphragms; best spring properties, resistant to wear and fatigue.

WESTERN RED BRASS #15
M-279; 85 Cu, 15 Zn
Hard. 70,000 TS, 57,000 YS, 5 El.
Soft 40,000 TS, 12,000 YS, 47 El
For coffee pots, novelties, giftware, hardware, resists corrosion and season cracking.

WESTERN SILVER BEARING COPPER #51.
M-279, 99 9 min Cu, 0 028 Ag
Hard: 51,000 TS, 45,000 YS, 6 El
Soft 33,000 TS; 10,000 YS, 45 El.
For heat exchangers, high softening point.

WESTFALIA RF5
M-1655, 0 20 C, 13 Cr, 1.2 Mo, bal Fe
Annealed· 90,000 TS; 40,000 YS; 25 El, B 92 Rock
Hardened. 240,000 TS; 200,000 YS; 9 El, C 50 Rock
For valves, cutlery, bearings, surgical instruments, pivots
Corrosion resistant, hardenable

WESTFALISCHE CDM.
M-1345; 1 1 C, 0.30 Mn, 0 4 Cr, bal Fe.
For cutters, bearings, tools; water hardened, wear resistant

WESTFALISCHE CEZ.
M-1345; 1.0 C, 0.07 Mn, 1.1 Cr, bal Fe.
For bearings, cutters, bushings; water hardened, wear resistant.

WESTFALISCHE CFSS.
M-1345; 1.05 C, Cr, bal Fe.
For bearings, bushings, liners; water hardened, wear resistant.

WESTFALISCHE EH10.
M-1345; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For tools, cutters, drills, taps, reamers; Type W1; water hardened.

WESTFALISCHE EM07.
M-1345; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 130,000 YS; 12 El; 36 RA; 355 Brin.
For springs, tools, punches, rails, cutters, axes, Type W1; water hardened

WESTFALISCHE EPS.
M-1345; 0.30 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe
For punches, shears, extrusion rams and liners; hot work steel, oil hardened.

WESTFALISCHE EWP970.
M-1345; 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For punches, shears, extrusion rams and liners; hot work steel, oil hardened.

WESTFALISCHE EZ13.
M-1345; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers' tools, forming dies, reamers; Type W1; water hardened.

WESTFALISCHE HSS.
M-1345; 1.65 C, 11.5 Cr, 0.1 V, 0.30 Mn, bal Fe.
For blanking and forming dies, punches; air hardened, nondeforming.

WESTFALISCHE ISS.
M-1345; 0.90 C, 1.90 Mn, 0.1 V, bal Fe.
For punches, dies, shears, cutters; oil hardened, nondeforming.

WESTFALISCHE OPS.
M-1345; 0.45 C, Si, Cr, V, bal Fe.
For springs, gears, bolts, fasteners; oil hardened, tough

WESTFALISCHE OWS.
M-1345; 0.38 C, Si, Cr, V, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, tough

WESTFALISCHE PM06.
M-1345; 0.60 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 160,000-115,000 TS, 113,000-77,000 YS; 12-23 El; 40-54 RA; 320-230 Brin.
For wheels, die blocks, rails, girders; water hardened.

WESTFALISCHE PM45.
M-1345; 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 98,000 TS; 59,000 YS; 24 El; 45 RA; 212 Brin.
For axles, gears, bolts, bushings, crankshafts; water hardening.

WESTFALISCHE PW10.
M-1345; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For springs, taps, cutters, hobs, reamers; Type W1; water hardened.

WESTFALISCHE RZ5.
M-1345; 0.50 C, 0.95 Mn, 1.05 Cr, 0.1 V, bal Fe.
For springs, gears, bolts, crankshafts; oil hardened, shock resistant.

WESTFALISCHE SPO7.
M-1345; 0.75 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Heat treated: 185,000 TS; 140,000 YS; 14 El; 38 RA; 370 Brin.
For springs, rails, clutch discs, girders; Type W1; water hardened

WESTFALISCHE SS09.
M-1345; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, drills, taps, reamers, hammers; Type W1; water hardened.

WESTFALISCHE SS10.
M-1345; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, taps, reamers, drills, hobs, Type W1; water hardened.

WESTFALISCHE SS BLAU.
M-1345; 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe
For drills, taps, reamers, broaches; high speed steel.

WESTFALISCHE SS GELB.
M-1345; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For broaches, taps, cutters, drills, reamers; high speed steel

WESTFALISCHE SS GOLD.
M-1345; 0.76 C, 10 Co, 4.2 Cr, 0.85 Mo, 1.8 V, 18 W, bal Fe
For cutters, taps, drills, hobs, reamers; high speed steel.

WESTFALISCHE SS GRUN.
M-1345; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe
For reamers, drills, broaches, taps, cutters; high speed steel

WESTFALISCHE SS KUPFER
M-1345, 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe
For reamers, drills, broaches, hobs, taps, high speed steel

WESTFALISCHE SS ROT
M-1345, 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For blanking and forming dies, engravers tools; high speed steel.

WESTFALISCHE SS SCHWARZ
M-1345, 1.35 C, 4 Cr, V, W, Mo, bal Fe
For blanking and forming dies, reamers, taps; high speed steel

WESTFALISCHE SS SILBER.
M-1345, 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For taps, chasers, drills, hobs, reamers; high speed steel.

WESTFALISCHE SS WEISS.
M-1345, 0.85 C, 4 Cr, V, W, Mo, bal Fe
For lathe and planer tools, reamers; high speed steel.

WESTFALISCHE SZO9.
M-1345; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For springs, taps, reamers, drills; Type W1; water hardened.

WESTFALISCHE TSS.
M-1345; 1.15 C, 0.65 Cr, 0.10 V, bal Fe.
For blanking and forming dies, bearings; water hardened, wear resistant.

WESTFALISCHE USS.
M-1345; 1.25 C, 1.15 Si, 0.70 Mn, 1.2 Cr, bal Fe.
For blanking and forming dies, bearings, liners; oil hardened.

WESTIG 100 K6.
M-1730; 1.0 C, 0.25 Si, 0.35 Mn, 1.55 Cr, bal Fe.
Oil hardenable high carbon steel; for ball and roller bearings.
Werkstoff Nr. 1.3505; AISI 52100.

WESTIG SSRM5.
M-1730; 0.78-0.86 C, 4.0 Cr, 5.0 Mo, 1.75 V, 6.5 W, bal Fe
High speed steel, Mo-W type.
Werkstoff Nr. 1.3343; AISI M2.

WESTIG SSR SPEZIAL.
M-1730; 0.70-0.78 C, 4.0 Cr, 1.0 V, 18.0 W, bal Fe.
High speed steel, tungsten type.
Werkstoff Nr. 1.3355; AISI T1

WESTINGHOUSE 52 Ni-Fe
M-118, 52 Ni, bal Fe.
For semiconductors and hermetically sealed electronic components.
Controlled expansion

WESTINGHOUSE B-33
M-118, 4 V, bal Cb.
At 73°F 81,000 TS, 595,000 YS, 32 El
At 2000°F 33,000 TS; 30,300 YS; 34 El
At −148°F 91,700 TS, 74,200 YS, 31 El.
For space vehicles, nuclear reactors.
Good combination of density, strength and oxidation resistance at high temperatures

WESTINGHOUSE B-66
M-118, 5 V, 5 Mo, 1 Zr, bal Cb
At −148°F: 128,000 TS; 108,000 YS; 12 El
At 73°F 115,000 TS; 91,000 YS, 14 El.
At 2000°F 65,000 TS; 58,000 YS; 28 El.
For space vehicles, nuclear reactors
Good combination of density, strength and oxidation resistance at high temperatures.

WESTINGHOUSE B-77
M-118, 5 V, 10 W, 1 Zr, bal Cb
At −148°F: 159,000 TS; 137,000 YS; 20 El
At 73°F. 132,000 TS, 106,500 YS; 18 El.
At 2400°F. 30,000 TS; 27,000 YS; 34 El.
For space vehicles, nuclear reactors.
Good combination of density, strength, and oxidation resistance at high temperatures.

WESTINGHOUSE HI-120.
M-118; Ti, bal Cb.
The ductility of the alloy windings enable the magnet to cycle from full strength to zero field without damage.
Operates in liquid helium at −452°F.
Superconducting magnet

WESTINGHOUSE NC155.
M-118, 5 Mo, 5 V, bal Cb.
For high temperature applications, space vehicles; heat resistant.

WESTINGHOUSE SR26.
M-118; 0.05 max C, 18 Cr, 37 Ni, 20 Co, 3.5 Mo, 4.2 Ti, 0.2 Al, 0.05 B, 0.05 Zr, bal Fe.
For high temperature applications; heat resistant.

WESTINGHOUSE T-111.
M-118; 7.0-9.0 W, 2.0-2.8 Hf, 0.003 C, bal Ta.
Stress Relieved Sheet: 150,000 TS; 144,800 YS; 9 El.
At 2000°F: 92,100 TS; 67,500 YS; 8 El.
At 3000°F: 16,300 TS; 14,100 YS; 52 El.
For aerospace structural components, containers, for high temperature liquid metals in nuclear reactors.
Superior strength at 2000-3500°F. Good ductility for forming.

WESTINGHOUSE T-222.
M-118; 0.01 C, 9.64 W, 2.4 Hf, bal Ta.
At −320°F: 184,600 TS; 175,000 YS; 28 El.
At 75°F: 110,600 TS, 105,000 YS; 30 El.
At 3000°F: 24,200 TS; 24,000 YS; 26 El.
For high temperature applications, re-entry space vehicles, rocket reaction chambers, nozzle parts, liquid metal systems.
High temperature strength and good ductility at low temperatures, good welding.

WESTINGHOUSE W545.
M-118; 0.05 C, 26 Ni, 12.5 Cr, 1.5 Mo, 0.08 B, 2.6 Ti, 0.2 Al, bal Fe.
Bar. 162,000 TS; 115,000 YS; 20 El; 25 RA; 350 Brin.
Sheet: 142,000 TS; 108,000 YS; 8 El; 320 Brin.
For jet engine components, gas turbine discs; age-hardenable, heat resistant, high tensile and creep strength.

WESTINGHOUSE XB-88.
M-118; 28 W, 2 Hf, 0.067 C, bal Cb.
For gas turbine buckets and blades.
High heat and corrosion resistant, good stress-rupture properties.

WESTROHR 17L
M-1334, 0.13 C, 0.85 Cr, 0.45 Mo, bal Fe.
For cams, gears, camshafts, fasteners; case hardened, tough

WESTROHR N5B.
M-1334; 0.1 C, 2.8 Cr, 0.6 Mn, bal Fe.
For oil refinery equipment; creep and heat resistant.

WESTROHR N8
M-1334; 0.17 C, 0.25 Mo, 0.15 V, 0.6 Mn, 2.7 Cr, bal Fe
For oil refinery equipment; creep and heat resistant.

WESTROHR N9.
M-1334, 0.20 C, 3.25 Cr, 0.5 Mo, 0.5 V, bal Fe
For oil refinery equipment; creep and heat resistant.

WESTROHR N10.
M-1334, 0.21 C, 3 Cr, 0.4 Mo, 0.8 V, 0.37 W, bal Fe
For die casting dies, ejector pins, liners, oil hardened

WFF.
M-1113; 1.3 C, 4.5 W, bal Fe.
For tools, cutters; fast finishing steel.

WHEEL BRAND BABBITT.
83 Sn, 14 Sb, 3 Cu
For bearings, bushings; anti-friction.

WHEEL BRASS.
U.S.; 68 Cu, 30 Zn, 2 Pb.
For wheels, hardware; free-cutting.

WHEELERITE.
M-1210; 3.0-3.5 T.C., 1.5-2.5 Si, 0.05-0.15 Mg, bal Fe.
Cast: 102,000 TS; 80,000 YS; 9 El; 241 Brin.
Annealed: 67,000 TS; 46,000 YS; 26 El; 207 Brin.
For gears, housings, machine tool castings; ductile cast iron.

WHEELING METAL.
M-451; 0.5 C, bal Fe.
For rolls; water hardening.

WHEELING SUPER STEEL.
M-451; 0.7 C, bal Fe.

WHELCO NO. 5.
M-119; 16-23 Cr, 0.12 max C, bal Fe.
For corrosion resistant parts; corrosion resistant.

WHELCO OIL HARDENING.
M-119; 0.9 C, 1.2 Mn, Cr, V, bal Fe.
For tools and dies, punches; oil hardened

WHISTLE, LAFOND'S.
80-81 Cu, 17-18 Sn, 0-2 Zn, 0-2 Sb.
For steam whistles, bronze

WHIT-ALLOY.
M-1077; Al alloy.
For body chuck; non-hardenable.

WHITE ALLOY-1.
64-5 Cu, 32 Sn, 3.5 As.
For metallic mirrors, high polish

WHITE ALLOY-2
53-49 Cu, 23-25 Zn, 22-25 Ni, 2-2.4 Fe.
For corrosion resistant white metal parts, corrosion resistant.

WHITE BENEDICT
60.4 Cu, 18.1 Zn, 16.4 Ni, 0.7 Sn, 4.4 Pb.
For restaurant white metal ware; corrosion resistant

WHITE BRASS.
U.S.; 66 Zn, 34 Cu.
For ornamental parts, castings

WHITE BRASS.
U.S.; 65 Cu, 32-33 Zn, 3-2 Sn.
For ornamental parts.

WHITE BUTTON ALLOY.
48.8-53 Cu, 24.4-23.0 Zn, 24.4-22 Ni, 2.4-2.0 Fe.
For white buttons, corrosion resistant.

WHITE CAST IRON NO. 1.
U.S.; 2.5 combined C, 0.20 Mn, 0.75 Si, bal Fe
Cast. 29,000 TS, 225 Brin
For cylinders, housings, very hard and brittle

WHITE COPPER.
70 Cu, 18 Zn, 12 Ni
For corrosion resistant white metal parts, corrosion resistant

WHITE END
M-259, 0.7 C, 1.5 Cr, 0.2 V, bal Fe.
For rolls, oil hardening

WHITE GOLD-1
90 Au, 10 Pd
For jewelry, corrosion resistant

WHITE GOLD-2.
85-75 Au, 10-8 Ni, 2-9 Zn
For jewelry, corrosion resistant

WHITE GOLD, 10 CARAT
41.6 Au, 25 Cu, 25 Ni, 8.3 Zn
For jewelry; corrosion resistant.

WHITE GOLD, 14 CARAT "A"
58.3 Au, 17 Cu, 17 Ni, 7.6 Zn
For jewelry; corrosion resistant

WHITE GOLD, 14 CARAT "B"
59 Au, 25.5 Cu, 12.3 Ni, 3.2 Zn.
For jewelry; corrosion resistant.

WHITE GOLD, 18 CARAT.
75 Au, 18.5 Ag, 1 Cu, 5.5 Zn.
For jewelry; corrosion resistant

WHITE GOLD SOLDERS 10 CARAT.
30 Au, 55 Ag, 1 Cu, 12 Zn, 2 Cd.
For gold solders; corrosion resistant.

WHITE GOLD SOLDER, 14 CARAT.
50 Au, 36 Ag, 1 Cu, 11 Zn, 2 Cd.
For gold solder; corrosion resistant.

WHITE GOLD SOLDER, 18 CARAT "A."
60.8 Au, 14 Ag, 4 Cu, 6 Ni, 5.2 Zn.
For gold solder; corrosion resistant.

WHITE GOLD SOLDER, 18 CARAT "B."
61 Au, 13.5 Ag, 1.5 Cu, 7 Ni, 17 Zn.
For gold solder; corrosion resistant.

WHITE GOLD SOLDER, 18 CARAT "C."
82 Au, 10 Ni, 6 Zn, 2 Cd.
For gold solder; corrosion resistant.

WHITE LABEL.
M-341; 1.55 C, 11.5 Cr, 0.8 Mo, 0.9 V, bal Fe.
For blanking, punching, forming and shearing dies, wear plates, thread rollers and drawing dies.
AISI D2 Cold work tool steel.

WHITE LABEL.
M-343, 0.75-0.90 C, bal Fe.
For blacksmith tools depending on temper, chisels, rock drills; "Hellers Electrica Tool."

WHITE LABEL.
M-363; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
For cutting tools, hobs; high speed steel.

WHITE LABEL.
M-365; 0.95-1.30 C (as desired).
AISI Type W1 water hardening tool steel

WHITE LABEL
M-694; 1.05 C, 0.3 Mn, 0.25 Si, 0.2 V, bal Fe.
AISI Type W2 water hardening tool steel

WHITE LABEL S
M-341, 2.05 C, 11.75 Cr, 0.6 V, bal Fe
For dies, tools, oil hardening, non-deforming.

WHITE LABEL STYRIAN-1
M-651, 0.77 C, 0.17 Mn, 4.34 Cr, 20.7 W, bal Fe
For tools, cutters, drills, high speed steel

WHITE LABEL STYRIAN-2 NEW RAPID
M-651; 0.70 C, 0.14 Mn, 4.63 Cr, 15.42 W, 1.0 V, bal Fe.
For tools, cutters, reamers, high speed steel.

WHITELEY
45-55 Au, 30-35 Pd, 15-20 Pt.
For dental alloy, corrosion resistant

WHITELIGHT ALUMINUM.
M-659; There are 13 aluminum alloys extruded; See AA listing for properties.

WHITELIGHT AZ10
M-659; 0.1-1.5 Al, 0.20 min Mn, 0.2-0.6 Zn, bal Mg.
Extruded: 33,000 TS; 20,000 YS; 5-10 El.
Low cost, good machinability, weldability, workability.
For light weight machined parts.

WHITELIGHT AZ31B.
M-659, 2.5-3.5 Al, 0.7-1.5 Zn, bal Mg.
Extruded: 38,000 TS; 26,000 YS; 15 El; 49 Brin
Rolled: 42,000 TS; 32,000 YS; 15 El; 73 Brin.
For light alloy parts; wrought.

WHITELIGHT AZ51
M-659; 4.1-5.5 Al, 0.15 min Mn, 0.4-1.3 Zn, bal Mg.
Extruded 38,000-41,000 TS, 23,000-28,000 YS; 10-11 El
Good structural properties, high endurance limit, good weldability, machinability, and corrosion resistance.

WHITELIGHT AZ61A.
M-659; 5.8-7.2 Al, 0.15 min Mn, 0.4-1.5 Zn, bal Mg.
Extruded: 45,000 TS; 32,000 YS; 16 El; 60 Brin.
For light alloy parts; wrought.

WHITELIGHT AZ80A.
M-659; 8.5 Al, 0.5 Zn, bal Mg.
Extruded: 49,000 TS; 36,000 YS; 11 El; 60 Brin.
For light alloy parts; wrought.

WHITELIGHT M1A.
M-659; 1.2 Mn, bal Mg.
Extruded: 32,000-39,000 TS; 26,000-29,000 YS; 11-10 El; 44 Brin.
For light alloy parts; wrought.

WHITELIGHT ZK20A.
M-659; 2.3 Zn, 0.55 Zr, bal Mg.
Extruded: 38,000 TS; 28,000 YS; 4 El.
For light weight structures.

WHITELIGHT ZK30A.
M-659; 3 Zn, 0.7 Zr, bal Mg.
Extruded: 44,000 TS; 34,000 YS.
For light weight structures.

WHITELIGHT ZK60A.
M-659; 5.7 Zn, 0.55 Zr, bal Mg.
Extruded: 49,000 TS; 38,000 YS; 14 El; 75 Brin.
T5-temper: 52,000 TS; 43,000 YS; 11 El; 82 Brin
For light weight structures; age-hardened.

WHITE METAL-1.
77 Pb, 15 Sb, 5 Sn, 2.3 Cu
For bearings, bushings; antifriction.

WHITE METAL-2.
53-49 Sn, 33-34 Pb, 11-14 Sb, 2.4-3.3 Cu, 0.1 Zn
For bearings, bushings; antifriction.

WHITE METAL, DUTCH.
81.5 Sn, 8.8 Sb, 9.6 Cu.
For bearings, domestic ware; Babbitt.

WHITE METAL, HANOVER.
86.8 Sn, 7.6 Sb, 5.6 Cu
For bearings, domestic ware; Babbitt

WHITE NICKEL.
64-55 Cu, 18 Ni, 0.35 Fe, bal Zn.
For trimmings, control brackets, levers, fittings, plumbing; S.A.E. Spec. 42.

WHITE NICKEL ALLOY.
65 Cu, 32.25 Ni, 2.75 Al.
For strong heat and corrosion resistant parts; corrosion resistant.
For bearings, bushings; antifriction

WHITE TOMBASIL
M-346, Zn, Mn, Ni, Pb, bal Cu
Cast: 46,000-90,000 TS; 18,000-45,000 YS; 50-7 El, 100-180 Brin.
Die cast and permanent mold; low melting temperature "white alloy"; corrosion resistant; for building hardware, marine hardware, ornamental, drain covers, pumps, swimming pool fixtures.

WHITEX ZINC.
M-659; Zn.
For trim, moulding.

WHITWORTH.
English; C, alloy, bal Fe.
For armor plate.

WHP.
M-1113; 1.5 C, 11.5 Cr, 0.75 Mo, bal Fe.
For dies, tools; non-deforming.

WI-52.
M-167; 0.45 C, 21 Cr, 1 Ni, 11 W, 0.5 Mn, 2 Fe, 0.5 Si, 2 Cb, bal Co.
Cast: 120,000 TS; 90,000 YS; C 38 Rock.
At 1800°F: 37,000 TS; 27,000 YS; 24 El.
For gas turbine engine components, turbine nozzle vanes.
High heat and oxidation resistant in the 1000-2000°F range.

WI-52.
M-1512; 20-22 Cr, 10-12 W, 0.4-0.5 C, 1.0-2.5 Fe, 1 max Ni, 1.5-2.5 Cb + Ta, bal Co
At 70°F: 125,000 TS; 85,000 YS; 5 El; 5 RA; 380 Brin.
At 1500°F: 75,000 TS; 52,000 YS; 8 El; 12.5 RA.
For turbine nozzle vanes in jet engines; high heat resistance, investment cast.

WI-301
M-764; 4 Cu, 0.8 Mg, 0.6 Mn, 2 Pb + Sn + Cd + Bi, bal Al
For screw machine products, fasteners; free-cutting.

WICROMAL
M-1359; 0.5-1.5 Mn, 0.3 max Cr, bal Al.
Soft: 16,000 TS; 6000 YS; 40 El.
Hard: 29,000 TS, 27,000 YS; 10 El.
For cooking utensils, heat exchangers, tanks, furniture; good forming and welding properties

WIDALOX
M-72; Al_2O_3 + additives
For cutting tools
Ceramic, high hardness

WIDDER.
German; 10-25 Sn, bal Pb
For soft solder

WIDIA-1.
M-371; 84 W, 3 C, 13 Co
Sintered. 215,000 TS.
For tools, dies, tool bits, lathe and planer tool cutters, shaper tools, reamers, twist drills; sintered alloy

WIDIA-2.
M-72, 87.4 W, 5.68 C, 6.1 Co
Sintered 250,000 TS.
For tools, dies, tool bits, lathe and planer tool cutters, shaper tools, reamers, twist drills, sintered alloy

WIDIA F 1
M-72, 69 WC, 25 TiC, 8 Co.
For cutting tools, dies; sintered.

WIDIA F 2.
M-72; 34.5 WC, 60 TiC, 5.5 Co
For cutting tools, dies; sintered.

WIDIA G1
M 72; 94 WC, 6 Co
For cutting tools for cast iron; cemented

WIDIA G2.
M-72; 89 WC, 11 Co.
For cutting tools for cast iron; cemented

WIDIA G3.
M-72, 85 WC, 15 Co
For cutting tools for cast iron; cemented.

WIDIA "H."
M 371, M-72, WC + Co.
For machining hard materials, chilled castings; glass; cemented carbide.

WIDIA H1
M-72, 94 WC, 6 Co.
For cutting tools for cast iron; cemented

WIDIA H2.
M-72; 91.5 WC, 1 TaC, 7 Co, 0.5 VC.
For cutting tools, dies; sintered.

WIDIA "N."
M-371, M-72; 88 W, 5 C, 6 Co.
For machining gray cast iron, brass, non-ferrous; best combination of hardness and toughness.

WIDIA "S."
M-371, M-72: WC + Co.
For machining light work, used for light tools as broaches, reamers, forming tools; cemented carbide.

WIDIA S1.
M-72; 78 WC, 16 TiC, 8 Co.
For cutting tools for steel, cemented.

WIDIA S2.
M-72; 78 WC, 14 TiC, 8 Co.
For cutting tools for steel; cemented.

WIDIA S3.
M-72; 88 WC, 5 TiC, 7 Co.
For cutting tools for steel, cemented

WIDIA TH10
M-72; 91 WC, 3 (TiC + TaC), 6 Co
For cutting tools, and dies, high temperature components.
Cemented carbides Hard and abrasion resistant

WIDIA TT25.
M-72; 20 TiC + TaC, 9 Co, bal WC
For high temperature applications, cutters, dies
Oxidation and corrosion resistant, wear and abrasion resistant

WIDIA TT40.
M-72; 12 TiC + TaC, 13 Co, bal WC
For cutting tools and drills, dies, wear parts
Cemented carbides, hard and abrasion resistant.

WIDIA TT50.
M-72; 15 TiC + TaC, 17 Co, bal WC.
For cutting tools and drills, dies, wear parts
Cemented carbides. Hard and abrasion resistant.

WIDIA "X."
M-371, M-72; WC, Ti C, Co
For machining alloy steel of over 275 Brinell, cemented carbide.

WIDIA "XX"
M-371, M-72, WC, Ti C, Co.
For machining mild and soft steels up to 275 Brinell; cemented carbide

WIDIE.
German, 30 Sn, bal Pb
For soft solder.

WIEGOLD
M-764; 67-68 Cu, 0.28 Al, 0-0.5 Pb, bal Zn.
For dental alloy; corrosion resistant

WIELAND AlBz4.
M-764; 4 Al, 96 Cu.
Soft: 50,000 TS, 17,000 YS, 55 El; 90 Brin.
Hard: 71,000 TS; 50,000 YS, 15 El, 150 Brin
For paper and chemical industries
Aluminum bronze. Wear and corrosion resistant.

WIELAND AlBz9
M-764; 9 Al, 91 Cu.
Soft: 54,000 TS; 28,000 YS; 30 El, 100 Brin
Hard: 78,000 TS; 60,000 YS; 8 El, 160 Brin
For paper and chemical industries.
Aluminum bronze. Wear and corrosion resistant

WIELAND EK2.
M-764; 76 Cu, 2 Al, 0.03 P, bal Zn.
For condenser tubes; resists sea water corrosion

WIELAND Fw.
M-764; 3.0-5.0 Sn, 3.0-5.0 Zn, 0.1 max P, bal Cu.
Soft: 50,000 TS; 50 El; 75 Brin.
Hard: 70,000 TS; 11 El; 140 Brin.
For paper and chemical industries.
Corrosion resistant.

WIELAND Fw2.
M-764; 1.0-2.0 Sn, 0.1 max P, 0.3 max Zn, bal Cu.
Soft: 38,400 TS; 48 El; 60 Brin.
Hard: 54,000 TS; 10 El; 105 Brin.
For paper and chemical industries.
Corrosion resistant.

WIELAND Fw6
M-764; 5.0-7.0 Sn, 0.4 max P, 0.3 max Zn, bal Cu.
Soft: 52,600 TS; 58 El; 80 Brin
Hard: 74,000 TS; 16 El; 145 Brin.
For paper and chemical industries.
Corrosion resistant.

WIELAND Fw8
M-764; 7.5-9.0 Sn, 0.4 max P, 0.3 max Zn, bal Cu.
Soft: 57,000 TS; 60 El; 85 Brin.
Hard 80,000 TS, 18 El; 155 Brin.
For paper and chemical industries.
Corrosion resistant

WIELAND Fw444
M-764, 3.0-5.0 Sn, 3.0-5.0 Zn, 3.0-5.0 Pb, 0.1 max P, bal Cu.
Soft. 47,000 TS; 40 El, 70 Brin.
Hard: 65,400 TS; 8 El; 135 Brin
For paper and chemical industries
Corrosion resistant

WIELAND HLOS
M-764; 99.96 Cu
For electrical terminals, oxygen-free copper

WIELAND PK1.
M-764, 70.0-72.5 Cu, 0.9-1.3 Fe, 0.5 max Ni, 0.1 max Mn, bal Zn
Soft 49,800 TS, 21,500 max YS, 45 El, 70 Brin
½ Hard 57,000 TS; 31,300 max YS, 35 El; 90 Brin
For clips, fasteners, containers, eyelets, hardware.
Corrosion resistant

WIELAND SoMs68
M-764, 68 Cu, 1 Si, 0.5 Pb, 30.5 Zn
Rolled 64,000 TS, 43,000 YS; 15 El, 110 Brin
For hardware, fasteners, bolts
Corrosion resistant

WIELAND T.
M-764; 80 Cu, 20 Zn.
Soft 47,000 TS, 14,000 YS, 40 El; 70 Brin
Hard 68,000 TS, 54 000 YS, 10 El; 140 Brin
For marine hardware, fasteners, compacts
Corrosion resistant

WIELAND T5.
M-764, 85 Cu, 15 Zn.
Soft 43,000 TS, 14,000 YS, 40 El; 70 Brin
Hard 60,000 TS, 51,000 YS, 14 El, 130 Brin.
For marine hardware, screws, grills, compacts
Corrosion resistant Good formability.

WIELAND T10.
M-764, 90 Cu, 10 Zn
Soft. 41,000 TS; 12,000 YS; 50 El; 65 Brin.
Hard: 55,500 TS; 50,000 YS, 18 El; 120 Brin
For grills, screen cloth, weather stripping, compacts, marine hardware, screws.
Good formability and resistance to stress-cracking.

WIELAND T15
M-764; 95 Cu, 5 Zn
Soft: 40,000 TS, 12,000 YS; 50 El; 60 Brin.
Hard. 54,000 TS; 47,000 YS; 12 El; 120 Brin.
For coins, medals, jewelry, fuse caps, bullet jackets.
Corrosion resistant Excellent workability.

WIELAND Tf.
M-764; 5.0-7.0 Sn, 5.0-7.0 Zn, 0.1 max P, bal Cu.
Soft: 55,500 TS; 52 El; 85 Brin.
Hard: 78,200 TS; 13 El; 160 Brin.
For marine hardware, fasteners, clips, terminals.
Corrosion resistant.

WIELAND WB206.
M-764; 58 Cu, 1 Al, 1 Mn, bal Zn.
For marine hardware.

WIELAND WB444
M-764; 88 Cu, 4 Zn, 4 Sn, 4 Pb.
For bearings; free-cutting.

WIELAND WB681.
M-764; 68 Cu, 1 Si, bal Zn.
For marine hardware; corrosion resistant.

WIELAND WB800.
M-764; 8 Sn, bal Cu.
For fittings, hardware; corrosion resistant

WIELAND WBT 11.
M-764; Al, bal Cu.
For gears, shafts, marine hardware; aluminum bronze, corrosion resistant

WIELAND Ws 80.
M-764, 68 Cu, 8 Ni, bal Zn.
Soft: 50,000 TS, 40 El; 70 Brin.
Hard: 71,000 TS; 12 El; 130 Brin.
For hardware, optical goods, novelties
Nickel silver Corrosion resistant.

WIELAND Ws 100
M-764; 45-49 Cu, 10-12 Ni, 2 Pb, bal Zn.
Soft: 64,000 TS, 32 El; 100 Brin
Hard 88,000 TS; 15 El, 180 Brin
For automatic tool holder swivels, hardware, optical goods, screw machine products.
Free-cutting nickel bronze. Corrosion resistant.

WIELAND Ws 120.
M-764; 55-59 Cu, 11-13 Ni, 2.5 Pb, bal Zn
Soft. 51,000 TS: 35 El; 80 Brin.
Hard 78,000 TS; 12 El; 140 Brin.
For hardware, optical goods, screw machine products
Nickel silver, free-cutting
Corrosion resistant

WIELAND Ws 125.
M-764; 63-67 Cu, 11-13 Ni, bal Zn
Soft. 51,000 TS; 30 El, 80 Brin
Hard: 71,000 TS; 8 El, 145 Brin.
For deep drawn parts, tableware, hardware, optical goods, diaphragms
Nickel bronze Corrosion resistant

WIELAND Ws 131
M-764, 45-49 Cu, 11-13 Ni, bal Zn
Soft 64,000 TS; 40 El, 100 Brin
Hard: 92,000 TS; 25 El; 180 Brin.
For swivels in tool holders, optical goods, hardware, diaphragms, fasteners.
Nickel bronze, corrosion resistant

WIELAND Ws 175
M-764; 59-63 Cu, 17-19 Ni, 2 Pb, bal Zn.
Soft: 54,000 TS, 38 El; 90 Brin.
Hard: 78,000 TS; 11 El; 155 Brin.
For hardware, screw machine products, optical goods, fasteners.
Nickel silver. Free-cutting. Corrosion resistant

WIELAND Ws 180.
M-764; 60-64 Cu, 17-19 Ni, bal Zn.
Soft. 54,000 TS; 34 El; 80 Brin.
Hard: 74,000 TS; 8 El; 140 Brin.
For hardware, optical goods, diaphragms, springs, novelties.
Nickel silver, corrosion resistant.

WIESILBER.
M-764; 46-67 Cu, 7-19 Ni, 0-2 Pb, bal Zn.
For marine hardware; nickel silver.

WIGGIN ALLOY C263.
M-86, M-121; 20 Cr, 20 Co, 5.9 Mo, 2.2 Ti, 0.5 Al, bal Ni.
For gas turbine jet pipes, thrust reversers, noise suppressors, flame tubes.
Creep resistant for service to 850°C.

WIG METAL.
M-270; tungsten carbide.
For hard tools, dies, drill bits; high wear resistance.

WIKMANS CRU-1.
M-1190, 1.2 C, 0.20 Si, 0.30 Mn, bal Fe.
For springs, cutters, drills, reamers, broaches; Type W1; water hardened.

WIKMAN'S CRU-2.
M-1190, 1 C, 0.20 Si, 0.30 Mn, bal Fe.
Annealed· 100,000 TS; 53,000 YS; 21 El; 42 RA; 200 Brin.
For springs, cutters, reamers, drills, taps, hobs; Type W1; water hardened.

WIKMANS CRU-3
M-1190; 0.80 C, 0.2 Si, 0.3 Mn, bal Fe.
Heat treated: 130,000-188,000 TS; 87,000-145,000 YS; 21-12 El, 50-35 RA, 235-390 Brin
For drills, punches, reamers, hobs; Type W1, water hardened

WIKMANS CRU-4
M-1190, 0.70 C, 0.20 Si, 0.30 Mn, bal Fe.
Heat treated· 122,000-174,000 TS, 82,000-128,000 YS, 22-12 El, 52-37 RA; 240-355 Brin
For wheels, die blocks, girders, rails, springs; Type W1; water hardened.

WIKMANS CRU-EX12.
M-1190, 0.70 C, 4.5 Cr, 18.5 W, 0.6 max Co, bal Fe.
For drills, reamers, broaches, lathe and planer tools; high speed steel.

WIKMANS CRU-EX20
M-1190, 0.80 C, 1.2 Mo, 4.5 Cr, 18.5 W, 2.5 Co, 1.6 V, bal Fe.
For milling cutters, planer and shaper tools, broaches, high speed steel.

WIKMANS CRU-EX22
M-1190, 0.80 C, 1.2 Mo, 4.5 Cr, 18.5 W, 5.5 Co, 1.6 V, bal Fe.
For milling cutters, hobs, planer and shaper tools; high speed steel

WIKMANS CRU-EX26.
M-1190; 0.80 C, 1 Mo, 18.5 W, 4.5 Cr, 10 Co, 1.6 V, bal Fe.
For milling cutters, planer and shaper cutters; high speed steel

WIKMAN'S CRU-EX49.
M-1190, 0.8 C, 4 Cr, 5 Mo, 6.2 W, 2 V, bal Fe
For lathe and planer tools, hobs, reamers; high speed steel.

WIKMANS CRU-02.
M-1190; 1.5 C, 0.30 Si, 0.30 Mn, bal Fe.
For engravers' tools, blanking tools; water hardened.

WIKMANS CRU 03.
M-1190; 1.4 C, 0.30 Si, 0.30 Mn, bal Fe.
For engravers' tools, blanking and forming dies; Type W1; water hardened

WIKMANS CRU-X42.
M-1190; 0.8 C, 4 Cr, 3 Mo, 6.2 W, 2 V, bal Fe
For lathe and planer tools, hobs, drills, taps; high speed steel.

WIKMANS VH7.
M-1190; 0.70 C, 0.20 Si, 0.30 Mn, bal Fe.
Heat treated: 122,000-174,000 TS; 82,000-128,000 YS; 22-12 El; 52-37 RA; 240-355 Brin.
For wheels, die blocks, girders, rails, springs; Type W1; water hardened.

WIKMANS VH8.
M-1190; 0.80 C, 0.2 Si, 0 3 Mn, bal Fe.
Heat treated: 130,000-188,000 TS; 87,000-145,000 YS; 21-12 El; 50-35 RA; 235-390 Brin.
For drills, punches, reamers, hobs; Type W1; water hardened.

WIKMANS VH10
M-1190; 1 C, 0.20 Si, 0.30 Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El; 42 RA, 200 Brin.
For springs, cutters, reamers, drills, taps, hobs; Type W1; water hardened.

WIKMANS VH10CV.
M-1190; 1 C, 0.20 Si, 0.30 Mn, 0.50 Cr, 0.1 V, bal Fe.
For bearings, heading and blanking dies; oil or water hardened.

WIKMAN'S VH10KA.
M-1190; 1 0-1.5 C, 0.20 Si, 0 30 Mn, 1 Cr, bal Fe
For cutting tools, files, bearings, water hardened, wear resistant.

WIKMANS VH11.
M-1190; 1.1 C, 0.2 Si, 0.3 Mn, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 21 El, 42 RA; 200 Brin.
For springs, cutters, drills, reamers, hobs; Type W1; water hardened.

WIKMANS VH12.
M-1190; 1.2 C, 0 20 Si, 0.30 Mn, bal Fe.
For springs, header dies, punches, cutters, drills, Type W1; water hardened

WIKMANS VH13C.
M-1190; 1.35 C, 0 30 Cr, 0 25 Mn, 0.25 Si, bal Fe
For files, razors, finishing tools; water hardened.

WIKMANS VH33.
M-1190, 0.95 C, 1.5 Si, 0 75 Mn, 1 0 Cr, bal Fe
For drawing and forming dies, punches; oil hardened, shock resistant.

WIKMANS VH-35.
M-1190; 0.40 C, 1 15 Mn, 1 15 Cr, bal Fe.
For machinery parts, gears; oil hardened

WIKMANS VH54.
M-1190, 0 30 C, 1 Cr, 3.5 Ni, 5 5 W, 0.25 Mn, 0.20 Si, bal Fe
For mandrels, extrusion press dies and liners; hot work steel, oil hardened.

WIKMANS VH60.
M-1190; 1.25 C, 2 Cr, 0.15 V, 0.7 Si, 0.3 Mn, bal Fe
For finishing tools, cutters; oil or water hardened.

WIKMANS VH63.
M-1190; 2.2 C, 1.2 W, 13 Cr, 0 75 Mn, 0.3 Si, bal Fe.
For forming and drawing dies, cold work tools, oil or air hardened, non-deforming

WIKMANS VH-68.
M-1190; 0 30 C, 0.55 Mn, 1.25 Cr, 4 25 Ni, bal Fe
For gears, shafts; tough, oil hardened.

WIKMANS VH78.
M-1190; 1.1 C, 0.20 Si, 0.30 Mn, 0.30 Cr, 1 W, 0.1 V, bal Fe.
For twist drills, punches, reamers, cutting tools; oil or water hardened.

WIKMANS VH94.
M-1190; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS; 40,000 YS; 32 El; 68 RA; 170 Brin.
For cutlery, valve trim, turbine blades; Type 420; stainless, hardenable.

WIKMANS VH214.
M-1190; 0.15 min C, 12-14 Cr, bal Fe.
Annealed: 88,000 TS, 40,000 YS; 32 El; 68 RA; 170 Brin
For cutlery, valve trim, pump parts; Type 420; stainless, hardenable

WIKMANS VH223.
M-1190; 1.8 C, 12 Cr, 0.6 Mo, 3 25 Co, bal Fe.
For cutting and cold work tools, air hardened, non-deforming.

WIKMANS VH225.
M-1190; 0.45 C, 0.9 Si, 0 3 Mn, 1.2 Cr, 0 25 Mo, 2 2 W, 0.15 V, bal Fe
For pneumatic tools, chisels, shears, punches, hot work steel, oil hardened

WIKMANS VH233
M-1190; 0 80 C, 0 20 Si, 0.30 Mn, 0.1 V, bal Fe.
Heat treated 190,000 TS; 145,000 YS; 12 El; 32 RA; 400 Brin.
For blanking and forming dies, punches, water hardened

WIKMANS VH236
M-1190, 0 55 C, 1 5 Cr, 3 Ni, 0.4 Mn, bal Fe.
For bakelite dies, cold work tools; oil hardened, shock resistant

WIKMANS VH238
M-1190, 0 90 C, 1 2 Mn, 0 5 Cr, 0.5 W, 0 1 V, bal Fe
For drawing and forming dies, punches, oil hardened, non-deforming.

WIKMANS VH239
M-1190, 0.15 min C, 12 14 Cr, bal Fe
Annealed. 88,000 TS, 40,000 YS, 32 El, 68 RA; 170 Brin
For cutlery, valve trim, turbine blades, Type 420; stainless, hardenable

WIKMANS VH240.
M-1190; 0 35 C, 23-27 Cr, bal Fe.
Annealed 90,000 TS, 60,000 YS, 20 El, 45 RA; 180 Brin.
For furnace parts, heat treating boxes; Type 446; heat resistant

WIKMANS VH244.
M-1190, 1 35 C, 0 30 Cr, 6 0 W, 0 30 Mn, bal Fe
For drawing and forming dies, finishing tools, oil hardened, high hardness

WIKMANS VH266.
M-1190, 0 55 C, 1 Cr, 3 Ni, 0 3 Mo, 0 4 Mn, 0 3 Si, bal Fe
For drop forging dies, cold work tools, oil or air hardened, shock resistant.

WIKMANS VH267
M-1190; 0 40 C, 1 3 Si, 5 Cr, 0 75 Mo, 5 W, bal Fe
For Al die casting dies, punches; oil or air hardened, hot work steel

WIKMANS VH273.
M-1190, 0 12 max C, 11 5-13 Cr, 0 1-0 3 Al, bal Fe
Annealed. 71,000 TS; 42,600 YS; 22 El; 70 RA; 150 Brin
Heat treated 175,000 TS; 145,000 YS; 21 El; 64 RA; 352 Brin.
For oil refinery and chemical plant equipment; Type 405; corrosion resistant.

WIKMANS VH274.
M-1190; 0.10 max C, 2 max Mn, 17-19 Cr, 8-10 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 125,000 TS; 95,000 YS; 22 El; 55 RA; 277 Brin.
For oil refinery and chemical plant equipment; Type 304; stainless, austenitic.

WIKMANS VH276.
M-1190; 0.10 max C, 18 Cr, 10 Ni, 1.3 Mo, bal Fe.
Annealed: 85,000-95,000 TS; 35,000-45,000 YS; 60-50 El; 75-60 RA; 150-190 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

WIKMANS VH277.
M-1190; 0.65 C, 1.4 Ni, 0.3 Mo, 0.7 Cr, 0.1 V, bal Fe.
For forging and cold working dies; oil hardened, shock resistant.

WIKMANS VH282.
M-1190; 0.4 C, 15 Cr, 15 Ni, 1.5 Si, 2.1 W, bal Fe.
For valves for large diesel engines; corrosion and heat resistant.

WIKMANS VH300.
M-1190, 0.30 C, 3 Cr, 1.7 Ni, 9 W, 0.3 V, 0.3 Mn, bal Fe.
For hot work tools, Cu die casting dies; hot work steel, oil hardened.

WIKMANS VH-312
M-1190; 0.25 C, 0.65 Mn, 1.05 Cr, 0.20 Mo, bal Fe
For gears, shafts, machinery parts, oil or water hardened, tough.

WIKMANS VH-313
M-1190; 0.3 C, 0.55 Mn, 1 Cr, 3.2 Ni, 0.25 Mo, bal Fe
For gears, shafts, axles, mandrels, machinery parts, oil hardened, shock resistant

WIKMANS VH320
M-1190, 1.5 C, 12 Cr, 0.80 Mo, 0.2 V, bal Fe.
For drawing and blanking dies, cold work tools, air hardened, non-deforming.

WIKMANS VH322
M-1190, 0.4 C, 12 Cr, 1 Mo, 2.5 Si, bal Fe
For values for large diesel engines; corrosion and heat resistant.

WIKMANS VH-341
M-1190, 0.35 C, 0.55 Mn, 1.15 Cr, 2.6 Ni, bal Fe
For gears, shafts; tough, oil hardened

WIKMANS VH357
M-1190, 1.2 C, 0.20 Si, 0.30 Mn, 0.55 W, 0.1 V, bal Fe.
For drills, taps, cutters, heading dies, oil or water hardened

WIKMANS VH-364
M-1190; 0.12 C, 0.55 Mn, 0.75 Cr, 3.0 Ni, bal Fe.
For gears, camshafts, crankshafts; case hardened

WIKMANS VH376.
M-1190; 0.08 max C, 18 Cr, 9 Ni, 1.3 Mo, bal Fe
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For chemical plant and oil refinery equipment; Type 316; stainless, austenitic.

WIKMANS VH388.
M-1190; 1 C, 0.2 Si, 0.6 Mn, 5.2 Cr, 1.1 Mo, 0.2 V, bal Fe.
For forming and drawing dies, punches, shears; oil or air hardened, non-deforming.

WIKMANS VH-392.
M-1190; 0.20 C, 0.55 Mn, 1.8 Ni, 0.25 Mo, bal Fe.
For gears, pinions, machinery parts; case hardened, shock resistant.

WIKMANS VH407.
M-1190; 0.12 max C, 20 Cr, 19 Ni, bal Fe.
For heat treat boxes, furnace parts and equipment; stainless, austenitic.

WIKMANS VH410.
M-1190; 0.35 C, 1 Si, 5 Cr, 1.5 Mo, 0.4 V, bal Fe.
For extrusion dies for Al; oil or air hardened, non-deforming.

WIKMANS VH417.
M-1190; 0.30-0.36 C, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 25 El; 55 RA; 195 Brin
For surgical instruments, valves, cutlery; Type 420; corrosion resistant.

WIKMANS VH602.
M-1190; 0.09-0.13 C, 12 Cr, 0.6 Ni, 0.5 Mo, bal Fe.
For turbine blades, valves; corrosion resistant.

WIKMANS VH604.
M-1190, 0.12 max C, 15.5 Cr, bal Fe.
Annealed. 80,000 TS; 50,000 YS; 25 El, 50 RA, 150 Brin
For hardware, kitchen sinks, fasteners; Type 430; corrosion resistant

WIKMANS VH611
M-1190, 0.53-0.58 C, 14 Cr, bal Fe
For butchers' knives, surgical instruments; corrosion resistant, hardenable

WIKMANS VH620
M-1190, 0.10 max C, 18 Cr, bal Fe
Annealed 80,000 TS; 50,000 YS, 25 El; 50 RA; 150 Brin
For oil refinery equipment, soot blowers and bolts; corrosion and heat resistant.

WIKMANS VH650.
M-1190, 0.07 max C, 18 Cr, 10 Ni, 2.6 Mo, bal Fe
Annealed. 85,000 TS, 35,000 YS; 50 El, 65 RA; 160 Brin
For acid resistant chemical plant equipment, Type 316, stainless, austenitic

WIKMANS VH-CN2.
M-1190, 0.25 C, 0.70 Cr, 3.0 Ni, bal Fe.
For gears, shafts, machinery parts; shock resistant

WIKMANS VH-CN3.
M-1190, 0.18 C, 0.3 Si, 0.55 Mn, 0.75 Cr, 3.0 Ni, bal Fe
For gears, camshafts, axles, machinery parts; case hardened, shock resistant

WIKMANS VH-EX1939.
M-1190; 0.80 C, 0.2 Mo, 4 Cr, 12.5 W, 0.8 Co, 2.5 V, bal Fe
For drills, planer and shaper tools, hobs, reamers; high speed steel

WIKMANS VH-FS
M-1190, 0.55 C, 1.75 Si, 0.75 Mn, bal Fe.
For springs; oil hardened.

WIKMANS VH VULC.
M-1190, 0.15 min C, 12-14 Cr, bal Fe
Annealed. 88,000 TS; 40,000 YS; 32 El; 68 RA; 170 Brin.
For cutlery, valve trim, pump parts; Type 420; stainless, hardenable.

WIKMANS WH602.
M-1190; 0.08 C, 14.5 Cr, 1.0 Mo, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 30 El; B 92 Rock.
For springs, table flatware, oil refinery and chemical plant equipment.
Corrosion resistant.

WILCO NO. 3.
M-237; Au, bal Pt.
For electric contacts; low corrosion resistant

WILCO NO. 4.
M-237; Au, bal Pt.
For electric contacts; free from atm films.

WILCO NO 6.
M-237.
For electrical contacts; resists oxidation and corrosion.

WILCO NO. 7.
M-237; Au, bal Pt.
For electric contacts

WILCO NO. 10.
M-237; Al alloy.
For electric contacts; hard, wear resistant.

WILCO NO. 14.
M-237; Pt alloy.
For electrica contacts; arc-resisting.

WILCO NO. 19.
M-237, Pt, bal Ag
For electric contacts; low contact resistance

WILCO NO 20.
M-237; 80 Ag, 20 Cd.
For relay contacts, high conductivity.

WILCO NO. 28.
M-237; Zn, bal Ag.
For electric contacts; resists film formation

WILCO NO 29.
M-237; Pd, bal Ag.
For electric contacts, for relays

WILCO NO 31.
M-237; Ag alloy
For electric contacts, high electrical conductivity

WILCO NO 33
M-237; Au, bal Ag
For electric contacts; corrosion resistant.

WILCO NO. 34
M-237, Pd, bal Pt.
For electric contacts; for low current applications

WILCO NO. 35.
M-237; Pd, bal Ag
For electric contacts

WILCO NO 38.
M-237; Ag, Cu.
For electric contacts; high conductivity.

WILCO NO. 39
M-237, Ag alloy.
Fo relectric contacts, for voltage regulators.

WILCO NO. 40
M-237, Ag alloy.
For electric contacts.

WILCO NO. 43.
M-237; Ru, bal Pt.
For electric contacts.

WILCO NO. 50.
M-237; 33 Rh, 67 Os.
For voltage regulators; corrosion resistant.

WILCO AMPLEX.
M-237.
For thermal cutouts in circuit breakers; bi-metal, temperature range 0-350°F

WILCO C-5.
M-237; Ag alloy
For electrical contacts, sintered.

WILCO DA.
M-237; Pd, bal Pt.
For electrical relays, voltage regulators; low contact resistance.

WILCO HIGHFLEX
M-237; 18 Ni, 11 Cr, 0.25 C, bal Fe, and 36 Ni + Co, 0.12 C, bal Fe.
For temperature indicating instruments, contact making devices; bi-metal temperature range 0-350°F

WILCO HIGHFLEX 45
M-237; 19.4 Ni, 0.55 C, 0.9 Mn, 2.2 Cr, 0.1 Co, bal Fe and 36 Ni + Co, 0.12 C, bal Fe.
For temperature indicating instruments, contact making devices, bi-metal, temperature range 0-350°F.

WILCO HIGH HEAT.
M-237.
For thermostats, temperature controls, bi-metal, temperature range 300-650°F.

WILCO HIGHHEAT 47
M-237
For thermostats, temperature controls; bi-metal, temperature range 300-650°F.

WILCO H T CONSTANT
M-237
For thermostats, temperature controls, bi-metal, temperature range 250-600°F.

WILCOLOY
M-237, WC
For telegraph relays, tungsten carbide

WILCOLOY-B
M-237, Be, bal Cu
Heat treated 190,000 TS, 150,000 YS, 400 Brin
For contact backing, spring arms, circuit vibrators, age-hardened, maximum service temperature to 700°F

WILCOLOY-C
M-237, Cr, Si, bal Cu
Heat treated 76,000 TS, 61,000 YS; 144 Brin
For contact backing, circuit breakers; heat treatable, high electrical conductivity

WILCOLOY F
M-237, Cd, bal Cu
Cold drawn: 64,000 TS, 55,000 YS, 137 Brin
For contact backing springs, reeds, relays; high electrical conductivity and strength

WILCOLOY T-1
M-237, Co, Be, bal Cu
Heat treated 120,000 TS; 90,000 YS, 222 Brin.
For contact backing, spring arms, reeds, switches; age-hardenable.

WILCO P-5
M-237; Ir, bal Pt
For electrical contacts, relays, thermostats; hard, wear resistant

WILCO P-6
M-237; Ru, bal Pt
For electrical contacts, thermostats, relays; hard, wear resistant.

WILCO P-10.
M-237; Ir, bal Pt.
For electrical contacts, thermostats, relays; hard, wear resistant.

WILCO P-15.
M-237; Ir, bal Pt.
For electrical contacts, thermostats, relays; hard, wear resistant.

WILCO P-20.
M-237; Ir, bal Pt
For electrical contacts, thermostats, relays; hard, wear resistant.

WILCO P-21.
M-237; Ir, bal Pt.
For electrical contacts, thermostats, relays; hard, wear resistant

WILCO P-34.
M-237; Ag, bal Pd.
For electrical contacts, thermostats, relays; low surface contact resistance.

WILCO P-35.
M-237, Pd, bal Ag
For electrical contacts, relays, radio vibrators; resists sulfide formation.

WILCO P-43.
M-237; Ru, bal Pt.
For electrical contacts, thermostats, relays; hard, wear resistant.

WILCO P-50.
M-237; Ir, Ru, Os, Rh, Pd, bal Pt.
For voltage regulators, electrical contacts, speed governors, high corrosion and wear resistance

WILCO P 53
M-237, Ru, bal Pt.
For electrical contacts, thermostats, relays; hard, wear resistant.

WILCO P 54
M-237, Ag, bal Pd
For electrical contacts, thermostats, relays; high hardness and wear resistance.

WILCO P-58.
M-237, Ru, bal Pd
For electrical contacts, thermostats, relays, hard, and wear resistant

WILCO P-60
M-237; Pd, bal Pt
For electrical contacts, relays, magnetos, wear and impact resistant.

WILCO P-61
M-237; Ag, Ni, bal Pd.
For electrical contacts, thermostats, relays, low surface contact resistance

WILCO P-62
M-237, Ag, Ni, bal Pd
For electrical contacts, voltage regulators; low surface contact resistance.

WILCO P-63
M-237; Pd, Ni, bal Ag.
For electrical contacts, relays, voltage regulators; low surface contact resistance

WILCO P-68.
M-237, Ag, Ni, bal Pd.
For electrical contacts, thermostats, relays, low surface contact resistance.

WILCO P-150
M-237; Ir, Ru, Os, Rh, Pd, bal Pt.
For electrical contacts, voltage regulators, speed controls; oxidation and wear resistant.

WILCO SCOFLEX.
M-237.
For temperature indicating instruments, contact making devices; bi-metal, temperature range 0-350°F.

WILCO SILVER SOLDER NO. 2.
M-237; 65 Ag, 25 Cu, 10 Zn.
For silver solder; corrosion resistant.

WILCO SILVER SOLDER NO. 18.
M-237; 49.5 Ag, 34.5 Cu, 16 Zn
For silver solder, corrosion resistant.

WILCO SILVER SOLDER NO. 25.
M-237; 22 Ag, 44 Cu, 34 Zn.
For silver solder; corrosion resistant.

WILCO SILVER SOLDER NO 27.
M-237; 40 Ag, 36 Cu, 24 Zn.
For silver solder; corrosion resistant

WILCO STANDARD.
M-237.
For temperature indicating instruments, contact making devices; bi-metal, temperature range 0-300°F.

WILCO THERMO-METAL CIRFLEX.
M-237, bimetal.
Thermostatic bimetal; operating temperature 50-300°F.

WILCO THERMO-METAL MIDFLEX 46.
M-237; bimetal.
Thermostatic bimetal; operating temperature 150-450°F

WILCO THERMOMETAL RUFLEX
M-237, bimetal
Thermometal for steam traps, gas pilot controls; bimetal.

WILCO W METAL.
M-237.
For thermostatic bimetals

WILLEYS 6A
M-976, 5.5 Co, 7 TiC, 10 TaC, 77.5 WC
Sintered Rockwell A92.5
For finishing cutters, carbides

WILLEYS 6AX
M-976, Sintered carbide tool material.
For semi-roughing and finishing of carbon and alloy steels, good crater and thermal resistance

WILLEYS 8A.
M-976; 8.5 Co, 7.5 TiC, 10 TaC, 74 WC
Sintered Rockwell A91.4
For general purpose cutters, carbides.

WILLEYS 10A
M-976; 10 Co, 7.5 TiC, 10 TaC, 72.5 WC.
Sintered Rockwell A91
For cutters for roughing steel, carbides.

WILLEYS 509
M-976; WC; 8 Co, 16 TiC.
For cutters for turning and boring; sintered

WILLEYS 606
M-976, 8 Co, 4 TaC, 10 TiC.
For cutting tools, finishing cuts; cemented carbide.

WILLEYS 710
M-976, WC, 10 TiC, 11 Co
For cutters for general machining; sintered.

WILLEYS 945
M-976, 10 Co, 4 Ti C, bal WC
For tools, dies, cutters, sintered; Tr.S. 240000.

WILLEYS E-3
M-976; 3 Co, bal WC.
For tools, dies, cutters, boring tools, sintered; Tr.S. 180000.

WILLEYS E-4.5.
M-976; 4.5 Co, bal WC.
For tools, dies, cutters; sintered; Tr.S. 190000.

WILLEYS E-5.
M-976; WC, 5 Co.
For cutting tools for finishing and boring; sintered, wear resisting.

WILLEYS E-6.
M-976; WC, 6 Co.
For cutting tools, for roughing and semi-finishing; sintered, tough.

WILLEYS E-8.
M-976; WC, 6 Co.
For cutters for heavy interrupted cuts; sintered, tough and wear resistant.

WILLEYS E9.
M-976; 9 Co, 91 WC.
Sintered: Rockwell A90.
For wear surfaces; light shock, carbides.

WILLEYS E-10.
M-976; 10 Co, bal WC.
For tools, dies, cutters; sintered; Tr. S. 280000.

WILLEYS E-12.
M-976; WC.
For cutters, rest blades, centers; sintered, tough.

WILLEYS E13.
M-976; 13 Co, 87 WC.
Sintered: Rockwell A89.
For wear surfaces; heavy shock, carbides.

WILLEYS E16.
M-976; 16 Co, 84 WC.
Sintered: Rockwell A87.
For wear surfaces; heavy shock, carbides.

WILLEYS E-18.
M-976; 18 Co, bal WC.
For tools, dies, cutters; sintered Tr. S. 400000.

WILLEYS E-25.
M-976; 25 Co, bal WC.
For tools, dies, cutters; sintered; Tr. S. 450000.

WILLEYS W9C.
M-976; 9 Co, 91 WC.
Sintered: Rockwell A89.
For mining and percussion tools; carbides.

WILLEYS W12C.
M-976; 12 Co, 88 WC.
Sintered: Rockwell A88.
For mining and percussion tools; carbides.

WILLEYS X3.
M-976; 6.5 Co, 3 TaC, 90.5 WC.
Sintered: Rockwell A92.
For general purpose cutting tools; carbides.

WILLEYS X620.
M-976; 6 Co, 20 TaC, 74 WC.
Sintered: Rockwell A92.
For special applications; carbides.

WILMIL.
M-187; 10-13 Si, 0.5 Mn, 0.1 Cu, 0.1 Mg, bal Al.
Sand cast: 28,000 TS; 9000 YS; 5-14 El; 50 Brin.
For housings, ship construction; corrosion resistant, good castability.

WILMIL M.
M-187; 0.1 Cu, 0.4 Mg, 0.5 Mn, 0.6 Fe, bal Al.
Cast: 25,000 TS; 16,000 YS; 1.5 El; 65 Brin.
Aged: 35,000 TS; 29,000 YS; 95 Brin.
For highly stressed castings; age-hardenable.

WILMOTT'S ALUMINUM.
86 Sn, 14 Bi.
For aluminum solder.

WILRICH 142.
M-947; 0.4 C, 13 Cr, 13 Ni, 3 W, 1.5 Si, bal Fe.
For supercharger buckets; high heat resistant.

WILRICH 300.
M-947; bimetal.
For hard facing electrodes; corrosion resistant.

WILRICH 301.
M-947; Ni-Cr.
Cast: 300-400 Brin.
For hard facing electrodes; corrosion resistant.

WILRICH 350.
M-947; Ni-Cr-Cu.
For hard facing electrodes; corrosion resistant.

WILRICH 600.
M-947; Cr, W.
Cast: 620 Brin.
For hard facing electrodes; corrosion resistant.

WILRICH 625.
M-947; Cr, W, Co.
Cast: 650 Brin.
For hard facing electrodes; heat, abrasion and corrosion resisting.

WILSON.
M-662; C, bal Fe.
For welding rod.

WILSON.
C, alloy, bal Fe.
For armor plate.

WILSON NO. 10LC.
M-662; 0.17 max C, 4.5-5.2 Ni, bal Fe.
For welding rod; wear resistant.

WILSON NO. 10SA.
M-662; 0.15 C, 5 Ni, bal Fe.
For welding rod; shielded.

WILSON 109.
M-663; 0.07 C, 0.28 Mn, 0.078 P, 0.020 S, 0.15 Si, bal Fe.
Welded: 70,000-80,000 TS; 60,000-68,000 YS; 21-25 El; 36-42 RA.
For welding rod; mild steel welding.

WILSON 512.
M-663; 0.10 C, 0.50 Mn, 0.028 P, 0.023 S, 0.49 Si, bal Fe
Welded: 75,000-80,000 TS; 60,000-65,000 YS; 25-30 El; 52-57 RA.
For welding rod for high S steels; low H_2 electrode.

WILSON NO. 512.
M-662; C, bal Fe.
For welding electrodes; mild steel.

WILSON NO. 520.
M-237; C, bal Fe.
For welding electrodes.

WILSON NO. 520.
M-662; C, bal Fe.
For welding rod for mild steel; shielded, arc.

WILSON NO 520A.
M-662; C, bal Fe.
For welding rod Cr-Mo steel; shielded, arc.

WILSON 520 AND 520A.
M-663; 0.10 C, 0.40 Mn, 0.35 Si, 0.003 S, bal Fe.
Welded· 70,000-80,000 TS; 58,000-66,000 YS; 18-25 El; 40-60 RA.
For welding rod; mild steel fabrication.

WILSON 575.
M-663; 0.83 C, 0.72 Mn, 0.14 P, 0.003 S, 92.66 Ni, 5.7 Fe.
Welded: 58,250-59,800 TS; 5.0-6.5 El.
For welding rod; for welding cast iron.

WILSON NO. 575.
M-662; high Ni core.
For welding electrodes for cast iron; coated.

WIMET 110B.
M-1006; 11 Co, bal WC.
Sintered: 1225 VDH.
General purpose rock drilling.

WIMET BP1.
M-1006; 16 Co, bal WC.
Sintered: 1150 VDH.
For pressing and blanking tools, forming tools, heavy duty dies.

WIMET CT.
M-1006; 9 Co, bal WC.
Sintered: 1300 VDH.
For rock drilling; rotary tools and percussive drills for abrasive rocks.

WIMET CXT.
M-1006; 9 Co, bal WC.
Sintered: 1225 VDH.
For tools for rock drilling.

WIMET G.
M-1006; 11 Co, bal WC.
Sintered: 1325 VDH.
For dies, forming tools, cutting tools for wood and plastics.
ISO K40 (Am. Code C-1).

WIMET H.
M-1006; 6 Co, bal WC.
Sintered: 1750 VDH.
For cutting iron at high speeds; glass, non-ferrous metals.
ISO K10.

WIMET HH.
M-1006; 1 TaC, 0.5 VC, 7 Co, bal WC.
Sintered: 1775 VDH.
For cutting hard cast irons; high speed precision turning and boring.
ISO KO1 (Am. Code C-4).

WIMET N.
M-1006, 6 Co, bal WC
Sintered: 1575 VDH
For turning and milling cast iron and non-ferrous metals; wire drawing dies, wear parts.
ISO K20 (Am. Code C-2).

WIMET NC.
M-1006; 9.5 Co, bal WC.
Sintered: 1400 VDH.
Tough cutting grade for low hardness cast iron, soft steels, and steel castings, with sand inclusions; dies.
ISO K30 (Am. Code C-1).

WIMET NH.
M-1006; 6 Co, bal WC.
Sintered: 1650 VDH.
For cutting cast iron and non-ferrous materials.
ISO K15 (Am. Code C-3).

WIMET R11.
M-1006; 11 Co, bal WC.
Sintered: 1225 VDH.
Heavy duty precussive rock drilling.

WIMET T.
M-1006; 20 Co, bal WC.
Sintered: 1050 VDH.
For cold heading and extrusion dies.

WIMET TT.
M-1006; 20 Co, bal WC.
Sintered: 950 VDH.
For cold heading and extrusion dies.

WIMET TTX.
M-1006; 30 Co, bal WC.
Sintered: 850 VDH.
For high duty cold heading and extrusion dies.

WIMET XL1.
M-1006; 16 TiC, 5 Co, bal WC.
Sintered: 1700 VDH.
High speed turning on steels; finishing cuts and precision boring.
ISO PO1 (Am. Code C-8).

WIMET XL2B.
M-1006; 19 TiC, 15 (Ta+Nb*) C, 10 Co, bal WC. (*Nb=Cb).
Sintered: 1525 VDH.
Steel turning at medium to high speeds, semi-finish and finishing cuts.
ISO P10 (Am. Code C-7).

WIMET XL3.
M-1006; 9 TiC, 12 (Ta+Nb*) C, 9 Co, bal WC. (*Nb=Cb).
Sintered: 1450 VDH.
General purpose steel cutting with good resistance to shock and impact.
ISO P20 (Am. Code C-6).

WIMET XL4.
M-1006; 5 TiC, 9 Co, bal WC.
Sintered: 1475 VDH
For heavy duty planing and turning steel at low speeds; roughing cuts.
ISO P30 (Am. Code C-5).

WIMET XL35.
M-1006; 10 TiC, 2 (Ta+Nb*) C, 10 Co, bal WC. (*Nb=Cb)
Sintered: 1550 VDH
For turning and milling steel having interrupted cuts
ISO P25 (Am. Code C-6).

WIMET XL45.
M-1006; 4 TiC, 8 (Ta+Nb*) C; 11 Co, bal WC. (*Nb=Cb).
Sintered: 1500 VDH.
For rough turning and planing operations on steel.

WINCHESTER DRAWING DIE.
1.54 C, 0.25 Mn, 5.11 W, bal Fe.
For tools, dies; oil hardening.

WINDSOR.
M-69; 0.98 C, 5.25 Cr, 0.25 V, 1.0 Mo, bal Fe.
For dies; air hardened. AISI A2.

WINDSOR (Cast to shape).
M-69, 1.0 C, 0.45 Mn, 0.25 Si, 5.25 Cr, 0.25 V, 1.1 Mo, bal Fe.
For heavy duty production loads; machinery cams, etc.
Air hardening tool steel.

WINN'S SUPERHEAT
62 Cu, 35 Zn, 2 Sn, 0.4 Pb, 0.13 As, 0.2 Fe.
For valves, fittings for super heated steam.

WINSTON.
M-1705; 1.0 C, 0.6 Mn, 5.25 Cr, 0.25 V, 1.1 Mo, bal Fe.
Medium alloy air hardening tool steel.
AISI A2.

WINSTON "V".
M-1705; 2.4 C, 5.25 Cr, 4.25 V, 1.1 Mo, bal Fe.
Air hardening tool steel. AISI A7.

WIPING SOLDER.
U.S.; 40 Sn, 60 Pb.
For commercial lead solder; M.P. 446°F.

WIPLA METAL.
German; 0.2 C, 18 Cr, 8 Ni, bal Fe.
For machinery parts; non-rusting.

WIPTAM.
M-72; 45.5 Co, 28.3 Cr, 24.4 Ni, 0.1 C, 1.1 Si, 0.7 Mn.
Rolled: 90,000 TS; 74,000 YS; 1.2 El; 378 Brin.
For dental alloy, dentures.
Corrosion and wear resistant.

WIRE BRASS.
72-65 Cu, 27-35 Zn, 0.17 Sn, 0.28 Pb.
For wire applications; high ductility.

WIRE DRAWING ALLOY.
M-35; 2.35 C, 1.9 Cr, 1.65 Mn, 10.5 W, 0.55 Mo, bal Fe.
For tools, wire drawing dies; abrasion resisting.

WIRESPRAY NO. 3 LO-SHRINK.
M-963;
High chrome stainless wire for metallizing gun; for producing heavy, machinable, stainless overlays.

WIRESPRAY NO. 10.
M-963;
A general purpose carbon steel wire for metallizing gun; deposits are machinable.

WIRESPRAY NO. 25.
M-963;
Carbon steel wire for metallizing gun; deposits harder than No 10 but still machinable.

WIRESPRAY NO. 80.
M-963;
A low shrink steel wire for metallizing gun; too hard to machine except with carbide; excellent wear resistance.

WIRONIT 140
M-1326; 0.05 C, 17.0 Cr, 4.0 Ni, 4.0 Cu, 0.40 Nb, bal Fe.
Precipitation hardenable stainless steel, good strength below 400° C.
DIN X7CrNiCuNb174; Werkstoff Nr. (1.4540)

WIRONIT 150.
M-1326; 0.05 C, 17 0 Cr, 7.0 Ni, 1.0 Al, bal Fe.
Precipitation hardenable stainless steel, good strength below 400°F.
DIN X7CrNiAl 177; Werkstoff Nr. 1.4568.

WIRONIT 151.
M-1326; 0.05 C, 15.0 Cr, 7.0 Ni, 3 0 Mo, 1.2 Al, bal Fe.
Precipitation hardenable stainless steel, good strength below 800°F.
DIN X7CrNiMoAl 157; Werkstoff Nr. 1.4532.

WIRONIT 151 L.
M-1326; 0.09 max C, 1.0 max Si, 1.0 max Mn, 15.0 Cr, 2.5 Mo, 7.0 Ni, 1.1 Al, bal Fe
Solution treat and age type stainless.
DIN X7CrNiMoAl 157; Werkstoff Nr. 1.4574
AMS 5657; PH 15-7 Mo.

WIRONIT 599.
M-1326; 0.08 max C, 13.0 Cr, bal Fe.
Ann: 64,000-92,000 TS; 35,000 min YS; 20 min El.
28,000 min YS at 400°F. Ferritic, magnetic.
For rust and acid resisting parts.
DIN X7Cr13.

WIRONIT 599 Al.
M-1326; 0.08 max C, 13.0 Cr, 0.10-0.30 Al, bal Fe.
Ann: 64,000-92,000 TS; 35,000 min YS; 20 min El.
28,000 min YS at 400°F. Ferritic, magnetic, weldable, non-hardenable.
For rust and acid-resisting parts.
DIN X7CrAl 13; AISI 405.

WIRONIT 600.
M-1326; 0.10 C, 13.0 Cr, bal Fe.
Ht. Tr.: 85,000-106,000 TS; 64,000 min YS; 18 min El.
Martensitic, magnetic, weldable, heat treatable, corrosion resistant.
For turbine wheels and blades, tableware, cutlery.
DIN X10Cr13; AISI 410.

WIRONIT 600 A.
M-1326; 0.10 C, 13.0 Cr, 0.20 S, bal Fe.
Ht. Tr.: 85,000-112,000 TS; 64,000 min YS; 12 min El.
Martensitic, magnetic, free machining, hardenable corrosion resistant.
For stainless parts of intermediate hardness; cutlery, tableware.
DIN X12CrS13; AISI 416.

WIRONIT 601.
M-1326; 0.15 C, 13.0 Cr, bal Fe.
Ht. Tr.· 92,000-112,000 TS; 71,000 min YS; 16 min El.
47,000 min YS at 400°C.
Martensitic, magnetic, weldable.
For turbine wheels and blades, cutlery, tableware, surgical and dental instruments.
DIN X15Cr13; AISI 403, 410.

WIRONIT 602.
M-1326; 0 08 max C, 14.5 Cr, bal Fe.
Ann: 64,000-92,000 TS; 35,000 min YS; 20 min El.
Ferritic, magnetic, weldable, non-hardenable.
For tableware, welded assemblies for rust resisting applications
DIN X7Cr14

WIRONIT 610.
M-1326; 0 10 max C, 17 0 Cr, bal Fe.
Ann· 64,000-85,000 TS; 38,000 min YS, 29 min El.
Ferritic, magnetic, weldable, non-hardenable, corrosion resistant.
For tableware, parts for food processing, dairy, textile industries.
DIN X8Cr17; AISI 430.

WIRONIT 610 E
M-1326; 0.10 max C, 17 0 Cr, Ti=7 × %Cmin, bal Fe.
Ann· 64,000-85,000 TS; 38,000 min YS; 20 min El
Ferritic, magnetic, weldable, corrosion resistant, non-hardenable.
For welded assemblies in food, dairy and chemical industries.
DIN X8CrTi17.

WIRONIT 610 EN
M-1326; 0 10 max C, 17 0 Cr, Nb=12 × %C, bal Fe.
Ann: 64,000-85,000 TS; 38,000 min YS; 20 min El.
Ferritic, magnetic, weldable, non-hardenable.
For welded assemblies in corrosive conditions.
DIN X8CrNb17.

WIRONIT 615.
M-1326; 0.20 C, 13.0 Cr, bal Fe.
Ht. Tr.: 92,000-120,000 TS; 64,000 min YS; 16 min El.
Martensitic, magnetic, hardenable, corrosion resistant.
For turbine wheels, cutlery, shafts and mandrels in chemical and textile plants, surgical and dental tools.
DIN X20Cr13; AISI 420.

WIRONIT 620.
M-1326; 0.10 max C, 20.0 Cr, 0.8 Ni, bal Fe.
Ann: 57,000-85,000 TS; 42,000 min YS; 20 min El.
Ferritic, magnetic, weldable, non-hardenable.

For parts subject to corrosive or elevated temperature conditions.
DIN X10CrNi20.

WIRONIT 632.
M-1326; 0.20 C, 17.0 Cr, 1.5 Ni, bal Fe.
Ht. Tr.: 112,000-135,000 YS; 85,000 min YS; 14 min El.
At 400°C: 54,000 min YS.
Corrosion resistant, good elevated temperature strength.
For shafts, hardware operating at temperatures to 450°C.
DIN X22CrNi17; AISI 431.

WIRONIT 632 L.
M-1326; 0.20 C, 1.0 max Si, 1.0 max Mo, 16.15 Cr, 1.7 Ni, bal Fe.
Hardenable corrosion resistant steel.
For highly stressed bolts, shafts, studs at temperatures to 400°C.
DIN X22CrNi17; Werkstoff Nr. 1.4044
AMS 5628; AISI 431.

WIRONIT 645.
M-1326; 0.45 C, 13.0 Cr, bal Fe.
Air or oil hardenable to 56-58 Rock C.
Martensitic, magnetic, corrosion resistant.
Shafts, mandrels, gears, for textile, paper industry, dental and surgical tools.
DIN X40Cr13; AISI 420.

WIRONIT 696.
M-1326; 1.0 C, 17.0 Cr, V, bal Fe.
Air or oil hardenable to 54-60 Rock C.
Martensitic, magnetic, corrosion resistant.
For ball and roller bearings, races, hardened shafts; for operation to about 400°C
Similar to AISI 440C.

WIRONIT 706 E.
M-1326; 0.10 max C, 17.0 Cr, 1.8 Mo, Ti = 7 × %C min, bal Fe
Ann: 71,000-92,000 TS, 42,000 min YS; 20 min El.
Ferritic, magnetic, weldable, corrosion resistant, non-hardenable
For welded assemblies in paper and chemical industries.
DIN X8CrMoTi17.

WIRONIT 710 A
M-1326; 0.15 C, 17.0 Cr, 0.3 Mo, 0.20 S, bal Fe.
Ht Tr.: 100,000-120,000 TS; 64,000 min YS, 12 min El
Ferritic, magnetic, free-machining, corrosion resistant.
For machined parts for food, beverage and chemical industries.
DIN X12CrMoS17; AISI 430 F.

WIRONIT 720.
M-1326; 0.20 C, 13.0 Cr. 1.2 Mo, bal Fe.
Ht. Tr.: 106,000-128,000 TS; 78,000 min YS; 14 min El.
At 400° C: 61,000 min YS.
Corrosion resistant, good high temperature strength.
For turbine wheels, shafts, hardware operating at temperatures up to about 450°C.
DIN X20CrMo13.

WIRONIT 735.
M-1326; 0.35 C, 17.0 Cr, 1.2 Mo, bal Fe.
Ht. Tr.: 112,000-135,000 TS; 85,000 min YS; 14 min El.
At 400°C: 68,000 min YS.
Corrosion resistant, good high temperature strength.
For shafts, gears, drive couplings, turbine wheels operating up to 450°C.
DIN X35CrMo17.

WIRONIT 745.
M-1326; 0.45 C, 14.5 Cr, 0.55 Mo, bal Fe.
Air or oil hardenable to 56-58 Rock C.
Martensitic, magnetic, stainless.
For cutlery, kitchen knives, dental and surgical instruments, hardened shafts for non-rusting conditions.
DIN X48CrMoV15.

WIRONIT 755.
M-1326; 0.55 C, 14.0 Cr, 0.55 Mo, bal Fe.
Air or oil hardenable to 50-57 Rock C.
Martensitic, magnetic, corrosion resistant.
For ball and roller bearings, shafts, cutlery, surgical instruments.
DIN X52CrMo13.

WIRONIT 765.
M-1326; 0.62 C, 14.0 Cr, 0.55 Mo, bal Fe.
Air or oil hardenable to 56-58 Rock C.
Martensitic, magnetic, stainless.
For cutlery, kitchen knives, dental and surgical instruments, hardened shafts for non-rusting conditions.
DIN X65CrMo14.

WIRONIT 770.
M-1326; 0.65 C, 14.0 Cr, 1.1 Mo, 1.4 Co, 0.4 V, bal Fe.
Air or oil hardening to 52-60 Rock C.
Martensitic, corrosion resistant.
Holds good sharp edge, for cutlery, surgical and dental instruments.

WIRONIT 785
M-1326; 0.90 C, 17.0 Cr, 0.5 Mo, 0.25 V, 1.5 Co, bal Fe.
Air or oil hardenable to 58-60 Rock C.
Martensitic, magnetic, stainless.
For hardened parts in food, beverage and textile industries.
DIN X90CrCoMoV17.

WIRONIT 795.
M-1326; 0.90 C, 18.0 Cr, 1.2 Mo, 0.10 V, bal Fe.
Air or oil hardenable to 57-59 Rock C.
Martensitic, corrosion resistant
For corrosion resistant bearings and bearing races; surgical instruments and dental tools
DIN X90 CrMOV18; AISI 440B.

WIRONIT 798.
M-1326; 1.0 C, 13.0 Cr, 0.5 Mo, bal Fe.
Air or oil hardenable to 59-61 Rock C.
Martensitic, magnetic, stainless
For cutlery, dental and surgical instruments, stainless bearings and bearing races.
DIN X100CrMo13.

WIRONIT 801.
M-1326; 0.02 max C, 18.0 Cr, 12.0 Ni, bal Fe.
Ann. (quenched); 71,000-100,000 TS, 26,000 min YS; 50 min El
Austenitic, stainless, weldable, non-hardenable except by cold work.
For food, dairy, textile, chemical plant equipment.

WIRONIT 803.
M-1326; 0.03 max C, 18.0 Cr, 11.0 Ni, bal Fe.
Ann (quenched): 71,000-100,000 TS; 26,000 min YS; 50 min El.
Austenitic, stainless, weldable, non-hardenable except by cold work.
For food, dairy, textile, chemical plant equipment.
DIN X2CrNi189.

WIRONIT 805;
M-1326; 0.02 C, 18.0 Cr, 11.0 Ni, N, bal Fe.
Ann. (quenched): 85,000-106,000 TS; 37,000 min YS; 40 min El.

Austenitic, stainless, non-hardenable except by cold work.
Stainless parts for special conditions.
DIN XCrNiN1812.

WIRONIT 807.
M-1326; 0.07 max C, 18.0 Cr, 10.0 Ni, bal Fe.
Ann. (quenched): 71,000-100,000 TS 27,000 min YS; 50 min El.
Austenitic, stainless, weldable, non-hardenable except by cold work.
For equipment for food, beverage, dairy and chemical parts.
DIN X5CrNi189.

WIRONIT 807 L.
M-1326; 0.07 max C, 1.0 max Si, 2.0 max Mn, 18.0 Cr, 10.0 Ni, bal Fe.
Austenitic stainless steel.
DIN X5CrNi189; Werkstoff Nr. 1.4314; AISI 304.

WIRONIT 808.
M-1326; 0.10 max C, 13.0 Cr, 13.0 Ni, bal Fe.
Ann. (quenched): 71,000-92,000 TS; 28,000 min YS; 50 min El.
Austenitic, stainless, non-hardenable except by cold work.
For valves, pumps, cutlery.
DIN X8CrNi1212.

WIRONIT 812.
M-1326; 0.12 max C, 18.0 Cr, 9.0 Ni, bal Fe.
Ann (quenched): 71,000-100,000 TS, 31,000 min YS; 50 min El.
Austenitic, stainless, weldable, non-hardenable except by cold work.
General purpose stainless steel for stampings, filters, tableware, food handling equipment
DIN X12CrNi188.

WIRONIT 812 A.
M-1326; 0.15 max C, 18.0 Cr, 9.0 Ni, 0.15 S, bal Fe.
Ann (quenched): 71,000-100,000 TS; 31,000 min YS; 50 min El.
Austenitic, stainless, free-machining, non-hardenable except by cold work.
For machined parts for food, dairy, textile, chemical plant equipment.
DIN X12CrNiS188.

WIRONIT 812 E.
M-1326; 0.10 max C, 18.0 Cr, 10.0 Ni, Ti=6 × %C min, bal Fe.
Ann (quenched): 71,000-106,000 TS; 30,000 min YS; 40 min El.
Austenitic, stainless, weldable, non-hardenable except by cold work, good high temperature properties.
For welded assemblies; for operation to 550°C.
DIN X10CrNiTi189.

WIRONIT 812 EL.
M-1326; 0.08 max C, 1.0 max Si, 2.0 max Mn, 18.0 Cr, 10.0 Ni, Ti=6 × %C min, bal Fe.
Austenitic stainless, weldable; usable for parts at 400-700°C.
DIN X10CrNiTi189; Werkstoff Nr. 1.4544; AISI 321.

WIRONIT 812 EN.
M-1326; 0.10 max C, 18.0 Cr, 10.0 Ni, Nb=10 × %C min, bal Fe.
Ann (quenched): 71,000-106,000 TS; 30,000 min YS; 40 min El.
Austenitic, stainless, weldable, non-hardenable except by cold work, good high-temperature properties.
For welded assemblies in food and chemical industries; for operation to 550°C.
DIN X10CrNiNb189.

WIRONIT 812 L.
M-1326; 0.12 max C, 1.0 max Si, 2.0 max Mn, 18.0 Cr, 9.0 Ni, bal Fe.
Austenitic stainless steel.
DIN X12CrNi188; Werkstoff Nr. 1.4304; AMS 5637; AISI 302.

WIRONIT 815.
M-1326; 0.15 max C, 17.0 Cr, 7.5 Ni, bal Fe.
Ann (quenched): 100,000-128,000 TS; 40,000 min YS; 40 max El.
Austenitic-except when cold worked, stainless.
Hardens rapidly when cold worked-to 180,000 TS.
For springs, strong sheets and strips for food, dairy, chemical industry.
DIN X12CrNi177

WIRONIT 2001.
M-1326; 0.02 max C, 17.0 Cr, 13.0 Ni, 2.2 Mo, bal Fe.
Ann (quenched) 64,000-100,000 TS; 28,000 min YS; 45 min El
Austenitic, excellent corrosion resistance, non-hardenable except by cold work.
For equipment for food, beverage, dairy, textile, and chemical industries.

WIRONIT 2003
M-1326; 0.03 max C, 17.0 Cr, 12.0 Ni, 2.2 Mo, bal Fe.
Ann (quenched): 64,000-100,000 TS; 28,000 min YS; 45 min El.
Austenitic, excellent corrosion resistance, non-hardenable except by cold work
For equipment for food, beverage, chemical industries.
DIN X2CrNiMo1810.

WIRONIT 2004
M-1326, 0.03 max C, 17.0 Cr, 13.5 Ni, 2.8 Mo, bal Fe
Ann (quenched): 64,000-100,000 TS, 28,000 min YS; 45 min El
Austenitic, excellent corrosion resistance, non-hardenable except by cold work.
For equipment for paper, food, textile, chemical industries.
DIN X2CrNiMo1812.

WIRONIT 2005
M-1326; 0.03 max C, 18.0 Cr, 14.0 Ni, 2.6 Mo, N, bal Fe
Ann (quenched)· 92,000-113,000 TS; 42,500 min YS; 35 min El.
Austenitic stainless, improved strength.
For stainless parts requiring better strength.
DIN XCrNiMoN1814.

WIRONIT 2007
M-1326; 0.07 max C, 18.0 Cr, 11.5 Ni, 2.2 Mo, bal Fe.
Ann (quenched): 71,000-100,000 TS; 30,000 min YS; 45 min El.
Austenitic, stainless, non-hardenable except by cold work, improved corrosion resistance.
For parts in food, paper, petroleum and textile industries.
DIN X5CrNiMo1810.

WIRONIT 2008.
M-1326; 0.07 max C, 18.0 Cr, 13.0 Ni, 2.8 Mo, bal Fe.
Ann (quenched): 71,000-100,000 TS; 30,000 min YS; 45 min El.
Austenitic, excellent corrosion resistance, non-hardenable except by cold work.

For equipment for food, paper, textile and chemical industries.
DIN X5CrNiMo1812.

WIRONIT 2010 E.
M-1326; 0.10 max C, 18.0 Cr, 11.5 Ni, 2.2 Mo, Ti=6 × % C min, bal Fe.
Ann (quenched): 71,000-106,000 TS; 33,000 min YS; 40 min El.
At 550°C: 18,500 min YS
Austenitic, stainless, weldable
For parts operating up to 550°C.
DIN X10CrNiMoTi 1810.

WIRONIT 2010 EN.
M-1326; 0.10 max C, 18 0 Cr, 11.5 Ni, 2.2 Mo, Nb=10 × %C min, bal Fe.
Ann (quenched): 71,000-106,000 TS; 35,000 min YS; 40 min El.
At 550° C: 18,500 min YS.
Austenitic, stainless, weldable.
For welded assemblies in corrosive conditions or operation up to 550°C.
DIN X10CrNiMoNb1810.

WIRONIT 2012 E.
M-1326; 0.10 max C, 18 0 Cr, 13.0 Ni, 2.8 Mo, Ti=6 × %C min, bal Fe
Ann (quenched): 71,000-106,000 TS; 33,000 min YS; 40 min El.
Austenitic, excellent corrosion resistance, weldable, non-hardenable except by cold work.
For welded assemblies in food and chemical industries, for operation up to 400° C.
DIN X10CrNiMoTi1812.

WIRONET 2012 EN
M-1326; 0.10 max C, 18.0 Cr, 13.0 Ni, 2.8 Mo, Nb=10 × %C min, bal Fe.
Ann (quenched) 71,000-106,000 TS; 33,000 min YS; 40 min El
Min. yield strength 20,000 psi at 550° C.
Weldable austenitic stainless.
For welded assemblies for operation in chemical plants and for up to 550° C.
DIN X10CrNiMoNb1812.

WIRONIT 2020
M-1326; 0.07 max C, 18 0 Cr, 19 5 Ni, 2 3 Mo, Cu 2.0, Nb=8 × %C min, bal Fe.
Ann (quenched): 71,000-106,000 TS; 31,000 min YS; 40 min El.
Austenitic, weldable stainless, non-hardenable except by cold work.
For welded assemblies in corrosive environments and up to 350° C.
DIN X5CrNiMoCuNb1818.

WIRONIT 2107.
M-1326; 0.07 max C, 17.0 Cr, 13.5 Ni, 4.5 Mo, bal Fe.
Ann (quenched): 71,000-106,000 TS; 31,000 min YS; 45 min El.
Austenitic, very good corrosion resistance.
For parts used in petroleum, paper, textiles photographic industries.
DIN X5CrNiMo1713

WIRONIT 4113.
M-1326; 0.07 C, 17.0 Cr, 1.1 Mo, bal Fe.
Ferritic type corrosion resistant steel for automobile trim.
DIN X6CrMo17; Werkstoff Nr. 1.4113.

WIRONIT 4460.
M-1326; 0.10 C, 27.0 Cr, 4.5 Ni, 1.5 Mo, bal Fe.
Ferritic austenitic type corrosion resistant steel with good elevated temperature strength.
DIN X8CrNiMo275; Werkstoff Nr. 1.4460.

WIRONIT B.
M-1326; 0.03 C, 5.0 Fe, 28.0 Mo, bal Ni.
Good corrosion resistant alloy with special resistance to reducing media.
DIN NiMo30; Werkstoff Nr. 2.4810.

WIRONIT C.
M-1326; 0.03 max C, 20.0 Cr, 0.10 max Si, 0.30 V, 15.0 Mo, bal Ni.
Corrosion resistant and high temperature alloy.
DIN NiCr20Mo15; Werkstoff Nr. 2 4811.

WISIL.
M-72, 66.2 Co, 27.0 Cr, 4.5 Mo, 0.35 C, 0.4 Si, 1.0 Mn.
Cast: 123,000 TS, 87,000 YS; 10 El; 362 Brin.
For dental alloy; corrosion resistant.

WISSCO NO. 1.
M-120; 0.12 max. C, 12-14 Cr, bal Fe.
130,000-233,000 TS.
For stainless wires, stainless, can be forged and gas welded.

WISCCO NO. 1 M.
M-120; 0 12 C, 12-15 Cr, S, Se or Mo, bal Fe.
For stainless wire; free machining

WISSCO NO. 2
M-120; 0.12 min C, 12-15 Cr, bal Fe.
For stainless wires; stainless, oil hardened.

WISSCO NO. 3.
M-120; 0.12 max, C, 16-18 Cr, bal Fe.
For stainless wires.

WISSCO NO 4
M-120; 18 Cr, 8 Ni, 0.20 C, bal Fe.
170,000-300,000 TS.
For stainless wires; stainless, can be forged and welded.

WISSCO NO 4 M
M-120; 0.08-0 20 C, 17-19 Cr, 7-9 Ni, P, S or Se, bal Fe.
For stainless wire; free machining.

WISSCO NO. 4 S.
M-120, 0.11 max. C, 17-19 Cr, 7-9 Ni, bal Fe.
For welding rods; stainless.

WISSCO 5 A.
M-120; 0.20 max C, 22-26 Cr, 11-13 Ni, bal Fe.
For heat resistant wire; heat resistant.

WISSCO NO. 5 C
M-120; 27 Cr, 0.30 C, bal Fe.
For high heat resistant wires; stainless.

WISSCO NO. 5 C N.
M-120; 0.25 max. C, 19-21 Cr, 24-26 Ni, Mn, Si, bal Fe.
For high heat resistant wires, springs for high temperature service; stainless.

WISSLER HIGH SPEED.
Eng.; 15-50 Ni or Co, 15-35 Cr, 15-40 W, 0.5-2.5 B, 0.75-2.5 C.
For cutting tools, dies; cast nonferrous.

WITHERM 8.
M-1326; 0 10 C, 2.4 Si, 6.0 Cr, bal Fe.
Ann: 78,000-100,000 TS; 57,000 YS; 18 El.
For high temperature operation, usable in air from 800-900°C.
DIN X10CrSi6; Werkstoff Nr. 4712.

WITHERM 10.
M-1326; 0.10 C, 0.8 Si, 6.5 Cr, 0.8 Al, bal Fe.
High temperature alloy, for use up to 800°C; creep and heat resistant.
DIN X10CrAl7; Werkstoff Nr. 4713.

WITHERM 15.
M-1326; 0.10 C, 1.2 Si, 13.0 Cr, 1.0 Al, bal Fe.
High temperature alloy, for use in air to 950°C, Heat and creep resistant.
DIN X10CrAl13; Werkstoff Nr. 4724.

WITHERM 20.
M-1326; 0.10 C, 1.0 Si, 18.0 Cr, 1.0 Al, bal Fe
For high temperature operation, good properties to 1050°C.
DIN X10CrAl18; Werkstoff Nr 4742

WITHERM 25.
M-1326, 0.10 C, 1.4 Si, 24.0 Cr, 1.5 Al, bal Fe
For high temperature operation; good strength and resistance to scaling to 1200°C.
DIN X10CrAl24; Werkstoff Nr. 4762.

WITHERM 29.
M-1326; 0.20 C, 1.2 Si, 25.0 Cr, 4.0 Ni, bal Fe
For high temperature operation; good strength and resistance to scaling to 1100°C.
DIN X20CrNiSi254; Werkstoff Nr. 4821.

WITHERM 32
M-1326; 0.08 C, 0.5 Si, 18.0 Cr, 10.0 Ni, Ti, bal Fe.
Austenitic Cr-Ni stainless steel for high temperature operation. Useful to 800°C.
DIN 12CrNiTi189; Werkstoff Nr 4878.

WITHERM 36.
M-1326; 0.15 C, 2.0 Si, 20.0 Cr, 12.0 Ni, bal Fe
For high temperature operation; good strength and resistance to scaling up to 1050°C.
DIN X15CrNiSi2012; Werkstoff Nr 4828

WITHERM 48
M-1326, 0.15 C, 2.0 Si, 25.0 Cr, 20.0 Ni, bal Fe.
Austenitic Cr-Ni steel for high temperature operation; useful to 1200°C
DIN X15CrNiSi2520; Werkstoff Nr 4841, AISI 310.

WITHERM 48 L
M-1326; 0.20 max C, 2.0 Si, 1.3 Mn, 25.0 Cr, 20.0 Ni, bal Fe.
Stainless steel for high temperature operation, weldable
DIN X15CrNiSi2520, Werkstoff Nr 1.4844, AISI 310.

WITHERM 52.
M-1326; 0.12 C, 1.9 Si, 16.0 Cr, 36.0 Ni, bal Fe
Austenitic Ni-Cr steel for high temperature operation; resists scaling and carburizing, useful to 1100° C.
DIN X12NiCrSi3616; Werkstoff Nr. 4864

WITHERM 61.
M-1326; 0.10 C, 1.0 Si, 32 Ni, 20 Cr, bal Fe.
Austenitic Ni-Cr steel for high temperature operation; resists scaling and carburization, useful to 1200° C.
DIN X10NiCr3220; Werkstoff Nr 4861.

WITTEN 5 H.
M-1326; 0.60 C, 1.0 Si, 1.1 Mn, bal Fe.
Oil hardenable to 58-62 Rock C
For tough, wear resistant small hand tools; chisels, staking tools.
DIN 60 MnSi4.

WITTEN 2260.
M-1326; 0.07 C, 22.0 Cr, 9.0 Mo, 5.0 max Fe. 0.40 Nb, bal Ni.
Nickel base precipitation hardening alloy, corrosion resistant.
DIN NiCr20Mo9Nb; Werkstoff Nr. 2.4856.

WITTEN AZ 35 M.
M-1326; 0.35 C, 0.8 Mn, 1.0 Al, 1.1 Cr, 0.2 Mo, bal Fe.
Nitriding steel for plastic molds, particularly for impressions possessing thin webs.
DIN 33AlCrMo4.

WITTEN AZ 38 M
M-1326; 0.35 C, 0.5 Mn, 1.0 Al, 1.7 Cr, 0.2 Mo, bal Fe.
Nitriding steel for plastic molds, particularly for impressions possessing thin webs.

WITTEN BCNO 18.
M-1326; 0.21 C, 0.80 Mn, 0.50 Cr, 0.20 Mo, 0.60 Ni, B, bal Fe.
For case hardening fairly heavy sections as drive gears, splined couplings; automotive and heavy transport equipment
DIN 21NiCrMoB2

WITTEN BCNO 22
M-1326; 0.20 C, 0.70 Mn, 0.50 Cr, 0.45 Mo, 1.6 Ni, B, bal Fe
For case hardening heavily loaded driving gears, spline shafts, drive couplings
DIN 20 NiCrMoB6

WITTEN BCO 23
M-1326; 0.23 C, 0.65 Mn, 1.05 Cr, 0.15 Mo, B, bal Fe
For case hardening intermediate thick sections; high hardness in core area.
For drive gears, spline shafts, transmission gears
DIN 23 CrMoB4, Werkstoff Nr 1.7211.

WITTEN BCO 24
M-1326, 0.23 C, 0.80 Mn, 0.80 Cr, 0.35 Mo, B, bal Fe.
For case hardening heavy sections to produce strong core properties
For drive gears, splined couplings, axles, shafts for heavy transport equipment
DIN 23 CrMoB33; Werkstoff Nr. 1.7271

WITTEN BI EXTRA
M-1326, 0.45 C, 1.4 Cr, 4.0 Ni, 0.5 W, bal Fe
Oil hardening die steel for hobbing tools, die sinking dies, embossing tools for table knives, spoons

WITTEN C 023 L
M-1326, 0.25 C, 0.25 Si, 0.65 Mn, 1.0 Cr, 0.20 Mo, bal Fe
Alloy Steel
Werkstoff Nr, 1.7214

WITTEN C 33
M-1326, 0.34 C, 0.75 Mn, 1.05 Cr, bal Fe
Water or oil hardening carbon steel
Annealed, cold finished: 223 max Brin
Hardenable to 115,000-135,000 psi TS in sections up to 40 mm diameter
For shafts, axles, splined couplings, drive pins.
DIN 34Cr4; Werkstoff Nr. 1.7033.

WITTEN C 37.
M-1326, 0.37 C, 0.75 Mn, 1.05 Cr, bal Fe.
Water or oil hardening low alloy steel
Annealed, cold finished: 235 max Brin.
Hardenable to 115,000-142,000 psi TS in sections up to 40 mm diameter.
For cog wheels, bolts, piston rods, shafts.
DIN 37Cr4; Werkstoff Nr. 1.7034.

WITTEN C 38.
M-1326; 0.38 C, 0.65 Mn, 0.50 Cr, bal Fe.
Water or oil hardening carbon steel.
Ann: 207 Brin, max.

Hardenable to 115,000-135,000 psi TS in sizes not over 16 mm diameter.
For shafts, spline couplings.
DIN 38 Cr2; Werkstoff Nr. 1.7003.

WITTEN C 40.
M-1326; 0.41 C, 0.75 Mn, 1.05 Cr, bal Fe.
Oil hardening low alloy steel.
Annealed: 217 Brin max.
Hardenable to 128,000-170,000 psi TS in sections up to 40 mm diameter.
Gear wheels for cyanide hardening, structural parts of high stress.
DIN 41Cr4; Werkstoff Nr. 1.7035.

WITTEN C 46
M-1326; 0.46 C, 0.65 Mn, 0.50 Cr, bal Fe.
Water or oil hardening carbon steel.
Annealed: 207 max Brin; cold finished: 223 max Brin.
Hardenable to 115,000-135,000 psi TS up to 40 mm diameter sections.
For shafts, axles, splined couplings, drive pins, induction hardened parts.
DIN 46Cr2; Werkstoff Nr 1.7006

WITTEN CN 15
M-1326, 0.15 C, 0.50 Mn, 1.5 Cr, 1.5 Ni, bal Fe.
For case hardening; intermediate depth of hardening of core area.
For drive gears and splines, axles, shafts, gages, wear parts
DIN 15CrNi6; Werkstoff Nr 1.5919

WITTEN CN 15 L
M-1326, 0.15 C, 0.25 Si, 0.50 Mn, 1.5 Cr, 1.5 Ni, bal Fe
Alloy carburizing steel, core strength after hardening, 128,000-170,000 psi, TS
For gears, splined shafts
DIN 15CrNi6, Werkstoff Nr 1.5924

WITTEN CN 18
M-1326, 0.18 C, 0.50 Mn, 2.0 Cr, 2.0 Ni, bal Fe.
For case hardening; deep hardening.
For large, heavy gears, shafts, ordnance parts requiring strong core areas in parts up to 63 mm thick cross section
DIN 18CrNi8, Werkstoff Nr 1.5920

WITTEN CN 18 L
M-1326, 0.18 C, 0.25 Si, 0.50 Mn, 2.0 Cr, 2.0 Ni, bal Fe
Alloy carburizing steel; core strength after heat treating 140,000-205,000 psi TS
DIN 18CrNi8, Werkstoff Nr 1.5934

WITTEN CNE 3
M-1326, 0.14 C, 0.45 Mn, 0.70 Cr, 3.5 Ni, bal Fe.
For case hardening heavy sections, 125,000-175,000 psi TS in sections to 30 mm thick after heat treating
For drive gears, heavy pinions, axles, spline shafts
DIN 14NiCr14, Werkstoff Nr 1.5752.

WITTEN CNE 4
M-1326; 0.14 C, 0.45 Mn, 1.0 Cr, 4.5 Ni, bal Fe.
For case hardening parts having heavy sections.
170,000-200,000 psi TS in sections up to 30 mm thick after heat treating.
For crank shafts, gear wheels, splined drive shafts of heavy sections
DIN 14 NiCr18, Merkstoff Nr. 1.5860.

WITTEN CNL.
M-1326; 0.40C, 1.3 Cr, 4.0 Ni, 0.3 Mo, bal Fe.
Air or oil hardenable to 44-50 Rock C
For heavy duty stamping and pressing dies with deep impressions, mandrel holders.
DIN 35NiCrMo16.

WITTEN CNO 17.
M-1326; 0.17 C, 0.50 Mn, 1.6 Cr, 0.35 Mo, 1.5 Ni, bal Fe.
For case hardening medium thick sections.
For drive gears, axles, cams, spline shafts, tractor gears
DIN 17CrNiMo6; Werkstoff Nr. 1.6587.

WITTEN CNO 18 F.
M-1326; 0.21 C, 0.80 Mn, 0.50 Cr, 0.20 Mo, 0.60 Ni, bal Fe
For case hardening.
For gears, pinions, splined shafts, cams.
DIN 21NiCrMo2; AISI 8620; Werkstoff Nr. 1.6523.

WITTEN CNO 36.
M-1326; 0.36 C, 0.65 Mn, 1.05 Cr, 0.20 Mo, 1.05 Ni, bal Fe.
Oil hardenable to 120,000-150,000 psi TS in sections 40-100 mm diameter
For axles, shafts, drive couplings, connecting rods, drive shafts.
DIN 36 CrNiMo4; Werkstoff Nr. 1.6511.

WITTEN CNO 40.
M-1326; 0.34 C, 0.55 Mn, 1.55 Cr, 0.20 Mo, 1.55 Ni, bal Fe.
Oil hardenable to 142,000-170,000 psi TS in sections 40-100 mm diameter
For large and highly stressed shafts, axles, and drive couplings in heavy equipment
DIN 34 CrNiMo6, Werkstoff Nr 1.6582.

WITTEN CNOV 30
M-1326, 0.30 C, 0.45 Mn, 2.0 Cr, 0.40 Mo, 2.0 Ni, bal Fe
Oil hardenable to 142,000-170,000 psi TS in sections 100-160 mm diameter
For very large and highly stressed axles, shafts and drive couplings in earth moving equipment, cranes, ordnance
DIN 30 CrNiMo8, Werkstoff Nr. 1.6580

WITTEN CNOV 30 L.
M-1326; 0.31 C, 0.25 Si, 0.45 Mn, 2.0 Cr, 0.40 Mo, 2.0 Ni, bal Fe.
Deep hardening alloy steel, weldable
Werkstoff Nr 1.6604

WITTEN CNOV 37 L VA
M-1326; 0.37 C, 0.25 Si, 0.65 Mn, 0.80 Cr, 0.35 Mo, 1.80 Ni, 0.10 V, bal Fe
Alloy steel, hardenable to 250,000 spi TS
Werkstoff Nr 1.6944, similar to AISI 4340.

WITTEN CNV 1
M-1326, 0.36 C, 0.60 Mn, 0.50 Cr, 1.50 Ni, bal Fe.
Oil hardening to 115,000-135,000 psi TS in sections 40-100 mm diameter.
For shafts, couplings, connecting rods, bolts, studs.
DIN 36NiCr6; Werkstoff Nr 1.5710

WITTEN CNV 2
M-1326, 0.36 C, 0.60 Mn, 0.70 Cr, 2.5 Ni, bal Fe.
Oil hardenable to 115,000-135,000 psi TS in sections 40-100 mm diameter
For wheel hubs axle arms, connecting rods, splined couplings
DIN 36NiCr10; Werkstoff Nr. 1.5736.

WITTEN CNV 3
M-1326, 0.31 C, 0.60 Mn, 0.75 Cr, 3.5 Ni, bal Fe.
Oil hardenable to 120,000-142,000 psi TS in sections 40-100 mm diameter
For axles, shafts, levers, connecting rods for diesel engines.
DIN 31NiCr14; Werkstoff Nr. 1.5755.

WITTEN CNV 4.
M-1326; 0.35 C, 0.60 Mn, 0.75 Cr, 4.5 Ni, bal Fe.
Oil hardenable to 142,000-164,000 psi TS in sections 40-100 mm diameter.
For shafts, axles, especially dynamo and turbine shafts.
DIN 35NiCr18; Werkstoff Nr. 1.5864.

WITTEN CO 20 AF.
M-1326; 0.20, 0.75 Mn, 0.35 Cr, 0.50 Mo, bal Fe.
For case hardening; good core strength and hardness up to about 30 mm cross section thickness by proper heat treating.
For gears, pinions, shafts, axles, splined couplings.
DIN 20 MoCr4; Werkstoff Nr. 1.7321.

WITTEN CO 20 AL.
M-1326; 0.20 C, 0.25 Si, 0.70 Mn, 0.45 Cr, 0.40 Mo, bal Fe.
Low alloy carburizing steel.
DIN 20CrMo2; Werkstoff Nr. 1.7334.

WITTEN CO 20 L.
M-1326; 0.20 C, 0.25 Si, 0.70 Mn, 0.45 Cr, 0.45 Mo, bal Fe.
Low alloy carburizing steel.
Werkstoff Nr. 1.7324.

WITTEN CO 23.
M-1326; 0.25 C, 0.65 Mn, 1.05 Cr, 0.20 Mo, bal Fe.
Oil hardening low alloy steel.
Hardenable to 115,000-135,000 psi TS in sections up to 40 mm diameter.
For axles, shafts, connecting rods; sometimes case hardened for transmission gears.
DIN 25CrMo4; Werkstoff Nr. 1.7218.

WITTEN CO 25 F.
M-1326; 0.25 C, 0.70 Mn, 0.45 Cr, 0.50 Mo, bal Fe.
For case hardening; higher core hardness through heavier sections.
For drive gears, heavy pinions, axles, shafts, splined couplings.
DIN 25 MoCr4; Werkstoff Nr. 1.7325.

WITTEN CO 32.
M-1326; 0.34 C, 0.65 Mn, 1.05 Cr, 0.20 Mo, bal Fe.
Oil hardening low alloy steel, weldable.
Ann: 217 max Brin.
Hardenable to 120,000-140,000 psi TS in sections up to 40 mm diameter.
For shafts, crankshafts, axle arms, support rods, bolts.
DIN 34CrMo4; Werkstoff Nr. 1.7220; AISI 4135.

WITTEN CO 38.
M-1326; 0.42 C, 0.65 Mn, 1.05 Cr, 0.20 Mo, bal Fe.
Oil hardening low alloy steel.
Ann: 217 max Brin.
Hardenable to 142,000-170,000 psi TS in sections up to 40 mm diameters.
For axles, axle arms, drive couplings, torque shafts, connecting rods.
DIN 42CrMo4, Werkstoff Nr. 1.7225; AISI 4140.

WITTEN CO 46.
M-1326; 0.50 C, 0.65 Mn, 1.05 Cr, 0.20 Mo, bal Fe.
Oil hardening low alloy steel.
Hardenable to 142,000-170,000 psi TS in sections up to 40 mm diameter.
For axles, drive couplings, torque shafts; for heavy sections that are highly loaded.
DIN 50CrMo4; Werkstoff 1.7228; AISI 4150.

WITTEN COL 30.
M-1326; 0.32 C, 0.55 Mn, 3.0 Cr, 0.40 Mo, bal Fe.
Oil hardenable to 142,000-170,000 psi TS in sections 40-100 mm diameter.
For large, heavily loaded shafts, drive couplings.
DIN 32CrMo12; Werkstoff Nr. 1.7361.

WITTEN COV 13 L.
M-1326; 0.15 C, 0.20 max Si, 0.90 Mn, 1.4 Cr, 0.90 Mo, 0.25 V, bal Fe.
Alloy carburizing steel.
Werkstoff Nr. 1.7734.

WITTEN COV 30.
M-1326; 0.30 C, 0.55 Mn, 2.50 Cr, 0.20 Mo, 0.15 V, bal Fe.
Oil hardenable to 142,000-170,000 psi TS in sections 100-160 mm diameter.
For large heavily loaded shafts for tractor, railroad, ordnance equipment.
DIN 30CrMoV9; Werkstoff Nr. 1.7707.

WITTEN COV 30 L.
M-1326; 0.30 C, 0.25 Si, 0.50 Mn, 2.5 Cr, 0.20 Mo, 0.15 V, bal Fe.
Alloy steel, fairly deep hardening.
DIN 30CrMoV9; Werkstoff Nr. 1.7704.

WITTEN CRL.
M-1326; 1.05 C, 1.2 Cr, bal Fe.
For bearings, sleeves, liners, bushings; water hardened, wear resistant.

WITTEN CRW 1.
M-1326; 0.40 C, 1.0 Si, 1.1 Cr, 0.2 V, 1.9 W, bal Fe.
Oil or water hardening, shock resisting tool steel; for chisels and other tools subject to impact.

WITTEN CRW 2.
M-1326; 0.50 C, 0.90 Si, 1.10 Cr, 0.20 V, 1.90 W, bal Fe.
Shock resisting steel for chisels, hot punches, riveting sets, pneumatic tools.

WITTEN CRW 3.
M-1326; 0.60 C, 0.55 Si, 1.1 Cr, 0.2 V, 1.9 W, bal Fe.
Oil hardening, shock resisting steel; for chisels, pneumatic tools.

WITTEN CV 48.
M-1326; 0.50 C, 0.90 Mn, 1.05 Cr, 0.12 V, bal Fe.
Oil hardening low alloy steel.
Ann: 235 Brin max.
Hardenable to 142,000-170,000 psi TS in sections up to 40 mm diameter.
For axles, shafts, gears, connecting rods, spline couplings, hatchet heads.
DIN 50CrV4; Werkstoff Nr. 1.8159 AISI 6150.

WITTEN D4.
M-1326; 0.45 C, 0.25-0.50 Si, 0.30-0.80 Mn, bal Fe.
Hot rolled: 98,000 TS; 60,000 YS, 24 El; 55 RA; 212 Brin.
For gears, bolts, fasteners, shafts; water hardened.

WITTEN D 6 G.
M-1326; 0.65 C, 0.25 Si, 0.40 Mn, bal Fe.
Water hardening tool steel for small and medium size forging dies, swaging dies, trimming dies, wood working tools.

WITTEN D 7 G.
M-1326; 0.75 C, 0.3 Si, 0.3 Mn, bal Fe.
Water hardening steel for small and medium plain carbon forging dies.
DIN C75W3.

WITTEN D 7 S.
M-1326; 0.75 C, 0.25 Si, 0.30 Mn, bal Fe.
Water hardening tool steel for hot shears, shear blades, screw drivers.
AISI W1.

WITTEN D 9 S.
M-1326; 0.90 C, 0.25 Si, 0.30 Mn, bal Fe.
Water hardening tool steel for punches, mandrels, drifts, scissors, woodworking tools.
AISI W1.

WITTEN D 1414.
M-1326; 0.32-0.40 C, 0.15-0.35 Si, 0.40-0.70 Mn, 0.50 Cr, bal Fe.
For forgings, bolts, screws, nuts; for operation up to 500°C.
DIN Ck 35; Werkstoff Nr. 1.1181.

WITTEN D 2417.
M-1326; 0.17-0.23 C, 0.40-0.60 Si, 1.0-1.3 Mn, 0.30 Cr, bal Fe.
For flange forgings, similar parts for use at temperatures to 500°C.
DIN 20 Mn5; Werkstoff Nr. 1.5053.

WITTEN D 4412 S.
M-1326; 0.12-0.20 C, 0.15-0.35 Si, 0.50-0.80 Mn, 0.30 Cr, 0.25-0.35 Mo, bal Fe.
For forgings, stampings, flanges; for operation up to 500°C.
DIN 15Mo3; Werkstoff Nr 1.5415.

WITTEN D 4415.
M-1326; 0.12-0.20 C, 0.15-0.50 Si, 0.50-0.80 Mn, 0.45-0.65 Mo, bal Fe.
For forgings, stampings, flanges for operation up to 530°C.
DIN 16Mo5; Werkstoff Nr. 1.5423.

WITTEN D 4519 S.
M-1326; 0.10-0.18 C, 0.15-0.35 Si, 0.30-0.60 Mn, 0.30-0.60 Cr, 0.50-0.65 Mo, 0.25-0.35 V, bal Fe
For forgings, stampings, flanges for operation up to 560°C.
DIN 14MoV63, Werkstoff Nr. 1.7715.

WITTEN D 5325.
M-1326, 0.08-0.12 C, 0.15-0.35 Si, 0.30-0.50 Mn, 2.7-3.0 Cr, 0.20-0.30 Mo, bal Fe.
For parts to be used up to about 520°C, particularly in hydrogenation plants.
DIN 10CrMo11, Werkstoff Nr. 1.7276

WITTEN D 5509
M-1326, 0.15-0.20 C, 0.15-0.35 Si, 0.30-0.50 Mn, 2.7-3.0 Cr, 0.20-0.30 Mo, 0.10-0.20 V, bal Fe.
For forgings, stampings, vessels for steam lines and similar operations at temperatures up to about 520°C
DIN 17CrMoV10; Werkstoff Nr. 1.7766.

WITTEN D 5512.
M-1326, 0.20-0.28 C, 0.15-0.35 Si, 0.50-0.80 Mn, 0.9-1.2 Cr, 0.20-0.30 Mo, 0.60 max Ni, bal Fe.
For forgings, nuts, bolts, hardware, flanges for operation up to 550°C.
DIN 24 CrMo5; Werkstoff Nr 1.7258

WITTEN D 5514 S.
M-1326, 0.15 max C, 0.30-0.50 Si, 0.30-0.60 Mn, 4.5-5.5 Cr, 0.45-0.65 Mo, bal Fe.
For forgings and parts for high pressure hydrogenation plants for use at temperatures up to about 520°C.
DIN 12CrMo195; Werkstoff Nr. 1.7362.

WITTEN D 5515 S.
M-1326; 0.10-0.18 C, 0.15-0.35 Si, 0.40-0.70 Mn, 0.7-1.0 Cr, 0.40-0.50 Mo, bal Fe.
For forgings, stampings, flanges for operation up to 560°C.
DIN 13 CrMo44; Werkstoff Nr. 1.7335.

WITTEN D 5517.
M-1326; 0.17-0.23 C, 0.15-0.35 Si, 0.30-0.50 Mn, 3.0-3.3 Cr, 0.50-0.60 Mo, 0.45-0.55 V, bal Fe.
For forgings, stampings, and similar parts for use up to about 520°C, such as steam engines.
DIN 20CrMoV135; Werkstoff Nr. 1.7779.

WITTEN D 5520.
M-1326; 0.20-0.28 C, 0.15-0.35 Si, 0.30-0.60 Mn, 1.2-1.5 Cr, 0.50-0.60 Mo, 0.15-0.25 V, 0.60 max Ni, bal Fe.
For forgings for turbine parts, flanges, nuts and bolts and similar hardware for operation up to 550°C.
DIN 24CrMoV55; Werkstoff Nr. 1.7733.

WITTEN D 5535.
M-1326; 0.17-0.25 C, 0.30-0.60 Si, 0.30-0.60 Mn, 1.2-1.5 Cr, 1.0-1.2 Mo, 0.25-0.35 V, 0.60 max Ni, bal Fe.
For forgings for turbine parts, flanges, nuts, bolts and similar hardware for operation up to 550°C.
DIN 21CrMoV511; Werkstoff Nr. 1.8070.

WITTEN D 5607.
M-1326; 0.15 max C, 0.15-0.50 Si, 0.40-0.60 Mn, 2.0-2.5 Cr, 0.9-1.1 Mo, bal Fe
For forgings for boiler plants, flanges, and similar parts for operation up to 580°C.
DIN 10 CrMo910; Werkstoff Nr. 1.7380.

WITTEN D 8512
M-1326; 0.19 C, 12.0 Cr, 1.0 Mo, bal Fe.
Ht. Tr : 100,000-120,000 TS; 71,000 YS; 14-16 El.
At 500°C: 38,800 min YS.
For turbine parts, high temperature bolts and nuts.
DIN X19CrMo121; Werkstoff Nr. 1.4921.

WITTEN D 8514
M-1326; 0.17 C, 11.0 Cr, 0.6 Ni, 0.6 Mo, 0.25 V, 0.20 Nb, bal Fe.
Ht. Tr.: 135,000-162,000 TS; 109,000 min YS; 6-8 El.
At 600°C: 61,000 min YS.
For turbine shafts and wheels
DIN X17CrMoVNb121; Werkstoff Nr. 4913.

WITTEN D 8516.
M-1326; 0.20 C, 12.0 Cr, 0.55 Ni, 1.0 Mo, 0.30 V, bal Fe.
Ht. Tr.: 100,000-120,000 TS; 71,000 YS; 14-16 El.
At 500°C: 38,000 min YS.
For shafts and hardware for turbines and boilers operating at temperatures up to 600°C.
DIN X20CrMoV121, Werkstoff Nr 1.4922.

WITTEN D 8518
M-1326, 0.22 C, 12.0 Cr, 0.55 Ni, 1.0 Mo, 0.30 V, bal Fe
Ht. Tr.: 112,000-134,000 TS, 85,000 min YS; 12-14 El.
At 500°C: 49,500 min YS.
For turbine shafts and other parts operating up to 600°C.
DIN X22CrMoV121; Werkstoff Nr. 1.4923.

WITTEN D 8518 L.
M-1326; 0.22 C, 0.30 Si, 0.50 Mn, 11.5 Cr, 1.0 Mo, 0.50 Ni, 0.30 V, bal Fe.
Martensitic stainless, forgeable, heat treatable.
DIN X22CrMoV121; Werkstoff Nr. 1.4934.

WITTEN D 8518 W.
M-1326; 0.20 C, 12.0 Cr, 0.55 Ni, 1.0 Mo, 0.5 W, 0.30 V, bal Fe.
Properties same as Witten DA 8518.
For turbine parts, shafts, blades, hardware, operating up to 600°C.
DIN X20CrMoWV121; Werkstoff Nr. 1.4935.

WITTEN DA 1525 LVA.
M-1326; 0.08 max C, 1.0 max Si, 1.5 Mn, 15.0 Cr, 1.3 Mo, 26.0 Ni, 0.30 V, 2.1 Ti, 0.006 B, bal Fe.
High temperature alloy, forgeable, age hardenable.
DIN X5NiCrTi2615; Werkstoff Nr. 1.4944;
AMS 5734; A-286.

WITTEN DA 1525 VU.
M-1326; 0.05 C, 15.0 Cr, 25.0 Ni, 1.3 Mo, 0.30 V, 2.1 Ti, 0.30 Al, B, bal Fe.
Hardened: 125,000-170,000 TS; 92,000 min YS; 12 El.
At 700°C: 45,000 min YS.
For stainless parts requiring good strength.
Usable to about 700°C.
DIN X5NiCrTi2615; Werkstoff Nr. 1.4980.

WITTEN DA 1573.
M-1326; 0.03 max C, 15.0 Cr, 5.0 Fe, bal Ni.
Ni-Cr corrosion resistant and high temperature alloy.
DIN LC-NiCr15Fe; Werkstoff Nr. 2.4814.

WITTEN DA 1613.
M-1326; 0.06 C, 16.0 Cr, 13.0 Ni, Nb, bal Fe.
Sol. Ann: 74,000-100,000 TS; 30,000 min YS; 22-35 El.
Niobium stabilized austenitic stainless steel.
For turbine parts and welded assemblies for use to 750°C.
DIN X8CrNiNb1613; Werkstoff Nr. 1.4961.

WITTEN DA 1613 V.
M-1326; 0.06 C, 16.0 Cr, 13.0 Ni, 1.3 Mo, 0.7 V, 0.10 N, Nb, bal Fe.
Ann: 78,000-106,000 TS; 37,000 min YS; 20-30 El.
Hot-cold work: 92,000-120,000 TS; 71,000 min YS; 12-16 El.
At 600°C: 30,000 min YS.
Parts in hot-cold worked condition usable in turbines to 650°C.
DIN X8CrNiMoVNb1613; Werkstoff Nr. 1.4988.

WITTEN DA 1616.
M-1326; 0.07 C, 16 0 Cr, 16 0 Ni, 1.8 Mo, Nb, bal Fe.
Sol. Ann: 75,000-100,000 TS; 31,000 min YS; 22-35 El.
Nobium stabilized austenitic stainless.
For parts to be used at temperatures up to 750°C.
DIN X8CrNiMoNb1616; Werkstoff Nr. 1.4981.

WITTEN DA 1616 B.
M-1326; 0.07 C, 16 0 Cr, 16.0 Ni, 1.8 Mo, 0.060 B, Nb, bal Fe.
Ann: 78,000-106,000 TS; 40,000 min YS; 20-30 El.
Hot cold work: at 600°C: 37,000 min YS.
Parts in hot-cold work condition have good tensile properties at 650-700°C.
DIN X8CrNiMoBNb1616; Werkstoff Nr. 1.4986.

WITTEN DA 1616 L.
M-1326; 0.10 max C, 0.40 Si, 1.2 Mn, 16.5 Cr, 1.8 Mo, 16.5 Ni, Nb = 10 × %C, min, bal Fe.
High temperature alloy, weldable.
DIN X8CrNiMoNb1616; Werkstoff Nr. 1.4984.

WITTEN DA 1616 W.
M-1326; 0.07 C, 16.0 Cr, 16 0 Ni, 3.0 W, 0.10 N, Nb, bal Fe.
Sol. Ann: 78,000-106,000 TS; 37,000 min YS; 20-30 El.
At 600°C: 21,000 min YS.
Stabilized austenitic stainless.
For parts to be used at temperatures up to 750°C.
DIN X6CrNiWNb1616; Werkstoff Nr. 1.4945.

WITTEN DA 1713.
M-1326; 0.06 C, 17.0 Cr, 13.0 Ni, 2.2 Mo, bal Fe.
Sol. Ann: 74,000-100,000 TS; 30,000 min YS; 34-45 El.
At 500°C: 15,500 min YS.
Austenitic, good corrosion resistance.
For parts and assemblies operating at temperatures up to 750°C.
DIN X6CrNiMo1713; Werkstoff 1.4919.

WITTEN DA 1713 W.
M-1326; 0.12 C, 16.0 Cr, 13.5 Ni, 3.0 W, Ti, bal Fe.
Ann: 71,000-106,000 TS; 34,000 min YS.
Hot-cold work: 92,000-112,000 TS; 64,000-78,000 YS; 25 El.
At 600°C: 24,000 min YS.
In hot-cold worked condition it is usable for turbine parts up to 650°C.
DIN X12CrNiWTi1613; Werkstoff Nr. 1.4962.

WITTEN DA 1811.
M-1326; 0.06 C, 18.0 Cr, 11.0 Ni, bal Fe.
Sol. Ann: 71,000-100,000 TS; 27,000 min YS; 37-50 El.
Austenitic Stainless.
DIN X6CrNi1811; Werkstoff Nr. 1.4948.

WITTEN DA 2019.
M-1326; 0.12 C, 21.0 Cr, 20.0 Co, 20.0 Ni, 3.2 Mo, 2.5 W, 1 0 Nb, 0.15 N, bal Fe.
Hardened: 100,000-142,000 TS; 50,000 min YS; 25 El.
At 600°C· 34,000 min YS.
For gas turbine parts operating up to 730°C.
DIN X12CrCoNi2120; Werkstoff Nr. 1.4971.

WITTEN DA 2019 L.
M-1326; 0.12 C, 1.0 max Si, 1.5 Mn, 21.0 Cr, 3.0 Mo, 20.0 Ni, 20 0 Co, 1.0 Nb, 0.15 N, 2.5 W, bal Fe.
High temperature alloy.
DIN X12CrCoNi2120; Werkstoff Nr. 1 4974.
AMS 5768; Multimet N-155.

WITTEN DA 2020.
M-1326, 0 40 C, 20.0 Cr 20.0 Co, 20.0 Ni, 4.0 Mo, 4.0 W, 4.0 Nb, bal Fe.
Hardened: 112,000-142,000 TS; 57,000 min YS; 20 El
At 700°C: 30,000 min YS.
For gas turbine parts operating up to 900°C.
DIN X40CoCrNi2020; Werkstoff Nr. 1 4977

WITTEN DA 2040.
M-1326; 0 10 C, 20.0 Cr, 10.0 Ni, 3.0 max Fe. 15 0 W, bal Co
Cobalt base high temperature alloy, for high temperature springs
DIN CoCr20W15Ni; Werkstoff Nr. 2.4967

WITTEN DA 2040 I
M-1326; 0.10 C, 1.0 max Si, 1 5 Mn, 20.0 Cr, 10 0 Ni, 15.0 W, bal Co
Cobalt base high temperature alloy
DIN CoCr20W15Ni; Werkstoff Nr. 2 4964.

WITTEN DA 2060 Ti.
M-1326; 0.07 C, 20.0 Cr, 18.0 Co, 5.0 max Fe, 2 4 Ti, 1.4 Al, bal Ni
Nickel base precipitation hardening alloy, corrosion resistant.
DIN NiCr20Co18Ti; Werkstoff Nr. 2.4969.

WITTEN DA 2060 TiL.
M-1326; 0.05 C, 0.35 Si, 0.50 Mn, 19.5 Cr, 17.5 Co, 2 3 Ti, 1.4 Al, 3.0 Fe, bal Ni.
Nickel base high temperature alloy.
DIN NiCr20Co18Ti; Werkstoff Nr. 2.4632.

WITTEN DA 2080.
M-1326; 0.12 C, 20.0 Cr, 5.0 max Fe, 0.40 Ti, bal Ni.
Nickel base high temperature alloy.
DIN NiCr20Ti; Werkstoff Nr. 2.4951.

WITTEN DA 2080 L.
M-1326; 0.10 C, 0.35 Si, 0.50 Mn, 19.5 Cr, 0.50 Ti, 3.0 Fe, bal Ni.
Nickel base high temperature alloy.
DIN NiCr20Ti; Werkstoff 2.6430.

WITTEN DA 2080 Ti.
M-1326; 0.07 C, 20.0 Cr, 5.0 max Fe, 2.4 Ti, 1.4 Al, bal Ni.
Nickel base precipitation hardening alloy, corrosion resistant.
DIN NiCr20TiAl; Werkstoff Nr. 2.4952.

WITTEN DA 2080 TiL.
M-1326; 0.05 C, 0.35 Si, 0.50 Mn, 19.5 Cr, 2.2 Ti, 1.2 Al, 3.0 Fe, bal Ni.
Nickel base high temperature alloy.
DIN NiCr20TiAl; Werkstoff Nr. 2.4631.

WITTEN D Mo.
M-1326; 0.45 C, 1.35 Si, 1.35 Cr, 0.1 V, bal Fe.
Oil hardening, shock resisting tool steel; for chisels, pneumatic tools, riveting sets.

WITTEN DMW.
M-1326; 0.40 C, 1.35 Si, 1.35 Cr, 0.1 V, bal Fe.
Oil or water hardening, shock resisting tool steel; for chisels, pneumatic tools, riveting hammers.

WITTEN EM 3.
M-1326; 0 15 C, 0.7 Cr, 3.5 Ni, bal Fe.
Case hardening steel, designed largely for high-duty plastic molds
DIN 15 NiCr14.

WITTEN EM 20.
M-1326; 0.20 C, 1.2 Mn, 1.2 Cr, bal Fe.
Case hardening steel for intricate plastic molds; cold hobbable after special annealing.
DIN 21MnCr5

WITTEN EML
M-1326, 0.20 C, 1.2 Cr, 4.0 Ni, 0.2 Mo, bal Fe.
Oil hardenable case hardening steel for high-duty plastic molds requiring low distortion during case hardening; good core hardness
DIN X19NiCrMo4

WITTEN EMW
M-1326; 0.04 C, 3.8 Cr, 0.5 Mo, bal Fe.
Cold hobbing steel to be subsequently case hardened for plastic molds
DIN X6CrMo4.

WITTEN G 65
M-1326; 0 70 C, 0 25 Si, 0.25 Mn, bal Fe
Water hardening tool steel, hollow or solid for drills, trepanning and core drilling tools for rock or soil

WITTEN G75
M-1326; 0.85 C, 0 25 max Si, 0 25 max Mn, bal Fe
Heat treated: 190,000 TS, 145,000 YS; 10 El; 30 RA; 400 Brin.
For drills, taps, reamers, springs. tools; Type W1; water hardened.

WITTEN G 110
M-1326, 1.15 C, 0.25 Si, 0.25 Mn, bal Fe.
Water hardening tool steel, for chisels, hammers, sculptor tools.

WITTEN GB.
M-1326, 1 0 C, 0.90 Mn, 1 0 Cr, 1.15 W, bal Fe
For cutters, tools, forming dies; water or oil hardened.

WITTEN GBA.
M-1326; 0.95 C, 1.10 Mn, 0.60 Cr, 0.10 V, 0.60 W, bal Fe.
Oil hardenable to 60-64 Rock C.
Non-deforming, for dies, gauges, milling cutters, reamers, forming tools

WITTEN GKM.
M-1326; 1.0 C, 1.55 Cr, 0.35 Mn, bal Fe.
For bearings, liners, bushings, cutters; water hardened, wear resistant.

WITTEN GLHA.
M-1326; 0.45 C, 1.4 Mn, 1.9 Cr, 0.2 Mo, bal Fe.
Oil hardening hot work steel for drop forging dies.
Available as hardened to 100 Kp/mm^2 TS for plastic molds.
DIN 40CrMnMo7.

WITTEN GSO.
M-1326; 1.45 C, 0.7 Mn, 1.4 Cr, bal Fe.
Oil hardening tool steel for shears, knives, files, threading tools.

WITTEN HBL.
M-1326; 1.0 C, 1 2 Cr, 0.30 Mo, bal Fe.
Oil hardening tool steel for drills, counter bores, rock drills.

WITTEN HCE.
M-1326; 0.15 C, 0.50 Mn, 0.65 Cr, bal Fe.
For case hardening; hardness of core after case hardening: 143-187 Brin.
For small machine parts as studs, screws, bolts, cap screws, levers, pins.
DIN 15Cr3; Werkstoff Nr. 1.1141.

WITTEN HFC 5 LVA.
M-1326; 0.40 C, 0.90 Si, 0 30 Mn, 5.0 Cr, 1.30 Mo, 0.50 V, bal Fe.
Air hardening hot work tool steel.
Werkstoff 1.7784; AMS 6487; AISI H11.

WITTEN HFC. 16.
M-1326; 0.03 max C, 13 5 Cr, 8.0 Co, 4.0 Ni, 4.0 Mo, 0.3 Ti, bal Fe
High temperature corrosion resistant steel.

WITTEN HFN 18
M-1326; 0.03 max C, 7 5 Co, 18 0 Ni, 5.0 Mo, 0.5 Ti, bal Fe
Maraging steel, high strength
DIN X2NiCoMo1885; Werkstoff Nr 1.6359.

WITTEN K 1 L.
M-1326; 1 05 C, 0 25 Si, 0.30 Mn, 0 50 Cr, bal Fe.
Water or oil hardening high carbon steel for ball bearings, balls, races
DIN 105Cr2; Werkstoff Nr 1.3501, AISI 50100.

WITTEN K 2 L.
M-1326; 1 05 C, 0.25 Si, 0.30 Mn, 1.0 Cr. bal Fe.
Water or oil hardening high carbon steel.
For ball and roller bearings and races
DIN 105 Cr4; Werkstoff Nr. 1 3503; AISI 51100.

WITTEN K 3 L
M-1326, 1 0 C, 0.25 Si, 0 30 Mn, 1 5 Cr, bal Fe.
Water or oil hardening high carbon steel
For ball and roller bearings and races
DIN 100 Cr6; Werkstoff Nr 1.3505;
AMS 6440; AISI-E 52100.

WITTEN KOBALT 5.
M-1326; 0 80 C, 4 1 Cr, 0 6 Mo, 1.6 V, 18 0 W, 4 7 Co.
For lathe, planer, milling cutters to operate at higher temperatures; good red hardness.
DIN S 18-1-2-5, AISI T4

WITTEN KOBALT 10.
M-1326; 0.76 C, 4.15 Cr, 0.65 Mo, 9.5 Co, 1.6 V, 18.0 W, bal Fe
For lathe, planer and milling tools for heavy cuts at high speeds; high speed steel with good red hardness

WITTEN KOBALT 54 V.
M-1326; 1.35 C, 4 1 Cr, 0.85 Mo, 3.75 V, 12.0 W, 4 65 Co, bal Fe
Air or oil hardenable to 65-67 Rock C
For lathe tools and other cutting tools requiring good wear resistance and good red hardness.
DIN S12-1-4-5, AISI T 15 High speed steel

WITTEN KOBALT 55 H.
M-1326; 1.12 C, 4.1 Cr, 5.0 Mo, 1.75 V, 6.4 W, 4.75 Co, bal Fe.
Air or oil hardenable to 67-69 Rock C.
For twist drills, lathe tools requiring good wear resistance at high speeds.
DIN S7-4-2-5; AISI M 41 High speed steel.

WITTEN KOBALT 55M.
M-1326; 0.92 C, 4.1 Cr, 5.1 Mo, 1.9 V, 6.4 W, 4.75 Co, bal Fe.
Air or oil hardenable to 64-67 Rock C.
For taps, reamers, milling cutters, lathe tools requiring good cutting efficiency, red hardness and toughness.
DIN S6-5-2-5; AISI M35 High speed steel

WITTEN KOBALT 105 M.
M-1326; 1.23 C, 4.2 Cr, 3.15 Mo, 3.2 V, 9 5 W, 10.2 Co, bal Fe.
Air or oil hardenable to 65-68 Rock C.
For cutting tools requiring good wearing properties and hot strength; well adopted to free cutting and engraving work
DIN S10-4-3-10.

WITTEN KOBALT 810 M.
M-1326; 1.08 C, 4.0 Cr, 9 3 Mo, 1.2 V, 1.5 W, 8 Co, bal Fe.
For finish turning, boring tools, requiring sharp edge at high speed.
DIN S2-10-1-8; AISI M42.

WITTEN KV 32 COL.
M-1326; 0.34 C, 0 25 Si, 0.65 Mn, 1.0 Cr, 0.20 Mo, bal Fe.
Alloy steel.
DIN 34CrMo4; Werkstoff Nr. 1 7220
AISI 4135.

WITTEN LDM
M-1326; 1.1 C, 0.35 Mn, 1.2 Cr, 0.15 V, 1.3 W, bal Fe.
Oil hardening tool steel, for cutting light metals and non-metallics.

WITTEN M 28.
M-1326; 0.28 C, 1.50 Mn, bal Fe.
Water or oil hardening carbon tool steel
Hardenable to 115,000-135,000 TS in sizes not over 16 mm diameter.
For shafts, connecting rods, spline couplings, lever arms.
DIN 28Mn6; Werkstoff Nr. 1 5065

WITTEN M 41.
M-1326; 0.40 C, 0.95 Mn, bal Fe
Water or oil hardening carbon steel.
16 mm bar hardenable to 130,000 psi TS.
For shafts, couplings, forgings, connecting rods, bolts, spindles, axles.
DIN 40 Mn4; Werkstoff Nr. 1.5038.

WITTEN MC 14.
M-1326; 0.16 C, 1.15 Mn, 1.0 Cr, bal Fe.
For case hardening; core strength to 170,000 psi TS possible on thin sections
For gears, pinions, shafts, cog wheels.
DIN 16 MnCr5; Werkstoff Nr. 1.7131.

WITTEN MC 18.
M-1326; 0.20 C, 1.25 Mn, 1.20 Cr, bal Fe.
For case hardening; for deeper hardening core sections.
For gears, pinions, splined shafts, cog wheels, automotive transmission gears.
DIN 20MnCr5; Werkstoff Nr. 1.7147.

WITTEN Mo 5.
M-1326; 0.88 C, 4.1 Cr, 5.1 Mo, 1.9 V, 6.4 W, bal Fe.
Air or oil hardenable to 64-66 Rock C.
For drills, taps, broaches, lathe tools.
DIN S6-5-2; AISI M2 high speed steel.

WITTEN Mo 5H.
M-1326; 0.98 C, 4.1 Cr, 5.1 Mo, 1.9 V, 6.4 W, bal Fe.
Air or oil hardenable to 65-67 Rock C.
For drills, reamers, lathe tools; good wear resistance.
DIN SC6-5-2; AISI M2 (Mod) high speed steel.

WITTEN Mo 9.
M-1326; 0.88 C, 3.8 Cr, 8.75 Mo, 1.1 V, 1.7 W, bal Fe.
Air or oil hardenable to 63-66 Rock C.
For drills, lathe tools for roughing cuts, *milling cutters and other tools requiring* toughness.
DIN S2-9-1; AISI M1 high speed steel.

WITTEN Mo 9V
M-1326; 1.01 C, 4.0 Cr, 8.75 Mo, 1 9 V, 1.7 W, bal Fe.
Air or oil hardenable to 64-66 Rock C.
Lathe tools, reamers, drills requiring improved wear resistance
DIN S2-9-2; AISI M7 high speed steel

WITTEN Mo 53 V
M-1326, 1.22 C, 4.1 Cr, 5.1 Mo, 3.2 V, 6.4 W, bal Fe.
Air or oil hardenable to 64-67 Rock C
Lathe tools and other cutting tools requiring extra high wear resistance
DIN S6-5-3; AISI M3 Type 2 HSS.

WITTEN MS 5.
M-1326; 0 50 C, 1.0 Cr, 0.10 V, bal Fe.
Oil hardening tool steel for cold chisels, punches, center punches.

WITTEN MS 5 P (HT).
M-1326, 0.50 C, 0.9 Mn, 1 0 Cr, 0.1 V, bal Fe
Normally supplied heat treated
Ht Tr : 100 kg/mm^2 TS (Rehardening to higher values possible)
For moulds and frames for processing plastic materials DIN 50CrV4.

WITTEN MS 33
M-1326, 0.45 C, 1 1 Mn, 2 3 Cr, 0.5 Mo, 0.1 V, bal Fe
Air hardening tool steel for various types of hand chisels

WITTEN MSL
M-1326; 0 45 C, 0 90 Mn, 1.8 Cr, 0.30 Mo, bal Fe.
Oil or air hardening tool steel for chisels and upsetting tools

WITTEN PCVWL.
M-1326; 0 50 C, 0 25 Si, 0 90 Mn, 1.0 Cr, 0 10 V, bal Fe.
Alloy steel; hardened and tempered 190,000 psi TS.
DIN 50 CrV4, Werkstoff 1.8154.
AMS 6448; AISI 6150

WITTEN PW SPEZIAL
M-1326; 0.95 C, 0.30 Si, 0.40 Mn, 0.40 V, bal Fe.
Oil or water hardening tool steel for embossing tools, dies, grippers and headers for making bolts and nuts.

WITTEN PWV.
M-1326; 1.45 C, 3.3 V, bal Fe.
Water hardening steel for header dies and striking jaws in screw and rivet industries, hardenable to above 60 Rock C.
DIN 145V33.

WITTEN RMH.
M-1326; 0.45 C, 13.0 Cr, bal Fe.
Corrosion resistant steel, oil or air hardenable to 52-58 Rock C.
For tooling for corrosively acting plastics as amino plastics and thermoplastics; for chambers in pressure die casting tools.
DIN X40Cr13; similar to AISI 420.

WITTEN RMH 735.
M-1326; 0.40 C, 16.0 Cr, 1.1 Mo, bal Fe.
Corrosion resistant steel, hardenable to 54 Rc.
For working corrosive plastic materials.
DIN X36CrMo17.

WITTEN S 2.
M-1326; 0.90 C, 2.0 Mn, 0.1 V, bal Fe.
Oil or air hardenable to about 60 Rock C for smaller size plastic moulds, pressure pads, leader pins in compression moulds.
DIN 90 MnV8; Werkstoff Nr. 1.2842.

WITTEN S 48 L.
M-1326; 0.15 max C, 1.5 max Si, 2.5 max Mn, 25.0 Cr, 20.0 Ni, bal Fe.
Stainless steel for deep drawing and for high temperation operation; weldable; welding rod.
DIN X10CrNi2520; Werkstoff Nr. 1.4854; AISI 310.

WITTEN S 87 NL.
M-1326; 0.08 max C, 2.0 max Si, 1.5 max Mn, 19.0 Cr, 9.0 Ni, Nb=12 × %C min, bal Fe.
Austenitic stainless steel, weldable
For welded stainless assemblies, welding wire.
DIN X8CrNiNb199, Werkstoff Nr 1.4554
AISI 347.

WITTEN S 1525 LVA.
M-1326; 0.08 max C, 1.0 max Si, 1.5 Mn, 15.0 Cr, 1.3 Mo, 26.0 Ni, 0.3 V, 2.1 Ti, 0.006 B, bal Fe.
Welding wire
DIN X5 NiCrTi2615; Werkstoff Nr. 1.4954; AMS 5805, A-286.

WITTEN SCS
M-1326, 0.65 C, 1.3 Si, 0.8 Mn, 0.9 Cr, bal Fe.
Oil hardening steel for hot or cold shears, knives, punches

WITTEN SOZ
M-1326; 1.25 C, 1.15 Si, 0.7 Mn, 1.2 Cr, bal Fe
Oil hardening tool steel for shears, punches, trimming dies, blanking dies

WITTEN SS 65 M
M-1326; 0.62 C, 14.0 Cr, 0.55 Mo, bal Fe
Air or oil hardening tool steel; for cutting tools, dies and moulds.

WITTEN SS 105
M-1326; 1.0 C, 5.25 Cr, 1.1 Mo, 0.1 V, bal Fe.
Oil hardening tool steel; for punching, forming and cold heading dies; used also for hot working dies.

WITTEN SS 110.
M-1326; 1.05 C, 13.5 Cr, 0.5 Mo, bal Fe.
Oil hardening cold work tool steel; for punching and forming dies.

WITTEN SS 115
M-1326; 1.60 C, 12.0 Cr, 0.1 V, bal Fe.
Oil or air hardening tool steel; for forming and blanking dies, shear blades, thread rolling tools.

WITTEN SS 115 C.
M-1326; 1.60 C, 12.0 Cr, 0.55 Mo, 1.3 Co, bal Fe.
Oil or air hardening tool steel; for forming and blanking dies, shear blades.

WITTEN SS 116.
M-1326; 1.6 C, 12.0 Cr, 0.65 Mo, 0.5 W, 1.2 V, bal Fe.
Air or oil hardening tool steel; for thread rolling tools, deep drawing dies with fine impressions.
DIN X165CrVMo121; Werkstoff Nr. 2609.

WITTEN SS 117 M.
M-1326; 1.6 C, 12.0 Cr, 0.65 Mo, 0.45 V, 0.50 W, bal Fe.
Air or oil hardenable to 60-64 Rc.
Non-deforming; for cutting and forming dies, nail and tack making dies, hobs, wood working tools. AISI D2.

WITTEN SS 120.
M-1326; 2.0 C, 12.0 Cr. bal Fe.
Air or oil hardenable to 60-63 Rock C.
For piercing mandrils, blanking, punching and and forming dies.
DIN X210Cr12; Similar to AISI D3.

WITTEN SS 125.
M-1326; 2.5 C, 12.0 Cr, bal Fe.
Oil hardening cold work tool steel; for punching and forming dies.

WITTEN SS 131.
M-1326; 2.1 C, 12.0 Cr, 0.7 W, bal Fe.
Air or oil hardenable to 60-64 Rock C.
For pierching mandrils on sheets thinner than 5/32 in; cold work forming tools and dies.
DIN X210CrW12; Similar to AISI D2.

WITTEN SS 213 C
M-1326; 2.1 C, 12.0 Cr, 0.5 Mo, 1.0 Co, 0.7 W, bal Fe.
Air or oil hardening tool steel; cold or hot work.
For punching and forming dies.

WITTEN SSO
M-1326; 1.05 C, 1.1 Mn, 0.90 Cr, 0.1 V, bal Fe.
Oil hardenable to 60-64 Rock C.
Non-deforming; for complicated cutting punches, blanking dies, blanking plates; also cutting tools as thread milling cutters.

WITTEN SW.
M-1326; 1.2 C, 0.7 Cr, 0.1 V, bal Fe.
Water or oil hardenable to 60-64 Rock C.
For twist drills, broaches, piercing mandrils, and similar tools.
DIN 115CrV3; AISI L 2

WITTEN UAM
M-1326; 0.55 C, 0.7 Cr, 1.7 Ni, 0.3 Mo, 0.1 V, bal Fe.
Oil hardening hot work steel for forging dies, hot trimming dies and hot shear blades.
DIN 55 NiCrMoV6.

WITTEN UAM EXTRA.
M-1326; 0.55 C, 1.1 Cr, 1.7 Ni, 0.8 Mo, 0.1 V, bal Fe.
Air or oil hardening hot work steel for forging dies, extrusion dies for production of light metal shapes.
DIN 57NiCrMoV77.

WITTEN UAM SPECIAL.
M-1326; 0.55 C, 1.1 Cr, 1.7 Ni, 0.5 Mo, 0.1 V, bal Fe.
Air or oil hardening hot work steel for forging dies, extrusion rams and hot shear blades.
DIN 56NiCrMoV7.

WITTEN UM 30.
M-1326; 0.45 C, 19.0 Mn, 4.0 Cr, 0.08-0.12 N, bal Fe.
Ann: 112,000 TS; 54,000 YS; 45 El.

Austenitic, non-magnetic, corrosion resistant; hardenable by cold work to about 200,000 TS, weldable.
For ship building, instruments, electrical equipment.
DIN X40MnCrN19, Werkstoff Nr. 3813.

WITTEN UM 40.
M-1326; 0.10 C, 18.0 Mn, 12.0 Cr, 2.0 Ni, 0.12 N, bal Fe.
Ann: 100,000 TS; 43,000 YS; 45 El.
Austenitic, non-magnetic, corrosion resistant; hardenable by cold work to about 190,000 TS; weldable.
For shipbuilding, instruments and electrical work
DIN X12MnCr1812; Werkstoff Nr. 3968.

WITTEN UM 45.
M-1326; 0.50 C, 20.0 Mn, 14.0 Cr, 1.0 V, bal Fe.
Sol. anneal: 127,000-141,000 TS; 71,000 YS, 40 El
Aged: 141,000-170,000 TS; 112,000 YS, 30 El.
For structural parts requiring good strength and corrosion resistance.
DIN X50MnCrV2014; Werkstoff Nr 3819

WITTEN UM 50.
M-1326; 0.05 max C, 18.0 Mn, 13.0 Cr, 2.5 Ni, 0.12 N, bal Fe.
Anneal. 92,000 TS; 37,000 YS; 45 El.
Austenitic, non-magnetic, corrosion resistant; hardenable only by cold work, weldable
For structural parts to resist corrosion
DIN X5MnCr1813; Werkstoff Nr. 3949

WITTEN UM 60.
M-1326; 0.04 max C, 18.0 Cr, 13.0 Ni, bal Fe.
Anneal: 78,000 TS; 31,000 YS; 45 El.
Austenitic, non-magnetic, corrosion resistant, hardenable only by cold work, weldable.
For parts to resist corrosion and elevated temperature scaling.
DIN X4CrNi1813, Werkstoff Nr. 3941

WITTEN UM 70
M-1326, 0.10 max C, 18.0 Cr, 12.0 Ni, bal Fe
Anneal: 78,000 TS; 31,000 YS, 45 El.
Austenitic, non-magnetic, corrosion resistant, hardenable only by cold work, weldable
For shipbuilding, non-magnetic electrical equipment, structural parts operating in corrosive media
DIN X10CrNi1812; Werkstoff Nr. 3956, AISI 305

WITTEN UM 80.
M-1326; 0.03 max C, 17.5 Cr, 14.0 Ni, 2.3 Mo, bal Fe.
Anneal· 78,000 TS, 31,000 YS, 45 El
Austenitic, non-magnetic, corrosion resistant; hardenable only by cold work, weldable
For corrosion resisting parts in food and chemical plants, electrical equipment
DIN X2CrNiMo 1813, Werkstoff Nr. 3953

WITTEN UM 85
M-1326, 0.05 C, 18.0 Cr, 14.0 Ni, 2.5 Mo, 0.15 N, bal Fe
Anneal: 71,000-100,000 TS; 42,500 YS, 40 El.
Austenitic, non-magnetic, corrosion resistant, hardenable by cold work to 200,000 TS
For corrosion resistant parts in electric equipment; weldable
DIN X4CrNiMoN 1814; Werkstoff Nr. 3952.

WITTEN UM 90.
M-1326; 0.03 C, 20.0 Cr, 15.0 Ni, 2.8 Mo, 0.25 N, bal Fe.
Anneal· 100,000-120,000 TS; 58,000 YS, 40 El
Austenitic, non-magnetic, corrosion resistant, hardenable by cold work to about 190,000 TS.
For non-magnetic, corrosion resistant structural parts; weldable.
DIN X2CrNiMoN 2015.

WITTEN UM 100.
M-1326; 0.10 max C, 18.0 Cr, 9.0 Mo, 6.0 Ni, bal Fe.
Anneal: 100,000 TS; 42,500 YS; 15 El.
Austenitic, non-magnetic, corrosion resistant; hardenable by cold work to about 175,000 TS.
For non-magnetic, corrosion resistant structural parts; weldable
DIN X8CrMnNi189; Werkstoff Nr. 3965.

WITTEN UM 110.
M-1326; 0.60 C, 9.5 Mn, 22.0 Cr, 4.5 Ni, bal Fe.
Anneal: 140,000 TS, 85,000 YS; 30 El
Austenitic, non-magnetic, corrosion resistant.
For highly stressed non-magnetic, stainless parts.
DIN X50 CrMnNi229, Werkstoff Nr. 3967.

WITTEN UM 115.
M-1326; 0.50 C, 9.0 Mn, 21.0 Cr, 4.0 Ni, 1.0 V, bal Fe.
Sol anneal· 120,000-155,000 TS; 78,000 YS; 30 El.
Aged: 150,000-175,000 TS, 120,000 YS; 12 El.
For structural parts requiring good strength and corrosion resistance
DIN X50CrMnNiV229; Werkstoff Nr. 3947.

WITTEN UM 125.
M-1326, 0.30 C, 3.5 Mn, 0.4 P, 18.0 Cr, 10.0 Ni, bal Fe.
Sol anneal 92,000 TS; 42,000 YS; 40 El.
Aged: 112,000-127,000 TS; 67,000-78,000 YS, 20 El.
DIN X25CrNiMnP 1810; Werkstoff Nr 3961

WITTEN UMK
M-1326; 0.55, 0.7 Mn, 0.7 Cr, 1.7 Ni, 0.3 Mo, 0.1 V, bal Fe
Normally supplied heat treated to 100 Kg/mm² (rehardening to higher values possible)
For moulds and frames for processing plastic materials
DIN 54NiCrMoV6.

WITTEN VM 03
M-1326; 0.45 C, 1.6 Cr, 0.6 Mo, 0.8 V, 0.6 W, bal Fe.
Oil hardening steel for pressure discs, mandrels, inner liners for extruding heavy metals, and for water cooled hot shear blades
DIN 45CrVMo58

WITTEN VM 23
M-1326, 0.45 C, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe.
Oil hardenable to 46-51 Rock C
For pressure casting tools, die holders of extrusion presses, hot shear blades
DIN 48CrMoV67

WITTEN W 01 E
M-1326, 0.10 C, 0.40 Mn, bal Fe
For case hardening, core remains soft
For small parts of machines, levers, links, bolts, pins
DIN Ck 10, Werkstoff Nr 1.1121

WITTEN W 10 E
M-1326, 0.15 C, 0.45 Mn, bal Fe
For case hardening, core remains soft.
Small machine parts, bolts, cap screws, links, locating pins
DIN Ck 15, Werkstoff Nr 1.1141.

WITTEN W 10 L
M-1326; 0.10 C, 0.25 Si, 0.40 Mn, bal Fe.
For carburizing purposes, soft core.
DIN Ck 15; Werkstoff Nr. 1.1144, AMS-5060.

WITTEN W 25 E
M-1326; 0.25 C, 0.55 Mn, bal Fe.
Ann: 64,000-78,000 TS; 35,000 min YS; 25 min El.
Hardened. (16 mm max cross section):

78,000-100,000 TS; 64,000 min YS; 19 min El.
For structural purposes on automotive, containers, small machines.
DIN Ck 25; Werkstoff Nr. 1.1158.

WITTEN W 30 E.
M-1326; 0.35 C, 0.25 Si, 0.65 Mn, bal Fe.
Ann: 71,000-92,000 TS; 37,000 min YS, 21 min El.
Hardened (16mm thick, water quenched): 88,000-110,000 TS; 61,000 min YS; 17 min El.
For levers, shafts, pins, bolts, studs for automotive and machines.
DIN Ck 35; Werkstoff Nr. 1.1181.

WITTEN W 30 L.
M-1326; 0.35 C, 0.25 Si, 0.60 Mn, bal Fe.
Water hardenable carbon steel
DIN Ck 35; Werkstoff Nr 1.1174; AMS 5080

WITTEN W 34
M-1326; 0.30 C, 3.0 Cr, 2.7 Mo, 0.5 V, bal Fe.
Air or oil hardening hot work steel for light and heavy metal pressure casting tools, die inserts, brass forging dies and dies and punches for screws and nuts; annealed material designed for cold hubbing
DIN X32CrMoV33

WITTEN W 40 E.
M-1326; 0.45 C, 65 Mn, bal Fe
Water hardening carbon steel
Normalized Ann 85,000-106,000 TS; 43,000 min YS; 17 min El; 163-217 Brin
Hardened (16mm): 100,000-122,000 TS; 70,000 min YS; 14 min El
For transmission parts of intermediate strength
DIN Ck 45, Werkstoff Nr 1.1191

WITTEN W 40 L
M-1326, 0.45 C, 0.25 Si, 0.70 Mn, bal Fe
Water hardening carbon steel
DIN Ck 45, Werkstoff Nr 1.1194; AISI C 1045.

WITTEN W 44
M1326, 0.30 C, 1.0 Si, 1.1 Cr, 0.18 V, 3.7 W, bal Fe
Oil hardening tool steel, for header and upsetter tools, chisels, rivet sets.

WITTEN W 50 E
M-1326, 0.55 C, 0.75 Mn, bal Fe
Water hardening carbon steel
Normalized Ann 95,000-120,000 TS (16 mm max); 52,000 min YS; 15 min El, 229 Brin
Hardened (16 mm max thickness) 114,000-125,000 TS, 78,000 min YS, 12 min El
For shafts, connecting rods, lever arms, induction hardened parts
DIN Ck 55, Werkstoff Nr. 1.1203

WITTEN W 53 SPECIAL.
M-1326; 0.40 C, 5.0 Cr, 3.2 Mo, 0.9 V, bal Fe
Air or oil hardening hot work steel for die inserts, dies, mandrels in forging presses, piercing mandrels and tube extrusion.
DIN X40CrMoV53.

WITTEN W 60 E.
M-1326; 0.60 C, 0.75 Mn, bal Fe.
Oil or water hardening carbon steel.
Normalized (16 mm thick) 100,000-128,000 TS; 55,000 min YS; 14 min El, 241 Brin
Hardened (16 mm thick) 120,000-142,000 TS; 82,000 min YS; 11 min El.
For axles, shafts, levers, crank pins.
DIN Ck 60; Werkstoff Nr. 1.1221.

WITTEN W 66
M-1326; 0.40 C, 1.0 Si, 5.2 Cr, 1.3 Mo, 0.4 V, bal Fe.
Air or oil hardening hot work steel for pressure casting tools for light metals, extrusion rams, mandrels, trimming dies and hot shear blades.
DIN X38CrMoV51.

WITTEN W 66 SPECIAL.
M-1326; 0.40 C, 1.0 Si, 5.2 Cr, 1.3 Mo, 1.0 V, bal Fe.
Air or oil hardenable to 48-54 Rock C.
Q + Temp 600° C: 225,000-240,000 psi TS.
Hot work tool steel for ejector pins, die casting dies, pressure casting models.
DIN X40CrMoV51; AISI H 13.

WITTEN W 77.
M-1326; 0.35 C, 1.0 Si, 5.2 Cr, 1.5 Mo, 0.3 V, 1.3 W, bal Fe
Air or oil hardening hot work steel for light metal extrusion dies, forging press dies, trimming tools and hot shear blades.
DIN X37CrMoW51.

WITTEN W 88 A
M-1326; 0.30 C, 2.4 Cr, 0.6 V, 4.3 W, bal Fe.
Oil hardenable to 46-50 Rock C.
For upsetting tools, hot shear blades, ram noses and pressure discs
DIN X30WCrV53

WITTEN W 99
M-1326; 0.30 C, 2.6 Cr, 0.4 V, 8.5 W, bal Fe.
Air or oil hardenable to 46-51 Rock C.
Q + Temp 600° C: 170,000 psi TS approximately.
For hot work extrusion dies or die casting dies, die inserts and trimming dies.
DIN X30WCrV93

WITTEN W1B
M-1326; 1.2 C, 0.2 Cr, 1.0 W, bal Fe.
Water hardening tool steel, for drills, boring tools, and other cutting tools

WITTEN W1B 100
M-1326; 1.2 C, 0.2 Cr, 0.1 V, 1.0 W, bal Fe.
Water hardenable to 62-65 Rock C.
For twist drills, pointed drills, taps, thread cutting dies
DIN 120WV4.

WITTEN W1W7
M-1326; 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated: 175,000 TS; 130,000 YS; 12 El; 37 RA; 355 Brin
For springs, tools, rails, hammers, axes, cutters; Type W1, water hardened.

WITTEN W1W8
M-1326; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe
Heat treated 190,000 TS; 145,000 YS; 10 El; 30 RA, 400 Brin.
For springs, tools, drills, taps, hobs, reamers, Type W1, water hardened.

WITTEN W1W 9.
M-1326; 1.0 C, 0.2 Si, 0.2 Mn, bal Fe
Water hardening tool steel, hardenable to high hardness and strength. For shears, punching and trimming dies, cutters.

WITTEN W1W 10.
M-1326; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 105,000 TS; 55,000 YS; 20 El; 40 RA; 210 Brin
For springs, cutters, drills, taps, reamers, hobs; Type W1; water hardened.

WITTEN W1Z 7.
M-1326; 0.70 C, 0.25 Si, 0.30 Mn, bal Fe.
Water hardening tool steel for drop forging dies, swaging dies, riveting sets, shear blades, knife blades, scissors, wood working tools.
AISI W1

WITTEN WIZ 8.
M-1326; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated 190,000 TS; 145,000 YS; 12 El; 35 RA; 390 Brin.
For springs, tools, taps, drills, reamers; Type W1; water hardened.

WITTEN WIZ 9.
M-1326; 1.0 C, 0.25 max Mn, 0.25 max Si, bal Fe.
Annealed: 100,000 TS; 53,000 YS; 20 El; 42 RA; 200 Brin.
For springs, tools, taps, drills; Type W1; water hardened.

WITTEN WIZ 11.
M-1326; 1.15 C, 0.25 Si, 0.30 Mn, bal Fe.
Water hardenable to 60-66 Rock C.
For hand tools, woodworking tools.
DIN C110W2; AISI W 1 Tool steel.

WITTEN WIZ 11 L.
M-1326; 1.10 C, 0.25 Si, 0.25 Mn, bal Fe.
Water hardening tool steel; drill rod.
DIN C110 W2; Werkstoff Nr. 1.1654; AISI 1095.

WITTEN WIZ 12.
M-1326; 1.15 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 56,000 YS; 18 El; 40 RA; 210 Brin.
For springs, tools, reamers, broaches; Type W1; water hardened.

WITTEN WOLFRAM 184.
M-1326; 0.75 C, 4.1 Cr, 1.1 V, 18.0 W, bal Fe.
Air or oil hardenable to 63-66 Rock C.
Lathe tools, hobs, milling cutters, taps, broaches for cutting soft and medium hard materials.
DIN S18-0-1; AISI T1 high speed steel.

WITTEN WS 45.
M-1326; 0.45 C, 4.5 Cr, 0.5 Mo, 2.0 V, 4.5 W, 4.5 Co, bal Fe.
Air hardening hot work tool steel for impression and die inserts, mandrels and hot pressure die casting dies.
DIN X45CoCrWV555.

WITTEN ZR 3.
M-1326; 1.35 C, 0.3 Cr, 0.2 V, 3.3 W, bal Fe.
Water hardening tool steel; for header dies, bearings, bushings; high hardness and wear resistance.

WITTEN ZR 5.
M-1326; 1.30 C, 4.75 W, bal Fe.
Water hardening tool steel; for drawing and header dies, high hardness and wear resistance.

WITTEN ZW.
M-1326; 1.35 C, 0.3 Cr, 0.1 V, bal Fe.
Water hardening tool steel; high hardness; for engraving tools.

WIZARD.
M-289; 0.45 C, 0.3 Mn, 0.9 Cr, 1 W, 0.2 Mo, bal Fe.
For pneumatic tools, hand chisels, punches, crimpers; shock resistant, oil or water hardened.

WIZARD.
M-498; C, alloy, bal Fe.
For high speed tools; high speed steel.

WIZARD.
M-783, 0.45 C, 0.8 Cr, 0.85 W, bal Fe.
For pneumatic chisels, shock tools; tough.

WKE-4, see FAGERSTA WKE-4.

WKL.
M-459; 1.0 C, 1.5 Cr, bal Fe.
For cutting tools, bearings; water hardened.

W.K.Z. HOT WORK.
M-363; 0.3 C, 9.5 W, 2.8 Cr, 4 V, bal Fe.
For hot work tools, dies; hot work steel.
AISI H 21.

WM 80F.
German; 80 Sn, 11 Sb, 9 Cu.
For bearings; anti-friction.

WM 559.
M-459; 0.45 C, 1.5 Cr, 0.5 Mo, 0.8 V, 0.5 W, bal Fe.
For screw dies, hot work tools; hot work steel, oil hardened.

W.M. 802.
M-1177; 80 Sn, 12 Sb, 6 Cu, 2 Pb.
For bearings; white metal.

W.M. 810.
M-1177; 80 Sn, 10 Sb, 10 Cu.
For bearings; white metal.

W.M. 855.
M-1177; 85 Sn, 10 Sb, 5 Cu, 0.35 max Pb.
For bearings; white metal.

W.M. 903.
M-1177; 90 Sn, 7 Sb, 3 Cu, 0.35 max Pb.
For bearings; white metal.

W.M. 1735.
M-1177; 10 Sn, 15 Sb, 1.5 Cu, 73.5 Pb.
For bearings; white metal.

WMD.
M-1701; 0.33 C, 0.3 Mn, 0.3 Si, 2.9 Cr, 0.5 V, 2.9 Mo, bal Fe.
Oil or air hardening hot work tool steel.

WMD. EXTRA.
M-1701; 0.33 C, 0.3 Mn, 0.3 Si, 2.9 Cr, 0.5 V, 2.9 Mo, 3.0 Co, bal Fe.
Air or oil hardening hot work tool steel.

W.M.S.
M-499; 0.4 C, 1.5 Ni, bal Fe.
Annealed: 74,000 TS; 27 El; 50 RA.
Hot treated: 100,000 TS; 27 El; 60 RA.
For car axles; shock resisting.

WNS
M-1113; 0.95 C, 1.2 Mn, 0.5 W, 0.5 Cr, bal Fe.
For tools, dies; non-deforming.

WOCO.
M-24; 0.45 C, 1.5 Cr, 2.25 W, 0.25 V, bal Fe.
For hot work dies; hot work steel.

WOCO.
M-334; 0.45 C, 1.5 Cr, 2.25 W, 0.25 V, bal Fe.
For crimpers, upsetters, heading tools; oil hardened.

WODURIT.
M-1331; 1.42 C, W, V, bal Fe.
For blanking and forming dies, punches; oil hardened, wear resistant.

WOLFF CC5.
M-1340; 1.1 C, 0.4 Cr, 0.3 Mn, bal Fe.
For bearings, liners, sleeves, cutters; water hardened, wear resistant.

WOLFF CC16
M-1340; 1.0 C, 0.35 Mn, 1.55 Cr, 0.3 Si, bal Fe.
For bearings, liners, bushings; water or oil hardened, wear resistant.

WOLFF CM SPEZIAL.
M-1340; 0.45 C, 0.7 Mn, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, tough.

WOLFF CMV12.
M-1340; 0.50 C, 0.95 Mn, 1.05 Cr, 0.1 V, bal Fe.
For gears, springs, bolts, shafts; oil hardened, shock resistant.

WOLFF CR-08.
M-1340; 0.90 C, 0.25 Si, 0.30 Mn, 0.80 Cr, bal Fe.
For bearings, liners, bushings; water hardened, wear resistant.

WOLFF CR-10.
M-1340; 1.05 C, 0.25 Si, 0.30 Mn, 1.2 Cr, bal Fe.
For bearings, liners, bushings; water hardened, wear resistant.

WOLFF CR-12.
M-1340; 2.1 C, 11.5 Cr, 0.35 Si, 0.30 Mn, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

WOLFF CSC 12.
M-1340; 1.25 C, 1.15 Si, 0.70 Mn, 1.2 Cr, bal Fe.
For bearings, bushings, liners, sleeves; water hardened.

WOLFF CV 60.
M-1340; 0.55 C, 0.10-0.40 Si, 0.50-0.70 Mn, bal Fe.
For gears, pinions, machine tool parts; water hardened.

WOLFF EC 15.
M-1340; 0.15 C, 0.25 Si, 0.25 Mn, bal Fe.
Annealed: 70,000 TS; 40,000 YS; 25 El; 60 RA; 145 Brin
For gears, bolts, machine tool parts; case hardened.

WOLFF EW.
M-1340; 0.15 C, 0.15-0.35 Si, 0.25-0.50 Mn, bal Fe.
For gears, pinions, machine tool parts; case hardened.

WOLFF EXTRA HART.
M-1340, 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
For drills, taps, reamers, broaches, springs; Type W1, water hardened.

WOLFF EXTRA ZAH.
M-1340; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA, 400 Brin.
For springs, tools, drills, taps; Type W1; water hardened.

WOLFF MCVII.
M-1340, 0.58 C, 1.0 Cr, 0.09 V, 0.95 Mn, bal Fe.
For springs, gears, bolts, shafts; oil hardened, shock resistant

WOLFF MS 10
M-1340; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
For punches, crimpers, bolts, gears; water hardened.

WOLFF MS 15.
M-1340; 0.70 C, 1.7 Si, 0.70 Mn, bal Fe.
For springs, oil hardened.

WOLFF SCRV 15.
M-1340; 0.45 C, Si, Cr, V, bal Fe.
For springs, gears, bolts, shafts; oil hardened, shock resistant.

WOLFF SVC 13H.
M-1340; 0.61 C, 1.18 Cr, 0.10 V, 0.75 Mn, bal Fe.
For springs, crankshafts, punches; oil hardened, shock resistant.

WOLFRAM.
M-275; 0.58 C, 18 W, 4 Cr, 1 V, bal Fe.
For punches, shear blades, hot forming and brass extrusion dies.
Type H26 hot work tool steel.

WOLFRAM.
M-1406; 0.55 C, 2.75 W, 1.25 Cr, 0.25 V, bal Fe.
For hot stamping dies; shock resistant, oil hardened.

WOLFRAM 184.
M-1326; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers; high speed steel.

WOLFRAMANT.
M-459; 0.7 C, 18 W, 4 Cr, 1 V, 5 Co, bal Fe.
For cutters, fluters, hobs; high speed steel.

WOLFRAMANT.
M-1246; WC, Co.
For inserts for boring crowns; sintered carbides.

WOLFRAMANT.
M-1340; 1.42 C, W, V, bal Fe.
For engraving tools, fast finishing cutters; Type W2; water hardened.

WOLFRAMINIUM.
98 Al, 1.4 Sb, 0.36 Cu, 1.0 Sn, 0.05 W.
Cast: 20,000 TS; 6 El
Rolled: 48,000 TS; 6 El.
Annealed: 24,000 TS; 16 El.
For motor car body work; non-tarnishing.

WOLFRAM LOW CARBON
M-275; 0.50 C, 4 Cr, 1 V, 18 W, bal Fe.
For drills, reamers, taps, broaches, end mills; Type H26; high speed steel.

WOLFRAMSTAHL EXTRA SPEZIAL.
M-1310; 1.42 C, W, V, bal Fe.
For engravers' tools, cutters, blanking dies; oil hardened, wear resistant

WOLVA
M-73; 0.9 C, 0.9 W, 0.2 Cr, bal Fe
For punches, dies, reamers; water hardened.

WOLVERINE ALLOY 01.
M-1521; 99.9 Cu, 0.025 P.
Ann: 34,000 TS; 45 El.
Ductile copper with good corrosion resistance; used in air conditioners, plumbing tube, and heat heat exchanger tubes

WOLVERINE ALLOY 02
M-1521; 99.4 Cu, 0.3 As, 0.025 P.
Ann: 34,000 TS, 45 El.
For heat exchanger applications

WOLVERINE ALLOY 07.
M-1521; 99.9 Cu, 0.007 P.
Ann: 34,000 TS, 45 El.
High conductivity copper for electrical conductivity applications such as waveguide and bus tube.

WOLVERINE ALLOY 08
M-1521; 98.7 Cu, 0.025 P, 1.0 Fe
Ann: 40,000 TS, 40 El.
For air conditioners, plumbing tube and heat exchangers

WOLVERINE ALLOY 21.
M-1521; 66.0 Cu, 0.5 Pb, bal Zn.
Cold drawn: 68,000 TS; 29 El.
Improved machinable brass used in plumbing brass goods, pump cylinders.

WOLVERINE ALLOY 22.
M-1521; 66.5 Cu, 1.5 Pb, 32.0 Zn.
Ann: 52,000 TS; 50 El.
Hard drawn: 75,000 TS, 7 El.
For applications requiring extensive machining; free cutting material.

WOLVERINE ALLOY 24.
M-1521; 70 Cu, 30 Zn.
Ann: 52,000 TS; 55 El.
Hard drawn: 78,000 TS; 8 El.
Highly ductile brass for miscellaneous fabrications; plumbing brass goods and pump cylinders.

WOLVERINE ALLOY 26
M-1521; 71 Cu, 28 Zn, 1 Sn, As, Sb or P= 0.02.
Ann: 53,000 TS; 65 El.
Used as heat exchanger tube for steam condensers in circulating sea water or brackish water.

WOLVERINE ALLOY 28.
M-1521; 85 Cu, 15 Zn.
Ann: 44,000 TS; 45 El.
Condenser and heat exchanger alloy for use in fresh waters, water pipe.

WOLVERINE ALLOY 29.
M-1521; 90 Cu, 10 Zn.
Ann: 38,000 TS; 50 El.
Drawn: 52,000 TS; 20 El.
For use in rotating bands, marine hardware.

WOLVERINE ALLOY 30.
M-1521; 76 Cu, 22 Zn, 2 Al, As or P = 0.05%.
Ann: 60,000 TS; 55 El.
For condenser and heat exchanger applications in sea water; resistant to impingement attack.

WOLVERINE ALLOY 32.
M-1521; 95 Cu, 5 Al, 0.02 As.
Ann: 52,000 TS; 60 El.
For condenser and heat exchanger tube applications, especially in sea water, brackish waters and polluted sea waters.

WOLVERINE ALLOY 40.
M-1521; 99.0 min Al, 0.4 Fe, 0.15 Si, 0.1 Cu.
O Temper: 13,000 TS; 45 El.
H-18: 24,000 TS; 15 El.
For refrigeration tube.

WOLVERINE ALLOY 41.
M-1521; 97.0 min Al, 1.25 Mn, 0.5 Fe, 0.3 Si
O Temper: 16,000 TS; 40 El.
H-18: 29,000 TS; 10 El.
Air conditioning and refrigeration tubing, condensers and heat exchangers in sulphur dioxide and hydrogen sulphide environments.

WOLVERINE ALLOY 42.
M-1521; 0.4 Si + Fe, 2.5 Mg, .25 Cr, bal Al.
O Temper: 28,000 TS; 30 El.
Good fatigue resistance; hydraulic lines.

WOLVERINE ALLOY 43.
M-1521; 0.8 Mg, 0.5 Si, 0 25 Fe, bal Al.
O Temper: 13,000 TS.
T6 Temper: 35,000 TS; 12 El.
Heat treatable high strength alloy used for furniture tube.

WOLVERINE ALLOY 44.
M-1521; 99.45 min Al.
O Temper: 12,000 TS; 35 El.
H-19 Temper: 27,000 TS; 5 El.
For electrical connectors and bus tubing.

WOLVERINE ALLOY 45.
M-1521; 0.68 Si, 0.11 Mn, 1.1 Mg, 0.3 Cu, 0.2 Cr, bal Al.
O Temper. 18,000 TS; 25 El.
T6 Temper: 45,000 TS; 12 El.
Heat treatable alloy, high strength structural applications.

WOLVERINE ALLOY 51.
M-1521; 68.7 Cu, 30.0 Ni, 0.7 Mn, 0.5 Fe.
Ann: 60,000 TS; 45 El.
Condenser and heat exchanger tube alloy in sea or brackish waters, resistant to impingement attack.

WOLVERINE ALLOY 52.
M-1521; 64 0 Ni, 1.0 Mn, 1.0 Fe, 34.0 Cu.
Ann: 78,000 TS; 43 El.
Heat exchanger tube alloy having high strength and overall excellent corrosion resistance.
Also known by Trade Name "Cu-Nel".

WOLVERINE ALLOY 53.
M-1521; 89 Cu, 10 Ni, 1 Fe.
Ann: 44,000 TS; 42 El.
Condenser and heat exchanger tube alloy in sea or brackish waters, resistant to impingement attack.

WOMPCO.
M-463; 0.90 combined C, 2 90 total C, 0.115 S, 0.74 Mn, 2.01 Si, bal Fe.
39,600-50,000 TS; 0 El; 0 RA; 213-230 Brin.
For cast iron castings, cylinders, gears; cast iron; S.S. 55000.

WONICO.
U.S.; 80 W, 13 Ni, 5 Co.
For alloy for sealing in glass; coefficient of expansion 55 x 10^{-7}.

WOOD BAND SAW
M-38; 0.7 C, 2 Cr, bal Fe.
For wood band saws; water or oil hardening.

WOOD FUSIBLE ALLOY-1.
U.S.; 50 Bi, 12.5 Sn, 25 Pb, 12.5 Cd.
For safety plugs, fuses; M.P. 71°C.

WOOD FUSIBLE ALLOY-2
U.S.; 52 5 Bi, 31 5 Pb, 16 Sn.
For safety plugs fuses, M P. 98°C.

WOOD SAW
M-357; 0 75 C, 0 7 Ni, 0 2 Cr, bal Fe.
For saws for wood

WORKWEAR #14
M-1422; C, 14 Mn, bal Fe.
Plate: 145,000-155,000 TS; 73-75 El; 54-56 RA; 200 Brin as rolled, over 500 Brin, as work hardened.
For chute liners, crushers, shovel and dragline buckets, quarry and mine skips
Austenitic, wear and abrasion resistant, shock and impact resistant

WORTHITE.
M-463; 24 Ni, 20 Cr, 3 Mo, 0 07 max C, 3.5 Si, 1 Mn, bal Fe
Cast: 75,000 TS; 30,000 YS; 35 El; 40 RA; 140 Brin
Rolled: 85,000 TS; 40,000 YS; 35 El; 45 RA; 140 Brin.
For pumps, valves, acid and alkali resisting castings; resists H_2SO_4 and weak HC1

WORTLE DIE
M-38; 1.2-1.3 C, 2.5-3 5 W, 0.50-0 75 Mn, bal Fe
For drawing dies; oil hardened

WORTLE DIE.
M 355, 1.2 C, 3 W, 0 6 Mn, bal Fe.
For tools, dies; oil hardening.

WORTLE DIE NO 1.
M-38; 2 1 C, 1.9 Cr, 4 3 W, bal Fe.
For cold drawing dies; oil hardening

WORTLE DIE NO 4
M-38; 2 1 C, 3.2 W, bal Fe.
For cold drawing dies; for hard abrasive metals.

WORTLE DIE NO 5.
M-38; 2.0 C, 2 Mn, 2 Cr, 12 W, bal Fe.
For cold drawing dies; for abrasive metals.

WORTLE DRAWING DIE.
M-38; C, alloy, bal Fe
For tools, drawing dies; oil hardened.

WOTAN AKS-98.
M-1313; Al, bal Cu.
20°C: 71,100 TS; 34,100 YS; 44 El.
At 600°C: 8500 TS; 2850 YS; 2 El.
For autoclaves, chemical equipment, pumps, valves; Al-bronze, corrosion resistant, tough

WOTAN COBALT 3.
M-1287; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, broaches, drills; high speed steel; 91WCoV3811.

WOTAN COBALT 5.
M-1287; 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.5 V, 18 W, bal Fe.
For reamers, hobs, drills, taps, broaches; high speed steel; 79WCo7419.

WOTAN COBALT 10.
M-1287; 0.76 C, 10 Co, 4 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, taps, reamers, hobs; high speed steel; 76WCoV7240

WOTAN COBALT 513.
M-1287; 0.80 C, Cr, Co, W, V, Mo, bal Fe.
For lathe and planer tools, taps, reamers, hobs; high speed steel, 80WCoCrVMo50.22.

WOTAN DRILLING.
M-1287; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For reamers, drills, lathe and planer tools, broaches; high speed steel; 130WV3838.

WOTAN DRILLING CO.
M-1287, 1.35 C, Cr, W, V, bal Fe
For cutters, form tools; high speed steel, 135WCo4619

WOTAN EXTRA F
M-1287; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, drills, hobs, reamers; high speed steel; 74WV74.

WOTAN III/3
M-1287, 0.95 C, 4 Cr, 1 V, Mo, W, bal Fe.
For lathe and planer tools, reamers, hobs, taps; high speed steel, 95WMo1126.

WOTAN II LING.
M-1287; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe
For lathe and planer tools, reamers, drills, hobs; high speed steel, 82WV3419.

WOTAN Mo 5
M-1287; 0.85 C, Cr, W, Mo, bal Fe.
For lathe and planer tools, hobs, broaches, taps; high speed steel; 82WV3419.

WOTAN Mo 5 CO.
M-1287; C, Cr, W, Mo, V, bal Fe
For cutters, hobs, broaches, drills; high speed steel.

WOTAN Mo 5 V 3.
M-1287; C, Cr, W, Mo, V, bal Fe.
For cutters, hobs, broaches, drills; high speed steel.

WOTAN Mo 9.
M-1287; C, Cr, W, Mo, V, bal Fe.
For cutters, hobs, broaches, drills, high speed steel.

WOTAN ZWILLING.
M-1287; 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, broaches, reamers, hobs, taps; high speed steel; 86WV3826.

WRM ALLOY A-5.
M-1426; 65 Cu, 5 Ni, bal Zn.
For hardware, trim, fasteners; nickel silver.

WRM ALLOY A-10.
M-1426; 66 Cu, 10 Ni, 24 Zn.
Annealed: 49,000 TS; 18,000 YS; 49 El; 63 Brin.
Hard: 86,000 TS; 75,000 YS; 4 El; 180 Brin.
For rivets, screws, fasteners, optical parts; ASTM-B122 alloy 3; nickel silver.

WRM ALLOY A-12.
M-1426; 65 Cu, 12 Ni, 23 Zn.
Annealed: 48,000 TS; 17,000 YS; 62 El; 114 Brin.
Hard: 105,000 TS; 101,000 YS; 2 El; 210 Brin.
For hollowware, screen cloth, tableware, camera parts; nickel silver; ASTM-B151 alloy D.

WRM ALLOY A-15.
M-1426; 65 Cu, 15 Ni, 20 Zn.
Annealed: 53,000 TS; 18,000 YS; 43 El; 63 Brin.
Hard: 85,000 TS; 75,000 YS; 3 El; 172 Brin.
For optical goods, camera parts, jewelry; nickel silver, corrosion resistant.

WRM ALLOY A-18.
M-1426; 65 Cu, 18 Ni, 17 Zn.
For hardware, flatware; nickel silver; ASTM-B122 alloy 2.

WRM ALLOY B-12-S.
M-1426; 56.5 Cu, 12 Ni, 31.5 Zn.
For hardware, flatware, fasteners; nickel silver; ASTM B122 alloy 8.

WRM ALLOY B-18-S.
M-1426; 55 Cu, 18 Ni, 27 Zn.
Annealed: 60,000 TS; 27,000 YS; 40 El; 100 Brin.
Hard: 100,000 TS; 85,000 YS, 3 El; 190 Brin.
For switches, springs, hardware; nickel silver; ASTM-B122 alloy 4.

WRM ALLOY K-8.
M-1426, 65 Cu, 8 Ni, 25 Zn, 2 Pb.
For keys; leaded nickel silver, free-cutting.

WRM ALLOY K-12.
M-1426; 65 Cu, 12 Ni, 21 Zn, 2 Pb.
For hardware, flatware, fasteners; leaded nickel silver, free-cutting.

WROUGHT IRON 4D.
M-292; 0.02 C, 2.5 silicates, 0.02 S, 0.12 P, 0.06 Mn, 0.12 Si, bal Fe.
Rolled 48,000 TS; 27,000 YS; 14 El; 97-105 Brin.
For condensers, fasteners, tanks, heaters; easy to work

WS1 EX.
M-459; 1.2 C, 0.1 V, 1 W, bal Fe.
For cutting tools; water hardened.

WSCR
M-459; 0.67 C, 1.3 Si, 0.50 Mn, 0.50 Cr, bal Fe.
For springs, chisels, punches; oil hardened, shock resistant

W.T.
M-73; 1.25 C, 1.5 W, 0.4 Cr, 0.3 Mo, bal Fe
For taps, drills, reamers, oil hardened.

W TAP.
M-73; C, W, bal Fe.
For tools, taps, oil hardening

WT DRILL ROD.
M-73; 1.23 C, 1.27 W, 0.4 Cr, 0.3 V, bal Fe.
For drill rod, tools; oil hardening.

WUEST NO 1.
50 Zn, 30 Al, 20 Cu.
For aluminum solder.

WUEST NO. 2.
65 Zn, 20 Al, 15 Cu.
For aluminum solder.

WUNDUS.
M-618; 0.7 C, 6 Co, 22 W, bal Fe.
For milling cutters, twist drills, turning, planing, shaping and slotting tools; for cutting hardest metals

WW-1.
M-1259; Cu alloy.
65,000 TS; 60,000 YS; 20 El; 60 RA; 125 Brin.
For resistance welding electrode; 85% conductivity, for coated metals.

WW-1W3.
M-1259; Cu-W.
Bars: 135,000 TS; 130 Brin.
For resistance welding electrode; 35% conductivity, for stainless steel and brass.

WW-2.
M-1259; Cr, bal Fe.
Cast: 50,000 TS; 35,000 YS; 15 El; 50 RA; 116 Brin.
Rolled: 75,000 TS; 65,000 YS; 15 El; 50 RA; 150 Brin.
For elect. contacts, resistance welding electrode; 75% conductivity, for carbon steel and brass

WW-3.
M-1259; Co, Be, bal Cu.
Rolled: 110,000 TS; 100,000 YS; 10 El; 210 Brin.
Cast: 95,000 TS; 65,000 YS; 6 El; 210 Brin.
For resistance welding electrode; 50% conductivity, for stainless steel.

WW-5.
M-1259, Cu-alloy
Cast: 80,000 TS; 10 El; 185 Brin.
Rolled: 100,000 TS; 20 El; 210 Brin.
For flash welding dies, bushings, structural parts, 45% conductivity; good strength

WW-6.
M-1259; Cu alloy.
Rolled: 115,000 TS; 95,000 YS; 10 El; 10 RA; 210 Brin.
For resisting welding wheels, dies, electrodes; for stainless steel.

WW-7.
M-1259; Be, Co, bal Fe
Cast: 110,000 TS; 60,000 YS; 2 El; 380 Brin.
Rolled: 195,000 TS; 170,000 YS; 4 El; 380 Brin
For resistance welding electrode; corrosion and abrasion resistant.

WW-8.
M-1259; Cu alloy.
Cast: 65,000-75,000 TS; 12,000-16,000 YS; 10-2 El; 116-165 Brin.
For resistance welding electrode.

WW-10W3.
M-1259; 23 Cu, 77 W.
Bars: 160,000 TS; 205 Brin.
For resistance welding electrode; 28% conductivity, for inserts and facings.

WW-20W3.
M-1259; Cu-W.
Bars: 170,000 TS; 228 Brin.
For resistance welding electrode; 27% conductivity, for heavy projection welds.

WW-100W.
M-1259; Cu-W.
Bars: 200,000 TS; Rockwell A76.
For resistance welding electrode; 30% conductivity, for Red Brass and Cu.

WW105F.
M-1259; 5 Al, 1.5 Fe, bal Cu.
Forged: 60,000 TS; 25,000 YS; 38 El; 100 Brin.
For machine tool slides, gibs, wear strips; corrosion and wear resistant.

WW110F.
M-1259; 7 Al, 2 Fe, bal Cu.
Forged: 70,000 TS; 32,000 YS; 30 El; 110 Brin.
For machine tool parts, liners, wear plates; corrosion resistant, Al-bronze.

WW-120.
M-1259; 9.5-10.5 Al, 1.5 Fe, bal Cu.
Rolled: 70,000 TS; 40,000 YS; 12 El; 14 RA; 120 Brin.
For pickling equipment, gears; Al-bronze, corrosion resistant.

WW-125.
M-1259, 88 Cu, 9 Al, 3 Fe.
Cast 80,000 TS; 29,000 YS; 25 El; 25 RA; 125 Brin
For bushings, bearings, sleeves; corrosion and wear resistant.

WW140F.
M-1259; 9 Al, 3 Fe, bal Cu.
Forged: 85,000 TS; 40,000 YS; 20 El; 140 Brin.
For gears, worm wheels, good weldability, corrosion resistant.

WW-150
M-1259; 86.2 Cu, 10.1 Al, 3.4 Fe, 0.3 special elements
Cast: 80,000 TS, 35,000 YS, 22 El; 20 RA, 150 Brin
For bushings, gears, slides, liners; corrosion and shock resistant, Al-bronze.

WW-175
M-1259; 85.2 Cu, 10.8 Al, 3.7 Fe, 0.3 special elements
Rolled: 90,000 TS; 35,000 YS; 12 El, 8 RA, 175 Brin.
Heat treated: 95,000 TS, 43,000 YS, 12 El; 12 RA; 190 Brin.
For gears, aircraft parts, bushings, acid equipment; Al bronze, shock and corrosion resistant

WW175A
M-1259; 10.5 Al, 4 Fe, bal Cu
Cast: 85,000 TS; 32,000 YS; 16 El; 175 Brin.
For bearings, gears, worm wheels, shifter forks, Al-bronze, wear and shock resistant.

WW175B.
M-1259, 10.5 Al, 4 Fe, bal Cu
Cast: 90,000 TS; 50,000 YS; 4 El; 220 Brin
For bushings, bearings; Al-bronze, wear and shock resistant

WW-190
M-1259, 12 Al, bal Cu
Cast: 70,000 TS; 45,000 YS; 3 El; 190 Brin.
For welding dies and welder jaws; good arc resistance characteristics.

WW-200
M-1259; 12 Al, 4.1 Fe, 0.4 special elements, bal Cu
Cast: 82,000 TS, 37,000 YS; 3 El; 200 Brin.
Heat treated: 95,000 TS, 40,000 YS; 5 El; 210 Brin.
For cams, gibs, slides, forming rolls; Al-bronze, corrosion and wear resistant.

WW-230.
M-1259; 10.5-11.5 Al, 4-5 Fe, 4-5 Ni, bal Cu.
Cast: 100,000 TS; 50,000 YS; 8 El; 230 Brin.
Heat treated: 105,000 TS; 60,000 YS; 10 El; 240 Brin.
For heavy duty wear parts, gears; Al-bronze, corrosion and wear resistant.

WW-275.
M-1259; 13 Al, 4.5 Fe, 0.5 special elements, bal Cu.
Cast: 80,000 TS; 55,000 YS; 1.5 El; 275 Brin.
For forming dies, die inserts, wear strips; corrosion and abrasion resistant.

WW-325.
M-1259; 81 Cu, 14 Al, 5 Fe.
Cast: 85,000 TS; 65,000 YS; 0.5 El; 325 Brin.
For cams, forming and drawing dies; corrosion and abrasion resistant.

WW-375.
M-1259; 14.5-15.5 Al, 4.5-5.5 special elements, bal Cu.
Cast: 80,000 TS; 60,000 YS; 375 Brin.
For forming and drawing dies; C.S 225,000.

W.W. HOT WORK.
M-115; 0.32 C, 0.35 Mn, 12 Cr, 12 W, 1.05 V, 0.5 Si, bal Fe.
For hot work and extrusion dies; for Al die casting dies; oil hardening; AISI H 23.

WYCKOFF 12L14X.
M-629, 0.09 max C, 0.85-1.15 Mn, 0.04-0.09 P, 0.26-0.35 S, 0.15-0.35 Pb, 0.035 min Te, bal Fe.
Cold Drawn· 75,000 TS; 56,000 YS; 15 El; 45 RA; 156 Brinell
For gears, shafts, hardware, bolts, fasteners.
Free-cutting, case-hardening steel.

WYCKOFF 1215.
M-629; 0.09 max C, 0.75-1.05 Mn, 0.04-0.09 P, 0.26-0.35 S, bal Fe.
Cold Drawn: 79,000 TS; 61,000 YS, 10 El; 35 RA; 167 Brin
For gears, shafts, hardware, bolts, fasteners.
Free-cutting Case hardening.

WYCKOFF WXB-1
M-629; 0.08-0.13 C, 0.80-0.90 Mn, 0.08-0.13 S, 0.07-0.12 P, bal Fe.
For nails, screws, machinery parts, screw machine products; B 1111 Steel; cold drawn, free-cutting.

WYCKOFF WXB-2
M-629; 0.13 max C, 0.70-1.00 Mn, 0.07-0.12 P, 0.16-0.23 S, bal Fe.
For screw machine products; B 1112 Steel; cold drawn, free-cutting

WYCKOFF WXB-3
M-629; 0.13 max C, 0.70-1.00 Mn, 0.07-0.12 P, 0.24-0.33 S, bal Fe.
For screw machine products; B 1113 Steel; cold drawn, free-cutting.

WYCLIFFE BLACK HEART MALLEABLE IRON.
M-752; Meets British Standard B.S. 310/1958, Grade B 22/14.
Castings for agriculture, automobile, ship-building, textile, commercial vehicle.

WYCO 100-44.
M-629; 0.40-0.48 C, 1.35-1.65 Mn, 0.04 max P, 0.24-0.33 S, bal Fe.
Cold Drawn· 125,000 TS; 100,000 min YS; 12 El; Rock C 25.
For gears, shafts, hardware, bolts, fasteners.
Free-cutting, oil or water hardening.

WYCO 100-50.
M-629; 0.48-0.55 C, 0.6-0.9 Mn, 0.04 max P, 0.05 max S, bal Fe.
Cold Drawn: 125,000 TS; 100,000 min YS; 11 El; C 25 Rock.
For gears, crankshafts, machinery parts, bolts, fasteners, hardware.
Oil or water hardening.

WYCO 125-44.
M-629; 0.40-0.48 C, 1.35-1.65 Mn, 0.24-0.33 S, bal Fe.
Cold Drawn: 140,000 min TS; 125,000 min YS; 5 El; 15 RA; C 30 Rock.
For gears, crankshafts, bolts, fasteners, hardware.
Free machining, water or oil hardening.

WYCO COLD FINISHED STEEL.
M-629; 0.3 C, 0.5 Ni, bal Fe.
For cold drawn steel products, machine tool parts; superior surface and machinability.

WYNDALOY.
M-1064; 60 Cu, 20 Ni, 20 Mn.
Hardened: 200,000 TS; 170,000 YS; 475 Brin.
Annealed: 98,000 TS; 80,000 YS; 140 Brin.
For valves, pistons, pump rods, screws, bolts, nuts, corrosion resistant, hardenable, non-magnetic.

WYNITE HIGH DUTY Ni-Cr CAST IRON.
M-752; Meets British Standard BS 1452. Grade 14 or Grade 17.
Cast: 16/18 tons/sq.in.TS.
For pumps, jigs.

WZ-1.
M-1197; TiC.
For gas turbine parts, jet engine and nuclear power plants; sintered, high heat resistant.

WZ-1B.
M-1197, M-1246; 60 TiC, 32 Ni, 8 Cr
For gas turbines, jet engines, nuclear power plants; sintered, oxidation resistant

WZ-1C.
M-1246; 50 TiC, 40 Ni, 10 Cr.
For gas turbine blades; sintered, oxidation resistant.

WZ-1D
M-1246; 35 TiC, 52 Ni, 13 Cr.
For high temperature applications; sintered cermet.

WZ-2.
M-1246; 60 TiC, 28 Co, 12 Cr.
For gas turbine blades; sintered, oxidation resistant.

WZ3.
Austria; 50 TiC, 10 TaC, 32 Ni, 8 Cr.
Sintered: 1070 Vickers.
For jet engine components; sintered carbides.

WZ-12A
M-1246; 75 Ti, 1.5 Ni, 5 Co, 5 Cr.
For gas turbine blades; sintered, oxidation resistant.

WZ-12B.
M-1197, M-1246; 60 TiC, 24 Ni, 8 Co, 8 Cr.
For gas turbines, jet engines, nuclear power plants; sintered, oxidation resistant.

WZ-12C.
M-1197, M-1246; 50 TiC, 30 Ni, 10 Co, 10 Cr.
For gas turbines, jet engines, nuclear power plants; sintered, oxidation resistant.

X see BETHLEHEM X.

X 8 NiCoCrTi55-20-20.
M-Germany; 0.10 C, 1.5 max Si, 1 max Mn, 0.8-1.8 Al, 5 max Fe, 1.8-2.7 Ti, 18-21 Cr, 15-21 Co, bal Ni.
At 20°C: 155,000 TS; 90,000 YS; 39 El; 20 RA.
At 800°C: 78,000 TS; 57,000 YS; 7 El; 4 RA.
For jet engine and gas turbine components.
High heat, corrosion and oxidation resistant.
Nimonic 90. Heat treatable.

X 8 NiCrAlTi 75-20.
M-Germany; 0.04 C, 21 Cr, 2.5 Ti, 0.7 Al, 0.6 Mn, bal Ni.
At 20°C: 132,000 TS; 80,000 YS; 45 El; 36 RA.
At 800°C: 62,000 TS; 53,000 YS; 8 El; 10 RA.
For gas turbine blades, jet engine components.
High heat, corrosion and oxidation resistant.
Nimonic 80A. Creep resistant.

X13RG.
M-1115; 0.30 C, 12.0 Cr, 0.3 Mo, 1.0 Ni, bal Fe.
Annealed: 95,000 TS; 40,000 YS; 25 El; 55 RA, B 92 Rock.
Heat Treated: 240,000 TS; 215,000 YS; 8 El; 25 RA; C 52 Rock
For cutlery, surgical instruments, gears, knives, hardware, scissors.
Corrosion resistant, hardenable

X40CoCrNiW 45-20.
M-Germany, 0.4 C, 1.2 Mn, 20 Cr, 20 Ni, 43 Co, 4 W, 3 Fe, 4 Cb.
Ht Tr : 140,000 TS, 67,000 YS; 31 El, 300 Brin.
For turbine blades, rotors, hardware, jet engine components
High heat and oxidation resistance to 1500°F.

X-41.
0.5 C, 0.5 Mn, 25 Cr, 8 Ni, 7.5 W, 1.75 Cr, 2 B, 1 Fe, bal Co
For high temperature applications, heat resistant

X-50.
0.76 C, 0.6 Mn, 22 Cr, 20 Ni, 40 Co, 12 W, 1 Fe
For high temperature applications, heat resistant

X-76.
U.S., 0.5-2.0 Cu, 0.4-0.8 Mn, 1.4-3.0 Mg, 5-8 Zn, bal Al.
For supercharger casings, diffusers, impellers, age-hardenable.

X-ALLOY.
English; 3.6 Cu, 0.6 Mg, 0.7 Ni, 1.2 Fe, 0.7 Si, bal Al.
For pistons; cast

XALOY.
M-947; 2.5-3.25 C, 0.7-1.1 B, 0.5-1.5 Si, 0.5-1.2 Mn, 3.5-4.5 Ni, bal Fe
Cast: 30,000-45,000 TS, 640-700 Brin
For oil field accessories, rolls, liners, abrasion resisting.

XALOY 100.
M-1473; 3.5 C, B, Ni, Si, Mn, bal Fe.
For extruder and injection molding barrels, cylinder liners, pump parts; hard, wear resistant white cast iron.
Was DI-HARD.

XALOY 101.
M-1473; 3.5 C, B, Ni, Cr, Si, Mn, bal Fe.
For extruder and injection molding barrels, cylinder liners, pump parts; hard, wear resistant white cast iron

XALOY 306.
M-1473; 7 Cr, 40 Ni, B, Si, Mn, bal Co.
For extruder and injection molding barrels, cylinder liners, pump parts, wear and corrosion resistant.

XALOY 1525.
M-1473; 12 Cr, 2.5 B, 3.5 Si, Fe, Mo, Cu, W, bal Ni.
For hard surfacing, plastic processing, chemical plant and other industrial equipment; wear and corrosion resistant.

XANTAL A.
M-541; 87.2 Cu, 9 Al, 3 Fe, 0.8 Mn
Sand cast: 71,000-85,000 TS; 25-15 El.
For castings, propellers; corrosion resistant.

XANTAL B.
M-541; 81 Cu, 11 Al, 4 Fe, 4 Ni
Cast: 101,000 TS; 1-2 El
Heat treated: 114,000 TS; 2-4 El
For castings, marine hardware; corrosion resistant

XANTAL M
M-541; 89.5 Cu, 9 Al, 1.5 Ni.
Sand cast: 64,000-78,000 TS, 28-18 El.
Tough

XANTAL S
M-541, 90.4 Cu, 7.8 Al, 0.5 Ni, 0.3 Mn, 1.0 Zn.
Annealed 71,000 TS, 50 El
Forged 65,000 TS; 50 El .
For marine hardware castings, corrosion resistant.

X-A-R 15
M-766, M-1594; 0.10-0.21 C, 0.6-1.1 Mn, 0.4-0.8 Si, 0.0025 B, 0.4-0.8 Cr, 0.18-0.28 Mo, 0.05-0.15 Zr, bal Fe
Ht Tr Plate 360 Brin min, 190,000 TS; 175,000 YS, 16 El, 55 RA
For bridges, booms, dipper sticks, penstocks, chutes, wear plates, truck bodies, fan blades, floor plates.
Quenched and tempered at mill Tough
Wear and abrasion resistant

X-A-R 30
M-766, M 1594, 0.30 max C, 0.6-1.1 Mn, 0.4-0.8 Si, 0.0025 B, 0.4-0.8 Cr, 0.18-0.28 Mo, 0.05-0.15 Zr, bal Fe
Ht Tr Plate 360 min Brin, 190,000 TS, 175,000 YS, 16 El, 55 RA
For bridges, booms, dipper sticks, penstocks, chutes, wear plates, truck bodies, fan blades, floor plates
Quenched and tempered at mill Tough
Wear and abrasion resistant

X-B
M-59, 33-37 Ni, 13-17 Cr, bal Fe
Cast 64,000 TS; 36,000 YS, 5 El; 196 Brin.
For castings, furnace parts, resists heat.

XB75S
M-4, 5.1-6.1 Zn, 2.1-2.9 Mg, 1.2-2 Cu, 0.15-0.4 Cr, bal Al
O-temper 33,000 TS, 15,000 YS, 17 El, 60 Brin
T6-Temper: 82,000 TS, 72,000 YS, 11 El, 150 Brin
For aircraft parts, extrusions

XB-STEEL
M-Italy; 0.80 C, 19.5 Cr, 1.45 Ni, 2.0 Si, 0.4 Mn, bal Fe
For exhaust valves operating up to 750°C.
Heat and corrosion resistant

XC-60 STEEL
M-766, 0.26 max C, 1.3 max Mn, 0.05 max Cb, bal Fe
For gas line pipes, combines high strength and weldability

X-CEL SUPER X
M-959;
Block solder, melt range 358-424°F

XCR.
U.S. 23.75 Cr, 4.75 Ni, 1.0 max Si, 2.75 Mo, 1 Mn, 0.45 C, bal Fe.
For exhaust valves; heat resistant

XCV GRADE 140.
Eng; 1.15 C, 0.24 Mn, 0.3 Cr, 0.15 V, bal Fe.
For tools, dies, drills, taps; water hardened

X-ITE.
M-59; 1.12 Mn, 38 Ni, 18 Cr, 2.0 Si, 0.5 C, bal Fe.
65,000-75,000 TS; 53,000-56,000 YS; 2.5 El; 4.0 RA.
For furnace parts, hearth plates, skid and roller rails; heat, corrosion and abrasion resistant.

X-ITE Cb.
M-59, 0.35-0.75 C, 17-21 Cr, 37-41 Ni, Cb, bal Fe.
Cast: 70,000 TS, 40,000 YS, 10 El, 180 Brin.
For furnace parts, heat treating boxes, salt pots, retorts, burners.
Heat and corrosion resistant

XL CHISEL
M-73, 0.55 C, 2.1 W, 1.5 Cr, 0.2 V, bal Fe.
For chisels, punches, oil hardening.

XLO
M-435; 0.6 C, 0.75 Cr, 0.3 Mo, 1.75 Ni, bal Fe
For drop forge die blocks; oil hardening

XL-STEEL
M-73; 0.45 C, 0.20 Si, 2.25 W, 1.30 Cr, 0.25 V, bal Fe
For chisel steel, pneumatic hammers, shock tools, heavy duty, tough.

X-SUPERMAL.
M-170, 1-1.6 T.C., 1.1-1.3 Si, 0.3 Mn, bal Fe
Heat treated: 60,000-70,000 TS; 50,000-60,000 YS, 8-6 El, 179-201 Brin
For chainlinks, buckets, conveyor equipment, wear resistant

XTRA TOUGH see DARWIN EXTRA TOUGH

XTROCUT-250
M-240, 0.09 max C, 0.75-1.05 Mn, 0.04-0.09 P, 0.26-0.35 S, bal Fe
Extruded Hot 60,000 TS, 40,000 YS, 30 El; B 65-75 Rock
Extruded Cold Drawn: 85,000 TS, 75,000 YS, 15 El, B 90-100 Rock
For rings, couplings, rolls, sleeves
Free machining tubing

X WIPING SOLDER
M-959, 40 Sn, bal Pb
Block solder, for plumbers, wiping solder

XX see BETHLEHEM XX

XX METAL
M-174, C, alloy, bal Fe
For machinery parts, oil hardening

XX SUPERIOR
Eng., C, Cr, bal Fe
For tools: water hardened

XYRON 2-23
M-717,
For machinable welds on cast iron; AC-DC reverse; for pump housings, pressure chambers
Strength 55,000-60,000 psi.

XYRON 2-24
M-717,
For machinable welds on cast iron; AC-DC; strength 50,000 psi.

XYRON 2-25.
M-717;
For machinable welds on cast iron, Meehanite and Ni-Resist; AC-DC;
Strength: 56,000 psi.

XYRON 2-26
M-717,
Electrode for repair and salvage of defective cast iron castings; AC-DC; good color match.
Strength 62,000 psi.

XYRON 244.
M-717;
Electrode for machinable welds and repairs on gray and alloyed castings; can join cast iron to steel; AC-DC;
Strength 53,000 psi.

YALE BRONZE.
U.S.; 7-8 Zn, 0.5-1.5 Sn, 0.7-1.5 Pb, bal Cu.
For screw machine products, bolts, bushings; free-cutting.

"Y" ALLOY.
M-106, 3.5-4.5 Cu, 1.2-1.7 Mg, 1.8-2.3 Ni, bal Al
Sand cast: 31,000-36,000 TS, 28,000-30,000 YS; 0-1 El; 95-105 Brin; 0.6 Izod.
Sand or chill cast aluminum for high temperature parts as automobile pistons.
Gen Eng. BS 1490: LM 14-WP, 16-W, 16-WP.

Y-ALLOY.
M-137, 3.5-4.5 Cu, 1.2-1.7 Mg, 1.8-2.3 Ni, 0-0.2 Ti, bal Al
34,000 TS, 28,000 YS, 100 Brin.
For pistons, cylinder heads; hardenable.

Y-ALLOY.
M-1176; 3.8-4.2 Cu, 1.3-1.7 Mg, 1.8-2.3 Ni, bal Al.
For pistons, cylinder heads, high temperature properties

YAW-TEN 41
M-1540; 0.18 max C, 0.35 max Si, 1.2 max Mn, 0.25-0.5 Cu, 0.4-0.65 Cr, bal Fe
Normalized 74,000 TS; 31,000 YP
Rolled: 58,000 TS, 34,000 YP
For buildings, bridges, industrial machinery
Good fabricability and weldability.
Resists atmosphere corrosion

YAW-TEN 50
M-1540, 0.12 max C, 0.15-0.35 Si, 0.90 max Mn, 0.06-0.12 P, 0.25-0.50 Cu, 0.15 max Ti, bal Fe
Annealed. 67,000 min TS, 50,000 min YP.
Rolled. 71,000 min TS, 57,000 min YP
For bridges, structures, mine cars, bus bodies, railroad cars, ships, farm implements.
Good weldability and impact resistance
Resists atmospheric corrosion.

YAW-TEN 60
M-1540, 0.16 max C, 0.15-0.55 Si, 0.8-1.4 Mn, 0.25-0.5 Cu, 0.4-0.65 Cr, 0.15 max Ti, bal Fe.
Heat Treated 82,000-100,000 TS, 63,000-67,000 YP.
For buildings, bridges, industrial machinery
Good fabricability and weldability
Resists atmospheric corrosion

YAW-TEN M
M-1540, 0.12 max C, 0.15-0.35 Si, 0.90 max Mn, 0.25-0.50 S, 0.5-1.0 Cr, 0.15 max Ti, bal Fe
Rolled 64,000 min TS, 47,000 min YP
For air preheaters, flues, stacks, gas exhaust systems
For applications exposed to corrosive attack from sulphuric acid gases and other corrosive chemicals.

YB-TEN
M-531, 0.12 max S, 0.75 max Mn, 0.04 max P, 0.05 max S, 0.10 max Si, 0.01 min Cb or V, bal Fe
Sheet: 62,000 TS; 45,000 YP; 28 El.
For automobile bumpers
High strength low alloy steel. Good weldability and fabricability.

YCb.
U.S.; 15 Cr, 25 Ni, 4 Mo, 1 Si, 2 Cb, bal Fe.
For supercharger wheels for jet engine; heat resistant.

YELLOW BRASS.
M-33; 66 Cu, 34 Zn.
Annealed: 49,000 TS; 17,000 YS; 57 El.
Rolled: 74,000 TS; 60,000 YS; 8 El.
For ornaments, lamp fixtures, automobile parts; deep drawing.

YELLOW BRASS 59.
M-8; 34 Zn, bal Cu.
Soft: 45,000 TS; 60 El; 52 Brin.
Hard: 76,000 TS; 4 El; 153 Brin.
For bead chains, eyelets, grommets, lamp fixtures; yellow brass.

YELLOW BRASS-61.
M-8; 63 Cu, 37 Zn.
Soft: 46,000 TS; 17,000 YS; 60 El.
Hard: 65,000 TS; 50,000 YS; 20 El.
For pins, screws, rivets; yellow brass, high strength.

YELLOW BRASS 268.
M-279; 66 Cu, 34 Zn.
Ann: 44,000-61,000 TS; 13,000-34,000 YS; 35-65 El.
Cold Rolled: 49,000-99,000 TS; 24,000-76,000 YS; 3-50 El.
General purpose yellow brass.
For formed parts, electrical hardware, hinges.

YELLOW BRASS 274.
M-8; 63 Cu, 37 Zn
Hard: 65,000 TS; 57,000 YS; 20 El; B 75 Rock.
Soft: 46,000 TS; 17,000 YS; 60 El; B 20 Rock.
For cold headed screws, bolts, rivets, studs and accessories, novelties, fixtures, appliances.
Elect. cond. 26. High strength.

YELLOW END.
M-510; 1.00-1.15 C, bal Fe.
For tools, taps, drills; water hardened

YELLOW GOLD-1.
U. S.; 53 Au, 25 Ag, 22 Cu.
Cast: 205 Brin.
For jewelry; corrosion resistant.

YELLOW GOLD-2.
U. S.; 50 Au, 25 Ag, 25 Cu.
Heat treated: 159 Brin.
For jewelry; corrosion resistant.

YELLOW LABEL.
M-341; 0.9 C, 1.2 Mn, 0.5 Cr, 0.5 W, 0.2 V, bal Fe.
For tools, dies, punches; non-deforming, oil hardening.

YELLOW LABEL.
M-343; 0.8-1.1 C, 0.15-0 25 V, bal Fe.
For tools, dies, boring and shaping tools, milling cutters; "Hellers Alloy Die."

YELLOW LABEL CAST.
M-261; 0.7-1.2 C, bal Fe.
For tools and dies, drills, taps, punches; water hardened.

YELLOW TUBE BRASS-218.
M-8; 66.5 Cu, 33 Zn, 0.5 Pb.
Soft: 45,000 TS; 17,000 YS; 55 El.
Hard: 73,000 TS; 60,000 YS; 10 El.
For plumbing goods, flashlight shells; tubes.

YIDOR.
M-111; 1.45 C, 1.4 Cr, 0.60 Mn, bal Fe.
For blanking and forming dies, cutters; water or oil hardened, abrasion resistant.

Y-LEGIERUNG-2.
M-1548; 4.5 Cu, 1.5 Mg, 2.0 Ni, bal Al.
Heat treated: 54,000-58,000 TS; 31,000-36,000 YS; 16-20 El; 100-120 Brin.
For aircraft engine cylinder heads, pistons, jet engine impellers.
Age-hardenable. High strength.

YND-30.
M-1540; 0.14 max C, 1.0-1.5 Mn, bal Fe.
Plate: 42,700 min YS; 61,200 min TS.
For storage tanks, transportable containers for liquified petroleum gas, pressure vessels.
High notch toughness for cryonics temperatures. Good weldability.

YND-33.
M-1540; 0.14 C, 1.0-1.5 Mn, 0.035 max S & P, bal Fe.
Plate: 64,000 min TS; 46,900 min YS.
For storage tanks and transportable containers for liquified petroleum gas, chemical industry apparatus, refrigerated ships.
Low temperature steel, high notch toughness.

YND-37.
M-1540; 0 14 C, 1.0-1.5 Mn, 0.70 max Ni, bal Fe.
Plate: 71,100 min TS; 52,600 min YS.
For storage tanks and transportable containers for liquified petroleum gas, chemical industry apparatus, refrigerated ships.
High notch toughness at low temperature.

YND-58
M-1540; 0 14 max C, 2.0-2.7 Ni, 0.50 max Cr, 0.55 max Mo, bal Fe.
Plate: 96-700-16,000 TS; 82,500 min YS.
For storage tanks and transportable containers for liquified petroleum gas, chemical equipment, pressure vessels.
High notch toughness, low temperature steel, good weldability

YOCOMITE.
M-1151; high C, 3 Ni, 0 75 Cr, bal Fe.
50,000 TS; 450 Brin
For dies, cast iron.

YOLOY 45-W.
M-531; 0 1 C, 0.8 Mn, 0.2 Si, 0 03 Cb, bal Fe.
Rolled: 60,000 min TS, 45,000 min YS; 25 min El
For trucks, plow frames, pressure vessels.
Good weldability and fabricability

YOLOY ACR replaced by YOLOY YSW-50 Steel.

YOLOY C
M-531; 0.10 max C, 0 30 max Cr, 0 60 max Mn, 0.25-0.50 Cu, bal Fe.
Rolled. 60,000 TS; 45,000 YS; 30 El.
For caskets, tanks, truck trailers, trim; good welding and forming

YOLOY "E" ACR.
M-531, 0.10 max C, 0.60 max Ni, 0.35 max Cr, 0 2-0 5 Cu, bal Fe
Rolled: 60,000 max TS; 45,000 max YS; 30 El.
For coal cars, dump trucks, bodies; good formability and weldability.

YOLOY E-HS.
M-531; 0.18 max C, 0.4-1.0 Ni, 0.20-0.35 Cr, 0.9 max Mn, 0 2-0.5 Cu, bal Fe.
Roller: 70,000 TS; 50,000 YS; 22 El.
For coal cars, dump truck bodies; good welding and forming.

YOLOY "E" HSX.
M-531; 0.18 max C, 0.4-1.0 Ni, 0.2-0.35 Cr, 0.2-0.5 Cu, bal Fe.
Rolled: 60,000 TS; 45,000 YS; 25 El.
For coal cars, dump trucks, bodies; good formability and weldability.

YOLOY HS.
M-531; 0.15 max C, 0.75 max Mn, 0.10 max P, 0.30 max Si, 0.75-1.25 Cu, bal Fe.
Rolled: 70,000 TS; 50,000 YS; 22 El; 62 RA; 85 Brin
For trucks, trailers, cars, bodies, bridges; good weldability and formability.

YOLOY HSX.
M-531; 0.15 max C, 1.0 max Mn, 0.75 Cu, 1.0 Ni, bal Fe.
Rolled: 65,000 TS; 45,000 YS; 25 El.
For railroad cars, trucks, bridges, mine equipment; good weldability and formability.

YOLOY M Gr. A.
M-531; 0.25 max C, 0.3 max Cu, 1.6 max Mn, bal Fe.
Rolled: 70,000 TS; 50,000 YS; 20 El.
For coal cars, dump trucks, trailer bodies, high strength, low alloy construction steel

YOLOY M GR B.
M-531; 0.23 max C, 1.4 max Mn, 0.15-0.20 Si, 0.20 min Cu, bal Fe.
Rolled: 70,000 TS; 45,000 YS; 22 El.
For road machinery; high strength.

YOLOY "S."
M-531; 0.12 max C, 0.75-1.25 Cu, 1.65-2.0 Ni, 0.6 max Mn, bal Fe.
Rolled: 60,000 TS; 45,000 YS; 25 El.
For transportation equipment, mine cars, truck bodies; good weldability, precipitation hardenable.

YOLOY YSW 42.
M-531; 0.16 C, 0.75-1.0 Mn, 0.02 V, or 0.02 Cb, bal Fe
Plate 62,000 min TS, 42,000 min YP; 19 min El.
For trucks, crane booms, mine cars, bridges, pressure vessels, trailers.
Low-alloy high-strength steel. High weldability

YOLOY YSW 45
M-531, 0.16 C, 0.75-1.0 Mn, 0.02 V, or 0.02 Cb, bal Fe
Plate: 60,000 min TS, 45,000 min YP, 19 min El
For trucks, crane booms, bridges, mine cars, trailers, pressure vessels
Low-alloy high-strength steel. High weldability

YOLOY YSW 50 STEEL.
M-531; 0.22 max C, 1.25 max Mn, 0.01 min Cb or V, bal Fe.
Rolled: 65,000 TS, 50,000 YS, 22 El
For structurals, auto and truck frames, R.R construction; high strength low alloy steel

YOLOY YSW 55
M-531; 0.16 C, 1.0 Mn, 0.02 V, or 0.02 Cb, bal Fe
Plate: 70,000 TS; 55,000 YP; 17 El (minimum)
For bridges, trucks, crane booms, mine cars, pressure vessels, trailers
Low-alloy high-strength steel. High weldability.

YOLOY YSW 60.
M-531; 0.16 C, 0.75-1.0 Mn, 0.02 V, or 0.02 Cb, bal Fe.
Plate: 75,000 min TS; 60,000 min YP; 16 min El.
For mine cars, trailers, trucks, crane booms, bridges, power shovels.
Low-alloy high-strength steel.
Good weldability.

YOLOY YSW 65.
M-531; 0.16 C, 1.0 Mn, 0.02 V, or 0.02 Cb, bal Fe.
Plate: 80,000 min TS; 65,000 min YP; 15 min El.
For power shovels, crane booms, railroad cars, pressure vessels, mine cars.
Low-alloy high-strength steeel. Good weldability.

YOLOY YSW 70.
M-531; 0.16 C, 1.0 Mn, 0.02 V, bal Fe.
Plate: 85,000 min TS; 70,000 min YP; 12 min El.
For mine cars, crane booms, buildings, pressure vessels, bridges, power shovels.
Low-alloy high-strength steel. High weldability.

YOLOY YSW-A441.
M-531; 0.22 max C, 1.25 max Mn, 0.20 min Cu, 0.02 min V, bal Fe.
Sheet. 60,000 TS; 45,000 YP; 25 El (minimum).
Bar: 67,000 TS; 46,000 YP; 19 El (minimum).
For railroad cars, bridges, buildings, crane booms, power shovels, mining machinery.
High-strength low alloy steel.

YO-MAN.
M-531, 0.25 max C, 1.1-1.6 Mn, 0.3 max Si, 0.20 min Cu, bal Fe.
Plate. 70,000 min TS; 50,000 min YP; 20 El.
For shovels, structural members, shovel blades.
High strength low alloy steel.

YORCALBRO.
M-286; 70 Cu, 0.04 As, 2 Al, bal Zn.
Annealed: 52,000 TS; 55 El; 60 Brin.
For condenser tubes; anti-corrosive alloy

YORCALBRO/ALUMBRO.
M-1560, 76 Cu, 22 Zn, 2 Al, 0.04 As.
For tubes in steam condensers and heat exchangers, oil refineries, sea water pipe lines.
Resists corrosion and erosion of sea water. Aluminum brass

YOR CASTAN
M-1560; 88 Cu, 12 Sn
As Drawn 106,000-121,000 TS; 10-15 El; 194-242 Brin
For condenser and heat exchanger tubes.
Resists sea water corrosion

YORCORON
M-286, M-1560, 31 Ni, 2 Fe, 2 Mn, bal Cu.
Plates and tubes.
Annealed 62,700-71,700 TS; 22,400-36,000 YS, 40-50 El; 97-116 Brin.
Hard 98,600-110,000 TS; 90,000-107,000 YS, 4-8 El; 175-213 Brin.
Very resistant to abrasion by such as sand.

YORCUNIC/KUNIFER 10
M-1560, 10 Ni, 2 Fe, 1 Mn, bal Cu.
For evaporator tubes in sugar industry, feed water heaters
Resists sea water corrosion

YORCUNIFE/KUNIFER 5
M-1560; 5.5 Ni, 1.2 Fe 0.5 Mn, bal Cu.
For sea water pipelines.
Resists sea water corrosion.

YORK.
M-1705; 0.75 C, 2.0 Mn, 0.3 Si, 1.0 Cr, 1.35 Mo, bal Fe
Air hardening tool steel. AISI A6.

YORKSHIRE 70/30.
M-1560, M-286; 30 Ni, 0.7 Fe, 0.8 Mn, bal Cu.
For condenser tubes, evaporator tubes, feed water heater tubes, heat exchangers
Resists sea water corrosion.
Cupro-nickel.

YOUNGSTOWN GALVANNEALED.
M-531; Zn coated low carbon steel.
For roofing, siding, culverts, fence wire.

Y-PHOSPHOR BRONZE NO. 207A.
M-423; 70 Cu, 29 Zn, 1 P.
For wire for weaving purposes; great ductility.

YuNDK 24.
M-Russia; 14 Ni, 24 Co, 9 Al, 3 Cu, bal Fe.
Sintered: Rockwell C 45.
For electrical and magnetic equipment.
Permanent magnet. Sintered alloy.
High external energy and permeability.

Y.W.A. STEEL.
M-210; 0.28 C, 0.45 Si, 1.3 Cr, 3.5 Ni, 5.8 W, 0.25 V, bal Fe.
For extrusion dies, hot punches.
High temperature and abrasion resistance, tough.

Z-1R.
M-1134; 0.8-1.0 Al, 0.3-0.4 Cu, bal Zn.
Rolled: 31,000-42,500 TS; 40-70 Brin.
For structures.

Z-2.
M-949; 4 Al, 3 Cu, 0.03 Mg, bal Zn.
Die cast: 50,000 TS; 4-8 El; 82-87 Brin.
For gears, pumps, motor frames, hardware; die castings.

Z-3
M-106; 6-8 Cu, 2-4 Si, 2-4 Zn, bal Al.
Sand Cast: 18,000-20,000 TS; 11,200-12,300 YS; 0-1 El; 60-70 Brin; 0-5 Izod.
Chill cast: 22,400-24,700 TS; 11,200-13,400 YS; 0.1 El; 70-80 Brin; 0.6 Izod.
For lightly stressed castings not subject to severe shock.
Gen. Eng: BS 1490: LM 1-M; LM 4-M.

Z-3.
M-949; 4 Al, 0.04 Mg, bal Zn.
Die cast: 37,000 TS; 4-6 El; 60-65 Brin.
For gears, frames, hardware, die castings.

Z-3 ALLOY.
M-137; 6.0-8.0 Cu, 2-4 Zn, 2-4 Si, 0.7-1.1 Fe, bal Al.
Cast: 23,000-28,000 TS; 1-2 El; 90 Brin.
For crankcases, gear boxes, flywheel housings, brake shoes; die and sand cast.

Z.A.
M-580; Zn, Al.
For electroplating anode.

ZADUR 5 BR.
M-1324; 1.42 C, W, V, bal Fe.
For engravers tools, bearings, cutters; water or oil hardened.

ZADUR B 25.
M-1324; C, Cr, Ni, V, bal Fe.
For molds, dies.

ZADUR B25S.
M-1324; C, Cr, Ni, V, bal Fe.
For headers, upsetters, punches; cold work steel.

ZADUR BC1.
M-1324; 1.05 C, 1.0 Cr, 0.25 Si, 0.30 Mn, bal Fe.
For bearings, liners, sleeves, forming dies; water hardened.

ZADUR BC12.
M-1324; 2.1 C, 11.5 Cr, bal Fe.
For blanking and forming dies; oil or air hardened, nonforming.

ZADUR BC12W.
M-1324; 1.65 C, 11.5 Cr, 0.1 V, bal Fe.
For blanking and forming dies, punches; air hardened, nondeforming.

ZADUR BC13.
M-1324; 2.1 C, 11.5 Cr, 0.7 W, bal Fe.
For blanking and forming dies, punches; oil or air hardened, nondeforming.

ZADUR BC13M EXTRA.
M-1324; C, Cr, Mn, bal Fe.
For upsetters, headers, dies, punches; cold work steel.

ZADUR BC13W.
M-1324; 1.65 C, 11.5 Cr, 0.1 V, 0.2 Mo, bal Fe.
For blanking and forming dies, punches; air hardened, nondeforming

ZAPP BC120.
M-1332; 1.65 C, 11.5 Cr, Co, bal Fe.
For blanking and forming dies, punches; air hardened, nondeforming.

ZADUR BCN.
M-1324; 0 45 C, Ni, Cr, W, bal Fe.
For upsetters, heading dies, crimpers; oil hardened tough.

ZADUR BDK.
M-1324; 0 45 C, 1.05 Cr, 0.2 V, 1.85 W, bal Fe.
For cold heading dies, headers, punches; oil hardened, tough.

ZADUR BDK EXTRA.
M-1324; 0.45 C, 0.9 Si, 1.05 Cr, 0.2 V, 1.85 W, bal Fe.
For cold heading dies, headers, punches; oil hardened, tough.

ZADUR BF2.
M-1324; 1.05 C, 1.25 Mn, 1.15 Cr, bal Fe.
For bearings, liners, sleeves; water hardened, wear resistant.

ZADUR BF2 EXTRA.
M-1324; 0.9 C, 1 9 Mn, 0.1 V, bal Fe.
For punches, dies, upsetters, shears, tools; oil hardened, nondeforming

ZADUR BFC.
M-1324; 1.05 C, 1 0 Cr, 1 15 W, 0.9 Mn, bal Fe
For cutting tools, bearings, liners; oil or water hardened, wear resistant

ZADUR BGM.
M-1324; 0.34 C, 1.55 Cr, 1 55 Ni, 0 2 Mo, bal Fe
For gears, shafts, crankshafts, bolts, fasteners; oi hardened, shock resistant.

ZADUR BGS.
M-1324; 0.45 C, Cr, Ni, bal Fe.
For gears, bolts, fasteners; oil hardened, shock resistant

ZADUR BKM.
M-1324; 1.0 C, 0.1 V, 0 25 Mn, 0 25 Si, bal Fe.
For cutters, hobs, drills, taps, reamers; Type W2 water hardened

ZADUR BLS.
M-1324; 0.55 C, 1 05 Cr, 0 18 V, 1 85 W, bal Fe.
For cold heading dies, punches, headers; oil hardened, tough.

ZADUR BMR.
M-1324; 0.40 C, Cr, Mo, bal Fe
For gears, pinions, shafts, bolts; oil hardened, tough

ZADUR BP5.
M-1324; 0.45 C, Si, Cr, V, bal Fe.
For springs, bolts, gears; oil hardened, tough.

ZADUR BPK.
M-1324; 0.40 C, Cr, V, Mn, bal Fe
For gears, bolts, crankshafts; oil hardened, tough,

ZADUR BRK.
M-1324; 0.50 C, 1.05 Cr, 3.25 Ni, 0.50 Mn, bal Fe
For gears, bolts, crankshafts, fasteners; oil hardened shock resistant.

ZADUR BST1.
M-1324; C, Cr, W, Ni, V, Co, bal Fe.

ZADUR BWF2.
M-1324; C, Cr, Ni, V, bal Fe.
For tools, dies; oil hardened, tough.

ZADUR BWM.
M-1324; 0.3 C, 2.65 Cr, 0.35 V, 8.5 W, bal Fe.
For extrusion press dies and rams, upsetters; hot work steel, oil hardened.

ZADUR BWM5.
M-1324; 0.3 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For extrusion press dies and rams, upsetters; hot work steel, oil hardened.

ZADUR BWM100.
M-1324; 0 3 C, 1 1 Cr, 1 Si, 0.18 V, 3.75 W, bal Fe.
For header dies, upsetters, crimpers; oil hardened, tough.

ZADUR BWMCo
M-1324; 0.30 C, 2 Co, 2.4 Cr, 0.25 V, 8 5 W, bal Fe.
For extrusion press dies and rams, upsetters; oil hardened, tough.

ZADUR BWM EXTRA.
M-1324; C, Cr, W, V, Ni, bal Fe.
For header and upsetter dies, shears, punches; hot work steel, oil hardened

ZADUR CCK.
M-1324; 1 45 C, 1.4 Cr, 0 60 Mn, bal Fe.
For bearings, bushings, liners, sleeves; water hardened, wear resistant.

ZADUR CCW.
M-1324; C, Cr, Ni, W, V, bal Fe.
Oil hardened, tough

ZADUR D0
M-1324; 0 28 C, Ni, Mo, bal Fe.
For gears, bolts, machine tool parts; oil hardened, tough.

ZADUR D1.
M 1324, 0 28 C, Ni, Cr, Mo, V, bal Fe.
For header dies, machine tool parts, oil hardened, tough

ZADUR D3
M-1324; 0 26 C, Ni, Cr, Mo, bal Fe
For machine tool parts, gears, bolts; oil hardened, tough.

ZADUR DS10
M-1324; 0.65 C, 3.75 Cr, 0.85 Mo, 8.5 W, 0.7 V, bal Fe.
For lathe and planer tools, reamers, drills, taps; high speed steel

ZADUR EDH2.
M-1324; 0.42 C, 1.0 Cr, 0 2 Mo, bal Fe
For gears, bolts, shafts, fasteners, oil hardened, tough

ZADUR EDH3.
M-1324, 0.40 C, Cr, Mo, bal Fe.
For gears, bolts, shafts, fasteners; oil hardened, tough.

ZADUR EDH11.
M-1324; 0.37 C, 1.25 Si, 1.25 Mn, bal Fe.
For gears, shafts, crankshafts; oil hardened, tough.

ZADUR EDHV.
M-1324; 0.50 C, 0.85 Mn, 1.0 Cr, 0 09 V, bal Fe.
For gears, springs, bolts, shafts; oil hardened, shock resistant.

ZADUR EH.
M-1324; 0.15 C, 0.65 Cr, 0.5 Mn, bal Fe.
For gears, machine tool parts, shafts; case hardening steel.

ZADUR EHC125.
M-1324; 0.16 C, 1.15 Mn, 0.95 Cr, bal Fe.
For gears, bolts, fasteners, cams; case hardening steel, tough.

ZADUR EHC135.
M-1324; 0.20 C, 1.15 Mn, 0.95 Cr, bal Fe.
For bolts, gears, camshafts, cams, pinions; case hardening steel.

ZADUR FE501.
M-1324; 0.7 C, V, W, Cr, bal Fe.
For lathe and planer tools, drills, reamers, hobs; high speed steel.

ZADUR FE501R.
M-1324; 0.7 C, 4 Cr, V, W, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel.

ZADUR FE601.
M-1324, 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe
For lathe and planer tools, reamers, drills, taps; high speed steel.

ZADUR FEX.
M-1324; 0.74 C, 4.1 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, reamers, drills, taps; high speed steel.

ZADUR FN.
M-1324, 0.82 C, 4.1 Cr, 0 85 Mo, 1 6 V, 8 7 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

ZADUR GC15.
M-1324; 0 25 C, 14.5 Cr, 1 max Ni, bal Fe.
For oil refinery equipment; creep and heat resistant.

ZADUR GC17.
M-1324, 0 25 C, 17 Cr, 1 8 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
Cold drawn: 130,000 TS; 110,000 YS; 15 El; 35 RA, 270 Brin.
For pumps, marine hardware, cutlery; Type 431; stainless and heat resistant.

ZADUR GC30H.
M-1324, 1 2 C, 1.3 Si, 29 Cr, bal Fe.
For wear plates, grates, grids, liners, valves; heat and abrasion resistant.

ZADUR GC30W.
M-1324; 0 40 C, 1.3 Si, 29 Cr, bal Fe.
Cast: 90,000 TS; 65,000 YS; 2 El; 212 Brin
For cylinder liners, valve seats and bodies, bushings; heat and abrasion resistant

ZADUR GCM30H.
M-1324; 1 2 C, 1.3 Si, 29 Cr, 2 Mo, bal Fe.
For cylinder liners, valve seats and bodies, bushings; heat and abrasion resistant.

ZADUR GD2.
M-1324, 0.7 C, Cr, W, V, bal Fe.
For lathe and planer tools, drills, reamers; high speed steel.

ZADUR GD15.
M-1324; 0.38 C, Si, Cr, V, bal Fe.
For springs, bolts, gears, machine tool parts; oil hardened, shock resistant.

ZADUR GD22.
M-1324; 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For upsetter dies, header dies, crimpers, punches; oil hardened, tough.

ZADUR GRMN.
M-1324; 0.15 C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks; Type 302; stainless, austenitic.

ZADUR GRMP.
M-1324; 0.15 C, 18 Cr, 9.5 Ni, 2 Mo, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment, tanks, mixers, filters; Type 316; stainless, austenitic.

ZADUR HDL.
M-1324; C, W, V, bal Fe.
For machine tool parts; oil hardened

ZADUR MSA1.
M-1324; 0.53 C, 0.9 Si, 0 9 Mn, bal Fe.
For gears, bolts, shafts, fasteners, water hardened.

ZADUR MSA2.
M-1324; 0.55 C, 0 7 Cr, 0.18 Mo, 1.65 Ni, 0 10 V, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

ZADUR MSA3.
M-1324; 0.56 C, 0 8 Cr, 0.2 Mo, 1.75 Ni, 0.1 V, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, shock resistant.

ZADUR RBM.
M-1324; 0 45 C, 1 4 Cr, 0.7 Mo, 0 3 V, bal Fe.
For forging and heading dies, upsetters, die casting dies; oil hardened, tough.

ZADUR RMA.
M-1324; 0.90 C, 1.15 Mo, 1.0 V, 18 Cr, bal Fe.
For cutlery, valves, ball bearings; hardenable, corrosion resistant.

ZADUR RMC.
M-1324; 0.20 C, 13 Cr, 1.15 Mo, bal Fe.
Annealed: 95,000 TS; 50,000 YS, 25 El, 55 RA; 195 Brin.
For turbine blades, cutlery, valves; hardenable, corrosion resistant.

ZADUR RME.
M-1324; 0.35 C, 16.5 Cr, 1 15 Mo, bal Fe.
For oil refinery equipment, corrosion and heat resistant.

ZADUR RMH.
M-1324; 0 40 C, 13 Cr, 0 30 Mn, bal Fe
Annealed: 100,000 TS; 55,000 YS; 20 El; 50 RA; 200 Brin.
For turbine blades, valves, cutlery, surgical instruments; Type 420; stainless.

ZADUR RMI
M-1324; 0.1 max C, 2 Si, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
For chemical plant equipment, tanks, agitators; Type 304; stainless, austenitic.

ZADUR RMK.
M-1324; 0.12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 55 El; 65 RA; 150 Brin.
For welded chemical plant equipment; Type 321; stainless, austenitic.

ZADUR RML.
M-1324; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
For welded acid resistant equipment; Type 316 Ti; stainless, austenitic.

ZADUR RMM.
M-1324; 0.2 C, 13 Cr, 0.4 Si, bal Fe.
Annealed; 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For turbine blades, valves, cutlery, surgical instruments; Type 420 stainless, hardenable.

ZADUR RMN.
M-1324; 0 15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS, 35,000 YS, 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, filters; Type 302; stainless, austenitic.

ZADUR RMO
M-1324, 0.22 C, 17 Cr, 1.5 Ni, 0.4 Si, bal Fe
Annealed· 125,000 TS; 90,000 YS; 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431; corrosion resistant

ZADUR RMP
M-1324, 0 1 max C, 18 Cr, 2 Mo, 9.5 Ni, bal Fe.
Annealed 85,000 TS, 35,000 YS; 50 El; 65 RA; 160 Brin.
For acid resistant chemical plant equipment; Type 316; stainless, austenitic

ZADUR RMR.
M-1324, 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin
For chemical plant equipment, tanks, mixers; Type 304; stainless, austenitic

ZADUR RMT.
M-1324, 0.07 max C, 18 Cr, 10 5 Ni, 2 Mo, bal Fe
Annealed. 85,000 TS; 35,000 YS, 50 El, 65 RA; 160 Brin
For acid resistant chemical plant equipment; Type 316; stainless, austenitic.

ZADUR RMW
M-1324, 0 12 max C, 0 4 Si, 13 Cr, bal Fe.
Annealed 75,000 TS, 40,000 YS; 35 El, 70 RA; 155 Brin
For turbine blades, valves, cutlery, Type 410; stainless.

ZADUR SO EXTRA
M-1324; 1 3 C, 4 3 Cr, 0 85 Mo, 3.8 V, 12 W, bal Fe.
For blanking and forming dies, high speed steel.

ZADUR SSB50N
M-1324, 0 80 C, W, Co, Cr, V, Mo, bal Fe
For lathe and planer tools, reamers, broaches; high speed steel.

ZADUR SS Co3
M-1324, 0.86 C, 2 8 Co, 4.3 Cr, 0 85 Mo, 2.1 V, 12 W, bal Fe.
For lathe and planer tools, reamers, drills; high speed steel.

ZADUR SS Co5.
M-1324, 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1 5 V, 18 W, bal Fe.
For lathe and planer tools, cutters, reamers; high speed steel.

ZADUR SS Co10.
M-1324; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1 8 V, 18 W, bal Fe.
For lathe and planer tools, form cutters, hobs; high speed steel.

ZADUR SS Co15.
M-1324; 0.7 C, 4 Cr, W, V, Co, bal Fe.
For lathe and planer tools, drills, taps, hobs; high speed steel.

ZADUR SS Co SPEZIAL.
M-1324; 1.35 C, Co, W, Mo, Cr, V, bal Fe.
For blanking and forming dies, engravers' tools; high speed steel.

ZADUR ZRS.
M-1324; 1.4 C, 0.30 Cr, 0.10 V, bal Fe.
For blanking and heading dies, engravers' tools; water or oil hardened, wear resistant.

ZAL-DIE.
M-233; 0.35 C, 0.5 Mn, 1 Cr, 3 Ni, 0.3 Mo, bal Fe.
For shafts, dies, gears, axles, crankshafts; oil hardened, shock resistant.

Z-ALLOY.
M-18; 1 Pt, bal Ag.

Z.A.M.
M-580; 0.5 Al, 0.25 Hg, bal Zn.
For anodes for Zn plating; acid resistant.

ZAMA.
Italy, Al, Mg, bal Zn.
For die castings, instrument cases; corrosion resistant.

ZAMAK NO. 3
M-91; 3.9-4.3 Al, 0.025-0.050 Mg, 0.10 max Cu, bal Zn.
Die Cast: 41,000 TS; 10 El; 82 Brin.
For gears, frames, hardware, pumps, die castings.

ZAMAK NO 5.
M-91; 3.9-4.3 Al, 0.75-1.25 Cu, 0.03-0.04 Mg, bal Zn
Die cast: 47,000 TS, 7 El; 91 Brin
For die castings, gears, hardware.

ZAMAK NO. 7.
M-91; 3.9-4.3 Al, 0.10 max Cu, 0.010-0.020 Mg, 0.010-0.020 Ni, bal Zn.
For die castings, housings; improved castability

ZAMAK ALPHA.
M-1134; 4 Al, 0.5-1 Cu, 0.3 Mg, bal Zn.
Rolled: 44,000-71,000 TS; 75-140 Brin.
For die castings, rolled or cast

ZAMAK BETA
M-1134; 10 Al, 0.7 Cu, 0.03 Mg, bal Zn
Rolled: 45,000-78,000 TS; 75-160 Brin
For housings, hardware.

ZAMAK ETA
M-1134; 10 Al, 0.3 Cu, bal Zn.
Rolled: 31,000-45,000 TS, 55-65 Brin.
For housings, hardware.

ZAMAK ETA H
M-1134; 10 Al, 0.3 Cu, 0.01 Mg, bal Zn.
Rolled: 56,700-70,000 TS; 100-130 Brin.
For housings, hardware.

ZAMAK GAMMA
Germany; 0.8 Al, 0.4 Cu, 0-0.2 Mg, bal Zn.
For castings or drawn wire.

ZAMAK Z 400.
M-299; 3.7-4.3 Al, 0-0.6 Cu, 0.02-0.05 Mg, bal Zn.
Die cast: 36,000-43,000 TS; 4-1.5 El; 70-80 Brin.
For housings, cases, ornaments, general die castings; impact resistant, shrinks on aging.

ZAMAK Z 410.
M-299; 3.7-4.3 Al, 0.6-1.0 Cu, 0.02-0.05 Mg, bal Zn.
Die cast: 39,000-46,000 TS; 5-2 El; 80-90 Brin.
For housings, cases, ornaments, general die castings; good corrosion resistance.

ZAMAK Z 430.
M-299; Zn alloy. For mold inserts, tools, dies.

ZAMIUM.
60 Ni, 40 Cr, Mn, W.
For heat resistant parts; corrosion and heat resistant.

ZAPP 13.
M-1332; 0.12 max C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
Cold drawn: 100,000 TS; 85,000 YS; 17 El; 60 RA; 205 Brin.
For turbine blades, valve trim, chemical plant equipment; Type 410; corrosion resistant.

ZAPP 17.
M-1332; 0.8 C, 17 Cr, bal Fe.
Annealed: 107,000 TS; 62,000 YS; 18 El; 35 RA; 220 Brin.
Heat treated: 280,000 TS; 270,000 YS; 3 El; 15 RA; 555 Brin.
For bearings, valves, surgical instruments; Type 440B; corrosion resistant, hardenable.

ZAPP 17LT.
M-1332; 0.1 C, 0.4 Si, 17 Cr, 1.8 Mo, Ti = 4 × C, bal Fe.
Annealed: 130,000 TS; 98,000 YS; 20 El; 53 RA; 260 Brin.
For chemical plant welded equipment; corrosion resistant, stabilized.

ZAPP 17T.
M-1332; 0.1 max C, 17.5 Cr, Ti = 7 × C, bal Fe.
Annealed: 130,000 TS; 98,000 YS; 20 El; 53 RA; 260 Brin.
For chemical plant welded equipment; corrosion resistant, stabilized.

ZAPP 17U.
M-1332; 0.12 max C, 16.5 Cr, 0.25 Mo, 0.2 S, bal Fe.
Annealed. 80,000 TS; 50,000 YS; 25 El; 50 RA; 160 Brin.
For screw machine products, chemical plant equipment; Type 430F, corrosion resistant.

ZAPP 28.
M-1332; 1.2 C, 1.3 Si, 29 Cr, bal Fe.
For wear plates, crushers, furnace equipment, corrosion and heat resistant.

ZAPP 28L.
M-1332, 1.2 C, 1.3 Si, 29 Cr, 2 Mo, bal Fe.
For wear plates, crushers, furnace equipment; corrosion and heat resistant.

ZAPP 28N.
M-1332; 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
For furnace parts, heat treat boxes; heat and oxidation resistant.

ZAPP 28W.
M-1332; 0.4 C, 27 Cr, Si, bal Fe.
For furnace parts, heat treat boxes; heat and oxidation resistant.

ZAPP 42MNV7.
M-1332; 0.42 C, 1.75 Mn, 0.1 V, bal Fe.
For punches, crimpers, dies; oil hardened, shock resistant.

ZAPP 80.
M-1332; 0.15 C, 1.5 Si, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, agitators; Type 302; stainless, austenitic.

ZAPP 80K.
M-1332; 0.15 max C, 18 Cr, 8.5 Ni, bal Fe.
Annealed: 80,000 TS; 35,000 YS; 55 El; 75 RA; 150 Brin.
For chemical plant equipment, tanks, mixers, agitators; Type 302; stainless, austenitic.

ZAPP 80P.
M-1332; 0.07 max C, 18 Cr, 9.5 Ni, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 60 El; 70 RA; 150 Brin.
Cold drawn: 180,000 TS; 125,000 YS; 10 El; 330 Brin.
For chemical plant equipment, welded structures, tanks; Type 304; stainless, austenitic.

ZAPP 80T.
M-1332, 0 12 max C, 18 Cr, 9.5 Ni, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS, 55 El; 65 RA; 150 Brin.
Cold drawn: 95,000 TS, 60,000 YS; 40 El; 60 RA; 185 Brin.
For welded structures, chemical plant equipment; Type 321; stainless, austenitic.

ZAPP 80U.
M-1332; 0 12 C, 9.5 Ni, 18 Cr, 0 2 S, bal Fe.
Annealed· 80,000 TS; 35,000 YS; 40 El; 55 RA; 160 Brin.
For screw machine products, bolts; Type 302; stainless, free-cutting.

ZAPP 80X.
M-1332; 0 12 max C, 18 Cr, 9 5 Ni, Cb = 8 × C, bal Fe.
Annealed· 90,000 TS, 35,000 YS, 56 El; 65 RA, 160 Brin.
Cold drawn: 100,000 TS; 65,000 YS; 40 El; 60 RA; 202 Brin
For welded structures, chemical plant equipment, Type 347; stainless, austenitic.

ZAPP 82.
M-1332; 0 15 C, 18 Cr, 9 5 Ni, 2 Mo bal Fe.
Annealed· 85,000 TS; 35,000 YS, 50 El; 65 RA, 160 Brin
Cold drawn. 150,000 TS; 135,000 YS; 6 El, 300 Brin.
For acid resistant equipment, mixers, agitators; Type 316, stainless, austenitic

ZAPP 82P.
M-1332; 0.07 max C, 18 Cr, 10.5 Ni, 2 Mo, bal Fe.
Annealed. 80,000 TS, 35,000 YS, 55 El, 70 RA; 150 Brin.
Cold drawn: 140,000 TS; 130,000 YS; 7 El; 280 Brin.
For acid resitant equipment, mixers, agitators, Type 316L; stainless, austenitic

ZAPP 82RT.
M-1332; 0 05 C, 18 Cr, 10 Ni, Cu, bal Fe
Annealed: 80,000 TS, 35,000 YS; 55 El; 70 RA; 150 Brin.
For chemical plant equipment; stainless, austenitic.

ZAPP 82S.
M-1332, 0 1 max C, 18 Cr, 9.5 Ni, 2 Mo, bal Fe.
Annealed: 80,000 TS; 35,000 YS, 55 El; 70 RA; 150 Brin.
Cold drawn: 140,000 TS; 130,000 YS; 7 El; 280 Brin.
For acid resistant equipment, mixers, agitators; Type 316; stainless, austenitic.

ZAPP 82T.
M-1332; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Ti = 4 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El; 300 Brin.
For welded acid resistant equipment; Type 316 Ti; stainless, austenitic.

ZAPP 82X.
M-1332; 0.12 max C, 18 Cr, 10.5 Ni, 2 Mo, Cb = 8 × C, bal Fe.
Annealed: 85,000 TS; 35,000 YS; 50 El; 65 RA; 160 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El; 300 Brin
For welded acid resistant equipment; Type 316 Cb; stainless, austenitic.

ZAPP 120.
M-1332; 0.10 max C, 12 5 Cr, 13 Ni, bal Fe.
For chemical plant equipment; corrosion resistant

ZAPP 135P.
M-1332; 0 07 C, 17 Cr, 13 Ni, 2 Mo, bal Fe
Annealed. 85,000 TS, 35,000 YS, 50 El; 65 RA; 160 Brin.
Cold drawn: 150,000 TS; 135,000 YS; 6 El; 300 Brin
For acid resistant equipment, mixers; Type 316L; stainless, austenitic

ZAPP 135T
M-1332, 0 05 C, 17 Cr, 13 Ni, 2 Mo, Ta, Cb, bal Fe.
Annealed 85,000 TS, 35,000 YS; 50 El; 60 RA, 150 Brin
Cold drawn 150,000 TS, 135,000 YS; 6 El; 300 Brin
For welded acid resistant equipment, tanks, mixers; Type 316Cb; stainless, austenitic.

ZAPP 182RT.
M-1332, 0 07 max C, 17 5 Cr, 17 5 Ni, 2 Mo, 2 Cu, Ti = 7 × C, bal Fe.
Annealed: 85,000 TS, 35,000 YS, 50 El; 65 RA; 160 Brin.
For welded acid resistant equipment, tanks, mixers, stainless, austenitic, stabilized

ZAPP AC14
M 1332, 0 34 C, 1 1 Al, 1 4 Cr, bal Fe
For oil refinery equipment, heat and creep resistant

ZAPP BC120
M-1332, 1 65 C, 11 5 Cr, Co, bal Fe
For blanking and forming dies, punches; air hardening, nondeforming

ZAPP BCVW85
M-1332, 0 3 C, 2 4 Cr, 0 25 V, 8 5 W, 2 Co, bal Fe.
For hot work tools, punches, shears, extrusion rams; oil hardened, tough

ZAPP C3
M-1332, 1 4 C, 0 3 Cr, 0 1 V, bal Fe.
For blanking and forming dies, engravers tools; water hardened, wear resistant

ZAPP C5.
M-1332, 1 1 C, 0.4 Cr, 0 3 Mn, bal Fe
For bearings, cutters, forming dies; water hardened, wear resistant

ZAPP C8.
M-1332; 0.90 C, 0 8 Cr, 0.3 Mn, bal Fe.
For bearing, cutters, punches; water hardened, wear resistant.

ZAPP C10.
M-1332; 1.05 C, 0.3 Mn, 1.0 Cr, bal Fe.
For bearing, cutters, punches; water hardened, wear resistant.

ZAPP C14.
M-1332; 1.05 C, 1.2 Cr, 0.3 Mn, bal Fe.
For bearing, cutters, punches; water hardened, wear resistant.

ZAPP C15.
M-1332; 1.0 C, 1.55 Cr, 0.35 Mn, bal Fe.
For bearings, liners, sleeves; water hardened, wear resistant

ZAPP C120.
M-1332; 2.1 C, 11.5 Cr, 0.70 W, bal Fe.
For blanking and forming dies, gauges, punches; oil or air hardened, non-deforming.

ZAPP C130W.
M-1332; 0.20 C, 13 Cr, 0.3 Mn, 0.4 Si, bal Fe.
Annealed: 95,000 TS, 50,000 YS; 25 El; 55 RA; 196 Brin.
For valve trim, turbine blades, surgical instruments; Type 420; corrosion resistant.

ZAPP C135M
M-1332; 0.4 C, 0.4 Si, 0.3 Mn, 13 Cr, bal Fe.
Annealed: 100,000 TS; 55,000 YS; 22 El; 50 RA; 200 Brin.
For valves, turbine blades, cutlery, knives; Type 420; stainless, hardenable.

ZAPP CLWV
M-1332, 0.45 C, 1.35 Cr, 0.8 V, 0.45 Mo; 0.45 W, bal Fe
For forging dies, upsetters, header dies; oil hardened, tough

ZAPP CN35
M-1332; 0.50 C, 1.05 Cr, 3.25 Ni, 0.50 Mn, bal Fe
For gears, bolts, machine tool parts; oil hardened, shock resistant.

ZAPP CNI 3
M 1332; 0.55 C, 0.7 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe
For gears, bolts, crankshafts, oil hardened, shock resistant

ZAPP CNI 5
M-1332. 0.57 C, 0.8 Cr, 0.2 Mo, 1.75 Ni, 0.1 V, bal Fe
For gears, bolts, crankshafts, oil hardened, shock resistant

ZAPP CVI 6
M-1332; 0.45 C, 0.7 Mn, 1.4 Cr, 0.7 Mo, 0.3 V, bal Fe
For gears, sprinsg, bolts, shafts; oil hardened, tough.

ZAPP CVW35
M-1332; 1.42 C, W, V, bal Fe.
For cutters, forming dies, tools; water or oil hardened

ZAPP CVW40
M-1332, 0.30 C, 0.18 V, 3.75 W, 1.1 Cr, bal Fe.
For extrusion dies, liners, rams, upsetters; oil hardened, tough.

ZAPP CVW45.
M-1332; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For extrusion dies, liners, rams, upsetters; oil hardened, tough

ZAPP CVW85.
M-1332; 0.30 C, 0.35 V, 8.5 W, 2.65 Cr, bal Fe.
For extrusion dies, rams, liners; oil hardened, tough.

ZAPP CVW95.
M-1332; 0.65 C, 0.85 Mo, 8.5 W, 3.75 Cr, 0.70 V, bal Fe.
For extrusion dies, rams, liners, cutters; high speed steel.

ZAPP CWN130.
M-1332; 0.45 C, Ni, Cr, W, bal Fe.
For forging dies, upsetters; oil hardened, tough.

ZAPP K2 PRIMA
M-1332; 1.3 C, 0.25 max Si, 0.25 max Mn, bal Fe.
For engravers' tools, form cutters; Type W1; water hardened.

ZAPP K3 EXTRA.
M-1332; 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed. 110,000 TS; 56,000 YS; 18 El; 40 RA; 210 Brin
For springs, drills, taps, cutters; Type W1; water hardened

ZAPP K3 PRIMA.
M-1332, 1.1 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed: 110,000 TS; 56,000 YS; 18 El; 40 RA; 210 Brin.
For springs, tools, cutters, drills, taps; Type W1; water hardened.

ZAPP K4 EXTRA
M-1332; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Annealed. 110,000 TS; 56,000 YS; 18 El; 40 RA; 210 Brin
For springs, tools, cutters, taps, reamers; Type W1; water hardened.

ZAPP K4 PRIMA.
M-1332; 1.0 C, 0.25 max Si, 0.25 max Mn, bal Fe
Annealed: 110,000 TS; 56,000 YS; 18 El, 40 RA; 210 Brin
For springs, tools, cutters, taps, reamers; Type W1; water hardened.

ZAPP K5 EXTRA.
M-1332, 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated, 190,000 TS, 145,000 YS, 10 El, 30 RA, 400 Brin
For springs, tools, cutters, drills, taps, hobs, Type W1, water hardened.

ZAPP K5 PRIMA.
M-1332; 0.85 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El, 30 RA, 400 Brin.
For springs, tools, cutters, drills, taps, hobs; Type W1, water hardened.

ZAPP K6 EXTRA.
M-1332, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS, 12 El; 37 RA; 355 Brin.
For rails, springs, hammers, axes, punches; Type W1, water hardened.

ZAPP K6 PRIMA.
M-1332, 0.70 C, 0.25 max Si, 0.25 max Mn, bal Fe.
Heat treated: 175,000 TS; 128,000 YS; 12 El; 37 RA; 355 Brin.
For rails, hammers, springs, axes, punches; Type W1; water hardened.

ZAPP K15.
M-1332, 0.15 C, 0.3-0.5 Si, 0.25-0.50 Mn, bal Fe.
Cold drawn: 72,000 TS, 60,000 YS; 22 El; 58 RA; 145 Brin
For gears shafts, machine tool parts; case hardening steel

ZAPP K20
M-1332; 0.2 C, 0.4 Si, 13 Cr, bal Fe.
Annealed 95,000 TS; 50,000 YS, 25 El; 55 RA; 195 Brin.
Cold drawn. 105,000 TS; 85,000 YS; 17 El; 50 RA; 215 Brin.
For valves, cutlery, turbine blades, surgical instruments; Type 420; stainless.

ZAPP K20L.
M-1332; 0.2 C, 1.15 Mo, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For valves, cutlery, pumps, turbine blades; Type 420 Mo; stainless.

ZAPP K20N.
M-1332; 0.22 C, 17 Cr, 1.5 Ni, bal Fe.
Annealed: 125,000 TS; 95,000 YS; 20 El; 55 RA; 260 Brin.
For pumps, marine hardware, valves; Type 431; heat and corrosion resistant.

ZAPP K35L.
M-1332; 0.35 C, 1.15 Mo, 16.5 Cr, bal Fe.
Annealed: 130,000 TS; 95,000 YS; 18 El; 50 RA; 270 Brin.
For oil refinery equipment, marine hardware; heat and corrosion resistant.

ZAPP K40.
M-1332; 0.4 C, 0.4 Si, 13 Cr, bal Fe.
Annealed: 95,000 TS; 50,000 YS; 25 El; 55 RA; 195 Brin.
For cutlery, valves, pumps; Type 420; stainless.

ZAPP K45.
M-1332; 0.45 C, 0.3-0.5 Si, 0.3-0.8 Mn, bal Fe.
Hot rolled: 98,000 TS; 60,000 YS; 24 El; 45 RA; 212 Brin.
For gears, bolts, machine tool parts; water hardened.

ZAPP K55S.
M-1332; 0.55 C, 0.1-0.4 Si, 0.5-0.7 Mn, bal Fe.
Annealed; 100,000 TS; 55,000 YS; 15 El; 22 RA; 180 Brin.
For gears, bolts, machine tool parts; water hardened.

ZAPP K60.
M-1332; 0.60 C, 0.10-0.40 Si, 0.5-0.7 Mn, bal Fe.
Heat treated: 160,000 TS; 115,000 YS; 12 El; 40 RA; 325 Brin.
For gears, shafts, fasteners; water hardened.

ZAPP K60G.
M-1332; 0.60 C, 0.10-0.40 Si, 0.5-0.7 Mn, bal Fe.
Heat treated: 160,000 TS; 115,000 YS; 12 El; 40 RA; 325 Brin.
For gears, shafts, fasteners, machine tool parts; water hardened.

ZAPP K90G.
M-1332; 0.90 C, 0.25-0.50 Si, 0.3-0.8 Mn, bal Fe.
Heat treated: 190,000 TS; 145,000 YS; 10 El; 30 RA; 400 Brin.
For drills, taps, punches, cutters, reamers; Type W1; water hardened.

ZAPP K90L.
M-1332; 0.90 C, Cr, Mo, bal Fe.
For dies, punches, cutters; oil hardened.

ZAPP LC 120.
M-1332; 1.65 C, Cr, Mo, V, bal Fe.
For blanking and piercing dies, punches; air hardened.

ZAPP LCN.
M-1332; 0.55 C, 0.7 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For header and forging dies; oil hardened, tough.

ZAPP LCN EXTRA.
M-1332; 0.50 C, 0.8 Cr, 0.2 Mo, 1.8 Ni, 0.1 V, bal Fe.
For header and forging dies, punches; oil hardened, tough.

ZAPP MC9.
M-1332; 1.0 C, 1.1 Cr, 0.07 Mn, 0.25 Si, bal Fe.
For bearings, bushings, liners; water hardened.

ZAPP MC13E.
M-1332; 0.20 C, 1.25 Mn, 1.15 Cr, bal Fe.
For gears, cams, camshafts; case hardening steel.

ZAPP MCL3.
M-1332; 0.40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, crankshafts, fasteners; oil hardened, tough.

ZAPP MCW10.
M-1332; 1.05 C, 1.0 Cr, 1.15 W, 0.90 Mn, bal Fe.
For bearings, cutters, form tools; water hardened.

ZAPP MS10.
M-1332; 0.53 C, 0.90 Si, 0.90 Mn, bal Fe.
For gears, bolts, crankshafts, shears, punches; oil hardened, tough.

ZAPP MVC12.
M-1332; 0.61 C, 0.85 Si, 0.75 Mn, 1.18 Cr, 0.1 V, bal Fe.
For springs, dies, upsetters, shears; oil hardened, shock resistant.

ZAPP SC5.
M-1332; 0.67 C, 0.5 Cr, 0.50 Mn, 1.3 Si, bal Fe.
For springs, shears, chisels, punches; oil hardened, tough.

ZAPP SC10.
M-1332; 0.90 C, 1.2 Cr, 1.15 Si, 0.70 Mn, bal Fe.
For blanking and forming dies; oil hardened, wear resistant.

ZAPP SC12.
M-1332; 1.25 C, 1.15 Si, 0.70 Mn, 1.2 Cr, bal Fe.
For blanking and forming dies; oil hardened, wear resistant

ZAPP SCW20H.
M-1332; 0.55 C, 0.90 Si, 1.05 Cr, 0.20 V, 1.85 W, bal Fe.
For forging and die casting dies; oil hardened, tough.

ZAPP SCW 20M.
M-1332; 0.45 C, W, Cr, V, bal Fe.
For extrusion liners and rams, upsetters; hot work tools, oil hardened.

ZAPP SSB30.
M-1332; 0.86 C, 2.8 Co, 4.3 Cr, 0.85 Mo, 2.1 V, 12 W, bal Fe
For lathe and planer tools, reamers, drills, taps; high speed steel.

ZAPP SSB50.
M-1332; 0.79 C, 4.75 Co, 4.3 Cr, 0.75 Mo, 1.55 V, 18 W, bal Fe.
For lathe and planer tools, reamers, broaches, taps; high speed steel.

ZAPP SSB 100.
M-1332; 0.76 C, 10 Co, 4.2 Cr, 0.8 Mo, 1.8 V, 18 W, bal Fe.
For lathe and planer tools, form tools; high speed steel.

ZAPP SSL25.
M-1332; 0.95 C, 4 Cr, W, Mo, V, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

ZAPP SSV25.
M-1332; 0.86 C, 4.1 Cr, 0.85 Mo, 2.5 V, 12 W, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel.

ZAPP SSV50.
M-1332; 1.3 C, 4.3 Cr, 0.85 Mo, 3.8 V, 12 W, bal Fe.
For blanking and forming dies, cutters, reamers; high speed steel.

ZAPP SSVB50.
M-1332; 1.35 C, 4 Cr, W, Co, V, Mo, bal Fe.
For blanking and forming dies; high speed steel.

ZAPP SSW85.
M-1332; 0.82 C, 4.1 Cr, 0.85 Mo, 1.6 V, 8.7 W, bal Fe.
For lathe and planer tools, reamers, broaches; high speed steel.

ZAPP SSW180.
M-1332; 0.74 C, 4.3 Cr, 1.1 V, 18.5 W, bal Fe.
For lathe and planer tools, drills, reamers, taps; high speed steel.

ZAPP SSWL50.
M-1332; 0.85 C, 4 Cr, W, Mo, V, bal Fe.
For lathe and planer tools, reamers, drills, taps; high speed steel.

ZAPP SVC14H.
M-1332; 0.45 C, Si, Cr, V, bal Fe.
For springs, bolts, gears, crankshafts; oil hardened, shock resistant.

ZAPP SVC14W.
M-1332; 0.45 C, Si, Cr, V, bal Fe.
For springs, bolts, gears, crankshafts; oil hardened, shock resistant.

ZAPP SVC25.
M-1332; 0.38 C, Si, Cr, V, bal Fe.
For springs, bolts, gears, crankshafts; oil hardened, shock resistant.

ZAPP VC5.
M-1332; 1.15 C, 0.65 Cr, 0.10 V, 0.30 Mn, bal Fe.
For bearings, blanking and forming dies; oil hardened, wear resistant.

ZAPP VC10.
M-1332, 0.50 C, 1.05 Cr, 0.1 V, 0.95 Mn, bal Fe.
For gears, bolts, crankshafts; oil hardened, shock resistant.

ZAPP VC120.
M-1332; 1.65 C, 11.5 Cr, 0.10 V, bal Fe.
For blanking and forming dies, punches; air hardened, non-deforming.

ZAPP VK4 EXTRA.
M-1332; 1.0 C, 0.10 V, 0.25 Mn, 0.20 Si, bal Fe.
For heading and blanking dies, bearings, cutters; Type W2; water hardened.

ZAPP VM20.
M-1332; 0.90 C, 1.9 Mn, 0.10 V, 0.25 Si, bal Fe.
For punches, forming dies, shear blades, upsetters; oil hardened, non-deforming.

ZAPP VW10.
M-1332; 1.2 C, 0.2 Cr, 0.1 V, 1.0 W, bal Fe.
For forming and blanking dies; water hardened, tough.

ZAPP WC120.
M-1332; 2.1 C, 11.5 Cr, 0.70 W, bal Fe.
For blanking and forming dies, punches; oil hardened, non-deforming.

ZE41A.
Various foundries; 4.2 Zn, 1.2 RE(Ce, etc), 0.7 Zr, bal Mg.
T5-temper: 28,000-30,000 TS; 16,000-20,000 YS; 4-5 El.
At 600°F: 11,000 TS; 8,000 YS; 43 El.
Magnesium sand castings with good pressure tightness and elevated temperature properties.
For parts operating at 350-600°F.
ASTM B80-57T; British RZ5.

ZELCO.
83 Zn, 15 Al, 2 Cu.
For aluminum solder.

ZELNICKER BABBITTS.
M-950; Pb, Sb, bal Sn.
For bearings; Babbitt.

ZENEL.
M-139; C, alloy, bal Fe.
For tools.

ZENITE.
M-1472; 2.85-3.15 C, 1.6-1.8 Si, 0.8 Mn, 0.65-0.85 Ni, 0.15-0.35 Cu, 0.20 max Cr, 0.2-0.4 Mo, bal Fe.
Cast: 45,000 min TS; 210-260 Brin.
For gears, shafts, housings.
High strength alloy cast iron.

ZENITH HIGH SPEED.
0.61 C, 0.12 Mn, 3.39 Cr, 19.2 W, bal Fe.
For tools, high speed cutting tools; high speed steel.

ZENITH SPECIAL.
M-1472; 2.00-2.30 Si, 3.20-3.50 C, 0.12 max S, 0.15 max P, 0.50-0.80 Mn, 0.2-0.4 Ni, 0.15-0.35 Cr, 0.5-0.7 Mo, bal Fe.
Cast: 40,000 min TS; 212-262 Brin.
For gears, shafts, housings.
High strength alloy cast iron.

ZENO
M-1472; 3.3 C, Si, Mn, alloy, bal Fe.
For gears, shafts, machinery housings; cast iron.

ZEPHOR BRONZE.
M-1579; 95 Cu, 4.2-5.8 Sn, 0.03-0.35 P.
½ H. 68,000 TS; 55,000 YS, 28 El; Rock B 78.
Hard: 81,000 TS; 75,000 YS; 10 El; Rock B 87.
Spring: 100,000 TS; 80,000 YS; 4 El; Rock B 95.
For diaphragms, electrical switches, washers, springs, fuse clips, fasteners.
Phosphor Bronze, corrosion resistant.

ZERGAL-X3.
M-Italy; 5.1-6.1 Zn, 2.1-2.9 Mg, 1.2-2.2 Cu, 0.18-0.40 Zr, 0.1-0.3 Mn, 0.2 max Ti, bal Al.
O Temper: 40,000 TS; 24,000 YS; 10 El.
T6 Temper: 80,000 TS; 72,000 YS; 7 El.
For aircraft structures, mobile equipment, hydraulic systems
Age-hardenable, high strength

ZERON METAL.
C, 0.8-1.0 Mn, bal Fe.
Heat treated. 70,000-80,000 TS; 55,000-60,000 YS; 16-14 El; 170-180 Brin.
For wrenches, hardware, fittings; heat treated malleable cast iron.

ZETONIA.
German; Pb, Sb, bal Sn.
For bearings, bushings; white antifriction.

ZEUS.
German; 80 Cu, 20 Ag.
For safety fuses.

ZEUS EV37 T.
M-72; 0.12 C, 0.3-0.5 Mn, 0.04 P, 0.035 S, 0.05 Ti, bal Fe.
For electrodes; welding

ZEUS GV37 T.
M-72; 0.12 C, 0.05 Si, 0.5 Mn, 0.05 Ti, bal Fe.
For electrodes; welding.

ZEVESCAL.
M-1166; C, Cr, Mo, bal Fe.
Cast; 700 Brin.
For gravel mixers, pug mill paddles; abrasion resistant.

ZEVESCAL W.
M-1166; 1.8-2.4 C, 15-17 Cr, 1.5-2.0 Mo, bal Fe.
Annealed: 120,000 TS; 95,000 YS; 2 El; 2 RA; 200 Brin.
For chemical plant equipment; wear and abrasion resistant.

Z-GUSS.
M-302; 6 Al, 3 Zn, bal Mg.
33,000-40,000 TS; 3-1 El; 100 Brin.
For light alloys; age-hardenable.

ZH62A.
Various foundries; 5.7 Zn, 0.7 Zr, 1.8 Th, bal Mg.
T5-temper: 35,000-40-000 TS; 22,000-25,000 YS; 4-6 El. At 500°F: 14,000 TS; 10,000 YS; 30 El.
Magnesium sand castings with good pressure tightness and freedom from porosity.
For parts operating at 300-500°F.
ASTM B80-69; AMS 4438; QQ-M-56; SAE 508.

ZHS-3.
M-Russia; 0.16 C, 15 Cr, 4 Mo, 5 W, 2 Ti, 2 Al, 0.02 B, bal Ni.
For gas turbine engines, buckets, and discs.
Heat and oxidation resistant.

ZhS-6.
M-Russia; 0.15 C, 12.5 Cr, 4.7 Mo, 7.0 W, 2.6 Ti, 5.0 Al, 0.01 B, bal Ni.
For gas turbine engines, buckets and discs.
Heat and oxidation resistant.

ZhS-6K.
M-Russia; 0.17 C, 11.5 Cr, 5 Co, 4 Mo, 5 W, 2.7 Ti, 5.5 Al, 0.01 B, bal Ni.
For gas turbine engines, buckets and discs.
Heat and oxidation resistant.

ZI-184.
U.S.; 0.8-1.0 C, 7-9 Cr, 4-5 W, 1.1-1.5 V, bal Fe.
For tools, dies; oil hardening.

ZICRAL.
French; Al alloy.
For light alloy arts; non-hardenable.

ZICRAL A-28GU.
French; Cu, Mg, Zn, bal Al.
For plight alloy parts; heat treatable.

ZIERAL.
M-462; 0.6-1.4 Mg, 0.6-1.6 Si, 0.6-1.0 Mn, 0.3 max Cr, bal Al.
Annealed: 21,000 TS; 8000 YS; 24 El.
For window frames, gutters, fan blades, boats; good welding and forming properties.

ZILLOY 15.
M-91; 1.05 Cu, 0.01 Mg, bal Zn.
Hot rolled: 30,000-40,000 TS; 30-15 El; 130 Brin.
Cold drawn: 36,000-47,000 TS; 25-15 El; 150 Brin
For corrugated roofing, weatherstrips; corrosion resistant.

ZILLOY 20.
M-91; 0.12-0.16 Ti, 0.50-0.70 Cu, 0 30 max Pb, bal Zn.
29,000-40,000 TS; 14-26 El; 60-76 Rock 15T.
For roofing, gutters, trim, housings, fuses, curtain walls, high creep resistance.

ZILLOY 40 - see ZILLOY 45.

ZILLOY 45.
M-91; 0.65-0.85 Cu, 0.10 max Pb, bal Zn.
Hot rolled: 22,000-30,000 TS; 41-21 El; 60 Rock 15 T.
Cold Rolled: 26,000-35,000 TS; 37-25 El; 65 Rock 15 T.
For weather strips, name plates, ferrules, drawn parts; corrosion resistant.

ZIMAL.
M-137; 4 Al, 3 Cu, bal Zn.
Cast-Die: 45,000 TS; 36,000 YS; 1 El; 100 Brin.
For carburetors, gears, corrosion resistant.

ZIMALIUM.
Germ.; <10 Mg, <20 Zn, bal Al.
For aircraft.

ZIMALIUM
Germ.; 3.7-7.1 Mg, 2.8-4.5 Zn, bal Al.

ZINC BABBITT.
Eng.; 69 Zn, 26 Sn, 5 Cu, 3 Sb.
For bearings; anti-friction.

ZINCDIE.
M-35; 0.30 C, 0.80 Mn, 0.50 Si, 0.4 Mo, 1.65 Cr, bal Fe.
Hardened: C 40-48 Rock.
For die casting dies, plastic molds, compression and plunger type molds.
Type P20, mold and die steel.

ZINC DURALUMIN ("E" ALLOY).
Eng.; 20 Zn, 2.5 Cu, 0 5 Mg, 0.5 Mn, bal Al.
Heat treated: 91,000 TS.
For strong light alloy parts; non-hardenable.

ZINCTITE.
M-1070
For solder; for soldering zinc.

ZINELL
M-975; 0.4 C, bal Fe.
For forgings; water hardening.

ZINKALIUM.
Eng ; 0 8-8.3 Mg, 0.8-8.3 Zn, bal Al.
For light alloy parts; non-hardenable.

ZINKAL M.
M-1134; 1 max Mn, bal Zn.
Rolled: 21,300-35,500 TS; 25-40 Brin.
For structures.

ZINNAL.
M-204; Al sheet coated on both sides with Sn and rolled so as to form a firmly welded whole.
For instrument cases; corrosion resistant.

ZINNBRONZE SnBz4.
M-297; 4 Sn, 0.3 P, bal Cu.
Hard: 71,600-92,000 TS; 20-35 El; 140-170 Brin.
Soft: 46,000-60,000 TS, 55-65 El; 70-80 Brin.
For paper and chemical plant equipment, corrosion resistant, P-bronze.

ZINNBRONZE SnBz6
M-297; 6 Sn, 0.3 P, bal Cu.
Hard: 71,600-92,000 TS; 20-35 El; 150-175 Brin.
Soft: 50,000-64,000 TS, 50 65 El, 75-85 Brin.
For paper and chemical plant equipment; corrosion resistant, P-bronze.

ZINNBRONZE SnBz8.
M-297; 8 Sn, 0.2 P, bal Cu
Hard: 78,000-100,000 TS; 20-35 El; 160-190 Brin.
Soft: 58,000-72,000 TS, 45-60 El; 80-90 Brin.
For paper and chemical plant equipment; corrosion resistant, P-bronze.

ZIP.
M-783; 0.65 C, 4 Cr, 7.5 Co, 1.65 V, 17.5 W, 0.85 Mo, bal Fe.
For lathe, planer and shaper tools; high speed steel.

ZIP.
M-289; 0.75 C, 19 W, 7 Co, 4.5 Cr, 2 V, 1 Mo, bal Fe.
For reamers, broaches, lathe and planer cutters, hobs; Type T5; high speed steel.

ZIPPALLOY.
M-103; 87 Cu, bal Zn.
½H-temper: 54,000 TS; 116 Brin.
Hard temper: 65,000 TS; 137 Brin.
Spring: 75,000 TS; 160 Brin.
For electrical components, hardware, jewelry, watches, lamps; high brass, corrosion resistant.

ZIRCAL.
French; 7-8.5 Zn, 2.5 Mg, 1.5 Cu, 0.25 Cr, bal Al.
Rolled: 78,000-92,000 TS; 64,000-71,000 YS.
Wire: 97,000 TS; 92,000 YS; 6 El; 180 Brin.
For light alloy parts; age-hardenable.

ZIRCALOY-2.
M-118; 1.5 Sn, 0.12 Fe, 0.10 Cr, 0.05 Ni, bal Zr.
At 70°F: 76,000 TS; 49,000 YS; 28 RA; 185 Brin.
At 500°F: 42,000 TS; 24,000 YS; 42 RA.
For nuclear reactors; low neutron absorption.

ZIRCALOY 3.
M-118; 0.05 max C, 0.2-0.3 Sn, 0.2-0.3 Fe, bal Zr.
R.T.: 61,100 TS; 44,200 YS; 36.5 RA; 165 Brin
At 500°F: 26,400 TS; 16,700 YS; 43.0 RA.
For high temperature applications; good strength to 750°F

ZIRCALOY-4.
M-1235, M-118, M-114, 1.5 Sn, 0.2 Fe, 0.1 Cr, bal Zr.
Bar: 80,000-115,000 TS; 40,000-105,000 YS; 3-20 El; B 82-100 Rock
For reactors, fuel sheathing, structural components in pressurized water reactors.
Corrosion resisting, high strength.

ZIRCONIUM-AJR.
M-83, 1.0 Cu, 1.5 Mo, bal Zr.
For nuclear reactors
Resists CO_2 corrosion at high temperatures.

ZIRCONIUM-ATR.
M-83, 0.5 Cu, 0.5 Mo, bal Zr
At 600°F: 45,000 TS, 42,000 YS; 24 El, B 84 Rock
For nuclear reactors, fuel sheathing, reactor structural components
Resists CO_2 corrosion at high temperatures

ZIRCONIUM COPPER 150.
M-8, 99.83 Cu, 0.17 Zr.
Ht. Tr.: 60,000 TS, 50,000 YS, 12 El; B 75 Rock
For commutators, collector rings, canned motor windings, rectifier bases
Heat treatable, corrosion resistant
93% electrical conductivity.

ZIRCONIUM-COPPER 992.
M-141, 0.13 Zr, bal Cu.
Annealed: 30,000 TS; 10,000 YS; 45 El; 40 Brin.
Aged. 60,000 TS, 55,000 YS; 15 El 116 Brin.
For resistance welding electrodes, grid wires, contacts, heat treatable, high conductivity.

ZIRCONIUM-COPPER N-4 (NIPPERT ALLOY N-4).
M-1402; 0.25 Zr, bal Cu
At 75°F: 53,000 TS; 50,500 YS; 10 El, 54 RA; 115 Brin.
At 550°F. 42,000 TS; 40,500 YS; 8 El; 37 RA; 63 Brin
For commutators, high strength and conductivity at high temperature.

ZIRCONIUM DISILICIDE.
M-109; 52.7 Zr, 35.5 Si, 8 Al, 1.5 Fe.
For special alloy applications; cermet.

ZIRCONIUM GR. 11.
M-1561; 0.2 Fe + Cr, 0.01 N, 99.5 Min Zr + Hf.
165 max Brin.
For chemical process applications.
Corrosion resistant.

ZIRCONIUM GR. 12.
M-1561; 0.05 Fe + Cr, 0.01 N, 99.5 min Zr + Hf.
150 Brin.
For chemical plant process equipment.
High corrosion resistant.

ZIRCONIUM GR. 21.
M-1609; 0.17 Fe + Cr, 0.007 N, 0.02 Hf, 99.5 min Zr.
Annealed: 65,000 TS; 38,000 YS; 19 El; 31 RA; Rock B 76.
For atomic reactor components, fuel sheathing, reactor structures.
Thermal neutron absorption 0.18-0.20 barns.

ZIRCONIUM GR. 32.
M-1561, M-1609; 1.5 Sn, 0.14 Fe, 0.10 Cr, 0.05 Ni, bal Zr.
Annealed: 70,000 TS; 43,000 YS; 28 El; 150 Brin.
At 1000°F: 18,000 TS, 10,000 YS, 45 El.
Cold Reduced 60%: 110,000 TS; 102,000 YS; 35 RA
For nuclear reactors, fuel sheathing, boiling and pressurized water reactors
Resists irradiated water corrosion.

ZIRCONIUM GR 34.
M-1561, 1.5 Sn, 0.21 Fe, 0.10 Cr, bal Zr
Annealed: 70,000 TS; 43,000 YS; 28 El
At 500°F: 35,000 TS; 120 DPH
For nuclear reactors, fuel sheathing, structural components
Resists irradiated water corrosion.

ZIRCONIUM STEEL.
Eng.; 0.1-0.6 Zr, 0.2-0.6 C, Mn, Si, P, S, bal Fe.
For machinery parts, shafts; water hardened

ZIRKONAL.
German, 0.5 Si, 15 Cu, 8 Mn, bal Al.
Rolled: 170-190 Brin
For light alloy parts, not hardenable.

ZIRMET
M-1038; 99.9 Zr.
Cold rolled: 111,300 TS, 77,500 YS
Annealed: 73,000 TS; 29,800 YS
For purifying gases; ductile, absorbs gases, corrosion resistant

ZIRTEN
M-1539; 0.16 max C, 0.35-0.65 Si, 0.3-1.2 Mn, 0.12 max P, 0.25-0.55 Cu, 0.5 max Ni, 0.4-0.8 Cr, 0.15 max Zr, bal Fe.
Plate; 70,000 min TS, 50,000 min YP; 18 min El.
For railroad and mine cars, bridges, booms, chutes.
Corrosion resisting to atmosphere
High strength low alloy steel plates.

ZIRTUNG
M-856; W-Zr.
For welding rod, for inert gas shielded arc welding.

ZISIUM
Eng.; 82-83 Al, 1-3 Cu, 15 Zn, 0-1 Sn.
For strong light alloy parts, non-hardenable.

ZISKON.
60 Al, 40 Zn.
For light alloy parts, non-hardenable.

ZISKON.
25-33 Al, 75-67 Zn.
For castings; non-hardenable.

ZIVAN 45.
M-289; 0.45 C, 0.75 Mn, 0.95 Cr, 0.16 V, bal Fe.
For machinery parts; oil hardening

ZIVCO.
M-289; 0.95-1.05 C, 0.5 Mn, 0.20 Si, bal Fe.
For sledges, picks, drills, taps; Type W1; water hardened.

ZIVCO VANADIUM.
M-289; 1.0-1.1 C, 0.15-0.25 V, bal Fe.
AISI Type W2 water hardening tool steel.

ZIVS COBALT.
M-289; 0.7 C, 19 W, 4.5 Cr, 2 V, 5 Co, bal Fe.
For broaches, reamers, gear cutters, hobs, taps; Type T4; high speed steel.

ZIV EXTRA.
M-289; 1.1 C, 0.3 Mn, 0.2 Si, 0.2 V, bal Fe.
For forming dies, shear blades, reamers, taps; water hardened; Type W2.

ZIVS REGULAR.
M-289; 0.95 C, 0.20 Si, 0.25 Mn, bal Fe.
For cold chisels, shear knives, punches, drills; water hardened; Type W1.

ZIV'S SOLID DRILL.
M-289; C, bal Fe.
For mining drills; water hardened.

ZIV SPECIAL.
M-289; 1.1 C, 0.3 Mn, 0.2 V, 0.2 Cr, bal Fe.
For tools, taps, reamers, shear blades; water hardened.

ZIV SUPER.
M-289; 0.7 C, 18 W, 4 Cr, 1 V, bal Fe.
Hardened: C 64-66 Rock.
For drills, hobs, reamers, broaches, taps, lathe and planer tools.
Type T1 high-speed steel.

ZK51A.
Various foundries; 4.5 Zn, 0.7 Zr, bal Mg.
T5-Temper: 34,000-40,000 TS; 20,000-24,000 YS; 5-8 El.
At 600°F: 8,000 TS; 6,000 YS; 16 El.
Magnesium sand castings with good corrosion resistance; recommended for simple, highly stressed parts of uniform cross section
ASTM B80-69; AMS 4443, SAE 509, QQ-M-56.

ZK60A
M-43; 5.7 Zn, 0.5 Zr, bal Mg.
F-temper: 43,000-49,000 TS, 31,000-38,000 YS; 5-14 El; 75 Brin.
T5-temper: 45,000-53,000 TS, 36,000-44,000 YS; 4-11 El; 82 Brin.
Extrusions for highly stressed parts, primarily in aircraft and military; also used as forgings
ASTM B107-69, B91-68; AMS 4352, 4362.

Z-METAL.
M-223, M-209, M-400; 2.0-2.6 T.C, 0.3-0.8 CC, 0.9-1.1 Si, 0.75-1.25 Mn, bal Fe.
Cast: 75,000-85,000 TS; 50,000-55,000 YS, 18-12 El; 155-225 Brin.
For gears, sprockets, wrenches, bolts, pipe clamps, tool bits, brake drums, air drills; a malleable cast iron; resistance to wear and corrosion; spherodized.

Z-METAL.
M-904; 2.0-2.6 C, 1.1 Si, 0.7-1.2 Mn, bal Fe.
Cast: 70,000-90,000 TS; 40,000-60,000 YS; 8-18 El; 155-225 Brin.
For castings, camshafts, gears, nozzles; spheroidized cast iron.

Z-METAL M-10.
M-275; 2.2 T.C., 1.0 Si, 1.0 Mn, bal Fe.
Heat treated: 65,000-85,000 TS; 45,000-55,000 YS; 10-18 El; 163-212 Brin.
For camshafts, axles, gears, machinery housings; pearlitic malleable iron.

Z-METAL M-15.
M-275; 2.2 T.C., 1.0 Si, 0.75-1.0 Mn, bal Fe.
Heat treated: 75,000-95,000 TS; 50,000-60,000 YS; 8-15 El; 170-223 Brin.
For camshafts, axles, gears, machinery parts, housings; pearlitic malleable iron.

Z-METAL M-16.
M-275; 2.2 T.C., 1.0 Si, 0.75-1.0 Mn, bal Fe.
Heat treated: 85,000-100,000 TS; 55,000-65,000 YS; 12-16 El; 201-235 Brin.
For gears, axles, housings, camshafts; pearlitic malleable iron.

Z-METAL M-17.
M-775; 2.0-2.6 T.C., 0.3-0.8 C.C., 0.9-1.1 Si, 0.75-1.2 Mn, bal Fe.
Heat treated: 80,000-100,000 TS; 60,000-75,000 YS; 6-14 El; 197-241 Brin.
For gears, crankshafts, axle housings, hammer heads; pearlitic malleable iron

Z-METAL M-50
M-775; 2.0-2.6 T.C, 0.3-0.8 C.C, 0.9-1.1 Si, 0.75-1.2 Mn, bal Fe
Heat treated: 70,000-90,000 TS; 45,000-60,000 YS; 3-9 El; 179-223 Brin
For gears, crankshafts, axle housings, shears; pearlitic malleable iron

Z-METAL P7
M-275; 3.0 C, 2.0 Si, Mn, bal Fe.
Cast: 100,000 TS; 85,000 YS; 3 El; 277 Brin
For castings, housings, pearlitic, malleable iron.

Zn Al-1 ALLOY.
German; 0.7-0.9 Al, 0.35-0.5 Cu, bal Zn.
For conductors for power transmission; high conductivity.

Zn-Fe ALLOY
German; 0.13 Fe, bal Zn
Rolled 23,000-25,000 TS; 25-40 Brin
For conductors for power transmission

ZOLLNER Z132
11-13 Si, 0.5-2.75 Cu, 0.7-1.3 Mg, 0.15 max Ti, 1.3 max Fe, bal Al.
Cast. 31,000 min TS 90-120 Brin.
For pistons; age hardenable.

ZORITE
M-184, 35 Ni, 17-15 Cr, 1.75 Mn, 0.5 C, 1.0 Si, bal Fe.
Cast: 65,000-55,000 TS; 45,000-40,000 YS, 2-5 El, 4-6 RA 190-180 Brin.
For furnaces, heaters, electrical resistances; heat and corrosion resisting; max working temperature 1900°F.

ZOVM
M-459, C, Cr, Mo, V, bal Fe
12 El.
For machinery parts; oil hardened

Z T M
M-73; 0.35 C, 0.50 Si, 0.8 Mn, 0.80 Cr, 0.32 Mo, bal Fe.
For die casting dies; hot work steel.

ZUNIT 6
M-1332; 0.12 max C, 2.3 Si, 6 Cr, bal Fe
For oil refinery equipment, creep and heat resistant.

ZUNIT 6A
M-1332; 0.12 max C, 0.8 Al, 6.5 Cr, bal Fe.
For oil refinery equipment; creep and heat resistant.

ZUNIT 13.
M-1332; 0.12 max C, 2.2 Si, 13 Cr, bal Fe
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For valves, cutlery, oil refinery equipment; corrosion resistant.

ZUNIT 13A.
M-1332; 0.12 max C, 1.2 Si, 1.0 Al, 13 Cr, bal Fe.
Annealed: 75,000 TS; 40,000 YS; 35 El; 70 RA; 155 Brin.
For oil refinery equipment, valves; creep and heat resistant.

ZUNIT 18.
M-1332; 0.12 max C, 2 Si, 18 Cr, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For valves, pumps, marine hardware, furnace parts; corrosion and heat resistant.

ZUNIT 18A.
M-1332; 0.12 max C, 1 Si, 1 Al, 18 Cr, bal Fe.
Annealed: 80,000 TS; 50,000 YS; 25 El; 50 RA; 150 Brin.
For valves, oil refinery equipment; heat and creep resistant.

ZUNIT 24A.
M-1332; 0.12 max C, 1 5 Al, 24 Cr, bal Fe.
Annealed: 85,000 TS; 50,000 YS; 30 El; 55 RA; 180 Brin.
For oil refinery equipment, valves, pumps; creep and heat resistant.

ZUNIT 25N.
M-1332, 0.2 C, 1.2 Si, 25 Cr, 4 Ni, bal Fe.
Cast: 90,000 TS; 65,000 YS; 2 El; 212 Brin
Heat treated. 97,000 TS; 65,000 YS; 18 El; 210 Brin.
For cylinder liners, bushings, valve seats and bodies; corrosion and heat resistant; Type CC-20.

ZUNIT-GUSS 17.
M-1332; 0 5 C, 1.5 Si, 17 Cr, bal Fe.
For furnace parts, heat treating boxes, retorts; corrosion and heat resistant.

ZUNIT-GUSS 22.
M-1332; 0.6 C, 1 5 Si, 22 Cr, bal Fe.
For grates, baffles, support skids, furnace parts; heat resistant.

ZUNIT-GUSS 28
M-1332, 0 6 C, 1 5 Si, 29 Cr, bal Fe.
For grates, baffles, support skids, furnace parts; heat resistant

ZUNIT-GUSS 28K
M-1332; 1.3 C, 1.5 Si, 29 Cr, bal Fe.
For dies, crusher parts; heat resistant.

ZUNIT-GUSS 28N
M-1332, 0.4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
Cast: 70,000 TS; 65,000 YS, 2 El, 190 Brin
Aged· 115,000 TS; 80,000 YS; 18 El.
For furnace parts, salt pots, soot blowers, grate bars; Type HC, heat resistant

ZUNIT-GUSS N10.
M-1332; 0 4 C, 1.3 Si, 27 Cr, 4 Ni, bal Fe.
Cast· 70,000 TS; 65,000 YS; 2 El; 190 Brin.
Aged: 115,000 TS; 80,000 YS, 18 El.
For furnace parts, salt pots, soot blowers, grate bars; Type HC, heat resistant

ZUNIT-GUSS N11.
M-1332; 0 4 C, 2 Si, 28 Cr, 11 Ni, bal Fe
Cast: 70,000 TS; 65,000 YS; 2 El; 190 Brin.
Aged· 115,000 TS; 80,000 YS; 15 El.
For furnace parts, salt pots, baffles, grids, Type HE; corrosion and heat resistant.

ZUNIT-GUSS N15.
M-1332; 0.4 C, 2 Si, 26 Cr, 14 Ni, bal Fe.
Cast: 75,000 TS; 47,000 YS; 17 El; 25 RA; 200 Brin.
For heat treating boxes, furnace parts, fixtures, grates; Type HH; corrosion and heat resistant.

ZUNIT-GUSS N20.
M-1332; 0.4 C, 2 Si, 26 Cr, 4 Ni, bal Fe.
Cast: 70,000 TS; 65,000 YS; 2 El; 190 Brin.
Aged: 115,000 TS; 80,000 YS; 15 El.
For furnace parts, salt pots, baffles, blowers; Type HC; corrosion and heat resistant.

ZUNIT-GUSS N30.
M-1332; 0.5 C, 1.8 Si, 25 Cr, 30 Ni, bal Fe.
For furnace parts, heat treating boxes, retorts; corrosion and heat resistant.

ZUNIT N10.
M-1332; 0.15 C, 19.5 Cr, 9.5 Ni, 2 Si, bal Fe.
Cast: 85,000 TS; 45,000 YS; 35 El; 165 Brin.
For heat treating boxes, baskets, burner tips, conveyors; Type HF; corrosion and heat resistant.

ZUNIT N20.
M-1332; 0 15 C, 2 Si, 24 Cr, 19 Ni, bal Fe.
Cast: 75,000 TS; 50,000 YS; 17 El; 170 Brin.
Aged: 85,000 TS; 50,000 YS; 10 El; 190 Brin.
For furnace parts, retorts, rabble arms, dampers; Type HK; corrosion and heat resistant.

ZURCO NO 18.
M-290; 16-18 Cr, 0 1 C, bal Fe.
Annealed· 80,000 TS; 55,000 YS
For non-corrosive parts; rustless steel; for continuous heat up to 1200°F.

ZURCO NO. 25.
M-290; 25-30 Cr, 0.1 C, bal Fe.
For non-corrosive parts; rustless steel; for continuous heat up to 2200°F.

ZURCO GALVACOTE.
M-290; 0.2 C, bal Fe.
For structures; galvanized sheets.

ZURCO RUSTLESS IRON.
M-290; 16-18 Cr, C, bal Fe.
For non-corrosive parts, rustless.

ZURCO RUSTLESS STEEL.
M-290; 0.10 C, 12-14 Cr, bal Fe.
Annealed: 75,000 TS; 44,000 YS.
For corrosion resisting parts; rustless, max operating temperature 1000°F.

ZURCO SILVATEX
M-290; 0.2 C, bal Fe.
For structures; coated sheets.

ZURCO STEEL "A"
M-290, 0 08-0 12 C, bal Fe.
For cold rolled or annealed pickled sheets; deep drawing

ZURCO STEEL "AAA."
M-290; 0 08-0 12 C, bal Fe.
For annealed pickled sheets for Ni and Cr plating; extra deep drawing.

ZURCO STEEL "B"
M-290; 0.08-0.12 C, bal Fe.
For furniture sheets, filing cabinets, lockers, deep drawing.

ZURCO STEEL "C."
M-290, 0.08-0.12 C, bal Fe.
For sheets, deep drawing.

ZW.1.
M-325; 1.2 Zn, 0 4-0.8 Zr, bal Mg.
Plate, sheet, strip, extruded sections.
28,000-34,000 TS; 14,000-22,000 Proof St. (0.1%) 8-10 El; 55-75 V.D.H.
Medium strength, good corrosion resistance; for structural components.

ZW.3.
M-325, 3 Zn, 0.4-0.8 Zr, bal Mg
Plate, sheet, extrusions, forgings.
30,000 40,000 TS; 16,000-28,000 Proof Stress (0.1%) 8-10 El; 60-80 VDH.
High strength with excellent corrosion resistance for structural components.

ZW.6.
M-325; 5.5 Zn, 0.4-0.8 Zr, bal Mg.
Extruded: 38,000-40,000 TS; 26,000-28,000 Proof Stress (0.1%); 8-10 El.
High strength with good corrosion resistance, not easily formed.

ZYKLON 5.
M-1340; 0.30 C, 2.35 Cr, 0.6 V, 4.25 W, bal Fe.
For upsetters, extrusion press parts; oil hardened, hot work steel.

ZYKLON 5SN.
M-1340; 0 30 C, 1.1 Cr, 0.18 V, 3.75 W, bal Fe.
For upsetters, extrusion press parts, rams, hot work steel, oil hardened.

ZYKLON 10.
M-1340; 0.30 C, 2.65 Cr, 0 35 V, 8 5 W, bal Fe.
For extrusion press parts, rams, and liners, hot work steel, oil hardened.

ZYKLON 12C.
M-1340; 0.3 C, 2 Co, 2.4 Cr, 0.25 V, 8.5 W, bal Fe.
For extrusion press parts, hot punches and shears; oil hardened, hot work steel.

ZYKLON 122.
M-1340; 0.35 C, 1.05 Cr, 0.18 V, 1.85 W, bal Fe.
For punches, shears, upsetters, cold headers; oil hardened, hot work steel.

ZYKLON CMV211.
M-1340; 0 40 C, Cr, Mn, Mo, bal Fe.
For gears, bolts, crankshafts; oil hardened.

ZYKLON CSM155.
M-1340; 0 67 C, 1.3 Si, 0 5 Mn, 0 5 Cr, bal Fe
For springs; oil hardened.

ZYKLON MNV15.
M-1340, 0 55 C, 0.7 Cr, 0 18 Mo, 1.65 Ni, 0 1 V, bal Fe.
For gears, pinions, bolts, studs, crankshafts; oil hardened, shock resistant

ZYKLON MNU35
M-1340, 0 56 C, 0.7 Cr, 0.18 Mo, 1.65 Ni, 0.1 V, bal Fe.
For gears, pinions, bolts, studs, crankshafts; oil hardened, shock resistant.

SECTION II

ALPHABETICAL LIST OF MANUFACTURERS

M-47	ABEX Corp., Engineered Products Div., Elyria, Ohio.
M-1099	ABEX Corp., Mahwah, N.J. (Formerly American Brake Shoe Co.)
M-1191	Accurate Brass Co., Inc., Bristol, Conn.
M-608	Achorn Steel Co., Cambridge, Mass.
M-281	Aciéral Company of America, New York, N.Y.
M-1116	Aciéries de Champagnole, La Courneuve, France
M-1645	Aciéries & Forges d'Anov, Paris, France.
M-1043	Aciéries & Forges de Firminy, Paris, France.
M-1487	Aciéries du Forez, St. Etienne (Loire), France
M-694	Ackerlind Steel Co., Inc., Long Island City, N.Y.
M-1022	Acme Aluminum Alloys, Inc., Dayton, Ohio.
M-1102	Acme Electric Welder Co., Los Angeles, Calif.
M-1142	Acme Foundry Company, Detroit, Mich.
M-654	Acme Foundry and Machine Co., Coffeyville, Kan.
M-191	Acme-Newport Steel Co., Newport, Ky.
M-568	Acme Steel Company, Chicago, Ill.
M-209	Acme Steel & Malleable Iron Works, Division of Buffalo Brake Beam Co., Buffalo, N.Y.
M-1611	Adalet Mfg., Cleveland, Ohio
M-1086	Adamas Carbide Corporation, Kenilworth, N.J.
M-656	Adams & Company, J. D., Indianapolis, Ind.
M-350	Adams & Osgood Steel Co., Boston, Mass.
M-655	Adirondack Steel Foundries Corp., Watervliet, N.Y.
M-1462	Advance Aluminum Casting Corp., Chicago, Ill.
M-898	Advance Foundry Company, Dayton, Ohio.
M-1241	Aetna Standard Engineering Co., Pittsburgh, Pa.
M-732	A.F.C., Société des, Paris, France
M-1302	AFY, Société des, Paris, France
M-783	Agawam Tool Co., Springfield, Mass.
M-1175	Agil Chemie, Berlin, Germany.
M-661	Agile Div. Nagle/Sybron Corp., Rochester, N.Y.
M-663	Airco Welding Products, Union, N.J., and Airco Vacuum Metals, Berkeley, Cal.
M-123	Ajax Metal Div., H. Kramer Co., Philadelphia, Pa.
M-1673	Ajax Steel and Forge Co.
M-96a	Ajax Tool Sales Co., New York, N.Y.
M-1058	Akron Bronze & Aluminum Co., Akron, Ohio
M-404	Aktiebolaget Skandinaviska Armaturfabriken, Stockholm, Sweden
M-882	Aktiebolaget Svenska Metallverken, Stockholm, Sweden
M-666	Aladdin Rod & Flux Mfg. Co., Grand Rapids, Mich.
M-678	Alais, Fonderies, et Forges, Compagnie des Mines, Temaris, France.
M-620	Alais, Forges et Camargue, Paris, France
M-559	Alamo Iron Works, San Antonio, Tex.
M-537	Alan Wood Steel Co., Conshohocken, Pa.
M-1272	Alar, Ltd., London, England.
M-1682	Albright & Wilson Ltd., London, England.
M-1276	Alcaloy, Inc., Cleveland, Ohio.
M-1625	Alcan Aluminum Corp., Div. Aluminum Ltd., Newton, Mass.
M-643	Alcan Booth Industries, Banbary, Oxon, England (Formerly Northern Aluminum Co.)
M-1715	Alcoa of Great Britain, Ltd., Droitwich, Worcestershire, England
M-1378	Alco Products, Inc., Schenectady, N.Y.
M-595	Alemite Die Casting & Mfg. Co., Woodstock, Ill.
M-658	Alfa Romeo, Milano, Italy.
M-1253	Algoma Steel Corp., Ltd., Sault Ste. Marie, Ontario, Canada
M-124	Allan and Son, A., Carlstad, N.J.
M-1179	Allard, Soc. Anon. Usines et Aciéries, Mont-sur-Marchienne, Belgium
M-1	Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
M-210	Allen & Company, Edgar, Sheffield, England
M-242	Allen Company, I. B., Chicago, Ill.
M-668	Allen Mfg. Co., Hartford, Conn.
M-1249	Allen-Sherman-Hoff Pump Co., Paoli, Pa.
M-210a	Allen Steel Company, Edgar, Inc., New York, N.Y.
M-621	Allgemeine Elektrizitats-Gesellschaft, Berlin, Germany
M-2	Allgemeines Deutsches Metallwerk, G.m.b.H., Berlin, Germany
M-125	Allied Die Casting Corporation, New York, N.Y.
M 953	Allied Process Corp., New York, N.Y. (Out of Business.)
M-1227	Allied Products Corp., Hillsdale, Mich.
M-1438	Allied Steel & Chemical Co., New York, N.Y.
M-642	Allis Chalmers Mfg. Co., Milwaukee, Wisconsin
M-3	Alloy Cast Steel Co., Marion, Ohio.
M-1005	Alloy Engineering & Casting Co., Champaign, Ill.
M-775	Alloy Foundries Div. of the Eastern Co., Naugatuck, Conn.
M-248	Alloy Metal Wire Co., Prospect Park, Pa.
M-692	Alloy Rods Co. see Chemetron Corp. M-1713.
M-126	Alloys & Products, Inc., New York, N.Y.
M-1265	Alloys & Products, Inc., New York, N.Y.
M-541	Alluminio S. A., Milano, Italy.
M-1490	Allvac Metals Co., A Teledyne Co., Monroe, N.C.
M-464	Allyne-Ryan Foundry Co., Cleveland, Ohio.
M-1023	ALOYCO Inc., Linden, N.J.
M-1073	Alpha Metals, Inc., Jersey City, N.J.
M-1314	Alpine-Montan Co., Wien, Austria.
M-672	Alsia, Société de, Paris, France.
M-1158	Alsoco Corp., New York, N.Y.
M-1040	Alten Foundry & Machine Works, Lancaster, Ohio
M-1216	Alter Company, Davenport, Iowa.

M-622	Aluminium Belge, S. A., Luttich, Belgium.
M-871	Aluminium Français, Paris, France.
M-1354	Aluminium G.m.b.H., Rheinfelden/Baden, Germany.
M-1634	Aluminium Industries, AG., Chippis, Switzerland.
M-644	Aluminium Union, Ltd., London, England.
M-493	Aluminium Walzwerke Singen, Singen-Hohentwiel, Germany.
M-302	Aluminiumwerke Maulbronn, Maulbronn, Württ., Germany.
M-555	Aluminiumwerke Nürnberg, G.m.b.H., Nürnberg, Germany.
M-1140	Aluminiumwerke A.G. Rorschach, Rorschach, Switzerland.
M-982	Aluminium Wire & Cable Co, Port Tennant, Swansea, England.
M-1548	Aluminium Zentral, G.m.b.H., Berlin, Germany.
M-4	Aluminum Company of America, Pittsburgh, Pa.
M-219	Aluminum Company of Canada, Ltd., Montreal, Canada.
M-6	Aluminum Industries, Inc., Chicago, Ill.
M-1279	Aluminum Smelting & Refining Co., Maple Heights, Ohio.
M-1233	Aluminum Smelting and Refining Works. same as M-1279.
M-750	Amalgamated Steel Div. Allied Steel and Tractor Products, Inc., Cleveland, Ohio.
M-558	AMAX Copper Div. American Metal Climax, New York, N.Y.
M-558	AMAX Metal Powders, Niagara Falls, N Y.
M-1708	AMAX Metal Powders, Div. United States Refining Co., Niagara Falls, N.Y (see also M-558).
M-127	Ambold Machine Tool Co., New York, N.Y.
M-1315	Ambo-Stahl Co., Koln, Germany.
M-1508	Amco Div., American Metal Climax Inc., New York, N.Y.
M-250	American Abrasive Metals Co., Irvington, N.J.
M-1638	American Alloys Corp., Kansas City, Mo.
M-1456	American Art Alloys Inc., Kokomo, Ind.
M-761	American Art Metals, Inc., New York, N.Y.
M-7	American Boron Products Division Continental Copper and Steel Industries, Buffalo, N.Y.
M-8	American Brass Company, Waterbury, Conn.
M-1483	American Brazing Alloys Co, Pelham, N Y.
M-877	American Bridge Co., Pittsburgh, Pa
M-1564	American Carbide Corp., Union City, N J.
M-285	American Cast Iron Pipe Co, Birmingham, Ala.
M-653	American Chain and Cable Co, Inc. (No longer produce alloys)
M-1122	American Clad Metals, Inc., Pawtucket, R.I.
M-956	American Crucible Produçts Co, Lorain, Ohio.
M-276	American Cutting Alloys, Inc., New York, N.Y.
M-1197	American Electro Metals Corp., Yonkers, N.Y.
M-1200	American Hoist & Derrick Co., St Paul, Minn.
M-128	American Injector Co., Detroit, Mich.
M-1639	American Light Alloys Co., Little Falls, N.J.
M-524	American Machine and Foundry Co., New York, N.Y.
M-313	American Magnesium Corp., Cleveland, Ohio.
M-129	American Manganese Bronze Company, Philadelphia, Pa.
M-197	American Manganese Mfg. Co. (Out of business.)
M-558a	American Metal Climax Corp., New York, N.Y.
M-1508	American Metal Climax, Inc., New York, N.Y.
M-1213	American Metallurgical Products Co., Pittsburgh, Pa.
M-1440	American Meter Co., Reliance Foundry, Pittsburgh, Pa.
M-538	American Nickeloid Co., Peru, Ill.
M-1153	American Non-Gran Bronze Co., Berwyn, Pa.
M-686	American Platinum & Silver Division, Engelhard Industries Inc., Newark, N.J.
M-1550	American Potash and Chemical Co., New York, N.Y.
M-684	American Radiator Co., (No proprietary alloys).
M-39	American Saw & Mfg. Co, Springfield, Mass.
M-11	American Sheet & Tin Plate Division U.S. Steel Corp., Pittsburgh, Pa.
M-771	American Silver Company, Inc., Flushing, N Y.
M-1595	American Silver Co., Flushing, N Y. (see also M-771)
M-314	American Smelting & Refining Co., Perth Amboy, N.J.
M-1088	American Solder Corp., Philadelphia, Pa.
M-293	American Stainless Steel Co, Pittsburgh, Pa.
M-551	American Steel Co, Pittsburgh, Pa.
M-12	American Steel and Wire Div., U.S. Steel Corp., Pittsburgh, Pa
M-991	American Steel Foundries, East Chicago, Ind.
M-473	American Steel Foundries, Chicago, Ill.
M-1057	American Tank & Fabrication Co., Cleveland, Ohio.
M-252	Amesbury Brass & Foundry Co, Amesbury, Mass
M-13	Ampco Metal, Inc, Milwaukee, Wis.
M-211	Amplex Division, Chrysler Corp, Detroit, Mich.
M-9	AMSCO Div. ABEX Corp, Chicago Heights, Ill.
M-8	Anaconda American Brass Co., Waterbury, Conn
M-1468	Anchor Alloys, Inc., Brooklyn, N.Y.
M-342	Anchor Drawn Steel Co. see Teledyne Vasco M-115.
M-351	Andrews Steel Co, Newport, Ky.
M-489	Andrews, Ltd, Sheffield, England.
M-641	Andrews & Co., Ltd, Thomas Royds Works, Sheffield, England
M-352	Andrews Toledo Ltd., London, England
M-606	Ansaldo, Societá Anonima, Rome, Italy
M-639	Antaciron, Inc., Wellesville, N Y
M-564	Apex Bronze Foundry Co., Oakland, Calif.
M-130	Apex Smelting Co, Div. American Metal Climax, Chicago, Ill.
M-485	Apex Steel Co., Ltd., Sheffield, England.
M-687	Apollo Metals, Inc, Chicago, Ill
M-131	Apollo Steel Company, Apollo, Pa.
M-1075	Apothecaries Hall Co., Waterbury, Conn.
M-448b	Appleby-Frodingham Steel Co., Ltd., The, Sheffield, England. (Now part of British Steel Corp. M-1724.)
M-14	Arcade Malleable Iron Company, Worcester, Mass.
M-677	Arcos Corporation, Philadelphia, Pa.
M-1074	ARC Products Div. of Chemetron Corp., Hanover, Pa. (Formerly All-State Welding Alloys.)
M-581	Ardal, Ltd., Worle, Weston-Super-Mare, England.
M-563	Ariston Metal Co., Jersey City, N.J.

M-10	Armco Steel Corp., Middletown, Ohio.
M-132	Armstrong Brothers Tool Co., Chicago, Ill.
M-670	Arnold Engineering Co., Marengo, Ill.
M-1012	Arpocalloy Co., Kansas City, Mo.
M-1662	Arwood Corp., Rockleigh Industrial Park, Rockleigh, N.J.
M-87	Ashby, Ltd., Morris, London, England.
M-1256	Ashton Ltd., N.C., Huddersfield, England
M-1637	Associated Electrical Industries, Ltd., Manchester, England.
M-15	Associated Steel Corp., Cleveland, Ohio.
M-674	Ateliers de la Gironde, Paris, France.
M-1470	Athenia Steel Div., National Standard Co., Clifton, N.J.
M-637	Athens Foundry Co., Athens, Pa
M-1062	Atkins, E. C & Co., Indianapolis, Ind.
M-567	Atkinson Co., Rochester, N.Y.
M-492	Atkinson & Co., E. Frank, Sheffield, England.
M-695	Atlantic Casting & Engineering Co., Clifton, N.J.
M-569	Atlantic Steel Casting Co., Chester, Pa.
M-353	Atlantic Steel Corp., Astoria, N.Y.
M-591	Atlantic Zinc Works, New York, N.Y.
M-1474	Atlas Brass Foundry Co., Los Angeles, Calif.
M-159	Atlas Foundry Co., Irvington, N.J. (Out of Business.)
M-1049	Atlas Metal & Alloys Co., Ltd., Chicago, Ill.
M-696	Atlas Pattern & Model Works, Brooklyn, N.Y.
M-435	Atlas Steels Ltd., Welland, Ontario, Canada.
M-1636	Atles Alloys Div., Rio Algom Corp., Cleveland, Ohio.
M-1115	Aubert et Duval, Neuilly-sur-Seine, France.
M-936	Audubon Wire Cloth Corp, Philadelphia, Pa
M-603	Aurora Metal Co., Inc., Aurora, Ill.
M-937	Austenal, Inc., New York, N.Y. (Part of Howmet Corp)
M-1152	Auto Specialists Mfg Co., St Joseph, Mich.
M-16	Avesta Jernverks Aktiebolag, Avesta, Sweden.
M-703	Axelson Mfg Co., Los Angeles, Calif.
M-1030	Babcock & Wilcox Co., Wilwaukee, Wis.
M-447	Babcock & Wilcox Company, Barberton, Ohio
M-17	Babcock & Wilcox Co, Division Tubular Products, Beaver Falls, Pa
M-704	Bachite Development Corporation.
M-1535	Badall Co, Hammond, Ind.
M-616a	Baker, Inc, Fred, Larchmont, N Y.
M-134	Baker, Perkins & Company, Ltd, Peterborough, England
M-309	Baldwin-Lima-Hamilton Corp, Eddystone Div., Philadelphia, Pa
M-1510	Baldwin Steel Co, Cleveland, Ohio.
M-814	Baldwins, Ltd., London, England.
M-1112	Balfor & Co., Ltd., Arthur, Sheffield, England.
M-1725	Balfour-Darwins Ltd., Sheffield, England
M-412	Ballard, F. J and Co., England. (No longer manufacture the alloys listed.)
M-19	Barber Asphalt Co., Philadelphia, Pa. (No longer manufacture the alloys listed)
M-705	Barium Stainless Steel Corp., Canton, Ohio.
M-135	Barker & Allen, Ltd, Birmingham, England.
M-20	Barronia Metals, Ltd., London, England.
M-619	Barrow Haematite Steel Co, Ltd., Barrow-in-Furness, Lancashire, England.
M-758	Bartlett Hayward Division, Koppers Company, Baltimore, Md.
M-1407	Barworth Steel Works, Ltd., Sheffield, England.
M-21	Batterium Metal & Vislok, Ltd., Market Harborough, England.
M-254	Bausch Machine Tool Co (No longer manufactures alloys listed.)
M-1406	Beardshaw & Son Ltd., J., Sheffield, England.
M-1258	Beardsley & Piper Co., Chicago, Ill.
M-431	Bearium Metals Corp., Rochester, N.Y.
M-1183	Beaumont Birch Co., Philadelphia, Pa.
M-706	Becker Bros. Carbon Company, Cicero, Ill.
M-613	Becker, Stahlwerk, A.G., Krefeld, Germany.
M-544	Becket Bronze Co., Muncie, Ind (No proprietary alloys.)
M-455	Bedel & Cie, Paris, France.
M-1429	Bedford Tool & Forge Co., Bedford, Ohio.
M-707	Belle City Malleable Cast Iron Co., Racine, Wis.
M-22	Bell Telephone Laboratories, Murray Hill, N.J. (No longer manufacture alloys.)
M-1255	Belmont Smelting & Refining Works, Inc., Roslyn Heights, N.Y.
M-1694	Bendix Steel Co., Cleveland, Ohio.
M-823	Benecke Alexander, Inc., New York, N.Y.
M-1146	Benedict-Miller, Inc., Lyndhurst, N.J.
M-1290	Bergische Stahlindustrie, Remscheid, Germany
M-708	Bergman Elektrizitäwerke, Berlin, Germany.
M-1260	Bergsoe & Son, Paul, Glostrup, Denmark.
M-1261	Bergsoe & Son, Paul, Lanskrona, Sweden.
M-1128	Bergstrom Alloys, Corp., New York, N.Y.
M-1281	Berry Metal Co., Harmony, Pa
M-1455	Berted Foundry Co., Columbiana, Ohio.
M-646	Beryllium Corp of America, part of Kawecki Beryllium Industries, Inc., Reading, Pa.
M-23	Bethlehem Foundry and Machine Co, Bethlehem, Pa (No longer manufacture the alloys listed)
M-24	Bethlehem Steel Co, Bethlehem, Pa
M-1042	Biad Powder Metallurgy Co, Pittsburgh, Pa.
M-698	Bidault, Paris, France.
M-410	Billington & Newton, Ltd., Longport, Staffordshire, England.
M-1177	Billiton Maatschappij, N. V, The Hague, Holland.
M-25	Binney Castings Co., Toledo, Ohio
M-136	Birdsboro Corp., Birdsboro, Pa.
M-577	Birkett, Billington & Newton, Ltd, Hanley, England.
M-325	Birmabright Ltd., Birmingham, England.
M-321	Birmetals, Ltd., Birmingham, England
M-137	Birmingham, Aluminum Casting Co, Ltd., Birmingham, England.
M-1551	Birmingham Battery and Metal Co, Ltd., Birmingham, England
M-334	Bissett Steel Company, Cleveland, Ohio.
M-1095	Blackalloy Co. of America, Paterson, N.J.
M-1254	Black-Clawson Co., Middletown, Ohio
M-861	Black Drill Company, Cleveland, Ohio.
M-26	Blackor Company, Los Angeles, Calif.
M-1640	Blackstone Corp, Jamestown, N.Y.
M-413	Blackwell's Metallurgical Works, Liverpool, England.
M-1222	Blaw-Knox Co., Pittsburgh, Pa.
M-382	Bleiwerk Goslar, Goslar a. Harz, Germany.
M-516	Bliss & Laughlin, Inc., Harvey, Ill.
M-1435	Bochlet Gebrüder, Kapfenberg, Steiermark, Austria
M-1331	Bochum Stahlwerke AG, Bochum, Germany.
M-1343	Bochumer Verein A, Bochum, Germany.
M-1184	Bofors AB., Bofors, Sweden.
M-27	Bohler Bros & Co., Vienna, Austria.
M-138	Bohn Aluminum & Brass Corp., Detroit, Mich.
M-345	Boker & Co, H., New York, N.Y.
M-1678	Boller Development Corp., Marion, Ind.
M-575	Bolton & Sons, Thos., Widnes, England
M-1674	Bolton-Emerson, Inc., Lawrence, Mass.
M-139	Bonney-Floyd Co, Columbus, Ohio (No longer Supply proprietary alloys.)

M-975	Bonny Tool & Forge Co., Allentown, Pa.
M-1649	Bonpertuis, Forges & Aciéries, France.
M-338	Booth Aluminum Ltd., James, Birmingham, England.
M-1284	Borolite Corporation, Niagara Falls, N.Y.
M-304	Bosch Metallwerk, Robert, A.G., Stuttgart, Germany.
M-632	Bound Brook Bearing Corp., Bound Brook, N.J.
M-1434	Bowsteel Distributers Corp., Linden, N.J. (No proprietary alloys at present.)
M-336	Boyd-Wagner Co., Chicago, Ill.
M-1154	Bradley & Foster Ltd., Staffordshire, England.
M-846	Bradley Laboratories, London, England.
M-140	Braeburn Alloy Steel Div., Continental Copper and Steel Industries Inc., Braeburn, Pa.
M-597	Braun-Steeples Co., Ltd., San Francisco, Calif.
M-1449	Breda Co., Rome, Italy.
M-1451	Bresciana Metallurgica, Rome, Italy.
M-1394	Brevets Berthelmy, Société des, Paris, France.
M-141	Bridgeport Brass Company, Bridgeport, Conn.
M-1389	Bridgeport Brass Co., Riverside, Cal., (see Bridgeport Brass M-141.)
M-509	Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.
M-1579	Bridgeport Rolling Mills Co., Bridgeport, Conn.
M-424	Brighton Electric Steel Casting Co., Beaver Falls, Pa.
M-1572	Bristol Brass Co., Bridgeport, Conn
M-28	British Aluminum Co., London, England.
M-416	British Driver-Harris Company, Ltd., Gaythorn Hill, Manchester, England.
M-978	British General Electric Co., Ltd., London, England.
M-711	British Insulated Cables Callenders, Ltd., Prescot, England.
M-699	British Metal Corp., Ltd., London, England.
M-396	British Non-Ferrous Metals Research Association, London, England
M-667	British Oxygen Company, Ltd., London, England.
M-715	British Piston Ring Company, Coventry, England
M-478	British Rolling Mills, Ltd., Tipton, Staffordshire, England.
M-504	British Standards Institution, London, England.
M-1724	British Steel Corp., Special Metals Div., Sheffield, England.
M-306	British Thomson Houston Co., Ltd., Rugby, Warwickshire, England.
M-961	Brockhouse Casting Company, Wolverhampton, England.
M-593	Bronze Die Casting Co., Pittsburgh, Pa.
M-1395	Brooks & Perkins, Inc., Detroit, Mich.
M-996	Brookside Metal Co., Ltd., England. (No proprietary alloys.)
M-759	Brown Alloy Works, Detroit, Mich.
M-472	Brown, Bayley's Steel Works, Ltd., Sheffield, England.
M-476	Brown Foundries Co., David, Penistone, England.
M-1126	Brown Firth Company, Ltd., Sheffield, England.
M-1172	Brown and Sharp Mfg. Co., North Kingston, R.I.
M-213	Brown-Wales Co., Boston, Mass.
M-385	Brukskoncernen, A.B., Fagersta, Sweden.
M-1037	Brush Beryllium Corp., Cleveland, Ohio.
M-256	Buckeye Brass & Mfg. Co., Cleveland, Ohio.
M-142	Buffalo Bronze Die Casting Co., Buffalo, N.Y. (Out of business.)
M-962	Buffalo Wire Works, Buffalo, N.Y.
M-143	Buflovak Equipment Division Blaw-Knox Co., Buffalo, N.Y.
M-719	Bull's Metal & Marine Ltd., Glasgow, Scotland.
M-401	Bundy Tubing Company, Detroit, Mich.
M-720	Bunting Brass & Bronze Co., Toledo, Ohio.
M-721	Burden Iron Co., Troy, N.Y. (Out of business.)
M-1467	Burdette Oxygen Co., Cleveland Ohio.
M-29	Burgess-Parr Co., Freeport, Ill.
M-722	Burndy Engineering, Inc., New York, N.Y.
M-1415	Burys & Co., Ltd., Sheffield, England.
M-1355	Busch-Jäger Ludenscheider Metallwerke, Ludenscheid, Germany.
M-292	Byers Co., A. M., Pittsburgh, Pa.
M-723	Byrwill Company, Cincinnati, Ohio.
M-214	Cadman Mfg. Co., A. W., Pittsburgh, Pa.
M-725	Callite Tungsten Corporation, Subsidiary Sylvania Electric Products, Inc., Union City, N.J
M-511	Calloy, Ltd., Avonmouth, England.
M-726	Caloriz Corp. of Great Britain, Ltd., London, England.
M-30	Calorizing Company, Pittsburgh, Pa.
M-1166	Calumet Steel Castings Corp., Hammond, Ind.
M-727	Cambridge Wire Cloth Co., Cambridge, Md.
M-1264	Cameron & Son, Ltd., L., Sheffield, England.
M-490	Cameron & Son, L., Sheffield, England
M-570	Canada Electric Steel Castings, Ltd., Ontario, Canada.
M-1530	Canadian Quebec Metallurgical Corp., Quebec, Canada.
M-347	Cannon-Muskegon Corp., Muskegon, Mich
M-1491	Cannon-Muskegon Co. Same as M-347.
M-354	Cannon-Stein Steel Co (Out of business.)
M-1654	Capito & Klein Co.
M-1557	Capper Pass & Son, Ltd., Bristol, England
M-1695	Carbidie, Div of Aiken Industries, McKeesport, Pa.
M-1609	Carborundum Metals Climax, Inc., Akron, Ohio
M-1696	Carmet Co., Pittsburgh, Pa.
M-251	Carobronze, Ltd., London, England.
M-1587	Carondelet Foundry Co., St. Louis, Mo.
M-1330	Carp & Hones Stahlwerk, Düsseldorf, Germany
M-32	Carpenter Technology Corp., Reading, Pa.
M-405	Carr, Ltd., Chas., Grove Lane, Smethwick, Birmingham, England
M-1410	Carr & Co., Ltd., Richard W., Sheffield, England
M-600	Castalloy Co., Natick, Mass
M-904	Castings Corporation, Buffalo, N.Y.
M-1091	Castings Development Co., Philadelphia, Pa.
M-648	Castolin Welding Alloys, Inc., New York, N.Y.
M-215	Central Brass & Aluminum Foundry Co., Cincinnati, Ohio
M-736	Central Engineering & Supply Co., Passaic, N.J.
M-592	Central Foundry Co., Joplin, Mo.
M-515	Central Institute of Metals, Leningrad, Russia
M-649	Central Iron & Steel Co., Harrisburg, Pa.
M-845	Central Pattern & Foundry Co., Chicago, Ill.
M-1709	Centrifugal Products, Inc., Long Beach, Cal.
M-122	Cerro Copper and Brass Co., Div. Cerro Corp., Bellefonte, Pa.
M-216	Cerro Corp., New York, N.Y.
M-1600	Certanium Alloys & Research Co.

M-582	Chace Co., W. M., Detroit, Mich.
M-566	Chain Belt Co., Milwaukee, Wis.
M-474	Chambersburg Engineering Co., Chambersburg, Pa.
M-1116	Champagnole, Aciéries de, La Courneuve, France.
M-712	Champion Rivet Company, Cleveland, Ohio.
M-1683	Champion Steel Co., Willowick, Ohio.
M-1021	Chance Vought Aircraft Div., United Aircraft Corp., Stratford, Conn.
M-145	Chapman Valve Mfg. Co., Indian Orchard, Mass.
M-33	Chase Brass and Copper Co., Cleveland, Ohio.
M-257	Chateaugay Ore & Iron Company, Standish, N.Y.
M-1117	Chatillon Commentary et Neuves-Maisons, Compagnie des Forges, Paris, France.
M-520	Chatillon & Sons, John, New York, N.Y.
M-76	Chemalloy Electronics Corp., Santee, Calif.
M-1713	Chemetron Corp., Hanover, Pa. (see also M-692, 1074)
M-1187	Chicago Development Corp , Riverdale, Md.
M-810	Chicago Hardware Foundry Co., N. Chicago, Ill.
M-902	Chicago Malleable Casting Co., Chicago, Ill.
M-146	Chicago Steel Foundry Company, Chicago, Ill.
M-1492	Chromalloy American Corp., West Nyack, N.Y.
M-147	Chrome Alloys Mfg. Company, Oakland, Calif.
M-148	Chrome Steel Corp , Carteret, N.J. (Out of business)
M-980	Chromium Corp. of America, Waterbury, Conn.
M-1059	Chromium Mining & Smelting Corp , Ltd , Sault Ste Marie, Ontario, Canada.
M-680	Chrysler Corporation, Detroit, Mich
M-211	Chrysler Corp , Amplex Division, Detroit, Mich.
M-807	Cie Française des Métaux, Paris, France.
M-867	Cinaudagraph Corp., Stamford, Conn (See Indiana Steel Products, Inc.)
M-437	Cincinnati Steel Castings Co., Cincinnati, Ohio
M-298	Cindal Aluminum, Ltd , Birmingham, England
M-149	Cleveland Automatic Machinery Co., Cleveland, Ohio (No longer manufacture alloys listed.)
M-480	Cleveland Brass Corp , Kinsman, Ohio (No proprietary alloys)
M-738	Cleveland Refractory Metals, Cleveland, Ohio.
M-1681	Cleveland Refractory Metals Div , Chase Brass and Copper Co , Solon, Ohio.
M-612	Cleveland Twist Drill Co., Cleveland, Ohio.
M-739	Clevite Bearing Div. Gould Inc., Cleveland, Ohio. (Formerly Cleveland Graphite Bronze.)
M-150	Clifford & Son, Ltd., Charles, Birmingham, England.
M-151	Climax Molybdenum Co., Div. American Metal Climax., Ann Arbor, Mich., and New York, N.Y.
M-1569	Clyde Alloy Steel Co., Ltd., Motherwell, England. (Now part of British Steel Corp. M-1724.)
M-1416	Clyde Works, Samuel Osborne Ltd., Sheffield, England.
M-218	Coan, Ltd., R. W., London, England.
M-1060	Coast Metals, Inc., Little Ferry, N.J.
M-1722	Cobalt Information Center, Columbus, Ohio.
M-503	Cochrane Corporation, Philadelphia, Pa
M-1450	Cogne Co., Rome, Italy.
M-1295	Cohn Corp., Sigmund, Mount Vernon, N.Y.
M-657	Cohn, Ltd., A., London, England.
M-740	Cold Metal Products Company, Youngstown, Ohio.
M-744	Colonial Alloys Co., Philadelphia, Pa.
M-1393	Colonial Metals Co., Columbia, Pa.
M-34	Colonial Steel Div., Teledyne Vasco, Monaco, Pa. (see Teledyne Vasco M-115.)
M-1529	Colorado Fuel and Iron Co., Denver, Colo.
M-1392	Columbia Bronze Corp., Freeport, N.Y.
M-35	Columbia Tool Steel Co., Chicago Heights, Ill.
M-835	Columbus-McKinnon Chain Corp., Tonawanda, N.Y.
M-530	Colvilles, Ltd., Glasgow, Scotland. (Now part of British Steel Corp. M-1724.)
M-1679	Cominco, Trail, B.C., Canada.
M-1248	Commerce Pattern Co., New York, N.Y.
M-152	Commercial Alloys Company, San Francisco, Calif.
M-623	Compagnie des Alliages Speciaux d'Aluminium, Asnières, France.
M-1117	Compagnie des Forges de Chatillon Commentary et Neuves-Maisons, Paris, France.
M-678	Compagnie des Mines, Fonderies et Forges d'Alais, Temaris, France.
M-258	Compagnie d'Orléans, Paris, France.
M-921	Compagnie Française de l'Etain, Paris, France.
M-780	Compound Electro Metals, Ltd., London, England.
M-734	Compressed Industrial Gases Co., Chicago, Ill
M-1676	Connecticut Metals Corp., Hamden, Conn.
M-636	Consolidated Ashcroft Hancock Co., Inc., Bridgeport, Conn.
M-920	Consolidated Car Heating Company, Albany, N Y.
M-746	Constrictor Ltd., London, England.
M-676	Continental Industries Corp., New York, N.Y.
M-451	Continental Foundry & Machine Co., E. Chicago, Ind.
M-631	Continental Steel Corp., Kokomo, Ind.
M-1405	Cook & Co , Ltd., Sheffield, England
M-36	Cooper Alloy Corp , Hillside, N.J
M-1011	Cooper Products Co., Cleveland, Ohio.
M-1657	Copper Range Co , New York, N Y
M-682	Copperweld Steel Co., Warren, Ohio
M-1217	Cop-Sil-Loy, Inc , Hollywood, Calif.
M-1506	Corning Glass Co , Corning, N.Y.
M-917	Cornish Wire Co , New York, N Y.
M-1437	Coulter Steel & Forge Co., Emeryville, Calif.
M-337	Craine-Schrage Steel Div., Detroit Steel Corp , Detroit, Mich (Liquidated.)
M-748	Crane Company, Chicago, Ill.
M-1109	Crane Co., Torrey S , Plantsville, Conn.
M 749	Crescent Tool Co., Jamestown, N.Y.
M-1488	Creusot, Soc. des Forges et Ateliers, Paris, France.
M-1052	Crobalt, Inc., Ann Arbor, Mich.
M-37	Cronite Foundry Co , Ltd., Tottenham, London, England.
M-355	Crowley Inc., John A., New York, N.Y.
M-356	Crucible Electric Steel Co., Homestead, Pa.
M-153	Crucible Steel Casting Company, Cleveland, Ohio.
M-1199	Crucible Steel Castings Co., Lansdowne, Pa.
M-38	Crucible Specialty Metals Div., Colt Industries, Syracuse, N.Y.
M-449	Cunningham Co., M. E , Pittsburgh, Pa.

M-154	Curtis Bay Copper and Iron Works. (Out of business.)
M-308	Cutler-Hammer, Inc., Milwaukee, Wis.
M-155	Cuyahoga Steel and Wire Div., Hoover Ball and Bearing Co., Solon, Ohio.
M-1545	Daido Steel Co., Ltd., Nakamura-Ku, Nagoya, Japan.
M-754	Damascus Steel Casting Co., New Brighton, Pa.
M-1016	Darbyshire Steel Co., El Paso, Tex.
M-40	Darwin & Milner, Inc., Cleveland, Ohio.
M-487	Darwin's, Ltd., Sheffield, England.
M-985	Darwin-Toledo, Ltd., Sheffield, England.
M-1019	Davis and Geck, Inc., Pearl River, N.Y.
M-1097	Dee Div. of Handy and Harmon, see Handy and Harmon, M-63.
M-584	Degefors Iron & Steel Works, Degefors, Sweden.
M-756	Delloy Metals, Philadelphia, Pa.
M-41	Deloro Stellite Ltd., Belleville, Ontario, Canada.
M-1580	Deloro Stellite, Ltd., Margaret, Swindon, England.
M-432	Delsteel, Inc., Wilmington, Del.
M-156	Delta Metal Co., The, Birmingham, England.
M-755	Denman & Davis Co., North Bergen, N.J.
M-157	Detroit Gray Iron Foundry—Detroit Alloy Steel Co., Detroit, Mich.
M-1079	Detroit Mold Engineering Co., Newark, N.J.
M-1105	Detroit Tap and Tool Co., Warren, Mich.
M-1300	Deutro, A G., Berlin, Germany.
M-1356	Deutsche Delta Metallgesellschaft, Düsseldorf-Grafenberg, Germany.
M-459	Deutsche Edelstahlwerke, A. G., Krefeld, Germany.
M-1133	Deutsche Gold und Silber Scheide, Hanau, Germany.
M-895	Deutsche Industrie, Nemen, Germany.
M-1334	Deutsche Mannesmannröhren A. G., Düsseldorf, Germany.
M-981	Deutsche Messingwerke, Berlin, Germany.
M-1489	Dewrance & Co , Ltd., London, England and Glasgow, Scotland
M-1726	Diamond Metal Alloys, Div. of G.W. Murphy Industries, Houston, Texas
M-819	Die Casting Appliance Corp., Ltd , London, England.
M-760	Die Castings, Ltd , Birmingham, England.
M-822	Diehl Steel Company, Cincinnati, Ohio.
M-1357	Diehl Metall-Guss & Presswork, Hrch., GbmH., Nürnberg, Germany
M-505	Dinorm Co., Berlin, Germany.
M-594	Dirigold Corporation, Kokomo, Ind.
M-1399	Dirilyte Co. of America, Kokomo, Ind.
M-357	Disston & Sons, Inc., Henry, Philadelphia, Pa.
M-1121	Division Lead Co., Summit, Ill.
M-1427	Dixon Sintaloy, Inc , Stamford, Conn.
M-1616	D-M-E Corp., Detroit, Mich.
M-1424	DoAll Company, Des Plaines, Ill.
M-762	Dodge Steel Company, Philadelphia, Pa.
M-158	Doehler-Jarvis Division National Lead Co., Toledo, Ohio.
M-855	Doelger & Kirsten, Inc., Milwaukee, Wis.
M-1348	Dohlen-Stahl Gusstahl-Handels, G.m.b.H., Wetter/Ruhr, Germany.
M-1033	Dominion Foundries and Steel, Ltd., Canada. (No proprietary alloys at present.)
M-1239	Dominion Magnesium Ltd., Toronto, Ontario, Canada.
M-763	Dominion Wheel & Foundry Company, Toronto, Canada.
M-1223	Donegal Steel Foundry Co., Marietta, Pa.
M-470	Dorman, Long & Co., Ltd., Middlesbrough, England.
M-614	Dorrenberg Sohne, Ed., Runderoth (Rheinland), Germany.
M-222	Dortmund-Hoerder Hüttenverein, A. G., Dortmund, Germany.
M-43	Dow Chemical Co., The, Metal Products Div., Midland, Mich.
M-924	Dravo-Doyle Co., Pittsburgh, Pa.
M-61	Driver Co., Wilbur B., Newark, N.J.
M-44	Driver-Harris Co , Harrison, N.J
M-358	Duke Steel Co , Inc., New York, N.Y.
M-1413	Dunford & Elliott Ltd., Sheffield, England.
M-1563	DuPont de Nemours & Co., Inc., E.I., Pigment Dept., Wilmington, Del. (No proprietary alloys at present.)
M-522	DuPont de Nemours & Co., Inc., E.I., Wilmington, Del (No proprietary alloys.)
M-993	Duquesne Smelting Corporation, Pittsburgh, Pa.
M-45	Duraloy Co., Scottsdale, Pa.
M-767	Duralumin, Société du, Paris, France.
M-769	Duraweld Metal Products Corporation, Long Island City, N Y.
M-457	Durener Metallwerke, Duren, Germany.
M-46	Duriron Company, Inc., Dayton, Ohio.
M-160	Dursar Corporation, Newark, N.J.
M-948	Dusenberry & Stracken, Inc., New York, N Y.
M-1324	Düsseldorf-Heerdt Edelstahlwerke, G m b H., Düsseldorf-Heerdt, Germany.
M-757	Duval et Poulain, Paris, France
M-773	Dymonhard Corporation of America, New York, NY
M-1218	Dyn-Metal Ltd , London, England
M-1014	Eastern Stainless Steel Co., Div. of EASCO Corp., Baltimore, Md
M-1710	Easton Metal Powder Inc., Easton, Pa.
M-947	Eaton Manufacturing Co , Wilcox-Rich Division, Detroit, Mich
M-1035	Eccles & Davis Machinery Co , Los Angeles, Calif
M-776	Eclipse-Pioneer Foundries, (Discontinued alloy production)
M-617	Edelstahlwerk Rochling, A G , Berlin, Germany
M-210	Edgar Allen & Co , Ltd , Sheffield, England.
M-433	Edgcomb Steel Company, Philadelphia, Pa.
M-999	Edgcomb Steel Corporation, Hillside, N.J.
M-1275	E & E Kaye Ltd., Enfield, England.
M 161	Egal Metal Products Company, Baltimore, Md.
M-549	Egge Company, E N , Los Angeles, Calif.
M-1003	Eimco Corp., Salt Lake City, Utah.
M-557	Eisenwerk Neubrandenburg, G.m.b H , Berlin, Germany
M-796	Eisler Electric Company, Union City, N.J.
M-359	Ekstrand & Tholand Co , New York, N.Y.
M-1141	Ekstrom, Carlson & Co., Rockford, Ill.
M-851	Electric Auto-Lite Co., Woodstock, Ill.
M-673	Electro-Gables, Société de, Paris, France.
M-1210	Electro Foundry Co., Troutdale, Ore.
M-1690	Electro Hercules Steel Co., Cleveland, Ohio.
M-778	Electroloy Company, Inc., Bridgeport, Conn.
M-1020	Electro Metal Corp , Yonkers, N.Y
M-1642	Electronic Specialties Co., H. & S. Metals Co., Pomona, Cal.
M-777	Electro Refractories & Abrasives Div. FERRO Corp., (Not in alloy business at present.)
M-388	Electro-Steel Company, Pittsburgh, Pa.
M-779	Elesco Superheated Company, East Chicago, Ill.
M-1712	Elgiloy Co., Elgin, Ill.
M-1087	Elgin National Watch Co., Elgin, Ill.

M-1358	Elisental Drahtwerk, Neuenrade/Westf., Germany.
M-175	EMF Electric Co., Ltd., Victoria, Australia.
M-691	Empire Sheet & Tin Plate Company, Mansfield, Ohio.
M-162	Empire Steel Castings, Inc., Reading, Pa.
M-49	Empire Steel Corp., Syracuse, N.Y.
M-1061	Emsco Derrick & Equipment Co., Los Angeles, Calif.
M-1083	Enfield Rolling Mills, Ltd., Brimsdown, Enfield, England
M-18	Engelhard Industries Div., Engelhard Mineral and Chemical Corp., Carteret, N.J. (Formerly Baker & Co.)
M-387a	Engelsted, K., New York, N.Y.
M-50	English Steel Corp., Ltd., Sheffield, Eng. (Now part of British Steel Corp., M-1724.)
M-1414	English Steel Rolling Mills Corp., Ltd., (Now part of British Steel Corp. M-1724.)
M-1359	Erbsloh, J. & A., Wuppertal-Barmen, Germany.
M-1333	Ergste Stahlwerk, A.G., Ergste/Ruhr, Germany.
M-1593	Erie Forge and Steel Co., Erie, Pa.
M-51	Erie Malleable Iron Company, Erie, Pa.
M-1425	Erie Steel Co., Erie, Pennsylvania.
M-1336	Erkenzweig & Schwemann, Hagen, Germany.
M-1024	Escaut & Meuse, Ste d', Paris, France.
M-438	ESCO Corp., Portland, Ore.
M-921	Etain, Compagnie Française de l', Paris, France.
M-717	Eutectic Corp., Flushing, N.Y.
M-259	Evans Steel Company, H. D, Boston, Mass.
M-589	Everard Tap & Die Corp. (No proprietary alloys)
M-965	Excelite Company, Woodbridge, N J.
M-1384	Exide Power Systems Div., ESB Inc., Philadelphia, Pa. (No proprietary alloys at present)
M-724	F A C.A , Paris, France.
M-52	Fagersta Bruks Aktiebolag, Fagersta, Sweden.
M-994	Fahralloy Co., Harvey, Ill.
M-886	Fairbanks, Morse & Co., Div Colt Industries, Pomona, Cal
M-491	Fairley & Sons, Jas., Ltd., Birmingham, England.
M-1464	Fairmount Foundry, Inc., Philadelphia, Pa.
M-627	Faitoute Iron & Steel Co, Newark, N.J.
M-1312	Fakirstahl Co, Remscheid, Germany
M-862	Falk Corp., Milwaukee, Wis.
M-53	Fansteel Inc., North Chicago, Ill.
M-78	Farbenindustrie Aktiengesellschaft, I. G. — Abteilung Elektronmetall, Frankfurt a.M., Germany.
M-163	Farrell-Birmingham Company, Ansonia, Conn.
M-220	Farrell-Cheek Steel Foundry Co., Sandusky, Ohio.
M-253	Farrelloy Co, Div. American Solder and Flux Co, Inc., Paoli, Pa.
M-1145	Federal Foundries & Steel Co., Lt., London, England.
M-709	Federal Mogul Corporation, Detroit, Mich.
M-815	Federated Metals Division, American Smelting & Refining Co., Perth Amboy, N.J.
M-1360	Felten & Guillaume Carlswerke, A. G., Köln-Mülheim, Germany.
M-1283	Feltrina, Società Metallurgica, Milano, Italy.
M-104a	Ferner Co., Inc., R.Y., Malden, Mass.
M-54	Ferranti, Ltd., Lancashire, England.
M-660	Ferrous Metals Corporation, New York, N.Y.
M-1232	Ferroxcube Corporation of America, Saugerties, N.Y.
M-1717	Ferry-Capitain, Joinville, France.
M-425	Field Co., B. A., Newark, N.J.
M-718	Fillmore Foundry, Inc., Buffalo, N.Y.
M-55	Finkl & Sons, A., Chicago, Ill.
M-587	Finn Metal Works, John, San Francisco, Calif.
M-1043	Firminy, Aciéries & Forges de, Paris, France.
M-56	Firth, Thos., & John Brown, Ltd., Sheffield, England.
M-1699	Firth-Loach Products, Div. of Howmet Corp., McKeesport, Pa.
M-57	Firth-Sterling, A Teledyne Co., McKeesport, Pa.
M-521	Firth-Vickers Stainless Steels, Ltd., Sheffield, England.
M-1659	Fisher AG., Georg, Germany.
M-378	Fisher Scientific Co., Pittsburgh, Pa.
M-894	Fitzsimons Steel Co., Youngstown, Ohio.
M-1409	Flockton, Tompkin & Co., Ltd., Sheffield, England.
M-806	Follansbee Steel Corp., Follansbee, W. Va.
M-752	Follsain-Wycliffe Foundries, Ltd., Lutterworth, England.
M-679	Fonderie de Précision Nanterre, Paris, France.
M-804	Foote Bros. Gear & Machine Corp., Chicago, Ill.
M-1038	Foote Mineral Co., Exton, Pa.
M-747	Ford Motor Company, Detroit, Mich.
M-439	Forging and Casting Div., Allegheny-Ludlum, Ferndale, Mich.
M-164	Fort Pitt Steel Casting Company, McKeesport, Pa.
M-104	Fourchambault et Decazeville, Soc. Anon. de Commentry, Paris, France.
M-430	Fox & Co., Samual Sheffield England. (Now part of British Steel Corp. M-1724.)
M-571	Frank Foundries Corp., Moline, Ill.
M-360	Frasse & Co., Peter A., Lake Success, N.Y. (Dealer—no proprietary alloys of its own.)
M-72	Fried. Krupp Steel Works, Essen, Germany.
M-403	Friedrich Wilhelms-Hütte, Mühlheim, Ruhr, Germany.
M-1285	Fromson Co., Inc , New York, N.Y
M-58	Frontier Bronze Co., Niagara Falls, N.Y.
M-1361	Fuchs KG Metallwerke, Otto, Meinerzhagen/Westf , Germany.
M-1538	Fugi Iron and Steel Co , Ltd., Chou-Ku, Tokyo, Japan.
M-1589	Fujikoshi Steel Industry Co., Ltd., Tokyo, Japan.
M-808	Fuller and Basch Co., New York, N.Y.
M-1101	Fulton Gold Refineries Corp., New York, N.Y
M-809	Fulton Iron Works, St. Louis, Mo.
M-1243	Fusion Engineering Co., Cleveland, Ohio.
M-407	Gabriel & Company, A. B., Row, Birmingham, England.
M-409	Gallimore & Sons, Wm., Ltd., Sheffield, England.
M-1104	Galv-Weld, Inc., Dayton, Ohio.
M-1205	Gardiner Metal Co., Chicago, Ill.
M-287	Garford Engineering Co., New York, N.Y.
M-550	Garrett Brass & Aluminum Foundry Co., Garrett, Ind.
M-782	Gautier & Co., D. G., New York, N.Y.
M-729	Gayer, A., Co., Paris, France.
M-27	Gebr. Bohler & Co., Aktiengesellschaft, Vienna, Austria.
M-1435	Gebrüder Bochlet, Kapfenberg, Steiermark, Austria.
M-1004	General Aircraft Equipment Co. (Out of business.)

M-59	General Alloys Co., Boston, Mass.
M-1111	General Cerium Co., Edgewater, N.J. (See Ronson Metals Corp.)
M-1520	General Communications Co., Boston, Mass.
M-60	General Electric Co., Metallurgical Products Dept., Detroit, Mich., and Magnetic Materials Product Section, Edmore, Mich.
M-31	General Electric Co., Metallurgical Products Dept., Detroit, Mich.
M-831	General Electric Ltd., Wembley, England.
M-1478	General Malleable Corp., Waukesha, Wis.
M-1063	General Metals Powder Co., Akron, Ohio.
M-165	General Motors Corp., Dayton, Ohio. (see also Central Foundry Div. General Motors Corp. M-690.)
M-690	General Motors Corp., Central Foundry Division, Saginaw, Mich
M-1286	General Motors Corp., Detroit, Mich.
M-926	General Plate Division Metals & Controls Corp , Attleboro, Mass.
M-1034	General Steel Industries, Inc., Granite City, Ill.
M-1513	General Thermoelectric Corp., Princeton, N.J.
M-797	General Tool and Die Co., East Orange, N.J.
M-1251	Georgia Iron Works, Augusta, Ga.
M-1323	Georgsmarienwerke Selesiastahl, G m.b.H., Georgsmarienhütte, Germany.
M-1362	Gerhardi & Co , Ludenscheid, Germany.
M-854	G. H R Foundry Div. Dayton Malleable Iron Co., Dayton, Ohio.
M-650	Gibson Electric-Talon, Div. of Textron, Delmont, Pa
M-897	Gilby-Wire, Soc. Anon., Rueil-Malmaison, France
M-1477	Gillett & Eaton, Inc , Lake City, Minn.
M-897	Gilly-Fodor, Tréfileries et Laminoirs de Précision, Rueil-Malmaison, France
M-817	Gilmore & Company, F. F. Boston, Mass.
M-1298	Gilson, Ltd., Brussels, Belgium
M-609	Gimo-Osterby Bruks, A B., Gimo, Sweden
M-284	Giulini Werke A. G., Rohrsbach, Germany.
M-586	Glacier Metal Co., Richmond, Va.
M-818	Glacier Metal Company, Ltd., Alpertone, England
M-1700	Glader Co., K. C., Niles, Ill.
M-1728	Glidden Co., The, Baltimore, Md
M-1576	Glyco-Metallwerke Daelen & Loos, G m b.H., Germany
M-528	Goldschmidt, Th , A G., Abteilung Metalle, Essen, Germany.
M-1108	Goldsmith Bros., Chicago, Ill. (Part of National Lead.)
M-1178	Gold und Silber Scheide Anstalt, Hanau, Germany
M-458	Goodlass Wall & Lead Industries, Ltd , London, England.
M-820	Gorham Tool Company, Detroit, Mich.
M-1363	Gottingen Aluminiumwerke G.m.b H , Gottingen, Germany.
M-816	Grammar, Dempsey & Hudson Co , Newark, N.J.
M-633	Granite City Steel Co., Granite City, Ill.
M-805	Grant & West, Ltd., London, England
M-247	Graphite Metallizing Corp , Yonkers, N Y.
M-821	Graphitized Alloy Corporation, New York, N.Y.
M-596	Grasselli Chemical Co , Cleveland, Ohio.
M-1009	Grayborn Steel Co., New York, N Y.
M-766	Great Lakes Steel Co., Div. National Steel Corp., Detroit, Mich, and Chicago, Ill.
M-1067	Great Western Steel Div. Hoyland Steel Co., Los Angeles, Calif.
M-1267	Grede Foundries, Inc., Milwaukee, Wis.
M-1194	Greenleaf Corporation, New York, N.Y.
M-1635	Green River Steel Corp., Gwensboro, Ky.
M-949	Grey Mfg. Co., C. M., East Orange, N.J.
M-380	Griesogen, Griesheimer Autogen Verkaufs, G.m.b.H., Griesheim a.M., Germany.
M-1316	Grimm Co., Gustaf, Remscheid-Haddenbach, Germany.
M-1404	Guertler G.m.b.H., William, Berlin, Germany.
M-1431	Gulf Steel Corp., Dallas, Tex.
M-223	Gunite Foundries Corp , Rockford, Ill.
M-1329	Guronitwerke Vervoort, G.m.b.H., Düsseldorf, Germany
M-1293	Gusstahl-Handels, G.m.b.H., van Dohlen-Stahl, Wetter, Ruhr, Germany.
M-825	Hackett Brass Foundry, Detroit, Mich.
M-62	Hadfields, Ltd., Sheffield, England.
M-841	Hadstrom Pattern Works, Oscar W., Chicago, Ill.
M-1318	Haecker, G m.b.H , Huscheswagen, Germany.
M-1652	Hagener Gusstahlwerl Remy G.m.b.H., Germany.
M-260	Halcom Steel Div Crucible Steel, see M-38.
M-1411	Hall & Pickles Ltd., Sheffield, England.
M-1202	Hallamshire Steel & File Co , Ltd., Sheffield, England
M-1514	Hamilton Die Cast, Inc., Hamilton, Ohio.
M-850	Hamilton Foundry Div , Hamilton Allied Corp , Hamilton, Ohio
M-1084	Hamilton Precision Metal Div., Hamilton Watch Co , Lancaster, Pa.
M-992	Hammond Brass Works, Hammond, Ind.
M-697	Hammond & Irving, Inc , Auburn, N.Y.
M-827	Hancock Valve Division, Manning-Maxwell & Moore Company, Bridgeport, Conn
M-361	Hand, Edward, A , Philadelphia, Pa
M-63	Handy & Harman, New York, N Y
M-1328	Handler, G m b H., Dusseldorf, Germany
M-1269	Hanford Foundry Co , San Bernardino, Calif
M-1574	Hanna Furnace Co , Cleveland, Ohio
M-833	Hansell-Elcock Company, Chicago, Ill
M-316	Hans-Heinrich Hutte, G m.b H , Langelsheim a Harz, Germany
M-580	Hanson-Van Winkle-Munning Co , Matawan, N J
M-1471	Hard Alloys Ltd , High Wycombe, Bucks , England.
M-502	Hardenite Steel Co., Ltd , Sheffield, England.
M-166	Hardite Metals, Inc , New York, N Y
M-799	Hardy & Co , Charles, New York, N Y.
M-828	Harnischfeger Corp , Milwaukee, Wis (Alloy welding rods business transferred to Chemetron M-1713)
M-1156	Harris, Arthur & Co , Chicago, Ill
M-310	Harrison, Fischer & Co , Ltd., Sheffield, England
M-1235	Harvey Aluminum Co , Torrance, Calif.
M-830	Harvill Mfg Co , H L , Corona, Cal
M-497	Hassall & Sons, William, Manchester, England.
M-1119	Hauts-Forneaux, Soc Anon , Paris, France.
M-979	Havre, Tréfileries du, Paris, France.
M-770	Havre, Tréfileries et Laminoirs du, Antony (Seine), France.
M-362	Hawkridge Bros. Co., Malden, Mass
M-1553	Haywood Foundries, Ltd , London, England.
M-1270	Haywood Tyler of Canada, Ltd., Kitchener, Ontario, Canada
M-411	Haywoods NCA Metal Ltd., London, England.
M-1554	Heckford, Ltd , Arthur E., Birmingham, England.
M-841	Hedstrom Corp., Oscar, W., Chicago, Ill.

M-1131	Heinkel-Herth Co., Berlin, Germany.
M-217	Hellefors Bruks Aktiebolag, Hellefors, Filipstad, Sweden.
M-343	Heller Bros., Co., Newark, N.J.
M-1221	Heller Tool Co., Div. Wallace Murray Corp., Newcomerstown, Ohio.
M-488	Hemmings & Co., Rotherham, England.
M-1287	Henckels Zwillingwerke, G. A., Solingen, Germany.
M-1391	Henning Bros. & Smith, Inc., Brooklyn, N.Y.
M-1188	Henricot Usines, Emil, Court-St.-Etiennes, Belgium.
M-64	Heppenstall Co., Pittsburgh, Pa.
M-296	Heraeus-Vacuumschmelze, A. G, Hanau, Germany
M-482	Herbert, Ltd., Alfred, Coventry, England.
M-1181	Hetzel & Co., Nurnberg, Germany.
M-204	Hetzel, Vereinigte Silberhammerwerke, Nürnberg, Germany.
M-959	Hewitt Metals, Detroit, Mich.
M-1044	Hewson Co, John, New York, N Y.
M-344	Hidalgo Steel Co., Inc., New York, N.Y.
M-562	Hiertz Metal Co, Theodore, St Louis, Mo.
M-426	High Duty Alloys, Ltd., Slough, England.
M-168	Hills-McCanna Co., Creston, Iowa.
M-1000	Hobart Bros Co, Troy, N Y.
M-340	Hobson, Houghton & Co, New York, N.Y.
M-1350	Hochfrequenz-Tiegelstahl, G.m.b.H., Bochum, Germany.
M-1526	Hoeganaes Metal Powders Ltd., Birmingham, England
M-798	Hoesch-Kohn-Nevessen, Dortmund, Germany
M-1338	Hoffman & Co, Germany. (No proprietary alloys at present)
M-1325	Hoffman Elektrogusstahlwerk, Alb, Eschweiler, Germany
M-224	Hofors Steel Works, Hofors, Sweden
M-638	Hoganas Billesholms Aktiebolaget, Hoganas, Sweden
M-844	Hollup Corporation, Chicago, Ill
M-169	Holroyd & Company, Ltd, John, Rochdale, England
M-1282	Holt Equipment Co, Independence, Ore
M-1303	Holzer, Jacob, (Discontinued.)
M-1364	Honsel-Werk A G., Leichtmetallwerke, Meschede-Dortmund, Germany
M-995	Hopkinsons, Ltd., London, England
M-1377	Horbach & Schmitz, A G, Koln, Germany.
M-610	Horndal Jernverks, A B, Horndal, Sweden.
M-65	Hoskins Mfg Co, Detroit, Mich
M-363	Houghton & Richards, Inc, Boston, Mass
M-1306	Hover Gebr., Kaiserau, Germany
M-1045	Howard Foundry Co, Chicago, Ill
M-908	Hoyland Steel Co, New York, N Y.
M-428	Hoyt Metal Company, New York, N Y.
M-317	Hoyt Metal Co of Great Britain, Ltd., London, England.
M-225	Hubbard Steel Foundry Co., E Chicago, Ind
M-890	Hueck, Edward, Ludenscheid, Germany
M-784	Hughes & Co, Ltd, F. A., London, England.
M-1389	Hunter Douglas Corp, Riverside, Calif. (Now Bridgeport Brass Co)
M-1499	Huntington Alloy Products Div., The International Nickel Co., Huntington, W. Va.
M-664	Hunt-Spiller Div. Power Products, Inc., South San Francisco, Cal.
M-892	Hurbenium Co of America, Detroit, Mich.
M-1271	Husqvarna Vapenfabrik Aktiebolag, Stockholm, Sweden.
M-194	Hybnickel Alloys Co., Wilmington, Del.
M-905	Hyde Park Foundry & Machine Co., Hyde Park, Pa.
M-42	Hydril Co., Los Angeles, Cal.
M-1505	Hydrometal Inc., New York, N.Y.
M-847	Hytensil Aluminum Co., Chicago, Ill.
M-1346	Idealstahl W. Breidenbach OHG, Dieringhausen, Rhld., Germany.
M-364	Illingsworth Steel Co, Philadelphia, Pa.
M-1226	Illinois Tool Works, Chicago, Ill.
M-226	Illinois Zinc Co., Chicago, Ill.
M-29	Illium Corporation, Freeport, Ill.
M-1452	Ilssa Viola Co., Rome, Italy.
M-1547	Imperial Aluminum Co., Ltd., Birmingham, England.
M-786	Imperial Brass Mfg. Co., Chicago, Ill
M-282	Imperial Chemical Industries, Ltd., (Metals Division), Birmingham, England.
M-469	Imperial Chemical Industries, Ltd., Merthyr, Tydfil, South Wales.
M-1578	Imperial Metal Industries, Knock Works, Birmingham, England.
M-351	Imperial Smelting Co., Ltd., London, England
M-771	Imphy, Société Metallurgique d', Imphy (Nièvre), France. (Also: American Silver Co., Inc., Flushing, N.Y.)
M-1076	Indiana General Corp., Valpariso, Ind.
M-1041	Indium Corp of America, Utica, N Y.
M-1482	Induction Steel Casting Co., East Detroit, Mich.
M-1689	Industrial Alloy Steel Co., Cleveland, Ohio.
M-400	Industrial Furnace Corp., Buffalo, N Y.
M-1585	Industria Magenti Fermanenti E Affini (Impia) Milano, Italy.
M-1219	Industria Nazionale Alluminio, Mori (Trento), E Bolzano, Italy.
M-1171	Industrial Overlay Metals Corp., New York, N.Y.
M-440	Industrial Steels, Inc, Cambridge, Mass.
M-499	Industrial Steels, Ltd, Sheffield, England (Now part of British Steel Corp. M-1724)
M-829	Industries Trading Co, New York, N Y.
M-1224	Ingersoll-Rand Co, Phillipsburg, N.J.
M-328	Ingersoll Steel Division Borg-Warner Co., New Castle, Ind
M-1606	Inland Electronics Products Corp., Pasadena, Cal
M-67	Inland Steel Co., Chicago, Ill
M-322	INSILCO Corp, Meriden, Conn. (Was International Silver Co)
M-5	International Alloys Ltd, Aylesbury, Bucks, England.
M-2a	International Development Corp., New York, N.Y.
M-1661	International Lead-Zinc Research Assoc., Inc, New York, N.Y
M-68	International Nickel Co, Inc., Huntington Alloy Products Division, New York, N.Y.
M-1598	International Wire Products Corp., Midland, N J
M-441	Interstate Foundry & Machine Co, Johnson City, Tenn.
M-1621	Isaacson Iron Works
M-789	Isabellenhuette, Berlin, Germany.
M-1570	Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan.
M-471	Isteg Steel Products Co., Westminster, England
M-1397	Istituto Sperimentali Metalli Leggeri, Milano, Italy.
M-269	ITT Components Group Europe, Harlow, Essex, United Kingdom (Was Standard Telephones and Cables.)
M-477	Jackman, Joseph & Co., Ltd., Sheffield, England.
M-1032	Jackson Iron & Steel Co., Jackson, Ohio.
M-1297	Jadot, Usines de, Brussels, Belgium.

M-1643	Jamestown Malleable Iron Div., Blackstone Corp., Jamestown, N.Y.
M-1423	Jamison Steel Corp., San Francisco, Calif.
M-508	Janney Cylinder Co., Philadelphia, Pa.
M-1577	Japan Metal Industry Co., Ltd., Kawasaki, Japan.
M-1419	Japan Special Steel Co., Tokyo, Japan.
M-1542	Japan Steel Tube Co., Ltd.; Tokyo, Japan.
M-1539	Japan Steel Works, Ltd., Tokyo, Japan.
M-170	Jeffrey Mfg. Company, Columbus, Ohio.
M-791	Jelenko & Co., J.F., New York, N.Y.
M-231	Jellif Corp., C. O., Southport, Conn.
M-261	Jessop-Saville, Ltd., Sheffield, England.
M-69	Jessop Steel Co., Washington, Pa.
M-1103	Jobbins Inc., W. F., Aurora, Ill.
M-1588	Jodots Freres, Ets., Boloeil, Belgium.
M-332	Johnson & Co., A., New York, N.Y.
M-200	Johnson, Mathey & Co., London, England.
M-172	Johnson Bronze Company, New Castle, Pa.
M-393	Johnson Manufacturing Co., Mount Vernon, Iowa.
M-1620	Johnston Steel & Wire Co., Worcester, Mass.
M-1195	Jonas & Culver Ltd., Sheffield, England.
M-422	Jones, Rd., Ltd., Garrison Lane, Birmingham, England.
M-173	Jones & Laughlin Steel Corp., Pittsburgh, Pa.
M-1555	Jones & Rooke, Ltd., Birmingham, England.
M-891	Joselin & Company, C., New York, N.Y.
M-560	Joslyn Stainless Steels Co., Ft. Wayne, Ind.
M-1347	Junker G.m.b.H., Otto, Lammersdorf, Germany.
M-1310	Kabel Stalwerke, C., Pouplier, Hagen-Kabel, Germany.
M-517	Kahl-Holt Co., Baltimore, Md.
M-429	Kahl Iron Foundry, Detroit, Mich.
M-1147	Kaiser Aluminum & Chemical Corp., Oakland, Calif.
M-1148	Kaiser Steel Corp., Oakland, Calif.
M-262	Kalif Corporation, Emeryville, Calif.
M-1150	Kanthal Corp., Bethel, Conn.
M-70	Kanthal, A. B., Hallstahammar, Sweden.
M-1313	Kanz Metallwerke, Hans, Zürich-Albisrieden, Switzerland.
M-1132	Kapfenberg, Steiermark, Austria.
M-1701	Kasle Steel Corp., Detroit, Mich.
M-1541	Kawasaki Iron & Steel Co., Ltd., Fukiaiku, Japan and Tokyo, Japan.
M-1622	Kawecki Chemical Co., Boyertown, Pa. (see also M-646.)
M-572	Kay-Brunner Steel Products, Inc., Alhambra, Cal. (No proprietary alloys).
M-1444	Kaye Ltd., E & E, Enfield, England.
M-510	Kayser-Ellison & Co., Ltd., Sheffield, England.
M-731	Keasby & Matteson Co., Ambler, Pa.
M-792	Kellogg & Co., M. W., Jersey City, N.J.
M-900	Kelly Foundry & Machine Co., Elkins, W. Va.
M-1317	Kelsey-Hayes Co., Metal Div., New Hartford, N.Y. Alloy production now operated as separate company, Special Metals M-1317.
M-171	Kencroft Malleable Co., Buffalo, N.Y.
M-793	Kennametal, Inc., Latrobe, Pa.
M-1590	Kensington Steel Co., Chicago, Ill.
M-1039	Keokuk Electro-Metals Co., Keokuk, Iowa.
M-1129	Kerkling & Co., Whittier, Calif.
M-1125	Kester Solder Co., Chicago, Ill.
M-989	Keystone Carbon Co., St. Marys, Pa.
M-339	Kidd Drawn Steel Co., Aliquippa, Pa.
M-1352	Kind & Co., Bielstein, Rheinland, Germany.
M-1641	King Laboratory Co., Victor, Los Altos, Cal. (see also M-1601.)
M-1601	King Materials Laboratory, Victor, Palo Alto, Cal. (see also M-1641.)
M-174	Kinite Corporation, Milwaukee, Wis.
M-546	Kinney Iron Works, Los Angeles, Calif.
M-794	Kirk & Sons, Morris P., Los Angeles, Calif.
M-1159	Kling Bros. Engineering Works, Chicago, Ill.
M-1650	Klockner-Werke A. G., Germany.
M-335	Kloster Steel Co., Chicago, Ill.
M-611	Klosters A. B., Langshyttan, Sweden.
M-1193	Knapp Mills, Inc., Long Island City, N.Y.
M-1518	Knowsley Cast Metal Co., Ltd., Manchester, England.
M-645	Knutange, Ste Métallurgique de, Paris, France.
M-1604	Kobe Steel Works Ltd., Kobe, Japan.
M-1583	Koerver & Nehring, G.m.b.H., Krefeld, Germany.
M-1702	Koncor Industries, Div. of Latrobe Steel Co., Wauseon, Ohio.
M-399	Koppers Co., Inc., Baltimore, Md.
M-346	Kramer & Co., H., Chicago, Ill.
M-324	Kreidler's Metall-und Drahtwerke, G.m.b.H., Stuttgart, Germany.
M-772	Kries & Sons Co., Henry A., Baltimore, Md.
M-1135	Kropp Forge Co., Chicago, Ill.
M-72	Krupp Steel Works, Fried., Essen, Germany.
M-1327	Kuhbier & Sohn, C. Dahlerbruk, Westf., Germany.
M-1517	Kulite Tungsten Co., Ridgefield, N.J.
M-263	LaBour Company, Elkhart, Ind.
M-552	Laclede Brass Works, Inc., St. Louis, Mo.
M-1527	Ladish Co., Cudahy, Wis.
M-857	Lake & Elliot, Ltd., Braintree, England.
M-888	Lake City Malleable Company, Cleveland, Ohio.
M-800	Lake Erie Engineering Corp., Buffalo, N.Y.
M-1480	Lakeside Malleable Castings Co., Racine, Wis.
M-1165	Lancaster Steel Co., Inc., New York, N.Y.
M-1169	Langley Alloys Ltd., Langley, Slough, England.
M-527	Lanz, Heinrich, A. G., Mannheim, Germany.
M-669	LaSalle Steel Company, Chicago, Ill.
M-73	Latrobe Steel Corporation, Latrobe, Pa.
M-801	Lavin & Sons, R., Chicago, Ill.
M-624	Lavorazione Leghe Leggere, Porto Marghera (Venezia), E. Ferrara, Milano, Italy.
M-1047	Lazalloys Ltd., Bently Works, Doncaster, England.
M-1408	Leadbeater & Scott Ltd., Sheffield, England.
M-74	Lebanon Steel Foundry, Lebanon, Pa.
M-1687	Le Bronze Industrial, France.
M-1586	Leghe E. Accini Speciali (LEAS) Milano, Italy.
M-300	Lehigh Babbitt Co., Allentown, Pa.
M-688	Lehigh Steel Corp., New York, N.Y.
M-1459	Lesjofors Aktiebolag, Lesjofors, Sweden.
M-1196	Les Moyne Steel Co., Pittsburgh, Pa.
M-227	Levett, Walker M., New York, N.Y.
M-1396	LeVita Metal Alloy Co., Detroit, Mich.
M-540	Lewin Metals Corp., E. St. Louis, Ill.
M-573	LFM Mfg., Co., Atchison, Kansas.
M-75	Lightalloys, Ltd., London, England.
M-1481	Light Alloys Products Co., Ltd., Munworth, England.
M-1031	Light Metals, Inc., Indianapolis, Ind.
M-951	Light Metal Works, Tokyo, Japan.
M-578	Lincoln Electric Co., Cleveland, Ohio.
M-605	Lindberg Hevi Duty Div. Solar Basic Industries, Chicago, Ill.
M-843	Linde Company, New York, N.Y.
M-1319	Lindenberg, G.m.b.H., Remscheid, Germany.
M-228	Link-Belt Div. F.M.C. Corp., Chicago, Ill.
M-1050	Lithaloys Corporation, New York, N.Y.
M-1479	Little Bros. Foundry Co., Port Huron, Mich.
M-1244	Little Falls Alloys, Inc., Paterson, N.J.
M-1466	Lobdell Co., Wilmington, Del.

M-573	Locomotive Finished Materials Co., Atchison, Kans.
M-802	Logan Iron & Steel Company, Philadelphia, Pa.
M-1311	Lohman, G.m.b.H., Fried., Herbede (Ruhr), Germany.
M-1546	Loire, Compagnie des Ateliers et Forges de la, Paris, France.
M-1118	Longwy, Soc. des Aciéries, Mont-Saint-Martin, France.
M-1495	Lorraine-Escault, Paris, France.
M-1457	Lovsted & Co., Inc., C. M., Seattle, Wash.
M-803	Lowmoor Best Yorkshire Iron, Ltd., Lowmoor, England.
M-1085	Ludlow-Saylor Wire Co., St. Louis, Mo.
M-1422	Ludlow Steel Corp., Bedford, Ohio.
M-176	Lukens Steel Company, Coatesville, Pa.
M-77	Lumen Bearing Co., Buffalo, N.Y.
M-264	Lunkenheimer Company, Cincinnati, Ohio.
M-534	Lunn & Co., E., Glasgow, Scotland.
M-1443	Luria Steel & Trading Co., New York, N.Y.
M-523	Lynchburg Foundry Co., Lynchburg, Va.
M-456	Lyon, Conklin & Co., Baltimore, Md.
M-1680	Macauley Foundry Co., H. C., Berkeley, Cal.
M-1218a	Machinery & Machine Supplies Co., Inc., New York, N.Y.
M-305	Machlett Laboratories, Stamford, Conn.
M-177	Mackenzie's Sons Co., Inc., Duncan, Trenton, N.J.
M-229	Mackintosh-Hemphill Company, Pittsburgh, Pa.
M-1461	Madison Foundry Co, Cleveland, Ohio.
M-1051	Madison-Kipp Corp, Madison, Wis.
M-556	Magnesium Castings & Products, Lt., Slough, England
M-78a	Magnesium Development Corp., Newark, N.J.
M-1130	Magnesium Elektron Ltd., Manchester, England
M-1089	Magnetic Metal Co., Camden, N.J.
M-1626	Magnetics, Inc., Butler, Pa.
M-436	Magnolia Antifriction Metal Co., of Great Britain, Ltd., London, S.W. 1, England.
M-178	Magnolia Metal Corp., Auburn, Neb.
M-958	Magnus Metal Division National Lead Co., Chicago, Ill.
M-1581	Magotteaux, Les Fonderies, Vaux-sous-Chevrement, (Liege), Belgium.
M-1365	Mahle K G Stuttgart-Bad Cannstatt, Germany.
M-1292	Main Metal Ltd., London, England.
M-859	Major Engineering Corp., Chicago, Ill.
M-1066	Makepeace, D. E, Div., Engelhard Industries, Attleboro, Mass.
M-79	Malleable Iron Fittings Co., Branford, Conn.
M-265	Mallory Metallurgical Co., Div. of P.R. Mallory and Co, Inc, Indianapolis, Ind.
M-1229	Mallory-Sharon Metals Corp., Niles, Ohio. (Now Reactive Metals Inc.)
M-221	Manco Products Co., Melvindale, Mich.
M-179	Manganese Bronze & Brass Co., Ltd., Ipswich, Eng. (see also Delta Metal Co. M-156.)
M-1504	Manganese Chemicals Corp., Minneapolis, Minn.
M-180	Manganese Steel Forge Company, Philadelphia, Pa.
M-1381	Mannesmann-Hüttenwerk, A. G., Duisburg, Germany.
M-230	Manning, Maxwell and Moore, Div of Dresser Industries, Muskegan, Mich.
M-1509	Manoir A., Pitres (Eure), Usines du, Paris, France.
M-893	Manos Ltd., Zürich, Switzerland.
M-1068	Manross Division, Associated Spring Co., Bristol, Conn.
M-1691	Mansfield Brass and Aluminum Corp., Mansfield, Ohio.
M-1496	Marathon Specialty Steels Inc., New York, N.Y.
M-1671	Markey Bronze Bushing Co., Delta, Ohio.
M-1096	Marquette Corp., Minneapolis, Minn.
M-1180	Marrell Frères, Soc. Anon. Etab., Rive de Gier, France.
M-753	Marsh Brothers & Co., Ltd., Sheffield, England.
M-1149	Marshall Steel Co., La Grange, Ill.
M-1536	Martin Metals Div., Martin-Marietta Corp., Wheeling, Ill. (Was Sierra Metals Corp.)
M-348	Martinel Steel Co., Ltd., Sheffield, England.
M-323	Maschinenbau, A. G., Golzern-Grimma, Germany.
M-1277	Massey Harris Ltd., Toronto, Ontario, Canada.
M-467	Massillon Steel Casting Co., Massillon, Ohio.
M-1721	Masten Corp., Arlington Heights, Ill.
M-1627	Materials Research Corp., Orangeburg, N.Y.
M-454	Mather & Platt, Ltd., Manchester, England.
M-1511	Mathieson-Hegler Co., LaSalle, Ill.
M-302	Maulbronn, Aluminiumwerke, Maulbronn-Württ., Germany.
M-315	Maywood Chemical Works, Maywood, N.J.
M-212	McCallum-Hatch Bronze Co., Inc., Buffalo, N.Y.
M-1107	McCauley Alloys Sales Co., New York, N.Y.
M-1592	McClouth Steel Corp., Detroit, Mich.
M-80	McDonald & Co., P. F., Boston, Mass.
M-710	McGean Chemical Company, Cleveland, Ohio.
M-181	McGill Mfg. Company, Valparaiso, Ind.
M-81	McInnes Co., Corry, Pa.
M-849	McKay Co., The, A Teledyne Co., Pittsburgh, Pa.
M-914	McKenchie Bros., Ltd., Birmingham, England.
M-182	McPhail & Sons, Wm., Glasgow, Scotland.
M-1208	McQuay-Norris Mfg., Co., St. Louis, Mo.
M-1441	Medart Engineering and Equipment Co., St. Louis, Mo.
M-1167	Meech Foundry, Inc, Cleveland, Ohio.
M-82	Meehanite Metal Corp., New Rochelle, N.Y.
M-1556	Meigh Castings, Ltd., Cheltenham, England.
M-1349	Mentah Co, Vorgtlinder, W. Berlin, Germany.
M-519	Merco Nordstrom Valve Co., Pittsburgh, Pa.
M-1436	Meridian Steel Co, Inc., Jerico, N.Y.
M-852	Mesta Machine Co., Pittsburgh, Pa.
M-1559	Metal Alloys, Ltd., Pontypride, Glam, South Wales.
M-1065	Metal and Alloy Div., Silver Creek Precision Corp, Silver Creek, N.Y.
M-31	Metallurgical Products Dept., General Electric Co., Detroit, Mich.
M-913	Metal Carbides Corporation, Youngstown, Ohio.
M-968	Metal Castings, Ltd., Worcester, England.
M-320	Metallbank, A. G., (Heddernheimer Copper Works), Heddernheim, Germany.
M-299	Metallgesellschaft, A. G., Frankfurt, Germany
M-402	Metallhüttenwerke Schaefer und Schael, A. G., Breslau, Germany.
M-381	Metallo-Chemische Fabrik, Dr. Leopold Rostosky, Berlin, Germany.
M-813	Metalloy Products Company, Los Angeles, Calif.
M-971	Metallwerke, A. G., Vienna, Austria.
M-1246	Metallwerk Plansee Gesellschaft, Reutte-Tirol, Austria.
M-1562	Metals and Controls, Inc., Attleboro, Mass.
M-183	Metal Sales Corp., Jersey City, N.J.

M-529	Metal & Thermit Corp., New York, N.Y.
M-853	METCO Inc., Westbury, Long Island, N.Y.
M-1552	Metro-Cutanit, Ltd., Grappenhall, England.
M-83	Metropolitan-Vickers Electrical Co., Ltd., Manchester, England.
M-450	Micheville, Ste des Aciéries de, Paris, France.
M-184	Michiana Products Corp., Michigan City, Ind.
M-1174	Michigan Powdered Metal Products Co., Inc., Northville, Mich.
M-545	Michigan Smelting & Refining Co., Detroit, Mich.
M-84	Michigan Standard Alloy Casting Co., Detroit, Mich.
M-751	Michigan Tool Co., Detroit, Mich.
M-312	Michigan Valve & Foundry Co., Detroit, Mich.
M-185	Midland Motor Cylinder Company, Smethwick, England.
M-85	Midvale-Heppenstall Co., Philadelphia, Pa.
M-1607	Midwest Materials Co., Cleveland, Ohio.
M-186	Millbury Steel Foundry Company, Millbury, Mass.
M-1144	Miller Company, Meriden, Conn.
M-1212	Miller Co. same as M-1144.
M-743	Miller Steel Company, Newark, N.J.
M-187	Mills, Wm., Ltd., Wednesbury, Staffordshire, England.
M-365	Milne and Co., A., Fairfield, Conn.
M-1476	Milwaukee Die Casting Co., Milwaukee, Wis.
M-475	Milwaukee Steel Foundry Co., Milwaukee, Wis.
M-858	Minimax Co., Chicago, Ill.
M-733	Mining & Chemical Products, Ltd., London, England.
M-415	Miralite, Ltd., Mortlake, England.
M-988	Mir-O-Col Alloy Co., Los Angeles, Calif.
M-536	Mitchell Co., Inc., Robt., Montreal, Canada.
M-1685	Mitsubishi Metal Products of Japan, Tokyo, Japan.
M-1543	Mitsubishi Steel Co., Ltd., Tokyo, Japan.
M-1523	Molecu Wire Co., Farmington, N.J.
M-860	Moltrop Steel Products Co., Beaver Falls, Pa.
M-837	Molybdenum Company, N. O., Reutte-Tyrol, Austria.
M-640	Molybdenum Corp. of America, New York, N.Y.
M-863	Monarch Alloy Co., Ravenna, Ohio.
M-495	Monarch Steel Corp., Indianapolis, Ind.
M-86	Mond Nickel Company, Ltd., London, England.
M-839	Moraine Products Company, Dayton, Ohio.
M-1445	Montecatini Settore Alluminio, Milano, Italy.
M-539a	More-Jones Brass & Metal Co., St. Louis, Mo.
M-1519	Morgan Crucible Co., Ltd., London, England.
M-87	Morris Ashby, Ltd , London, England.
M-1250	Morris Machine Works, Baldwinsville, N.Y.
M-601	Motor Castings Co., Milwaukee, Wis.
M-934	Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
M-266	Mueller Brass Company, Port Huron, Mich.
M-188	Muntz, P. H., & Co., Ltd., Birmingham, England.
M-526	Murex, Ltd., Rainham, England.
M-1531	Muskegon Piston Co., Muskegon, Mich.
M-1245	Myrens Verksted A/S, Oslo, Norway.
M-679	Nanterre, Fonderie de Précision, Paris, France.
M-952	Napraloy Co., Jersey City, N.J.
M-548	Nassau Smelting and Refining Co., New York, N.Y. (No proprietary alloys.)
M-1463	National Air Oil Burner Co., Philadelphia, Pa.
M-414	National Alloys, Ltd., London, England.
M-189	National Alloy Steel Division Blaw-Knox Co., Blawknox, Pa.
M-1688	National Alloy Tool Co., Cleveland, Ohio.
M-539	National Bearing Div., ABEX Corp., Meadville, Pa.
M-864	National Broach & Machine Co., Detroit, Mich.
M-190	National Bronze & Aluminum Foundry Company, Cleveland, Ohio.
M-910	National Cable & Metal Company, Glendale, Calif.
M-89	National Castings Co., Cleveland, Ohio.
M-232	National Erie Corp., Erie, Pa.
M-483	National Forge & Ordnance Co., Irvine, Pa.
M-88	National Lead Co., Metal Div., New York, N.Y.
M-311	National Physical Laboratory, Teddington, England.
M-1624	National Research Corp., Metals Div., Newton, Mass
M-1507	National Standard Co., Niles, Mich.
M-836	National Steel Corp., Pittsburgh, Pa.
M-1466	National Tool Co. Div. National Cleveland Corp., Cleveland, Ohio.
M-90	National Tube Div. U. S. Steel Corp., Pittsburgh, Pa
M-1458	Navan, Inc., El Secundo, Cal.
M-865	Nesaloy Products, Inc., New York, N.Y.
M-1386	Neubrandenburg Eisenwerke, G m.b.H., Berlin, Germany.
M-1366	Neumayer Kabel u Metallwerke A. G , Nürnberg, Germany.
M-1203	Newcomer Products, Inc., Latrobe, Pa.
M-1720	New England Brass, Taunton, Mass
M-973	New England Collapsible Tube Co , New London, Conn
M-442	New England High Carbon Wire Co., Millbury, Mass. (No proprietary alloys)
M-91	New Jersey Zinc Co., The, Bethlehem, Pa.
M-191	Newport Steel Corp , Newport, Ky. (See Acme-Newport.)
M-349	Ney Co , J M , Bloomfield, Conn.
M-92	Niagara Falls Smelting & Refining Division Continental Copper & Steel Industries, Inc , Buffalo, N Y.
M-1693	Niborium Industries Inc , Providence, R.I.
M-93	Nicralium Company, Jackson, Mich
M-716	Nihon Jyokiko Seikosho Goshi, Koisha, Japan
M-1402	Nippert Co , The, Delaware, Ohio.
M-1612	Nippon Kohan Kaisha, Ltd., Tokyo Japan,.
M-1651	Nippon Stainless Steel Co., Ltd., Tokyo, Japan
M-1732	Nippon Steel Co., Japan
M-386	Nitralloy Corporation, New York, N..Y.
M-427	Non-Corrodal Alloys, Ltd., London, England.
M-576	Non-Ferrous Castings Co., Ltd., Smethwick, England.
M-1608	Noranda Copper Mills, Ltd., Montreal, Canada.
M-1238	Nordisk Aluminum-Industry, A/S, Holmestrand, Norway.
M-1237	Norsk Aluminum Co. A/S, Hoyanger, Norway.
M-1139	North American Philips Co , Inc., Mt. Vernon, N.Y.
M-1401	North American Philips Co., Inc., New York, N.Y.
M-207	North American Steel Co., Warrensville Heights, Ohio.
M-683	Northeast Metals Company, Philadelphia, Pa.

M-643	Northern Aluminium Co., Ltd., London, England.
M-542	Northfield Iron Co., Northfield, Minn.
M-532	Norton Co., Metals Div., Newton, Mass.
M-868	Novo Pump and Machine Div., American Marsh Pumps, Inc., Lansing, Mich.
M-1629	Nuclear Metals Div., Textron, Inc., W. Concord, Mass.
M-555	Nürnberg, Aluminiumwerke, G.m b.H., Nürnberg, Germany.
M-1454	Nusite Steel Process Co., Warsaw, Ind.
M-1448	Nyby Bruks Aktiebolag, Nyby Bruk, Sweden.
M-1094	Oakes Foundry Co., Warren, Ohio.
M-1420	Oederlin & Co., Ltd., Baden, Switzerland.
M-94	Ohio Brass Company, Mansfield, Ohio
M-398	Ohio Ferro Alloys Corp., Canton, Ohio.
M-1163	Ohio Stainless & Commercial Steel Co., Cleveland, Ohio.
M-788	Oil Well Supply Co., Houston, Tex.
M-927	Oklahoma Steel Casting Company, Tulsa, Okla.
M-866	Oldham & Co., F B, Buffalo, N Y.
M-1007	Olds Alloys Co., South Gate, Calif.
M-279	Olin Brass Div. Olin Corp, E Alton, Ill.
M-1566	Olin Mathieson Chemical Corp., Metals Div., New York, N.Y
M-1719	Olin Metals Research Labs., New Haven, Conn.
M-714	Oman Non-Friction Metal Co., El Paso, Tex.
M-366	Onandago Steel Co., Inc, Syracuse, N Y.
M-1532	Oregon Metallurgical Corp, Albany, Ore.
M-1603	Oregon Steel Mills, Portland, Ore
M-258	Orléans, Compagnie de, Paris, France
M-233	Osborn Steel Ltd, Sheffield, Eng
M-1028	Oscap Manufacturing Co., New York, N.Y.
M-462	Osnabrück Kupfer und Drahtwerke, Osnabruck, Germany
M 301	Osram, G m b H, Kommandit-Ges., Berlin, Germany.
M-1655	Ossenberg & Cie, W, Edelstahlwerke, Germany
M-330	Ostermann & Co, Metallwerke, Koln-Ehrenfeld, Germany
M-331	Otis Elevator Co, New York, N Y.
M-840	Otis Steel Division Jones & Laughlin Steel Corp., Cleveland, Ohio
M-484	Oxley & Co, William, Rotherham, England.
M-192	Pacific Foundry Company, San Francisco, Calif
M-553	Pacific Metal Co, Portland, Ore.
M-1263	Pacific Welding Alloys Mfg. Co, Los Angeles, Calif.
M-872	Page Steel & Wire Division, American Chain & Cable Company, Monessen, Pa.
M-367	Paragon Steel Co, Rutherford, N J
M-879	Paraloy Company, Chicago, Ill.
M-1185	Paris & d'Outreau, Aciéries de, Paris, France.
M-234	Parker Appliance Company, Cleveland, Ohio.
M-874	Parker-Kalon Corp., Clifton, N.J.
M-1160	Parker Pen Co., Janesville, Wis.
M-944	Park Sales Company, New York, N.Y
M-368	Patriarche & Bell, New York, N Y
M-832	Paulson & Sons, Thomas, Brooklyn, N.Y.
M-876	Peckovers, Ltd., Toronto, Canada.
M-341	Peninsular Steel Company, Detroit, Mich.
M-1252	Pennrold Div., Brush Beryllium Corp., Reading, Pa.
M-1433	Pennsylvania Steel Corp., Detroit, Mich.
M-466	Pennsylvania Steel Foundry and Machine Co., Hamburg, Pa.
M-1599	Perfect Circle Co., Hagerstown, Md.
M-1615	Perfection Mica Co., Chicago, Ill.
M-1025	Permanente Magnesium, Inc., Oakland, Calif. (Discontinued.)
M-1010	Permanent Magnet Association, London, England.
M-880	Permo, Inc., Chicago, Ill.
M-881	Permold Company, Medina, Ohio.
M-878	Perry Barr Metal Co., Ltd., Birmingham, England.
M-728	Perry Equipment Corp., Philadelphia, Pa.
M-1053	Peterson Steels, Inc., Union, N.J.
M-1623	Pfizer & Co., Inc., Charles, Easton, Pa. and Wallingford, Conn.
M-319	Phelps-Dodge Copper Products Corporation, New York, N.Y.
M-1228	Philadelphia Bronze and Brass Corp., Philadelphia, Pa. (see Ampco M-13.)
M-1549	Philips Co., N.V. Eindhover, Netherlands.
M-1127	Philips Electrical, Ltd, London, England.
M-685	Phillips, & Co, C.E., Detroit, Mich.
M-1658	Phoenix-Rheinrohr AG., Germany
M-1594	Phoenix Steel Corp., Claymont, Del.
M-1072	Pickands Mather & Co., Cleveland, Ohio.
M-326	Pioneer Alloy Products Co, Cleveland, Ohio.
M-1403	Pioneer Aluminum Inc, Los Angeles, Calif.
M-1078	Pipe Machinery Corp., Cleveland, Ohio.
M-543	Pittsburgh Brass Mfg. Co, Irwin, Pa.
M-235	Pittsburgh Crucible Steel Division Crucible Steel Co. of America, Midland, Pa.
M-626	Pittsburgh Metallurgical Co Inc, Niagara Falls, N.Y
M-1206	Pittsburg Metal Purifying Corp., Saxonburg, Pa
M-369	Pittsburgh Rolls Division Blaw-Knox Co., Pittsburgh, Pa
M-236	Pittsburgh Steel Foundry Corp, Glassport, Pa.
M-370	Pittsburgh Tool Steel Wire Co, Monaca, Pa.
M-1246	Plansee, Metallwerk, Reutte-Tirol, Austria.
M-1090	Plastic Metals Division, National Radiator Co., Johnstown, Pa
M-1321	Plattawerke, G m b.H., West Berlin, Germany
M-1344	Plettenberger Gusstahlwerke, Plettenberg, Germany.
M-1215	Plew Tool Co., Columbia City, Ind
M-547	Plouff Metallographic Institute, Boston, Mass.
M-193	P. I & M Company, Los Angeles, Calif.
M-318	Plykrome Corp., New York, N Y.
M-1322	Poldihütte, Westa-Westdeutsche Edelstahlhandels-Gesellschaft Düsseldorf, Germany
M-96	Poldi Steel Works, Prague, Czechoslovakia.
M-1567	Polymer Corp., Ltd., Sarnia, Ontario, Canada.
M-886	Pomona Pump Co, Pomona, Calif
M-884	Pompey, Aciérie de, Paris, France.
M-1648	Pont-St-Martin, Officine Metallurgiche d', France
M-525	Poro Metals, Ltd., London, England
M-1342	Pose-Marre G.m.b.H., Erkrath-Düsseldorf, Germany
M-307	Potts Co., Horace T., Philadelphia, Pa.
M-1568	Powder Alloys Corp, Clifton, N.J.
M-1098	Powder Metal Products Co., Franklin Park, Ill
M-885	Powder Metals, Inc., Long Island City, N.Y.
M-940	Pratt & Company, J. M., Cincinnati, Ohio.
M-1278	Pratt and Whitney Cutting Tool Div., West Hartford, Conn.
M-838	Precious Metals Research Works, Inc., Brooklyn, N.Y.
M-887	Precision Castings Co., Fayettesville, N.Y.
M-1619	Precision Cast Parts Corp., Portland, Ore.
M-1703	Precision-Kidd, Inc., West Aliquippa, Pa.

M-602	Prentiss & Co., Geo. W., Holyoke, Mass.
M-506	Prescott Co., Menominee, Mich.
M-1168	Pressco Casting & Mfg. Corp., Chesterton, Ind.
M-583	Pressed Steel Car Co., Chicago, Illinois.
M-371	Prosser & Sons, Thos., New York, N.Y.
M-561	Puget Sound Metal Works, Tacoma, Wash.
M-372	Purdy Co. Inc., A. R., Lyndhurst, N.J.
M-1432	Pyramid Steel Co., Cleveland, Ohio.
M-630	Q. & C. Co., New York, N.Y.
M-1628	Quaker Alloy Casting Co., Myerstown, Pa.
M-1390	Quint-Alloy Corp., Dearborn, Mich.
M-1155	Randall Graphite Products Co., Chicago, Ill.
M-1100	Rankin Mfg. Co., Alhambra, Cal.
M-1164	Rasmussen Mfg. Co., Hollydale, Calif.
M-812	Ratcliff Metals, Ltd., J. F., Birmingham, England.
M-1182	Raven Steel & Tool Co., Valley Stream, N.Y.
M-1465	RCA Industrial Electronics Products Div., Camden, N.J.
M-1229	Reactive Metals Corp., Niles, Ohio.
M-291	Reading Iron Co., Reading, Pa.
M-1082	Redhard Metals Inc., Hatboro, Pa.
M-1242	Reeves International Inc., New York, N.Y.
M-689	Régie National des Usines Renault, St. Michael de Maurienne, France.
M-986	Reid-Avery Co., Baltimore, Md.
M-1353	Reining & Co., Hirsch, G.m.b.H., Düsseldorf, Germany.
M-1335	Reisholz A.G., Stahl & Röhrenwerke, Düsseldorf-Reisholz, Germany.
M-1440	Reliance Foundry, American Meter Co., Pittsburgh, Pa.
M-907	Reliance Steel Casting Company, Pittsburgh, Pa.
M-420	Rely Metal Works, Cape Town, South Africa.
M-1299	Remanit, G.m.b.H., Berlin, Germany.
M-1698	Remington Arms Inc., Hi-Dense Alloys Div., Ilion, N.Y.
M-1339	Remy & Co., Hagener Gusstahlwerke, G.m.b.H., Hagen, Westf., Germany.
M-689	Renault, Régie Nationale des Usines, St. Michael de Maurienne, France
M-1633	Renewal Services, Inc., Philadelphia, Pa.
M-1273	Renfrew Foundries Ltd., Hillingdon, Glasgow, Scotland.
M-790	Rennie Tool Co., Ltd., Manchester, England.
M-97	Republic Steel Corp., Cleveland, Ohio.
M-507	Resisto-Loy Co., Grand Rapids, Mich
M-238	Revere Copper & Brass Company, New York, N.Y.
M-1525	Rex Buckeye Co., Cleveland, Ohio.
M-671	Reynolds Metals Co., Richmond, Va.
M-1558	Reynolds Tube Co., Ltd., T.I., Birmingham, England. (No proprietary alloys at present.)
M-625	Rheinische Röhrenwerke, Mülheim (Ruhr), Germany.
M-990	Rhoades Metaline Co., R. W., Long Island City, N.Y.
M-1367	Rieger Gebr., Aalen, Germany.
M-419	Rieter & Company, J. J., New York, N.Y.
M-1110	Riken Metal Mfg. Co., Ube, Japan.
M-98	Riverside Alloy Metal Div. H.K. Porter Co., Riverside, N.J.
M-911	Riverside Foundry & Galvanizing Company, Kalamazoo, Mich.
M-195	Robbins & Meyers, Inc., Springfield, Ohio.
M-1288	Robert-Leyer-Pritzkow & Co., Solingen-Ohligs, Germany.
M-460	Robins Conveyors, Inc., Passaic, N.J.
M-1582	Rochette. Laminoire de la. Chaudfontaine.
M-501	Rochling-Buderus, A. G., Wetzlar, Germany.
M-912	Rochlingsche Eisen & Stahlwerke, Voelklingen (Saar), Germany.
M-1663	Rodney Metals Inc., New Bedford, Mass.
M-265	Röhrenwerke, Rheinische, Mulheim (Ruhr), Germany.
M-1209	Rolled Alloys, Inc., Detroit, Mich.
M-1240	Rollschen Eisenwerke, A.G., Gesellschaft der Ludv. von, Gerlafingen, Germany.
M-1247	Rollschen Eisenwerke, A.G., Ludv. von, Solothurn, Switzerland.
M-239	Rolls-Royce Mfg. Company, Derby, England.
M-1497	Ronson Metals Corp., Newark, N.J.
M-1140	Rorschach, Aluminiumwerke, Rorschach, Switzerland
M-82a	Ross Meehan Foundry Co., Chattanooga, Tenn.
M-713	Rossell & Company, Henry, Sheffield, England
M-1207	Royalloy Inc., New York, N.Y.
M-1475	R-S Products Corp., Philadelphia, Pa.
M-1382	Ruhrstahl A. G., Henrichshütte, Hattingen/Ruhr, Germany.
M-99	Ruselite Corporation, Milwaukee, Wis.
M-100	Rustless Iron Division Armco Steel Corp., Baltimore, Md.
M-1211	Ryan Aeronautical Co., San Diego, Calif.
M-1672	Ryanite Tips, Inc., St. Paul, Minn.
M-434	Ryer, Inc., Ltd., Los Angeles, Calif.
M-240	Ryerson & Son, Inc., Joseph T., Chicago, Ill
M-966	Saginaw Bearing Co., Saginaw, Mich.
M-1646	Sambra & Meuse, Aciéries de, France.
M-618	Sanderson Bros & Newbould, Ltd., Sheffield, England.
M-903	Sanderson Steel Div., see Crucible Specialty Metals Div. Colt Industries M-38
M-295	Sandusky Foundry & Machine Co., Sandusky, Ohio.
M-101a	Sandvik Steel, Inc., Fairlawn, N.J.
M-101	Sandvikens Jernverks Aktiebolag, Sandviken, Sweden
M-101b	Sandvikstahl G.m.b.H., Dusseldorf, Germany
M-1591	Sankey & Sons, Ltd., London, England
M-241	Sargent and Co., New Haven, Conn. (No proprietary alloys.)
M-1494	Saut-du-Tarn, Ste Ame des Forges et Aciéries du, Paris, France
M-486	Saville & Co., Ltd., J. J., Sheffield, England.
M-1516	Scaife Company, Oakmont, Pa.
M-1575	Scandinavian Metal Co., Sweden.
M-1048	Scaw Alloys Ltd., Banstead, Surrey, England
M-1453	Schenk Leichtgusswerke, Maulbronn, Germany.
M-196	Schmidt Company, Karl, Neckarsulm, Germany.
M-1305	Schmidt & Clemens Edelstahlwerke, Bez, Köln, Germany.
M-615	Schmidt Stahlwerke, Rudolf, Vienna, Austria.
M-1368	Schmole, RuG, Metallwerke Menden, Krs. Iserlohn, Westf., Germany.
M-533	Schneider & Cie, Paris, France.
M-1301	Schneider, Virgo, Paris, France.
M-616	Schoeller-Bleckman Steel Corp., Styria, Austria.
M-1308	Schoeller-Bleckmann, Ternitz, Vienna, Austria.
M-1718	Heinr. Aug. Schulte Eisenhandlung, G.m.b.H., Dortmund, Germany.
M-1383	Schwabenstahl Hüttenwerke G.m.b.H

M-481	Scientific Alloys, Inc., Los Angeles, Calif.
M-1561	Scientific Products, Inc., State Park, Pa.
M-408	Scott & Company, Ltd., A. C., Manchester, England.
M-102	Scovill Mfg. Company, Waterbury, Conn.
M-969	Seaboard Steel Company of America, New York, N.Y.
M-1524	Secon Metals Corp., White Plains, N.Y.
M-1369	Seibel, W., AG, Mettmann, Rhld, Germany.
M-590	Seitzinger's, Inc., Atlanta, Ga.
M-1729	Semi-Alloys, Mount Vernon, N.Y.
M-972	Seneca Wire & Mfg. Company, Fostoria, Ohio.
M-1669	SERMAG, Belgium. (see M-1644.)
M-1644	SERMAG, Brussels, Belgium.
M-970	Sessions Foundry Company, Bristol, Conn.
M-103	Seymour Products Co., Seymour, Conn.
M-453	Shanks & Co., Ltd., Barrhead, Scotland.
M-1071	Sharon Steel Corp., Sharon, Pa.
M-417	Shaw, J., Son & Greenhalgh, Ltd., Albert Works, Huddersfield, England.
M-443	Shawinigan Chemicals, Ltd., Montreal, Canada.
M-1485	Sheepbridge Alloy Castings, Ltd., Sutton-in-Ashfield, Notts., England.
M-494	Sheepbridge Engineering Ltd., Chesterfield, England.
M-906	Sheepbridge Equipment Ltd., Chesterfield, England.
M-494	Sheepbridge Stokes Centrifugal Casting Co., Ltd , Chesterfield, England.
M-1552	Sheffield Smelting Co., Ltd., Sheffield, England
M-1428	Sheffield Steel Div., Armco Steel Corp., Houston, Tex.
M-974	Shenango-Penn Div. Shenango Furnace Co. (No longer produce proprietary alloys.)
M-1002	Sherman & Co., New York, N Y.
M-1573	Sherritt Gordon Mines, Ltd., Toronto, Canada.
M-198	Siemens & Halske, A. G., Berlin, Germany.
M-199	Siemens-Schuckert, A G., Berlin, Germany.
M-1017	Sight Feed Generator Co , Richmond, Ind.
M-461	Silicum Pistons Ltd., London, England.
M-373	Simonds Steel Div., Wallace-Murray Corp., Lockport, N Y.
M-1015	Simonds Worden White Co., Dayton, Ohio.
M-875	Simpson Brothers, Portsmouth, Ohio.
M-493	Singen, Aluminium Walzwerke, Singen-Hohentwiel, Germany.
M-1469	Sintercast Div. of Chromalloy American Corp , West Nyack, N.Y
M-1379	Sintox Corp of America, Allentown, Pa.
M-512	Sioux Tools, Inc., Sioux City, Iowa. (Was Albertson & Co.)
M-1080	SIPI Metal Corporation, Chicago, Ill.
M-1727	Sitkin Smelting and Refining Co., Inc., Lewiston, Pa.
M-288	Sivyer Steel Casting Co., Milwaukee, Wis.
M-404	Skandinaviska Armaturfabriken, A.G., Stockholm, Sweden.
M-267	S.K F. Industries, Inc., Philadelphia, Pa.
M-651	Skoda Works, Czechoslovakia.
M-244	S-M Metal Works, London, England.
M-579	Smith Co., A. O., Milwaugee, Wis.
M-1716	A.O. Smith-Inland Inc., Powder Metallurgy Div., Milwaukee, Wis.
M-1093	SMS Corporation, Detroit, Mich.
M-870	Snowbar, J. L., New York, N Y.
M-1176	Società Alluminio Veneto per Azioni, Porto Marghera, Milano, Italy.
M-1220	Società Alluminio Veneto per Azioni, Porto Marghera, Venezia, Italy.
M-606	Società Anonima Ansaldo, Rome, Italy
M-672	Société Alsia. Paris. France.
M-1043	Société Anon. Aciéries & Forges de Firminy, Paris, France.
M-104	Société Anon. de Commentry Fourchambault et Decazeville, Paris, France.
M-1180	Société Anon. des Établissements Marrell Frères, Rive de Gier, France.
M-1119	Société Anon. des Hauts-Fourneaux, Forges & Aciéries du Saut-du-Tarn, Paris, France.
M-897	Société Anon. Gilby-Wire, Rueil-Malmaison, France.
M-1179	Société Anon. Usines et Aciéries Allard, Mont-sur-Marchienne, Belgium.
M-1723	Société Commentryenne des Aciers Fins Vanadium Alloys, Paris, France.
M-884	Société de Aciéries de Pompey, Paris, France.
M-1120	Société d'Electro-Chimie, d'Electro Métallurgie et des Aciéries Electriques d'Ugine, Paris, France.
M-1118	Société des Aciéries de Longwy, Mont-Saint-Martin, France.
M-647	Société des Sondures, Castolin, South America.
M-767	Société du Duralumin, Paris, France.
M-673	Société Electro-Cables, Paris, France.
M-768	Société Metallurgica Italia, Firenze, Italy.
M-387	Soderfors Steel Works, Soderfors, Sweden.
M-1309	Soding, J. C., & Halbach, Hagen, Westf., Germany.
M-1670	Solar Div., International Harvester Co., San Diego, Cal.
M-1136	Soldering Specialties Co., Summit, N.J.
M-960	Somers Thin Strip, Inc., Waterbury, Conn.
M-647	Sondures, Société des, Castolin, South America.
M-1266	Sonken-Galamba Corp., Kansas City, Kans.
M-1274	Southern Forge Ltd., Langley, Bucks, England.
M-268	Southern Malleable Iron Co., East St. Louis, Ill.
M-665	Southern Metals Co., St. Louis, Mo.
M-479	Sowers Mfg. Co , Buffalo, N.Y.
M-735	Spang Chalfant Div. National Supply Co., Pittsburgh, Pa.
M-1236	Specialloy Inc., Chicago, Ill.
M-1317	Special Metals Corp., Div. of Allegheny-Ludlum Industries, New Hartford, N.Y.
M-1704	Specialty Steel Co. of America, Warrensville Heights, Ohio.
M-701	Sperry Gyroscope Co., Inc., Great Neck, N.J.
M-889	Spuck Iron & Foundry Co., St. Louis, Mo.
M-1486	St. Jacques, Société des Usines, Montluçon, France.
M-1656	St Joseph Lead Co., Monaca, Pa.
M-1684	St. Lawrence Steel Co., Cleveland, Ohio.
M-1069	Stackpole Carbon Co., St Marys, Pa.
M-1294	Stahlschmidt & Co., K. G., Düsseldorf, Germany.
M-613	Stahlwerk Becker, A G , Krefeld (Rheinland), Germany.
M-1310	Stahlwerke Kabel, C., Pouplier, Hagen-Kabel, Germany.
M-1337	Stahlwerke R & H Plate, Lüdenscheid-Platehof, Germany.
M-1307	Stahlwerke Suedwestfalen, Werk Geisweid, Germany.
M-1730	Stahlwerk Westic G.m.b.H., Unna/Westf., Germany.
M-1262	Stainless Foundry & Engineering Co., Milwaukee, Wis.
M-105	Standard Alloy Company, Inc., Cleveland, Ohio. (Now Michigan-Standard Alloy Casting Co.)

M-896	Standard Brake Shoe & Foundry Company, Pine Bluff, Ark.
M-1439	Standard Pressed Steel Co., Jenkintown, Pa.
M-1602	Standard Steel Div., Baldwin-Lima-Hamilton Corp., Burnham, Pa.
M-1370	Standard-Werke, G.m.b.H., Werl/Westf., Germany.
M-574	Stanley Steel Div. of the Stanley Works, New Britain, Conn. (No proprietary alloys.)
M-1225	Starrett Co., The L.S., Athol, Mass.
M-1528	Stauffer Metals Div., Stauffer Chemical Co., New York, N.Y.
M-1304	Stavenger So., Oslo, Norway.
M-700	Sté de Produits Métallurgiques, Paris, France.
M-675	Sté des Laminoirs et Tréfileries du Havre, Paris, France.
M-518	Stedman's Foundry & Machine Works, Aurora, Ind.
M-742	Steel Co , Ltd., Motherwell, England
M-1714	Steel Co. of Australia, The, PTY, Ltd., Melbourne, Vic , Australia.
M-1124	Steel Co. of Canada, Ltd , The, Toronto, Ontario, Canada
M-826	Steel Co. of Scotland, Glasgow, Scotland. (Now part of British Steel Corp. M-1724.)
M-448a	Steel, Peech & Tozer, Sheffield, England. (Now part of British Steel Corp M-1724.)
M-607	Steel Sales Corp., Chicago, Ill
M-395	Steel & Tubes, Division Republic Steel Corp., Cleveland, Ohio
M-270	Steinvertriebs Aktiengesellschaft, Berlin, Germany.
M-1291	Steirische Gusstahlwerke, A G , Vienna, Austria.
M-1114	Steirische Gusstahlwerke, Vienna, Austria
M-167	Stellite Div. Cabot Corp., Kokomo, Ind. (Formerly Haynes Stellite)
M-1008	Sterling Alloys Ltd , Woburn, Mass
M-106	Sterling Metals Ltd., Gypsy Lane, Nuneaton, Eng
M-201	Sterlite Foundry & Mfg. Co , Auburn, Ind.
M-514	Stewart Die Casting Division Stewart-Warner Co., Chicago, Ill
M-452	Stone & Co , J , Deptford, London, England
M-1675	Stone Manganese Marine, Ltd , London, England
M-202	Stoody Company, Whittier, Calif
M-286a	Strachan Co , John, New York, N.Y
M-283	Strasser Co , E Rorschach, Switzerland.
M-899	Stroh Process Steel Company, Pittsburgh, Pa
M-1081	Strong, Carlisle & Hammond Co., Cleveland, Ohio
M-208	Studebaker Chemical Co., Elyria, Ohio.
M-374	Stulz Sickles Steel Co , Elizabeth, N.J.
M-928	Stupakoff Div Carborundum Co , Latrobe, Pa
M-795	Stupakoff Laboratories, Inc , Pittsburgh, Pa.
M-1307	Suedwestfalen Stahlwerke, Werk Geisweid, Germany
M-243	Suffolk Iron Foundry, Stowmarket, England.
M-1660	Sulzer Bros.
M-71	Sumet Corp , Buffalo, N.Y.
M-1296	Sumitomo Metal Industries Ltd., Osaka, Japan.
M-1515	Sumitoms Trading Co., Osaka, Japan.
M-1018	Superior Die Casting Co., Cleveland, Ohio.
M-1070	Superior Flux Co., Cleveland, Ohio.
M-1170	Superior Foundry Co., Cleveland, Ohio.
M-967	Superior Metal Co., Chicago, Ill
M-635	Superior Sheet Steel Div., Parkersburg Steel Corp . Parkersburg. W. Va. (No
M-901	Superior Steel Corporation, Pittsburgh, Pa.
M-945	Superior Tube Company, Norristown, Pa.
M-406	Supersteels, Inc., Cleveland, Ohio.
M-916	Super Tool Co., Elk Rapids, Mich.
M-1189	Surahammar Bruks, A. B., Surahammar, Sweden.
M-107	Sutcliffe, Speakman & Company, Leigh, Lancaster, England.
M-1186	Svenska Metallverken, A. B., Stockholm, Sweden.
M-333	Swedish American Steel Corp , Brooklyn, N.Y
M-1026	Swedish Crucible Steel Co , Detroit, Mich.
M-375	Swedish Iron and Steel Corp., Middlesex, N.J (No proprietary alloys at present.)
M-785	Swedish Steel Mills, A. A., New York, N.Y.
M-1605	Swiss Aluminum Ltd., Neuhausen, Rhf., Switzerland
M-66	Swiss Laboratory Inc., Akron, Ohio. (No Proprietary alloys)
M-418	Sybry, Searls & Co., Ltd Cannon Steel Works, Sheffield, England
M-1632	Sydney Steel Corp , Sydney, Nova Scotia, Canada. (No proprietary alloys at present)
M-856	Sylvania Electric Products, Inc , Towanda, Pa
M-500	Symington-Gould Corp , Depew, N Y.
M-390	Tacony Steel Co , Philadelphia. (Out of business)
M-997	Tata Iron & Steel Co , Calcutta, India
M-1412	Taylor & Co , Ltd , Robert, Larbert, Scotland
M-496	Taylor, Ltd , Samuel, Birmingham, England
M-915	Taylor Chain Co., S G , Hammond, Ind.
M-271	Taylor-Wharton Div. of Harsho Corp , Easton, Pa
M 1442	Taylor-Wilson Mfg. Co., Pittsburgh, Pa
M-1280	Techalloy Co , Inc , Rahns, Pa
M-108	Telcon Metals Ltd , Crawley, Sussex, England
M-95	Teledyne Ohiocast, Springfield, Ohio
M-115	Teledyne Vasco, Latrobe, Pa
M-337	Tennessee Coal, Iron & Railroad Co , Birmingham, Ala
M-444	Texas Electric Steel Casting Co , Houston, Texas (No proprietary alloys)
M-421	Thermit, Ltd , Edmonton, London, England
M1417	Thomas and Baldwins, Ltd , Richard, Sheffield (Now part of British Steel Corp M-1724)
M 1460	Thomas Foundries, Inc , Birmingham, Ala.
M-1192	Thomas & Skinner Steel Products Co , Indianapolis, Ind.
M-445	Thomas Steel Co., Warren, Ohio (Alloys listed have been discontinued)
M-1617	Thompson Wire Co , Chicago, Ill.
M-1400	Thompson Industries Inc , Manhasset, N Y.
M-1234	Thyssen Co , August, Berlin, Germany
M-1268	T I Aluminium Ltd , Birmingham, England.
M-1705	Time Steel Service, Inc , Cleveland, Ohio
M-376	The Timken Co., Canton, Ohio
M-702	Timken-Detroit Axle Company, Detroit, Mich.
M-1398	Tin Research Institute, Greenford, England.
M 1157	Tipaloy, Inc , Detroit, Mich
M-955	Titanite Alloys Corporation, Cleveland, Ohio.
M-109	Titanium Alloy Mfg., Division National Lead Co., Niagara Falls, N Y
M-144	Titanium Metals Corp. of America, W Caldwell, N.J.

M-787	T. L. M. Co., Paris, France.
M-1647	Tokushu Seiko, Ltd., Tokyo, Japan.
M-1614	Tokyo Keikiseizosho, Ltd., Tokyo, Japan.
M-1001	Tonowanda Iron Corp., North Tonowanda, N.Y.
M-1667	Toshiba Tungaloy Ltd., Tokyo, Japan.
M-1544	Toto Steel Co., Ltd., Tokyo, Japan.
M-1036	Toughite Process Co., Chicago, Ill.
M-1664	Transformer Steels, Ltd.
M-834	Transleteur & Company, Berlin, Germany.
M-979	Tréfileries du Havre, Paris, France.
M-770	Tréfileries et Laminoirs du Havre, Antony (Seine), France.
M-535	Trenite Foundry Corp., Trenton, N.J.
M-1056	Trethaway Associates, New York, N Y.
M-1677	Triangle Conduit & Cable Co., Copper Rod and Brass Products Div , New Brunswick, N.J
M-909	Tri-Clover Div. Ladish Co., Racine, Wis. (see Ladish Co. M-1527)
M-923	Tri-Lok Company, Pittsburgh, Pa.
M-954	Trimout Mfg Company, Boston, Mass.
M-925	True Alloys, Inc., Detroit, Mich
M-513	TRW Inc , Minerva, Ohio.
M-957	Tube Reducing Corp , Wallington, N.J.
M-1029	Tuff-Hard Corp , Detroit, Mich.
M-737	Tullis, D. & J , Ltd., London, England.
M-1046	Tungsit Electro-Metals Works, Ltd., London, England
M-987	Tungsten Alloy Mfg Co , Harrison, N.J.
M-1054	Tungsten Electric Corp., Union City, N.J.
M-1385	Tungsten & Molybdenum Ltd , Nyon, Switzerland
M-598	Tungsten Widia Tool Corp., New York, N Y.
M-110	Tungum Alloy Co , Ltd., Cheltenham, Eng.
M-929	Tyler Co , W S , Div. of W S Tyler, Inc., Mentor, Ohio
M-111	Uddeholms, A B , Uddeholm, Sweden.
M-111a	Uddeholm Steel Corp , Totowa, N J.
M-1120	Ugine, Aciéries Electriques de, Ugine (Savoie), France
M-1231	Ullman & Associates, A E , New York, N.Y
M-1351	Ultraloy Corporation, Chicago, Ill
M-272	Ultralumin Leichmetal, A G , Germany. (Out of business)
M-1618	U.N A. Corp , Youngstown, Ohio, and Boston, Mas
M-930	Una Welding, Inc , Cleveland, Ohio
M-745	Unexcelled Mfg Co , New York, N Y
M-1711	Unibraze Corp , White Plains, N Y
M-634	Unicast Corp, Div Midland Ross Corp , Toledo Ohio
M-391	Unimetal Company, Franklin, Pa
M-1706	Unimet Carbides, United Greenfield Div,; TRW Inc , Chicago, Ill
M-588	Union Bronze Co , Reading, Pa
M-48	Union Carbide Corp , New York, N.Y.
M-397	Union Drawn Steel Div , Republic Steel Corp (see Republic Steel Corp M-97)
M-931	Union Metal Mfg Company, Canton, Ohio.
M-1533	Union Minière du Haut-Katanga, Central Workshop, Jadotville, Katanga, Congo.
M-112	Union Steel Casting Division, Blaw-Knox Co , Pittsburgh, Pa.
M-1610	Union Steel Corp , Union, N.J
M-327	United Alloy Steel Corp., Canton, Ohio. (Now Republic Steel Corp.)
M-565	United American Metals Corp., Chicago, Ill
M-273	United Lead Co see National Lead Co. M-88.
M 245	United States Graphite Co., Saginaw, Mich.
M-558	United States Metals Refining Co., Carteret, N J.
M-203	United States Pipe & Foundry Company, Burlington, N.J.
M-585	United States Reduction Co., E. Chicago, Ind.
M-604	United States Steel Corp., Pittsburgh, Pa.
M-964	United States Steel Supply Co., Chicago, Ill.
M-448	United Steel Companies, Ltd., Sheffield, England. (Now British Steel Corp. M-1724.)
M-1013	United Wire & Supply Co., Providence, R.I.
M-932	Universal Alloys, Inc., Newark, N.J.
M-431a	Universal Bearing Metals Corporation, Rochester, N.Y.
M-1341	Universal Castings Corporation, Chicago, Ill.
M-114	Universal Cyclops Specialty Steel Div., Pittsburgh, Pa.
M-811	Universal Power Corporation, Cleveland, Ohio.
M-1161	Uniworld Research Corp. of America, Cleveland, Ohio.
M-1371	Unna Messingwerk, A.G , Unna, Westf., Germany.
M-379	Upson Nut Division Republic Steel Corp., Cleveland, Ohio.
M-1320	Urbach & Co., Krawinklerbrüche, Germany.
M-1597	Urich Foundry Co., Erie, Pa.
M-1188	Usines Emile Henricot, Court-Saint-Etienne, Belgium
M-1686	Usines Vallouric S A., Paris, France.
M-1534	U S Magnet & Alloy Corp , Bloomfield, N.J.
M-585	U.S Reduction Co , E. Chicago, Ind
M-1138	U.S. Spring & Bumper Co , Los Angeles, Calif
M-1317	Utica Metals Div., Kelsey Hayes Co , Utica, N.Y (Now Special Metals Inc)
M-1055	Utility Electric Steel Foundry Co., Los Angeles, Calif.
M-1630	Vacuum Metals Corp , Cambridge, Mass.
M-1214	Vacuum Metals Div. Crucible Steel see M-38
M-1631	Vakuumschmelze AG., Hanau, Main, Germany
M-1653	Valbruna di Ernesto Gresele, Acciaierie, Vicenza, Italy.
M-1668	Valenite Metals Div., Valeron Corp , Madison Heights, Mich
M-394	Vanadium Corporation of America, New York, N Y
M-1500	Van der Horst Corp., Terrell, Texas
M-984	Vapal, Paris, France
M-983	Vedderheimer Kupferwerke, Berlin, Germany
M-1176	Veneto per Azioni, Soc Alluminio, Porto Marghera, Milano, Italy.
M-1220	Veneto per Azioni, Soc. Alluminio, Porto Marghera, Venezia, Italy.
M-1430	Venture Corporation, Newark, N J.
M-1289	Veraloy Products Ltd., Birmingham, England
M 935	Vereinigte Aluminiumwerke, Bohn, Germany.
M-133	Vereinigte Chemische Fabriken, Leopoldshall, Germany
M-297	Vereinigte Deutsche Metallwerke, A G , Altena (Westf), Germany.
M-303	Vereinigte Deutsche Nickelwerke, A. G., Schwerte (Ruhr), Germany.
M-116	Vereinigte Leichtmetall Werke, G m.b.H., Hannover-Linden, Germany.
M-204	Vereinigte Silberhammerwerke Hetzel, Nuremburg, Germany
M-383	Vereinigte Stahlwerke, Düsseldorf, Germany.
M-274	Verilite Metals Co., N Y., N.Y.
M-1372	Vesevorder Metallwerke G.m b.H , Werdohl/Westf., Germany.

M-117	Vickers-Armstrong Company, Division English Steel Company, London, England.
M-1204	Victor Equipment Co., Alloy Rod and Metal Div. (Now part of Stellite Div. Cabot Corp. M-167.)
M-423	Victor Manufacturing Company, London, England.
M-1447	Vikmanshyttan AG., Vikmanshyttan, Sweden.
M-1418	Vimetal SA, Berne, Switzerland.
M-1571	Vitra Chemical Co., Chattanooga, Tenn.
M-1421	Voelklingen, Forges et Aciéries de, Voelklingen (Sarre), France.
M-998	Volco Brass & Copper Company, Kenilworth, N.J.
M-329	VR/Wesson Co., Waukegan, Ill. (Formerly Vascoloy-Ramet.)
M-1666	VR/Wesson Co., Waukegan, Ill. (Same as M-329).
M-1257	Vulcan Foundry Co., Oakland, Calif.
M-922	Vulcan Iron Works, Wilkes-Barre, Pa.
M-275	Vulcan-Kidd Steel Div., H. K. Porter Co., Aliquippa, Pa.
M-938	Vulcan Mold & Iron Company, Latrobe, Pa.
M-1565	Wabash Smelting Co., Inc., Wabash, Ind.
M-133a	Wagner, Gerhard, New York, N.Y.
M-1596	Wah Chang, A Teledyne Co., Albany, Ore. (see also M-1537.)
M-1537	Wah Chang Corp., New York, N.Y. and Albany, Ore (See also M-1596.)
M-1512	Waimet Alloys Co., Dearborn, Mich.
M-824	Wakefield Bearing Corp., Wakefield, Mass.
M-1027	Walker Metal Products Ltd., Walkerville, Ontario, Canada.
M-963	Wall-Colmonoy Corporation, Detroit, Mich.
M-1692	Wallram Hartmetall G.m.b.H., Essen, Germany.
M-1707	Walmet Corp., The, Pleasant Ridge (or Royal Oak), Mich.
M-942	Waltham Watch Company, Waltham, Mass.
M-392	Wardlow, S. & C., Nutley, N.J.
M-389	Ward's Sons Company, Edgar T., Newark, N.J.
M-1113	Wardlow's Ltd., Sheffield, England.
M-277	Warman Steel Casting Company, Huntington Park, Calif.
M-774	Washburn Wire Co., Phillipsdale, R.I.
M-246	Washington Iron Works, Seattle, Wash.
M-1484	Washington Steel Co., Washington, Pa.
M-1426	Waterbury Rolling Mills, Inc, Waterbury, Conn.
M-1173	Watsontown Foundry Co., Watsontown, Pa.
M-941	Waukesha Foundry Co., Waukesha, Wis.
M-1106	Wausau Motor Parts Co., Schofield, Wis.
M-278	Weatherly Foundry & Mfg. Co., Weatherly, Pa.
M-446	Webb Wire Works, New Brunswick, N.J.
M-599	Wehr Steel Co., Milwaukee, Wis.
M-1731	Emil Weingartner & Co., KG., 2 Hamberg-Stellingen, Germany.
M-628	Weirton Steel Co., Weirton, W. Va.
M-1388	Welded Carbide Tool Co., Clifton, N.J.
M-939	Welding Alloy Mfg. Company, Malden, Mass.
M-765	Welding Equipment & Supply Co., Detroit, Mich.
M-943	Welding Material Company, New Orleans, La.
M-1092	Welding Sales & Engineering Co., Detroit, Mich.
M-1230	Weldwire Co., Inc., New York, New York.
M-946	Welland Electric Steel Foundry, Welland, Ontario, Canada.
M-681	Wellman Bronze & Aluminum Co., Cleveland, Ohio.
M-933	Wellman Company, S.K., Cleveland, Ohio.
M-1387	Wells Manufacturing Co., Skokie, Ill.
M-1162	Wel-Met Co., Kent, Ohio.
M-1697	Wendt-Sonis, United Greenfield Div. TRW Inc., Rogers, Ark.
M-1498	Wesson Co., Ferndale, Mich.
M-465	West Steel Casting Co., Cleveland, Ohio.
M-1322	Westa-Westdeutsche Edelstahl-handelsgesellschaft, von Poldi-hütte, Düsseldorf, Germany.
M-1198	Western Alloyed Steel Casting Co., Minneapolis, Minn.
M-279	Western Brass-Metals Division Olin Industries, E. Alton, Ill.
M-468	Western Crucible Steel Casting Co., Minneapolis, Minn.
M-205	Western Electric Co. (No longer produces proprietary alloys.)
M-1493	Western Gold & Platinum Works, Belmont, Calif.
M-1380	Westfalenhütte Dortmund A.G., Dortmund, Germany.
M-1373	Westfalische Kupfer & Messingwerke A.G., Ludenscheid, Germany.
M-1375	Westfalische Leichmetallwerke G.m.b.H, Nachrodt, Krs Altena, Westf., Germany.
M-1345	Westfalische Stahlgesellschaft, Plettenberg, Germany.
M-384	Westinghouse Air Brake Co., Wilmerding, Pennsylvania.
M-118	Westinghouse Electric Corp., Specialty Metals Div, Blairsville, Pa.
M-510a	Wetherell Bros. Co., Cambridge, Mass.
M-883	Wheeling-Pittsburgh Steel Corp., Pittsburgh, Pa.
M-206	Wheeling Steel Corp., Wheeling, W. Va.
M-119	Wheelock, Lovejoy & Company, Cambridge, Mass.
M-652	Whipple & Choate Company, Bridgeport, Conn.
M-659	White Metal Rolling and Stamping Corp., New York, N.Y.
M-1077	Whiton Machine Co., London, Conn.
M-1165	Whittaker Corp, Nuclear Metals Div., West Concord, Mass
M-1006	Wickman Wimet Ltd., Hard Metal Div., Coventry, England
M-120	Wickwire Spencer Steel Co., New York, N.Y.
M-764	Wieland-Werke A.G., Ulm/Donau, Germany
M-121	Wiggin & Company, Ltd, Henry, Birmingham, England.
M-1190	Wikmanshytte Bruks, A B, Wikmanshyttan, Sweden.
M-947	Wilcox Rich Division, Eaton Mfg. Company, Detroit, Mich.
M-919	Wilkinson, Wm., Shustoke, England.
M-1584	Willan Ltd., G.L., Sheffield, England
M-976	Willeys Carbide Tool Co., Unit of Excello Corp., Dearborn, Mich.
M-741	Williams & Sons, E.A., Carlstad, N.J.
M-20a	Williams, W.E., New York, N.Y.
M-781	Williamson Bros., Inc., Bridgeport, Conn.
M-918	Willworthy Piston Ring, Ltd., London, England.
M-1374	Wilms A.G., G. Robert, Remscheid-Hasten, Germany.
M-237	Wilson Co., H.A., Engelhard Minerals and Chemical Corp., Union, N.J.
M-662	Wilson Welder & Metals Co., New York, N.Y.
M-554	Wing & Co., J. T., Detroit, Mich.
M-848	Winn, W. Martin, Ltd., S. Staffordshire, England.

M-869	Wintershall, A.G., Heringen, Germany.
M-1613	Wisconsin Steel Div., International Harvester Co., Chicago, Ill.
M-1326	Witten Edelstahl AG., Witten, Germany.
M-1340	Wolff Edelstahlverkauf, Otto, Köln, Germany.
M-1521	Wolverine Tube Div., Calumet & Hecla-Universal Oil Products, Allen Park, Mich.
M-110a	Wonham, Inc., New York, N.Y.
M-842	Woodworkers Tool Works, Chicago, Ill.
M-280	Workington Iron and Steel Co., Inc., Workington, Eng. (Now part of British Steel Corp. M-1724.)
M-463	Worthington Corp., Harrison, N.J.
M-498	Worthington Steel & Annealing Co., Sheffield, England.
M-730	Wrought Bearing Metals, Inc., New York, N.Y.
M-1376	Wutoschingen Aluminiumwerke G.m.b.H., Wutoschingen, Germany.
M-1259	W.W. Alloys, Inc., Detroit. see Fansteel Inc. M-53.
M-629	Wyckoff Steel Div. AMCO Pittsburgh Corp., Pittsburgh, Pa. (No proprietary alloys at present.)
M-1503	Wyman-Gordon Co., Worcester, Mass. No proprietary alloys at present.)
M-1064	Wyndale Manufacturing Co., Indianapolis, Ind.
M-1473	Xaloy, Inc., New Brunswick, N.J. (Was Industrial Research Labs.)
M-1540	Yawata Iron & Steel Co., Ltd., Tokyo, Japan.
M-1151	Yokum, James & Son, Inc., Philadelphia, Pa.
M-1143	York Machine & Supply Co., York, Pa.
M-1560	Yorkshire Imperial Metal, Ltd., Leeds, England.
M-286	Yorkshire Imperial Metals Ltd., Leeds, England. (Same as M-1560.)
M-977	Youngstown Alloy Castings Co., Youngstown, Ohio.
M-873	Youngstown Foundry & Machine Co., Youngstown, Ohio.
M-531	Youngstown Steel, Youngstown Sheet and Tube Co., Youngstown, Ohio.
M-1332	Zapp, Robert, Edelstahle, Düsseldorf, Germany.
M-950	Zelnicker, W.A., Co., St. Louis, Mo.
M-1472	Zenith Foundry Co., West Allis, Wis.
M-1134	Zinkberatungsstelle, G.m.b.H., Berlin, Germany.
M-289	Ziv Steel and Wire Co., Detroit, Mich.
M-290	Zurbach Steel Co., Salem, N.H.

SECTION III

NUMERICAL LIST OF MANUFACTURERS

M-1	Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
M-2	Allgemeines Deutsches Metallwerk, G.m.b.H., Berlin, Germany.
M-2a	International Development Corp., New York, N.Y.
M-3	Alloy Cast Steel Co., Marion, Ohio.
M-4	Aluminum Co. of America, Pittsburgh, Pa.
M-5	International Alloys, Ltd., Aylesbury, Bucks, England.
M-6	Aluminum Industries, Inc., Chicago, Ill.
M-7	American Boron Products Division, Continental Copper & Steel Industries, Buffalo, N.Y.
M-8	Anaconda American Brass Co., Waterbury, Conn.
M-9	AMSCO Div. ABEX Corp., Chicago Heights, Ill.
M-10	Armco Steel Corp., Middletown, Ohio.
M-11	American Sheet and Tin Plate Div., U.S. Steel Corp., Pittsburgh, Pa.
M-12	American Steel and Wire Div., U.S Steel Corp., Pittsburgh, Pa
M-13	Ampco Metal, Inc., Milwaukee, Wis.
M-14	Arcade Malleable Iron Co., Worcester, Mass.
M-15	Associated Steel Corp , Cleveland, Ohio
M-16	Avesta Jernverks Aktiebolag, Avesta, Sweden.
M-17	Babcock & Wilcox Tube Co., Beaver Falls, Pa.
M-18	Engelhard Industries Div , Engelhard Mineral and Chemical Corp , Carteret, N.J. (Formerly Baker & Co.)
M-19	Barber Asphalt Co., Philadelphia, Pa (No longer manufacture the alloys listed)
M-20	Barronia Metals, Ltd., London, England
M-20a	William E. Williams, New York, N.Y.
M-21	Batterium Metal & Vislok, Ltd., Market Harborough, England.
M-22	Bell Telephone Laboratories, Murray Hill, N.J. (No longer manufacture alloys)
M-23	Bethlehem Foundry and Machine Co., Bethlehem, Pa (No longer manufacture the alloys listed.)
M-24	Bethlehem Steel Co , Bethlehem, Pa
M-25	Binney Castings Co , Toledo, Ohio
M-26	Blackor Company, Los Angeles, Calif
M-27	Bohler Bros. & Co., Vienna, Austria
M-28	British Aluminium Co., London, England.
M-29	Illium Corp., Freeport, Ill.
M-30	Calorizing Company, Pittsburgh, Pa
M-31	Metallurgical Products Dept., General Electric Co., Detroit, Mich.
M-32	Carpenter Technology Corp , Reading, Pa.
M-33	Chase Brass and Copper Co , Cleveland, Ohio.
M-34	Colonial Steel Div., Teledyne Vasco, Monaco, Pa. (see Teledyne Vasco M-115)
M-35	Columbia Tool Steel Co., Chicago Heights, Ill.
M-36	Cooper Alloy Corp., Hillside, N.J.
M-37	Cronite Foundry Co., Tottenham, London, England.
M-38	Crucible Specialty Metals Div., Colt Industries, Syracuse, N.Y.
M-39	American Saw & Mfg. Co., Springfield, Mass.
M-40	Darwin & Milner, Inc., Cleveland, Ohio.
M-41	Deloro Stellite Ltd., Belleville. Ontario, Canada.
M-42	Hydril Co., Los Angeles, Cal.
M-43	Dow Chemical Co., The, Metal Products Div., Midland, Mich.
M-44	Driver-Harris Co., Harrison, N.J.
M-45	Duraloy Co., Scottsdale, Pa.
M-46	Duriron Co., Inc., Dayton, Ohio.
M-47	ABEX Corp , Engineered Products Div., Elyria, Ohio.
M-48	Union Carbide Corp., New York, N.Y.
M-49	Empire Metal Co., Syracuse, N.Y.
M-50	English Steel Corp., Ltd., Sheffield, Eng. (Now part of British Steel Corp , M-1724)
M-51	Erie Malleable Iron Co., Erie, Pa.
M-52	Fagersta Bruks Aktiebolag, Fagersta, Sweden.
M-53	Fansteel Inc , North Chicago, Ill.
M-54	Ferranti, Ltd., Lancashire, England.
M-55	A Finkl & Sons, Chicago, Ill
M-56	Thos Firth & John Brown, Ltd., Sheffield, England.
M-57	Firth-Sterling, A Teledyne Co., McKeesport, Pa
M-58	Frontier Bronze Co , Niagara Falls, N.Y
M-59	General Alloys Co., Boston, Mass
M-60	General Electric Co., Metallurgical Products Dept., Detroit, Mich , and Magnetic Materials Products Section, Edmore, Mich
M-61	Wilbur B. Driver Co , Newark, N J
M-62	Hadfields, Ltd , Sheffield, England
M-63	Handy & Harman, New York, N Y
M-64	Heppenstall Co , Pittsburgh, Pa
M-65	Hoskins Mfg Co , Detroit, Mich
M-66	Swiss Laboratory Inc , Akron, Ohio (No proprietary alloys.)
M-67	Inland Steel Co , Chicago, Ill
M-68	International Nickel Co , Inc , New York, N Y
M-69	Jessop Steel Co , Washington, Pa.
M-70	Kanthal, A B , Hallstahammar, Sweden.
M-71	Sumet Corp , Buffalo, N Y.
M-72	Fried Krupp, Steel Works, Essen, Germany.
M-73	Latrobe Steel Corp., Latrobe, Pa.
M-74	Lebanon Steel Foundry, Lebanon, Pa
M-75	Lightalloys, Ltd , London, England
M-76	Chemalloy Electronics Corp., Santee, Cal.
M-77	Lumen Bearing Co , Buffalo, N Y
M-78	I G. Farbenindustrie Aktiengesellschaft, Abteilung Elektronmetall, Frankfurt a.M., Germany
M-78a	Magnesium Development Corp., Newark, N.J
M-79	Malleable Iron Fittings Co., Bradford, Conn.
M-80	P. F McDonald & Co., Boston, Mass.
M-81	McInnes Co., Corry, Pa.
M-82	Meehanite Metal Corp., New Rochelle, N.Y.
M-82a	Ross-Meehan Foundry Co., Chattanooga, Tenn.

M-83	Metropolitan Vickers Electrical Co., Ltd., Manchester, England.
M-84	Michigan Steel Casting Co., Detroit, Mich.
M-85	Midvale-Heppenstall Co., Philadelphia, Pa.
M-86	Mond Nickel Co, Ltd., London, England.
M-87	Ashby, Ltd., Morris, London, England.
M-88	National Lead Co., Metal Div., New York, N.Y.
M-89	National Castings Co., Cleveland, Ohio.
M-90	National Tube Div., U.S. Steel Corp., Pittsburgh, Pa
M-91	New Jersey Zinc Co., The, Bethlehem, Pa.
M-92	Niagara Falls Smelting & Refining Division Continental Copper & Steel Industries, Inc., Buffalo, N.Y.
M-93	Nicralumin Co., Jackson, Mich.
M-94	Ohio Brass Co., Mansfield, Ohio.
M-95	Teledyne Ohiocast, Springfield, Ohio.
M-96	Poldi Steel Works, Prague, Czechoslovakia.
M-96a	Ajax Tool Steel Sales, New York, N Y.
M-97	Republic Steel Corp., Cleveland, Ohio.
M-98	Riverside Alloy Metal Div., H K Porter Co, Riverside, N J.
M-99	Ruselite Corp, Milwaukee, Wis.
M-100	Rustless Iron and Steel Division, Armco Steel Corp., Baltimore, Md
M-101	Sandvikens Jernverks Aktiebolag, Sandviken, Sweden
M-101a	Sandvik Steel Inc, Fairlawn, N.J
M-101b	Sandvikstahl G.m.b H., Dusseldorf, Germany
M-102	Scovill Mfg. Co., Waterbury, Conn.
M-103	Seymour Products Co., Seymour, Conn
M-104	Soc Anon de Commentry Fourchambault et Decazeville, Paris, France.
M-104a	Ferner Co, Inc, R Y., Malden, Mass
M-105	Standard Alloy Co, Inc., Cleveland, Ohio.
M-106	Sterling Metals Ltd, Gypsy Lane, Nuneaton, Eng
M-107	Sutcliffe, Speakman & Co, Leigh, Lancashire, England
M-108	Telcon Metals, Ltd, London, England.
M-109	Titanium Alloy Mfg Division National Lead Co., Niagara Falls, N Y.
M-110	Tungum Alloy Co., Ltd, Cheltenham, Eng
M-110a	Womham, Inc, New York, N.Y
M-111	Uddeholms, A. B, Uddeholm, Sweden.
M-111a	Uddeholm Steel Corp, Totowa, N J
M-112	Union Steel Casting Co, Pittsburgh, Pa
M-114	Universal Cyclops Specialty Steel Div, Pittsburgh, Pa
M-115	Teledyne Vasco, Latrobe, Pa.
M-116	Vereinigte Leichtmetall Werke, G m b H., Hannover-Linden, Germany
M 117	Vickers-Armstrongs, Division English Steel Corp, Ltd, London, England
M-118	Westinghouse Electric Corp., Specialty Metals Div, Blairsville, Pa
M-119	Wheelock, Lovejoy & Co., Cambridge, Mass.
M-120	Wickwire Spencer Steel Co, New York, N Y
M-121	Henry Wiggin & Co, Ltd, Birmingham, England
M-122	Cerro Copper and Brass Co, Div Cerro Corp., Bellefonte, Pa
M-123	Ajax Metal Div, H Kramer & Co., Philadelphia, Pa
M-124	Allen and Son, A Carlstad, N.J.
M 125	Allied Die Casting Corp., New York, N.Y
M-126	Alloys & Products, Inc., New York, N.Y
M-127	Ambold Machine Tool Co., New York, N.Y
M-128	American Injector Co, Detroit, Mich
M-129	American Manganese Bronze Co., Philadelphia, Pa.
M-130	Apex Smelting Co., Div American Metal Climax, Chicago, Ill.
M-131	Apollo Steel Co., Apollo, Pa.
M-132	Armstrong Bros. Tool Co., Chicago, Ill.
M-133	Vereinigte Chemische Fabriken, Leopoldshall, Germany.
M-133a	Gerhard Wagner, New York, N.Y.
M-134	Baker, Perkins & Co., Ltd., Peterborough, England.
M-135	Barker & Allen, Ltd., Birmingham, England
M-136	Birdsboro Corp., Birdsboro, Pa.
M-137	Birmingham Aluminium Casting Co, Ltd., Birmingham, England.
M-138	Bohn Aluminum & Brass Corp, Detroit, Mich.
M-139	Bonney-Floyd Co., Columbus, Ohio. (No longer supply proprietary alloys.)
M-140	Braeburn Alloy Steel Div., Continental Copper and Steel Industries Inc., Braeburn, Pa.
M-141	Bridgeport Brass Co., Bridgeport, Conn
M-142	Buffalo Bronze Die Casting Co., Buffalo, N.Y. (Out of business.)
M-143	Buflovak Equipment Division Blaw-Knox Co., Buffalo, N.Y
M-144	Titanium Metals Corp. of America, W. Caldwell, N.J.
M-145	Chapman Valve Mfg. Co., Indian Orchard, Mass.
M-146	Chicago Steel Foundry Co, Chicago, Ill
M-147	Chrome Alloys Mfg. Co., Oakland, Calif
M-148	Chrome Steel Corp., Carteret, N.J (Out of business.)
M-149	Cleveland Automatic Machinery Co, Cleveland, Ohio (No longer manufacture alloys listed)
M-150	Chas Clifford & Son, Ltd., Birmingham, England.
M-151	Climax Molybdenum Co, Div American Metal Climax, Ann Arbor, Mich and New York, N.Y.
M-152	Commercial Alloys Co., San Francisco, Calif
M-153	Crucible Steel Casting Co., Cleveland, Ohio.
M-154	Curtis Bay Copper and Iron Works. (Out of business)
M-155	Cuyahoga Steel and Wire Div., Hoover Ball and Bearing Co. Solon, Ohio.
M-156	Delta Metal Co, The, Birmingham, England
M-157	Detroit Gray Iron Foundry—Detroit Alloy Steel Co., Detroit, Mich.
M-158	Doehler-Jarvis Div., National Lead Co, Toledo, Ohio.
M-159	Atlas Foundry Co (Out of business)
M-160	Dursar Corp, Newark, N.J.
M 161	Egal Metal Products Co., Baltimore, Md
M-162	Empire Steel Castings, Inc, Reading, Pa
M-163	Farrell-Birmingham Co, Ansonia, Conn
M-164	Fort Pitt Steel Casting Co., McKeesport, Pa.
M-165	General Motors Corp, Dayton, Ohio (see also Central Foundry Div. General Motors Corp. M-690)
M-166	Hardite Metals, Inc., New York, N Y
M-167	Stellite Div. Cabot Corp., Kokomo, Ind (Formerly Haynes Stellite.)
M 168	Hills-McCanna Co, Creston, Iowa
M-169	John Holroyd & Co., Ltd., Rochdale, England
M-170	Jeffrey Mfg Co., Columbus, Ohio
M-171	Kencroft Malleable Co, Buffalo, N Y.
M-172	Johnson Bronze Co, New Castle, Pa
M-173	Jones & Laughlin Steel Corp, Pittsburgh, Pa
M-174	Kinite Corporation, Milwaukee, Wis
M-175	E. M. F. Electric Co, Ltd, Victoria, Australia

M-176	Lukens Steel Co., Coatesville, Pa.
M-177	Duncan Mackenzie's Sons Co., Inc , Trenton, N.J.
M-178	Magnolia Metal Corp., Auburn, Neb.
M-179	Manganese Bronze & Brass Co., Ltd., Ipswich, Eng. (see also Delta Metal Co. M-156.)
M-180	Manganese Steel Forge Co., Philadelphia, Pa.
M-181	McGill Mfg. Co., Valparaiso, Ind.
M-182	Wm. McPhail & Sons, Glasgow, Scotland
M-183	Metal Sales Corp., Jersey City, N J.
M-184	Michiana Products Corp., Michigan City, Ind.
M-185	Midland Motor Cylinder Co., Birmingham, England.
M-186	Millbury Steel Foundry Co., Millbury, Mass.
M-187	William Mills Ltd., Wednesbury, Staffordshire, England.
M-188	Muntz & Co., Ltd., P. H., West Bromwich, England.
M-189	National Alloy Steel Division Blaw-Knox Co., Blawnox, Pa.
M-190	National Bronze & Aluminum Foundry Co., Cleveland, Ohio.
M-191	Newport Steel Corp , Newport, Kentucky
M-192	Pacific Foundry Co , San Francisco, Calif.
M-193	P. L. & M. Co , Los Angeles, Calif
M-194	Hybnickel Alloys Co., Wilmington, Del
M-195	Robbins & Meyers, Inc., Springfield, Ohio
M-196	Karl Schmidt Co., Neckarsulm, Germany.
M-197	American Manganese Mfg. Co (Out of business)
M-198	Siemens & Halske, A. G., Berlin, Germany.
M-199	Siemens-Schuckert, Ltd , London, England
M-200	Johnson, Matthey & Co , Ltd , London, England.
M-201	Sterlite Foundry & Mfg Co , Auburn, Ind
M-202	Stoody Co., Whittier, Calif.
M-203	U.S. Pipe and Foundry Co , Burlington, N.J.
M-204	Vereinigte Silberhammerwerke Hertzel, Nuremburg, Germany.
M-205	Western Electric Co (No longer produces proprietary alloys.)
M-206	Wheeling Steel Corp , Wheeling, W Va
M-207	North American Steel Co , Warrensville Heights, Ohio.
M-208	Studebaker Chemical Co , Elyria, Ohio.
M-209	Acme Steel & Malleable Iron Works, Buffalo, N Y.
M-210	Edgar Allen & Co , Sheffield, England.
M-210a	Edgar Allen Steel Co , Inc , New York, N Y
M-211	Amplex Division, Chrysler Corporation, Detroit, Mich.
M-212	McCallum-Hatch Bronze Co , Inc., Buffalo, N Y.
M-213	Brown-Wales Co , Boston, Mass
M-214	Cadman Mfg Co , A W , Pittsburgh, Pa
M-215	Central Brass & Aluminum Foundry Co., Cincinnati, Ohio.
M-216	Cerro Co , New York, N.Y
M-217	Hellefors Bruks Aktiebolag, Hellefors, Filipstad, Sweden.
M-218	R. W. Coan, Ltd., London, England
M-219	Aluminum Company of Canada. Ltd , Montreal, Canada.
M-220	Farrell-Cheek Steel Foundry Co , Sandusky, Ohio.
M-221	Manco Products Co., Melvindale, Mich
M-222	Dortmund-Hoerder Hüttenverein A G., Dortmund, Germany.
M-223	Gunite Foundries Corp , Rockford, Ill.
M-224	Hofors Steel Works, Hofors, Sweden.
M-225	Hubbard Steel Foundry Co , E Chicago, Ind (Now M-451.)
M-226	Illinois Zinc Co., Chicago, Ill.
M-227	Walker M. Levett, New York, N.Y.
M-228	Link-Belt Div. F.M.C. Corp., Chicago, Ill.
M-229	Mackintosh-Hemphill Co , Pittsburgh, Pa.
M-230	Manning, Maxwell and Moore, Div. of Dresser Industries, Muskegan, Mich.
M-231	Jellif Corp., C.O., Southport, Conn.
M-232	National Erie Corp., Erie, Pennsylvania.
M-233	Osborn Steel Ltd , Sheffield, Eng.
M-234	Parker Appliance Co., Cleveland, Ohio.
M-235	Pittsburgh Crucible Steel Division, Crucible Steel Company of America, Midland, Pa.
M-236	Pittsburgh Steel Foundry Corp., Glassport, Pa.
M-237	Wilson Co., H. A., Engelhard Minerals and Chemical Corp., Union, N.J.
M-238	Revere Copper & Brass Co., New York, N Y.
M-239	Rolls-Royce Mfg Co., Derby, England.
M-240	Joseph T. Ryerson & Son, Inc., Chicago, Ill.
M-241	Sargent and Co., New Haven, Conn. (No proprietary alloys.)
M-242	L. B. Allen Co , Chicago, Ill
M-243	Suffolk Iron Foundry, Stowmarket, England.
M-244	S-M Metal Works, London, England.
M-245	United States Graphite Co , Saginaw, Mich
M-246	Washington Iron Works, Seattle, Wash
M-247	Graphite Metallizing Corp., Yonkers, N.Y.
M-248	Alloy Metal Wire Co., Prospect Park, Pa.
M-249	Aluminium Industrie Aktiengesellschaft, Lausanne-Ouchy, Switzerland.
M-250	American Abrasive Metals Co , Irvington, N J
M-251	Carobronze, Ltd., London, England
M-252	Amesbury Brass & Foundry Co , Amesbury, Mass
M-253	Farrelloy Co , Div American Solder and Flux Co , Inc , Paoli, Pa
M-254	Bausch Machine Tool Co (No longer manufactures alloys listed)
M-255	Rem-Cru Titanium, Inc., Midland, Pa
M-256	Buckeye Brass Mfg Co , Cleveland, Ohio
M-257	Chateaugay Ore & Iron Co , Standish, N Y
M-258	Compagnie d'Orléans, Paris, France
M-259	H D Evans Steel Co , Boston, Mass
M-260	Halcomb Steel Div Crucible Steel see M-38
M-261	Jessop-Saville, Ltd., Sheffield, Eng
M-262	Kalif Corp , Emeryville, Calif.
M 263	LaBour Co , Elkhart, Ind
M-264	Lunkenheimer Co., Cincinnati, Ohio
M 265	Mallory Metallurgical Co., Div of P R Mallory and Co., Inc , Indianapolis, Ind
M-266	Mueller Brass Co , Port Huron, Mich
M-267	S K F. Industries, Inc , Philadelphia, Pa
M-268	Southern Malleable Iron Co , East St Louis, Ill
M-269	ITT Components Group Europe, Harlow, Essex, United Kingdom (Was Standard Telephones & Cables)
M-270	Steinvertriebs Aktiengesellschaft, Berlin, Germany.
M-271	Taylor-Wharton Div. of Harsho Corp , Easton, Pa
M-272	Utlralumin Leichtmetal, A. G , Germany. (Out of business)
M-273	United Lead Co see National Lead Co M-88.
M-274	Verilite Metals Co., N Y , N.Y
M-275	Vulcan-Kidd Steel Div H K. Porter Co , Aliquippa, Pa.
M-276	American Cutting Alloys, Inc., New York, N.Y.
M-277	Warman Steel Casting Co., Huntington Park, Calif

M-278	Weatherly Foundry & Mfg. Co., Weatherly, Pa.
M-279	Olin Brass Div. Olin Corp., E. Alton, Ill.
M-280	Workington Iron & Steel Co., Inc., Workington, Eng. (Now part of British Steel Corp. M-1724.)
M-281	Acieral Co. of America, New York, N.Y.
M-282	Imperial Chemical Industries, Ltd., Metals Division, Birmingham, England.
M-283	Strasser Co., E., Rorschach, Switzerland.
M-284	Giulini Werke A. G., Rohrsbach, Germany.
M-285	American Cast Iron Pipe Co., Birmingham, Ala
M-286	Yorkshire Imperial Metals Ltd., Leeds, England. (Same as M-1560.)
M-286a	John Strachan Co., New York, N Y.
M-287	Garford Engineering Co., Garford, Ind.
M-288	Sivyer Steel Casting Co., Milwaukee, Wis
M-289	Ziv Steel and Wire Co., Detroit, Mich.
M-290	Zurbach Steel Co., Salem, N H
M-291	Reading Iron Co, Reading, Pa.
M-292	A. M. Byers Co, Pittsburgh, Pa
M-293	American Stainless Steel Co, Pittsburgh, Pa.
M-294	Titusville Forge Co., Titusville, Pa.
M-295	Sandusky Foundry & Machine Co., Sandusky, Ohio.
M-296	Heraeus-Vacuumschmelze A. G., Hanau, Germany.
M-297	Vereinigte Deutsche Metallwerke, A. G., Altena (Westf), Germany.
M-298	Cindal Aluminium, Ltd, Birmingham, England.
M-299	Metallgesellschaft, A G., Frankfurt, Germany
M-299a	American Lurgi Corp, New York, N Y.
M-300	Lehigh Babbitt Co, Allentown, Pennsylvania
M-301	Osram G m b H, Kommandit-Ges,, Berlin, Germany.
M-302	Aluminiumwerke Maulbronn, Maulbronn, Wurtt, Germany.
M-303	Vereinigte Deutsche Nickelwerke A G., Schwerte (Ruhr), Germany
M-304	Robert Bosch A. G, Metallwerk, Stuttgart, Germany
M-305	Machlett Laboratories, Stamford, Conn
M-306	British Thomson Houston Co, Ltd, Rugby, Warwickshire, England
M-307	Potts Co, Horace T, Philadephia, Pa
M-308	Cutler-Hammer, Inc, Milwaukee, Wis
M-309	Baldwin-Lima-Hamilton Corp., Philadelphia, Pa
M-310	Harrison, Fischer & Co., Ltd, Sheffield, England
M-311	National Physical Laboratory, Teddington, England
M-312	Michigan Valve & Foundry Co, Detroit, Mich
M-313	American Magnesium Corp., Cleveland, Ohio
M-314	American Smelting & Refining Co., Perth Amboy, N J.
M-315	Maywood Chemical Works, Maywood, N.J.
M-316	Hans-Heinrich Hütte, G.m.b H., Langelsheim a Harz, Germany.
M-317	Hoyt Metal Co of Great Britain, Ltd., London, England
M-318	Plykrome Corp., New York, N.Y.
M-319	Phelps Dodge Copper Products Corp., New York, N.Y.
M-320	Metallbank A. G., (Heddernheimer Copper Works), Heddernheim, Germany
M-321	Birmetals, Ltd, Birmingham, England.
M-322	INSILCO Corp., Meriden, Conn. (Was International Silver Co.)
M-323	Maschinenbau, A. G., Golzern-Grimma, Germany.
M-324	Kreidler's Metall und Drahtwerke G.m.b.H., Stuttgart, Germany.
M-325	Birmabright, Ltd., Birmingham, England.
M-326	Pioneer Alloy Products Co., Cleveland, Ohio.
M-327	United Steel Division of Republic Steel Corp., Canton, Ohio.
M-328	Ingersoll Steel Division Borg-Warner Co., New Castle, Ind.
M-329	VR/Wesson Co., Waukegan, Ill. (Formerly Vascoloy-Ramet.)
M-330	Ostermann & Co. Metallwerke, Köln-Ehrenfeld, Germany.
M-331	Otis Elevator Co., New York, N.Y.
M-332	A. Johnson & Co., Inc., New York, N.Y.
M-333	Swedish American Steel Corp., Brooklyn, N.Y.
M-334	Bissett Steel Co, Cleveland, Ohio.
M-335	Kloster Steel Corp., Chicago, Ill.
M-336	Boyd-Wagner Co., Chicago, Ill
M-337	Craine-Schrage Steel Division Detroit Steel Corp., Detroit, Mich
M-338	Booth Aluminum Ltd., James Birmingham, England.
M-339	Kidd Drawn Steel Co, Aliquippa, Pa.
M-340	Hobson, Houghton & Co., New York, N.Y.
M-341	Peninsula Steel Co, Detroit, Mich
M-342	Anchor Drawn Steel Co. see Teledyne Vasco M-115.
M-343	Heller Bros. Co, Newark, N.J
M-344	Hidalgo Steel Co, Inc, New York, N.Y.
M-345	H. Boker & Co, Inc., New York, NY.
M-346	H Kramer & Co, Chicago, Ill.
M-347	Cannon-Muskegon Corp., Muskegon, Mich.
M-348	Martinel Steel Co, Ltd, London, England
M-349	Ney Co, J M, Bloomfield, Conn
M-350	Adams & Osgood Steel Co., Boston, Mass.
M-351	Imperial Smelting Co., Ltd., London, England
M-352	Andrews, Toledo, Ltd., London, England
M-353	Atlantic Steel Corp, Astoria, N Y.
M-354	Cannon-Stein Steel Co (Out of business.)
M-355	John A Crowley, New York, N Y.
M-356	Crucible Electric Steel Co, Homestead, Pa.
M-357	Disston & Sons, Inc, Philadelphia, Pa
M-358	Duke Steel Co., Inc, New York, N Y.
M-359	Ekstrand & Tholand, New York, N Y
M-360	Frasse & Co, Peter A, Lake Success, N Y (Dealer—no proprietary alloys of its own)
M-361	Edward A Hand, Philadelphia, Pa
M-362	Hawkridge Bros Co, Malden, Mass
M-363	Houghton & Richards, Inc, Boston, Mass
M-364	Illingworth Steel Co, Philadelphia, Pa
M-365	Milne and Co., A, Fairfield, Conn.
M-366	Onondaga Steel Co., Inc., Syracuse, N Y.
M-367	Paragon Steel & Tool Co., Inc, Rutherford, N J.
M-368	Patriarche & Bell, New York, N Y
M-369	Pittsburgh Rolls Division Blaw-Knox Corp, Pittsburgh, Pa
M-370	Pittsburgh Tool Steel Wire Co., Monaca, Pa.
M-371	Thos Prosser & Son, New York, N.Y.
M-372	Purdy Co, A R Inc, Lyndhurst, NJ
M-373	Simonds Steel Div., Wallace-Murray Corp., Lockport, N.Y.
M-374	Stulz Sickles Steel Co., Elizabeth, N.J.
M-375	Swedish Iron and Steel Corp, Middlesex, N.J (No proprietary alloys at present.)
M-376	The Timken Co, Canton, Ohio.
M-377	Tennessee Coal, Iron & Railroad Co., Birmingham, Ala (Subsidiary of United States Steel Corp.)
M-378	Fisher Scientific Co., Pittsburgh, Pa.
M-379	Tool Steel Dept., Republic Steel Corp., Cleveland Ohio

M-380	"Griesogen" Griesheimer Autogen Verkaufs G.m.b.H., Griesheim a. M., Germany.
M-381	Metallo-Chemische Fabrik, Dr. Leopold Rostosky, Berlin, Germany.
M-382	Bleiwerk Goslar, Goslar a.Harz, Germany.
M-383	Vereinigte Stahlwerke, Düsseldorf, Germany.
M-384	Westinghouse Air Brake Co., Wilmerding, Pa.
M-385	Brukskoncernen A. B., Fagersta, Sweden.
M-386	Nitralloy Corp., New York, N.Y.
M-387	Soderfors Steel Works, Soderfors, Sweden.
M-387a	K. Engelsted, New York, N Y.
M-388	Electro-Steel Co, Pittsburgh, Pa.
M-389	Edgar T. Ward's Sons Co., Newark, N.J.
M-390	Tacony Steel Co., Philadelphia (Out of business.)
M-391	Unimetal Co., Franklin, Pa
M-392	S. & C. Wardlow, Nutley, N.J
M-393	Johnson Mfg Co., Mount Vernon, Iowa.
M-394	Vanadium Corp. of America, New York, N.Y.
M-395	Steel & Tubes Division of Republic Steel Corp., Cleveland, Ohio
M-396	British Non-Ferrous Metals Research Association, London, England.
M-397	Union Drawn Steel Div, Republic Steel Corp. (see Republic Steel Corp M-97)
M-398	Ohio Ferro Alloys Corp., Canton, Ohio
M-399	Koppers Co., Inc., Baltimore, Md
M-400	Industrial Furnace Corp, Buffalo, N.Y
M-401	Bundy Tubing Co., Detroit, Mich
M-402	Metallhuttenwerke Schaefer und Schael A G, Breslau, Germany
M-403	Friedrich Wilhelms-Hutte, Muhlheim, Ruhr, Germany
M-404	Aktiebolaget Skandinaviska Armaturfabriken, Stockholm, Sweden
M-405	Chas Carr, Ltd, Grove Lane, Smethwick, Birmingham, England.
M-406	Supersteels Inc, Cleveland, Ohio.
M-407	Gabriel & Co, A. B Row, Birmingham, England.
M-408	A. C Scott & Co, Ltd, Manchester, England
M-409	Wm. Gallimore & Sons, Ltd, Sheffield, England.
M-410	Billington & Newton, Ltd, Longport, Staffs, England.
M-411	Haywoods NCA Metal, Ltd, London, England
M-412	Ballard, F J and Co, England (No longer manufacture the alloys listed)
M-413	Blackwell's Metallurgical Works, Liverpool, England
M-414	National Alloys, Ltd, London, England
M-415	Miralite, Ltd, Mortlake, London, England
M-416	British Driver-Harris Co, Ltd, Gaythorn Mill, Manchester, England.
M-417	J. Shaw Son, & Greenhalgh, Ltd, Albert Works, Huddersfield, England
M-418	Sybry, Searls & Co, Ltd, Cannon Steel Works Sheffield, England
M-419	J. J Rieter & Co, New York, N.Y
M-420	Rely Paint and Metal Works, Cape Town, South Africa
M-421	Thermit, Ltd, Edmonton, London, England
M-422	Rd Jones, Ltd, Garrison Lane, Birmingham, England.
M-423	Victor Mfg Co, London, England.
M-424	Brighton Electric Steel Casting Co, Beaver Falls, Pa.
M-425	B. A. Field, Newark, N.J.
M-426	High Duty Alloys, Ltd, Slough, England
M-427	Non-Corrodal Alloys, Ltd., London, England.
M-428	Hoyt Metal Co., New York, N Y.
M-429	Kahl Iron Foundry, Detroit, Mich.
M-430	Samual Fox & Co., Sheffield England. (Now part of British Steel Corp. M-1724)
M-431	Bearium Metals Corp., Rochester, N.Y.
M-431a	Universal Bearing Metals Corp., Rochester, N Y.
M-432	Delsteel, Inc, Wilmington, Del.
M-433	Edgcomb Steel Co., Philadelphia, Pa
M-434	Ryer Inc, Ltd., Los Angeles, Calif
M-435	Atlas Steels, Ltd., Welland, Ontario, Canada
M-436	Magnolia Antifriction Metal Co. of Great Britain, Ltd, London, S.W. 1, England
M-437	Cincinnati Steel Castings Co., Cincinnati, Ohio.
M-438	ESCO Corp, Portland, Ore
M-439	Forging and Casting Div, Allegheny-Ludlum, Ferndale, Mich.
M-440	Industrial Steels, Inc., Cambridge, Mass
M-441	Interstate Foundry & Machine Co., Johnson City, Tenn
M-442	New England High Carbon Wire Co, Millbury, Mass (No proprietary alloys.)
M-443	Shawinigan Chemicals, Ltd, Montreal, Canada
M-444	Texas Electric Steel Casting Co, Houston, Texas (No proprietary alloys.)
M-445	Thomas Steel Co, Warren, Ohio (Alloys listed have been discontinued)
M-446	The Webb Wire Works, New Brunswick, N J
M-447	Babcock & Wilcox Co, Barberton, Ohio
M-448	United Steel Companies, Ltd, Sheffield, England (Now British Steel Corp M-1724)
M-448a	Steel, Peech & Tozer, Sheffield, England (Now part of British Steel Corp M-1724.)
M-448b	Appleby-Frodingham Steel Co, Ltd, The, Sheffield, England. (Now part of British Steel Corp M-1724)
M-449	M F Cunningham Co, Pittsburgh, Pa
M-450	Micheville, Sté des Aciéries de, Paris, France
M-451	Continental Foundry & Machine Co, E Chicago, Ind
M-452	J Stone & Co, Deptford, London, England
M-453	Shanks & Co, Ltd, Barrhead, Scotland
M-454	Mather & Platt, Ltd, Manchester, England
M-455	Bedel & Cie, Paris, France
M-456	Lyon, Conklin & Co, Baltimore, Md
M-457	Durener Metallwerke, Duren, Germany
M-458	Goodlass Wall and Lead Industries, Ltd, London, England
M-459	Deutsche Edelstahlwerke, A G, Krefeld, Germany.
M-460	Robins Conveyor, Inc, Passaic, N J
M-461	Silicium Pistons, Ltd, London, England.
M-462	Osnabruck Kupfer und Drahtwerke, Osnabruck, Germany
M-463	Worthington Corp, Harrison, N J
M-464	Allyne-Ryan Foundry Co, Cleveland, Ohio
M-465	West Steel Casting Co, Cleveland, Ohio
M-466	Pennsylvania Steel Foundry and Machine Co, Hamburg, Pa
M-467	Massillon Steel Casting Co, Massillon, Ohio
M-468	Western Crucible Steel Casting Co, Minneapolis, Minn.
M-469	Imperial Chemical Industries, Ltd., Merthyr Tydfil, S Wales.
M-470	Dorman, Long, & Co, Ltd, Middlesbrough, England
M-471	Isteg Steel Products Co, Westminster, England
M-472	Messrs. Brown, Bayley's Steel Works, Ltd, Sheffield, England

M-473	American Steel Foundries, Chicago, Ill.
M-474	Chambersburg Engineering Co., Chambersberg, Pa.
M-475	Milwaukee Steel Foundry Co., Milwaukee, Wis.
M-476	David Brown Foundries Co., Ltd., Penistone, England.
M-477	Jos. Jackman & Co., Ltd., Sheffield, England.
M-478	British Rolling Mills, Ltd., Tipton, Staffordshire, England
M-479	Sowers Mfg. Co., Buffalo, N.Y.
M-480	Cleveland Brass Corp., Kinsman, Ohio. (No proprietary alloys.)
M-481	Scientific Alloys, Inc., Los Angeles, Calif.
M-482	Herbert, Ltd., Alfred, Coventry, England.
M-483	National Forge & Ordnance Co., Irvine, Pa
M-484	Wm Oxley & Co., Rotherham, England.
M-485	Apex Steel Co., Ltd., Sheffield, England.
M-486	J. J. Saville & Co., Ltd., Sheffield, England.
M-487	Darwin's Ltd., Sheffield, England
M-488	Hemmings & Co., Rotherham, England.
M-489	Andrews, Ltd., Sheffield, England.
M-490	L Cameron & Son, Sheffield, England.
M-491	Fairley and Sons, Ltd., James, Birmingham, England
M-492	Atkinson, E Frank & Co., Sheffield, England
M-493	Aluminium Walzwerke Aktiengesellschaft, Singen-Hohentwiel, Germany
M-494	Sheepbridge Stokes Centrifugal Castings Co., Ltd., Chesterfield, England
M-495	Monarch Steel Corp., Indianapolis, Ind.
M-496	Samuel Taylor, Ltd., Birmingham, England.
M-497	Wm Hassall & Sons, Manchester, England.
M-498	Worthington Steel & Annealing Co., Sheffield, England
M-499	Industrial Steels, Ltd., Sheffield, England (Now part of British Steel Corp M-1724.)
M-500	Symington-Gould Corporation, Depew, N Y
M-501	Rochling-Buderus A. G., Wetzlar, Germany.
M-502	Hardenite Steel Co., Ltd., Sheffield, England
M-503	Cochrane Corporation, Philadelphia, Pa
M-504	British Standards Institution, London, England
M-505	Dinorm, Berlin, Germany
M-506	Prescott Co., Menominee, Mich
M-507	Resisto-Loy Co., Grand Rapids, Mich
M-508	Janney Cylinder Co., Philadelphia, Pa
M-509	Bridgeport Deoxidized Bronze and Metal Co., Bridgeport, Conn
M-510	Kayser, Ellison & Co., Ltd., Sheffield, England
M-510a	Wetherell Bros Co., Cambridge, Mass
M-511	Calloy, Ltd., Avonmouth, England
M-512	Sioux Tools, Inc., Sioux City, Iowa (Was Albertson & Co.)
M-513	TRW Inc., Minerva, Ohio
M-514	Stewart Die Casting Division Stewart-Warner Corp., Chicago, Ill.
M-515	Central Institute of Metals, Leningrad, Russia
M-516	Bliss & Laughlin, Inc., Harvey, Ill.
M-517	Kahl-Holt Co., Baltimore, Md
M-518	Stedman's Foundry & Machine Works, Aurora, Ind
M-519	Merco Nordstrom Valve Co., Pittsburgh, Pa.
M-520	John Chatillon & Sons, New York, N Y.
M-521	Firth-Vickers Stainless Steels, Ltd., Sheffield, England
M-522	Du Pont de Nemours & Co., E. I., Wilmington, Del. (No proprietary alloys.)
M-523	Lynchburg Foundry Co., Lynchburg, Va.
M-524	American Machine and Foundry Co., New York, N.Y
M-525	Poro Metals, Ltd., London, England.
M-526	Murex Ltd., Rainham, England.
M-527	Heinrich Lanz, A. G., Mannheim, Germany.
M-528	Th. Goldschmidt, A. G., Abteilung Metalle, Essen, Germany.
M-529	Metal & Thermit Corp., New York, N.Y.
M-530	Colvilles, Ltd., Glasgow, Scotland. (Now part of British Steel Corp. M-1724).
M-531	Youngstown Steel, Youngstown Sheet and Tube Co., Youngstown, Ohio.
M-532	Norton Co., Metals Div., Newton, Mass.
M-533	Schneider & Cie, Paris, France.
M-534	E Lunn & Co., Glasgow, Scotland.
M-535	Trenite Foundry Corp., Trenton, N J.
M-536	Robt. Mitchell Co., Ltd., Montreal, Canada
M-537	Alan Wood Steel Co., Conshohocken, Pa.
M-538	American Nickeloid Co., Peru, Ill.
M-539	National Bearing Div., ABEX Corp., Meadville, Pa
M-540	Lewin Metals Corp., E. St. Youis, Ill
M-541	Alluminio S. A., Milano, Italy
M-542	Northfield Iron Co., Northfield, Minn
M-543	Pittsburg Brass Mfg., Co., Irwin, Pa
M-544	Becket Bronze Co., Muncie, Ind. (No proprietary alloys.)
M-545	Michigan Smelting & Refining Co., Detroit, Mich.
M-546	Kinney Iron Works, Los Angeles, Calif.
M-547	Plouff Metallographic Institute, Boston, Mass.
M-548	Nassau Smelting and Refining Co., New York, N Y (No proprietary alloys.)
M-549	E N. Egge Co., Los Angeles, Calif.
M-550	Garrett Brass & Aluminum Foundry Co., Garrett, Ind
M-551	American Steel Co., Pittsburgh, Pa.
M-552	Laclede Brass Works, Inc., St. Louis, Mo.
M-553	Pacific Metal Co., Portland, Ore
M-554	J T Wing & Co., Detroit, Mich
M-555	Aluminiumwerke Nurnberg G.m.b.H., Nurnberg, Germany
M-556	Magnesium Castings & Products, Ltd., Slough, England
M-557	Eisenwerk Neubrandenburg G.m.b.H., Berlin, Germany
M-558	United States Metals Refining Co., Carteret, N.J., AMAX Copper Div., American Climax, New York, N Y., AMAX Metal Powders, Niagara Falls, N.Y.
M-558a	American Metal Climax Corp., New York, N Y
M-559	Alamo Iron Works, San Antonio, Tex
M-560	Joslyn Stainless Steels Co., Ft Wayne, Ind
M-561	Puget Sound Metal Works, Tacoma, Wash.
M-562	Hiertz Metal Co., St. Louis, Mo
M-563	Ariston Metal Co., Jersey City, N J
M-564	Apex Bronze Foundry Co., Oakland, Calif.
M-565	United American Metals Corp., Chicago, Ill.
M-566	Chain Belt Co., Milwaukee, Wis.
M-567	Atkinson Co., Rochester, N Y.
M-568	Acme Steel Co., Chicago, Ill
M-569	Atlantic Steel Castings Co., Chester, Pa.
M-570	Canada Electric Steel Castings, Ltd., Orillia, Ontario, Canada.
M-571	Frank Foundries Corp., Moline, Ill.
M-572	Kay-Brunner Steel Products, Inc., Alhambra, Cal. (No proprietary alloys.)
M-573	The Locomotive Finished Materials Co., Atchison, Kans.
M-574	Stanley Steel Div. of the Stanley Works, New Britain, Conn (No proprietary alloys.)
M-575	Thos. Bolton & Sons, Widnes, England.
M-576	Non-Ferrous Castings Co., Ltd., Smethwick, England.

M-380	"Griesogen" Griesheimer Autogen Verkaufs G.m.b.H., Griesheim a. M., Germany.
M-381	Metallo-Chemische Fabrik, Dr. Leopold Rostosky, Berlin, Germany.
M-382	Bleiwerk Goslar, Goslar a.Harz, Germany.
M-383	Vereinigte Stahlwerke, Düsseldorf, Germany.
M-384	Westinghouse Air Brake Co., Wilmerding, Pa.
M-385	Brukskoncernen A. B., Fagersta, Sweden.
M-386	Nitralloy Corp., New York, N Y.
M-387	Soderfors Steel Works, Soderfors, Sweden.
M-387a	K. Engelsted, New York, N Y.
M-388	Electro-Steel Co., Pittsburgh, Pa.
M-389	Edgar T. Ward's Sons Co., Newark, N.J.
M-390	Tacony Steel Co., Philadelphia. (Out of business.)
M-391	Unimetal Co., Franklin, Pa.
M-392	S. & C. Wardlow, Nutley, N J
M-393	Johnson Mfg. Co , Mount Vernon, Iowa.
M-394	Vanadium Corp. of America, New York, N.Y.
M-395	Steel & Tubes Division of Republic Steel Corp., Cleveland, Ohio.
M-396	British Non-Ferrous Metals Research Association, London, England
M-397	Union Drawn Steel Div., Republic Steel Corp. (see Republic Steel Corp. M-97)
M-398	Ohio Ferro Alloys Corp , Canton, Ohio
M-399	Koppers Co , Inc., Baltimore, Md
M-400	Industrial Furnace Corp., Buffalo, N Y
M-401	Bundy Tubing Co , Detroit, Mich
M-402	Metallhuttenwerke Schaefer und Schael A G , Breslau, Germany.
M-403	Friedrich Wilhelms-Hutte, Muhlheim, Ruhr, Germany
M-404	Aktiebolaget Skandinaviska Armaturfabriken, Stockholm, Sweden
M-405	Chas Carr, Ltd , Grove Lane, Smethwick, Birmingham, England
M-406	Supersteels Inc , Cleveland, Ohio.
M-407	Gabriel & Co., A B Row, Birmingham, England
M-408	A. C. Scott & Co , Ltd , Manchester, England
M-409	Wm. Gallimore & Sons, Ltd , Sheffield, England
M-410	Billington & Newton, Ltd , Longport, Staffs , England.
M-411	Haywoods NCA Metal, Ltd , London, England
M-412	Ballard, F J and Co , England. (No longer manufacture the alloys listed)
M-413	Blackwell's Metallurgical Works, Liverpool, England
M-414	National Alloys, Ltd , London, England
M-415	Miralite, Ltd., Mortlake, London, England
M-416	British Driver-Harris Co , Ltd , Gaythorn Mill, Manchester, England
M-417	J. Shaw Son, & Greenhalgh, Ltd , Albert Works, Huddersfield, England.
M-418	Sybry, Searls & Co , Ltd , Cannon Steel Works Sheffield, England
M-419	J. J Rieter & Co , New York, N Y.
M-420	Rely Paint and Metal Works, Cape Town, South Africa
M-421	Thermit, Ltd , Edmonton, London, England
M-422	Rd. Jones, Ltd., Garrison Lane, Birmingham, England.
M-423	Victor Mfg. Co , London, England
M-424	Brighton Electric Steel Casting Co , Beaver Falls, Pa.
M-425	B A Field, Newark, N.J
M-426	High Duty Alloys, Ltd., Slough, England.
M-427	Non-Corrodal Alloys, Ltd., London, England
M-428	Hoyt Metal Co., New York, N.Y.
M-429	Kahl Iron Foundry, Detroit, Mich.
M-430	Samual Fox & Co., Sheffield England. (Now part of British Steel Corp. M-1724.)
M-431	Bearium Metals Corp., Rochester, N.Y.
M-431a	Universal Bearing Metals Corp., Rochester, N.Y.
M-432	Delsteel, Inc , Wilmington, Del.
M-433	Edgcomb Steel Co., Philadelphia, Pa.
M-434	Ryer Inc., Ltd., Los Angeles, Calif.
M-435	Atlas Steels, Ltd , Welland, Ontario, Canada.
M-436	Magnolia Antifriction Metal Co. of Great Britain, Ltd., London, S.W. 1, England
M-437	Cincinnati Steel Castings Co., Cincinnati, Ohio.
M-438	ESCO Corp., Portland, Ore.
M-439	Forging and Casting Div., Allegheny-Ludlum, Ferndale, Mich.
M-440	Industrial Steels, Inc , Cambridge, Mass
M-441	Interstate Foundry & Machine Co., Johnson City, Tenn
M-442	New England High Carbon Wire Co , Millbury, Mass. (No proprietary alloys)
M-443	Shawinigan Chemicals, Ltd , Montreal, Canada
M-444	Texas Electric Steel Casting Co., Houston, Texas (No proprietary alloys)
M-445	Thomas Steel Co , Warren, Ohio (Alloys listed have been discontinued)
M-446	The Webb Wire Works, New Brunswick, N J
M-447	Babcock & Wilcox Co , Barberton, Ohio
M-448	United Steel Companies, Ltd , Sheffield, England. (Now British Steel Corp. M-1724)
M-448a	Steel, Peech & Tozer, Sheffield, England (Now part of British Steel Corp M-1724)
M-448b	Appleby-Frodingham Steel Co , Ltd , The, Sheffield, England (Now part of British Steel Corp M-1724)
M-449	M F Cunningham Co , Pittsburgh, Pa
M 450	Micheville, Sté des Aciéries de, Paris, France
M-451	Continental Foundry & Machine Co , E Chicago, Ind
M-452	J Stone & Co , Deptford, London, England
M-453	Shanks & Co , Ltd , Barrhead, Scotland
M-454	Mather & Platt, Ltd , Manchester, England
M 455	Bedel & Cie, Paris, France
M-456	Lyon, Conklin & Co , Baltimore, Md
M-457	Durener Metallwerke, Duren, Germany
M-458	Goodlass Wall and Lead Industries, Ltd , London, England
M-459	Deutsche Edelstahlwerke, A. G , Krefeld, Germany.
M-460	Robins Conveyor, Inc., Passaic, N J
M-461	Silicum Pistons, Ltd , London, England
M-462	Osnabruck Kupfer und Drahtwerke, Osnabruck, Germany
M-463	Worthington Corp , Harrison, N J
M-464	Allyne-Ryan Foundry Co , Cleveland, Ohio
M-465	West Steel Casting Co , Cleveland, Ohio
M-466	Pennsylvania Steel Foundry and Machine Co , Hamburg, Pa
M-467	Massillon Steel Casting Co , Massillon, Ohio
M-468	Western Crucible Steel Casting Co , Minneapolis, Minn
M-469	Imperial Chemical Industries, Ltd , Merthyr Tydfil, S Wales
M-470	Dorman, Long, & Co , Ltd , Middlesbrough, England
M-471	Isteg Steel Products Co , Westminster, England.
M-472	Messrs. Brown, Bayley's Steel Works, Ltd , Sheffield, England

M-473	American Steel Foundries, Chicago, Ill.
M-474	Chambersburg Engineering Co., Chambersberg, Pa.
M-475	Milwaukee Steel Foundry Co., Milwaukee, Wis.
M-476	David Brown Foundries Co., Ltd, Penistone, England.
M-477	Jos. Jackman & Co., Ltd., Sheffield, England.
M-478	British Rolling Mills, Ltd., Tipton, Staffordshire, England.
M-479	Sowers Mfg. Co, Buffalo, N Y.
M-480	Cleveland Brass Corp., Kinsman, Ohio (No proprietary alloys.)
M-481	Scientific Alloys, Inc., Los Angeles, Calif.
M-482	Herbert, Ltd, Alfred, Coventry, England.
M-483	National Forge & Ordnance Co., Irvine, Pa.
M-484	Wm. Oxley & Co., Rotherham, England
M-485	Apex Steel Co., Ltd., Sheffield, England.
M-486	J. J Saville & Co., Ltd., Sheffield, England.
M-487	Darwin's Ltd, Sheffield, England.
M-488	Hemmings & Co., Rotherham, England
M-489	Andrews, Ltd, Sheffield, England
M-490	L. Cameron & Son, Sheffield, England.
M-491	Fairley and Sons, Ltd, James, Birmingham, England
M 492	Atkinson, E. Frank & Co., Sheffield, England.
M-493	Aluminium Walzwerke Aktiengesellschaft, Singen-Hohentwiel, Germany
M-494	Sheepbridge Stokes Centrifugal Castings Co, Ltd, Chesterfield, England.
M-495	Monarch Steel Corp, Indianapolis, Ind.
M 496	Samuel Taylor, Ltd, Birmingham, England.
M-497	Wm Hassall & Sons, Manchester, England.
M-498	Worthington Steel & Annealing Co, Sheffield, England
M-499	Industrial Steels, Ltd, Sheffield, England. (Now part of British Steel Corp M-1724)
M 500	Symington-Gould Corporation, Depew, N Y.
M-501	Rochling-Buderus A. G, Wetzlar, Germany.
M-502	Hardenite Steel Co, Ltd., Sheffield, England
M-503	Cochrane Corporation, Philadelphia, Pa
M-504	British Standards Institution, London, England
M-505	Dinorm, Berlin, Germany.
M-506	Prescott Co, Menominee, Mich
M-507	Resisto-Loy Co, Grand Rapids, Mich
M-508	Janney Cylinder Co, Philadelphia, Pa
M-509	Bridgeport Deoxidized Bronze and Metal Co, Bridgeport, Conn
M-510	Kayser, Ellison & Co, Ltd, Sheffield, England.
M 510a	Wetherell Bros Co, Cambridge, Mass
M-511	Calloy, Ltd, Avonmouth, England
M-512	Sioux Tools, Inc, Sioux City, Iowa (Was Albertson & Co)
M-513	TRW Inc, Minerva, Ohio
M-514	Stewart Die Casting Division Stewart-Warner Corp, Chicago, Ill.
M-515	Central Institute of Metals, Leningrad, Russia.
M-516	Bliss & Laughlin, Inc, Harvey, Ill
M-517	Kahl-Holt Co, Baltimore, Md
M-518	Stedman's Foundry & Machine Works, Aurora, Ind.
M-519	Merco Nordstrom Valve Co., Pittsburgh, Pa
M-520	John Chatillon & Sons, New York, N.Y
M-521	Firth-Vickers Stainless Steels, Ltd, Sheffield, England
M-522	Du Pont de Nemours & Co, E. I, Wilmington, Del. (No proprietary alloys.)
M-523	Lynchburg Foundry Co., Lynchburg, Va.
M-524	American Machine and Foundry Co., New York, N.Y
M-525	Poro Metals, Ltd., London, England.
M-526	Murex Ltd., Rainham, England.
M-527	Heinrich Lanz, A. G., Mannheim, Germany.
M-528	Th. Goldschmidt, A. G., Abteilung Metalle, Essen, Germany.
M-529	Metal & Thermit Corp., New York, N.Y.
M-530	Colvilles, Ltd., Glasgow, Scotland. (Now part of British Steel Corp. M-1724).
M-531	Youngstown Steel, Youngstown Sheet and Tube Co, Youngstown, Ohio.
M-532	Norton Co., Metals Div., Newton, Mass.
M-533	Schneider & Cie, Paris, France.
M-534	E. Lunn & Co, Glasgow, Scotland.
M-535	Trenite Foundry Corp, Trenton, N.J.
M-536	Robt. Mitchell Co., Ltd., Montreal, Canada.
M-537	Alan Wood Steel Co., Conshohocken, Pa.
M-538	American Nickeloid Co., Peru, Ill.
M-539	National Bearing Div, ABEX Corp., Meadville, Pa
M-540	Lewin Metals Corp., E. St Youis, Ill
M-541	Alluminio S. A, Milano, Italy.
M-542	Northfield Iron Co, Northfield, Minn.
M-543	Pittsburg Brass Mfg., Co., Irwin, Pa.
M-544	Becket Bronze Co, Muncie, Ind. (No proprietary alloys)
M-545	Michigan Smelting & Refining Co, Detroit, Mich.
M-546	Kinney Iron Works, Los Angeles, Calif.
M-547	Plouff Metallographic Institute, Boston, Mass
M-548	Nassau Smelting and Refining Co, New York, N Y (No proprietary alloys)
M-549	E N. Egge Co., Los Angeles, Calif
M-550	Garrett Brass & Aluminum Foundry Co, Garrett, Ind.
M-551	American Steel Co., Pittsburgh, Pa
M-552	Laclede Brass Works, Inc, St Louis, Mo
M-553	Pacific Metal Co., Portland, Ore
M-554	J T. Wing & Co, Detroit, Mich
M-555	Aluminiumwerke Nurnberg G m b H, Nurnberg, Germany.
M-556	Magnesium Castings & Products, Ltd, Slough, England
M-557	Eisenwerk Neubrandenburg G m.b H, Berlin, Germany
M-558	United States Metals Refining Co, Carteret, N J, AMAX Copper Div, American Climax, New York, N Y, AMAX Metal Powders, Niagara Falls, N Y.
M-558a	American Metal Climax Corp, New York, N Y
M-559	Alamo Iron Works, San Antonio, Tex
M-560	Joslyn Stainless Steels Co, Ft. Wayne, Ind.
M 561	Puget Sound Metal Works, Tacoma, Wash.
M 562	Hieitz Metal Co, St. Louis, Mo
M-563	Ariston Metal Co, Jersey City, N J
M-564	Apex Bronze Foundry Co, Oakland, Calif
M-565	United American Metals Corp., Chicago, Ill.
M-566	Chain Belt Co, Milwaukee, Wis
M-567	Atkinson Co., Rochester, N Y.
M-568	Acme Steel Co, Chicago, Ill.
M-569	Atlantic Steel Castings Co., Chester, Pa.
M-570	Canada Electric Steel Castings, Ltd, Orillia, Ontario, Canada
M-571	Frank Foundries Corp, Moline, Ill
M-572	Kay-Brunner Steel Products, Inc, Alhambra, Cal (No proprietary alloys.)
M-573	The Locomotive Finished Materials Co., Atchison, Kans.
M-574	Stanley Steel Div. of the Stanley Works, New Britain, Conn. (No proprietary alloys)
M-575	Thos. Bolton & Sons, Widnes, England
M-576	Non-Ferrous Castings Co., Ltd., Smethwick, England.

M-577	T. M. Birkett & Sons, Ltd., Hanley, England.
M-578	Lincoln Electric Co., Cleveland, Ohio.
M-579	A. O. Smith Co., Milwaukee, Wis.
M-580	Hanson-Van Winkle-Munning Co., Matawan, N.J.
M-581	Ardal Ltd., Worle, Weston-Super-Mare, England.
M-582	W. M. Chace Co., Detroit, Mich.
M-583	Pressed Steel Car Co., Chicago, Ill.
M-584	Degefors Iron & Steel Works, Degefors, Sweden.
M-585	U.S. Reduction Co., E. Chicago, Ind.
M-586	Glacier Metal Co., Richmond, Va.
M-587	John Finn Metal Works, San Francisco, Calif.
M-588	Union Bronze Co., Reading, Pa.
M-589	Everard Tap & Die Corp. (No proprietary alloys.)
M-590	Seitzinger's, Inc., Atlanta, Ga.
M-591	Atlantic Zinc Works, New York, N.Y.
M-592	Central Foundry Co., Joplin, Mo.
M-593	Bronze Die Casting Co., Pittsburgh, Pa.
M-594	Dirigold Corp., Kokomo, Ind.
M-595	Alemite Die Casting & Manufacturing Co., Woodstock, Ill.
M-596	Grasselli Chemical Co., Cleveland, Ohio.
M-597	Braun-Steeples Co., Ltd., San Francisco, Calif.
M-598	Tungsten Widia Tool Corp., New York, N.Y.
M-599	Wehr Steel Co., Milwaukee, Wis.
M-600	Castalloy Company, Natick, Mass.
M-601	Motor Castings Co., Milwaukee, Wis.
M-602	Geo. W. Prentiss & Co., Holyoke, Mass.
M-603	Aurora Metal Co., Inc., Aurora, Ill.
M-604	United States Steel Corp., Pittsburgh, Pa.
M-605	Lindberg Hevi Div. Solar Basic Industries, Chicago, Ill.
M-606	Societá Anonima Ansaldo, Rome Italy.
M-607	Steel Sales Corp., Chicago, Ill.
M-608	Achorn Steel Co., Cambridge, Mass.
M-609	Gimo-Osterby Bruks A. B., Gimo, Sweden.
M-610	Horndal Jernverks A. B., Horndal, Sweden.
M-611	Klosters A. B., Langshyttan, Sweden.
M-612	Cleveland Twist Drill Co., Cleveland, Ohio.
M-613	Stahlwerk Becker A. G., Krefeld (Rheinland), Germany.
M-614	Ed. Dörrenburg Söhne, Runderoth (Rheinland), Germany
M-615	Rudolf Schmidt Stahlwerke, Vienna, Austria.
M-616	Schöller-Bleckman Steel Corp., Styria, Austria.
M-616a	Fred Baker, Inc., Larchmond, N.Y.
M-617	Edelstahlwerk Röchling A. G., Volklingen (Saar), Germany.
M-618	Sanderson Bros. & Newbould, Ltd., Sheffield, England.
M-619	Barrow Haematite Steel Co., Ltd., Borrow-in-Furness, Lancashire, England.
M-620	Alais, Forges et Camargue, Paris, France.
M-621	Allgemeine Elektrizitäts-Gesellschaft, Berlin, Germany.
M-622	Aluminium Belge S. A., Lüttich, Belgium.
M-623	Comp. des Alliages Spéciaux d'Aluminium, Asnières, France.
M-624	Lavorazione Leghe Leggere, Milano, Italy.
M-625	Rheinische Röhrenwerke Aktiengesellschaft, Mülheim, Germany.
M-626	Pittsburgh Metallurgical Co., Inc., Niagara Falls, N.Y.
M-627	Paitoute Iron & Steel Co., Newark, N.J.
M-628	Weirton Steel Co., Weirton, W. Va.
M-629	Wyckoff Steel Div. AMCO Pittsburgh Corp., Pittsburgh, Pa. (No proprietary alloys at at present.)
M-630	Q. & C. Co., New York, N.Y.
M-631	Continental Steel Corp., Kokomo, Ind.
M-632	Bound Brook Bearing Corp., Bound Brook, N.J.
M-633	Granite City Steel Co., Granite City, Ill.
M-634	Unicast Corp., Div. Midland Ross Corp., Toledo, Ohio.
M-635	Superior Sheet Steel Div., Parkersburg Steel Corp., Parkersburg, W. Va. (No proprietary alloys.)
M-636	Consolidated Ashcroft Hancock Co., Inc., Bridgeport, Conn.
M-637	Athens Foundry Co., Athens, Pa.
M-638	Hoganas-Billesholm Aktiebolaget, Hoganas, Sweden.
M-639	Antaciron, Inc., Wellesville, N.Y.
M-640	Molybdenum Corp. of America, New York, N.Y.
M-641	Andrews & Co., Ltd., Thomas, Royds Works, Sheffield, England.
M-642	Allis-Chalmers Mfg. Co., Milwaukee, Wis.
M-643	Alcan Booth Industries, Banbary, Oxon, England. (Formerly Northern Aluminum Co.)
M-644	Aluminium Union, Ltd., London, England.
M-645	Knutange, Sté Métallurgique de, Paris, France.
M-646	Beryllium Corp. of America, part of Kawecki Beryllium Industries, Inc., Reading, Pa.
M-647	Société des Sondures, Castolin, South America.
M-648	Castolin Welding Alloys, Inc., New York, N.Y.
M-649	Central Iron and Steel Co., Harrisburg, Pa.
M-650	Gibson Electric-Talon, Div. of Textron, Delmont, Pa.
M-651	Skoda Works, Czechoslovakia.
M-652	Whipple & Choate Company, Bridgeport, Conn.
M-653	American Chain and Cable Co., Inc. (No longer produce alloys.)
M-654	Acme Foundry and Machine Co., Coffeyville, Kan.
M-655	Adirondack Steel Foundries Corp., Watervliet, N.Y.
M-656	J. D. Adams & Co., Indianapolis, Ind.
M-657	Cohn, A., Ltd., London, England.
M-658	Alfa Romeo, Rome, Italy.
M-659	White Metal Rolling and Stamping Corp., New York, N.Y.
M-660	Ferrous Metals Corp., New York, N.Y.
M-661	Agile Div. Nagle/Sybron Corp., Rochester, N.Y.
M-662	Wilson Welder and Metals Company, New York, N.Y.
M-663	Airco Welding Products, Union, N.J. and Airco Vacuum Metals, Berkeley, Cal.
M-664	Hunt-Spiller Div. Power Products, Inc., South San Francisco, Cal.
M-665	Southern Metals Company, St. Louis, Mo.
M-666	Aladdin Rod & Flux Mfg. Co., Grand Rapids, Mich.
M-667	British Oxygen Company, Ltd., London, England.
M-668	Allen Mfg. Company, Hartford, Conn.
M-669	LaSalle Steel Company, Chicago, Ill.
M-670	Arnold Engineering Co., Marengo, Ill.
M-671	Reynolds Metals Co., Richmond, Va.
M-672	Société Alsia, Paris, France.
M-673	Société Electro-Cables, Paris, France.
M-674	Ateliers de la Gironde, Paris, France.
M-675	Sté des Laminoirs et Tréfileries du Havre, Paris, France.
M-676	Continental Industries Corporation, New York, N.Y.

M-677	Arcos Corporation, Philadelphia, Pa.
M-678	Compagnie des Mines, Fonderies et Forges d'Alais, Tamaris, France.
M-679	Fonderie de Précision Nanterre, Paris, France.
M-680	Chrysler Corporation, Detroit, Mich.
M-681	Wellman Bronze & Aluminum Company, Cleveland, Ohio.
M-682	Copperweld Steel Company, Warren, Ohio.
M-683	Northeast Metals Company, Philadelphia, Pa.
M-684	American Radiator Co., (No proprietary alloys.)
M-685	Phillips, & Co., C.E., Detroit, Mich
M-686	American Platinum and Silver Div. Engelhard Industries, Newark, N.J.
M-687	Apollo Metals, Inc., Chicago, Ill.
M-688	Lehigh Steel Corp., New York, N Y.
M-689	Régie Nationale des Usines Renault, St. Michael de Maurienne, France.
M-690	General Motors Corp., Central Foundry Div., Saginaw, Mich.
M-691	Empire Steel Corp , Mansfield, Ohio.
M-692	Alloy Rods Co see Chemetron Corp. M-1713
M-693	Copper Development Association, London, England.
M-694	Ackerlind Steel Co., Inc., Long Island City, N Y.
M-695	Atlantic Casting & Engineering Co., Clifton, N.J.
M-696	Atlas Pattern & Model Works, Brooklyn, N Y
M-697	Hammond & Irving, Inc , Auburn, N.Y
M-698	Bidault, Paris, France.
M-699	British Metal Corp , Ltd , London, England
M-700	Sté de Produits Métallurgiques, Paris, France.
M-701	Sperry Gyroscope Co , Great Neck, N Y.
M-702	Timken Detroit Axle Company, Detroit, Mich
M-703	Axelson Mfg Co., Los Angeles, Calif
M-704	Bachite Development Corporation
M-705	Barium Steel Corporation, Canton, Ohio
M-706	Becker Brothers Carbon Company, Cicero, Ill.
M-707	Belle City Malleable Cast Iron Co., Racine, Wis.
M-708	Bergman Electrizitätswerke, Berlin, Germany.
M-709	Federal Mogul Corporation, Detroit, Mich.
M-710	McGean Chemical Company, Cleveland, Ohio.
M-711	British Insulated Callender's Cables Ltd., Prescot, England.
M-712	Champion Rivet Company, Cleveland, Ohio
M-713	Rossell, Henry & Co., Sheffield, England.
M-714	Oman Non-Friction Metal Co., El Paso, Tex
M-715	British Piston Ring Company, Coventry, England.
M-716	Nihon Jyokiko Seikosho Goshi Koisha, Japan.
M-717	Eutectic Corp , Flushing, N.Y.
M-718	Fillmore Foundry, Inc., Buffalo, N.Y
M-719	Bulls Metal & Marine Ltd., Glasgow, Scotland.
M-720	Bunting Brass & Bronze Co., Toledo, Ohio.
M-721	Burden Iron Co., Troy, N.Y. (Out of business.)
M-722	Burndy Engineering, Inc., New York, N.Y.
M-723	Byrwill Co., Cincinnati, Ohio.
M-724	F.A.C.A., Paris, France.
M-725	Callite Tungsten Corp., Subsidiary of Sylvania Electric Products Inc., Union City, N.J.
M-726	Caloriz Corp. of Great Britain, Ltd., London, England.
M-727	Cambridge Wire Cloth Co., Cambridge, Md.
M-728	Perry Equipment Corp., Philadelphia, Pa.
M-729	A. Gayer Co., Paris, France.
M-730	Wrought Bearing Metals, Inc., New York, N.Y.
M-731	Keasby & Matteson Co., Ambler, Pa.
M-732	A.F.C., Sté des, Paris, France.
M-733	Mining & Chemical Products, Ltd , London, England.
M-734	Compressed Industrial Gases Co., Chicago, Ill.
M-735	Spang Chalfant Co., Division National Supply Co., Pittsburgh, Pa.
M-736	Central Engineering & Supply Co., Passaic, N.J.
M-737	Tullis, D & J , Ltd., London, England.
M-738	Cleveland Refractory Metals, Cleveland, Ohio.
M-739	Clevite Bearing Div Gould Inc., Cleveland, Ohio. (Formerly Cleveland Graphite Bronze.)
M-740	Cold Metal Products Company, Youngstown, Ohio.
M-741	Williams & Sons, E.A., Carlstad, N.J.
M-742	Steel Co., Ltd.. Motherwell, England.
M-743	Miller Steel Company, Newark, N.J.
M-744	Colonial Alloys Co., Philadelphia, Pa.
M-745	Unexcelled Mfg Co., New York, N.Y.
M-746	Constrictor, London, England.
M-747	Ford Motor Company, Detroit, Mich.
M-748	Crane Company, Chicago, Ill.
M-749	Crescent Tool Co., Jamestown, N.Y.
M-750	Amalgamated Steel Div. Allied Steel and Tractor Products, Inc., Cleveland, Ohio.
M-751	Michigan Tool Co., Detroit, Mich.
M-752	Follsain-Wycliffe Foundries, Ltd., Lutterworth, England.
M-753	Marsh Brothers & Co., Ltd., Sheffield, England.
M-754	Damascus Steel Casting Co , New Brighton, Pa.
M-755	Denman & Davis, North Bergen, N J.
M-756	Delloy Metals, Philadelphia, Pa.
M-757	Duval et Poulain, Paris, France.
M-758	Bartlett Hayward Division, Koppers Co., Baltimore, Md.
M-759	Brown Alloy Works, Detroit, Mich.
M-760	Die Castings, Ltd., Birmingham, England.
M-761	American Art Metals, Inc., New York, N.Y.
M-762	Dodge Steel Co., Philadelphia, Pennsylvania.
M-763	Dominion Wheel & Foundry Co., Toronto, Canada
M-764	Wielandwerke, Ulm, Germany.
M-765	Welding Equipment & Supply Co., Detroit, Mich.
M-766	Great Lakes Steel Co , Div. National Steel Corp., Detroit, Mich and Chicago, Ill.
M-767	Société du Duralumin, Paris, France
M-768	Societá Metallurgica Italia, Firenze, Italy.
M-769	Duraweld Metal Products Corp , Long Island City, N.Y.
M-770	Tréfileries et Laminoirs du Havre, Antony (Seine), France
M-771	Imphy, Société Metallurgique d', Imphy (Nièvre), France. (Also: American Silver Co , Inc , Flushing, N.Y)
M-772	Henry A. Kries & Sons Co., Baltimore, Md.
M-773	Dymonhard Corp. of America, New York, N.Y.
M-774	Washburn Wire Company, Phillipsdale, R.I.
M-775	Alloy Foundries Div. of the Eastern Co., Naugatuck, Conn.
M-776	Eclipse-Pioneer Foundries. (Discontinued alloy production.)

M-777	Electro Refractories & Abrasives Div. FERRO Corp. (Not in alloy business at present.)
M-778	Electroloy Company, Inc., Bridgeport, Conn.
M-779	Elesco Superheated Company, East Chicago, Ill.
M-780	Compound Electro Metals, Ltd., London, England.
M-781	Williamson Bros., Inc., Bridgeport, Conn.
M-782	Gautier, D. G. & Company, New York, N.Y.
M-783	Agawam Tool Company, Springfield, Mass.
M-784	Hughes, F. A. & Company, Ltd., London, England.
M-785	Swedish Steel Mills, New York, N.Y.
M-786	Imperial Brass Manufacturing Company, Chicago, Ill.
M-787	T.L.M. Co., Paris, France.
M-788	Oil Well Supply Company, Houston, Tex
M-789	Isabellenhuette, Berlin, Germany.
M-790	Rennie Tool Company, Ltd , Manchester, England.
M-791	Jelenko, W , & Company, New York, N.Y.
M-792	Kellogg, M W., & Company, Jersey City, N.J.
M-793	Kennametal, Inc., Latrobe, Pa.
M-794	Kirk, P , & Sons, Los Angeles, Calif
M-795	Stupakoff Laboratories, Inc., Pittsburgh, Pa.
M-796	Eisler Electric Company, Union City, N J.
M-797	General Tool & Die Company, East Orange, N.J.
M-798	Hoesch-Kohn-Nevessen, Dortmund, Germany.
M-799	Hardy, Charles & Company, New York, N.Y.
M-800	Lake Erie Engineering Corporation, Buffalo, N.Y.
M-801	Lavin, R & Sons, Chicago, Ill.
M-802	Logan Iron & Steel Company, Philadelphia, Pa.
M-803	Lowmoor Best Yorkshire Iron, Ltd , Lowmoor, England.
M-804	Foote Bros Gear & Machine Corp , Chicago, Ill.
M-805	Grant & West, Ltd., London, England
M-806	Follansbee Steel Corp , Follansbee, W. Va
M-807	Cie Français des Métaux, Paris, France.
M-808	Fuller and Basch Co , New York, N.Y.
M-809	Fulton Iron Works, St. Louis, Mo
M-810	Chicago Hardware Foundry Company, N Chicago, Ill.
M-811	Universal Power Corporation, Cleveland, Ohio.
M-812	Ratcliff, J F. Metals, Ltd , Birmingham, England.
M-813	Metalloy Products Company, Los Angeles, Calif.
M-814	Baldwins, Ltd , London, England
M-815	Federated Metals Division, American Smelting & Refining Co , Perth Amboy, N.J.
M-816	Grammar, Dempsey & Hudson Company, Newark, N.J.
M-817	Gilmore, F. F., and Company, Boston, Mass.
M-818	Glacier Metal Company, Ltd., Alpertone, England.
M-819	Die Casting Appliance Corporation, Ltd., London, England.
M-820	Gorham Tool Company, Detroit, Mich.
M-821	Graphitized Alloy Corporation, New York, N.Y.
M-822	Diehl Steel Company, Cincinnati, Ohio.
M-823	Benecke, Alexander, Inc., New York, N.Y.
M-824	Wakefield Bearing Company, Wakefield, Mass
M-825	Hackett Brass Foundry, Detroit, Mich.
M-826	Steel Co. of Scotland, Glasgow, Scotland. (Now part of British Steel Corp. M-1724.)
M-827	Hancock Valve Division, Manning-Maxwell and Moore Company, Bridgeport, Conn.
M-828	Harnischfeger Corp , Milwaukee, Wis. (Alloy welding rods business transferred to Chemetron M-1713.)
M-829	Industries Trading Company, New York, N.Y.
M-830	Harvill Mfg Co , H.L., Corona, Cal
M-831	General Electric Company, Ltd , Wembley, England.
M-832	Paulson, Thomas and Sons, Brooklyn, N Y.
M-833	Hansell-Elcock Co., Chicago, Ill.
M-834	Translateur & Company, Berlin, Germany.
M-835	Columbus-McKinnon Chain Corporation, Tonawanda, N.Y.
M-836	National Steel Corp , Pittsburgh, Pa.
M-837	Molybdenum, N O , Company, Reutte-Tyrol, Austria
M-838	Precious Metals Research Works, Inc , Brooklyn, N Y.
M-839	Moraine Products Co , Division General Motors Corp , Dayton, Ohio
M-840	Otis Steel Division Jones & Laughlin Steel Corp , Cleveland, Ohio
M-841	Hedstrom, Oscar W , Corp , Chicago, Ill.
M-842	Woodworkers Tool Works, Chicago, Ill
M-843	Linde Company, New York, N Y.
M-844	Hollup Corporation, Division National Cylinder Gas Co , Chicago, Ill
M-845	Central Pattern & Foundry Co , Chicago, Ill
M-846	Bradley Laboratories, London, England
M-847	Hytensil Aluminum Co , Chicago, Ill
M-848	Winn, W Martin, Ltd , S Staffordshire, England
M-849	McKay Co., The, A Teledyne Co , Pittsburgh, Pa.
M-850	Hamilton Foundry Div , Hamilton Allied Corp , Hamilton, Ohio.
M-851	Electric Auto-Lite Co., Woodstock, Ill
M-852	Mesta Machine Co., Pittsburgh, Pa
M-853	METCO Inc., Westbury, Long Island, N Y
M-854	G.H.R. Foundry Div Dayton Malleable Iron Co , Dayton, Ohio.
M-855	Doelger & Kirsten, Inc , Milwaukee, Wis
M-856	Sylvania Electric Products, Inc , Towanda, Pa
M-857	Lake & Elliot, Ltd , Braintree, England
M-858	Minimax Co , Chicago, Ill
M-859	Major Engineering Corp , Chicago, Ill
M-860	Moltrop Steel Products Co , Beaver Falls, Pa.
M-861	Black Drill Co., Cleveland, Ohio
M-862	Falk Corp., Milwaukee, Wis.
M-863	Monarch Alloy Co , Ravenna, Ohio
M-864	National Broach & Machine Co , Detroit, Mich
M-865	Nesaloy Products, Inc , New York, N Y.
M-866	Oldham, F. B & Co , Buffalo, N Y
M-867	Cinaudagraph Corp , Stamford, Conn
M-868	Novo Pump and Machine Div., American Marsh Pumps, Inc , Lansing, Mich
M-869	Wintershall, A. G., Heringer, Germany.
M-870	Snowbar, J L , New York, N Y
M-871	Aluminium Français, Paris, France.
M-872	Page Steel & Wire Division, American Chain & Cable Co , Monessen, Pa.
M-873	Youngstown Foundry & Machine Co , Youngstown, Ohio.
M-874	Parker-Kalon Corp., Clifton, N.J.
M-875	Simpson Bros., Portsmouth, Ohio.
M-876	Peckovers, Ltd , Toronto, Canada
M-877	American Bridge Co , Pittsburgh, Pa

M-878	Perry Barr Metal Co., Ltd., Birmingham, England.
M-897	Paraloy Co., Chicago, Ill.
M-880	Permo Incorporated, Chicago, Ill.
M-881	Permold Co., Medina, Ohio.
M-882	Aktiebolaget Svenska Metallverken, Stockholm, Sweden.
M-883	Wheeling-Pittsburgh Steel Corp., Pittsburgh, Pa.
M-884	Société des Aciéries de Pompey, Paris, France.
M-885	Powder Metals, Inc., Long Island City, N.Y.
M-886	Fairbanks, Morse & Co., Div. Colt Industries, Pomona, Cal.
M-887	Precision Castings Co , Fayetteville, N Y.
M-888	Lake City Malleable Company, Cleveland, Ohio
M-889	Spuck Iron & Foundry Company, St Louis, Mo.
M-890	Hueck, Edward, Ludenscheid, Germany.
M-891	Joselin, C & Company, New York, N.Y.
M-892	Hurbenium Co of America, Detroit, Mich
M-893	Manos Ltd , Zürich, Switzerland
M-894	Fitzsimmons Steel Company, Youngstown, Ohio.
M-895	Deutsche Industrie, Nemen, Germany.
M-896	Standard Brake Shoe & Foundry Company, Pine Bluff, Ark
M-897	Gilby Wire, Soc Anon , Rueil-Malmaison, France
M-898	Advance Foundry Company, Dayton, Ohio.
M-899	Stroh Process Steel Company, Pittsburgh, Pa
M-900	Kelly Foundry & Machine Company, Elkins, W Va
M 901	Superior Steel Corporation, Pittsburgh, Pa
M-902	Chicago Malleable Casting Company, Chicago, Ill
M-903	Sanderson Steel Div , see Crucible Specialty Metals Div Colt Industries M 38
M-904	Castings Corporation, Buffalo, N Y
M-905	Hyde Park Foundry & Machine Company, Hyde Park, Pa
M 906	Sheepbridge Equipment Ltd , Chesterfield, England
M-907	Reliance Steel Casting Company, Pittsburgh, Pa
M-908	Hoyland Steel Company, New York, N Y
M 909	Tri-Clover Div. Ladish Co , Racine, Wis (see Ladish Co M-1527)
M-910	National Cable & Metal Company, Glendale, Calif
M-911	Riverside Foundry & Galvanizing Co , Kalamazoo, Mich
M-912	Rochlingstahl, G.m b H , Voelklingen, Germany
M-913	Metal Carbides Corporation, Youngstown, Ohio
M-914	McKechie Bros , Ltd., Birmingham, England
M-915	Taylor, S G , Chain Company, Hammond, Ind.
M 916	Super Tool Co., Elk Rapids, Mich
M-917	Cornish Wire Company, New York, N Y
M-918	Willworthy Piston Ring, Ltd , London, England
M-919	Wilkinson, William, Shustoke, England
M-920	Consolidated Car Heating Co , Albany, N.Y.
M-921	Compagnie Française de l'Etain, Paris, France.
M-922	Vulcan Iron Works, Wilkes-Barre, Pa
M-923	Tri-Lok Company, Pittsburgh, Pa
M-924	Dravo-Doyle Company, Pittsburgh, Pa.
M-925	True Alloys, Inc , Detroit, Mich
M-926	General Plate Division Metals & Controls Corp., Attleboro, Mass.
M-927	Oklahoma Steel Casting Company, Tulsa, Okla.
M-928	Stupakoff Seramic & Mfg. Co., Latrobe, Pa.
M-929	Tyler Co., W.S., Div. of W S. Tyler, Inc., Mentor, Ohio.
M-930	Una Welding, Inc., Cleveland, Ohio.
M-931	Union Metal Mfg. Company, Canton, Ohio.
M-932	Universal Alloys, Inc., Newark, N.J.,
M-933	Wellman, S. K., Company, Cleveland, Ohio.
M-934	Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
M-935	Vereinigte Aluminiumwerke, Bohn, Germany.
M-936	Audubon Wire Cloth Corporation, Philadelphia, Pa.
M-937	Austenal, Inc , New York, N Y. (Part of Howmet Corp)
M-938	Vulcan Mold & Iron Company, Latrobe, Pa.
M-939	Welding Alloy Mfg. Company, Malden, Mass.
M-940	Pratt, J. M , & Company, Cincinnati, Ohio.
M-941	Waukesha Foundry Company, Waukesha, Wis
M-942	Waltham Watch Company, Waltham, Massachusetts
M-943	Welding Material Company, New Orleans, La
M-944	Park Sales Company, New York, N Y.
M-945	Superior Tube Company, Norristown, Pa
M-946	Welland Electric Steel Foundry, Welland, Ontario, Canada
M-947	Eaton Mfg. Company, Detroit, Mich
M-948	Dusenberry & Stracken, Inc., New York, N Y.
M-949	Grey, C. M , Mfg Co , East Orange, N J.
M-950	Zelnicker, W A , Company, St. Louis, Mo
M-951	Light Metal Works, Tokyo, Japan
M-952	Napraloy Co., Jersey City, N J
M-953	Allied Process Corp. (Out of business)
M-954	Trimout Mfg Company, Boston, Mass
M-955	Titanite Alloys Corporation, Cleveland, Ohio
M-956	American Crucible Products Co , Lorain, Ohio
M-957	Tube Reducing Corporation, Wallington, N J.
M 958	Magnus Metal Division National Lead Co , Chicago, Ill
M-959	Hewitt Metals, Detroit, Mich
M-960	Somers Thin Strip, Inc , Waterbury, Conn
M-961	Brockhouse Casting Company, Wolverhampton, England
M-962	Buffalo Wire Works, Buffalo, N.Y
M-963	Wall-Colmonoy Corporation, Detroit, Mich
M-964	United States Steel Supply Co , Chicago, Ill
M 965	Excelite Company, Woodbridge, N J
M-966	Saginaw Bearing Co , Saginaw, Mich
M-967	Superior Metal Co , Chicago, Ill
M-968	Metal Castings, Ltd , Worcester, England.
M-969	Seaboard Steel Company of America, New York, N Y
M-970	Sessions Foundry Company, Bristol, Conn.
M-971	Metallwerke, A. G , Vienna, Austria
M-972	Seneca Wire & Mfg Company, Fostoria, Ohio
M-973	New England Collapsible Tube Company, New London, Conn
M-974	Shenango-Penn Div. Shenango Furnace Co. (No longer produce proprietary alloys)
M-975	Bonny Tool & Forge Co , Allentown Pa
M-976	Willeys Carbide Tool Co., Unit of Excello Corp , Dearborn, Mich
M-977	Youngstown Alloy Castings Co., Youngstown, Ohio

M-978	British General Electric Co., Ltd., London, England.
M-979	Tréfileries du Havre, Paris, France.
M-980	Chromium Corp. of America, Waterbury, Conn.
M-981	Deutsche Messingwerke, Berlin, Germany.
M-982	Aluminium Wire & Cable Co., Ltd., Port Tennant, Swansea, England.
M-983	Veddernheimer Kupferwerke, Berlin, Germany.
M-984	Vapal, Paris, France.
M-985	Darwins-Toledo, Ltd., Sheffield, England.
M-986	Reid-Avery Co., Baltimore, Md.
M-987	Tungsten Alloy Mfg. Co., Harrison, N.J.
M-988	Mir-O-Col Alloy Co., Los Angeles, Calif.
M-989	Keystone Carbon Co., St. Marys, Pa.
M-990	Rhoades Metaline Co., R. W., Long Island City, N.Y.
M-991	American Steel Foundries, Newark, N.J.
M-992	Hammond Brass Works, Hammond, Ind.
M-993	Duquesne Smelting Corp., Pittsburgh, Pa.
M-994	Fahralloy Co., Harvey, Ill.
M-995	Hopkinsons, Ltd., London, England.
M-996	Brookside Metal Co., Ltd., England. (No proprietary alloys.)
M-997	Tata Iron & Steel Co., Calcutta, India.
M-998	Volco Brass & Copper Co., Kenilworth, N.J.
M-999	Edgcomb Steel Corp., Hillside, N.J.
M-1000	Hobart Bros. Co., Troy, Ohio.
M-1001	Tonawanda Iron Corporation, North Tonawanda, N.Y.
M-1002	Sherman and Co., New York, N.Y.
M-1003	Eimco Corp., Salt Lake City, Utah
M-1004	General Aircraft Equipment Co. (Out of business.)
M-1005	Alloy Engineering & Casting Co., Champaign, Ill.
M-1006	Wickman Wimet Ltd., Hard Metal Div., Coventry, England
M-1007	Olds Alloys Co., South Gate, Calif.
M-1008	Sterling Alloys, Inc., Woburn, Mass.
M-1009	Grayborn Steel Co., New York, N.Y.
M-1010	Permanent Magnet Association, London, England.
M-1011	Cooper Products Co., Cleveland, Ohio
M-1012	Arpocalloy Co., Kansas City, Mo.
M-1013	United Wire and Supply Co., Providence, R.I.
M-1014	Eastern Stainless Steel Co., Div. of FASCO Corp., Baltimore, Md.
M-1015	Simonds Worden White Co., Dayton, Ohio.
M-1016	Darbyshire Steel Co., El Paso, Texas
M-1017	Sight Feed Generator Co., Richmond, Ind.
M-1018	Superior Die Casting Co., Cleveland, Ohio
M-1019	Davis and Geck, Inc., Pearl River, N.Y.
M-1020	Electro Metal Corporation, Yonkers, N.Y.
M-1021	Chance Vought Aircraft, Div. United Aircraft Corp., Stratford, Conn.
M-1022	Acme Aluminum Alloys, Inc., Dayton, Ohio
M-1023	ALOYCO Inc., Linden, N.J.
M-1024	Escaut & Meuse, Sté, Paris, France
M-1025	Permanente Magnesium Inc. (Discontinued.)
M-1026	Swedish Crucible Steel Co., Detroit, Mich.
M-1027	Walker Metal Products Ltd., Walkerville, Ontario, Canada.
M-1028	Oscap Manufacturing Co., New York, N.Y.
M-1029	Tuff-Hard Corp., Detroit, Mich.
M-1030	Globe Steel Tubes Co., Milwaukee, Wis.
M-1031	Light Metals, Inc., Indianapolis, Ind.
M-1032	Jackson Iron and Steel Co., Jackson, Ohio.
M-1033	Dominion Foundries and Steel, Ltd., Canada. (No proprietary alloys at present.)
M-1034	General Steel Industries, Inc., Granite City, Ill.
M-1035	Eccles and Davis Machinery Co., Inc., Los Angeles, Calif.
M-1036	Tough-ite Process Co., Chicago, Ill.
M-1037	Brush Beryllium Co., Cleveland, Ohio.
M-1038	Foote Mineral Co., Exton, Pa.
M-1039	Keokuk Electro-Metals Co., Keokuk, Iowa.
M-1040	Alten Foundry and Machine Works, Lancaster, Ohio.
M-1041	Indium Corp. of America, Utica, N.Y.
M-1042	Baad Powder Metallurgy Co., Pittsburgh, Pa.
M-1043	Aciéries de Forges de Firminy, Paris, France.
M-1044	Hewson Co., John, New York, N.Y.
M-1045	Howard Foundry Co., Chicago, Ill.
M-1046	Tungit Electro-Metals Work, Ltd., London, England.
M-1047	Lazalloys Ltd., Bently Works, Doncaster, England
M-1048	Scraw Alloys Ltd., Banstead, Surrey, England.
M-1049	Atlas Metal and Alloys Co., Ltd., Chicago, Ill.
M-1050	Lithaloys Corporation, New York, New York.
M-1051	Madison-Kipp Corp., Madison, Wis.
M-1052	Crobalt, Inc., Ann Arbor, Mich.
M-1053	Peterson Steels, Inc., Union, N.J.
M-1054	Tungsten Electric Corp., Union City, N.J.
M-1055	Utility Electric Steel Foundry Co., Los Angeles, Calif.
M-1056	Trethaway Associates, New York, N.Y.
M-1057	American Tank and Fabrication Co., Cleveland, Ohio
M-1058	Akron Bronze and Aluminum Co., Akron, Ohio
M-1059	Chromium Mining and Smelting Corp., Ltd., Sault Ste. Marie, Ontario, Canada
M-1060	Coast Metals, Inc., Little Ferry, N.J.
M-1061	Emsco Derrick and Equipment Co., Los Angeles, Calif.
M-1062	Atkins, E. C. and Co., Indianapolis, Ind.
M-1063	General Metals Powder Co., Akron, Ohio
M-1064	Wyndale Mfg. Co., Indianapolis, Ind.
M-1065	Metal and Alloy Div., Silver Creek Precision Corp., Silver Creek, N.Y.
M-1066	Makepeace, D. E., Div. Engelhard Industries, Attleboro, Mass.
M-1067	Great Western Steel Co., Inc., Los Angeles, Calif.
M-1068	Manross Division, Associated Spring Co., Bristol, Conn.
M-1069	Stackpole Carbon Co., St. Marys, Pa.
M-1070	Superior Flux Co., Cleveland, Ohio
M-1071	Sharon Steel Corp., Sharon, Pa.
M-1072	Pickands Mather and Co., Cleveland, Ohio.
M-1073	Alpha Metals, Inc., Jersey City, N.J.
M-1074	ARC Products Div. of Chemetron Corp., Hanover, Pa. (Formerly All-State Welding Alloys.)
M-1075	Apothecaries Hall Co., Waterbury, Conn.
M-1076	Indiana General Corp., Valparaiso, Ind.
M-1077	Whiton Machine Co., New London, Conn.
M-1078	Pipe Machinery Corp., Cleveland, Ohio
M-1079	Detroit Mold Engineering Co., Newark, N.J.
M-1080	SIPI Metals Corp., Chicago, Ill.
M-1081	Strong, Carlisle and Hammond Co., Cleveland, Ohio
M-1082	Redhard Metals, Inc., Hatboro, Pa.
M-1083	Enfield Rolling Mills Ltd., Brimsdown, Enfield, England.
M-1084	Hamilton Precision Metal Div., Hamilton Watch Co., Lancaster, Pa.
M-1085	Ludlow-Saylor-Wire Co., St. Louis, Mo.
M-1086	Adamas Carbide Corp., Kenilworth, N.J.
M-1087	Elgin National Watch Co., Elgin, Ill.

M-1088	American Solder Corp., Philadelphia, Pa.
M-1089	Magnetic Metals Co., Camden, N.J.
M-1090	Plastic Metals, Division, National Radiator Co., Johnstown, Pa.
M-1091	Casting Development Co., Philadelphia, Pa.
M-1092	Welding Sales and Engineering Co., Detroit, Mich.
M-1093	SMS Corporation, Detroit, Mich
M-1094	Oakes Foundry Co , Warren, Ohio.
M-1095	Blackalloy Co. of America, Paterson, N.J.
M-1096	Marquette Corp., Minneapolis, Minn
M-1097	Dee Div. of Handy and Harmon see Handy and Harmon, M-63
M-1098	Powder Metal Products Co., Franklin Park, Ill.
M-1099	ABEX Corp., Mahwah, N.J. (Formerly American Brake Shoe Co.)
M-1100	Rankin Mfg Co , Alhambra, Cal.
M-1101	Fulton Gold Refiners Corp , New York, N.Y.
M-1102	Acme Electric Welder Co., Los Angeles, Calif.
M-1103	Jobbins, W F , Aurora, Ill.
M-1104	Galv-Weld Inc., Dayton, Ohio.
M-1105	Detroit Tap and Tool Co., Warren, Mich
M-1106	Wausau Motor Parts Co , Schofield, Wis.
M-1107	McCauley Alloy Sales Co., New York, N Y.
M-1108	Goldsmith Bros , Chicago, Ill (Part of National Lead)
M-1109	Crane Co., Torrey S , Plantsville, Conn
M-1110	Riken Metal Mfg Co , Ube, Japan
M-1111	General Cerium Co., Edgewater, N J. (See Ronson Metals Co)
M 1112	Balfour & Co., Ltd., Arthur, Sheffield, England
M 1113	Wardlow's Ltd , Sheffield, England
M-1114	Stierische Gusstahlwerke, Vienna, Austria
M-1115	Aubert et Duval, Neuilly-sur-Seine, France.
M-1116	Aciéries de Champagnole, La Courneuve, France
M-1117	Compagnie des Forges de Chatillon Commentary et Neuves-Maisons, Paris, France
M-1118	Société des Aciéries de Longwy, Mont-Saint-Martin, France.
M-1119	Société Anonyme des Hauts-Fourneaux, Forges et Aciéries du Saut-du-Tarn, Paris, France
M-1120	Ugine, Aciéries Electriques de Ugine, (Savoie) France
M-1121	Division Lead Co , Summit, Ill.
M-1122	American Clad Metals, Inc , Pawtucket, R.I.
M-1123	Rochlingstahl Steel Works, Wetzlar, Germany
M-1124	Steel Co of Canada, Ltd , The, Toronto, Ontario, Canada
M 1125	Kester Solder Co , Chicago, Ill
M-1126	Brown-Firth Co., Ltd., Sheffield, England.
M-1127	Philips Electrical, Ltd , London, England
M-1128	Bergstrom Alloys Corp., New York, N Y.
M-1129	Kerkling & Co , Whittier, Cal.
M-1130	Magnesium Elektron Ltd., Manchester, England
M-1131	Heinkel-Hirth Co., Berlin, Germany.
M-1132	Kapfenberg, Steiermark, Austria.
M-1133	Deutsche Gold und Silber Scheide, Hanau, Germany.
M-1134	Zinkberatungsstelle, G.m.b H , Berlin, Germany.
M-1135	Kropp Forge Co., Chicago, Ill.
M-1136	Soldering Specialties Co., Summit, N.J.
M-1137	L. and R. Mfg Co., Arlington, N.J.
M-1138	U.S Spring & Bumper Co., Los Angeles, Calif.
M-1139	North American Philips Co., Inc., New York, N.Y.
M-1140	Aluminiumwerk A.G., Rorschach, Switzerland.
M-1141	Ekstrom, Carlson & Co., Rockford, Ill.
M-1142	Acme Foundry Co., Detroit, Mich.
M-1143	York Machine & Supply Co., York, Pa.
M-1144	Miller Company, Meriden, Conn.
M-1145	Federal Foundries & Steel Co., Ltd., London, England.
M-1146	Benedict-Miller, Inc., Lyndhurst, N.J.
M-1147	Kaiser Aluminum & Chemical Corp., Oakland, Calif.
M-1148	Kaiser Steel Corp., Oakland, Calif.
M-1149	Marshall Steel Co., La Grange, Ill
M-1150	Kanthal Corp., Bethel, Conn.
M-1151	Yocom, James & Son, Inc., Philadelphia, Pa.
M-1152	Auto Specialties Mfg Co , Inc., St. Joseph, Mich.
M-1153	American Non-Gran Bronze Co., Berwyn, Pa.
M-1154	Bradley & Foster, Ltd., Staffordshire, England.
M-1155	Randall Graphite Products Co., Chicago, Ill.
M-1156	Harris & Co , Arthur, Chicago, Ill.
M-1157	Tipaloy, Inc , Detroit, Mich
M-1158	Aluminum Solder Corp., New York, N.Y.
M-1159	Kling Bros. Engineering Works, Chicago, Ill.
M-1160	Parker Pen Co , Janesville, Wis.
M-1161	Uniworld Research Corp of America, Cleveland, Ohio.
M-1162	Wel-Met Co , Kent, Ohio.
M-1163	Ohio Stainless & Commercial Steel Co., Cleveland, Ohio
M-1164	Rasmussen Mfg., Co., Hollydale, Calif.
M-1165	Lancaster Steel Co., Inc , New York, N Y.
M-1166	Calumet Steel Castings Corp., Hammand, Ind
M-1167	Meech Foundry, Inc., Cleveland, Ohio
M-1168	Pressco Casting & Mfg Corp., Chesterton, Ind
M-1169	Langley Alloys, Ltd , London, England
M-1170	Superior Foundry, Inc., Cleveland, Ohio
M-1171	Industrial Overlay Metals Corp , New York, N.Y
M-1172	Brown and Sharp Mfg Co , North Kingston, R.I
M-1173	Watsontown Foundry Co., Watsontown, Pa.
M-1174	Michigan Powdered Metal Products Co., Inc., Northville, Mich.
M-1175	Agil Chemie, Berlin, Germany.
M-1176	Società Alluminio Veneto per Azioni (SAVA), Porto Marghera, Milano, Italy.
M-1177	N V Billiton Maatschappu, The Hague, Holland.
M-1178	Gold und Silber Scheide Anstalt, Hanau, Germany.
M-1179	Société Anonyme Usines et Aciéries Allard, Mon-sur-Marchienne, Belgium.
M-1180	Société Anonyme des Etablissements Marrell Frères, Rive de Gier (Loire), France
M-1181	Hetzel & Co., Nürnberg, Germany
M-1182	Raven Steel & Tool Co., Valley Stream, N.Y.
M-1183	Beaumont Birch Co , Philadelphia, Pa.
M-1184	Bofors AB., Bofors, Sweden.
M-1185	Paris & d'Outreau, Aciéries de, Paris, France.
M-1186	Svenska Metallverken, AB, Stockholm, Sweden.
M-1187	Chicago Development Corp , Riverdale, Md.
M-1188	Usines Emile Henricot, Court-Saint-Etienne, Belgium
M-1189	Surahammars, Bruks, A.B., Surahammar, Sweden.
M-1190	Wikmanshytte Bruks, A.B., Vikmanshyttan, Sweden.

M-1191	Accurate Brass Co., Inc., Bristol, Conn.
M-1192	Thomas & Skinner Steel Products Co., Indianapolis, Ind
M-1193	Knapp Mills, Inc., Long Island City, N.Y.
M-1194	Greenleaf Corp., New York, N Y.
M-1195	Jonas & Culver, Ltd., Sheffield, England.
M-1196	LeMoyne Steel Co., Pittsburgh, Pa.
M-1197	American Electro Metals Corp., Yonkers, N.Y.
M-1198	Western Alloyed Steel Casting Co., Minneapolis, Minn.
M-1199	Crucible Steel Castings Co., Lansdowne, Pa
M-1200	American Hoist & Derrick Co , St Paul, Minn.
M-1201	E.M F. Electric Co , Pty, Ltd , Victoria, Australia.
M-1202	Hallamshire Steel & File Co , Ltd., Sheffield, England
M-1203	Newcomer Products, Inc., Latrobe, Pa.
M-1204	Victor Equipment Co , Alloy Rod and Metal Div. (Now part of Stellite Div. Cabot Corp M-167.)
M-1205	Gardiner Metal Co , Chicago, Ill.
M-1206	Pittsburgh Metal Purifying Corp , Saxonburg, Pa
M-1207	Royalloy, Inc New York, N.Y.
M-1208	McQuay-Norris Mfg Co , St Louis, Mo
M-1209	Rolled Alloys, Inc , Detroit, Mich
M-1210	Electro Foundry Co , Troutdale, Ore
M-1211	Ryan Aeronautical Co , San Diego, Calif
M-1212	Miller Co same as M-1144.
M-1213	American Metallurgical Products Co , Pittsburgh 13, Pa.
M-1214	Vacuum Metals Div Crucible Steel. see M 38
M-1215	Plew Tool Co , Columbia City, Ind
M-1216	Alter Company, Davenport, Iowa
M-1217	Cop-Sil-Loy, Inc., Hollywood, Calif
M-1218	Dyn-Metal Ltd., London, England
M-1218a	Machinery & Machine Supplies Co , Inc , New York, N Y
M-1219	Industria Nazionale Alluminio, Mori (Trento), F Bolzano, Italy
M-1220	Società Alluminio Veneto per Azioni, Porto Marghera, Venezia, Italy
M-1221	Heller Tool Co., Div. Wallace Murray Corp , Newcomerstown, Ohio
M-1222	Blaw Knox Co , Pittsburgh, Pa
M-1223	Donegal Steel Foundry Co , Marietta, Pa
M-1224	Ingersoll-Rand Co , Phillpsburg, N J
M-1225	Starrett Co , The L S , Athol, Mass
M-1226	Illinois Tool Works, Chicago, Ill
M-1227	Allied Products Corp , Hillsdale, Mich
M-1228	Philadelphia Bronze and Brass Corp , Philadelphia, Pa (see Ampco M-13)
M-1229	Reactive Metals Corp , Niles, Ohio
M-1230	Weldwire Company, Inc , New York, N.Y.
M-1231	Ulman & Associates, A E , New York, N.Y
M-1232	Ferroxcube Corporation of America, Saugerties, N Y
M-1233	Aluminum Smelting and Refining Works same as M-1279.
M-1234	Thyssen Co., August, Berlin, Germany
M-1235	Harvey Aluminum Co , Torrance, Calif.
M-1236	Specialloy, Inc , Chicago, Ill.
M-1237	Norsk Aluminium Co., A/S, Hoyanger, Norway
M-1238	Nordisk Aluminiumindustry, A/S Holmestrand, Norway.
M-1239	Dominion Magnesium Ltd , Toronto, Canada.
M-1240	Rollschen Eisenwerke A. G., Gesellschaft der Ludv. von, Gerlafingen, Germany.
M-1241	Aetna Standard Engineering Co., Pittsburgh, Pa.
M-1242	Reeves International Inc., New York, N.Y.
M-1243	Fusion Engineering, Cleveland, Ohio.
M-1244	Little Falls Alloys, Inc , Paterson, N.J.
M-1245	Myrens Verksted A/S, Oslo, Norway.
M-1246	Metallwerk Plansee, Gesellschaft M. B. H., Reutte-Tirol, Austria
M-1247	Rollschen Eisenwerke, Ludwig von, Solothurn, Switzerland.
M-1248	Commerce Pattern Co , New York, N.Y.
M-1249	Allen-Sherman-Hoff Pump Co., Paoli. Pa.
M-1250	Morris Machine Works, Baldwinsville, N.Y.
M-1251	Georgia Iron Works, Augusta, Ga
M-1252	Pennrold Division, Brush Beryllium, Inc., Reading, Pa.
M-1253	Algoma Steel Corp , Ltd , Sault Ste Marie, Ontario, Canada.
M-1254	Black-Clawson Co., Middletown, Ohio
M-1255	Belmont Smelting & Refining Works, Inc., Roslyn Heights, N Y
M-1256	Ashton Ltd , N. C , Huddersfield, England.
M-1257	Vulcan Foundry Co , Oakland, Calif.
M-1258	Beardsley & Piper Co , Chicago, Ill.
M-1259	W. W Alloys, Inc., Detroit. see Fansteel Inc M-53
M-1260	Bergsoe & Son, Paul, Glostrup, Denmark
M-1261	Bergsoe & Son, Paul, Landskrona, Sweden
M-1262	Stainless Foundry & Engineering Co , Milwaukee, Wis
M-1263	Pacific Welding Alloys Mfg Co , Los Angeles, Calif
M-1264	Cameron & Son, Ltd , I , Sheffield, England.
M-1265	Alloys and Products, Inc., New York 59, N Y
M-1266	Sonken-Galamba Corp , Kansas City 18, Kans
M-1267	Giede Foundries, Inc , Milwaukee, Wis
M-1268	T I Aluminium, Ltd , Birmingham, England
M-1269	Hanford Foundry Co , San Bernardino, Calif
M-1270	Hayward Tyler of Canada Ltd , Kitchener, Ontario, Canada
M-1271	Husqvarna Vapenfabriks Aktiebolag, Stockholm, Sweden
M-1272	Alar, Ltd , London, England
M-1273	Renfrew Foundries Ltd , Hillingdon, Glasgow, Scotland
M-1274	Southern Forge Ltd , Langley, Bucks, England
M 1275	E & F Kaye Ltd , Enfield, England
M-1276	Alcaloy, Inc , Cleveland 20, Ohio.
M-1277	Massey Harris Ltd , Toronto, Canada
M-1278	Pratt and Whitney Cutting Tool Div , West Hartford, Conn
M-1279	Aluminum Smelting & Refining Co Maple Heights, Ohio.
M-1280	Techalloy Company, Inc , Rahns, Pa.
M-1281	Berry Metal Co , Harmony, Pa
M-1282	Holt Equipment Co , Independence, Ore
M-1283	Feltrina, Società Metallurgica, Milano, Italy.
M-1284	Borolite Corporation, Niagara Falls, N Y.
M-1285	Fromson Co , Inc , New York, N Y
M-1286	General Motors Corp , Detroit, Mich
M-1287	Henckels Zwillingwerke, J. A , Solingen, Germany.
M-1288	Robert-Leyer-Pritzkow & Co , Solingen-Ohligs, Germany
M-1289	Veraloy Products Ltd., Birmingham, England
M-1290	Bergische Stahlindustrie, Remscheid, Germany.
M 1291	Steirische Gusstahlwerke, A. G , Vienna, Austria
M-1292	Main Metal Ltd , London, England.
M-1293	Gusstahl-Handels, G m.b H., von Dohlen-Stahl, Wetter/Ruhr, Germany.

M-1294	Stahlschmidt & Co., K. G., Düsseldorf, Germany.
M-1295	Cohn Corp., Sigmund, Mount Vernon, N.Y.
M-1296	Sumitomo Metal Industries, Ltd., Osaka, Japan.
M-1297	Jadot, Usines de, Brussels, Belgium
M-1298	Gilson Co., Liege, Belgium.
M-1299	Remanit, G.m.b.H., Berlin, Germany
M-1300	Deutro, G m b.H., Berlin, Germany.
M-1301	Schneider, Virgo, Paris, France.
M-1302	AFY, Sté des, Paris, France
M-1303	Holzer, Jacob (Discontinued.)
M-1304	Stavanger Co., Oslo, Norway.
M-1305	Schmidt & Clemens Edelstahlwerke, Bez, Koln, Germany
M-1306	Gebr Hover, Kaiserau, Germany
M-1307	Suedwestfalen, Stahlwerke, Werk Geisweid, Germany.
M-1308	Schoeller-Bleckmann, Ternitz-Vienna, Austria
M-1309	Soding, J. C & Halbach, Hagen, Westf, Germany
M-1310	Stahlwerke Kabel C, Pouplier Jr., Hagen-Kabel, Germany.
M-1311	Lohman, G m b.H., Friedr, Herbede, Ruhr, Germany
M-1312	Fakirstahl, Remscheid, Germany.
M-1313	Kanz, Metallwerk. Hans, Zurich-Albisrieden, Switzerland
M-1314	Alpine Montan Co, Wien, Austria
M-1315	Ambo-Stahl Co., Koln, Germany
M-1316	Grimm Co, Gustaf, Remscheid-Haddenbach, Germany.
M 1317	Special Metals Corp, Div of Allegheny-Ludlum Industries, New Hartford, N Y.
M-1318	Haecker, G m b H, W., Huscheswagen, Germany
M-1319	Lindenberg, G m b H, Remscheid, Germany.
M-1320	Urbach & Co, Krawinklerbruche, Germany
M-1321	Plattawerke, W Berlin, Germany
M-1322	Westa-Westdeutsche Edelstahlhandelsgesellschaft, G m b H., von Poldihütte, Dusseldorf, Germany
M-1323	Georgsmarienwerke Silesiastahl, G m b H, Georgsmarienhutte, Germany
M-1324	Dusseldorf Heerdt Edelstahlwerk, G m b H, Dusseldorf-Heerdt, Germany
M-1325	Hoffmann Elektrogusstahlwerk, Alb, Eschwailer, Germany.
M 1326	Witten Edelstahl A G, Witten, Germany
M-1327	Kuhbier & Son Co, C, Dahlerbruck, Germany.
M-1328	Handler, G m b H, Dusseldorf, Germany
M-1329	Guronitwerke Vervoort, G m b H, Dusseldorf, Germany
M-1330	Carp & Hones Stahlwerk, Dusseldorf, Germany
M-1331	Bochum Stahlwerke, A G, Bochum, Germany.
M-1332	Zapp, Robert, Edelstahle, Dusseldorf, Germany.
M-1333	Ergste Stahlwerk, A G, Ergste, Ruhr, Germany
M-1334	Deutsche Mannesmannröhren A G, Düsseldorf, Germany
M-1335	Reisholz, A G, Stahl-und Rohrenwerke, Düsseldorf-Reisholz, Germany.
M-1336	Erkenzweig & Schwemann, Hagen, Germany
M-1337	Stahlwerke R & H Plate, Lüdenscheid-Platehof, Germany.
M-1338	Hoffman & Co, Germany. (No proprietary alloys at present)

M-1339	Remy & Co., Hagener Gusstahlwerke, G.m.b.H., Hagen, Westf., Germany.
M-1340	Wolff, Edelstahlverkauf, Otto, Köln, Germany.
M-1341	Universal Castings Corp., Chicago, Ill.
M-1342	Pose-Marre Edelstahlwerk G.m.b.H., Erkrath-Düsseldorf, Germany.
M-1343	Bochumer Verein A. G., Bochum, Germany.
M-1344	Plettenberger Gusstahlwerk, Plettenberg, Germany.
M-1345	Westfalische Stahlgesellschaft, Plettenberg, Germany.
M-1346	Idealstahl W. Breidenbach OHG, Dieringhausen/Rhld, Germany.
M-1347	Junker G.m.b H., Otto, Lammersdorf, Germany.
M-1348	Dohlen-Stahl, Gusstahl-Handels G.m.b.H., Wetter/Ruhr, Germany.
M-1349	Mentah Co., Vorgtlinder, W. Berlin, Germany
M-1350	Hochfrequenz-Tiegelstahl G.m.b.H., Bochum, Germany.
M-1351	Ultralloy Corp, Chicago, Ill
M-1352	Kind & Co, Bielstein/Rheinland, Germany
M-1353	Reining & Co, Hirsch, G.m b.H, Dusseldorf, Germany
M-1354	Aluminium G m b H., Rheinfelden, Baden, Germany
M-1355	Busch-Jager Ludenscheider Metallwerke A G, Ludenscheid, Germany
M-1356	Deutsche Delta Metallgesellschaft, Dusseldorf-Grafenberg, Germany.
M-1357	Diel Metall-Guss und Presswerk, Hrch, G m b H, Nurnberg, Germany
M-1358	Elisental Drahtwerk, Neuenrade, Westf, Germany.
M 1359	Erbsloh, J & A, Wuppertal-Barmen, Germany
M-1360	Felten & Guillaume Carlswerke, A. G., Koln-Mulheim, Germany
M-1361	Fuchs KG Metallwerke, Otto, Meinerzhagen/Westf, Germany.
M-1362	Gerhardi & Co, Ludenscheid, Germany.
M-1363	Gottingen Aluminiumwerke G m b H, Gottingen, Germany.
M-1364	Honsel Werk A G, Leichtmetallwerke, Meschede-Dortmund, Germany
M-1365	Mahle K G, Stuttgart-Bad Cannstatt, Germany
M-1366	Neumayer Kabel u. Metallwerke A G, Nurnberg, Germany
M-1367	Rieger Gebr, Aalen, Germany
M-1368	Schmole, RuG, Metallwerke Menden, Krs. Iserlohn/Westf, Germany
M-1369	Seibel, W, A G, Mettmann, Rheinland, Germany.
M-1370	Standard-Werke, G m b.H, Werl, Westf., Germany
M-1371	Unna Messingwerk A G, Unna, Westf, Germany
M-1372	Vesevorder Metallwerke G.m b.H, Werdohl/Westf, Germany
M-1373	Westfalische Kupfer u Messingwerke A G., Ludenscheid, Germany.
M-1374	Wilms A. G., G. Robert, Remscheid-Hasten, Germany
M-1375	Westfalische Leichtmetallwerke G.m.b H., Nachrodt, Krs, Altena, Westf., Germany.
M-1376	Wutoschingen Aluminiumwalzwerk G.m.b.H., Wutoschingen, Germany.
M-1377	Horbach & Schmitz A. G., Koln, Germany.
M-1378	Alco Products, Inc., Schnectady 1, N.Y.

M-1379 Sintox Corporation of America, Allentown, Pa.
M-1380 Westfalenhütte Dortmund A. G., Dortmund, Germany.
M-1381 Mannesmann-Hüttenwerk A. G., Duisburg, Germany.
M-1382 Ruhrstahl A. G., Henrichshütte, Hattingen/Ruhr, Germany.
M-1383 Schwabenstahl Hüttenwerke, G.m.b.H., Wasseralfingen (Württ.), Germany.
M-1384 Exide Power Systems Div., ESB Inc., Philadelphia, Pa. (No proprietary alloys at present.)
M-1385 Tungsten & Molybdenum Ltd., Nyon, Switzerland.
M-1386 Neubrandenburg Eisenwerk G.m.b.H., Berlin, Germany
M-1387 Wells Mfg. Co., Skokie, Ill
M-1388 Welded Carbide Tool Company, Clifton, N.J.
M-1389 Bridgeport Brass Co., Riverside, Cal., (see Bridgeport Brass M-141.)
M-1390 Quint-Alloy Corporation, Dearborn, Mich.
M-1391 Henning Bros. & Smith, Inc., Brooklyn, N.Y.
M-1392 Columbia Bronze Corporation, Freeport, N.Y.
M-1393 Colonial Metals Company, Columbia, Pa.
M-1394 Brevets Berthelmy, La Société des, Paris, France
M-1395 Brooks & Perkins, Inc., Detroit, Mich.
M-1396 Le Vita Metal Alloy Company, Detroit, Mich.
M-1397 Istitutc Sperimentale Metalli Leggeri, Milano, Italy.
M-1398 Tin Research Institute, Greenford, England.
M-1399 Dirilyte Co. of America, Kokomo, Ind.
M-1400 Thomson Industries, Inc, Manhasset, N Y.
M-1401 North American Philips Co, Inc, New York, N.Y
M-1402 Nippert Co., The, Delaware, Ohio.
M-1403 Pioneer Aluminum, Inc., Los Angeles 45, Calif.
M-1404 Guertler, G.m b.H., William, Berlin, Germany.
M-1405 Cook & Co., Ltd., George H., Sheffield, England.
M-1406 Beardshaw & Son Ltd., J., Sheffield, England
M-1407 Barworth Steel Works Ltd., Sheffield, England.
M-1408 Leadbeater & Scott Ltd., Sheffield, England
M-1409 Flockton, Tompkin & Co., Ltd., Sheffield, England.
M-1410 Carr & Co, Ltd., Richard W, Sheffield 6, England
M-1411 Hall & Pickles Ltd., Sheffield, England.
M-1412 Taylor & Co., Ltd., Robert, Labert, Scotland.
M-1413 Dunford & Elliott Ltd., Sheffield, England.
M-1414 English Steel Rolling Mills Corp., Ltd., (Now part of British Steel Corp M-1724)
M-1415 Burys & Co. Ltd., Sheffield, England.
M-1416 Clyde Werks, Samuel Osborn Ltd., Sheffield, England.
M-1417 Thomas and Baldwins, Ltd., Richard, Sheffield, (Now part of British Steel Corp. M-1724.)
M-1418 Vimetal SA, Berne, Switzerland.
M-1419 Japan Special Steel Co., Tokyo, Japan.
M-1420 Oederlin & Co., Ltd., Baden, Switzerland.
M-1421 Voelklingen, Forges et Aciéries de, Voelklingen (Sarre), France.
M-1422 Ludlow Steel Corp., Bedford, Ohio.
M-1423 Jamison Steel Corp., San Francisco, Calif.
M-1424 DoAll Company, Des Plaines, Ill.
M-1425 Erie Steel Co., Erie, Pa.
M-1426 Waterbury Rolling Mills, Inc., Waterbury, Conn.
M-1427 Dixon Sintaloy, Inc., Stamford, Conn.
M-1428 Sheffield Steel Div. Armco Steel Corp., Houston, Texas.
M-1429 Bedford Tool & Forge Co., Bedford, Ohio.
M-1430 Venture Corp., Newark, N.J.
M-1431 Gulf Steel Corp., Chicago, Ill.
M-1432 Pyramid Steel Co., Cleveland, Ohio.
M-1433 Pennsylvania Steel Corp., Detroit, Mich.
M-1434 Bowsteel Distributers Corp., Linden, N.J. (No proprietary alloys at present.)
M-1435 Gebrüder Bochlet, Kapfenberg, Steiermark, Austria.
M-1436 Meridian Steel Co., Inc., Jerico, N.Y.
M-1437 Coulter Steel & Forge Co., Emeryville, Calif.
M-1438 Allied Steel & Chemical Co., New York, N.Y.
M-1439 Standard Pressed Steel Co., Jenkintown, Pa.
M-1440 American Meter Co., Reliance Foundry, Pittsburgh, Pa.
M-1441 Medart Engineering and Equipment Co., St. Louis, Mo
M-1442 Taylor-Wilson Mfg. Co., Pittsburgh, Pa.
M-1443 Luria Steel & Trading Corp., New York, N Y.
M-1444 Kaye Ltd., E. & E., Enfield, England.
M-1445 Montecatini-Settore Alluminio, Milano, Italy.
M-1446 National Tool Co., Div National Cleveland Corp., Cleveland, Ohio.
M-1447 Vikmanshyttan A. G., Vikmanshyttan, Sweden.
M-1448 Nyby Bruks Aktiebolag, Nyby Bruk, Sweden.
M-1449 Breda Co, Rome, Italy.
M-1450 Cogne Co, Rome, Italy.
M-1451 Bresciana, Metallurgica, Rome, Italy.
M-1452 Ilssa Viola Co, Rome, Italy
M-1453 Schenk Leichtgusswerke, Maulbronn, Germany.
M-1454 Nusite Steel Process Co, Warsaw, Ind.
M-1455 Berted Foundry Co., Columbiana, Ohio
M-1456 American Art Alloys, Inc., Kokomo, Ind.
M-1457 Lovstad & Co, Inc., C. M., Seattle, Wash.
M-1458 Navan, Inc, El Secundo, Cal
M-1459 Lesjofors Aktiebolag, Lesjofors, Sweden.
M-1460 Thomas Foundries, Inc., Birmingham, Ala.
M-1461 Madison Foundry Co., Cleveland, Ohio.
M-1462 Advance Aluminum Castings Corp, Chicago, Ill.
M-1463 National Air-Oil Burner Co., Philadelphia, Pa
M-1464 Fairmount Foundry, Inc., Philadelphia, Pa.
M-1465 RCA Industrial Electronics Products Div., Camden, N.J.
M-1466 Lobdell Co., Wilmington, Del.
M-1467 Burdette Oxygen Co, Cleveland, Ohio.
M-1468 Anchor Alloys, Inc., Brooklyn, N.Y.
M-1469 Sintercast Div of Chromalloy American Corp., West Nyack, N.Y.
M-1470 Athenia Steel Division, National Standard Co., Clifton, N.J.
M-1471 Hard Alloys Ltd., High Wycombe, Bucks., England.
M-1472 Zenith Foundry Co., West Allis, Wis.
M-1473 Xaloy, Inc., New Brunswick, N.J (Was Industrial Research Labs).
M-1474 Atlas Brass Foundry, Los Angeles, Calif.
M-1475 R-S Products Corp., Philadelphia, Pa.
M-1476 Milwaukee Die Casting Co., Milwaukee, Wis.
M-1477 Gillett & Eaton, Inc., Lake City, Minn.
M-1478 General Malleable Corp., Waukesha, Wis.
M-1479 Little Bros. Foundry Co., Port Huron, Mich.
M-1480 Lakeside Malleable Castings Co., Racine, Wis.

M-1481	Light Alloys Products Co., Ltd., Munworth, England.
M-1482	Induction Steel Casting Co., East Detroit, Mich.
M-1483	American Brazing Alloy Co., Pelham, N.Y.
M-1484	Washington Steel Co., Washington, Pa.
M-1485	Sheepbridge Alloy Castings, Ltd., Sutton-in-Ashfield, Notts., England.
M-1486	St. Jacques, Société des Usines, Montlucon, France.
M-1487	Aciéries du Forez, St. Etienne (Loire), France.
M-1488	Creusot, Société des Forges et Ateliers du, Paris, France.
M-1489	Dewrance & Co., Ltd., London, England and Glasgow, Scotland.
M-1490	Allvac Metals Co., A Teledyne Co., Monroe, N.C.
M-1491	Cannon-Muskegon Co. Same as M-347.
M-1492	Chromalloy American Corp., West Nyack, N.Y.
M-1493	Western Gold & Platinum Works, Belmont, Calif.
M-1494	Saut-du-Tarn, Sté Ame des Forges et Aciéries du, Paris, France.
M-1495	Lorraine Escault, Paris, France.
M-1496	Marathon Specialty Steels, Inc., New York, N.Y.
M-1497	Ronson Metals Corp., Newark, N.J.
M-1498	Wesson Co, Ferndale, Mich.
M-1499	Huntington Alloy Products Div., The International Nickel Co., Huntington, W. Va.
M-1500	Van der Horst Corp., Terrell, Texas.
M-1501	Rolle Mfg Co, Lansdale, Pa.
M-1502	Curtiss-Wright Corp, Quehanna, Pa
M-1503	Wyman-Gordon Co., Worcester, Mass (No proprietary alloys at present)
M-1504	Manganese Chemicals Corp., Minneapolis, Minn
M-1505	Hydrometals, Inc, New York, N Y.
M-1506	Corning Glass Co., Corning, N.Y
M-1507	National Standard Co., Niles, Mich.
M-1508	American Metal Climax, Inc., New York, N Y (AMAX)
M-1509	Monir A, Pitres (Eure), Usines du, Paris, France.
M-1510	Baldwin Steel Co., Cleveland, Ohio.
M-1511	Mathieson-Hegler Co, LaSalle, Ill.
M-1512	Waimet Alloys Co, Dearborn, Mich
M-1513	General Thermoelectric Corp, Princeton, N.J
M-1514	Hamilton Die Casting, Inc., Hamilton, Ohio.
M-1515	Sumitoms Trading Co., Osaka, Japan
M-1516	Scaife Company, Oakmont, Pa.
M-1517	Kulite Tungsten Co, Ridgefield, N.J.
M-1518	Knowsley Cast Metals Co, Ltd., Titan Works, Manchester, England.
M-1519	Morgan Crucible Co., Ltd., London, England.
M-1520	General Communications Co., Boston, Mass.
M-1521	Wolverine Tube Div., Calumet & Hecla-Universal Oil Products, Allen Park, Mich.
M-1522	Sheffield Smelting Co., Ltd., Sheffield, England.
M-1523	Molecu Wire Co., Farmington, N.J.
M-1524	Secon Metals Corp., White Plains, N.Y.
M-1525	Rex Buckeye Co., Cleveland, Ohio.
M-1526	Holganaes Metal Powders, Ltd., Birmingham, England.
M-1527	Ladish Company, Cudahy, Wis.
M-1528	Stauffer Metals Div., Stauffer Chemical Co., New York, N.Y.
M-1529	Colorado Fuel and Iron Co., Denver, Colo.
M-1530	Canadian Quebec Metallurgical Corp., Quebec, Canada.
M-1531	Muskegon Piston Ring Co., Muskegon, Mich.
M-1532	Oregon Metallurgical Corp., Albany, Ore.
M-1533	Union Minière du Haut-Katanga, Central Workshop, Jadotville, Katanga, Congo.
M-1534	U.S. Magnet & Alloy Corp., Bloomfield, N.J.
M-1535	Badali Company, Hammond, Ind.
M-1536	Martin Metals Div., Martin-Marietta Corp., Wheeling, Ill (Was Sierra Metals Corp.)
M-1537	Wah Chang Corp., New York, N Y. and Albany, Ore (See also M-1596.)
M-1538	Fugi Iron and Steel Co., Ltd, Chou-Ku, Tokyo, Japan.
M-1539	Japan Steel Works, Ltd., Tokyo, Japan.
M-1540	Yawata Iron & Steel Co, Ltd., Tokyo, Japan.
M-1541	Kawasaki Iron & Steel Co, Ltd., Fukiaiku, Japan and Tokyo, Japan.
M-1542	Japan Steel Tube Co., Ltd., Tokyo, Japan.
M-1543	Mitsubishi Steel Co, Ltd, Tokyo, Japan.
M-1544	Toto Steel Co, Ltd., Tokyo, Japan.
M-1545	Daido Steel Co., Ltd, Nakamura-Ku, Nagoya, Japan.
M-1546	Loire, Compagnie des Ateliers et Forges de la, Paris, France.
M-1547	Imperial Aluminum Co., Ltd., Birmingham, England.
M-1548	Aluminium Zentral, G.m b.H, Berlin, Germany.
M-1549	Philips Co., N.V. Eindhover, Netherlands.
M-1550	American Potash and Chemical Co., New York, N Y.
M-1551	Birmingham Battery and Metal Co., Ltd, Birmingham, England.
M-1552	Metro-Cutanit, Ltd., Grappenhall, England
M-1553	Haywood Foundries, Ltd, London, England.
M-1554	Heckford, Ltd., Arthur E. Birmingham, England
M-1555	Jones & Rooke, Ltd., Birmingham, England.
M-1556	Meigh Castings, Ltd., Cheltenham, England
M-1557	Capper Pass & Son, Ltd, Bristol, England
M-1558	Reynolds Tube Co., Ltd., T.I, Birmingham, England. (No proprietary alloys at present)
M-1559	Metal Alloys, Ltd, Pontypride, Glam, South Wales
M-1560	Yorkshire Imperial Metal, Ltd, Leeds, England.
M-1561	Scientific Products, Inc., State Park, Pa.
M-1562	Metals and Controls, Inc., Attleboro, Mass.
M-1563	DuPont de Nemours & Co, Inc., E I, Pigment Dept., Wilmington, Del (No proprietary alloys at present).
M-1564	American Carbide Corp., Union City, N.J.
M-1565	Wabash Smelting Co, Inc., Wabash, Ind.
M-1566	Olin Mathieson Chemical Corp., Metals Div., New York, N.Y.
M-1567	Polymer Corp., Ltd., Sarnia, Ontario, Canada
M-1568	Powder Alloys Corp., Clifton, N.J
M-1569	Clyde Alloy Steel Co., Ltd., Motherwell, England (Now part of British Steel Corp. M-1724.)
M-1570	Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan.
M-1571	Vitra Chemical Co., Chattanooga, Tenn.
M-1572	Bristol Brass Co., Bridgeport, Conn.
M-1573	Sherritt Gordon Mines, Ltd., Toronto, Canada.
M-1574	Hanna Furnace Co., Cleveland, Ohio.
M-1575	Scandinavian Metal Co., Sweden.
M-1576	Glyco-Metallwerke Daelen & Loos, G.m.b.H., Germany.

M-1577	Japan Metal Industry Co., Ltd., Kawasaki, Japan.
M-1578	Imperial Metal Industries, Knock Works, Birmingham, England.
M-1579	Bridgeport Rolling Mills Co., Bridgeport, Conn.
M-1580	Deloro Stellite, Ltd., Margaret, Swindon, England.
M-1581	Magotteaux, Les Fonderies, Vaux-sous-Chevrement, (Liege), Belgium.
M-1582	Rochette, Laminoire de la, Chaudfontaine, Belgium.
M-1583	Koerver & Nehring, G.m.b.H, Krefeld, Germany.
M-1584	Willan Ltd., G. L., Sheffield, England.
M-1585	Industria Magenti Fermanenti E. Affini (Impia) Milano, Italy.
M-1586	Leghe E. Accini Speciali (LEAS) Milano, Italy
M-1587	Garondelet Foundry Co, St Louis, Mo.
M-1588	Jodots Freres, Ets, Boloeil, Belgium
M-1589	Fujikoshi Steel Industry Co, Ltd, Tokyo, Japan.
M-1590	Kensington Steel Co, Chicago, Ill.
M-1591	Sankey & Sons, Ltd., London, England
M-1592	McClouth Steel Corp, Detroit, Mich
M-1593	Erie Forge and Steel Co, Erie, Pa
M-1594	Phoenix Steel Corp, Claymont, Del.
M-1595	American Silver Co., Flushing, N Y. (see also M-771.)
M-1596	Wah Chang, A Teledyne Co., Albany, Ore (see also M-1537)
M-1597	Urich Foundry Co, Erie, Pa
M-1598	International Wire Products Corp, Midland, N.J
M-1599	Perfect Circle Co, Hagerstown, Md.
M-1600	Certanium Alloys & Research Co
M-1601	King Materials Laboratory, Victor, Palo Alto, Cal (see also M-1641.)
M-1602	Standard Steel Div, Baldwin-Lima-Hamilton Corp., Burnham, Penn.
M-1603	Oregon Steel Mills, Portland, Ore
M-1604	Kobe Steel Works Ltd., Kobe, Japan.
M-1605	Swiss Aluminum Ltd., Neuhausen, Rhf, Switzerland
M-1606	Inland Electronics Products Corp, Pasadena, Cal.
M-1607	Midwest Materials Co, Cleveland, Ohio.
M-1608	Noranda Copper Mills, Ltd., Montreal, Canada.
M-1609	Carborundum Metals Climax, Inc, Akron, Ohio.
M-1610	Union Steel Corp., Union, N J.
M-1611	Adalet Mfg., Cleveland, Ohio
M-1612	Nippon Kokan Kaisha, Ltd, Tokyo, Japan.
M-1613	Wisconsin Steel Div, International Harvester Co, Chicago, Ill.
M-1614	Tokyo Keikiseizosho, Ltd., Tokyo, Japan
M-1615	Perfection Mica Co, Chicago, Ill.
M-1616	D-M-E Corp, Detroit, Mich.
M-1617	Thompson Wire Co., Chicago, Ill.
M-1618	U N.A Corp, Youngstown, Ohio, and Boston, Mass
M-1619	Precision Cast Parts Corp., Portland, Ore.
M-1620	Johnston Steel & Wire Co., Worcester, Mass
M-1621	Isaacson Iron Works.
M-1622	Kawecki Chemical Co., Boyertown, Pa (see also M-646)
M-1623	Pfizer & Co., Inc., Charles, Easton, Pa and Wallingford, Conn.
M-1624	National Research Corp, Metals Div., Newton, Mass.
M-1625	Alcan Aluminum Corp., Div. Aluminum Ltd., Newton, Mass.
M-1626	Magnetics, Inc., Butler, Pa.
M-1627	Materials Research Corp., Orangeburg, N.Y.
M-1628	Quaker Alloy Casting Co., Myerstown, Pa.
M-1629	Nuclear Metals Div., Textron, Inc., W. Concord, Mass.
M-1630	Vacuum Metals Corp., Cambridge, Mass
M-1631	Vakuumschmelze A. G., Hanau, Main, Germany
M-1632	Sydney Steel Corp., Sydney, Nova Scotia, Canada. (No proprietary alloys at present.)
M-1633	Renewal Services, Inc, Philadelphia, Pa
M-1634	Aluminium Industrie, A. G., Chippis, Switzerland.
M-1635	Green River Steel Corp, Gwensboro, Ky.
M-1636	Atles Alloys Div., Rio Algom Corp., Cleveland, Ohio.
M-1637	Associated Electrical Industries, Ltd, Manchester, England.
M-1638	American Alloys Corp, Kansas City, Mo.
M-1639	American Light Alloys Co., Little Falls, N.J.
M-1640	Blackstone Corp, Jamestown, N Y.
M-1641	King Laboratory Co, Victor, Los Altos, Cal (see also M-1601)
M-1642	Electronic Specialties Co, H. & S. Metals Co, Pomona, Cal
M-1643	Jamestown Malleable Iron Div., Blackstone Corp, Jamestown, N Y
M-1644	SERMAG, Brussels, Belgium.
M-1645	Acieries & Forges d'Anov, Paris, France.
M-1646	Sambra & Meuse, Aciéries de, France.
M-1647	Tokoshu Seiko, Ltd, Tokyo, Japan
M-1648	Pont-St-Martin, Officine Metallurgiche d', France
M-1649	Bonpertuis, Forges & Aciéries, France
M-1650	Klockner Werke A G, Germany.
M-1651	Nippon Stainless Steel Co, Ltd., Tokyo, Japan.
M-1652	Hagener Gusstahlwerl Remy G m b H, Germany.
M-1653	Valbruna di Ernesto Gresele, Acciaierie, Vicenza, Italy
M-1654	Capito & Klein Co
M-1655	Ossenberg & Cie, W, Edelstahlwerke, Germany
M-1656	St Joseph Lead Co, Monaca, Pa
M-1657	Copper Range Co., New York, N.Y.
M-1658	Phoenix-Rheinrohr A G, Germany
M-1659	Fisher A G, Georg, Germany
M-1660	Sulzer Bros
M-1661	International Lead-Zinc Research Assoc, Inc, New York, N Y
M-1662	Arwood Corp, Rockleigh Industrial Park, Rockleigh, N J
M-1663	Rodney Metals Inc, New Bedford, Mass
M-1664	Transformer Steels, Ltd
M-1665	Whittaker Corp, Nuclear Metals Div., West Concord, Mass
M-1666	VR/Wesson Co, Waukegan, Ill (Same as M-329.)
M-1667	Toshiba Tungaloy Ltd, Tokyo, Japan
M-1668	Valenite Metals Div, Valeron Corp, Madison Heights, Mich.
M-1669	SERMAG, Belgium. (see M-1644)
M-1670	Solar Div, International Harvester Co., San Diego, Cal
M-1671	Markey Bronze Bushing Co., Delta, Ohio
M-1672	Ryanite Tips, Inc., St. Paul, Minn.
M-1673	Ajax Steel and Forge Co.
M-1674	Bolton-Emerson, Inc, Lawrence, Mass.
M-1675	Stone Manganese Marine, Ltd., London, England.
M-1676	Connecticut Metals Corp., Hamden, Conn.
M-1677	Triangle Conduit & Cable Co., Copper Rod and Brass Products Div., New Brunswick, N.J.

M-1678	Boller Development Corp., Marion, Ind.
M-1679	Cominco, Trail, B. C., Canada.
M-1680	Macauley Foundry Co., H. C., Berkeley, Cal.
M-1681	Cleveland Refractory Metals Div., Chase Brass and Copper Co., Solon, Ohio.
M-1682	Albright & Wilson Ltd., London, England.
M-1683	Champion Steel Co., Willowick, Ohio.
M-1684	St. Lawrence Steel Co., Cleveland, Ohio.
M-1685	Mitsubishi Metal Products of Japan, Tokyo, Japan.
M-1686	Usines Vallouric S. A., Paris, France.
M-1687	Le Bronze Industrial, France.
M-1688	National Alloy Tool Steel Co., Cleveland, Ohio.
M-1689	Industrial Alloy Steel Co., Cleveland, Ohio.
M-1690	Electro Hercules Steel Co., Cleveland, Ohio.
M-1691	Mansfield Brass and Aluminum Corp., Mansfield, Ohio.
M-1692	Wallram Hartmetall G.m.b.H., Essen, Germany
M-1693	Niborium Industries Inc., Providence, R.I.
M-1694	Bendix Steel Co., Cleveland, Ohio.
M-1695	Carbide, Div. of Aiken Industries, McKeesport, Pa.
M-1696	Carmet Co., Pittsburgh, Pa.
M-1697	Wendt-Sonis, United Greenfield Div. TRW Inc., Rogers, Ark.
M-1698	Remington Arms Inc., Hi-Dense Alloys Div., Ilion, N.Y
M-1699	Firth-Loach Products, Div. of Howmet Corp., McKeesport, Pa
M-1700	Glader Co., K. C., Niles, Ill.
M-1701	Kasle Steel Corp., Detroit, Mich
M-1702	Koncor Industries, Div. of Latrobe Steel Co., Wauseon, Ohio
M-1703	Precision-Kidd, Inc., West Aliquippa, Pa.
M-1704	Specialty Steel Co., of America, Warrensville Heights, Ohio
M-1705	Time Steel Service, Inc., Cleveland, Ohio.
M-1706	Unimet Carbides, United Greenfield Div., TRW Inc., Chicago, Ill.
M-1707	Walmet Corp, The, Pleasant Ridge (or Royal Oak), Mich.
M-1708	AMAX Metal Powders, Div. United States Refining Co., Niagara Falls, N.Y. (see also M-558.)
M-1709	Centrifugal Products, Inc., Long Beach, Cal.
M-1710	Easton Metal Powder Inc., Easton, Pa.
M-1711	Unibraze Corp., White Plains, N.Y.
M-1712	Elgiloy Co., Elgin, Ill.
M-1713	Chemetron Corp., Hanover, Pa (see also M-692, 1074).
M-1714	Steel Co. of Australia, The, PTY, Ltd., Melbourne, Vic., Australia
M-1715	Alcoa of Great Britain, Ltd., Droitwich, Worcestershire, England.
M-1716	A.O. Smith-Inland Inc., Powder Metallurgy Div., Milwaukee, Wis.
M-1717	Ferry-Capitain, Joinville, France.
M-1718	Heinr. Aug. Schulte Eisenhandlung, G.m.b.H., Dortmund, Germany.
M-1719	Olin Metals Research Labs., New Haven, Conn.
M-1720	New England Brass, Taunton, Mass.
M-1721	Masten Corp., Arlington Heights, Ill.
M-1722	Cobalt Information Center, Columbus, Ohio.
M-1723	Société Commentryenne des Aciers Fins Vanadium Alloys, Paris, France
M-1724	British Steels Corp., Special Metals Div., Sheffield, England.
M-1725	Balfour-Darwins Ltd., Sheffield, England
M-1726	Diamond Metal Alloys, Div. of G.W. Murphy Industries, Houston, Texas.
M-1727	Sitkin Smelting and Refining Co., Inc., Lewiston, Pa
M-1728	Glidden Co., The, Baltimore, Md.
M-1729	Semi-Alloys, Mount Vernon, N.Y
M-1730	Stahlwerk Westic G.m.b.H., Unna/Westf., Germany
M-1731	Emil Weingartner & Co., KG., 2 Hamberg-Stellingen, Germany.
M-1732	Nippon Steel Co., Japan

SECTION IV

This section contains a list of the alloys mentioned in the Fourth Edition of Engineering Alloys but which have been discontinued and not otherwise listed in this edition. For information concerning these alloys please refer to the Fourth Edition or to the supplier listed for the alloy.

No. 000	M-111
No. 2 B	M-260
4 Best (Frasse)	M-360
No 4 Vasco Finish	M-115
11A45	M-64
No. 11V	M-32
"202" Nickel	M-1499
"204" Nickel	M-1499
"330" Nickel	M-1499
No. 426 Alloy	M-31
No. 1015-65	M-669
No. 1020-90 Steel	M-397
Al-L-24	M-28
AA-1	M-586
Abrasocote 10	M-828
Accumet	M-38
Ace Oil Hardening	M-307
Acme Silcrome 12	M-568
Acme Silcrome CC	M-568
Acme Silcrome KA2	M-568
Acme Silcrome KA2S	M-568
Acme Silcrome L-12	M-568
Acme Silcrome M-17	M-568
Adams HFA	M-656
Adams HFB	M-656
Adalloy No 3	M-655
Admiralty Alloy-442	M-8
Admiralty Bronze	M-8
Adnic	M-102
Aegis	M-327
Aero-12-3	M-38
A.E. Supernickel	M-282
Afcoloy 13	M-159
Afcoloy 17H	M-159
Afcoloy 18-8 Cb	M-159
Afcoloy 18-8 L	M-159
Afcoloy 18-8 Mo	M-159
Afcoloy 18-8 Se	M-159
Afcoloy 18 8 Ti	M-159
Afcoloy 20	M-159
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Witten D2414	M-1326
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Witten NE1	M-1326
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Witten PW	M-1326
Witten PWH	M-1326
Witten S	M-1326
Witten SC67	M-1326
Witten SCR	M-1326
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Witten TL65	M-1326
Witten TL80	M-1326
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Z.T. Die Steel	M-73

ALUMINUM ASSOCIATION STANDARDS

Nominal Chemical Composition — Wrought Alloys

PERCENT OF ALLOYING ELEMENTS—Aluminum and Normal Impurities Constitute Remainder

Alloy	Silicon	Copper	Manganese	Magnesium	Chromium	Nickel	Zinc	Lead
EC			99.45 percent minimum aluminum					
1060			99.60 percent minimum aluminum					
1100		0.12	99.00 percent minimum aluminum					
1145			99.45 percent minimum aluminum					
1175			99.75 percent minimum aluminum					
1230			99.30 percent minimum aluminum					
1235			99.35 percent minimum aluminum					
2011		5.5						0.40
2014	0.8	4.4	0.8	0.50				
2017		4.0	0.7	0.50				
2018		4.0		0.7		2.0		
2024		4.4	0.6	1.5				
2025	0.8	4.5	0.8					
2117		2.6		0.35				
2218		4.0		1.5		2.0		
2219②		6.3	0.30					
2618③		2.3		1.6		1.0		
3003		0.12	1.2					
3004			1.2	1.0				
4032	12.2	0.9		1.1		0.9		
4043	5.2							
4045	10.0							
4343	7.5							
5005				0.8				
5050				1.4				
5052				2.5	0.25			
5056			0.12	5.1	0.12			
5083			0.6	4.45	0.15			
5086			0.45	4.0	0.15			
5154				3.5	0.25			
5252				2.5				
5254				3.5	0.25			
5356①			0.12	5.0	0.12			
5454			0.8	2.7	0.12			
5456			0.8	5.1	0 12			
5457			0.30	1.0				
5652				2.5	0.25			
5657				0.8				
6003	0.7			1.2				
6053	0.7			1.3	0.25			
6061	0.6	0.27		1.0	0.20			
6063	0.40			0.7				
6066	1.3	0.9	0.8	1.1				
6070	1.4	0.3	0.7	0.8				
6101	0.50			0.6				
6151	0.9			0.6	0.25			
6201	0.7			0.8				
6253				1.2	0.25		2.0	
6262	0.6	0.27		1.0	0.09			0.55
6463	0.40			0.7				
6951	0.30	0.25		0.6				
7001		2.1		3.0	0.30		7.4	
7039			0.27	2.8	0.20		4.0	
7072							1.0	
7075		1.6		2.5	0.30		5.6	
7079		0.6	0.20	3.3	0.20		4.3	
7178		2.0		2.7	0.30		6.8	

① Titanium 0.13 percent
② Titanium 0.06; Vanadium 0.10; Zirconium 0.18
③ Iron 1.1; Titanium 0.07

Typical Properties

The following typical mechanical and physical properties are averages which take into account the variations introduced by type of wrought product, size, shape and method of manufacture. Typical mechanical properties for all except 0 temper materia higher than specified minimum properties. F temper products typical ultimate and yield v are slightly lower than specified (maximum) va

Typical Mechanical Properties①

ALLOY AND TEMPER	TENSION				HARDNESS	SHEAR	FATIGUE	MODUL
	STRENGTH ksi (kg/mm^2)		ELONGATION percent in 2 in.		BRINELL NUMBER	ULTIMATE SHEARING STRENGTH	ENDURANCE③ LIMIT	MODUI OI ELASTI
	ULTIMATE	YIELD	1/16 Inch Thick Specimen	1/2 Inch Diameter Specimen	500 kg load 10 mm ball	ksi (kg/mm^2)	ksi (kg/mm^2)	ksi (kg/ x 1
EC-0④	12 (8.4)	4 (2.8)		⑥		8 (5.6)		10.0
EC-H12④	14 (9.8)	12 (8.4)				9 (6.3)		10.0
EC-H14④	16 (11.2)	14 (9.8)				10 (7.0)		10.0
EC-H16④	18 (12.7)	16 (11 2)				11 (7.7)		10.0
EC-H19④	27 (19.0)	24 (16.9)		⑥		15 (10.5)	7 (4.9)	10.0
1060-0	10 (7.0)	4 (2.8)	43		19	7 (4.9)	3 (2.1)	10.0
1060-H12	12 (8.4)	11 (7.7)	16		23	8 (5.6)	4 (2.8)	10.0
1060-H14	14 (9.8)	13 (9.1)	12		26	9 (6.3)	5 (3.5)	10.0
1060-H16	16 (11.2)	15 (10.5)	8		30	10 (7.0)	6.5 (4.6)	10.0
1060-H18	19 (13.4)	18 (12.7)	6		35	11 (7.7)	6.5 (4.6)	10.0
1100-0	13 (9.1)	5 (3.5)	35	45	23	9 (6.3)	5 (3.5)	10.0
1100-H12	16 (11.2)	15 (10.5)	12	25	28	10 (7.0)	6 (4.2)	10.0
1100-H14	18 (12.7)	17 (12.0)	9	20	32	11 (7.7)	7 (4.9)	10.0
1100-H16	21 (14.8)	20 (14.1)	6	17	38	12 (8.4)	9 (6.3)	10.0
1100-H18	24 (16.9)	22 (15.5)	5	15	44	13 (9.1)	9 (6.3)	10.0
2011-T3	55 (38.7)⑦	43 (30.2)⑦		15	95	32 (22.5)	18 (12.7)	10.2
2011-T8	59 (41.5)	45 (31.6)		12	100	35 (24.6)	18 (12.7)	10.2
2014-0	27 (19.0)	14 (9.8)		18	45	18 (12.7)	13 (9.1)	10.6
2014-T4, -T451	62 (43.6)	42 (29.5)		20	105	38 (26.7)	20 (14.1)	10.6
2014-T6, -T651	70 (49.2)⑧	60 (42.2)⑧		13	135	42 (29.5)	18 (12.7)	10.6
Alclad 2014-0	25 (17.6)	10 (7.0)	21			18 (12.7)		10.5
Alclad 2014-T3	63 (44.3)⑨	40 (28.1)⑨	20			37 (26.0)		10.5
Alclad 2014-T4, -T451	61 (42.9)⑨	37 (26.0)⑨	22			37 (26.0)		10.5
Alclad 2014-T6, -T651	68 (47.8)⑨	60 (42.2)⑨	10			41 (28.8)		10.5
2017-0	26 (18.3)	10 (7.0)		22	45	18 (12.7)	13 (9.1)	10.5
2017-T4, -T451	62 (43.6)	40 (28.1)		22	105	38 (26.7)	18 (12.7)	10.5
2018-T61	61 (42.9)	46 (32.3)		12	120	39 (27.4)	17 (12 0)	10.8
2024-0	27 (19.0)	11 (7.7)	20	22	47	18 (12.7)	13 (9.1)	10.6
2024-T3	70 (49.2)	50 (35.2)	18		120	41 (28.8)	20 (14.1)	10.6
2024-T4, -T351	68 (47.8)	47 (33.0)⑧	20	19	120	41 (28.8)	20 (14 1)	10.6
2024–T361 ⑫	72 (50.6)	57 (40.1)	13		130	42 (29.5)	18 (12.7)	10.6
Alclad 2024-0	26 (18.3)	11 (7.7)	20			18 (12.7)		10.6
Alclad 2024-T3	65 (45.7)⑩	45 (31.6)⑩	18			40 (28.1)		10.6
Alclad 2024-T4, -T351	64 (45.0)⑩	42 (29.5)⑩	19			40 (28.1)		10.6
Alclad 2024-T361 ⑫	67 (47.1)⑩	53 (37.3)⑩	11			41 (28.8)		10.6
Alclad 2024-T81, -T851	65 (45.7)⑩	60 (42.2)⑩	6			40 (28.1)		10.6
Alclad 2024-T861⑬	70 (49.2)⑩	66 (46.4)⑩	6			42 (29.5)		10.6
2025-T6	58 (40.8)	37 (26.0)		19	110	35 (24.6)	18 (12 7)	10.4
2117-T4	43 (30.2)	24 (16.9)		27	70	28 (19.7)	14 (9.8)	10.3
2218-T72	48 (33.7)	37 (26.0)		11	95	30 (21.1)		10.8
2219-0⑪	25 (17.6)	11 (7.7)	18					10.6
2219-T42⑪	52 (36.6)	27 (19.0)	20					10.6
2219-T31, -T351⑪	52 (36.6)	36 (25.3)	17					10.6
2219-T37⑪	57 (40.1)	46 (32.3)	11					10.6
2219-T62⑪	60 (42.2)	42 (29.5)	10				15 (10.5)	10.6
2219-T81, -T851⑪	66 (46.4)	51 (35.9)	10				15 (10.5)	10.6
2219-T87⑪	69 (48.5)	57 (40.1)	10				15 (10.5)	10.6

For all numbered footnotes, see page 1378

Typical Mechanical Properties (continued)①

ALLOY AND TEMPER	TENSION				HARDNESS	SHEAR	FATIGUE	MODULU
	STRENGTH ksi (kg/mm^2)		ELONGATION percent in 2 in.		BRINELL NUMBER 500 kg load 10 mm ball	ULTIMATE SHEARING STRENGTH ksi (kg/mm^2)	ENDUR-ANCE② LIMIT ksi (kg/mm^2)	MODULUS OF ELASTICI ksi (kg/mn x 10^3
	ULTIMATE	YIELD	1/16 Inch Thick Specimen	1/2 Inch Diameter Specimen				
3003-0	16 (11.2)	6 (4.2)	30	40	28	11 (7.7)	7 (4.9)	10.0 (7.
3003-H12	19 (13.4)	18 (12.7)	10	20	35	12 (8.4)	8 (5.6)	10.0 (7.
3003-H14	22 (15.5)	21 (14.8)	8	16	40	14 (9.8)	9 (6.3)	10.0 (7.
3003-H16	26 (18.3)	25 (17.6)	5	14	47	15 (10.5)	10 (7.0)	10.0 (7.
3003-H18	29 (20.4)	27 (19.0)	4	10	55	16 (11.2)	10 (7.0)	10.0 (7.
Alclad 3003-0	16 (11.2)	6 (4.2)	30	40		11 (7.7)		10.0 (7.
Alclad 3003-H12	19 (13.4)	18 (12.7)	10	20		12 (8.4)		10.0 (7.
Alclad 3003-H14	22 (15.5)	21 (14.8)	8	16		14 (9.8)		10.0 (7.
Alclad 3003-H16	26 (18.3)	25 (17.6)	5	14		15 (10.5)		10.0 (7.
Alclad 3003-H18	29 (20.4)	27 (19.0)	4	10		16 (11.2)		10.0 (7.
3004-0	26 (18.3)	10 (7.0)	20	25	45	16 (11.2)	14 (9.8)	10.0 (7.0
3004-H32	31 (21.8)	25 (17.6)	10	17	52	17 (12.0)	15 (10.5)	10.0 (7.0
3004-H34	35 (24.6)	29 (20.4)	9	12	63	18 (12.7)	15 (10.5)	10.0 (7.0
3004-H36	38 (26.7)	33 (23.2)	5	9	70	20 (14.1)	16 (11.2)	10.0 (7.0
3004-H38	41 (28.8)	36 (25.3)	5	6	77	21 (14.8)	16 (11.2)	10.0 (7.0
Alclad 3004-0	26 (18.3)	10 (7.0)	20	25		16 (11.2)		10.0 (7.0
Alclad 3004-H32	31 (21.8)	25 (17.6)	10	17		17 (12.0)		10.0 (7.0
Alclad 3004-H34	35 (24.6)	29 (20.4)	9	12		18 (12.7)		10.0 (7.0
Alclad 3004-H36	38 (26.7)	33 (23.2)	5	9		20 (14.1)		10.0 (7.0
Alclad 3004-H38	41 (28.8)	36 (25.3)	5	6		21 (14.8)		10.0 (7.0
4032-T6	55 (38.7)	46 (32.3)		9	120	38 (26.7)	16 (11.2)	11.4 (8.0
5005-0	18 (12.7)	6 (4.2)	25		28	11 (7.7)		10.0 (7.0
5005-H12	20 (14.1)	19 (13.4)	10			14 (9.8)		10.0 (7.0
5005-H14	23 (16.2)	22 (15.5)	6			14 (9.8)		10.0 (7.0
5005-H16	26 (18.3)	25 (17.6)	5			15 (10.5)		10.0 (7.0
5005-H18	29 (20.4)	28 (19.7)	4			16 (11.2)		10.0 (7.0
5005-H32	20 (14.1)	17 (12.0)	11		36	14 (9.8)		10.0 (7.0)
5005-H34	23 (16.2)	20 (14.1)	8		41	14 (9.8)		10.0 (7.0)
5005-H36	26 (18.3)	24 (16.9)	6		46	15 (10.5)		10.0 (7.0)
5005-H38	29 (20.4)	27 (19.0)	5		51	16 (11.2)		10.0 (7.0)
5050-0	21 (14.8)	8 (5.6)	24		36	15 (10.5)	12 (8.4)	10.0 (7.0)
5050-H32	25 (17.6)	21 (14.8)	9		46	17 (12.0)	13 (9.1)	10.0 (7.0)
5050-H34	28 (19.7)	24 (16.9)	8		53	18 (12.7)	13 (9.1)	10.0 (7.0)
5050-H36	30 (21.1)	26 (18.3)	7		58	19 (13.4)	14 (9.8)	10.0 (7.0)
5050-H38	32 (22.5)	29 (20.4)	6		63	20 (14.1)	14 (9.8)	10.0 (7.0)
5052-0	28 (19.7)	13 (9.1)	25	30	47	18 (12.7)	16 (11.2)	10.2 (7.2)
5052-H32	33 (23.2)	28 (19.7)	12	18	60	20 (14.1)	17 (12.0)	10.2 (7.2)
5052-H34	38 (26.7)	31 (21.8)	10	14	68	21 (14.8)	18 (12.7)	10.2 (7.2)
5052-H36	40 (28.1)	35 (24.6)	8	10	73	23 (16.2)	19 (13.4)	10.2 (7.2)
5052-H38	42 (29.5)	37 (26.0)	7	8	77	24 (16.9)	20 (14.1)	10.2 (7.2)
5056-0	42 (29.5)	22 (15.5)		35	65	26 (18.3)	20 (14.1)	10.3 (7.2)
5056-H18	63 (44.3)	59 (41.5)		10	105	34 (23.9)	22 (15.5)	10.3 (7.2)
5056-H38	60 (42.2)	50 (35.2)		15	100	32 (22.5)	22 (15.5)	10.3 (7.2)
5083-0	42 (29.5)	21 (14.8)		22		25 (17.6)		10.3 (7.2)
5083-H321	46 (32.3)	33 (23.2)		16			23 (16.2)	10.3 (7.2)
5086-0	38 (26.7)	17 (12.0)	22			23 (16.2)		10.3 (7.2)
5086-H32	42 (29.5)	30 (21.1)	12					10.3 (7.2)
5086-H34	47 (33.0)	37 (26.0)	10			27 (19.0)		10.3 (7.2)
5086-H112	39 (27.4)	19 (13.4)	14					10.3 (7.2)
5154-0	35 (24.6)	17 (12.0)	27		58	22 (15.5)	17 (12.0)	10.2 (7.2)
5154-H32	39 (27.4)	30 (21.1)	15		67	22 (15.5)	18 (12.7)	10.2 (7.2)
5154-H34	42 (29.5)	33 (23.2)	13		73	24 (16.9)	19 (13.4)	10.2 (7.2)
5154-H36	45 (31.6)	36 (25.3)	12		78	26 (18.3)	20 (14.1)	10.2 (7.2)
5154-H38	48 (33.7)	39 (27.4)	10		80	28 (19.7)	21 (14.8)	10.2 (7.2)
5154-H112	35 (24.6)	17 (12.0)	25		63		17 (12.0)	10.2 (7.2)

all numbered footnotes, see page 1378

Typical Mechanical Properties (continued)①

ALLOY AND TEMPER	TENSION				HARDNESS	SHEAR	FATIGUE	MODULUS
	STRENGTH ksi (kg/mm²)		ELONGATION percent in 2 in.		BRINELL NUMBER	ULTIMATE SHEARING STRENGTH	ENDURANCE⑧ LIMIT	MODULUS⑧ OF ELASTICITY
	ULTIMATE	YIELD	1/16 Inch Thick Specimen	1/2 Inch Diameter Specimen	500 kg load 10 mm ball	ksi (kg/mm²)	ksi (kg/mm²)	ksi (kg/mm²) x 10³
5252-H25	34 (23.9)	25 (17.6)	11		68	21 (14.8)		10.0 (7.0)
5252-H38, -H28	41 (28.8)	35 (24.6)	5		75	23 (16.2)		10.0 (7.0)
5254-0	35 (24.6)	17 (12.0)	27		58	22 (15.5)	17 (12.0)	10.2 (7.2)
5254-H32	39 (27.4)	30 (21.1)	15		67	22 (15.5)	18 (12.7)	10.2 (7.2)
5254-H34	42 (29.5)	33 (23.2)	13		73	24 (16.9)	19 (13.4)	10.2 (7.2)
5254-H36	45 (31.6)	36 (25.3)	12		78	26 (18.3)	20 (14.1)	10.2 (7.2)
5254-H38	48 (33.7)	39 (27.4)	10		80	28 (19.7)	21 (14.8)	10.2 (7.2)
5254-H112	35 (24.6)	17 (12.0)	25		63		17 (12.0)	10.2 (7.2)
5454-0	36 (25.3)	17 (12.0)	22		62	23 (16.2)		10.2 (7.2)
5454-H32	40 (28.1)	30 (21.1)	10		73	24 (16.9)		10.2 (7.2)
5454-H34	44 (30.9)	35 (24.6)	10		81	26 (18.3)		10.2 (7.2)
5454-H111	38 (26.7)	26 (18.3)	14		70	23 (16.2)		10.2 (7.2)
5454-H112	36 (25.3)	18 (12.7)	18		62	23 (16.2)		10.2 (7.2)
5456-0	45 (31.6)	23 (16.2)		24				10.3 (7.2)
5456-H111	47 (33.0)	33 (23.2)		18				10.3 (7.2)
5456-H112	45 (31.6)	24 (16.9)		22				10.3 (7.2)
5456-H321	51 (35.9)	37 (26.0)		16	90	30 (21.1)		10.3 (7.2)
5457-0	19 (13.4)	7 (4.9)	22		32	12 (8.4)		10.0 (7.0)
5457-H25	26 (18.3)	23 (16.2)	12		48	16 (11.2)		10.0 (7.0)
5457-H38, -H28	30 (21.1)	27 (19.0)	6		55	18 (12.7)		10.0 (7.0)
5652-0	28 (19.7)	13 (9.1)	25	30	47	18 (12.7)	16 (11.2)	10.2 (7.2)
5652-H32	33 (23.2)	28 (19.7)	12	18	60	20 (14.1)	17 (12.0)	10.2 (7.2)
5652-H34	38 (26.7)	31 (21.8)	10	14	68	21 (14.8)	18 (12.7)	10.2 (7.2)
5652-H36	40 (28.1)	35 (24.6)	8	10	73	23 (16.2)	19 (13.4)	10.2 (7.2)
5652-H38	42 (29.5)	37 (26.0)	7	8	77	24 (16.9)	20 (14.1)	10.2 (7.2)
5657-H25	23 (16.2)	20 (14.1)	12		40	14 (9.8)		10.0 (7.0)
5657-H38, -H28	28 (19.7)	24 (16.9)	7		50	15 (10.5)		10.0 (7.0)
6061-0	18 (12.7)	8 (5.6)	25	30	30	12 (8.4)	9 (6.3)	10.0 (7.0)
6061-T4, -T451	35 (24.6)	21 (14.8)	22	25	65	24 (16.9)	14 (9.8)	10.0 (7.0)
6061-T6, -T651	45 (31.6)	40 (28.1)	12	17	95	30 (21.1)	14 (9.8)	10.0 (7.0)
Alclad 6061-0	17 (12.0)	7 (4.9)	25			11 (7.7)		10.0 (7.0)
Alclad 6061-T4, -T451	33 (23.2)	19 (13.4)	22			22 (15.5)		10.0 (7.0)
Alclad 6061-T6, -T651	42 (29.5)	37 (26.0)	12			27 (19.0)		10.0 (7.0)
6063-0	13 (9.1)	7 (4.9)			25	10 (7.0)	8 (5.6)	10.0 (7.0)
6063-T1‡	22 (15.5)	13 (9.1)	20		42	14 (9.8)	9 (6.3)	10.0 (7.0)
6063-T4	25 (17.6)	13 (9.1)	22					10.0 (7.0)
6063-T5	27 (19.0)	21 (14.8)	12		60	17 (12.0)	10 (7.0)	10.0 (7.0)
6063-T6	35 (24.6)	31 (21.8)	12		73	22 (15.5)	10 (7.0)	10.0 (7.0)
6063-T83	37 (26.0)	35 (24.6)	9		82	22 (15.5)		10.0 (7.0)
6063-T831	30 (21.1)	27 (19.0)	10		70	18 (12.7)		10.0 (7.0)
6063-T832	42 (29.5)	39 (27.4)	12		95	27 (19.0)		10.0 (7.0)
6066-0	22 (15.5)	12 (8.4)		18	43	14 (10.2)		10.0 (7.0)
6066-T4, -T451	52 (36.6)	30 (21.1)		18	90	29 (20.7)		10.0 (7.0)
6066-T6, -T651	57 (40.1)	52 (36.6)		12	120	34 (23.9)	16 (11.2)	10.0 (7.0)
6070-T6	55 (38.7)	51 (35.9)	10			34 (23.9)	14 (10.2)	10.0 (7.0)
6101-H111	14 (9.8)	11 (7.7)						10.0 (7.0)
6101-T6	32 (22.5)	28 (19.7)	15*		71	20 (14.1)		10.0 (7.0)
6262-T9	58 (40.8)	55 (38.7)		10	120	35 (24.6)	13 (9.1)	10.0 (7.0)
6463-T1‡	22 (15.5)	13 (9.1)	20		42	14 (9.8)	10 (7.0)	10.0 (7.0)
6463-T5	27 (19.0)	21 (14.8)	12		60	17 (12.0)	10 (7.0)	10.0 (7.0)
6463-T6	35 (24.6)	31 (21.8)	12		74	22 (15.5)	10 (7.0)	10.0 (7.0)

For all numbered footnotes, see page 1378

* Specimen ¼ inch thick.

‡ Formerly designated T42.

Typical Mechanical Properties (concluded)①

ALLOY AND TEMPER	TENSION				HARDNESS	SHEAR	FATIGUE	MODULUS
	STRENGTH ksi (kg/mm²)		ELONGATION percent in 2 in.		BRINELL NUMBER	ULTIMATE SHEARING STRENGTH	ENDURANCE② LIMIT	MODULUS③ OF ELASTICITY
	ULTIMATE	YIELD	1/16 Inch Thick Specimen	1/2 Inch Diameter Specimen	500 kg load 10 mm ball	ksi (kg/mm²)	ksi (kg/mm²)	ksi (kg/mm²) x 10³
7001-0	37 (26.0)	22 (15.5)		14	60			10.3 (7.2)
7001-T6, -T651	98 (68.9)	91 (64.0)		9	160		22 (15.8)	10.3 (7.2)
7039-T61, -T6151⑪	60 (42.2)	50 (35.2)	14		123			
7075-0	33 (23.2)	15 (10.5)	17	16	60	22 (15.5)		10.4 (7.3)
7075-T6, -T651	83 (58.4)†	73 (51.3)†	11	11	150	48 (33.7)	23 (16.2)	10.4 (7.3)
Alclad 7075-0	32 (22.5)	14 (9.8)	17			22 (15.5)		10.4 (7.3)
Alclad 7075-T6, -T651	76 (53.4)	67 (47.1)	11			46 (32.3)		10.4 (7.3)
7079-0	33 (23.2)	15 (10.5)	17	16				10.4 (7.3)
7079-T6, -T651	78 (54.8)	68 (47.8)		14	145	45 (31.6)	23 (16.2)	10.4 (7.3)
Alclad 7079-0	32 (22.5)	14 (9.8)	16					10.4 (7.3)
Alclad 7079-T6	71 (49.9)	62 (43.6)	10			42 (29.5)		10.4 (7.3)
7178-0	33 (23.2)	15 (10.5)	15	16				10.4 (7.3)
7178-T6, -T651	88 (61.9)†	78 (54.8)†	10	11				10.4 (7.3)
7178-T76, -T7651	83 (58.4)	73 (51.3)		11				10.3 (7.2)
Alclad 7178-0	32 (22.5)	14 (9.8)	16					10.4 (7.3)
Alclad 7178-T6, -T651	81 (56.9)	71 (49.9)	10					10.4 (7.3)

† Extruded products will have strengths approximately 10 percent higher than these values.

① *These typical properties are average for various forms, sizes and methods of manufacture, and may not exactly describe any one particular product.*

② Based on 500,000,000 cycles of completely reversed stress using the R. R. Moore type of machine and specimen.

③ Average of tension and compression moduli. Compression modulus is about 2% greater than tension modulus.

④ Electrical conductor grade, 99.45% minimum aluminum.

⑤ EC-O wire will have an elongation of approximately 23% in 10 inches.

⑥ EC-H19 wire will have an elongation of approximately 1½% in 10 inches.

⑦ Sizes greater than 1½ inches will have strengths slightly lower than these values.

⑧ Extruded products more than ¾ inch thick will have strengths 15 to 20% higher than these values

⑨ Sheet less than 0.040 inch thick will have strengths slightly lower than these values

⑩ Sheet more than 0.062 inch thick will have strengths slightly higher than these values.

⑪ Applicable to sheet and plate products only.

⑫ Tempers T361 and T861 were formerly designated T36 and T86, respectively.

Castings

Chemical Composition Limits for Sand and Permanent Mold Casting Alloys①②

AA Number	Former Designation	Product③	Silicon	Iron	Copper	Manganese	Magnesium	Chromium	Nickel	Zinc	Titanium	OT
												Each
208.0	108	S	2.5-3.5	1.2	3.5-4.5	0.50	0.10		0.35	1.0	0.25	
213.0	C113	S&P	1.0-3 0	1 2	6.0-8.0	0.6	0.10		0.35	2.5	0.25	
222.0	122	S&P	2.0	1.5	9.2-10.7	0.50	0 15-0.35		0.50	0.8	0.25	
242.0	142	S&P	0.7	1.0	3 5-4.5	0.35	1.2-1.8	0.25	1.7-2.3	0 35	0.25	0.05
295.0	195	S	0.7-1.5	1.0	4.0-5.0	0.35	0.03			0.35	0.25	0.05
B295.0	B195	P	2.0-3.0	1.2	4.0-5.0	0.35	0.05		0.35	0.50	0.25	
308.0	A108	S&P	5.0-6.0	1.0	4 0-5.0	0.50	0.10			1.0	0.25	
319.0	319, Allcast	S&P	5.5-6.5	1.0	3.0-4.0	0.50	0.10		0.35	1.0	0.25	
328.0	Red X-8	S	7.5-8.5	1.0	1.0-2.0	0.20-0.6	0.20-0.6	0 35	0.25	1.5	0.25	
A332.0	A132	P	11.0-13.0	1.2	0.50-1.5	0.35	0 7-1.3		2.0-3.0	0.35	0.25	0.05
F332.0	F132	P	8.5-10.5	1.2	2.0-4.0	0.50	0 50-1.5		0.50	1.0	0.25	
333.0	333	P	8 0-10.0	1.0	3.0-4.0	0.50	0.05-0.50		0.50	1.0	0 25	
355.0	355	S&P	4.5-5.5	0.6④	1.0-1.5	0.50④	0 40-0 6	0 25		0.30	0.25	0.05
C355.0	C355	S&P	4.5-5.5	0.20	1.0-1.5	0.10	0.40-0.6			0.10	0.20	0.05
356.0	356	S&P	6.5-7.5	0.6	0.25	0 35	0.20-0.40			0.35	0.25	0.05
A356.0	A356	S&P	6.5-7.5	0.20	0.20	0.10	0.20-0.40			0.10	0 20	0.05
357.0	357	S&P	6.5-7.5	0.15	0.05	0 03	0.45-0.6			0.05	0.20	0 05
B443.0	43 (0 15 max cu)	S&P	4.5-6.0	0.8	0.15	0.35	0 05			0.35	0.25	0.05
514.0	214	S	0.35	0.50	0 15	0.35	3.5-4.5			0.15	0.25	0.05
A514.0	A214	P	0.30	0.40	0.10	0.30	3.5-4.5			1.4-2 2	0.20	0.05
B514.0	B214	S	1.4-2 2	0.6	0 35	0 8	3 5-4.5	0.25		0.35	0 25	0.05
520.0	220	S	0.25	0.30	0.25	0.15	9 5-10.6			0.15	0.25	0 05
535.0	Almag 35	S	0.15	0.15	0.05	0.10-0 25	6 2-7.5				0.10-0.25	0.05(
705.0	603, Ternalloy 5	S&P	0.20	0.8	0 20	0.40-0 6	1 4-1.8	0.20-0 40		2 7-3.3	0.25	0.05
707.0	607, Ternalloy 7	S&P	0.20	0.8	0.20	0.40-0.6	1.8-2.4	0 20-0.40		4.0-4.5	0.25	0.05
A712.0	A612	S	0.15	0.50	0 35-0.65	0.05	0 6-0 8			6.0-7.0	0.25	0.05
D712.0	D612, 40E	S	0 30	0.50	0.25	0 10	0.50-0.65	0.40-0.6		5.0-6.5	0.15-0.25	0.05
713.0	613, Tenzaloy	S&P	0.25	1 1	0.40-1 0	0 6	0.20-0.50	0 35	0.15	7.0-8 0	0 25	0.10
771.0	Precedent 71A	S	0.15	0.15	0.10	0 10	0 8-1.0	0 06-0 20		6.5-7 5	0 10-0.20	0.05
850.0	750	S&P	0.7	0.7	0.7-1.3	0 10	0 10		0.7-1.3		0 20	
A850.0	A750	S&P	2.0-3.0	0.7	0 7-1.3	0 10	0.10		0 30-0.7		0.20	
B850.0	B750	S&P	0 40	0.7	1 7-2 3	0 10	0 6-0.9		0.9-1.5		0 20	

①The alloys listed are those which have been included in Federal Specifications QQ-A-596d, ALUMINUM ALLOYS PERMANENT AND SEMI-PERMANENT MOLD CASTINGS, QQ-A-601d, ALUMINUM ALLOY SAND CASTINGS, and Military Specification MIL-A-21180C, ALUMINUM ALLOY CASTINGS, HIGH STRENGTH. Other alloys are registered with The Aluminum Association and are available. Information on these should be requested from individual foundries or ingot suppliers.

②Analysis is regularly made only for the elements for which specific limits are shown If, however, the presence of other elements is suspected to be, or in the course of routine analysis is indicated to be, in excess of the specified limits, further analysis is made to determine that those other elements are not in excess of the amount Composition in percent maximum unless shown as a range, is the remainder.

③ S = Sand Cast P = Permanent Mold Cas

④If iron exceeds 0 45 percent, manganese content shall not than one-half the iron content

⑤Also contains 0.003-0 007 percent beryllium, boron 0.002 maximum

⑥Also contains 5 5 7.0 percent tin.

Mechanical Property Limits of Sand and Permanent Mold Casting Alloys①

ALLOY		Product②	Temper	Tensile Strength (ksi) min		Elongation in 2 Inches percent min
ber	Former Designation			Ultimate	Yield	
.0	108	S	F	19.0		1.5
.0	108	S	T55	21.0		
.0	113	S	F	19.0		
.0	113	P	F	23.0		
.0	122	S	T2	23.0		
.0	122	S	T61	30.0		
.0	122	P	T551	30.0		
.0	122	P	T65	40.0		
.0	142	S	T21	23.0		
.0	142	S	T571	29.0		
.0	142	P	T571	34.0		
.0	142	P	T61	40.0		
.0	195	S	T4	29.0		6.0
.0	195	S	T6	32.0	20.0	3.0
.0	195	S	T62	36.0		
.0	195	S	T7	29.0		3.0
.0	B195	P	T4	33.0		4.5
.0	B195	P	T6	35.0		2.0
.0	B195	P	T7	33.0		3.0
.0	A108	P	F	24.0		
.0	319, Allcast	S	F	23.0		
.0	319, Allcast	S	T5	25.0		
.0	319, Allcast	S	T6	31.0		1.5
.0	319, Allcast	P	F	28.0		1.5
.0	319, Allcast	P	T6	34.0		2.0
.0	Red X-8	S	F	25.0		1.0
.0	Red X-8	S	T6	34.0		1 0
0	A132	P	T551	31.0		
0	A132	P	T65	40.0		
0	F132	P	T5	31.0		
.0	333	P	F	28.0		
0	333	P	T5	30.0		
0	333	P	T6	35.0		
0	333	P	T7	31.0		
0	355	S	T51	25.0		
0	355	S	T6	32.0	20.0	2.0
0	355	S	T7	35.0		

ALLOY		Product②	Temper	Tensile Strength (ksi) min		Elongation in 2 Inches percent min
AA Number	Former Designation			Ultimate	Yield	
355.0	355	S	T71	30.0		
355.0	355	P	T51	27.0		
355.0	355	P	T6	37.0		1.5
355.0	355	P	T62	42.0		
355.0	355	P	T71	34.0		
C355.0	C355	P	T61	40.0		3.0
356.0	356	S	T51	23.0		
356.0	356	S	T6	30.0	20.0	3.0
356.0	356	S	T7	31.0	29.0	
356.0	356	P	T51	25.0		
356.0	356	P	T6	33.0		3.0
356.0	356	P	T7	29.0		4.0
A356.0	A356	P	T61	37.0		5.0
357.0	357	P	T6	45.0		3.0
B443.0	43 (0 15 max cu)	S	F	17.0		3.0
B443.0	43 (0.15 max cu)	P	F	21.0		5.0
514.0	214	S	F	22.0		6.0
A514.0	A214	P	F	22.0		2.5
B514.0	B214	S	F	17.0	10.0	
520.0	220	S	T4	42.0	22.0	12.0
535.0	Almag 35	S	F	35.0	18.0	9.0
535.0	Almag 35	S	T2	35.0	18.0	9.0
705.0	603, Ternalloy 5	S	F or T5	30.0	17.0	5.0
705 0	603, Ternalloy 5	P	T5	37.0		10.0
707.0	607, Ternalloy 7	S	F or T5	33.0	22.0	2.0
707.0	607, Ternalloy 7	P	T5	42.0		4.0
707.0	607, Ternalloy 7	P	T7	45 0		3.0
A712.0	A612	S	T5	32.0	20.0	2.0
D712.0	D612, 40E	S	F or T5	34.0	25.0	4.0
713.0	613, Tenzaloy	S	F or T5	32.0	22.0	3.0
713.0	613, Tenzaloy	P	T5	32.0		4.0
771.0	Precedent 71A	S	T6	45.0	37.0	5.0
850.0	750	S	T5	16 0		5.0
850.0	750	P	T5	18.0		8.0
A850.0	A750	S	T5	17.0		3.0
A850.0	A750	P	T5	17 0		3.0
B850.0	B750	S	T5	24.0	18 0	
B850.0	B750	P	T5	27.0		3.0

es represent properties obtained from separately cast test bars.
stomer should keep in mind that (1) some foundaries may offer
ial tempers for the above alloys, and (2) foundaries are constantly improving casting technique and, as a result, some may guarantee minimum properties in excess of the above.

② S = Sand Cast P = Permanent Mold Cast

STANDARD DESIGNATIONS FOR COPPER AND COPPER ALLOYS

(Wrought Products only)

COPPERS

COPPER NUMBER	DESIGNATION	TYPE	COMPOSITION, PER CENT MAXIMUM (UNLESS OTHERWISE INDICATED) Cu + Ag (% MIN.)	Ag ① (OZ/TON-MIN.)	As	Sb	P	Te	OTHER NAMED ELEMENTS
101②	OFE	Oxygen Free Electronic	99.99③	–	⑤	⑤	.0003	.0010	④ ⑤
102②	OF	**Oxygen Free**	99.95	–	–	–	–	–	–
104②	OFS	Oxygen Free with Ag	99.95	8	–	–	–	–	–
105②	OFS	Oxygen Free with Ag	99.95	10	–	–	–	–	–
107②	OFS	Oxygen Free with Ag	99.95	25	–	–	–	–	–
109②	BDHC	Boron Deoxidized High Conductivity	99.99⑥	–	⑤	⑤	.0005	⑤	⑤ ⑦
110②	ETP	**Electrolytic Tough Pitch**	99.90	–	–	–	–	–	–
–	FRHC	**Fire-Refined High Conductivity**	99.90	–	–		–	–	–
–	CRTP	**Chemically Refined Tough Pitch**	99.90	–	–	–	–	–	–
111②	–	Electrolytic Tough Pitch, Anneal Resistant	99.90	–	–	–	–	–	⑧
113②①	STP	**Tough Pitch with Ag**	99.90	8	–	–	–	–	–
114②①	STP	**Tough Pitch with Ag**	99.90	10	–	–	–	–	–
115②①	STP	**Tough Pitch with Ag**	99.90	16	–	–	–	–	–
116②①	STP	**Tough Pitch with Ag**	99.90	25	–	–	–	–	–
120	DLP	Phosphorus Deoxidized, Low Residual Phosphorus	99.90	–	–	–	.004-.012	–	–
121	–		99.90	4	–	–	.005-.012	–	–
122⑨	DHP	**Phosphorus Deoxidized, High Residual Phosphorus**	99.90	–	–	–	.015-.040	–	–
123	–		99.90	4	–	–	.015-.025	–	–
125⑩	FRTP	Fire-Refined Tough Pitch	99.88	–	.012	003	–	.025⑪	.050 Ni .003 Bi .004 Pb

① NOTES APPEAR AT THE END OF THE TABLE.

COPPERS (*Continued*)

COPPER NUMBER	DESIGNATION	TYPE	COMPOSITION, PER CENT MAXIMUM (UNLESS OTHERWISE INDICATED) Cu + Ag (% MIN.)	Ag ① (OZ/TON-MIN.)	As	Sb	P	Te	OTHER NAME ELEMENTS
127 ⑪	FRSTP	Fire-Refined Tough Pitch with Ag	99.88	8	.012	.003	–	.025 ⑫	.050 Ni .003 Bi .004 Pb
128 ⑪	FRSTP	Fire-Refined Tough Pitch with Ag	99.88	10	.012	.003	–	.025 ⑫	.050 Ni .003 Bi .004 Pb
129 ⑪	FRSTP	Fire-Refined Tough Pitch with Ag	99.88	16	.012	.003	–	.025 ⑫	.050 Ni .003 Bi .004 Pb
130 ⑪	FRSTP	Fire-Refined Tough Pitch with Ag	99.88	25	.012	.003	–	.025 ⑫	.050 Ni .003 Bi .004 Pb
141	ATP	Arsenical, Tough Pitch	99.40	–	.15–.50	–	–	–	–
142	DPA	Phosphorus Deoxidized, Arsenical	99.40	–	.15–.50	–	.015–.040	–	–
145 ⑬	DPTE	Phosphorus Deoxidized, Tellurium Bearing	99.90 ⑭	–	–	–	.004–.012 ⑮	.40–.60	–
147	–	Sulfur Bearing	99.90 ⑯	–	–	–	–	–	.20–.50 S
150	–	Zirconium Copper	99.80	–	–	–	–	–	.10–.20 Z

HIGH COPPER ALLOYS

COPPER ALLOY NUMBER	PREVIOUS TRADE NAME	⑰ Cu + Ag + ELEMENTS WITH SPEC. LIM. (% MIN.)	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Fe	Sn	Ni	Co	Cr	Si	Be	Pb	Cd	OTHER NAMED ELEMENTS
162	Cadmium Copper ...	99.8	.02	–	–	–	–	–		–	.7–1.2	
164	....	99.8	.02	.20–.40		–	–	–	–	–	.6–.9	–
165	....	99.8	.02	.50–.7	–	–	–		–		.6–1.0	–
170	**Beryllium Copper ..**	99.5	⑱	–	⑱	⑱	–	–	1.6–1.8	–	–	–
172	**Beryllium Copper ..**	99.5	⑱	–	⑱	⑱	–	–	1.8–2.0		–	
175	**Beryllium Copper ..**	99.5	.10	–	–	2.4–2.7	–	–	.40–.7	–	–	–
182	Chromium Copper ..	99.5	.10	–	–	–	.6–1.2	.10	–	.05	–	–
184	Chromium Copper ..	99.8	.15	–	–	–	.40–1.2	.10	–	–	–	.005 As .005 Ca .05 Li .05 P .7 Zn
185	Chromium Copper ..	99.8	–	–	–	–	.40–1.0	–		.015	–	.04 P .08–.12
187	....	99.9	–	–	–		–			.8–1.2	–	–
189	....	99.9	–	.6–.9	–			.15–.40		.02	–	.05 P .01 Al .10–.30 .10 Zn
190	....	99.5	.10	–	.9–1.3	–	–	–	–	.05	–	.8 Zn .15–.35
191	....	99.5	.20	–	.9–1.3	–		–		.10	–	.50 Zn .35–.6 .15–.35

	PREVIOUS TRADE NAME	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Cu	Fe	Sn	Zn	Al	Pb	P	TOTAL OTH ELEMENT
192	....	98.7 min.	.8–1.2	–	–	–	–	.01–.04	.10
193	....	92.0–94.0	2.0–2.6	.03	Rem.	.02	.03	–	.05
194	....	97.0 min.	2.1–2.6	.03	.05–.20	–	.03	.01–.04	.15

COPPER - ZINC ALLOYS (BRASSES)

COPPER ALLOY NUMBER	PREVIOUS TRADE NAME	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Cu	Pb	Fe	Sn	Zn	P	OTHER NAMED ELEMENTS	TOT OTH EL MEN
205	....	97.0-98.0	.02	.05	–	Rem.	–	–	.0
210	**Gilding, 95%**	94.0-96.0	.05	.05	–	Rem.	–	–	.1
220	**Commercial Bronze, 90%**............	89.0-91.0	.05	.05	–	Rem.	–	–	.1
226	**Jewelry Bronze, 87½%**	86.0-89.0	.05	.05	–	Rem.	–	–	.1
230	**Red Brass, 85%**	84.0-86.0①	.05 ①	.05	–	Rem.	–	–	.1
234	....	81.0-84.0	.05	.05	–	Rem.	–	–	.1
240	**Low Brass, 80%**.......................	78.5-81.5	.05	.05	–	Rem.	–	–	.1
250	....	74.0-76.0	.05	.05	–	Rem.	–	–	.1
260	**Cartridge Brass, 70%**	68.5-71.5	.07	.05	–	Rem.	–	–	.1
261	....	68.5-71.5	.05	.05	–	Rem.	.02–.05	–	.1
262	....	67.0-70.0	.07	.05	–	Rem.	–	–	.1
268	**Yellow Brass, 66%**	64.0-68.5	.15	.05	–	Rem.	–	–	.1
270	**Yellow Brass, 65%**	63.0-68.5	.10	.07	–	Rem.	–	–	.2
272	....	62.0-65.0	.07	.07	–	Rem.	–	–	.2
274	Yellow Brass, 63%......................	61.0-64.0	.10	.05	–	Rem.	–	–	.2
280	**Muntz Metal, 60%**	59.0-63.0	.30	.07	–	Rem.	–	–	.2
282	....	58.0-61.0	.03	.05	.05	Rem.	.12–.22	.005 Al ②	.1
298	Brazing Alloy	49.0-52.0	.50	.10	–	Rem.	–	.10 Al	–

COPPER-ZINC-LEAD ALLOYS (LEADED BRASSES)

COPPER ALLOY NUMBER	PREVIOUS TRADE NAME	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Cu	Pb	Fe	Sn	Zn	P	OTHER NAMED ELEMENTS	TOTA OTHE ELE MENT
310	Leaded Commercial Bronze (Low Lead)	89.0-91.0	.30-.7	.10	–	Rem.	–	–	.50
314	**Leaded Commercial Bronze**	87.5-90.5	1.3-2.5	.10	–	Rem.	–	–	.50
316	Leaded Commercial Bronze (Nickel Bearing)	87.5-90.5	1.3-2.5	.10	–	Rem.	–	.7-1.2 Ni	.50
320	Leaded Red Brass	83.5-86.5	1.5-2.2	.10	–	Rem.	–	–	.50
325	....	72.0-74.5	2.5-3.0	.10	–	Rem.	–	–	.50
330	**Low Leaded Brass (Tube)**...........	65.0-68.0	.20-.8②	.07	–	Rem.	–	–	.50
331	....	65.0-68.0	.7-1.2	.06	–	Rem.	–	–	.50
332	**High Leaded Brass (Tube)**..........	65.0-68.0	1.3-2.0	.07	–	Rem.	–	–	.50
335	**Low Leaded Brass**	62.5-66.5	.30-.8	.10	–	Rem.	–	–	.50
340	**Medium Leaded Brass, 64½%**........	62.5-66.5	.8-1.4	.10	–	Rem.	–	–	.50
342	**High Leaded Brass, 64½%**...........	62.5-66.5	1.5-2.5	.10	–	Rem.	–	–	.50
344	....	62.0-66.0	.50-1.0	.10	–	Rem.	–	–	.50
345	....	62.0-64.0	1.5-2.8	.10	–	Rem.	–	–	.50
347	....	62.5-64.5	1.0-1.8	.10	–	Rem.	–	–	.50
348	....	61.5-63.5	.40-.8	.10	–	Rem.	–	–	.50
349	....	61.0-64.0	.10-.50	.10	–	Rem.	–	–	.50
350	Medium Leaded Brass, 62%.........	61.0-64.0	.8-1.4	.10	–	Rem.	–	–	.50
353	**High Leaded Brass, 62%**............	59.0-64.5③	1.3-2.3	.10	–	Rem.	–	–	.50
356	**Extra High Leaded Brass**...........	60.0-64.5	2.0-3.0	.10	–	Rem.	–	–	.50
360	**Free Cutting Brass**	60.0-63.0	2.5-3.7	.35	–	Rem.	–	–	.50
362	....	60.0-63.0	3.5-4.5	.15	–	Rem.	–	–	.50
365	**Leaded Muntz Metal, Uninhibited**	58.0-61.0	.40-.9	.15	.25	Rem.	–	–	.10
366	**Leaded Muntz Metal, Arsenical**......	58.0-61.0	.40-.9	.15	.25	Rem.	–	.02-.10 As	.10
367	**Leaded Muntz Metal, Antimonial**	58.0-61.0	.40-.9	.15	.25	Rem.	–	.02-.10 Sb	.10
368	**Leaded Muntz Metal, Phosphorized.**	58.0-61.0	.40-.9	.15	.25	Rem.	.02–.10	–	.10
370	**Free Cutting Muntz Metal**...........	59.0-62.0	.9-1.4	.15	–	Rem.	–	–	.50
371	....	58.0-62.0	.6-1.2	.15	–	Rem.	–	–	.50
377	**Forging Brass**	58.0-62.0	1.5-2.5	.30	–	Rem.	–	–	.50
380	....	55.0-60.0	1.5-2.5	.35	.30	Rem.	–	.50 Al	.50
385	**Architectural Bronze**	55.0-60.0	2.0-3.8	.35	–	Rem.	–	–	.50

COPPER - ZINC - TIN ALLOYS (TIN BRASSES)

COPPER ALLOY NUMBER	PREVIOUS TRADE NAME	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Cu	Pb	Fe	Sn	Zn	P	OTHER NAMED ELEMENTS	TOTA OTHE ELE MENT
405	....	94.0-96.0	.05	.05	.7-1.3	Rem.	–	–	.15
408	....	94.0-96.0	.05	.05	1.8-2.2	Rem.	–	–	.15
409	....	92.0-94.0	.05	.05	.50-.8	Rem.	–	–	.15
410	....	91.0-93.0	.05	.05	2.0-2.8	Rem.	–	–	.15
411	....	89.0-92.0	.10	.05	.30-.7	Rem.	–	–	.15

COPPER - ZINC - TIN ALLOYS (TIN BRASSES) *(Continued)*

COPPER ALLOY NUMBER	PREVIOUS TRADE NAME	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Cu	Pb	Fe	Sn	Zn	P	As	Sb	OTHER NAMED ELEMENTS	TOTAL OTHER ELEMENTS
413	....	89.0-93.0	.10	.05	.7-1.3	Rem.	–	–	–	–	.15
415	....	89.0-93.0	.10	.05	1.5-2.2	Rem.	–	–	–	–	.15
419	....	89.0-92.0	.10	.05	4.8-5.5	Rem.	–	–	–	–	.15
420	....	88.0-91.0	–	–	1.5-2.0	Rem.	.25	–	–	–	.15
421	....	87.5-89.0	.05	.05	2.2-3.0	Rem.	.35	–	–	.15-.35 Mn	.15
422	....	86.0-89.0	.05	.05	.8–1.4	Rem.	.35	–	–	–	.15
425	....	87.0-90.0	.05	.05	1.5–3.0	Rem.	.35	–	–	–	.15
430	....	85.0-89.0	.10	.05	1.7–2.7	Rem.	–	–	–	–	.15
432	....	85.0-88.0	.05	.05	.40–.6	Rem.	.35	–	–	–	.15
434	....	84.0-86.0	.05	.05	.50–1.0	Rem.	–	–	–	–	.15
435	....	79.0-83.0	.10	.05	.6–1.2	Rem.	–	–	–	–	.15
436	....	80.0-83.0	.05	.05	.20–.50	Rem.	–	–	–	–	.15
438	....	79.0-82.0	.05	.05	1.0–1.5	Rem.	–	–	–	–	.15
442	**Admiralty, Uninhibited**..........	70.0-73.0	.07	.06	.8–1.2	Rem.	–	–	–	–	.15
443	**Admiralty, Arsenical**............	70.0-73.0	.07	.06	.8–1.2	Rem.	–	.02-.10	–	–	.15
444	**Admiralty, Antimonial**	70.0-73.0	.07	.06	.8–1.2	Rem.	–	–	.02-.10	–	.15
445	**Admiralty, Phosphorized**.......	70.0-73.0	.07	.06	.8–1.2	Rem.	.02-.10	–	–	–	.15
462	Naval Brass, 63¾%..............	62.0-65.0	.20	.10	.50–1.0	Rem.	–	–	–	–	.10
464	**Naval Brass, Uninhibited**.......	59.0-62.0	.20	.10	.50–1.0	Rem.	–	–	–	–	.10
465	**Naval Brass, Arsenical**.........	59.0-62.0	.20	.10	.50–1.0	Rem.	–	.02-.10	–	–	.10
466	**Naval Brass, Antimonial**........	59.0-62.0	.20	.10	.50–1.0	Rem.	–	–	.02-.10	–	.10
467	**Naval Brass, Phosphorized**....	59.0-62.0	.20	.10	.50–1.0	Rem.	.02-.10	–	–	–	.10
470	Naval Brass Welding & Brazing Rod	57.0-61.0	.05	–	.25–1.0	Rem.	–	–	–	.01 Al	.50 ㉔
472	Brazing Alloy	49.0-52.0	.50	.10	3.0–4.0	Rem.	–	–	–	–	–
476	....	86.0-88.0	1.8–2.2	.05	1.8–2.2	Rem.	.03-.07	–		.05–.15 Mn	.15
482	Naval Brass, Medium Leaded..	59.0-62.0	.40–1.0	.10	.50–1.0	Rem.	–	–	–	–	.10
485	**Naval Brass, High Leaded**......	59.0-62.0	1.3–2.2	.10	.50–1.0	Rem.	–	–	–	–	.10

COPPER - TIN ALLOYS (PHOSPHOR BRONZES)

COPPER ALLOY NO.	PREVIOUS TRADE NAME	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Cu + Sn + P (% MIN.)	Pb	Fe	Sn	Zn	P	Mn	Al
502	....	99.5	.05	.10	1.0–1.5	-	.04	-	-
505	**Phosphor Bronze, 1.25% E**.....	99.5	.05	.10	1.0–1.7	.30	.03–.35	–	-
507	....	99.5	.05	.10	1.5 2.0	-	.30	–	-
508	....	99.5	.05	.10	2.6–3.4	-	.01–.07	–	
509	....	99.5	.05	.10	2.5–3.8	.30	.03–.30	–	–
510	**Phosphor Bronze, 5% A**.........	99.5	.05	.10	3.5–5.8	.30	.03–.35		
518	Phosphor Bronze	99.5	.02	–	4.0–6.0	–	.10–.35	–	.01
519	....	99.5	.05	.10	5.0–7.0	.30	.03–.35	–	–
521	**Phosphor Bronze, 8% C**.........	99.5	.05	.10	7.0–9.0	.20	.03–.35	–	–
524	**Phosphor Bronze, 10% D**........	99.5	.05	.10	9.0–11.0	.20	.03–.35	–	–
526	....	99.5 ㉕	.05	.10	2.2–3.3	.20	.03 .35	1.0–2.0	–
529	....	99.5 ㉕	.05	.10	7.0–9.0	.20	.03–.35	1.0–2.0	–

COPPER - TIN - LEAD ALLOYS (LEADED PHOSPHOR BRONZES)

COPPER ALLOY NUMBER	PREVIOUS TRADE NAME	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Cu + Sn + P + Pb (% MIN.)	Pb	Fe	Sn	Zn	P
532	Phosphor Bronze B	99.5	2.5–4.0	.10	4.0–5.5	.20	.03–.35
534	Phosphor Bronze B-1	99.5	.8–1.2	.10	3.5 5.8	.30	.03–.35
544	**Phosphor Bronze B-2**..........................	99.5 ㉗	3.5–4.5	.10	3.5–4.5	1.5–4.5	.01 .50
546	Phosphor Bronze B-2 (P .50 max.)	99.5 ㉘	3.5–4.5	.10	3.5–4.5	1.5–4.5	.50

COPPER - ALUMINUM ALLOYS (ALUMINUM BRONZES)

COPPER ALLOY NUMBER	PREVIOUS TRADE NAME	⑰ Cu + ELEMENTS WITH SPEC. LIMITS (% MIN.)	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Pb	Fe	Sn	Zn	Al	As	Mn	Si	Ni
606		99.5	–	.50	–	–	4.0–7.0	–	–	–	–
607		99.5	.01	–	1.7–2.0	–	2.3–2.9	–	–	–	–
608		99.5	.10	.10	–	–	5.0–6.5	.35	–	–	–
610		99.5	.02	–	–	.20	6.0–9.0	–	–	.10	–
612		99.5	–	.50	–	–	7.0–9.0	–	–	–	–
613		99.5	–	3.5	.20–.50	–	6.0–8.0	–	–	–	–
614	**Aluminum Bronze D**	99.5	–	1.5–3.5	–	–	6.0–8.0	–	1.0	–	–
616		99.5	–	4.0	.6	1.0	6.5–11.0	–	1.5	.25	1.0
617		99.5		1.5	2.0 ㉑	–	7.0–10.0	–	2.0 ㉑	–	2.0 ㉑
618		99.5	.02	1.5	–	.02	9.0–11.0	–	–	.10	–
620		99.5	–	3.2–3.7	–	–	9.8–10.5	–		–	–
622		99.5	.02	3.0–4.2	–	.02	11.0–12.0	–	–	.10	–
623		99.5	–	2.0–4.0	.20	–	8.0–10.0	–	–	.25	–
624		99.5	–	2.0 4.0	.20	–	10.0–11.5	–	.30	.25	–
625		99.5	–	3.5–5.0	–	–	12.5–13.5	–	–	–	–
626		99.7		2.0–4.5	–	–	9.7–10.7	–	1.5	–	3.0–4.5
628	Aluminum Bronze E	99.5	–	1.5–3.5		–	8.0–11.0	–	.50–2.0	–	4.0–7.0
630		99.5	–	2.0–4.0	.20	–	9.0–11.0		1.5	.25	4.0–5.5
633		99.5	–		.01–.05	.05	4.5–5.5	–	–	–	3.5–4.3
634		99.5	.05	.10	.20	.20	2.6–3.2	.15	–	.25–.45	.10
636		99.5	.05	.10	.20	.30	3.0–4.0	.15	–	.7–1.3	.10
637		99.5	.05	.30	.6	1.0	6.5–8.5	.15	–	1.2–2.2	.25
639		99.5	.05	.10	–	–	6.5–8.0	.15	–	1.5–3.0	–
642		99.5	–	1.0	.6	1.0	6.5–11.0	.15	1.5	2.2 ㉓	1.0 ㉓

COPPER - SILICON ALLOYS (SILICON BRONZES)

COPPER ALLOY NUMBER	PREVIOUS TRADE NAME	⑰ Cu + ELEMENTS WITH SPEC. LIMITS (% MIN.)	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Pb	Fe	Sn	Zn	Al	Mn	Si	Ni
647		99.5	.10	10	–	.50	–	–	.40–.8	1.6–2.2
649		99.5	.05	.10	1.2–1.6	.20	.10		.8–1.2	.10
651	**Low Silicon Bronze B**	99.5	.05	.8		1.5	–	.7	.8–2.0	–
653		99.7	.05	.8	–				2.0–3.0	.6
655	**High Silicon Bronze A**	99.5	.05	.8	–	1.5		1.5	2.8–3.8	.6
656		99.5	.02	.50	1.5	1.5	.01	1.5	2.8–4.0	–
658		99.5	.05	.50	–	–	.01	1.5	2.8 3.8	–
661		99.5	20 .8	.25	–	1.5	–	1.5	2.8–3.5	–

MISCELLANEOUS COPPER - ZINC ALLOYS

COPPER ALLOY NUMBER	PREVIOUS TRADE NAME	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Cu	Pb	Fe	Sn	Zn	Ni	Al	As	Mn	Si	P	TOTAL OTHER ELEMENTS
665		80.0–82.0	05	.10		Rem.	–	–		.7–1.5			.15
667	Manganese Brass	68.5–71.5	.07	.10	–	Rem.	–	–		.8–1.5		–	50
668		60.0–63.0	50	.35	.40	Rem.	.25	.25	–	2.0–3.5	.50–1.5	–	.10
670	Manganese Bronze B	63.0–68.0	.20	2.0–4.0	.50	Rem.		3.0–6.0		2.5–5.0	–	–	.10
671		59.0–62.0	.15–.35	.20–.8	.50–1.0	Rem.	–	–	–	.05–.25	–		.50
673		58.0–63.0	40–3.0	.50	30	Rem.	.25	.25		2.0–3.5	.50–1.5	–	.10
674		57.0–60.0	.50	35	.30	Rem.	.25	.50–2.0		2.0–3.5	.50–1.5	–	.10
675	**Manganese Bronze A**	57.0 60.0	.20	.8–2.0	.50–1.5	Rem.		25	–	.05–.50		–	.10
676		57.0–60.0	.50–1.0	.40–1.3	.50–1.5	Rem.		–	–	.05–.50	–		.30
677		55.5–58.0	.50–1.0	.7–1.5	–	Rem.	1.5–2.3	–	.40–.8	.05–.30	–		.50
678		56.0 59.0	.30	.7–1.5	.20	Rem.	–	.50–1.5	–	.20–.6	–	–	.10
679		49.0–52.0	.05	1.5–2.5	–	Rem.	3.0–5.0	–		7.5–8.5	–	–	.10
680	Bronze, Low Fuming (Nickel)	56.0–60.0	.05	.25–1.25	.75–1.10	Rem.	.20–.8	.01	–	.01–.50	.04–.15	–	.50 ⑳
681	Bronze, Low Fuming	56.0–60.0	.05	.25–1.25	.75–1.10	Rem.	–	.01	–	.01–.50	.04–.15	–	.50 ⑳
685		85.0–89.0	.05	1.5–2.5	.10	Rem.		3.5–4.5	–			–	.10
687	**Aluminum Brass, Arsenical**	76.0–79.0	07	.06	–	Rem.	–	1.8–2.5	.02–.10	–	–	–	.15

MISCELLANEOUS COPPER - ZINC ALLOYS *(Continued)*

Copper Alloy Number	Previous Trade Name	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Cu	Pb	Fe	Sn	Zn	Ni	Al	As	Mn	Si	P	Total Other Elements ●
689		65.0–67.0	.03	.8-1.4	–	Rem.	–	1.1-2.0	–	–	–	.02	.15
692	Silicon Brass	89.0–91.0	.05	.05	–	Rem.	–	–	–	–	.8-1.5	–	.50
694	Silicon Red Brass	80.0–83.0	.30	.20	–	Rem.	–	–	–	–	3.5-4.5	–	.50
697		75.0–80.0	.50-1.5	.20	–	Rem.	–	–	–	.40	2.5-3.5	–	.50

COPPER - NICKEL ALLOYS

Copper Alloy Number	Previous Trade Name	⑰ COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Cu + Elements with Spec. Limits (% Min.)	Pb	Fe	Zn	Ni	Mn	Other Named Elements
701		99.7	–	.05	.25	3.0- 4.0	.25-.50	–
702		99.7	.05	.10	–	2.0- 3.0	.40	–
703		99.5	–	.05	–	4.7- 5.7	.50	–
704	Copper Nickel, 5%	99.6	.05	1.3-1.7	1.0	4.8- 6.2	.30-.8	–
705	Copper Nickel, 7%	99.5	.05	.10	.20	5.8- 7.8	.15	–
706	**Copper Nickel, 10%**	99.5	.05	1.0-1.8	1.0	9.0-11.0	1.0	–
707		99.5	–	.05	–	9.5-10.5	.50	–
708	Copper Nickel, 11%	99.5	.05	.10	.20	10.5-12.5	.15	–
709		99.5	.05	.6	1.0	13.5-16.5	.6	–
710	Copper Nickel, 20%	99.5	.05	1.0	1.0	19.0-23.0	1.0	–
711		99.5	.05	.10	.20	22.0-24.0	.15	-
713		99.5	.05	.20	1.0	23.5-26.5	1.0	–
715	**Copper Nickel, 30%**	99.5	.05	.40- .7	1.0	29.0-33.0	1.0	–
716		99.5	.05	4.8-5.8	1.0	29.0-33.0	1.0	–
717		99.5	–	.40-1.0	–	29.0-33.0	–	.30-.7 Be
720	Copper Nickel, 40%	99.5	.05	1.5-2.5	.30	40.0-43.0	.50-1.7	--

COPPER - NICKEL - ZINC ALLOYS (NICKEL SILVERS)

Copper Alloy Number	Previous Trade Name	COMPOSITION, PERCENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM) Cu	Pb	Fe	Zn	Ni	Mn	Other Named Elements	Total Other Elements ⑱
732		70.0 (Min.)	.05	.6	3.0–6.0	19.0–23.0	1.0	–	.50
735		70.5–73.5	.10	.25	Rem.	16.5–19.5	.50	–	.50
736		70.5–73.5	.05	.25	Rem.	14.0–16.0	.50	–	.50
740		69.0–73.5	.10	.25	Rem.	9.0–11.0	.50	–	.50
745	**Nickel Silver, 65-10**	63.5–68.5	.10	.25	Rem.	9.0–11.0	.50	–	.50
752	**Nickel Silver, 65-18**	63.0–66.5	.10	.25	Rem.	16.5–19.5	.50	–	.50
754	**Nickel Silver, 65-15**	63.5–66.5	.10	.25	Rem.	14.0- 16.0	.50	–	.50
757	**Nickel Silver, 65-12**	63.5–66.5	.05	.25	Rem.	11.0–13.0	.50	–	.50
760		60.0–63.0	.10	.25	Rem.	7.0– 9.0	.50	–	.50
761		59.0–63.0	.10	.25	Rem.	9.0–11.0	.50	-	.50
762		57.0–61.0	.10	.25	Rem.	11.0–13.5	.50	–	.50
764		58.5–61.5	.05	.25	Rem.	16.5–19.5	.50	–	.50
766		55.0–58.0	.10	.25	Rem.	11.0–13.5	.50	–	.50
767	Nickel Silver, 56.5 - 15	55.0–58.0	–	–	Rem.	14.0–16.0	.50	–	.50
770	**Nickel Silver, 55-18**	53.5–56.5	.10	.25	Rem.	16.5–19.5	.50	–	.50
773		46.0–50.0	.05	–	Rem.	9.0–11.0	–	.01 Al .25 P .04-.25Si	.50
774		43.0–47.0	.20	–	Rem.	9.0–11.0	–	–	.50
776	Nickel Silver, 43.5 - 13	42.0–45.0	.25	.20	Rem.	12.0–14.0	.25	.15 Sn	.50
782		63.0–67.0	1.5-2.5	.35	Rem.	7.0– 9.0	.50	–	.10
784		60.0–63.0	.8-1.4	.25	Rem.	9.0–11.0	.50	–	.50
786		60.0–63.0	1.2-1.8	.35	Rem.	8.5–11.0	.50	–	.10
788		63.0–67.0	1.5-2.0	.25	Rem.	9.0–11.0	.50	–	.50
790		63.0–67.0	1.5-2.2	.35	Rem.	11.0–13.0	.50	–	.10
792		59.0–66.5	.8-1.4	.25	Rem.	11.0–13.0	.50	–	.50
794		59.0–66.5	.8-1.2	.25	Rem.	16.5–19.5	.50	–	.50
796	Leaded Nickel Silver, 10%	43.5–46.5	.8-1.2	–	Rem.	9.0–11.0	1.5-2.5	–	.50
798		45.5–48.5	1.5-2.5	.25	Rem.	9.0–11.0	1.5-2.5	–	.50

NOTES

① Troy ounces per avoirdupois ton.

② These are high conductivity coppers which have in the annealed condition a minimum conductivity of 100% IACS.

③ The 99.99 value for Cu is exclusive of Ag.

④ Hg, max., 1 ppm, (.0001%), Zn, max., 1 ppm, (.0001%); Cd, max., 1 ppm, (.0001%); S, max., 18 ppm, (.0018%); Pb, max., 10 ppm, (.0010%), Se, max., 10 ppm (.0010%); Bi, max., 10 ppm (.0010%), Oxygen max., 10 ppm. (.0010%).

⑤ The 99.99 value includes Cu, Ag and B.

⑥ The total of the seven following elements, Se, Te, Bi, As, Sb, Sn and Mn not to exceed 40 ppm, (.0040%).

⑦ S, max., 15 ppm, (.0015%), Cd, max., 3 ppm, (.0003%), Zn, max., 5 ppm, (.0005%), Hg, max., 1 ppm, (.0001%), Pb, max., 10 ppm, (.0010%), B, (.005-.015%).

⑧ Small amounts of Cd or other elements may be added by agreement to improve resistance to softening at elevated temperature.

⑨ This includes Low Resistance Lake Copper and Electrolytic Copper.

⑩ This includes Oxygen-Free Copper which contains P in an amount agreed upon.

⑪ This includes High Resistance Lake Copper.

⑫ This includes permissible Se

⑬ This includes Oxygen-Free Tellurium Bearing Copper which contains P in an amount agreed upon

⑭ This includes Cu + Ag + Te.

⑮ Other deoxidizers may be used as agreed upon, in which case P need not be present.

⑯ This includes Cu + Ag + S.

⑰ Specific limits are defined as any numerical values, whether maximum only, minimum only, or ranges.

⑱ Co, .20% min.
Ni + Fe + Co, .60% maximum.

⑲ Analysis is regularly made for the elements for which specific limits are listed except Zn. If, however, the presence of other elements is suspected or indicated in the course of routine analysis further analysis shall be made to determine that the total of these "other" elements is not in excess of the limits specified.

⑳ For pipe and tube, the Cu limit may be 83.0% minimum, and the Pb .06% maximum.

㉑ Al + Si, .005% max.

㉒ For tube over 5 inch O.D., the Pb may be less than .20%.

㉓ Copper, 61.0% min. for rod.

㉔ Including Al and Pb.

㉕ Including Mn.

㉖ Including Zn

㉗ Ni + Sn + Mn, 2.0% maximum.

㉘ When both Ni and Si are present, only one shall be i excess of .25%.

COPPER CAST
COPPER DEVELOPMENT ASSOCIATION

STANDARD DESIGNATIONS FOR COPPER AND COPPER ALLOYS

(Cast Products only)

HIGH COPPER ALLOYS

COPPER ALLOY NO.	OTHER DESIGNATIONS ①	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)												
		Cu	Ag	Be	Co	Si	Ni	Fe	Al	Sn	Pb	Zn	Cr	TOTAL OTHER ELEMENTS
813	....	98.50 min.	–	.02–.10	.6–1.0	–	–	–	–	–	–	–	–	.40
814	70C	98.50 min.	–	.02–.10	–	–	–	–	–	–	–	–	.6-1.0	.40
815	....	98.00 min.	–	–	–	–	–	–	–	–	–	–	.40-1.5	.50
817	....	94.25 min.	.75–1 25	.30–.55	.25–1.50	–	.25–1.50	–	–	–	–	–	–	–
818	50C	95.60 min.	.75–1.25	.30–.55	1.40–1.70	–	–	–	–	–	–	–	–	–
820	QQ–C–390–X5 10C	Rem.	–	.45–.75	2.35–2.70②	.15	.20③	.10	.10	.01	.01	.01	.10	–
821	....	95.50 min.	–	.35–.75	.25–1.50	–	.25–1.50	–	–	–	–	–	–	–
822	35C 53B	96.50 min.	–	.35–.75	–	–	1.00–2.00	–	–	–	–	–	–	–
824	165C	97.20 min.	–	1.65–1.75	.20–.30	–	–	–	–	–	–	–	–	–
825	QQ–C–390–X6 20C	Rem.	–	1.90–2.15	.35–.65②	.20–.35	.20③	.25	.15	.10	02	.10	.10	–
826	245C	95.65 min.	–	2.25–2.45	.35–.65	.20–.35	–	–	–	–	–	–	–	–
827	QQ–C–390–X7	Rem.	–	2.35–2.55	–	.15	1.00–1.50	.25	.15	.10	.02	.10	.10	–
828	QQ–C–390–X8 275C	Rem.	–	2.50–2.75	.35– 65②	.20–.35	.20③	.25	.15	.10	.02	.10	.10	–

① CIRCLED NUMBERS REFER TO NOTES AT THE END OF THE TABLE.

COPPER-TIN-ZINC AND COPPER-TIN-ZINC-LEAD ALLOYS (RED BRASSES AND LEADED RED BRASSES)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)							TOTAL OTHER ELEMENTS
		Cu	Sn	Pb	Zn	Ni	Fe	P④	
833	....	92.0–94.0	1.0–2.0	1.0–2.0	2.0–6.0	–	–	–	.50
834	....	88.0–92.0	.20	.50	8.0–12.0	–	–	–	.50
836⑱	B62 B145(B271)–4A	84.0–86.0 ⑤	4.0–6.0	4.0–6.0	4.0–6.0	1.0⑤	.30	.05	–
838⑱	B145(B271)–4B	82.0–83.7 ⑤	3.3–4.2	5.0–7.0	5.0–8.0	1.0⑤	.30	.03	–

COPPER-TIN-ZINC AND COPPER-TIN-ZINC-LEAD ALLOYS (SEMI RED BRASSES AND LEADED SEMI RED BRASSES)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)							TOTAL OTHER ELEMENT
		Cu	Sn	Pb	Zn	Ni	Fe	P④	
842	QQ–C–390–B1	78.0–82.0	4.0–6.0	2.0–3.0	10.0–16.0	.7	.35	.05	.50
844⑱	B145(B271)–5A	78.0–82.0 ⑤	2.3–3.5	6.0–8.0	7.0–10.0	1.0⑤	.40	.02	–
848⑱	B145(B271)–5B	75.0–76.8 ⑤	2.0–3.0	5.3–6.7	13.0–17.0	1.0⑤	.40	.02	–

COPPER-TIN-ZINC AND COPPER-TIN-ZINC-LEAD ALLOYS (YELLOW BRASSES AND LEADED YELLOW BRASSES)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)									TOTAL OTHER ELEMENT
		Cu	Sn	Pb	Zn	Ni	Fe	Si	Al	Mn	
852⑱	B146(B271)–6A	70.0–74.0	.8–2.0	1.5–3.7	Rem.	–	.6	–	–	–	–
853	....	68.0–72.0	.50	.50	Rem.	–	–	–	–	–	1.0 ⑧
854⑱	B146(B271)–6B	65.0–70.0	1.5	1.5–3.7	Rem.	–	.7	–	.30	–	–
855	QQ–C–390–A5	59.0–63.0	⑦	⑦	Rem.	⑦	⑦	–	.50–1.0	⑦	⑧
856	....	59.0–63.0	⑦	⑦	Rem.	.50–1.0	–	–	–	–	⑧
857⑱	B146(B271)–6C	60.0–65.0	.50–1.5	.8–1.5	Rem.	–	.7	–	.50	–	–
858	B176–Z30A	57.0 min.	1.5	1.5	30.0 min.	–	.50	.25	.25	.25	.50⑩

MANGANESE AND LEADED MANGANESE BRONZE ALLOYS (HIGH STRENGTH YELLOW BRASSES AND LEADED HIGH STRENGTH YELLOW BRASSES)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)							
		Cu	Sn	Pb	Zn	Ni	Fe	Al	Mn
861 ⑱	QQ–C–390–C5	66.0–68.0	.20	.20	Rem.	–	2.0–4.0	4.5–5.5	2.5–5.0
862 ⑱	B147(B271)–8B	60.0–68.0	.20	.20	Rem.	–	2.0–4.0	3.0–7.5	2.5–5.0
863 ⑱	B147(B271)–8C	60.0–68.0	.20	.20	Rem	–	2.0–4.0	3.0–7.5	2.5–5.0
864 ⑱	B132–A B147(B271)–7A	56.0–62.0	1.5	.5–1.5	Rem.	–	2.0	1.5	1.5
865⑱	B147(B271)–8A	55.0–60.0	1.0	.40	Rem.	.50	.40–2.0	.50–1.5	1.5
867	B132(B271)–B	55.0–60.0	1.5	.5–1.5	Rem.	–	3.0	3.0	3.5
868	QQ–C–390–C1	53.5–57.0	1.0	.20	Rem.	2.5–4.0	1.0–2.5	2.0	2.5–4.0

COPPER-ZINC-SILICON ALLOYS (SILICON BRONZES AND SILICON BRASSES)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)									
		Cu	Sn	Pb	Zn	Fe	Al	Si	Mn	Mg	TOTAL OTHER ELEMENTS
872	B198 (B271)—12A	99.5 min. ⑧	1.0	.50	5.0	2.5	1.5	1.0–5.0	1.5	—	—
874	B198 (B271)—13A	99.5 min. ⑧	—	1.0	12.0–16.0	—	—	2.5–4.0	—	—	—
875	B198 (B271)—13B	99.5 min. ⑧	—	.50	12.0–16.0	—	—	3.0–5.0	—	—	—
876	B198—13C	99.5 min. ⑧	—	.50	4.0–7.0	—	—	3.5–5.5	—	—	—
878	B176—ZS144A	80.0–83.0	.25	.15	Rem.	.15	.15	3.8–4.2	.15	.01	.25 ⑩
879	B176—ZS331A	63.0–67.0	.25	.25	Rem.	.15	.15	.8–1.2	.15	—	.50 ⑩

COPPER-TIN AND COPPER-TIN-LEAD ALLOYS (TIN BRONZES)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)								
		Cu	Sn	Pb	Zn	Ni	Fe	P	Al	TOTAL OTHER ELEMENTS
902	. . . .	91.0–94.0	6.0–8.0	—	.50	—	—	—	—	1.0
903 ⑱	B143 (B271)—1B	86.0–89.0	7.5–9.0	.30	3.0–5.0	1.0	.15	.05 ④	—	—
905 ⑱	B143 (B271)—1A SAE 62	86.0–89.0	9.0–11.0	.30	1.0–3.0	1.0	.15	.05 ④	—	—
907	SAE 65	88.0–90.0	10.0–12.0	.50 ⑪	.50 ⑪	⑪	.15	.10–.30	.005	—
909	. . . .	86.0–89.0	12.0–14.0	—	—	—	—	—	—	.50
910	QQ–C–390–D2	84.0–86.0	13.0–15.0	.20	1.5	.7	.10	.05 ④	—	—
911	B22—B	82.0–85.0	15.0–17.0	.25	.25	—	.25	1.0	—	—
913	B22—A	79.0–82.0	18.0–20.0	.25	.25	—	.25	1.0 ④	—	—
915	B427—D	Rem.	9.0–11.0	2.0–3.2	—	2.8–4.0	—	.50	—	.50
916	B427—C	⑫	9.8–10.7 ⑫	.25	—	1.3–2.0 ⑫	—	.25 ⑫	—	.50
917	B427—B	⑫	11.3–12.5 ⑫	.25	—	1.3–2.0 ⑫	—	.30 ⑫	—	.50

COPPER-TIN-LEAD ALLOYS (LEADED TIN BRONZES)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)							
		Cu	Sn	Pb	Zn	Ni	Fe	P	Al
922 ⑱	B61 B143 (B271)—2A	86.0–90.0	5.5–6.5	1.0–2.0	3.0–5.0	1.0	.25	.05 ④	–
923 ⑱	B143 (B271)—2B	85.0–89.0	7.5–9.0	1.0	2.5–5.0	1.0	.25	.05 ④	—
925	SAE 640	85.0–88.0	10.0–12.0	1.0–1.5	.50	.8–1.5	.30	.20–.30	.005
926	. . . .	86.0–88.5	9.3–10.5	.8–1.2	1.3–2.5	.7	.15		—
927	SAE 63	86.0–89.0	9.0–11.0	1.0–2.5	.7	1.0	.15	.25	.005
928	MIL–R–16937	78.0–82.0	15.0–17.0	4.0–6.0	.50	.50	—	—	—

COPPER-TIN-LEAD ALLOYS (HIGH LEADED TIN BRONZES)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)								
		Cu	Sn	Pb	Zn	Ni	Fe	P	Sb	TOTAL OTHER ELEMENTS
932 ⑱	B144 (B271)—3B	81.0–85.0 ⑧	6.3–7.5	6.0–8.0	2.0–4.0	.50 ⑤	.20	.15 ④	.35	—
934	QQ–C–390–E8	82.0–85.0	7.0–9.0	7.0–9.0	.7	1.0	.15	.50 ④	.50	—
935 ⑱	B144 (B271)—3C	83.0–86.0 ⑧	4.5–6.0	8.0–10.0	2.0	.50 ⑤	.20	— ④	.30	—
936	SAE 793	83.0 min.	3.5–4.5	7.0–9.0	4.0	1.50	.35	—	.50	.30
937 ⑱	B144 (B271)—3A	78.0–82.0 ⑧	9.0–11.0	8.0–11.0	.7	.7 ⑤	.15 ⑬	.05 ④	.50	—
938 ⑱	B66 (Hard Bronze) B144 (B271)—3D	75.0–79.0 ⑧	6.3–7.5	13.0–16.0	.7	.7 ⑤	.15	.05 ④	.7	—
939	. . . .	76.5–79.5 ⑧	5.0–7.0	14.0–18.0	1.5	.8 ⑤	.4	.5 ④	—	—
940	QQ–C–390–E2	69.0–72.0 ⑧	12.0–14.0	14.0–16.0	.50	.50–1.0 ⑤	.25	.05 ④	.35	⑭
941	B67	65.0–75.0	4.5–6.5	15.0–22.0	3.0	—	—	—	—	1.0
942	SAE 794	68.5–75.5	3.0–4.0	21.0–25.0	3.0	.50	.35	—	.50	.40
943	B66 (Soft Bronze) B144 (B271)—3E	68.5–73.5 ⑧	4.5–6.0	22.0–25.0	.50	.7 ⑤	.15 ⑬	.05 ④	.7	—
944	B66 (Phos. Bronze)	Rem.	7.0–9.0	9.0–12.0	.7	1.0	1.0	.15	.20-.50	.50
945	B66 (Med. Bronze)	Rem.	6.0–8.0	16.0–22.0	1.2	—	—	—	—	.7

COPPER-TIN-NICKEL ALLOYS (NICKEL-TIN BRONZES)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)									
		Cu	Sn	Pb	Zn	Ni	Fe	Mn	Sb	P	TOTAL OTHER ELEMENTS
947	B292–A	85.0–90.0	4.5–6.0	.10 ⑮	2.5	4.5–6.0	.25	.20	.15	④	.25
948	B292–B	84.0–89.0	4.5–6.0	1.0	2.5	4.5–6.0	.25	.20	.15	④	.25

COPPER-ALUMINUM-IRON AND COPPER-ALUMINUM-IRON-NICKEL ALLOYS (ALUMINUM BRONZES)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)							
		Cu	Pb	Ni	Fe	Al	Si	Mn	TOTAL OTHER ELEMENTS
952	B148 (B271)–9A	86.0 min.	–	–	2.5–4.0	8.5–9.5	–	–	1.0
953	B148 (B271)–9B	86.0 min.	–	–	.8–1.5	9.0–11.0	–	–	1.0
954	B148 (B271)–9C	83.0 min.	–	2.5	3.0–5.0	10.0–11.5	–	.50	.50
955	B148 (B271)–9D	78.0 min.	–	3.0–5.5	3.0–5.0	10.0–11.5	–	3.5	.50
956	B148–9E	88.0 min.	–	.25	–	6.0–8.0	1.8–3.2	–	1.0
957	B148–9F	71.0 min.	.03	1.5–3.0	2.0–4.0	7.0–8.5	.10	11.0–14.0	.50
958	MIL–B–23921	78.0 min.	.02	4.0–5.5 ⑯	3.0–5.0⑯	8.5–9.5	10	3.5	.50

COPPER-NICKEL-IRON ALLOYS (COPPER-NICKELS)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS RANGE OR MINIMUM)							
		Cu	Pb	Ni	Fe	Cb	Si	Mn	Be
962 ⑱	B369–A	Rem.	.03 ⑰	9.0–11.0	1.0–1.8	1.0	.25	1.5	–
963	. . . .	Rem.	.03 ⑰	18.0–22.0	.40–1.0	–	.7	1.0	–
964 ⑱	B369–B	Rem.	.03 ⑰	28.0–32.0	.25–1.5	1.0	.7	1.5	–
966	MIL–C–81519	Rem.	.01	29.0–33.0	.8–1.1	–	.15	1.0	.40–.7

COPPER-NICKEL-ZINC ALLOYS (NICKEL SILVERS)

COPPER ALLOY NO.	OTHER DESIGNATIONS	COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)						
		Cu	Sn	Pb	Ni	Zn	Fe	Mn
973 ⑱	B149 (B271)–10A	53.0–58.0	1.5–3.0	8.0–11.0	11.0–14.0	Rem.	1.5	.50
974	. . . .	58.0–61.0	2.5–3.5	4.5–5.5	15.5–17.0	Rem.	1.5	.50
976 ⑱	B149 (B271)–11A	63.0–67.0	3.5–4.5	3.0–5.0	19.5–21.5	Rem.	1.5	1.0
978 ⑱	B149 (B271)–11B	64.0–67.0	4.0–5.5	1.0–2.5	24.0–27.0	Rem.	1.5	1.0

COPPER-LEAD ALLOYS (LEADED COPPERS)

COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)

COPPER ALLOY NO.	OTHER DESIGNATIONS	Cu	Sn	Pb	Ag	Zn	P	Fe	TOTAL OTHER ELEMENTS
982	SAE 49 MIL–B–13506	73.0–79.0	.50	21.0–27.0	–	–	–	.35	.45
984	SAE 48 MIL–B–13506	67.0–74.0	.25	25.0–32.0	1.5	.10	.02	.35	.15
986	SAE 480 MIL–B–13506	60.0–70.0	.50	30.0–40.0	1.5	–	–	.35	.30
988	SAE 481	56.5–62.5	.25	37.5–42.5	5.5	.10	.02	.35	.30

SPECIAL ALLOYS

COMPOSITION, PER CENT MAXIMUM (UNLESS SHOWN AS A RANGE OR MINIMUM)

COPPER ALLOY NO.	OTHER DESIGNATIONS	Cu	Sn	Pb	Ni	Fe	Al	Co	Si	TOTAL OTHER ELEMENTS
993	Incramet 800	Rem.	.05	.02	13.5–16.5	.40–1.0	10.7–11.5	1.0–2.0	.02	.25

NOTES

① The Alloy No. in the Other Designation column is commonly used as the Brass and Bronze Ingot Institute (B.B.I.I.) designation for the equivalent ingot.

② Ni + Co

③ Ni is a residual element and shall not be intentionally added to the melt.

④ For continuous castings, the maximum P shall be 1.5%.

⑤ In determining Cu minimum, Cu may be calculated as Cu + Ni.

⑥ Including Sn and Pb.

⑦ Sn + Pb + Ni + Mn + Fe; Total 1.0% maximum.

⑧ .20% maximum for each element.

⑨ Cu + Sum of Named Elements

⑩ As, Sb and S shall not exceed .05 percent eac and P .01% maximum.

⑪ Total Pb, Zn and Ni shall be 1.0% maximum.

⑫ Cu + Sn + Ni + P shall be 99.5% minimum

⑬ The Fe shall be .35% maximum when used for ste backed bearings.

⑭ For continuous castings, S shall be .25% maximu and Total Other Elements .35% maximum.

⑮ The mechanical properties in the heat treate condition may not be attained if the Pb content e ceeds .01%.

⑯ Fe content shall not exceed Ni content.

⑰ For welding grades, the Pb shall not exceed .01%

⑱ Ingot for Remelting specifications vary from the ranges shown.

AMERICAN IRON & STEEL INSTITUTE
AISI ALLOY STEELS

STANDARD ALLOY STEELS

LADLE CHEMICAL RANGES AND LIMITS

AISI Number	Chemical Composition Ranges and Limits, per cent								Corresponding SAE Number*
	C	Mn	P Max.	S Max.	Si	Ni	Cr	Mo	
1330	0.28/0.33	1.60/1.90	0.035	0.040	0.20/0.35	—	—	—	1330
1335	0.33/0.38	1.60/1.90	0.035	0.040	0.20/0.35	—	—	—	1335
1340	0.38/0.43	1.60/1.90	0.035	0.040	0.20/0.35	—	—	—	1340
1345	0.43/0.48	1.60/1.90	0.035	0.040	0.20/0.35	—	—	—	1345
4012	0.09/0.14	0.75/1.00	0.035	0.040	0.20/0.35	—	—	0.15/0.25	4012
4023	0.20/0.25	0.70/0.90	0.035	0.040	0.20/0.35	—	—	0.20/0.30	4023
4024	0.20/0.25	0.70/0.90	0.035	0.035/ 0.050	0.20/0.35	—	—	0.20/0.30	4024
4027	0.25/0.30	0.70/0.90	0.035	0.040	0.20/0.35	—	—	0.20/0.30	4027
4028	0.25/0.30	0.70/0.90	0.035	0.035/ 0.050	0.20/0.35	—	—	0.20/0.30	4028
4037	0.35/0.40	0.70/0.90	0.035	0.040	0.20/0.35	—	—	0.20/0.30	4037
4047	0.45/0.50	0.70/0.90	0.035	0.040	0.20/0.35	—	—	0.20/0.30	4047
4118	0.18/0.23	0.70/0.90	0.035	0.040	0.20/0.35	—	0.40/0.60	0.08/0.15	4118
4130	0.28/0.33	0.40/0.60	0.035	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	4130
4137	0.35/0.40	0.70/0.90	0.035	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	4137
4140	0.38/0.43	0.75/1.00	0.035	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	4140
4142	0.40/0.45	0.75/1.00	0.035	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	4142
4145	0.43/0.48	0.75/1.00	0.035	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	4145
4147	0.45/0.50	0.75/1.00	0.035	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	4147
4150	0.48/0.53	0.75/1.00	0.035	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	4150
4161	0.56/0.64	0.75/1.00	0.035	0.040	0.20/0.35	—	0.70/0.90	0.25/0.35	4161
4320	0.17/0.22	0.45/0.65	0.035	0.040	0.20/0.35	1.65/2.00	0.40/0.60	0.20/0.30	4320
4340	0.38/0.43	0.60/0.80	0.035	0.040	0.20/0.35	1.65/2.00	0.70/0.90	0.20/0.30	4340
E4340	0.38/0.43	0.65/0.85	0.025	0.025	0.20/0.35	1.65/2.00	0.70/0.90	0.20/0.30	E4340
4419	0.18/0.23	0.45/0.65	0.035	0.040	0.20/0.35	—	—	0.45/0.60	4419
4615	0.13/0.18	0.45/0.65	0.035	0.040	0.20/0.35	1.65/2.00	—	0.20/0.30	4615
4620	0.17/0.22	0.45/0.65	0.035	0.040	0.20/0.35	1.65/2.00	—	0.20/0.30	4620
4621	0.18/0.23	0.70/0.90	0.035	0.040	0.20/0.35	1.65/2.00	—	0.20/0.30	4621
4626	0.24/0.29	0.45/0.65	0.035	0.040	0.20/0.35	0.70/1.00	—	0.15/0.25	4626
4718	0.16/0.21	0.70/0.90	0.035	0.040	0.20/0.35	0.90/1.20	0.35/0.55	0.30/0.40	4718
4720	0.17/0.22	0.50/0.70	0.035	0.040	0.20/0.35	0.90/1.20	0.35/0.55	0.15/0.25	4720
4815	0.13/0.18	0.40/0.60	0.035	0.040	0.20/0.35	3.25/3.75	—	0.20/0.30	4815
4817	0.15/0.20	0.40/0.60	0.035	0.040	0.20/0.35	3.25/3.75	—	0.20/0.30	4817
4820	0.18/0.23	0.50/0.70	0.035	0.040	0.20/0.35	3.25/3.75	—	0.20/0.30	4820
5015	0.12/0.17	0.30/0.50	0.035	0.040	0.20/0.35	—	0.30/0.50	—	5015
5120	0.17/0.22	0.70/0.90	0.035	0.040	0.20/0.35	—	0.70/0.90	—	5120
5130	0.28/0.33	0.70/0.90	0.035	0.040	0.20/0.35	—	0.80/1.10	—	5130
5132	0.30/0.35	0.60/0.80	0.035	0.040	0.20/0.35	—	0.75/1.00	—	5132
5135	0.33/0.38	0.60/0.80	0.035	0.040	0.20/0.35	—	0.80/1.05	—	5135
5140	0.38/0.43	0.70/0.90	0.035	0.040	0.20/0.35	—	0.70/0.90	—	5140
5145	0.43/0.48	0.70/0.90	0.035	0.040	0.20/0.35	—	0.70/0.90	—	5145
5147	0.46/0.51	0.70/0.95	0.035	0.040	0.20/0.35	—	0.85/1.15	—	5147
5150	0.48/0.53	0.70/0.90	0.035	0.040	0.20/0.35	—	0.70/0.90	—	5150
5155	0.51/0.59	0.70/0.90	0.035	0.040	0.20/0.35	—	0.70/0.90	—	5155
5160	0.56/0.64	0.75/1.00	0.035	0.040	0.20/0.35	—	0.70/0.90	—	5160
E51100	0.98/1.10	0.25/0.45	0.025	0.025	0.20/0.35	—	0.90/1.15	—	51100
E52100	0.98/1.10	0.25/0.45	0.025	0.025	0.20/0.35	—	1.30/1.60	—	52100

* Society of Automotive Engineers, Inc

(continued)

(concluded)

AISI Number	C	Mn	P Max.	S Max.	Si	Ni	Cr	Mo	Corresponding SAE Number*
	Chemical Composition Ranges and Limits, per cent								
								V	
6118	0.16/0.21	0.50/0.70	0.035	0.040	0.20/0.35	—	0.50/0.70	0.10/0.15	6118
6150	0.48/0.53	0.70/0.90	0.035	0.040	0.20/0.35	—	0.80/1.10	0.15 Min.	6150
								Mo	
8615	0.13/0.18	0.70/0.90	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8615
8617	0.15/0.20	0.70/0.90	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8617
8620	0.18/0.23	0.70/0.90	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8620
8622	0.20/0.25	0.70/0.90	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8622
8625	0.23/0.28	0.70/0.90	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8625
8627	0.25/0.30	0.70/0.90	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8627
8630	0.28/0.33	0.70/0.90	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8630
8637	0.35/0.40	0.75/1.00	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8637
8640	0.38/0.43	0.75/1.00	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15/$.25	8640
8642	0.40/0.45	0.75/1.00	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8642
8645	0.43/0.48	0.75/1.00	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15:0.25	8645
8655	0.51/0.59	0.75/1.00	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8655
8720	0.18/0.23	0.70/0.90	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.20/0.30	8720
8740	0.38/0.43	0.75/1.00	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.20/0.30	8740
8822	0.20/0.25	0.75/1.00	0.035	0.040	0.20/0.35	0.40/0.70	0.40/0.60	0.30/0.40	8822
9254	0.51/0.59	0.60/0.80	0.035	0.040	1.20/1.60	—	0.60/0.80	—	9254
9255	0.51/0.59	0.70/0.95	0.035	0.040	1.80/2.20	—	—	—	9255
9260	0.56/0.64	0.75/1.00	0.035	0.040	1.80/2.20	—	—	—	9260
STANDARD BORON STEELS									
These steels can be expected to have 0.0005 per cent minimum boron content.									
50B44	0.43/0.48	0.75/1.00	0.035	0.040	0.20/0.35	—	0.40/0.60	—	50B44
50B46	0.44/0.49	0.75/1.00	0.035	0.040	0.20/0.35	—	0.20/0.35	—	50B46
50B50	0.48/0.53	0.75/1.00	0.035	0.040	0.20/0.35	—	0.40/0.60	—	50B50
50B60	0.56/0.64	0.75/1.00	0.035	0.040	0.20/0.35	—	0.40/0.60	—	50B60
51B60	0.56/0.64	0.75/1.00	0.035	0.040	0.20/0.35	—	0.70/0.90	—	51B60
81B45	0.43/0.48	0.75/1.00	0.035	0.040	0.20/0.35	0.20/0.40	0.35/0.55	0.08/0.15	81B45
94B17	0.15/0.20	0.75/1.00	0.035	0.040	0.20/0.35	0.30/0.60	0.30/0.50	0.08/0.15	94B17
94B30	0.28/0.33	0.75/1.00	0.035	0.040	0.20/0.35	0.30/0.60	0.30/0.50	0.08/0.15	94B30

* Society of Automotive Engineers, Inc.

Note 1. Grades shown in the above list with prefix letter E are normally made only by the basic electric furnace process. All others are normally manufactured by the basic open hearth or basic oxygen processes but may be manufactured by a basic electric furnace process.

Note 2. The phosphorus and sulphur limitations for each process are as follows:

	Maximum per cent	
	P	S
Basic electric	0.025	0.025
Basic open hearth or basic oxygen	0.035	0.040

Note 3. Small quantities of certain elements, which are not specified or required, are present in alloy steels. These elements are considered as incidental and may be present to the following maximum amounts: Copper, 0.35 per cent; Nickel, 0.25 per cent; Chromium, 0.20 per cent; Molybdenum, 0.06 per cent.

Note 4. Where minimum and maximum sulphur content is shown it is indicative of resulphurized steel.

Note 5. The chemical ranges and limits shown in Table 6-1 are produced to check analysis tolerances shown in Table 6-3.

Note 6. Standard alloy steels can be produced with a lead range of 0.15/0.35 per cent. Such steels are identified by inserting the letter "L" between the second and third numerals of the AISI number, e.g., 41L40. A ladle analysis for lead is not determinable, since lead is added to the ladle stream while each ingot is poured.

AMERICAN IRON & STEEL INSTITUTE
AISI TOOL STEELS

IDENTIFICATION AND TYPE CLASSIFICATION OF TOOL STEELS WITH TYPICAL APPLICATIONS

HIGH SPEED TOOL STEELS

Symbol M, Molybdenum Types

The high speed steels listed under the letter symbol M are generally considered to have molybdenum as the principal alloying element, although several contain an equal or a slightly greater amount of such elements as tungsten or cobalt. Those types with higher carbon and vanadium contents generally offer improved abrasion resistance, but machinability and grindability may be adversely affected. The series beginning with M41 is characterized by the capability of attaining exceptionally high hardness in heat treatment.

Typical applications.

- Broaches
- Chasers
- Cheeking Tools
- Drills
- End Mills
- Hobs
- Lathe Tools
- Milling Cutters
- Planer Tools
- Punches
- Reamers
- Routers
- Saws
- Taps
- Woodworking Tools

In addition to the above cutting tools, some of these high speed steels are successfully used for such cold work applications as cold header die inserts, thread rolling dies, punches, and blanking dies. For such applications, the high speed steels are frequently hardened from a lower than normal temperature (i.e. underhardened) to increase toughness.

It should be recognized that because of differences in properties, availability, and economic considerations, all of these steels should not be considered for each application.

Type	Identifying Elements, in Per Cent							
	C	Mn	Si	W	Mo	Cr	V	Co
M1	.80*	—	—	1.50	8.00	4.00	1.00	—
M2	.85; 1.00*	—	—	6.00	5.00	4.00	2.00	—
M3 Class 1	1.05	—	—	6.00	5.00	4.00	2.40	—
M3 Class 2	1.20	—	—	6.00	5.00	4.00	3.00	—
M4	1.30	—	—	5.50	4.50	4.00	4.00	—
M6	.80	—	—	4.00	5.00	4.00	1.50	12.00
M7	1.00	—	—	1.75	8.75	4.00	2.00	—
M10	85; 1.00*	—	—	—	8.00	4.00	2.00	—
M30	.80	—	—	2.00	8.00	4.00	1.25	5.00
M33	.90	—	—	1.50	9.50	4.00	1.15	8.00
M34	.90	—	—	2.00	8.00	4.00	2.00	8.00
M36	.80	—	—	6.00	5.00	4.00	2.00	8.00
M41	1.10	—	—	6.75	3.75	4.25	2.00	5.00
M42	1.10	—	—	1.50	9.50	3.75	1.15	8.00
M43	1.20	—	—	2.75	8.00	3.75	1.60	8.25
M44	1.15	—	—	5.25	6.25	4.25	2.25	12.00
M46	1.25	—	—	2.00	8.25	4.00	3.20	8.25
M47	1.10	—	—	1.50	9.50	3.75	1.25	5.00

NOTE 1. Some of the types can be produced with a sulphur addition to improve machinability.

* Other carbon contents may be available.

(Continued)

IDENTIFICATION AND TYPE CLASSIFICATION OF TOOL STEELS WITH TYPICAL APPLICATIONS

Symbol T, Tungsten Types

The high speed steels listed under the letter symbol T have tungsten as the principal alloying element. They are more resistant to decarburization in heat treatment than the molybdenum types, and are usually hardened from higher temperatures.

Typical applications. Similar to those listed for the molybdenum types.

Type	Identifying Elements, in Per Cent							
	C	Mn	Si	W	Mo	Cr	V	Co
T1	.75*	—	—	18.00	—	4.00	1.00	—
T2	.80	—	—	18.00	—	4.00	2.00	—
T4	.75	—	—	18.00	—	4.00	1.00	5.00
T5	.80	—	—	18.00	—	4.00	2.00	8.00
T6	.80	—	—	20.00	—	4.50	1.50	12.00
T8	.75	—	—	14.00	—	4.00	2.00	5.00
T15	1.50	—	—	12.00	—	4.00	5.00	5.00

NOTE 1. Some of the types can be produced with a sulphur addition to improve machinability.
* Other carbon contents may be available.

HOT WORK TOOL STEELS

Symbol H

H1-H19, incl., Chromium Types

These hot work steels are referred to as chromium types, although there may be other significant alloying elements present. The types containing molybdenum, H10, H11, H12 and H13, are the most widely used of all the hot work steels, and are characterized by high hardenability and excellent toughness. They offer the best selection from warehouse stocks.

The chromium-tungsten type H14 and the chromium-tungsten-cobalt type H19 offer greater resistance to softening, but are less ductile in service, and are not as readily available from stock.

Typical hot work applications.

- Bolsters
- Die Casting Dies
- Dummy Blocks
- Extrusion Dies
- Forging Dies
- Gripper Dies
- Hot Header Dies
- Mandrels
- Punches
- Piercing Tools

In addition to the above hot work tooling, some of these hot work steels are used for cold work applications requiring exceptional toughness at high hardness levels. Such uses may include coining dies, forming rolls, and header die casings.

Type	Identifying Elements, in Per Cent							
	C	Mn	Si	W	Mo	Cr	V	Co
H10	.40	—	—	—	2.50	3.25	.40	—
H11	.35	—	—	—	1.50	5.00	.40	—
H12	.35	—	—	1.50	1.50	5.00	.40	—
H13	.35	—	—	—	1.50	5.00	1.00	—
H14	.40	—	—	5.00	—	5.00	—	—
H19	.40	—	—	4.25	—	4.25	2.00	4.25

NOTE 1. Some of the types can be produced with a sulphur addition to improve machinability.

(Continued)

IDENTIFICATION AND TYPE CLASSIFICATION OF TOOL STEELS WITH TYPICAL APPLICATIONS

HOT WORK TOOL STEELS

Symbol H

H20-H39, incl., Tungsten Types

The tungsten types are intended for those hot work applications where resistance to the softening effect of elevated temperature is of greatest importance, and a lesser degree of toughness can be tolerated.

Typical hot work applications.

Hot Blanking Dies	Gripper Dies	Punches
Dummy Blocks	Mandrels	Hot Shear Blades
Extrusion Dies	Piercer Points	Hot Trim Dies

Type	Identifying Elements, in Per Cent							
	C	Mn	Si	W	Mo	Cr	V	Co
H21	.35	—	—	9.00	—	3.50	—	—
H22	.35	—	—	11.00	—	2.00	—	—
H23	.30	—	—	12.00	—	12.00	—	—
H24	.45	—	—	15.00	—	3.00	—	—
H25	.25	—	—	15.00	—	4.00	—	—
H26	.50	—	—	18.00	—	4.00	1.00	—

H40-H59, incl., Molybdenum Types

The molybdenum types are low carbon modifications of molybdenum high speed steels. They offer excellent resistance to the softening effect of elevated temperature, but, like the tungsten types, should be restricted to those applications where less ductility is acceptable. They are generally not readily available except on a mill delivery basis.

Typical applications. Similar to those listed for the tungsten types.

Type	Identifying Elements, in Per Cent							
	C	Mn	Si	W	Mo	Cr	V	Co
H41	.65	—	—	1.50	8.00	4.00	1.00	—
H42	.60	—	—	6.00	5.00	4.00	2.00	—
H43	.55	—	—	—	8.00	4.00	2.00	—

(Continued)

IDENTIFICATION AND TYPE CLASSIFICATION OF TOOL STEELS WITH TYPICAL APPLICATIONS

COLD WORK TOOL STEELS

Symbol D, High Carbon High Chromium Types

The cold work tool steels listed under the letter symbol D are all characterized by high carbon content, from 1.00 to 2.35 per cent, and nominally 12 per cent chromium. The types containing molybdenum are air hardening and therefore offer a high degree of dimensional stability in heat treatment. The D series exhibit high wear resistance, which increases with increasing carbon and vanadium content.

Typical applications.

Blanking Dies
Burnishing Tools
Cold Forming Dies
Drawing Dies

Gages
Knurls
Lamination Dies
Punches

Rolls
Shear Knives
Slitter Knives
Thread Rolling Dies

The final selection is dependent upon differences in properties, availability, production requirements, and economic considerations.

Type	Identifying Elements, in Per Cent								
	C	Mn	Si	W	Mo	Cr	V	Co	Ni
D2	1.50	—	—	—	1.00	12.00	1.00	—	—
D3	2.25	—	—	—	—	12.00	—	—	—
D4	2.25	—	—	—	1.00	12.00	—	—	—
D5	1.50	—	—	—	1.00	12.00	—	3.00	—
D7	2.35	—	—	—	1.00	12.00	4.00	—	—

NOTE 1. Some of the types can be produced with a sulphur addition to improve machinability

Symbol A, Medium Alloy Air Hardening Types

The cold work tool steels listed under the letter symbol A cover a wide range of carbon and alloy contents, but all have high hardenability and exhibit a high degree of dimensional stability in heat treatment. The low carbon types A8 and A9 offer greater shock resistance than the other steels in this group, but are lower in their resistance to wear. Type A7, which has high carbon and vanadium, exhibits maximum abrasion resistance, but should be restricted to applications where lower toughness will not be detrimental, such as brick mold liners, gages and wear parts.

Typical applications.

Blanking Dies
Coining Dies
Cold Forming Tools
Forming Dies

Knurls
Mandrels
Master Hubs
Molds

Rolls
Shear Knives
Slitter Knives
Spindles

It should be recognized that because of the wide differences in properties and availability, all of these steels should not be considered for each application.

(Continued)

IDENTIFICATION AND TYPE CLASSIFICATION OF TOOL STEELS WITH TYPICAL APPLICATIONS

Symbol A, Medium Alloy Air Hardening Types (Continued)

Type	Identifying Elements, in Per Cent								
	C	Mn	Si	W	Mo	Cr	V	Co	Ni
A2	1.00	—	—	—	1.00	5.00	—	—	—
A3	1.25	—	—	—	1.00	5.00	1.00	—	—
A4	1.00	2.00	—	—	1.00	1.00	—	—	—
A6	.70	2.00	—	—	1.25	1.00	—	—	—
A7	2.25	—	—	1.00*	1.00	5.25	4.75	—	—
A8	.55	—	—	1.25	1.25	5.00	—	—	—
A9	.50	—	—	—	1.40	5.00	1.00	—	1.50
A10**	1.35	1.80	1.25	—	1.50	—	—	—	1.80

NOTE 1. Some of the types can be produced with a sulphur or lead addition to improve machinability.

* Optional.

** Contains free graphite in the microstructure to improve machinability.

Symbol O, Oil Hardening Types

The cold work tool steels listed under the letter symbol O are all low alloy types that must be oil quenched in heat treatment. Sizes up to about 2 to 2½ inches will usually reach full hardness throughout the cross section, but larger sizes may exhibit lower hardness in the interior. They are generally available from warehouse stocks and are widely used.

Typical applications.

Blanking Dies
Cams
Coining Dies
Drawing Dies
Forming Dies
Gages
Machine Ways
Plastic Mold Dies
Shear Blades
Trim Dies

Type	Identifying Elements, in Per Cent								
	C	Mn	Si	W	Mo	Cr	V	Co	Ni
O1	.90	1.00	—	.50	—	.50	—	—	—
O2	.90	1.60	—	—	—	—	—	—	—
O6*	1.45	—	1.00	—	.25	—	—	—	—
O7	1.20	—	—	1.75	—	75	—	—	—

* Contains free graphite in the microstructure to improve machinability.

(Continued)

IDENTIFICATION AND TYPE CLASSIFICATION OF TOOL STEELS WITH TYPICAL APPLICATIONS

SHOCK RESISTING TOOL STEELS

Symbol S

The shock resisting tool steels are listed under the letter symbol S. There is considerable variation in their alloy content and hardenability, but all are intended for applications requiring high toughness and resistance to shock loading.

Typical applications.

- Chipping Chisels
- Circular Pipe Cutters
- Drift Pins
- Grippers
- Hand Chisels
- Knock Out Pins
- Mandrels
- Punches
- Rivet Sets
- Screw Driver Blades
- Shear Blades
- Stamps
- Track Tools

Type	Identifying Elements, in Per Cent									
	C	Mn	Si	W	Mo	Cr	V	Co	Ni	Al
S1	.50	—	—	2.50	—	1.50	—	—	—	—
S2	.50	—	1 00	—	.50	—	—	—	—	—
S5	.55	.80	2.00	—	.40	—	—	—	—	—
S7	.50	—	—	—	1.40	3.25	—	—	—	—

MOLD STEELS

Symbol P

The steels listed under the letter symbol P are generally intended for mold applications. The types P2-P6 are very low in carbon content, and are usually supplied at very low hardness to facilitate cold hubbing of the impression. They are then carburized to develop the required surface properties for injection and compression molds for plastics.

The types P20 and P21 are usually supplied in the prehardened condition, so that the cavity can be machined and the mold placed directly in service. They may be used for plastic molds, zinc die casting dies, and holder blocks.

Type	Identifying Elements, in Per Cent									
	C	Mn	Si	W	Mo	Cr	V	Co	Ni	Al
P2	.07	—	—	—	20	2.00	—	—	.50	—
P3	.10	—	—	—	—	60	—	—	1 25	—
P4	.07	—	—	—	.75	5 00	—	—	—	—
P5	.10	—	—	—	—	2 25	—	—	—	
P6	10	—	—	—	—	1.50	—	—	3 50	—
P20	.35	—	—	—	40	1.25	—	—	—	—
P21	.20	—	—	—	—	—	—	—	4.00	1 20

(Continued)

IDENTIFICATION AND TYPE CLASSIFICATION OF TOOL STEELS WITH TYPICAL APPLICATIONS

SPECIAL PURPOSE TOOL STEELS

Symbol L, Low Alloy Types

The tool steels listed under the letter symbol L cover a wide range of alloy content and physical
perties, and are intended for special applications. Type L6 and the low carbon version of L2 are gen-
lly used for machine parts and in applications where toughness is an important consideration. The
h carbon type L3 may be used for relatively short-run and special purpose tools and dies.

Typical applications.

Low Carbon Types

- Arbors
- Brake Dies
- Cams
- Chucks
- Collets
- Drift Pins
- Jigs
- Machine Tool Parts
- Pinions
- Punches
- Rivet Sets
- Rolls
- Spindles
- Wrenches

High Carbon Types

- Arbors
- Dies
- Drills
- Gages
- Knife Edges
- Knurls
- Rolls
- Taps

ype	Identifying Elements, in Per Cent								
	C	Mn	Si	W	Mo	Cr	V	Co	Ni
2	.50/1.10**	—	—	—	—	1.00	.20	—	—
3	1.00	—	—	—	—	1.50	.20	—	—
6	.70	—	—	—	.25*	.75	—	—	1.50

ptional.
arious carbon contents are available.

Symbol F, Carbon Tungsten Types

The tool steels listed under the letter symbol F are all high carbon with varying tungsten content.
F1 type is used for relatively short-run fine cutting edge tools, such as broaches, reamers, and taps.
higher tungsten type F2 is used where high wear resistance and keen cutting edge capability are
ired.

Typical applications.

- Burnishing Tools
- Draw Dies
- Forming Dies
- Finishing Tools
- Quills
- Roll Turning Tools

e	Identifying Elements, in Per Cent								
	C	Mn	Si	W	Mo	Cr	V	Co	Ni
	1.00	—	—	1.25	—	—	—	—	—
	1.25	—	—	3.50	—	—	—	—	—

(Concluded)

IDENTIFICATION AND TYPE CLASSIFICATION OF TOOL STEELS WITH TYPICAL APPLICATIONS

WATER HARDENING TOOL STEELS

Symbol W

The tool steels listed under the letter symbol W are plain carbon steels, and are among the le expensive of tool steels. They must be water quenched to attain the necessary hardness, and except very small sizes, will harden with a hard case and a soft core. They may be used for a wide variety tools, as indicated below, but their limitations must be recognized, and discussion of the applicati with the producer is strongly recommended.

Typical applications.

- Axes
- Blanking Dies
- Cold Heading Dies
- Cold Striking Dies
- Countersinks
- Drills
- Files
- Forming Dies
- Jewelers Dies
- Reamers
- Taps
- Woodworking Tools

Type	Identifying Elements, in Per Cent								
	C	Mn	Si	W	Mo	Cr	V	Co	Ni
W1	.60/1.40*	—	—	—	—	—	—	—	—
W2	.60/1.40*	—	—	—	—	—	.25	—	—
W5	1.10	—	—	—	—	.50	—	—	—

* Various carbon contents are available.

SOME CHARACTERISTICS AND TYPICAL APPLICATIONS FOR SPECIFIC TYPES OF FLAT ROLLED ELECTRICAL STEEL

AISI Type No.	Some Characteristics*	Typical Applications
M-4 M-5 M-6	Highly directional magnetic properties due to grain orientation. Very low core loss and high permeability in rolling direction.	Highest efficiency power and distribution transformers with lower weight per kva.
M-7 M-8	Grain oriented but properties are less directional than M-6.	Large generators and power transformers.
M-14	Lowest core loss conventional grade. High permeability at low induction but it is low at high induction. Comparatively brittle.	Distribution and power transformers and rotating machines of high efficiency.
M-15	Characteristics depend upon which of two annealing processes is used. The open annealed lower silicon product is quite ductile.	Punchings requiring low core loss and excellent permeability at low and moderate induction.
M-19	Usually more ductile than types of lower core loss. Moderately high permeability at all inductions.	Communication transformers and reactors. High efficiency fractional horsepower motors.

(continued)

SOME CHARACTERISTICS AND TYPICAL APPLICATIONS FOR SPECIFIC TYPES OF FLAT ROLLED ELECTRICAL STEEL

AISI Type No.	Some Characteristics*	Typical Applications
M-22	Ductile. Relatively good punching properties.	Cores of high reactance, stators of high efficiency rotating electrical equipment, intermittent-duty transformers, and magnetos.
M-27	Ductile. Relatively good punching properties.	Continuous duty, high efficiency motors. Small transformers operating at moderate induction.
M-36	Ductile. Excellent permeability at high induction.	Used extensively for rotating machines including alternating current and direct current motors.
M-43	Ductile. High core loss but good permeability at high induction.	Suitable for fractional horsepower motors, pole pieces and relays.
M-45	Ductile. High core loss but good permeability at high induction.	Suitable for fractional horsepower motors, pole pieces and relays.
M-47	Ductile. High core loss but good permeability at high induction.	Used for intermittently operating electrical apparatus and pole pieces.

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*Core loss is considered the principal measure of quality for flat rolled electrical steel. Tests for other properties, such a permeability, lamination factor, electrical resistivity, interlamination resistance, aging, ductility, tensile strength an hardness are sometimes required. Methods for performing tests are described in ASTM Designation: A34.

Maximum Core Losses

FULLY PROCESSED—CONVENTIONAL TYPES

Hot Rolled and Cold Rolled Flat Rolled Electrical Steel

Losses determined according to ASTM A34 and A343

	Maximum Core Losses* in Watts Per Pound at 60 Cycles Per Second (Hertz)					
Electrical Steel Standard Gage No.	29	26	24	29	26	24
Thickness, Inch	.0140	.0185	.0250	.0140	.0185	.0250
Type No.	15 Kilogausses			10 Kilogausses		
M-14	1.30	—	—	0.52	—	—
M-15	1.45	1.70	—	0.58	0.68	—
M-19	1.64	1.86	2.10	0.67	0.76	0.91
M-22	1.77	1.97	2.23	0.73	0.83	0.98
M-27	1.92	2.14	2.45	0.81	0.93	1.10
M-36	2.15	2.38	2.84	0.92	1.06	1.24
M-43	2.70	2.92	3.35	1.15	1.25	1.45
M-45	—	3.47	4.00	—	1.45	1.74
M-47	—	4.60	5.75	—	2.30	2.70

* Specimens not annealed after shearing (AS).

NOTE: 1. Core losses are commonly specified at inductions of either 15 kilogausses or 10 kilogausses, but not at both, o specimens one half parallel and one half transverse to direction of rolling.

NOTE: 2. To convert the above values to *watts per pound at 50 cycles per second (hertz)* multiply values shown by 0.7

NOTE: 3. To convert the above values to *watts per kilogram at 60 cycles per second (hertz)* multiply values shown b 2.204.

Maximum Core Losses

SEMIPROCESSED—CONVENTIONAL TYPES

Hot Rolled and Cold Rolled Flat Rolled Electrical Steel

Losses determined according to ASTM A34 and A343

	Maximum Core Losses* in Watts Per Pound at 60 cycles Per Second (Hertz)					
Electrical Steel Standard Gage No.	29	26	24	29	26	24
Thickness, Inch	.0140	.0185	.0250	0140	.0185	.0250
Type No.	**15 Kilogausses**			**10 Kilogausses**		
M-22	1.82	1.90	2.10	0.76	0.80	0.93
M-27	1.99	2.03	2.25	0.84	0.88	1.00
M-36	2.14	2.17	2.50	0.94	0.95	1.08
M-43	2.52	2.67	3.06	1.11	1.15	1.30
M-45	—	3.08	3.50	—	1.29	1.51
M-47	—	3.50	4.20	—	1.52	1.75

* Core loss is determined after a quality evaluation anneal This anneal is performed on the specimen using a suitable atmosphere and a specimen soak temperature of 1550F for approximately one hour, except for M47, where 1450 F for approximately one hour applies

NOTE 1. Core losses are commonly specified at inductions of either 15 kilogausses or 10 kilogausses, but not at both, on specimens one half parallel and one half transverse to direction of rolling

NOTE 2. To convert the above values to *watts per pound at 50 cycles per second (hertz)* multiply values shown by 0 79

NOTE 3. To convert the above values to *watts per kilogram at 60 cycles per second (hertz)* multiply values shown by 2.204.

Maximum Core Losses

GRAIN ORIENTED TYPES

Flat Rolled Electrical Steel

Losses determined according to ASTM A34 and A343

	Maximum Core Losses* in Watts Per Pound at 60 Cycles Per Second (Hertz)		
Thickness, Inch	011	.012	.014
Thickness, Millimeter	.28	30	.36
Type No.	**15 Kilogausses**		
M-4	0.53	—	—
M-5	0.57	0.58	0.60
M-6	0.63	0.64	0.66
M-7	—	0.71	0.73
M-8	—	0.78	0.80

* Specimens cut parallel to direction of rolling and stress relief annealed at 1450 F for approximately one hour

NOTE: 1 To convert the above values to *watts per pound at 50 cycles per second (hertz)* multiply values shown by 0.76.

NOTE: 2. To convert the above values to *watts per kilogram at 60 cycles per second (hertz)* multiply values shown by 2.204.

NOTE: 3. To convert the above values to *watts per kilogram at 50 cycles per second (hertz)* multiply values shown by 1.675.

ALLOY STEEL FOR PLATES

ASTM Specification Designations

Designation	Grade	Thickness, Inch	Chemical Composition Ranges and Limits, Per Cent														
			C	Mn	P Max.	S Max.	Si	Cr	Ni	Mo	V	Ti	Zr	Cu	B	Co	Al
A 202	A		0.17 Max.	1.05-1.40	0.035	0.04	0.60-0.90	0.35-0.60									
	B		0.25 Max.	1.05-1.40	0.035	0.04	0.60-0.90	0.35-0.60									
A 203	A	Up to 2, incl.	0.17 Max.	0.70 Max.	0.035	0.04	0.15-0.30		2.10-2.50								
		Over 2 to 4, incl.	0.20 Max.	0.80 Max.	0.035	0.04	0.15-0.30		2.10-2.50								
		Over 4 to 6, incl	0.23 Max.	0.80 Max.	0.035	0.04	0.15-0.30		2.10-2.50								
	B	Up to 2, incl	0.21 Max.	0.70 Max.	0.035	0.04	0.15-0.30		2.10-2.50								
		Over 2 to 4, incl.	0.24 Max	0.80 Max.	0.035	0.04	0.15-0.30		2.10-2.50								
		Over 4 to 6, incl.	0.25 Max	0.80 Max.	0.035	0.04	0.15-0.30		2.10-2.50								
	D	Up to 2, incl.	0.17 Max.	0.70 Max.	0.035	0.04	0.15-0.30		3.25-3.75								
		Over 2 to 4, incl.	0.20 Max.	0.80 Max.	0.035	0.04	0.15-0.30		3.25-3.75								
	E	Up to 2, incl.	0.20 Max.	0.70 Max.	0.035	0.04	0.15-0.30		3.25-3.75								
		Over 2 to 4, incl.	0.23 Max.	0.80 Max.	0.035	0.04	0.15-0.30		3.25-3.75								
A 204	A	1 and under	0.18 Max.	0.90 Max.	0.035	0.04	0.15-0.30			0.45-0.60							
		Over 1 to 2, incl.	0.21 Max	0.90 Max.	0.035	0.04	0.15-0.30			0.45-0.60							
		Over 2 to 4, incl.	0.23 Max.	0.90 Max.	0.035	0.04	0.15-0.30			0.45-0.60							
		Over 4 to 6, incl.	0.25 Max.	0.90 Max.	0.035	0.04	0.15-0.30			0.45-0.60							
	B	1 and under	0.20 Max.	0.90 Max.	0.035	0.04	0.15-0.30			0.45-0.60							
		Over 1 to 2, incl.	0.23 Max.	0.90 Max	0.035	0.04	0.15-0.30			0.45-0.60							
		Over 2 to 4, incl.	0.25 Max	0.90 Max.	0.035	0.04	0.15-0.30			0.45-0.60							
		Over 4 to 6, incl.	0.27 Max	0.90 Max.	0.035	0.04	0.15-0.30			0.45-0.60							
	C	1 and under	0.23 Max	0.90 Max.	0.035	0.04	0.15-0.30			0.45-0.60							
		Over 1 to 2, incl.	0.26 Max.	0.90 Max.	0.035	0.04	0.15-0.30			0.45-0.60							
		Over 2 to 4, incl.	0.28 Max.	0.90 Max.	0.035	0.04	0.15-0.30			0.45-0.60							
A 225	A		0.18 Max.	1.45 Max.	0.035	0.04	0.15-0.30				0.09-0.14						
	B		0.20 Max.	1.45 Max.	0.035	0.04	0.15-0.30				0.09-0.14						
A 302	A	1 and under	0.20 Max.	0.95-1.30	0.035	0.040	0.15-0.30			0.45-0.60							
		Over 1 to 2, incl.	0.23 Max.	0.95-1.30	0.035	0.040	0.15-0.30			0.45-0.60							
		Over 2	0.25 Max.	0.95-1.30	0.035	0.040	0.15-0.30			0.45-0.60							
	B	1 and under	0.20 Max.	1.15-1.50	0.035	0.040	0.15-0.30			0.45-0.60							
		Over 1 to 2, incl.	0.23 Max.	1.15-1.50	0.035	0.040	0.15-0.30			0.45-0.60							
		Over 2	0.25 Max	1.15-1.50	0.035	0.040	0.15-0.30			0.45-0.60							
	C	1 and under	0.20 Max	1.15-1.50	0.035	0.040	0.15-0.30		0.40-0.70	0.45-0.60							
		Over 1 to 2, incl	0.23 Max.	1.15-1.50	0.035	0.040	0.15-0.30		0.40-0.70	0.45-0.60							
		Over 2	0.25 Max.	1.15-1.50	0.035	0.040	0.15-0.30		0.40-0.70	0.45-0.60							
	D	1 and under	0.20 Max.	1.15-1.50	0.035	0.040	0.15-0.30		0.70-1.00	0.45-0.60							
		Over 1 to 2, incl.	0.23 Max.	1.15-1.50	0.035	0.040	0.15-0.30		0.70-1.00	0.45-0.60							
		Over 2	0.25 Max.	1.15-1.50	0.035	0.040	0.15-0.30		0.70-1.00	0.45-0.60							
A 353			0.13 Max.	0.90 Max.	0.035	0.040	0.15-0.30		8.50-9.50								
A 387 *Group I*	A		0.21 Max.	0.55-0.80	0.035	0.040	0.15-0.30	0.50-0.80		0.45-0.60							
	B		0.17 Max.	0.40-0.65	0.035	0.040	0.15-0.30	0.80-1.15		0.45-0.60							
	C		0.17 Max.	0.40-0.65	0.035	0.040	0.50-0.80	1.00-1.50		0.45-0.65							
Group II	D		0.15 Max.	0.30-0.60	0.035	0.035	0.15-0.30	2.00-2.50		0.90-1.10							
	E		0.15 Max.	0.30-0.60	0.035	0.035	0.15-0.30	2.75-3.25		0.90-1.10							

Concluded

Designation†	Grade	Thickness, Inch	C	Mn	P Max	S Max	Si	Cr	Ni	Mo	V	Ti	Zr	Cu	B	Co	Al
			Chemical Composition Ranges and Limits, Per Cent														
A 514 and A 517	A		0.15-0.21	0.80-1.10	0.035	S Max for A 514 0.04 S Max for A 517: 0.040	0.40-0.80	0.50-0.80		0.18-0.28			0.05-0.15		0.0025 Max.		
	B-514		0.12-0.21	0.70-1.00	0.035		0.20-0.35	0.40-0.65		0.15-0.25	0.03-0.08	0.01-0.03			0.0005-0.005		
	B-517		0.15-0.21	0.70-1.00	0.035		0.20-0.35	0.40-0.65		0.15-0.25	0.03-0.08	0.01-0.03			0.0005-0.005		
	C		0.10-0.20	1.10-1.50	0.035		0.15-0.30			0.20-0.30					0.001-0.005		
	D		0.13-0.20	0.40-0.70	0.035		0.20-0.35	0.85-1.20		0.15-0.25	*	0.04-0.10		0.20-0.40	0.0015-0.005		
	E		0.12-0.20	0.40-0.70	0.035		0.20-0.35	1.40-2.00		0.40-0.60	*	0.04-0.10		0.20-0.40	0.0015-0.005		
	F		0.10-0.20	0.60-1.00	0.035		0.15-0.35	0.40-0.65	0.70-1.00	0.40-0.60	0.03-0.08			0.15-0.50	0.002-0.006		
	G		0.15-0.21	0.80-1.10	0.035		0.50-0.90	0.50-0.90		0.40-0.60			0.05-0.15		0.0025 Max.		
	H-514		0.12-0.21	0.95-1.30	0.035		0.20-0.35	0.40-0.65	0.30-0.70	0.20-0.30	0.03-0.08				0.0005-0.005		
	H-517		0.12-0.21	0.95-1.30	0.035		0.20-0.35	0.40-0.65	0.30-0.70	0.20-0.30	0.03-0.08				0.0005 Min.		
	J		0.12-0.21	0.45-0.70	0.035		0.20-0.35			0.50-0.65					0.001-0.005		
	K		0.10-0.20	1.10-0.50	0.035		0.15-0.30			0.45-0.55					0.001-0.005		
	L		0.13-0.20	0.40-0.70	0.035		0.20-0.35	1.15-1.65		0.25-0.40	*	0.04-0.10		0.20-0.40	0.0015-0.005		
	M		0.12-0.21	0.45-0.70	0.035		0.20-0.35		1.20-1.50	0.45-0.60					0.001-0.005		
	N-514 only		0.15-0.21	0.80-1.10	0.035		0.40-0.90	0.50-0.80		0.25 Max.			0.05-0.15		0.0005-0.0025		
	P		0.12-0.21	0.45-0.70	0.035		0.20-0.35	0.85-1.20	1.20-1.50	0.45-0.60					0.001-0.005		
A 533	A		0.25 Max	1.15-1.50	0.035	0.040	0.15-0.30			0.45-0.60	**						
	B		0.25 Max.	1.15-1.50	0.035	0.040	0.15-0.30		0.40-0.70	0.45-0.60							
	C		0.25 Max.	1.15-1.50	0.035	0.040	0.15-0.30		0.70-1.00	0.45-0.60							
	D		0.25 Max	1.15-1.50	0.035	0.040	0.15-0.30		0.20-0.40	0.45-0.60							
A 538	A		0.03 Max	0.10 Max	0.010	0.010	0.10 Max		17.0-19.0	4.0-4.5		0.10-0.25				7.0-8.5	0.05-0.15
	B		0.03 Max	0.10 Max	0.010	0.010	0.10 Max		17.0-19.0	4.6-5.1		0.30-0.50				7.0-8.5	0.05-0.15
	C		0.03 Max	0.10 Max	0.010	0.010	0.10 Max.		18.0-19.0	4.6-5.2		0.55-0.80				8.0-9.5	0.05-0.15
A 542			0.15 Max	0.30-0.60	0.035	0.035	0.15-0.30	2.00-2.50		0.90-1.10							
A 543	A	Up to 4, incl	0.23 Max	0.40 Max	0.035	0.040	0.20-0.35	1.50-2.00	2.60-3.25	0.45-0.60	0.03 Max.**						
		Over 4	0.23 Max	0.40 Max	0.035	0.040	0.20-0.35	1.50-2.00	3.00-4.00	0.45-0.60	0.03 Max **						
	B	Up to 4, incl	0.23 Max	0.40 Max	0.020	0.020	0.20-0.35	1.50-2.00	2.60-3.25	0.45-0.60	0.03 Max.**						
		Over 4	0.23 Max.	0.40 Max	0.020	0.020	0.20-0.35	1.50-2.00	3.00-4.00	0.45-0.60	0.03 Max **						
A 553	A		0.13 Max	0.90 Max	0.035	0.040	0.15-0.30		8.50-9.50								
	B		0.13 Max	0.90 Max	0.035	0.040	0.15-0.30		7.50-8.50								
A 562			0.12 Max	1.20 Max	0.04	0.05	0.15-0.50					4 x C Min		0.15 Max.			

* May be substituted for part or all of titanium content on a one for one basis

** Vanadium content of 0.05 per cent max shall be furnished when specified

NOTE: ASME may or may not have specifications with similar chemical composition ranges and limits Refer to ASME publications

BASIC NUMBERING SYSTEM FOR SAE STEELS

Numerals and Digits	Type of Steel and Average Chemical Contents, %
	CARBON STEELS
10XX	Plain Carbon (Mn 1.00% max)
11XX	Resulphurized
12XX	Resulphurized and Rephosphorized
15XX	Plain Carbon (max Mn range over 1.00 1.65%)
	MANGANESE STEELS
13XX	Mn 1.75
	NICKEL STEELS
23XX	Ni 3.50
25XX	Ni 5.00
	NICKEL-CHROMIUM STEELS
31XX	Ni 1.25; Cr 0.65 and 0.80
32XX	Ni 1.75 Cr 1.07
33XX	Ni 3.50, Cr 1.50 and 1.57
34XX	Ni 3.00, Cr 0.77
	MOLYBDENUM STEELS
40XX	Mo 0.20 and 0.25
44XX	Mo 0.40 and 0.52
	CHROMIUM-MOLYBDENUM STEELS
41XX	Cr 0.50, 0.80 and 0.95; Mo 0.12, 0.20, 0.25 and 0.30
	NICKEL-CHROMIUM MOLYBDENUM STEELS
43XX	Ni 1.82; Cr 0.50 and 0.80, Mo 0.25
43BVXX	Ni 1.82; Cr 0.50, Mo 0.12 and 0.25, V 0.03 minimum
47XX	Ni 1.05; Cr 0.45, Mo 0.20 and 0.35
81XX	Ni 0.30, Cr 0.40; Mo 0.12
86XX	Ni 0.55, Cr 0.50, Mo 0.20
87XX	Ni 0.55, Cr 0.50, Mo 0.25
88XX	Ni 0.55, Cr 0.50, Mo 0.35
93XX	Ni 3.25; Cr 1.20, Mo 0.12
94XX	Ni 0.45, Cr 0.40, Mo 0.12
97XX	Ni 0.55, Cr 0.20, Mo 0.20
98XX	Ni 1.00, Cr 0.80, Mo 0.25
	NICKEL-MOLYBDENUM STEELS
46XX	Ni 0.85 and 1.82 Mo 0.20 and 0.25
48XX	Ni 3.50, Mo 0.25
	CHROMIUM STEELS
50XX	Cr 0.27, 0.40, 0.50 and 0.45
51XX	Cr 0.80, 0.87, 0.92, 0.95, 1.00 and 1.05
501XX	Cr 0.50
511XX	Cr 1.02
521XX	Cr 1.45
	CHROMIUM VANADIUM STEELS
61XX	Cr 0.60, 0.80 and 0.95 V 0.10 and 0.15 minimum
	TUNGSTEN CHROMIUM STEELS
71XXX	W 13.50 and 16.50, Cr 3.50
72XX	W 1.75; Cr 0.75
	SILICON MANGANESE STEELS
92XX	Si 1.40 and 2.00, Mn 0.65, 0.82 and 0.85 Cr 0.00 and 0.65
	LOW ALLOY HIGH TENSILE STEELS
9XX	Various
	STAINLESS STEELS
	(Chromium Manganese Nickel)
302XX	Cr 17.00 and 18.00, Mn 6.50 and 8.75; Ni 4.50 and 5.00
	(Chromium Nickel)
303XX	Cr 8.50, 15.50, 17.00, 18.00, 19.00, 20.00, 20.50, 23.00, 25.00 Ni 7.00 9.00 10.00, 10.50, 11.00, 11.50, 12.00, 13.00, 13.50, 20.50 21.00, 35.00
	(Chromium)
514XX	Cr 11.12, 12.25, 12.50, 13.00, 16.00, 17.00, 20.50 and 25.00
515XX	Cr 5.00
	BORON INTENSIFIED STEELS
XXBXX	B denotes Boron Steel
	LEADED STEELS
XXLXX	L denotes Leaded Steel

TABLE 1A—CARBON STEEL COMPOSITIONS APPLICABLE ONLY TO SEMIFINISHED PRODUCTS FOR FORGING, TO HOT ROLLED AND COLD FINISHED BARS, TO WIRE RODS, AND TO SEAMLESS TUBING

SAE No	Ladle Chemical Composition[a, c] Limits, %				Corresponding AISI No
	C	Mn	P, max	S, max	
1005	0.06 max	0.35 max	0.040	0.050	—
1006	0.08 max	0.25-0.40	0.040	0.050	1006
1008	0.10 max	0.30-0.50	0.040	0.050	1008
1010	0.08-0.13	0.30-0.60	0.040	0.050	1010
1011	0.08-0.13	0.60-0.90	0.040	0.050	—
1012	0.10-0.15	0.30-0.60	0.040	0.050	1012
1013	0.11-0.16	0.50-0.80	0.040	0.050	—
1015	0.13-0.18	0.30-0.60	0.040	0.050	1015
1016	0.13-0.18	0.60-0.90	0.040	0.050	1016
1017	0.15-0.20	0.30-0.60	0.040	0.050	1017
1018	0.15-0.20	0.60-0.90	0.040	0.050	1018
1019	0.15-0.20	0.70-1.00	0.040	0.050	1019
1020	0.18-0.23	0.30-0.60	0.040	0.050	1020
1021	0.18-0.23	0.60-0.90	0.040	0.050	1021
1022	0.18-0.23	0.70-1.00	0.040	0.050	1022
1023	0.20-0.25	0.30-0.60	0.040	0.050	1023
1024[b]	0.19-0.25	1.35-1.65	0.040	0.050	1024
1025	0.22-0.28	0.30-0.60	0.040	0.050	1025
1026	0.22-0.28	0.60-0.90	0.040	0.050	1026
1027[b]	0.22-0.29	1.20-1.50	0.040	0.050	1027
1029	0.25-0.31	0.60-0.90	0.040	0.050	—
1030	0.28-0.34	0.60-0.90	0.040	0.050	1030
1035	0.32-0.38	0.60-0.90	0.040	0.050	1035
1036[b]	0.30-0.37	1.20-1.50	0.040	0.050	1036
1037	0.32-0.38	0.70-1.00	0.040	0.050	1037
1038	0.35-0.42	0.60-0.90	0.040	0.050	1038
1039	0.37-0.44	0.70-1.00	0.040	0.050	1039
1040	0.37-0.44	0.60-0.90	0.040	0.050	1040
1041[b]	0.36-0.44	1.35-1.65	0.040	0.050	1041
1042	0.40-0.47	0.60-0.90	0.040	0.050	1042
1043	0.40-0.47	0.70-1.00	0.040	0.050	1043
1044	0.43-0.50	0.30-0.60	0.040	0.050	—
1045	0.43-0.50	0.60-0.90	0.040	0.050	1045
1046	0.43-0.50	0.70-1.00	0.040	0.050	1046
1047[b]	0.43-0.51	1.35-1.65	0.040	0.050	—
1048[b]	0.44-0.52	1.10-1.40	0.040	0.050	1048
1049	0.46-0.53	0.60-0.90	0.040	0.050	1049
1050	0.48-0.55	0.60-0.90	0.040	0.050	1050
1051[b]	0.45-0.56	0.85-1.15	0.040	0.050	—
1052[b]	0.47-0.55	1.20-1.50	0.040	0.050	1052
1053	0.48-0.55	0.70-1.00	0.040	0.050	—
1055	0.50-0.60	0.60-0.90	0.040	0.050	1055
1060	0.55-0.65	0.60-0.90	0.040	0.050	1060
1061[b]	0.55-0.65	0.75-1.05	0.040	0.050	—
1064	0.60-0.70	0.50-0.80	0.040	0.050	1064
1065	0.60-0.70	0.60-0.90	0.040	0.050	1065
1066[b]	0.60-0.71	0.85-1.15	0.040	0.050	—
1069	0.65-0.75	0.40-0.70	0.040	0.050	—
1070	0.65-0.75	0.60-0.90	0.040	0.050	1070
1072[b]	0.65-0.76	1.00-1.30	0.040	0.050	—
1074	0.70-0.80	0.50-0.80	0.040	0.050	1074
1075	0.70-0.80	0.40-0.70	0.040	0.050	—
1078	0.72-0.85	0.30-0.60	0.040	0.050	1078
1080	0.75-0.88	0.60-0.90	0.040	0.050	1080
1084	0.80-0.93	0.60-0.90	0.040	0.050	1084
1085	0.80-0.93	0.70-1.00	0.040	0.050	—
1086	0.80-0.93	0.30-0.50	0.040	0.050	1086
1090	0.85-0.98	0.60-0.90	0.040	0.050	1090
1095	0.90-1.03	0.30-0.50	0.040	0.050	1095

NOTE LEAD When lead is required as an added element to a standard steel, a range of 0.15 to 0.35%, inclusive, is generally used. Such a steel is identified by inserting the letter 'L' between the second and third numerals of the grade number, that is, 10L45

[a] These steels may be produced by the basic open hearth, the basic oxygen, or the basic electric steelmaking process (see SAE J411). Where silicon is required, the following limits and ranges are commonly used: for steel designations up to but excluding SAE 1015, 0.10% max for SAE 1015 to SAE 1025, 0.10% max or ranges of 0.10–0.20%, 0.15–0.30%, 0.20–0.40%, or 0.30–0.60%; for over SAE 1025, ranges of 0.10–0.20%, 0.15–0.30%, 0.20–0.40% 0.30–0.60%

[b] These grades, with max Mn in excess of 1%, have been renumbered 1500 series Table 3. Present 10XX standard designation will be discontinued after 1970.

[c] Certain qualities and commodities are customarily produced to lower limits of phosph and sulfur

TABLE 1B—CARBON STEEL COMPOSITIONS APPLICABLE ONLY TO STRUCTURAL SHAPES, PLATES, STRIP, SHEETS[a] AND WELDED TUBING

SAE No.	Ladle Chemical Composition[b, c] Limits, %				SAE No.	Ladle Chemical Composition[b, c] Limits, %			
	C	Mn	P, max	S, max		C	Mn	P, max	S, max
1006	0.08 max	0.25–0.45	0.040	0.050	1040	0.36–0.44	0.60–0.90	0.040	0.050
1008	0.10 max	0.25–0.50	0.040	0.050	1041	0.36–0.45	1.30–1.65	0.040	0.050
1009	0.15 max	0.60 max	0.040	0.050	1042	0.39–0.47	0.60–0.90	0.040	0.050
1010	0.08–0.13	0.30–0.60	0.040	0.050	1043	0.39–0.47	0.70–1.00	0.040	0.050
1012	0.10–0.15	0.30–0.60	0.040	0.050	—	—	—	—	—
1015	0.12–0.18	0.30–0.60	0.040	0.050	1045	0.42–0.50	0.60–0.90	0.040	0.050
1016	0.12–0.18	0.60–0.90	0.040	0.050	1046	0.42–0.50	0.70–1.00	0.040	0.050
1017	0.14–0.20	0.30–0.60	0.040	0.050	—	—	—	—	—
1018	0.14–0.20	0.60–0.90	0.040	0.050	1048	0.43–0.52	1.05–1.40	0.040	0.050
1019	0.14–0.20	0.70–1.00	0.040	0.050	1049	0.45–0.53	0.60–0.90	0.040	0.050
1020	0.17–0.23	0.30–0.60	0.040	0.050	1050	0.47–0.55	0.60–0.90	0.040	0.050
1021	0.17–0.23	0.60–0.90	0.040	0.050	1052	0.46–0.55	1.20–1.55	0.040	0.050
1022	0.17–0.23	0.70–1.00	0.040	0 050	1055	0.52–0.60	0.60–0.90	0.040	0.050
1023	0.19–0.25	0.30–0.60	0.040	0.050	1060	0.55–0.66	0.60–0.90	0 040	0.050
1024	0.18–0.25	1.30–1.65	0.040	0.050	1064	0.59–0.70	0.50–0.80	0.040	0.050
1025	0.22–0.28	0.30–0.60	0.040	0.050	1065	0.59–0.70	0.60–0.90	0.040	0.050
1026	0.22–0.28	0.60–0.90	0.040	0.050	1070	0.65–0.76	0 60–0.90	0.040	0.050
1027	0.22–0.29	1.20–1.55	0.040	0.050	1074	0.69–0.80	0.50–0.80	0.040	0.050
1030	0.27–0.34	0.60–0.90	0.040	0.050	1078	0.72–0.86	0.30–0.60	0.040	0.050
1033	0.29–0.36	0.70–1.00	0.040	0.050	1080	0.74–0.88	0.60–0.90	0.040	0 050
1035	0.31–0.38	0.60–0.90	0.040	0.050	1084	0.80–0.94	0.60–0.90	0.040	0.050
1036	0.30–0.38	1.20–1.55	0 040	0.050	1085	0.80–0.94	0.70–1.00	0.040	0.050
1037	0.31–0.38	0.70–1.00	0 040	0.050	1086	0.80–0.94	0.30–0.50	0.040	0.050
1038	0.34–0.42	0.60–0.90	0.040	0.050	1090	0.84–0.98	0.60–0.90	0 040	0.050
1039	0.36–0.44	0.70–1.00	0.040	0.050	1095	0.90–1.04	0.30–0.50	0.040	0.050

[a] Sheet steel surface requirements may be broadly identified as to the end use by the suffix etter "E" for exposed parts requiring a good painted surface and suffix "U" for unexposed arts for which surface finish is unimportant

[b] These steels may be produced by the basic open hearth, the basic oxygen, or the basic lectric steelmaking process (see SAE J411, Carbon and Alloy Steels) Where silicon is required, the following limits and ranges are commonly used: for steel designations up to but excludin SAE 1015, 0 10% max, for SAE 1015 to SAE 1025, 0.10% max or ranges of 0.10–0 20% c 0 15–0 30%, for over SAE 1025 ranges of 0.10–0 20% or 0.15–0 30%

[c] Certain qualities and commodities are customarily produced to lower limits of phosphor and sulfur (See SAE J411, Table 1 for listing.)

ABLE 2—FREE CUTTING CARBON STEEL COMPOSITIONS APPLICABLE ONLY TO SEMIFINISHED PRODUCTS FOR FORGING, HOT ROLLED AND COLD FINISHED BARS, WIRE RODS AND SEAMLESS TUBING

SAE No	Ladle Chemical Composition[a] Limits, %				Corresponding AISI No.
	C	Mn	P	S	
1110	0.08–0.13	0.30–0 60	0.04 max	0.08–0 13	1110
1116	0.14–0.20	1.10–1.40	0.04 max	0.16–0.23	1116
1211	0.13 max	0.60–0.90	0.07–0.12	0.10–0.15	1211
1212	0.13 max	0.70–1.00	0.07–0.12	0.16–0.23	1212
1213	0.13 max	0.70–1.00	0.07–0.12	0.24–0.33	1213
1215	0.09 max	0.75–1.05	0.04–0.09	0.26–0.35	1215
12L13[b]	0.13 max	0.70–1.00	0.07–0.12	0.24–0.33	
12L14[b]	0.15 max	0.85–1.15	0.04–0.09	0.26–0.35	12L14

SAE No	Ladle Chemical Composition[a] Limits, %				Corresponding AISI No.
	C	Mn	P Max	S	
1108	0.08–0.13	0.50–0.80	0.040	0 08–0.13	1108
1109	0.08–0.13	0.60–0.90	0.040	0.08–0.13	1109
1117	0.14–0.20	1.00–1.30	0.040	0.08–0 13	1117
1118	0.14–0.20	1.30–1.60	0.040	0.08–0.13	1118
1119	0.14–0.20	1.00–1.30	0.040	0.24–0.33	1119
1132	0.27–0.34	1.35–1.65	0.040	0.08–0.13	1132
1137	0.32–0.39	1.35–1.65	0.040	0.08–0.13	1137
1139	0.35–0 43	1 35–1.65	0.040	0 13–0.20	1139
1140	0.37–0.44	0.70–1.00	0.040	0.08–0 13	1140
1141	0.37–0.45	1.35–1.65	0.040	0.08–0.13	1141
1144	0 40–0.48	1.35–1.65	0.040	0.24–0.33	1144
1145	0.42–0.49	0.70–1.00	0.040	0.04–0.07	1145
1146	0 42–0.49	0.70–1.00	0.040	0.08–0 13	1146
1151	0.48–0.55	0.70–1.00	0.040	0.08–0.13	1151

NOTE: SAE Grades 1110, 1211, 1212, 1213, 12L14, 1108, and 1109 are customarily rnished without specified silicon content.

When silicon is required, the following limits and ranges are commonly used for steel signations 1108, 1109, and 1110, 0.10% max; for 1116 and over, 0 10% max, or ranges 10–0.20%, 0 15–0.30%, 0.20–0.40%, or 0.30–0.60%

[a] These steels may be produced by the basic open hearth, the basic oxygen, or the bas electric steelmaking process (see SAE J411)

[b] When lead is required as an added element to other grades of steel, a range of 0 15 0 35% inclusive, is generally used Such a steel is identified by inserting the letter "L" betwee the second and third numerals of the grade number, that is, 11L17.

BLE 3—HIGH MANGANESE CARBON STEEL COMPOSITIONS APPLICABLE ONLY SEMIFINISHED PRODUCTS FOR FORGING, TO HOT ROLLED AND COLD FINISHED BARS, TO WIRE RODS, AND TO SEAMLESS TUBING

SAE No.	Former SAE No.	Ladle Chemical Composition[a] Limits, %			
		C	Mn	P, Max	S, Max
1513	—	0.10–0.16	1.10–1.40	0.040	0.050
1518	—	0.15–0.21	1.10–1.40	0.040	0.050
1522	—	0.18–0.24	1.10–1.40	0.040	0.050
1524	1024	0.19–0.25	1.35–1.65	0.040	0.050
1525	—	0.23–0.29	0.80–1.10	0.040	0.050
1526	—	0.22–0.29	1.10–1.40	0.040	0.050
1527	1027	0.22–0.29	1.20–1.50	0.040	0.050
1536	1036	0.30–0.37	1 20–1.50	0.040	0.050
1541	1041	0.36–0.44	1.35–1.65	0.040	0.050
1547	1047	0.43–0.51	1.35–1.65	0.040	0.050
1548	1048	0.44–0.52	1.10–1.40	0.040	0.050
1551	1051	0.45–0.56	0.85–1.15	0.040	0.050
1552	1052	0.47–0.55	1.20–1.50	0.040	0.050
1561	1061	0.55–0.65	0.75–1.05	0.040	0.050
1566	1066	0.60–0.71	0.85–1.15	0.040	0.050
1572	1072	0.65–0.76	1.00–1.30	0.040	0.050

NOTE: When lead is required as an added element to a standard steel, a range of 0 15–5%, inclusive, is generally used. Such a steel is identified by inserting the letter "L" between second and third numerals of the grade number, that is, 15L41.

[a] Where silicon is required, the following limits and ranges are commonly used: for steel ignations up to and including SAE 1524, 0.10% max or ranges of 0.10–0.20%, 0.15–0.30%, 0–0.40%, or 0.30–0.60%; for SAE 1525 and over, ranges of 0 10–0.20%, 0.15–0.30%, 0–0.40%, or 0.30–0.60%.

CHEMICAL COMPOSITIONS OF SAE ALLOY STEELS—SAE J404g

SAE Standard

Report of Iron and Steel Division approved June 1911 and last revised by Iron and Steel Technical Committee April 1970.

In 1941, the SAE Iron and Steel Division in collaboration with the American Iron and Steel Institute made a major change in the method of expressing composition ranges for the SAE steels The plan, as nov applied, is based in general on narrower ladle analysis ranges plus certai

TABLE 1A—ALLOY STEEL COMPOSITIONS[a]

SAE No.	Ladle Chemical Composition Limits, %									Correspondin AISI No.
	C	Mn	P	S	Si	Ni	Cr	Mo	V	
1330	0.28–0.33	1.60–1.90	0.035	0.040	0.20–0.35	—	—	—	—	1330
1335	0.33–0.38	1.60–1.90	0.035	0.040	0.20–0.35	—	—	—	—	1335
1340	0.38–0.43	1.60–1.90	0.035	0.040	0.20–0.35	—	—	—	—	1340
1345	0.43–0.48	1.60–1.90	0.035	0.040	0.20–0.35	—	—	—	—	1345
4012	0.09–0.14	0.75–1.00	0.035	0.040	0.20–0.35	—	—	0.15–0.25	—	4012
4023	0.20–0.25	0.70–0.90	0.035	0.040	0.20–0.35	—	—	0.20–0.30	—	4023
4024	0.20–0.25	0.70–0.90	0.035	0.035–0.050	0.20–0.35	—	—	0.20–0.30	—	4024
4027	0.25–0.30	0.70–0.90	0.035	0.040	0.20–0.35	—	—	0.20–0.30	—	4027
4028	0.25–0.30	0.70–0.90	0.035	0.035–0.050	0.20–0.35	—	—	0.20–0.30	—	4028
4032	0.30–0.35	0.70–0.90	0.035	0.040	0.20–0.35	—	—	0.20–0.30	—	—
4037	0.35–0.40	0.70–0.90	0.035	0.040	0.20–0.35	—	—	0.20–0.30	—	4037
4042	0.40–0.45	0.70–0.90	0.035	0.040	0.20–0.35	—	—	0.20–0.30	—	—
4047	0.45–0.50	0.70–0.90	0.035	0.040	0.20–0.35	—	—	0.20–0.30	—	4047
4118	0.18–0.23	0.70–0.90	0.035	0.040	0.20–0.35	—	0.40–0.60	0.08–0.15	—	4118
4130	0.28–0.33	0.40–0.60	0.035	0.040	0.20–0.35	—	0.80–1.10	0.15–0.25	—	4130
4135	0.33–0.38	0.70–0.90	0.035	0.040	0.20–0.35	—	0.80–1.10	0.15–0.25	—	—
4137	0.35–0.40	0.70–0.90	0.035	0.040	0.20–0.35	—	0.80–1.10	0.15–0.25	—	4137
4140	0.38–0.43	0.75–1.00	0.035	0.040	0.20–0.35	—	0.80–1.10	0.15–0.25	—	4140
4142	0.40–0.45	0.75–1.00	0.035	0.040	0.20–0.35	—	0.80–1.10	0.15–0.25	—	4142
4145	0.43–0.48	0.75–1.00	0.035	0.040	0.20–0.35	—	0.80–1.10	0.15–0.25	—	4145
4147	0.45–0.50	0.75–1.00	0.035	0.040	0.20–0.35	—	0.80–1.10	0.15–0.25	—	4147
4150	0.48–0.53	0.75–1.00	0.035	0.040	0.20–0.35	—	0.80–1.10	0.15–0.25	—	4150
4161	0.56–0.64	0.75–1.00	0.035	0.040	0.20–0.35	—	0.70–0.90	0.25–0.35	—	—
4320	0.17–0.22	0.45–0.65	0.035	0.040	0.20–0.35	1.65–2.00	0.40–0.60	0.20–0.30	—	4320
4340	0.38–0.43	0.60–0.80	0.035	0.040	0.20–0.35	1.65–2.00	0.70–0.90	0.20–0.30	—	4340
E4340[b]	0.38–0.43	0.65–0.85	0.025	0.025	0.20–0.35	1.65–2.00	0.70–0.90	0.20–0.30	—	E4340
4419	0.18–0.23	0.45–0.65	0.035	0.040	0.20–0.35	—	—	0.45–0.60	—	4520
4422	0.20–0.25	0.70–0.90	0.035	0.040	0.20–0.35	—	—	0.35–0.45	—	—
4427	0.24–0.29	0.70–0.90	0.035	0.040	0.20–0.35	—	—	0.35–0.45	—	—
4615	0.13–0.18	0.45–0.65	0.035	0.040	0.20–0.35	1.65–2.00	—	0.20–0.30	—	4615
4617	0.15–0.20	0.45–0.65	0.035	0.040	0.20–0.35	1.65–2.00	—	0.20–0.30	—	—
4620	0.17–0.22	0.45–0.65	0.035	0.040	0.20–0.35	1.65–2.00	—	0.20–0.30	—	4620
4621	0.18–0.23	0.70–0.90	0.035	0.040	0.20–0.35	1.65–2.00	—	0.20–0.80	—	4621
4626	0.24–0.29	0.45–0.65	0.035	0.04 max	0.20–0.35	0.70–1.00	—	0.15–0.25	—	
4718	0.16–0.21	0.70–0.90	—	—	—	0.90–1.20	0.35–0.55	0.30–0.40	—	4718
4720	0.17–0.22	0.50–0.70	0.035	0.040	0.20–0.35	0.90–1.20	0.35–0.55	0.15–0.25	—	4720
4815	0.13–0.18	0.40–0.60	0.035	0.040	0.20–0.35	3.25–3.75	—	0.20–0.30	—	4815
4817	0.15–0.20	0.40–0.60	0.035	0.040	0.20–0.35	3.25–3.75	—	0.20–0.30	—	4817
4820	0.18–0.23	0.50–0.70	0.035	0.040	0.20–0.35	3.25–3.75	—	0.20–0.30	—	4820
5015	0.12–0.17	0.30–0.50	0.035	0.040	0.20–0.35	—	0.30–0.50	—	—	5015
50B40	0.38–0.43	0.75–1.00	0.035	0.040	0.20–0.35	—	0.40–0.60	—	—	—
50B44	0.43–0.48	0.75–1.00	0.035	0.040	0.20–0.35	—	0.40–0.60	—	—	50B44
5046	0.43–0.48	0.75–1.00	0.035	0.040	0.20–0.35	—	0.20–0.35	—	—	—
50B46[c]	0.44–0.49	0.75–1.00	0.035	0.040	0.20–0.35	—	0.20–0.35	—	—	50B46
50B50[c]	0.48–0.53	0.75–1.00	0.035	0.040	0.20–0.35	—	0.40–0.60	—	—	50B50
5060	0.56–0.64	0.75–1.00	0.035	0.040	0.20–0.35	—	0.40–0.60	—	—	—
50B60[c]	0.56–0.64	0.75–1.00	0.035	0.040	0.20–0.35	—	0.40–0.60	—	—	50B60
5115	0.13–0.18	0.70–0.90	0.035	0.040	0.20–0.35	—	0.70–0.90	—	—	—
5120	0.17–0.22	0.70–0.90	0.035	0.040	0.20–0.35	—	0.70–0.90	—	—	5120
5130	0.28–0.33	0.70–0.90	0.035	0.040	0.20–0.35	—	0.80–1.10	—	—	5130
5132	0.30–0.35	0.60–0.80	0.035	0.040	0.20–0.35	—	0.75–1.00	—	—	5132
5135	0.33–0.38	0.60–0.80	0.035	0.040	0.20–0.35	—	0.80–1.05	—	—	5135
5140	0.38–0.43	0.70–0.90	0.035	0.040	0.20–0.35	—	0.70–0.90	—	—	5140
5145	0.43–0.48	0.70–0.90	0.035	0.040	0.20–0.35	—	0.70–0.90	—	—	5145
5147	0.46–0.51	0.70–0.95	0.035	0.040	0.20–0.35	—	0.85–1.15	—	—	5147
5150	0.48–0.53	0.70–0.90	0.035	0.040	0.20–0.35	—	0.70–0.90	—	—	5150
5155	0.51–0.59	0.70–0.90	0.035	0.040	0.20–0.35	—	0.70–0.90	—	—	5155
5160	0.56–0.64	0.75–1.00	0.035	0.040	0.20–0.35	—	0.70–0.90	—	—	5160
51B60[c]	0.56–0.64	0.75–1.00	0.035	0.040	0.20–0.35	—	0.70–0.90	—	—	51B60
50100[b]	0.98–1.10	0.25–0.45	0.025	0.025	0.20–0.35	—	0.40–0.60	—	—	—
51100[b]	0.98–1.10	0.25–0.45	0.025	0.025	0.20–0.35	—	0.90–1.15	—	—	E51100
52100[b]	0.98–1.10	0.25–0.45	0.025	0.025	0.20–0.35	—	1.30–1.60	—	—	E52100
6118	0.16–0.21	0.50–0.70	0.035	0.040	0.20–0.35	—	0.50–0.70	—	0.10–0.15	6118
6150	0.48–0.53	0.70–0.90	0.035	0.040	0.20–0.35	—	0.80–1.10	—	0.15	6150
8115	0.13–0.18	0.70–0.90	0.035	0.040	0.20–0.35	0.20–0.40	0.30–0.50	0.08–0.15	—	8115
81B45[c]	0.43–0.48	0.75–1.00	0.035	0.040	0.20–0.35	0.20–0.40	0.35–0.55	0.08–0.15	—	81B45
8615	0.13–0.18	0.70–0.90	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	—
8617	0.15–0.20	0.70–0.90	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	8617
8620	0.18–0.23	0.70–0.90	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	8620
8622	0.20–0.25	0.70–0.90	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	8622
8625	0.23–0.28	0.70–0.90	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	8625
8627	0.25–0.30	0.70–0.90	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	8627
8630	0.28–0.33	0.70–0.90	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	8630
8637	0.35–0.40	0.75–1.00	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	8637
8640	0.38–0.43	0.75–1.00	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	8640

TABLE 1A—ALLOY STEEL COMPOSITIONS[a] (CONTINUED)

SAE No.	Ladle Chemical Composition Limits, %									Corresponding AISI No.
	C	Mn	P	S	Si	Ni	Cr	Mo	V	
8642	0.40–0.45	0.75–1.00	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	8642
8645	0.43–0.48	0.75–1.00	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	8645
86B45[c]	0.43–0.48	0.75–1.00	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	—
8650	0.48–0.53	0.75–1.00	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	—
8655	0.51–0.59	0.75–1.00	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	8655
8660	0.56–0.64	0.75–1.00	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.15–0.25	—	—
8720	0.18–0.23	0.70–0.90	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.20–0.30	—	8720
8740	0.38–0.43	0.75–1.00	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.20–0.30	—	8740
8822	0.20–0.25	0.75–1.00	0.035	0.040	0.20–0.35	0.40–0.70	0.40–0.60	0.30–0.40	—	8822
9254	0.51–0.59	0.60–0.80	0.035	0.040	1.20–1.60	—	0.60–0.80	—	—	—
9255	0.51–0.59	0.70–0.95	0.035	0.040	1.80–2.20	—	—	—	—	9255
9260	0.56–0.64	0.75–1.00	0.035	0.040	1.80–2.20	—	—	—	—	9260
9310[b]	0.08–0.13	0.45–0.65	0.025	0.025	0.20–0.35	3.00–3.50	1.00–1.40	0.08–0.15	—	—
94B15[c]	0.13–0.18	0.75–1.00	0.035	0.040	0.20–0.35	0.30–0.60	0.30–0.50	0.08–0.15	—	—
94B17[c]	0.15–0.20	0.75–1.00	0.035	0.040	0.20–0.35	0.30–0.60	0.30–0.50	0.08–0.15	—	94B17
94B30	0.28–0.33	0.75–1.00	0.035	0.040	0.20–0.35	0.30–0.60	0.30–0.50	0.08–0.15	—	94B30

[a] For standard variations in composition limits, see Table 4 of SAE J409. Small quantities of certain elements which are not specified or required may be found in alloy steels. These elements are to be considered as incidental and are acceptable to the following maximum amounts copper to 0.35%, nickel to 0.25%, chromium to 0.20%, and molybdenum to 0.06%.

[b] Electric furnace steel.

[c] Boron content is 0.0005% min

TABLE 1B—ALLOY STEEL PLATE COMPOSITIONS[a, b, c] (OPEN HEARTH AND BASIC OXYGEN)

SAE No.	Ladle Chemical Composition Limits, %								
	C	Mn	P max	S max	Si[d]	Ni	Cr	Mo	V
1330	0.27–0.34	1.50–1.90	0.035	0.040	0.15–0.30	—	—	—	—
1335	0.32–0.39	1.50–1.90	0.035	0.040	0.15–0.30	—	—	—	—
1340	0.36–0.44	1.50–1.90	0.035	0.040	0.15–0.30	—	—	—	—
1345	0.41–0.49	1.50–1.90	0.035	0.040	0.15–0.30	—	—	—	—
4118	0.17–0.23	0.60–0.90	0.035	0.040	0.15–0.30	—	0.40–0.65	0.08–0.15	—
4130	0.27–0.34	0.35–0.60	0.035	0.040	0.15–0.30	—	0.80–1.15	0.15–0.25	—
4135	0.32–0.39	0.65–0.95	0.035	0.040	0.15–0.30	—	0.08–1.15	0.15–0.25	—
4137	0.33–0.40	0.65–0.95	0.035	0.040	0.15–0.30	—	0.80–1.15	0.15–0.25	—
4140	0.36–0.44	0.70–1.00	0.035	0.040	0.15–0.30	—	0.08–1.15	0.15–0.25	—
4142	0.38–0.46	0.70–1.00	0.035	0.040	0.15–0.30	—	0.80–1.15	0.15–0.25	—
4145	0.41–0.49	0.70–1.00	0.035	0.040	0.15–0.30	—	0.80–1.15	0.15–0.25	—
4340	0.36–0.44	0.55–0.80	0.035	0.040	0.15–0.30	1.65–2.00	0.60–0.90	0.20–0.30	—
E4340	0.37–0.44	0.60–0.85	0.025	0.025	0.15–0.30	1.65–2.00	0.65–0.90	0.20–0.30	—
4615	0.12–0.18	0.40–0.65	0.035	0.040	0.15–0.30	1.65–2.00	--	0.20–0.30	—
4617	0.15–0.21	0.40–0.65	0.035	0.040	0.15–0.30	1.65–2.00	—	0.20–0.30	—
4620	0.16–0.22	0.40–0.65	0.035	0.040	0.15–0.30	1.65–2.00	—	0.20–0.30	—
5160	0.54–0.65	0.70–1.00	0.035	0.040	0.15–0.30	—	0.60–0.90	—	—
6150	0.46–0.54	0.60–0.90	0.035	0.040	0.15–0.30	—	0.80–1.15	—	0.15 min
8615	0.12–0.18	0.60–0.90	0.035	0.040	0.15–0.30	0.40–0.70	0.35–0.60	0.15–0.25	—
8617	0.15–0.21	0.60–0.90	0.035	0.040	0.15–0.30	0.40–0.70	0.35–0.60	0.15–0.25	—
8620	0.17–0.23	0.60–0.90	0.035	0.040	0.15–0.30	0.40–0.70	0.35–0.60	0.15–0.25	—
8622	0.19–0.25	0.60–0.90	0.035	0.040	0.15–0.30	0.40–0.70	0.35–0.60	0.15–0.25	—
8625	0.22–0.29	0.60–0.90	0.035	0.040	0.15–0.30	0.40–0.70	0.35–0.60	0.15–0.25	—
8627	0.24–0.31	0.60–0.90	0.035	0.040	0.15–0.30	0.40–0.70	0.35–0.60	0.15–0.25	—
8630	0.27–0.34	0.60–0.90	0.035	0.040	0.15–0.30	0.40–0.70	0.35–0.60	0.15–0.25	—
8637	0.33–0.40	0.70–1.00	0.035	0.040	0.15–0.30	0.40–0.70	0.35–0.60	0.15–0.25	—
8640	0.36–0.44	0.70–1.00	0.035	0.040	0.15–0.30	0.40–0.70	0.35–0.60	0.15–0.25	—
8655	0.49–0.60	0.70–1.00	0.035	0.040	0.15–0.30	0.40–0.70	0.35–0.60	0.15–0.25	—
8742	0.38–0.46	0.70–1.00	0.035	0.040	0.15–0.30	0.40–0.70	0.35–0.60	0.20–0.30	—

[a] Small quantities of certain elements not required may be found. These elements are to be considered as incidental and are acceptable to the following maximum amounts: copper to 0.35%, nickel to 0.25%, chromium to 0.20%, and molybdenum to 0.06%.

[b] When electric furnace steel is ordered, the carbon range is restricted 0.01%, manganese 0.05%, chromium 0.05% up to 1.25% incl and 0.10% over 1.25%. The maximum phosphorus and sulfur is 0.025% each

[c] Boron or lead may be added to these compositions.

[d] Silicon available in ranges of 0.10–0.20%, 0.20–0.35%, and 0.35% maximum (when carbon deoxidized) when so specified by the purchaser.

CHEMICAL COMPOSITIONS OF SAE WROUGHT STAINLESS STEELS

TABLE 1—WROUGHT CHROMIUM-NICKEL AUSTENITIC STEELS (NOT HARDENABLE BY THERMAL TREATMENT)

SAE No.[a]	Chemical Composition Limits, %								AISI Type
	C Max	Mn Max	Si Max	P Max	S Max	Cr Range	Ni Range	Other Elements	
30201	0.15	5.5 – 7.5	1.00	0.060	0.030	16.00–18.00	3.50– 5.50	N, 0.25 max	201
30202	0.15	7.5 –10.0	1.00	0.060	0.030	17.00–19.00	4.00– 6.00	N, 0.25 max	202
30301	0.15	2.00	1.00	0.045	0.030	16.00–18.00	6.00– 8.00	—	301
30302	0.15	2.00	1.00	0.045	0.030	17.00–19.00	8.00–10.00	—	302
30302B	0.15	2.00	2.00–3.00	0.045	0.030	17.00–19.00	8.00–10.00	—	302B
30303	0.15	2.00	1.00	0.20	0.15 min	17.00–19.00	8.00–10.00	Zr or Mo, 0.60 max[c]	303
30303 Se	0.15	2.00	1.00	0.20	0.06	17.00–19.00	8.00–10.00	Se, 0.15 min	303 Se
30304	0.08	2.00	1.00	0.045	0.030	17.00–19.00	8.00–12.00	—	304
30304L	0.03	2.00	1.00	0.045	0.030	18.00–20.00	8.00–12.00	—	304L
30305	0.12	2.00	1.00	0.045	0.030	17.00–19.00	10.00–13.00	—	305
30308	0.08	2.00	1.00	0.045	0.030	19.00–21.00	10.00 12.00	—	308
30309	0.20	2.00	1.00	0.045	0.030	22.00–24.00	12.00–15.00	—	309
30309S	0.08	2.00	1.00	0.045	0.030	22.00–24.00	12.00–15.00	—	309S
30310	0.25	2.00	1.50	0.045	0.030	24.00–26.00	19.00–22.00	—	310
30310S	0.08	2.00	1.50	0.045	0.030	24.00–26.00	19.00–22.00	—	310S
30314	0.25	2.00	1.50–3.00	0.045	0.030	23.00–26.00	19.00–22.00	—	314
30316	0.08	2.00	1.00	0.045	0.030	16.00–18.00	10.00–14.00	Mo, 2.00–3.00	316
30316L[d]	0.03	2.00	1.00	0.045	0.030	16.00–18.00	10.00–14.00	Mo, 2.00–3.00	316L
30317	0.08	2.00	1.00	0.045	0.030	18.00–20.00	11.00–15.00	Mo, 3.00–4.00	317
30321[e]	0.08	2.00	1.00	0.045	0.030	17.00–19.00	9.00–12.00	Ti, 5 × C min	321
30330	0.15	2.00	1.50[b]	0.045	0.04	14.00–17.00	33.00–37.00	—	—
30347	0.08	2.00	1.00	0.045	0.030	17.00–19.00	9.00–13.00	Cb-Ta, 10 × C min	347
30348	0.08	2.00	1.00	0.045	0.030	17.00–19.00	9.00–13.00	Cb-Ta, 10 × C min; Ta, 0.10 max	348

[a] The suffixes with grade numbers denote: B—2.00-3.00 silicon range, Se—a free machining steel with selenium addition; L—extra low carbon grade; S—lower carbon grade.

[b] To minimize carbon or nitrogen pick-up 0.75-1.50 Si is recommended for high temperature application involving carbon or nitrogen atmosphere.

[c] At producer's option; reported only when intentionally added.

[d] 10.0-15.0 Ni permitted for tubular products.

[e] 9.0-13.0 Ni permitted for tubular products.

TABLE 2—WROUGHT STAINLESS MARTENSITIC CHROMIUM STEELS (HARDENABLE BY THERMAL TREATMENT)

SAE No.[a]	Chemical Composition Limits, %								AISI Type[a]
	C Max	Mn Max	Si Max	P Max	S Max	Cr Range	Ni Range	Other Elements	
51403	0.15	1.00	0.50	0.040	0.030	11.50–13.00	—	—	403
51410	0.15	1.00	1.00	0.040	0.030	11.50–13.50	—	—	410
51414	0.15	1.00	1.00	0.040	0.030	11.50–13.50	1.25–2.50	—	414
51416	0 15	1.25	1.00	0.06	0.15 min	12.00–14.00	—	Zr or Mo, 0.60 max[b]	416
51416 Se	0 15	1.25	1.00	0.06	0.06	12.00–14.00	—	Se, 0.15 min	416 Se
51420	Over 0.15	1.00	1.00	0.040	0.030	12.00–14.00	—	—	420
51420F	0.30–0.40	1.25	1.00	0.06	0 15 min	12.00–14.00	—	Zr or Mo, 0.60 max[b]	420F
51420F Se	0.30–0.40	1.25	1.00	0.06	0.06	12.00–14.00	—	Se, 0.15 min	—
51431	0.20	1.00	1.00	0.040	0.030	15.00–17.00	1.25–2.50	—	431
51440A	0.60–0 75	1.00	1.00	0 040	0.030	16 00–18.00	—	Mo, 0.75 max	440A
51440B	0.75–0.95	1.00	1.00	0.040	0.030	16.00–18.00	—	Mo, 0.75 max	440B
51440C	0 95–1.20	1.00	1.00	0.040	0.030	16.00–18.00	—	Mo, 0.75 max	440C
51440F	0 95–1.20	1.25	1.00	0.06	0.15 min	16.00–18.00	—	Zr or Mo, 0.75 max[b]	—
51440F Se	0 95–1.20	1.25	1.00	0.06	0.06	16.00–18.00	—	Se, 0.15 min	—
51501	Over 0 10	1.00	1 00	0.040	0.030	4 00– 6 00	—	Mo, 0.40–0.65	501

[a] Suffixes A, B and C denote differing carbon ranges for the same grade; F—a free machining steel; Se—a free machining steel with selenium addition.

[b] At producer's option; reported only when intentionally added

TABLE 3—WROUGHT STAINLESS FERRITIC CHROMIUM STEELS (NOT HARDENABLE BY THERMAL TREATMENT)

SAE No.[a]	Chemical Composition Limits, %								AISI Type[a]
	C Max	Mn Max	Si Max	P Max	S Max	Cr Range	Ni Range	Other Elements	
51405[b]	0.08	1.00	1.00	0.040	0.030	11.50–14.50	—	Al, 0.10–0.30	405
51409	0.08	1.00	1.00	0.045	0.045	10.50–11.75	0.50 max	Ti, 6 x C or max of 0.75; Fe, rem	
51430	0.12	1.00	1.00	0.040	0.030	14.00–18.00	—	—	430
51430F	0.12	1.25	1.00	0.06	0.15 min	14.00–18.00	—	Zr or Mo, 0.60 max[c]	430F
51430F Se	0 12	1.25	1.00	0.06	0.06	14.00–18.00	—	Se, 0.15 min	430F S
51434	0.12	0.30–0.90	0.50	0.040	0.030	16.00 min	—	Mo, 0.75–1.25	434
51436	0.12	0.30–0.90	0.50	0.040	0.030	16.00 min	—	Mo, 0.75–1.25; Cb + Ta, 0.25–0.75	436
51442	0.20	1.00	1.00	0.04	0.035	18.00–23.00	—	—	—
51446	0.20	1.50	1.00	0.04	0.030	23.00–27.00	—	N, 0.25 max	446
51502	0.10	1.00	1.00	0.04	0 030	4.00– 6.00	—	Mo, 0.40–0.65	502

[a] Suffix F—denotes a free machining steel; Se—denotes a free machining steel with selenium addition.

[b] Essentially nonhardenable by heat treatment.

[c] At producer's option; reported only when intentionally added.

TABLE 4—WROUGHT STAINLESS STEELS FOR SPECIAL MACHINABILITY

Proprietary Designation	Chemical Composition Limits, %							
	C Max	Mn Max	Si Max	P Max	S Max	Cr Range	Ni Range	Other Elements
303 EZ[a]	0.08	5.00–6.50	1.00	0.04	0.18–0.35	16.00–18.00	5.00– 6.50	Mo, 0.50 max; Cu, 1.75/2.25
303 MA[a]	0.15	2.00	1.00	0.05	0 11–0.16	17 00–19.00	8 00–10 00	Mo, 0.40–0.60, Al, 0.60–1.00
303 Pb[a]	0.15	2.00	1 00	0.04	0.12–0 25	17.00–19.00	8.00–10.00	Mo, 0.60 max; Pb, 0.12–0.30
303 Cu[a]	0 15	2.00	1.00	0.15	0.10 min	17.00–19.00	6.00–10.00	Se, 0.10 max; Cu, 2.50–4.00
303 Plus X[a]	0.15	2 50–4.50	1.00	0.20	0 15 min	17.00–19 00	7.00–10.00	Mo, 0 60 max
416 Plus X[b]	0.15	1.50–2.50	1.00	0.06	0.15 min	12.00–14.00	—	Mo, 0.60 max

[a] Not hardenable by thermal treatment.
[b] Hardenable by thermal treatment.

ASTM GRAY IRON CASTINGS (A 48)

TABLE I.—REQUIREMENTS FOR TENSILE STRENGTH OF GRAY CAST IRONS IN SEPARATELY CAST TEST BARS.

Class	Tensile Strength, min, psi	Test Bar Diameter, in.
No. 20 A	20 000	0.88
No. 20 B		1.2
No. 20 C		2.0
No. 20 S		Bar S[a]
No. 25 A	25 000	0 88
No. 25 B		1.2
No. 25 C		2.0
No. 25 S		Bar S[a]
No. 30 A	30 000	0.88
No. 30 B		1.2
No. 30 C		2.0
No. 30 S		Bar S[a]
No. 35 A	35 000	0 88
No. 35 B		1.2
No. 35 C		2.0
No 35 S		Bar S[a]
No. 40 A	40 000	0 88
No. 40 B		1 2
No. 40 C		2.0
No. 40 S		Bar S[a]
No. 45 A	45 000	0 88
No. 45 B		1.2
No. 45 C		2.0
No. 45 S		Bar S[a]
No. 50 A	50 000	0.88
No. 50 B		1.2
No. 50 C		2.0
No 50 S		Bar S[a]
55 A	55 000	0.88
55 B		1.2
55 C		2 0
55 D		Bar S[a]
No. 60 A	60 000	0 88
No. 60 B		1.2
No. 60 C		2.0
No. 60 S		Bar S[a]

[a] All dimensions of test bar S shall be as agreed upon between the manufacturer and the purchaser.

TABLE II.—DIAMETERS AND LENGTHS OF CAST TEST BARS.

Test Bar	As-Cast Diameter, in			Length, in.	
	Nominal (Mid-Length)	Minimum (Bottom)	Maximum (Top)	Minimum (Specified)	Maximum (Recommended)
A	0.88	0.85	0.91	5.0	6.0
B	1.20	1 14	1.26	6 0	9.0
C	2.00	1 90	2.10	7.0	10.0
S[a]					

[a] All dimensions of test bar S shall be as agreed upon by the manufacturer and the purchaser.

TABLE II.—CHEMICAL REQUIREMENTS.

Grade	CF-8	CG-12	CF-20	CF-8M	CF-8C	CF-16F[a]	CH-20[b]	CK-20	CE-30	CA-15	CA-15M
Type	19 Chromium, 9 Nickel	22 Chromium, 12 Nickel	19 Chromium, 9 Nickel	19 Chromium, 10 Nickel, with Molybdenum	19 Chromium, 10 Nickel, with Columbium	19 Chromium, 9 Nickel, Free Machining	25 Chromium, 12 Nickel	25 Chromium, 20 Nickel	29 Chromium, 9 Nickel	12 Chromium	12 Chromium
Carbon, max, per cent	0.08	0.12	0.20	0.08	0.08	0.16	0.20[b]	0.20	0.30	0.15	0.15
Manganese, max, per cent	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.00	1.50	1.00	1.00
Silicon, max, per cent	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.50	0.65
Phosphorus,[d] max, per cent	0.04	0.04	0.04	0.04	0.04	0.04[c]	0.04	0.04	0.04	0.04	0.040
Sulfur,[e] max, per cent	0.04	0.04	0.04	0.04	0.04	0.04[c]	0.04	0.04	0.04	0.04	0.040
Chromium, per cent	18.0 to 21.0	20.0 to 23.0	18.0 to 21.0	18.0 to 21.0	18.0 to 21.0	18.0 to 21.0	22.0 to 26.0	23.0 to 27.0	26.0 to 30.0	11.5 to 14.0	11.5 to 14.0
Nickel, per cent	8.0 to 11.0	10.0 to 13.0	8.0 to 11.0	9.0 to 12.0	9.0 to 12.0	9.0 to 12.0	12.0 to 15.0	19.0 to 22.0	8.0 to 11.0	1.00 max	1.0 max
Molybdenum,[e] per cent	....	....	....	2.0 to 3.0	....	[c]	....	....	....	0.50 max	0.15 to 1.0
Columbium, per cent	....	....	...	. .	[d]	....	....	....	....	....	.
Selenium, per cent	. ..	....	....	....	....	[c]	....	....	....	....	.
Copper, per cent	....	....	...	....	...	. ..	....	....	....	....	.

Grade	CB-30	CC-50	CA-40	CF-3	CF-3M	CG-8M	CN-7M	CW-12M	CY-40
Type	20 Chromium	28 Chromium	12 Chromium	19 Chromium, 9 Nickel	19 Chromium, 10 Nickel, with Molybdenum	19 Chromium, 11 Nickel, with Molybdenum	20 Chromium, 29 Nickel, with Copper and Molybdenum	Nickel, Molybdenum, Chromium	Nickel, Chromium, Iron
Carbon, per cent	0.30 max	0.50 max	0.20 to 0.40	0.03[f] max	0.03[f] max	0.08 max	0.07 max	0.12 max	0.40 max
Manganese, max, per cent	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.00	1.50
Silicon, max, per cent	1.50	1.50	1.50	2.00	1.50	1.50	1.50	1.50	3.00
Phosphorus,[d] max, per cent	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.040	0.030
Sulfur,[e] max, per cent	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.030	0.030
Chromium, per cent	18.0 to 21.0	26.0 to 30.0	11.5 to 14.0	17.0 to 21.0	17.0 to 21.0	18.0 to 21.0	19.0 to 22.0	15.50 to 20.00	14.00 to 17.00
Nickel, per cent	2.00 max	4.00 max	1.0 max	8.0 to 12.0	9.0 to 13.0	9.0 to 13.0	27.5 to 30.5	Remainder	Remainder
Molybdenum,[e] per cent	....	....	0.5 max	....	2.0 to 3.0	3.0 to 4.0	2.0 to 3.0	16.00 to 20.00	....
Columbium, per cent	...	....	....	...	. .	....	....	....	....
Selenium, per cent	..	...	....	....	....	....	....	....	....
Copper, per cent	[g]	....	....	....	....	....	3.0 to 4.0	....	....
Tungsten, max, per cent	....	....	....	....	....	....	....	5.25	....
Vanadium, max, per cent	....	....	....	....	....	....	....	0.40	....
Cobalt, max, per cent	....	....	....	....	....	....	....	2.50	....
Iron, max, per cent	....	....	....	....	....	....	....	7.50	11.00

Grade	CZ-100	M-35	N-12M
Type	Nickel Alloy	Nickel-Copper Alloy	Nickel-Molybdenum Alloy
Carbon, max, per cent	1.00	0.35	0.12
Manganese, max, per cent	1.50	1.50	1.00
Silicon, max, per cent	2.00	2.00	1.00
Phosphorus, max, per cent	0.030	0.030	0.040
Sulfur, max, per cent	0.030	0.030	0.030
Copper, per cent	1.25 max	26.0 to 33.0	...
Molybdenum, per cent	...	...	26.0 to 33.0
Cobalt, max, per cent	...	...	2.50
Vanadium, max, per cent	...	...	0.60
Chromium, max, per cent	...	...	1.00
Iron, max, per cent	3.00	3.50	6.00
Nickel, per cent	95.0 min	remainder	remainder

TABLE II.—*Continued*

[a] For free machining properties the composition of Grade CF-16F may contain suitable combinations of selenium, phosphorus and molybdenum (Grade CF-16F) or of sulfur and molybdenum (Grade CF-16Fa) as follows:

Selenium, phosphorus and molybdenum	
Selenium, per cent	0.20 to 0.35
Phosphorus, max, per cent	0.17
Molybdenum, max, per cent	1.50
Sulfur and molybdenum:	
Sulfur, per cent	0.20 to 0.40
Molybdenum, per cent	0.40 to 0.80

Other combinations of elements for free-machining properties may be agreed upon by the manufacturer and the purchaser.

[b] For the more severe general corrosive conditions, and when so specified, the carbon content shall not exceed 0.10 per cent. This low-carbon grade shall be designated as grade CH-10.

[c] Chemical analysis is not normally required for the elements phosphorus, sulfur and molybdenum, but if they are present in amounts over those stated they may be cause for rejection.

[d] Grade CF-8C shall have a columbium content of not less than 8 times the carbon content and not more than 1.0 per cent. If a columbium-plus-tantalum alloy in the approximate Cb:Ta ratio of 3:1 is used for stabilizing this grade, the total columbium-plus-tantalum content shall not be less than nine times the carbon content and shall not exceed 1.1 per cent.

[e] For grade CB-30 a copper content of 0.90 to 1.20 per cent is optional.

[f] For purposes of determining conformance with these specifications, the observed or calculated value for carbon content shall be rounded off to the nearest 0.01 per cent in accordance with the rounding-off method of the Recommended Practice for Indicating Which Places of Figures Are to Be Considered Significant in Specified Limiting Values (ASTM Designation: E 29).

TABLE III.—TENSILE REQUIREMENTS

Grade	CF-8	CG-12	CF-20	CF-8M	CF-8C	CF-16F and CF-16Fa	CH-20 and CH-10	CK-20	CE-30	CA-15 and CA-15M
Type	19 Chromium, 9 Nickel	22 Chromium, 12 Nickel	19 Chromium, 9 Nickel	19 Chromium, 10 Nickel, with Molybdenum	19 Chromium, 10 Nickel, with Columbium	19 Chromium, 9 Nickel, Free Machining	25 Chromium, 12 Nickel	25 Chromium, 20 Nickel	29 Chromium, 9 Nickel	12 Chromium
Tensile strength, min, psi	65 000	70 000	70 000	70 000	70 000	70 000	70 000[a]	65 000	80 000	90 000
Yield point, min, psi	28 000	28 000	30 000	30 000	30 000	30 000	30 000	28 000	40 000	65 000
Elongation in 2 in., min, per cent	35	35	30	30	30	25	30	30	10	18
Reduction of area, min, per cent	...	...	...	...	...	...	...	...	...	30

Grade	CB-30	CC-50	CA-40	CF-3	CF-3M	CG-8M	CN-7M	CW-12M	CY-40
Type	20 Chromium	28 Chromium	12 Chromium	19 Chromium, 9 Nickel	19 Chromium, 10 Nickel, with Molybdenum	19 Chromium, 11 Nickel, with Molybdenum	20 Chromium, 29 Nickel, with Copper and Molybdenum,	Nickel, Molybdenum, Chromium	Nickel, Chromium, Iron
Tensile strength, min, psi	65 000	55 000	100 000	65 000	70 000	75 000	62 500	72 000	70 000
Yield point, min, psi	30 000	...	70 000	28 000	30 000	35 000	25 000	46 000	28 000
Elongation in 2 in., min, per cent	....	...	15	35	30	25	35	4.0	30
Reduction of area, min, per cent	....	....	25	....	....	....	....	...	....

Grade	CZ-100	M-35	N-12M
Type	Nickel Alloy	Nickel-Copper Alloy	Nickel-Molybdenum Alloy
Tensile strength, min, psi	50 000	65 000	72 000
Yield point, min, psi	18 000	30 000[a]	46 000
Elongation in 2 in., min, per cent	10	25	6

[a] When adequate weldability is stipulated the silicon content may have to be lowered, in which case the minimum required yield strength shall be 26,000 psi.

TABLE I.—CHEMICAL REQUIREMENTS.

Grade	HF	HH	HI	HK	HE	HT	HU	HW	HX	HC	HD	HL	HN
Type	19 Chromium, 9 Nickel	25 Chromium, 12 Nickel	28 Chromium, 15 Nickel	25 Chromium, 20 Nickel	29 Chromium, 9 Nickel	15 Chromium, 35 Nickel	19 Chromium, 39 Nickel	12 Chromium, 60 Nickel	17 Chromium, 66 Nickel	28 Chromium,	28 Chromium, 5 Nickel	29 Chromium, 20 Nickel	20 Chromium, 25 Nickel
Carbon, per cent	0.20 to 0.40	0.20 to 0.50	0.20 to 0.50	0.20 to 0.60	0.20 to 0.50	0.35 to 0.75	0.35 to 0.75	0.35 to 0.75	0.35 to 0.75	0.50 max	0.50	0.20 to 0.60	0.20 to 0.50
Manganese, max, per cent	2.00	2 00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.50	2.00	2.00
Silicon, max, per cent	2.00	2.00	2.00	2.00	2.00	2.50	2.50	2.50	2.50	2.00	2.00	2.00	2.00
Phosphorus, max, per cent	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Sulfur, max, per cent	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Chromium, per cent	18.0 to 23.0	24.0 to 28.0	26.0 to 30.0	24.0 to 28.0	26.0 to 30.0	13.0 to 17.0	17.0 to 21.0	10.0 to 14.0	15.0 to 19.0	26.0 to 30.0	26.0 to 30.0	28.0 to 32.0	19.0 to 23.0
Nickel, per cent	8.0 to 12.0	11.0 to 14.0	14.0 to 18.0	18.0 to 22.0	8.0 to 11.0	33.0 to 37.0	37.0 to 41.0	58.0 to 62.0	64.0 to 68.0	4.00 max	4.0 to 7.0	18.0 to 22.0	23.0 to 27.0
Molybdenum, max, per cent[a]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50

[a] Castings having a specified molybdenum range agreed upon by the manufacturer and the purchaser may also be furnished under these specifications.

TABLE II.—PHYSICAL REQUIREMENTS.

Grade	HF	HH	HI	HK	HE	HT	HU	HW	HX	HC	HD	HL	HN
Type	19 Chromium, 9 Nickel	25 Chromium, 12 Nickel	28 Chromium, 15 Nickel	25 Chromium, 20 Nickel	29 Chromium, 9 Nickel	15 Chromium, 35 Nickel	19 Chromium, 39 Nickel	12 Chromium, 60 Nickel	17 Chromium, 66 Nickel	28 Chromium	28 Chromium, 5 Nickel	29 Chromium, 20 Nickel	20 Chromium, 25 Nickel
Tensile strength, min, psi	70 000	75 000	70 000	65 000	85 000	65 000	65 000	60 000	60 000	55 000	75 000	65 000	63 000
Yield point, min, psi	35 000	35 000	35 000	35 000	40 000	..	...	..	..	..	35 000	35 000	...
Elongation in 2 in., min, per cent	25	10	10	10	9	4	4	...	..	..	8	10	8

TABLE I.—CHEMICAL REQUIREMENTS.

	Type 1	Type 1b	Type 2	Type 2b	Type 3	Type 4	Type 5	Type 6
Carbon, total, max, per cent	3.00	3.00	3.00	3.00	2.60	2.60	2.40	3.00
Silicon, per cent	1.00 to 2.80	1.00 to 2.80	1.00 to 2.80	1.00 to 2.80	1.00 to 2.00	5.00 to 6.00	1.00 to 2.00	1.50 to 2.50
Manganese, per cent	1.00 to 1.50	1.00 to 1.50	0.80 to 1.50	0.80 to 1.50	0.40 to 0.80	0.40 to 0.80	0.40 to 0.80	0.80 to 1.50
Nickel, per cent	13.50 to 17.50	13.50 to 17.50	18.00 to 22.00	18.00 to 22.00	28.00 to 32.00	29.00 to 32.00	34.00 to 36.00	18.00 to 22.00
Copper, per cent	5.50 to 7.50	5.50 to 7.50	0.50 max	0.50 max	0.50 max	0.50 max	0.50 max	3.50 to 5.50
Chromium, per cent	1.75 to 2.50	2.50 to 3.50	1.75 to 2.50	3.00 to 6.00[a]	2.50 to 3.50	4.50 to 5.50	0.10 max	1.00 to 2.00
Sulfur, max, per cent	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Molybdenum, max, per cent	...	...	...	...	...	...	...	1.00

[a] Where some machining is required, the 3.00 to 4.00 per cent chromium range is recommended.

TABLE II.—MECHANICAL PROPERTIES.

	Type 1	Type 1b	Type 2	Type 2b	Type 3	Type 4	Type 5	Type 6
Tensile Strength, min, psi	25 000	30 000	25 000	30 000	25 000	25 000	20 000	25 000
Brinell Hardness (3000 kg)	131 to 183	149 to 212	118 to 174	171 to 248	118 to 159	149 to 212	99 to 124	124 to 174

TABLE I.—CHEMICAL REQUIREMENTS.

Type	D-2[a]	D-2B	D-2C	D-3[a]	D-3A	D-4	D-5	D-5B
Total carbon, max, per cent	3.00	3.00	2.90	2.60	2.60	2.60	2.40	2.40
Silicon, per cent	1.50 to 3.00	1.50 to 3.00	1.00 to 3.00	1.00 to 2.80	1.00 to 2.80	5.00 to 6.00	1.00 to 2.80	1.00 to 2.80
Manganese, per cent	0.70 to 1.25	0.70 to 1.25	1.80 to 2.40	1.00 max[b]	1.00 max[b]	1.00 max[b]	1.00 max[b]	1.00 max[b]
Phosphorus, max, per cent	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Nickel, per cent	18.00 to 22.00	18.00 to 22.00	21.00 to 24.00	28.00 to 32.00	28.00 to 32.00	28.00 to 32.00	34.00 to 36.00	34.00 to 36.00
Chromium, per cent	1.75 to 2.75	2.75 to 4.00	0.50 max[b]	2.50 to 3.50	1.00 to 1.50	4.50 to 5.50	0.10 max	2.00 to 3.00

[a] Additions of 0.7 to 1.0 per cent of molybdenum will increase the mechanical properties above 800 F.

[b] Not intentionally added.

TABLE II.—MECHANICAL PROPERTIES.

Type	D-2	D-2B	D-2C	D-3	D-3A	D-4	D-5	D-5B
Tensile strength, min, psi	58 000	58 000	58 000	55 000	55 000	60 000	55 000	55 000
Yield strength (0.2 per cent offset), min, psi	30 000	30 000	28 000	30 000	30 000	...	30 000	30 000
Elongation in 2 in., min, per cent	8.0	7.0	20.0	6.0	10.0	...	20.0	6.0
Brinell hardness (3000 kg)	139 to 202	148 to 211	121 to 171	139 to 202	131 to 193	202 to 273	131 to 185	139 to 193

APPENDIX

TABLE I – CHEMICAL ELEMENTS AND THEIR SYMBOLS

Name	Symbol	Name	Symbol
Aluminum	Al	Mercury	Hg
Antimony	Sb	Molybdenum	Mo
Argon	A	Neodymium	Nd
Arsenic	As	Neon	Ne
Barium	Ba	Nickel	Ni
Beryllium	Be	Nitrogen	N
Bismuth	Bi	Osmium	Os
Boron	B	Oxygen	O
Bromine	Br	Palladium	Pd
Cadmium	Cd	Phosphorus	P
Calcium	Ca	Platinum	Pt
Caesium	Cs	Potassium	K
Carbon	C	Praseodymium	Pr
Cerium	Ce	Radium	Ra
Chlorine	Cl	Radon	Rn
Chromium	Cr	Rhodium	Rh
Cobalt	Co	Rubidium	Rb
*Columbium	Cb	Ruthenium	Ru
Copper	Cu	Samarium	Sa
Dysprosium	Dy	Scandium	Sc
Erbium	Er	Selenium	Se
Europium	Eu	Silicon	Si
Fluorine	F	Silver	Ag
Gadolinium	Gd	Sodium	Na
Gallium	Ga	Strontium	Sr
Germanium	Ge	Sulfur	S
Gold	Au	Tantalum	Ta
Hafnium	Hf	Tellurium	Te
Helium	He	Terbium	Tb
Holmium	Ho	Thalium	Tl
Hydrogen	H	Thorium	Th
Indium	In	Thulium	Tm
Iodine	I	Tin	Sn
Iridium	Ir	Titanium	Ti
Iron	Fe	† Tungsten	W
Krypton	Kr	Uranium	U
Lanthanum	La	Vanadium	V
Lead	Pb	Xenon	Xe
Lithium	Li	Ytterbium	Yb
Lutecium	Lu	Yttrium	Y
Magnesium	Mg	Zinc	Zn
Manganese	Mn	Zirconium	Zr

*Columbium = Niobium

† Tungsten = Wolfram

TABLE II—PHYSICAL CONSTANTS OF THE PRINCIPAL ALLOY FORMING ELEMENTS

Element	At. Wt.	M P, °F	B P, °F	Density, g/cc	Atomic Volume	Linear coef thermal expansion per °C $\times 10^{-6}$, 0°-100°C	Sp. Ht, cal/g/°C at room temp.	Thermal cond. cal/cc/°C at room temp.	Electrical resistivity, microhms/cc	Crystallization shrinkage, %	Young's modulus, lb/sq in. $\times 10^{6}$
Aluminum	27.0	1220	3,272	2.70	10.0	23.1 (25-100° C)	0.21	0.48	2.83 (20° C)	6.6	10
Antimony	120.2	1166	2,624	6 69	18.0	10.5	0.05	0.043	38.6 (0° C)	1.4	11
Arsenic	74.96	1562	680	5.73	13.1	5.0	0 08	.....	35 (0° C)	...	.
Beryllium	9.1	2336	5,020	1.85	4.9	12.4	0.425	0.385	4.3 (20° C)	...	42.7
Bismuth	209.0	519 8	2,606	9.75	21.4	13 2	0.03	0.019	119 (0° C)	—3.3	4.6
Cadmium	112.4	609 6	1,432	8.64	13.0	31.6	0.055	0.22	7.54 (18° C)	4.7	10
Calcium	40.07	1490	....	1.54	26.0	....	0.16	.....	....	...	..
Carbon	12 005	.....	6,512	...	....						
Diamond	...	....	.. .	3.52	3.42	1.18	0.11	. ...	....	..	..
Graphite	....	....	...	2.25	5.35	7.86	0.16	0.04	....	..	..
Cerium	140 25	1184	.....	6.79	20.6	...	0.045	.....	....	...	..
Chromium	52.0	2939	3,992	6.92	7 5	...	0.105	.....	2.6 (0° C)	...	..
Cobalt	58.97	2631	...	8 71	6 8	12 36	0.10	.....	9.7 (20° C)	...	..
Copper	63.57	1981	4,190	8.93	7 15	16 8 (25-100° C)	0.091	0 92	1.7241 (20° C)	4.0	17.8
Gold	197.2	1945	...	19.32	10.2	13.8 (25-100° C)	0.032	0.70	2.42 (18° C)	5.2	11.1
Indium	114.8	311	....	7 28	15.8	...	0 057	.....	...	...	..
Iridium	193.1	4262	.....	22.42	8.6	..	0.030	0.14	6.1 (0° C)	...	..
Iron	55.84	2786	4,442	7.88	7 1	11.7	0 102	0.16	10.6 (25° C)	...	30
Lead	207 20	621	2,777	11 34	18.3	27 09	0.030	0.083	2.04 (0° C)	3.4	..
Lithium	6 94	366.8	2,552	0.534	13.0	...	0.83	.....	...	...	..
Magnesium	24 32	1202	2,048	1.74	14.0	25.8	0.24	0 38 (0-100° C)	4.35 (0° C)	4.2	6.25
Manganese	54.93	2246	3,452	7 42	7.4	..	0.11	.....	5	...	..
Mercury	200.6	—37 9	675	13 6	14.7	..	0.033	0.015 (0° C)	95 74 (20°C)	3.75	..
Molybdenum	96.0	4757	6,512	10.3	9.3	5.32 (20° C)	0.063	0.35	5 5 (27° C)	...	..
Nickel	58.68	2645 6	.. .	8.9	6.7	13.2 (25-100° C)	0.102	0.14	6.93 (20° C)	...	30
Osmium	190.9	4892	..	22.5	8 5	....	0.031	. ...	....	..	..
Palladium	106.7	2822	..	12 16	8 8	11.76	0.055	0.17	10.2 (0° C)	.	..
Phosphorus.	31 04	111	554	1.83	17 0	125 3 (0-40° C)	0.18	....	....	...	..
Platinum	195 2	3191	7,070	21.37	9 1	8.99	0.030	0.17	10.96 (0° C)	...	23.5
Rhodium	102.9	3542	..	12.44	8 3	..	0 058	....	....	...	..
Ruthenium	101.7	4442	. ..	12.06	8 4	.. .	0.061	. ..	. ..	..	..
Silicon	28.1	2588	..	2 42	11.6	7 63	0.17	.....	58	...	.
Silver	107 88	1761	3,551	10.53	10.2	19.21	0 054	1.00	1.63 (18° C)	5.0	10.3
Tantalum	181 5	5252	....	16 6	10.9	..	0.035	0 13	14.6	. .	..
Thorium	232.15	3092	.....	12 16	19.1	...	0.028	....	....	...	..
Tin	118 7	449	4,118	7.3	16 3	22.96	0.053	0.15	13.0 (0° C)	2.8	5.9
Titanium	48 1	3272	....	4.5	10.7	...	0.10	.....	3 2	. .	..
Tungsten	184.0	6152	10,526	19 3	9.5	4.44 (27° C)	0.034	0.48	5 6 (20° C)	...	60
Uranium	238.2	3362	.....	18.7	12.7	....	0.029	.....	....	...	..
Vanadium	51.0	3128	....	6.0	8.5	....	0.11	.....	...	...	..
Zinc	65.37	787	1,706	7.14	9 1	29.76	0.088	0.26	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	3090		6 4	14 1		[illegible]				

TABLE III – WEIGHTS OF ALLOYS AND METALS

Alloys and Metals	Pounds per cu. ft.	Pounds per cu. in.
Aluminum	163	0.0943
Aluminum and Tin:		
Al 91%, Sn 9%	178	0.103
Aluminum, Copper, and Tin:		
Al 85%, Cu 7.5%, Sn 7.5%	188	0.1087
Al 6.25%, Cu 87.5%, Sn 6.25%	459	0.2656
Al 5%, Cu 5%, Sn 90%	425	0.2459
Aluminum and Magnesium:		
Al 70%, Mg 30%	125	0.0723
Aluminum and Zinc:		
Al 91%, Zn 9%	175	0.1012
Antimony	419	0.2424
Babbitt Alloy	454	0.2627
Bismuth	611	0.3535
Bismuth, Lead, and Tin:		
Bi 53%, Pb 40%, Sn 7%	659	0.3813
Wood's Metal:		
Bi 50%, Pb 25%, Cd 12.5%, Sn 12.5%	605	0.3501
Brass:		
Cu 90%, Zn 10%	536	0.3101
Cu 70%, Zn 30%	527	0.3049
Cu 60%, Zn 40%	521	0.3015
Cu 50%, Zn 50%	511	0.2957
Bronze:		
Cu 90%, Sn 10%	548	0.3171
Cu 85%, Sn 15%	555	0.3211
Cu 80%, Sn 20%	545	0.3153
Cu 75%, Sn 25%	551	0.3188
Cu 90%, Al 10%	480	0.2777
Cu 95%, Al 5%	522	0.3020
Cu 97%, Al 3%	542	0.3136
Bronze, Phosphorus, Average	537	0.3107
Bronze, Tobin, Average	503	0.291
Cadmium and Tin:		
Cd 32%, Sn 68%	480	0.2777
Chromium	436	0.2523
Cobalt	533	0.3084
Copper	557	0.3223
Copper and Nickel:		
Cu 60%, Ni 40%	554	0.3206
German Silver:		
Cu 60%, Zn 20%, Ni 20%	530	0.3607
Cu 52%, Zn 26%, Ni 22%	527	0.3049
Cu 59%, Zn 30%, Ni 11%	520	0.3009
Cu 63%, Zn 30%, Ni 7%	518	0.2997
Gold	1208	0.699
Gold and Copper:		
Au 98%, Cu 2%	1176	0.6805
Au 90%, Cu 10%	1071	0.6197
Au 86%, Cu 14%	1027	0.5943
Gun metal, Average	544	0.3148
Iridium	1396	0.8078
Iron, Cast	450	0.2604
Iron, Wrought	480	0.2777
Lead	708	0.4097
Lead and Antimony:		
Pb 30%, Sb 70%	450	0.2604
Pb 37%, Sb 63%	460	0.2662
Pb 44%, Sb 56%	475	0.2748
Pb 63%, Sb 37%	514	0.2974

TABLE III (CONTINUED) – WEIGHTS OF ALLOYS AND METALS

Alloys and Metals	Pounds per cu. ft.	Poun per cu. i
Lead and Antimony (cont'd):		
Pb 83%, Sb 17%	596	0.3449
Pb 90%, Sb 10%	658	0.3807
Lead and Bismuth:		
Bi 67%, Pb 33%	639	0.3697
Bi 50%, Pb 50%	656	0.3796
Bi 33%, Pb 67%	682	0.3946
Bi 25%, Pb 75%	697	0.4033
Bi 17%, Pb 83%	702	0.4062
Bi 12%, Pb 88%	703	0.4068
Lead and Tin:		
Pb 87.5%, Sn 12.5%	661	0.3825
Pb 84%, Sn 16%	644	0.3726
Pb 63.7%, Sn 36.3%	588	0.3402
Pb 46.7%, Sn 53.3%	545	0.3153
Pb 30.5%, Sn 69.5%	514	0.2974
Magnesium	109	0.063
Manganese	499	0.2887
Manganese, Copper, and Nickel:		
Mn 12%, Cu 84%, Ni 4%	530	0.3067
Mercury	849	0.4913
Nickel	550	0.3182
Osmium	1402	0.8113
Palladium	712	0.412
Platinum	1344	0.7777
Platinum and Iridium:		
Pt 90%, Iridium 10%	1348	0.780
Rhodium	755	0.4369
Ruthenium	765	0.4427
Silver	654	0.3784
Steel, Cast	490	0.2835
Tin	460	0.2662
Tin and Antimony:		
Sn 50%, Sb 50%	424	0.2453
Sn 75%, Sb 25%	442	0.2557
Tin and Bismuth:		
Bi 78%, Sn 22%	587	0.3396
Bi 63%, Sn 37%	570	0.3298
Bi 50%, Sn 50%	546	0.3159
Bi 37%, Sn 63%	530	0.3067
Bi 22%, Sn 78%	504	0.2916
Tin and Lead:		
Sn 97%, Pb 3%	456	0.2638
Sn 89%, Pb 11%	475	0.2748
Sn 80%, Pb 20%	487	0.2818
Sn 67%, Pb 33%	512	0.2962
Sn 50%, Pb 50%	550	0.3182
Titanium	224	0.1296
Tungsten	1078.7	0.6242
Zinc	437	0.2528

TABLE IV — STRENGTH — CONVERSION TABLE

Kilograms per square millimeter to pounds per square inch
1 kg. per sq. mm. = 1442.34 lbs. per sq. inch.

0	1	2	3	4	5	6	7	8	9
......	1422	2845	4267	5689	7112	8534	9956	11379	12801
14223	15646	17068	18490	19913	21335	22757	24180	25602	27024
28447	29869	31291	32714	34146	35559	36981	38403	39826	41248
42670	44093	45515	46937	48360	49782	51204	52627	54049	55471
56894	58316	59738	61161	62583	64005	65428	66850	68272	69691
71117	72539	73962	75384	76806	78229	79651	81073	82496	83915
85340	86763	88185	89607	91030	92452	93874	95297	96719	88148
99564	100986	102408	103831	105253	106676	108098	109520	110943	112365
113787	115210	116632	118054	119477	120899	122321	123744	125166	126588
12801'	129433	130855	132278	133700	135122	136545	137967	139389	140812

Thousands of pounds per square inch to kilograms per square millimeter
1000 lbs. per sq. inch = 0.70307 kg. per sq mm.

0	1	2	3	4	5	6	7	8	9
......	0.70	1.41	2.11	2.81	3.52	4.2.	4.92	5.62	6.35
7.03	7.73	8.44	9.14	9.84	10.55	11.25	11.95	12.66	13.36
14.06	14.76	15.47	16.17	16.87	17.58	18.28	18.98	19.69	20.39
21.09	21.80	22.50	23.20	23.90	24.61	25.31	26.01	26.72	27.42
28.12	28.83	29.53	30.23	30.93	31.64	32.34	33.04	33.75	34.45
35.15	35.86	36.56	37.26	37.97	38.67	39.37	40.07	40.78	41.48
42.18	42.89	43.59	44.29	45.00	45.70	46.40	47.11	47.81	48.51
49.21	49.92	50.62	51.32	52.03	52.73	53.43	54.14	54.84	55.54
56.25	56.95	57.65	58.35	59.06	59.76	60.46	61.17	61.87	62.57
63.28	63.98	64.68	65.39	66.09	66.79	67.49	68.20	68.90	69.60

Kilograms per square millimeter to tons per square inch
1 kg. per sq. mm = 0.635 ton per sq. inch

0	1	2	3	4	5	6	7	8	9
......	0.64	1.27	1.91	2.54	3.18	3.81	.45	5.08	5.72
6.35	6.99	7.62	8.26	8.89	9.53	10.16	1.80	11.43	12.07
12.70	13.34	13.97	14.61	15.24	15.88	16.51	1 15	17.78	18.41
19.05	19.68	20.32	20.95	21.59	22.22	22.86	2.49	24.13	24.76
25.40	26.03	26.67	27.30	27.94	28.57	29.21	29.84	30.48	31.11
31.75	32.38	33.02	33.65	34.29	34.92	35.56	36.19	36.83	37.46
38.10	38.73	39.37	40.00	40.64	41.27	41.91	42.54	43.18	43.81
44.45	45.08	45.72	46.35	46.99	47.62	48.26	48.9	49.53	50.16
50.80	51.43	52.07	52.70	53.34	53.97	54.61	55.4	55.88	56.51
57.15	57.78	58.42	59.05	59.69	60.32	60.96	61.	62.23	62.86

Tons per square inch to kilograms per square millimete
1 ton per sq. inch = 1.57487 kg. per sq. mm.

0	1	2	3	4	5	6	7	8	9
......	1.57	3.15	4.72	6.30	7.87	9.45	11.02	12.60	14.17
15.75	17.32	18.90	20.47	22.05	23.62	25.20	26.77	28.35	29.92
31.50	33.07	34.65	36.22	37.80	39.37	40.95	42.52	44.10	45.67
47.25	48.82	50.42	51.97	53.54	55.12	56.69	58.27	59.84	61.42
62.99	64.57	66.15	67.72	69.29	70.87	72.44	74.02	75.59	77.17
78.74	80.32	81.89	83.47	85.04	86.62	88.19	89.77	91.34	92.92
94.49	96.07	97.64	99.22	100.79	102.37	103.94	105.52	07.09	108.67
110.24	111.82	113.39	114.97	116.54	118.11	119.69	121.26	2.84	124.41
125.99	127.56	129.14	130.71	142.29	133.86	133.44	137.01	8.59	140.16
141.74	143.31	144.89	146.46	148.04	149.61	151.19	152.76	4.33	155.91

TABLE V – TEMPERATURE CONVERSION TABLE

Degrees Centigrade to Degrees Fahrenheit

°C	0	10	20	30	40	50	60	70	80	90
-200	-328	-346	-364	-382	-400	-418	-436	-454		
-100	-148	-166	-184	-202	-220	-238	-256	-274	-292	-310
-0	32	14	-4	-22	-40	-58	-76	-94	-112	-130
0	32	50	68	86	104	122	140	158	176	194
100	212	230	248	266	284	302	320	338	356	374
200	392	410	428	446	464	482	500	518	536	554
300	572	590	608	626	644	662	680	698	716	734
400	752	770	788	806	824	842	860	878	896	914
500	932	950	968	986	1004	1022	1040	1058	1076	1094
600	1112	1130	1148	1166	1184	1202	1220	1238	1256	1274
700	1292	1310	1328	1346	1364	1382	1400	1418	1436	1454
800	1472	1490	1508	1526	1544	1562	1580	1598	1616	1634
900	1652	1670	1688	1706	1724	1742	1760	1778	1796	1814
1000	1832	1850	1868	1886	1904	1922	1940	1958	1976	1994
1100	2012	2030	2048	2066	2084	2102	2120	2138	2156	2174
1200	2192	2210	2228	2246	2264	2282	2300	2318	2336	2354
1300	2372	2390	2408	2426	2444	2462	2480	2498	2516	2534
1400	2552	2570	2588	2606	2624	2642	2660	2678	2696	2714
1500	2732	2750	2768	2786	2804	2822	2840	2858	2876	2894
1600	2912	2930	2948	2966	2984	3002	3020	3038	3056	3074
1700	3092	3110	3128	3146	3164	3182	3200	3218	3236	3254
1800	3272	3290	3308	3326	3344	3362	3380	3398	3416	3434
1900	3452	3470	3488	3506	3524	3542	3560	3578	3596	3614
2000	3632	3650	3668	3686	3704	3722	3740	3758	3776	3794
2100	3812	3830	3848	3866	3884	3902	3920	3938	3956	3974
2200	3992	4010	4028	4046	4064	4082	4100	4118	4136	4154
2300	4172	4190	4208	4226	4244	4262	4280	4298	4316	4334
2400	4352	4370	4388	4406	4424	4442	4460	4478	4496	4514
2500	4532	4550	4568	4586	4604	4622	4640	4658	4676	4694
2600	4712	4730	4748	4766	4784	4802	4820	4838	4856	4874
2700	4892	4910	4928	4946	4964	4982	5000	5018	5036	5054
2800	5072	5090	5108	5126	5144	5162	5180	5198	5216	5234
2900	5252	5270	5288	5306	5324	5342	5360	5378	5396	5414
3000	5432	5450	5468	5486	5504	5522	5540	5558	5576	5594
3100	5612	5630	5648	5666	5684	5702	5720	5738	5756	5774
3200	5792	5810	5828	5846	5864	5882	5900	5918	5936	5954
3300	5972	5990	6008	6026	6044	6062	6080	6098	6116	6134
3400	6152	6170	6188	6206	6224	6242	6260	6278	6296	6314
3500	6332	6350	6368	6386	6404	6422	6440	6458	6476	6494
3600	6512	6530	6548	6566	6584	6602	6620	6638	6656	6674
3700	6692	6710	6728	6746	6764	6782	6800	6818	6836	6854
3800	6872	6890	6908	6926	6944	6962	6980	6998	7016	7034
3900	7052	7070	7088	7106	7124	7142	7160	7178	7196	7214
°C	0	10	20	30	40	50	60	70	80	90

$°F = °C \times 9/5 + 32$

TABLE V – TEMPERATURE CONVERSION TABLE
Degrees Fahrenheit to Degrees Centigrade

°F	0	10	20	30	40	50	60	70	80	90
-400	-240	-246	-251	-257	-262	-268	-273			
-300	-184	-190	-196	-201	-207	-212	-218	-223	-229	-234
-200	-129	-134	-140	-146	-151	-157	-162	-168	-173	-179
-100	-73	-79	-84	-90	-96	-101	-107	-112	-118	-123
-0	-18	-23	-29	-34	-40	-46	-51	-57	-62	-68
0	-18	-12	-7	-1	4	10	16	21	27	32
100	38	43	49	54	60	66	71	77	82	88
200	93	99	104	110	116	121	127	132	138	143
300	149	154	160	166	171	177	182	188	193	199
400	204	210	216	221	227	232	238	243	249	254
500	260	266	271	277	282	288	293	299	304	310
600	316	321	327	332	338	343	349	354	360	366
700	371	377	382	388	393	399	404	410	416	421
800	427	432	438	443	449	454	460	466	471	477
900	482	488	493	499	504	510	516	521	527	532
1000	538	543	549	554	560	566	571	577	582	588
1100	593	599	604	610	616	621	627	632	638	643
1200	649	654	660	666	671	677	682	688	693	699
1300	704	710	716	721	727	732	738	743	749	754
1400	760	766	771	777	782	788	793	799	804	810
1500	816	821	827	832	838	843	849	854	860	866
1600	871	877	882	888	893	899	904	910	916	921
1700	927	932	938	943	949	954	960	966	971	977
1800	982	988	993	999	1004	1010	1016	1021	1027	1032
1900	1038	1043	1049	1054	1060	1066	1071	1077	1082	1088
2000	1093	1099	1104	1110	1116	1121	1127	1132	1138	1143
2100	1149	1154	1160	1166	1171	1177	1182	1188	1193	1190
2200	1204	1210	1216	1221	1227	1232	1238	1243	1249	1254
2300	1260	1266	1271	1277	1282	1288	1293	1299	1304	1310
2400	1316	1321	1327	1332	1338	1343	1349	1354	1360	1366
2500	1371	1377	1382	1388	1393	1399	1404	1410	1416	1421
2600	1427	1432	1438	1443	1448	1454	1460	1466	1471	1477
2700	1482	1488	1493	1499	1508	1510	1516	1521	1527	1532
2800	1538	1543	1549	1554	1560	1566	1571	1577	1582	1588
2900	1593	1599	1604	1610	1616	1621	1627	1632	1638	1643
3000	1649	1654	1660	1666	1671	1677	1682	1688	1693	1699
3100	1704	1710	1716	1721	1727	1732	1738	1743	1749	1754
3200	1760	1766	1771	1777	1782	1788	1793	1799	1804	1810
3300	1816	1821	1827	1832	1838	1843	1849	1854	1860	1866
3400	1871	1877	1882	1888	1893	1899	1904	1910	1916	1921
3500	1927	1932	1938	1943	1949	1954	1960	1966	1971	1977
3600	1982	1988	1993	1999	2004	2010	2016	2021	2027	2032
3700	2038	2043	2049	2054	2060	2066	2071	2077	2082	2088
3800	2093	2099	2104	2110	2116	2121	2127	2132	2138	2143
3900	2149	2154	2160	2166	2171	2177	2182	2188	2193	2199
°F	0	10	20	30	40	50	60	70	80	90

°C = 5/9 (°F - 32)

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